UPDATED DRAFT SCREENING-LEVEL ECOLOGICAL RISK ASSESSMENT (SLERA) FOR THE GULFCO MARINE MAINTENANCE SUPERFUND SITE FREEPORT, TEXAS

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1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) named the former site of Gulfco Marine Maintenance, Inc. (the Site) in Freeport, Brazoria County, Texas to the National Priorities List (NPL) in May 2003. The EPA issued a modified Unilateral Administrative Order (UAO), effective July 29, 2005, which was subsequently amended effective January 31, 2008. The UAO required the Respondents to conduct a Remedial Investigation and Feasibility Study (RI/FS) for the Site. The Statement of Work (SOW) for the RI/FS at the Site, provided as an Attachment to the UAO from the EPA, requires an Ecological Risk Assessment (ERA). The SOW specifies that the Respondents follow EPA's *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA, 1997). This guidance document proposes an eight-step approach for conducting a scientifically-defensible ERA:

1. Screening-Level Problem Formulation and Ecological Effects Evaluation;
2. Screening-Level Preliminary Exposure Estimate and Risk Calculation;
3. Baseline Risk Assessment Problem Formulation;
4. Study Design and Data Quality Objectives;
5. Field Verification of Sampling Design;
6. Site Investigation and Analysis of Exposure and Effects;
7. Risk Characterization; and
8. Risk Management.

Briefly, Steps 1 and 2 of the process are scoping phases of the ERA in which existing information is reviewed to preliminarily identify the ecological components that are potentially at risk, the chemicals of potential ecological concern (COPECs), and the transport and exposure pathways that are important to the ERA. This process is conducted using conservative assumptions to avoid underestimating risk or omitting receptors or COPECs, and constitutes the Screening-Level Ecological Risk Assessment (SLERA). Step 3 is the Baseline Problem Formulation that uses the results of the SLERA to identify methods for risk analysis and characterization, resulting in the identification of ERA data needs for the RI/FS. Steps 4 through 7 include formalization of the data needs, data collection, and data analysis for the risk characterization. Risk management activities are the eighth step in the process.

Steps 1 and 2 were performed through the submittal of an initial SLERA based on pre-RI data to EPA on November 17, 2005, as outlined in the SOW. The initial SLERA recommended collecting additional data to better characterize the nature and extent of contamination and potential risks associated with the Site. These data needs were identified in the RI/FS Work Plan (PBW, 2006a), which was approved with modifications by EPA on May 4, 2006 and finalized on May 16, 2006. Data needs were based on the preliminary conceptual site models (CSMs) provided in the Work Plan. Identification of COPECs for the baseline ecological risk assessment (BERA), which was one of the primary objectives of the initial SLERA, is based on maximum soil and sediment concentrations exceeding risk-based criteria. However, given the limited data available for the Site when the initial SLERA was conducted, eliminating COPECs from further evaluation or determining those that do required further evaluation could not be performed at that time.

As discussed at the August 4, 2005 Project Scoping Meeting and provided for in the RI/FS Work Plan, the SLERA and the resulting Scientific Management Decision Point (SMDP) were to be re-evaluated after the complete database of soil, sediment, and surface water samples collected during the RI was available. A Draft Nature and Extent Data Report (NEDR) providing these data was submitted to EPA on March 2, 2009 and was approved with modifications by EPA on April 29, 2009. The Final NEDR (PBW, 2009), which incorporated the requested modifications, was submitted to EPA on May 20, 2009. This updated SLERA presents a re-evaluation of the November 16, 2005 SLERA (PBW, 2005) and is based on the data presented in the NEDR (PBW, 2009).

1.1 PURPOSE AND SCOPE

The purpose and scope of this document is to summarize the analytical data for environmental media sampled during the RI and to conduct an updated SLERA based on those data. The SLERA is a conservative assessment and serves to evaluate the need and, if required, the level of effort necessary to conduct a baseline ecological risk assessment. Per EPA guidance (EPA, 2001), the SLERA provides a general indication of the potential for ecological risk (or lack thereof) and may be conducted for several purposes including: 1) to estimate the likelihood that a particular ecological risk exists; 2) to identify the need for site-specific data collection efforts; or 3) to focus site-specific ecological risk assessments where warranted.

This report concludes with an updated SMDP, which provides documentation for whether further assessment (i.e., proceeding with the baseline ecological risk assessment) is necessary, and helps guide the next phases of evaluation, if necessary.

1.2 SITE SETTING AND HISTORY

The Site is located in Freeport, Texas in Brazoria County at 906 Marlin Avenue (also referred to as County Road 756). The Site consists of approximately 40 acres within the 100-year coastal floodplain along the north bank of the Intracoastal Waterway between Oyster Creek to the east and the Old Brazos River Channel to the west. Figure 1 provides a map of the site vicinity, while Plate 1 provides a detailed site map and shows site features and sampling locations.

During the 1960s, the Site was used for occasional welding but there were no on-site structures (Losack, 2005). According to the Hazard Ranking Score Documentation (TNRCC, 2002), from 1971 through 1999, at least three different owners used the Site as a barge cleaning facility. Beginning in approximately 1971, barges were brought to the facility and cleaned of waste oils, caustics and organic chemicals, with these products stored in on-site tanks and later sold (TNRCC, 2002). Sandblasting and other barge repair/refurbishing activities also occurred on the Site. At times during the operation, wash waters were stored either on a floating barge, in on-site storage tanks, and/or in surface impoundments on Lot 56 of the Site. The surface impoundments were closed under the Texas Water Commission's (TCEQ predecessor agency) direction in 1982 (Carden, 1982).

Marlin Avenue divides the Site into two areas. For the purposes of this report, it is assumed that Marlin Avenue runs due west to east. The property to the north of Marlin Avenue (the North Area) consists of undeveloped land and the closed surface impoundments, while the property south of Marlin Avenue (the South Area) was developed for industrial uses with multiple structures, a dry dock, sand blasting areas, an aboveground storage tank (AST) tank farm that is situated on a concrete pad with a berm, and two barge slips connected to the Intracoastal Waterway.

The South Area is zoned as "W-3, Waterfront Heavy" by the City of Freeport. This designation provides for commercial and industrial land use, primarily port, harbor, or marine-related activities. The North Area is zoned as "M-2, Heavy Manufacturing."

Adjacent property to the north, west and east of North Area is unused and undeveloped. Adjacent property to the east of the South Area is currently used for industrial purposes while the property directly to the west of the property is currently vacant and previously served as a commercial marina. The Intracoastal Waterway bounds the Site to the south. Residential areas are located south of Marlin Avenue, approximately 300 feet west of the Site, and 1,000 feet east of the Site.

2.0 SCREENING-LEVEL PROBLEM FORMULATION AND ECOLOGICAL EFFECTS EVALUATION (STEP 1)

Problem formulation establishes the goals, scope and focus of the SLERA by describing the physical features of the site, the communities of potential receptors present at the site, the selection of assessment and measurement endpoints, and potential exposure pathways. This information serves as the basis for the conceptual site model, which is used to focus the remaining steps of the SLERA.

2.1 ENVIRONMENTAL SETTING

The Site is located between Galveston and Matagorda Bays and is situated along approximately 1200 feet (ft.) of shoreline on the Intracoastal Waterway. The Intracoastal Waterway is a coastal shipping canal that extends from Port Isabel to West Orange on the Texas Gulf Coast and is a vital corridor for the shipment of bulk materials and chemicals. It is the third busiest shipping canal in the United States, and along the Texas coast carries an average of 60 to 90 million tons of cargo each year (TxDOT, 2001). Of the cargo carried between Galveston and Corpus Christi, TX, 49 percent is comprised of petroleum and petroleum products and 38 percent is comprised of chemicals and related products. Approximately 50,000 trips were made by vessels making the passage through the Intracoastal Waterway between Galveston and Corpus Christi, TX in 2006 (USACE, 2006).

The South Area includes approximately 20 acres of upland that were created from dredged material from the Intracoastal Waterway. Prior to construction of the Intracoastal Waterway, this area was most likely coastal wetlands. The North Area, excluding the capped impoundments and access roads, is considered estuarine wetland (USFWS, 2008). The North Area consists of approximately five acres of upland, which supports a variety of herbaceous vegetation that is tolerant of drier soil conditions, while the North wetlands is approximately 15 acres in size.

2.1.1 Terrestrial Areas

According to the United States Department of Agriculture (USDA) County Soils Maps (USDA, 1981), surface soils south of Marlin Avenue are classified as Surfside clays, and soils north of the road are classified as Velasco clays. Both soils are listed on the state and federal soils lists as

hydric soils. The Velasco series consists of very deep, nearly level, very poorly drained saline soils. These soils formed in thick recent clayey sediments near the mouth of major rivers and streams draining into the Gulf of Mexico. They occur on level to slightly depressed areas near sea level and are saturated most of the year. Slope is less than one percent. The Surfside series consists of very deep, very poorly drained, saline soils that formed in recent clayey coastal sediments. They are saturated most of the year, and are on level to depressed areas near sea level with a slope less than one percent. It should be noted, however, that during drought periods, much of the wetlands area north of the Site is dry and desiccated, with standing water confined to very limited, localized areas.

Much of the South Area is covered with concrete slabs associated with former structures or Site operations. Because of the former industrial operations, the South Area contains very few areas of undisturbed terrestrial or upland habitat. Little resident wildlife has been observed at the South Area. During field work, nests were noted on some of the vertical structures at the Site.

The approximately five acres of terrestrial or upland habitat at the North area was created during previous operations at the Site. The five acres has developed some vegetation because plants have grown in some areas of the oyster-shell covered parking lot and former surface impoundments cap.

2.1.2 North Area Wetlands

There are two ponds on the North Area, located east of the former surface impoundments (Plate 1). The larger of the two ponds is called the Fresh Water Pond while the other pond is referred to as the Small Pond. It should be noted, however, that based on field measurements of specific conductance and salinity, the water in the Fresh Water Pond is brackish while water in the Small Pond is less brackish (but is not fresh water). The Fresh Water Pond water depth is generally 4 to 4.5 feet. The Small Pond is a shallow depression that tends to dry out during summer months and periods of drought; the water depth was approximately 0.2 feet when sampled in July 2006 and nearly dry when sampled in June 2008.

Based on field observations, the wetland in the North Area appears tidally influenced. Figure 2 depicts wetlands areas in the Site vicinity. Wetlands are the transitional zones between uplands and aquatic habitats and usually include elements of both. The wetlands at the Site are typical of

irregularly flooded tidal marshes on the Texas Gulf Coast. The lower areas in the northern half of the property are dominated by obligate and facultative wetland vegetation such as saltwort (*Batis maritima*), sea-oxeye daisy (*Borrichia frutescens*), shoregrass (*Monanthocloe littoralis*), Carolina wolf berry (*Lycium caroliniaum*), spike sedge (*Eleocharis sp.*), and glasswort (*Salicornia bigelovii*). Higher ground near the road supports facultative wetland vegetation such as eastern bacchari (*Baccharis halimifolia*), sumpweed (*Iva frutescens*), and wiregrass (*Spartina patens*). Near Marlin Avenue, there are several shallow depressions that apparently collect and hold enough freshwater to allow homogenous stands of saltmarsh bulrush (*Schoenoplectus robustus*) to develop.

The high marsh, or supra-tidal zone, is the driest part of the coastal marsh habitat and supports far fewer invertebrate species. Due to the irregularity of flooding in the high marsh, there are no filter feeding bivalves or worms. Rather, the worms, amphipods, and isopods that live in the high marsh sediment are detritivores, direct deposit feeders, or predators. The crabs that live in the high marsh live in burrows that are excavated to groundwater, allowing them to keep their gills moist. Most crab species only return to the water to lay their eggs.

The North Area supports wildlife that would be common in a Texas coastal marsh. Fiddler crabs (*Uca rapax*) are likely the most abundant crustacean in the North Area. Other crustaceans found at the Site were fiddler crabs (*Uca panacea*), and hermit crabs (*Clibanarius vittatus*). The most common gastropod is the marsh periwinkle (*Littorina irrorata*). The Site is also used by a variety of shorebirds. Birds observed at the Site include the great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), green heron (*Butorides striatus*), white ibis (*Eudocimus albus*), glossy ibis (*Plegadis falcinellus*), and willet (*Catoptrophorus semipalmatus*). The Site provides suitable habitat for rails, sora, and gallinules and moorhens, and may also be used by a variety of small mammals, rodents, and reptiles.

Other than gross disturbances in the wetlands area due to the former surface impoundment caps and other man-made upland terrain, the North Area wetlands is functionally and visually identical to the adjacent off-site wetlands area. Likewise, observations made during sediment sampling indicated consistent sediment characteristics for all North Area wetlands sampling locations.

2.1.3 Intracoastal Waterway

The Intracoastal Waterway supports barge traffic and other boating activities. The area near the Site is regularly dredged and, as noted by the United States Fish and Wildlife Service (USFWS), shoreline habitat is limited (USFWS, 2005a). Reduced light penetration, periodic dredging, wave action from barge traffic, and higher than normal tidal energy prevent submerged vegetation from growing in the Intracoastal Waterway near the Site. The absence of attached vegetation, which provides food and shelter, decreases the number of invertebrate species that can utilize the habitat in this sub-tidal zone and, therefore, most of the epibenthic invertebrates that utilize the sub-tidal zone in the Intracoastal Waterway near the Site are migrants.

Because of the reduced tidal energy at the upper end of each of the barge slips, there is a small amount of intertidal emergent marsh that has developed in these areas. Sand and silt has accumulated in the ends of the slips and is supporting small stands of gulf cordgrass (*Spartina alterniflora*). Sheetpile and concrete bulkheads protect the remainder of the shoreline. The bulkheads provide habitat for oysters (*Crassostrea virginica*), barnacles (*Balanus improvisus*), sea anemones (*Bunodosoma cavernata*), limpets and sponges.

Fishing has been known to occur on and near the Site. Red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*) and other species are reportedly caught in the area (TPWD, 2009). It should be noted that, during the fish sampling conducted for the human health fish ingestion pathway risk assessment, red drum were not caught (using nets) as frequently as other species (see discussion in NEDR (PBW, 2009)), presumably because of a lack of habitat and prey items to keep them near the Site. Recreational and commercial fishermen collect blue crabs (*Callinectes sapidus*) from waterways in the area. The Texas Department of State Health Services (TDSHS) has banned the collection of oysters from this area due to biological hazards and has issued a consumption advisory for king mackerel for the entire Gulf Coast due to mercury levels in the fish (TDSHS, 2005).

2.2 NATURE AND EXTENT OF POTENTIAL CONTAMINATION

Data related to the nature and extent of potential contamination in ecologically-relevant media (e.g., soil, sediment, and surface water) at the Site were obtained as part of the RI and, as noted

previously, are discussed in the NEDR (PBW, 2009). Unless otherwise noted, the samples were analyzed for the full suite of analytes as specified in the approved Work Plan (PBW, 2006a). Plate 1 provides sample locations for site-related samples, and Figure 3 provides sample locations for the background soil, surface water, and sediment samples. Tables 1 through 17 summarize the key parameters for the chemicals of interest (COIs) measured in these samples. A chemical of interest is defined in this report as any compound measured in at least one sample above the detection limit and at a detection frequency of greater than five percent. Tables 1 through 17 provide maximum and minimum measured concentrations, as well as summary statistics for each COI for each media. Average and 95% upper confidence limits (95% UCLs) on the mean were estimated using EPA guidance (EPA, 2002a) and are described in greater detail in the following section.

Eighty-three surface soil samples (0 to 0.5 ft below ground surface (bgs)) and 83 subsurface soil samples (0.5 ft to 4 ft bgs) were collected in the South Area. Eighteen surface soil samples and 18 subsurface soil samples were collected in the North Area. Two additional surface soil samples were collected near the former transformer shed at the South Area for polychlorinated biphenyls (PCBs) analyses only. Ten background soil samples were collected within the approved background area approximately 2,000 feet east of the Site near the east end of Marlin Avenue (Figure 3).

Sixteen sediment samples were collected from the Intracoastal Waterway in front of the Site. Nine background sediment samples were collected from the Intracoastal Waterway east of the Site and across the canal. One additional sediment sample was collected from the Intracoastal Waterway near the Site and analyzed for DDT to further characterize the extent of contamination as described in the NEDR (PBW, 2009). Forty-eight sediment samples were collected in the North Area wetlands. Additional sediment samples were collected from the North Area wetlands and analyzed for DDT; five of these samples were also analyzed for zinc. A total of eight sediment samples were collected from the two ponds located in the North Area.

Four surface water samples were collected in the Intracoastal Waterway adjacent to the Site. Four surface water samples were collected from the background surface water area – the Intracoastal Waterway east of the Site, and across the canal (Figure 3). Four surface water samples were collected in the wetlands drainage areas north of Marlin Avenue and a total of six surface water samples were collected from the two ponds located in the North Area. Chemical

analyses of these surface water samples included both total and dissolved concentrations of metals.

2.3 POTENTIALLY COMPLETE EXPOSURE PATHWAYS AND PRELIMINARY CONCEPTUAL SITE MODEL

The identification of potentially complete exposure pathways is performed to evaluate the exposure potential as well as the risk of effects on ecosystem components. In order for an exposure pathway to be considered complete, it must meet all of the following four criteria (EPA, 1997):

- A source of the contaminant must be present or must have been present in the past.
- A mechanism for transport of the contaminant from the source must be present.
- A potential point of contact between the receptor and the contaminant must be available.
- A route of exposure from the contact point to the receptor must be present.

Exposure pathways can only be considered complete if all of these criteria are met. If one or more of the criteria are not met, there is no mechanism for exposure of the receptor to the contaminant. Potentially complete pathways used in the SLERA are shown in the conceptual site models for the terrestrial and estuarine ecosystems (Figures 4 and 5, respectively).

In general, biota can be exposed to chemical stressors through direct exposure to abiotic media, or through ingestion of forage or prey that have accumulated contaminants. Exposure routes are the mechanisms by which a chemical may enter a receptor's body. Possible exposure routes include 1) absorption across external body surfaces such as cell membranes, skin, integument, or cuticle from the air, soil, water, or sediment; and 2) ingestion of food and incidental ingestion of soil, sediment, or water along with food. Absorption is especially important for plants and aquatic animals.

2.4 THREATENED AND ENDANGERED SPECIES

The USFWS was consulted (USFWS, 2005b) and information was obtained from the USFWS and Texas Parks and Wildlife Department (TPWD) regarding Threatened and Endangered Species. According to USFWS (USFWS, 2005c), Threatened and Endangered Species for

Brazoria County include: bald eagle (*Haliaeetus leucocephalus*), brown pelican (*Pelecanus occidentalis*), green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricate*), Kemp's ridley sea turtle (*Lepidochelys kempii*), leatherback sea turtle (*Dermochelys coriacea*), loggerhead sea turtle (*Caretta caretta*), piping plover (*Circus melodus*), and whooping crane (*Grus americana*). According to TPWD (TPWD, 2005), Threatened and Endangered Species for Brazoria County include: bald eagle (*Haliaeetus leucocephalus*), black rail (*Laterallus jamaicensis*), eastern brown pelican (*Pelecanus occidentalis*), interior least tern (*Sterna antillarum*), piping plover (*Circus melodus*), reddish egret (*Falco rufescens*), swallow-tailed kite (*Elanoides forficatus*), white-faced ibis (*Plegadis chihi*), wood stork (*Mycteria americana*), and corkwood (*Leitneria floridana*). None of these species have been observed at the Site but they are known to live in or on, feed in or on, or migrate through the Texas Gulf Coast and estuarine wetlands (TPWD, 2005).

2.5 ASSESSMENT AND MEASUREMENT ENDPOINTS

Assessment endpoints are explicit expressions of the ecological resource to be protected for a given receptor of potential concern (EPA, 1997). Identification of assessment endpoints is necessary to focus the SLERA on relevant receptors rather than attempting to evaluate risks to all potentially affected ecological receptors. Measurement endpoints comprise what are actually measured to protect the assessment endpoints. Assessment and measurement endpoints are discussed in relation to the risk question and testable hypotheses for each habitat and receptor group in Tables 18 and 19 (terrestrial and estuarine wetland/aquatic, respectively).

2.5.1 Terrestrial Assessment Endpoints

The terrestrial habitat associated with the Site includes the entire South Area and a small area of land adjacent to Marlin Avenue near the former surface impoundments in the North Area. The environmental value of this area is related to its ability to support plant communities, soil microbes/detritivores and wildlife. As indicated on Figure 4 and described in Table 18, the assessment endpoints for this area include:

- Vegetation survival, growth, and reproduction are values to be preserved in the terrestrial ecosystem. As food, plants provide an important pathway for energy and nutrient

transfer from the soil to herbivores, omnivores, and invertebrates. Plants also provide critical habitat for terrestrial animals.

- Detritivore survival, growth, and reproduction and function (as a decomposer) are ecological values to be preserved in a terrestrial ecosystem because they provide a mechanism for the physical and chemical breakdown of detritus for microbial decomposition (remineralization), which is a vital function.
- Mammalian and avian herbivore and omnivore survival, growth, and reproduction are ecological values to be preserved in a terrestrial ecosystem because they are critical components of local food webs in most habitat types. In addition, small mammal and avian receptors can be important in the dispersal of seeds and the control of insect populations.
- Mammalian, reptilian, and avian carnivore survival, growth, and reproduction are values to be preserved in the terrestrial ecosystem because they provide food to other carnivores, omnivores, scavengers, and microbial decomposers. They also affect the abundance, reproduction, and recruitment of lower trophic levels, such as vertebrate herbivores and omnivores, through predation.

2.5.2 Estuarine Wetland and Aquatic Assessment Endpoints

The estuarine wetland habitat for the Site extends over the majority of the North Area while the Intracoastal Waterway (i.e., aquatic habitat) is south of the Site. Wetlands are particularly important habitat because they often serve as a filter for water prior to it going into another water body, they are important nurseries for fish, crab, and shrimp, and they act as natural detention areas to prevent flooding. The environmental value for these areas is related to their ability to support wetland plant communities, microbes/benthos/detritivores and wildlife. As indicated in Figure 5 and described in Table 19, the assessment endpoints for these areas include:

- Wetland vegetation survival, growth, and reproduction are values to be preserved in the estuarine wetland ecosystem. As food, plants provide an important pathway for energy and nutrient transfer from the soil to herbivores and omnivores as well as invertebrates. Plants also provide critical habitat for vertebrates and invertebrates.
- Benthos survival, growth, and reproduction are values to be preserved in estuarine ecosystems because these organisms provide a critical pathway for energy transfer from detritus and attached algae to other omnivorous organisms (e.g., polychaetes and crabs)

and carnivorous organisms (e.g., black drum and sandpipers), as well as integrating and transferring the energy and nutrients from lower trophic levels to higher trophic levels. The most important service provided by benthic detritivores is the physical breakdown of organic detritus to facilitate microbial decomposition.

- Zooplankton survival, growth, and reproduction are values to be preserved in estuarine ecosystems. Zooplankton provide a food source for energy transfer through the water column-based pathway from phytoplankton to filter feeding and planktivorous organisms (e.g., finfish, shrimp, clams, worms, and oysters).
- Herbivorous and omnivorous fish and shellfish survival, growth, and reproduction are values to be preserved in estuarine ecosystems because they are critical components of the food web.
- Vertebrate carnivore (i.e., fish, fish-eating, and invertebrate-eating birds) survival, growth, and reproduction are values to be preserved in estuarine ecosystems. Vertebrates provide food for other carnivores and omnivores and affect species composition, recruitment, and abundance of lower trophic level organisms.

Because the Intracoastal Waterway is a deep, high-energy environment (i.e., dredged regularly) and light penetration is poor due to the high turbidity, submerged aquatic vegetation is not likely to thrive and, as such, is not an ecological resource to be protected as part of this assessment. Therefore, an assessment endpoint was not developed for submerged aquatic vegetation.

2.5.3 Measurement Endpoints

The measurement endpoints for the Site and the Intracoastal Waterway are the measurements of spatial distribution of chemical concentrations in soil and sediment to assess exposure concentrations for potentially exposed receptors. Maximum concentrations of chemicals measured in environmental media were compared to ecological benchmarks for the purposes of the screening-level problem formulation and ecological effects characterization (Step 1) of the SLERA.

2.6 SELECTION OF AND COMPARISON TO ECOLOGICAL BENCHMARKS

This section describes the ecological benchmarks used to initially evaluate the data, and provides a summary of the comparison between Site data and the benchmarks. The benchmarks were

chosen to conservatively represent the assessment endpoints since they are generally protective of the most relevant or sensitive endpoint for a variety of species. This was performed as an initial step in the SLERA process given the large number of analytes, media and receptors analyzed during the RI/FS and evaluated in the SLERA. It is believed that this is a reasonable step since the Site has been thoroughly characterized and the evaluation includes a robust data set. The COIs with no ecological benchmarks are discussed in the uncertainty section (Section 4.0).

It should be noted that any chemical considered to be bioaccumulative by the TCEQ (as defined in Table 3-1 of their ecological guidance document (TCEQ, 2006)) was retained for further evaluation if it was detected in at least one sample, even if it was reported below a screening criteria or if there were not any screening criteria. This approach was conservatively taken to ensure that food chain effects were considered for bioaccumulative compounds. In addition, polynuclear aromatic hydrocarbons (PAHs) were evaluated as individual compounds, as a total concentration, and grouped as high-molecular weight (HPAH) or low-molecular weight (LPAH) as defined by TCEQ in Box 3-6 of the TNRCC (2001) ecological risk guidance. To quantitatively evaluate classes of PAHs in Step 2, individual PAHs were not eliminated from further assessment in Step 1 even if they were measured below their benchmark.

2.6.1 Soil

Soil sample data were compared with EPA and TCEQ ecological soil screening values contained in Tables 1 through 5. The EPA soil screening values were obtained from EPA's website at www.epa.gov/ecotox/ecossl/ while the TCEQ values were obtained from Table 3-4 of TCEQ ecological guidance document (TCEQ, 2006). The screening value listed in Tables 1 through 5 is the lowest of the values provided by each Agency for plants, soil invertebrates, avians, and mammals (as indicated with the notation of "p", "i", "a", or "m", respectively).

South Area. Tables 1 and 2 provide a summary of the data for South Area soil samples. Only compounds with measured detections, including "J" flagged (or estimated) data, are listed in these tables. Table 1 contains only surface soil (0 to 0.5 ft bgs) data while Table 2 provides data for both surface and subsurface samples (0.5 ft to 4 ft bgs). This distinction was made to account for the different soil horizons that the different receptors may be exposed. For example, it was assumed that incidental ingestion of soil for the American robin would only occur within the 0 to 0.5 ft bgs soil whereas an earthworm may reasonably be exposed to the surface soil and the soil

below 0.5 ft bgs as well. At least one South Area soil sample contained 4,4'-DDT, antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, dieldrin, lead, lithium, manganese, mercury, molybdenum, nickel, vanadium, zinc, or HPAHs at a concentration above an ecological benchmark. Although not reported in any South Area soil sample at a concentration above an ecological benchmark, 4,4'-DDD, 4,4'-DDE, Aroclor-1254, gamma-Chlordane, endrin aldehyde, and endrin ketone were detected in at least one South Area soil sample and are considered bioaccumulative in soil. These compounds, as well as those compounds with at least one sample concentration exceeding a benchmark, were evaluated further in the SLERA.

North Area. Tables 3 and 4 provide a summary of the data for North Area soil samples. Only compounds with measured detections, including "J" flagged (or estimated) data, are listed in these tables. Table 3 contains only surface soil data. Table 4 provides data for both surface (0 to 0.5 ft bgs) and subsurface samples (0.5 ft to 4 ft bgs). This distinction was made to account for the different soil horizons that the different receptors may be exposed. At least one sample contained antimony, barium, boron, cadmium, chromium, copper, dieldrin, lead, lithium, manganese, molybdenum, vanadium, zinc, or HPAHs at a concentration above its ecological benchmark. Although not reported in any North Area soil sample at a concentration above an ecological benchmark, endrin, endrin ketone, mercury, nickel, Aroclor-1254, 4,4'-DDE, and 4,4'-DDT were detected in at least one North Area soil sample and are considered bioaccumulative in soil. These compounds, as well as those compounds with measurements exceeding a benchmark, were evaluated further in the SLERA.

Background Soils. Table 5 provides a summary of the data for background soil samples (all surface samples). Only compounds with measured detections, including "J" flagged (or estimated) data, are listed in the table. At least one background sample contained antimony, barium, chromium, lead, lithium, manganese, zinc, or HPAHs at a concentration above its ecological benchmark. Although not reported in any background soil sample at a concentration above the ecological benchmark, cadmium, copper, and mercury were detected in at least one background soil sample and are considered bioaccumulative in soil. These compounds, as well as those compounds with measurements exceeding a benchmark, were evaluated further in the SLERA. It should be noted that boron, strontium, titanium, and vanadium analyses were not performed on background soil samples.

2.6.2 Sediment

Sediment sample data were compared with EPA and TCEQ ecological screening values contained in Tables 6 through 9. The sediment screening values were the lower of the benchmark criterion obtained from EPA's ECO Update re: Ecotox Thresholds (EPA, 1996) and the TCEQ's ecological benchmarks listed in Table 3-3 of TCEQ (2006). The hierarchy for the benchmark values from the Ecotox Thresholds was marine sediment quality criteria, sediment quality benchmark, and Effects Range Low value. It should be noted that the midpoint between TCEQ's Protective Concentration Limit and Secondary Effects Level is also presented in these tables for comparison purposes.

Intracoastal Waterway. Table 6 provides a summary of the data for sediment samples collected in the Intracoastal Waterway adjacent to the Site. Only compounds with measured detections, including "J" flagged (or estimated) data are listed in the table. At least one sample contained 4,4'-DDT, acenapthylene, benzo(a)anthracene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, pyrene, fluoranthene, fluorene, phenanthrene, pyrene, LPAHs, HPAHS, or total PAHs at a concentration above an ecological benchmark. Although not reported in any Intracoastal Waterway sediment sample at a concentration above an ecological benchmark, copper, gamma-Chlordane, hexachlorobenzene, mercury, nickel, and zinc were detected in at least one sediment sample and are considered bioaccumulative in sediment. These compounds, as well as those compounds with measurements exceeding a benchmark, were evaluated further in the SLERA.

Intracoastal Waterway Background. Table 7 provides a summary of the data for sediment samples collected in the Intracoastal Waterway background area. Only compounds with measured detections, including "J" flagged (or estimated) data, are listed in the table. At least one sample contained arsenic or nickel at a concentration above its ecological benchmark. Although not reported in any Intracoastal Waterway background sample at a concentration above an ecological benchmark, copper, 4,4'-DDT, mercury, and zinc were detected in at least one sediment sample and are considered bioaccumulative in sediment. These compounds, as well as those compounds with measurements exceeding a benchmark, were evaluated further in the SLERA.

Wetlands. Table 8 provides a summary of the data for sediment samples collected in the wetlands area north of Marlin Avenue. Only compounds with measured detections, including "J"

flagged (or estimated) data, are listed in the table. At least one sample contained 2-methylnaphthalene, 4,4'-DDT, acenaphthene, acenaphthylene, anthracene, arsenic, benzo(a)anthracene, benzo(a)pyrene, chrysene, copper, dibenz(a,h)anthracene, endosulfan sulfate, fluoranthene, fluorene, gamma-chlordane, lead, nickel, phenanthrene, pyrene, zinc, LPAHs, HPAHs, or total PAHs at a concentration above its ecological benchmark. Although not reported in any wetlands sediment sample at a concentration above an ecological benchmark, cadmium, endrin aldehyde, endrin ketone, and mercury were detected in at least one sediment sample and are considered bioaccumulative in sediment. These compounds, as well as those compounds with measurements exceeding a benchmark, were evaluated further in the SLERA.

Ponds. Table 9 provides a summary of the data for sediment samples collected in the ponds north of Marlin Avenue. Only compounds with measured detections, including "J" flagged (or estimated) data, are listed in the table. At least one sample contained 4,4'-DDT or zinc at a concentration above its ecological benchmark. Although not reported in any pond sediment sample at a concentration above an ecological benchmark, cadmium, copper, 4,4'-DDD, and nickel were detected in at least one sediment sample and are considered bioaccumulative in sediment. These compounds, as well as those compounds with measurements exceeding a benchmark, were evaluated further in the SLERA.

2.6.3 Surface Water

Surface water samples were compared with TCEQ ecological screening criteria, which were obtained from TCEQ's ecological benchmarks listed in Table 3-2 of TCEQ (2006). If a TCEQ value was not available and a value was available in the Screening Quick Reference Tables (or SQuiRTs; Buchman, 2008), that value was used as the screening criterion. If the benchmark was listed for dissolved concentrations (only applicable to metals), it was not compared to the total concentration data.

Intracoastal Waterway. Tables 10 and 14 summarize the analytical data for total and dissolved concentrations, respectively, for surface water samples collected from the Intracoastal Waterway adjacent to the Site. Boron concentrations measured in four of four dissolved surface water samples collected exceeded the ecological benchmark available in SQuiRTs (Buchman, 2008). Selenium, which is considered bioaccumulative in water, was measured in four of four surface

water samples collected from the Intracoastal Waterway but at concentrations below the benchmark.

Intracoastal Waterway Background. Tables 11 and 15 summarize the analytical data for total and dissolved concentrations, respectively, for surface water samples collected in the Intracoastal Waterway background area, east of the Site and across the Intracoastal Waterway. 4,4'-DDT and dissolved silver were detected in at least one sample in excess of their respective benchmark values. 4,4'-DDD and 4,4'-DDT were detected in two of four and one of four surface water samples collected at the background locations and are considered bioaccumulative although it should be noted that 4,4'-DDD was not measured at a concentration greater than the benchmark. Boron concentrations measured in four of four dissolved surface water samples collected exceeded the ecological benchmark available in SQuiRTs (Buchman, 2008). Iron concentrations measured in one of four dissolved surface water samples collected in the background area for the Intracoastal Waterway exceeded the benchmark.

Wetlands. Tables 12 and 16 summarize the analytical data for total and dissolved concentrations, respectively, for surface water samples collected in the wetlands drainage areas north of Marlin Avenue. Acrolein and dissolved boron, copper, and manganese were detected in at least one sample in excess of their respective benchmark. Mercury, which is considered bioaccumulative, was detected in two of four surface water samples (total concentrations only) but below a benchmark for a dissolved concentration.

Ponds. Tables 13 and 17 summarize the analytical data for total and dissolved concentrations, respectively, for surface water samples collected in the two ponds located in the North Area. Dissolved silver was detected in all six pond surface water samples in excess of its benchmark value. Boron and manganese were measured in at least one dissolved surface water sample at a concentration greater than the benchmark (Buchman, 2008). Thallium, which is considered bioaccumulative by the TCEQ, was measured in all three dissolved surface water samples collected from the Small Pond. Selenium, which is also considered bioaccumulative in water, was measured in one total surface water sample collected from the Small Pond. No concentration of selenium or thallium was measured above their benchmarks.

2.7 COMPARISON TO THE BACKGROUND AREAS

Soil samples were collected at ten off-site locations; sediment samples were collected at nine off-site locations in the Intracoastal Waterway; and four surface water samples were collected at four off-site "zones" in the Intracoastal Waterway as described in the Work Plan (PBW, 2006a) to help provide an understanding of what COIs and concentrations may be considered site-related. This information was used to characterize Site conditions in the NEDR (PBW, 2009).

EPA guidance for conducting SLERAs (EPA, 2001) recommends that comparison with background generally not be used to remove compounds from further evaluation in order to conservatively ensure that site risks are adequately characterized. This recommendation is based on the premise that the SLERA is often conducted on limited data set prior to a comprehensive site characterization. A background comparison, however, was conducted in this SLERA because: 1) a large Site data set was developed during the RI (including data for an approved and Site-specific background area); 2) the nature and extent of contamination at the Site has been thoroughly and completely characterized, and 3) the high quality of the Site and background data allows for a reliable comparison. Moreover, eliminating COIs in Step 2 because they were measured at concentrations considered to be associated with background conditions allows the SLERA to focus on those compounds that may be Site-related and potentially hazardous to ecological receptors. Hazard quotients were calculated for the background data sets per EPA guidance (EPA, 2001) for risk management purposes as discussed in Step 2.

The soil background data were compared to soil from the South Area and North Areas of the Site, as well as sediments from the North wetland and the North Area ponds. As described in the NEDR (PBW, 2009), based on similarities in composition and condition between background soil and sediments of the North wetlands area, this comparison was appropriate. Sediment and surface water data for the Intracoastal Waterway samples were compared to sediment and surface water data collected in the Intracoastal Waterway background location.

Comparisons between Site sampling data and Site-specific background data were conducted for all inorganic compounds measured in excess of their respective benchmark values. Background comparisons were also made for compounds considered bioaccumulative but measured at a concentration less than the benchmark. The background comparisons were performed in accordance with EPA's *Guidance for Comparing Background and Chemical Concentrations in*

Soil for CERCLA Sites (EPA, 2002b). Distribution testing was conducted to estimate 95% UCLs and the summary statistics were used to perform comparison of the means analysis. The output of these background statistical comparison tests is provided in Appendix B. Table 20 summarizes the results of the testing and indicates whether the site data were found to be statistically different than the background data.

In several instances (e.g., lithium in South Area soil; barium in North Area wetlands sediment), statistical differences between the two data sets were due to higher concentrations in the background population, as noted in Table 20. If there was not Site-specific background data for a COI (as noted in Table 20 with an "NA"), the COI was retained for further evaluation in Step 2. COIs shown to be statistically different (and higher) when compared to background data were also retained for further evaluation in Step 2. The list of COPECs carried through Step 2 of the SLERA is presented in Table 21.

A statistical comparison between Site surface water and background surface water could not be conducted given the small size of both data sets. Visual inspection of the data indicates that there is no consistent observable difference between the data sets and COIs. However, because of the preliminary nature of this evaluation, all COIs measured in surface water from both Site and background sampling areas were evaluated further in Step 2.

3.0 SCREENING-LEVEL PRELIMINARY EXPOSURE ESTIMATE AND HAZARD QUOTIENT CALCULATION (STEP 2)

The screening-level exposure and risk calculation description presented in this section of the SLERA corresponds to Step 2 of EPA guidance (EPA, 1997). Step 2 includes a quantitative assessment of potential ecotoxicity and the result of Step 2 is a decision on whether additional ecological risk evaluation is necessary.

3.1 RECEPTORS OF POTENTIAL CONCERN

Several representative groups of wildlife were identified as receptors of potential concern (ROPCs) for use in the SLERA. Each group of receptors represents a group of species (ie., feeding guild) with similar habitat use and feeding habits that could potentially inhabit either the terrestrial, estuarine wetland, or aquatic habitats at the Site. Representative species groups that may use the habitats at the Site are described briefly below. When several species may be present that could represent the feeding guild for a habitat, the species was chosen as the ROPC for that feeding guild based on its habitat affinity and potential for exposure.

3.1.1 Terrestrial Receptors

- Detritivores, Invertebrates and Terrestrial Plants. There are limited terrestrial areas at the Site. The earthworm was chosen to represent detritivores and invertebrates for the terrestrial ecosystem in this area because it is an important part of the food chain as prey for some first-order carnivores.

- Mammalian Herbivores and Omnivores. Habitat type plays a major role in the presence and abundance of the various species of mammals found at the Site. Of the three major groups of mammalian receptors (carnivores, ungulates, and rodents) potentially found at the Site, the small mammalian rodents are the most diverse and complex, and are most likely to have the highest area use factor. The habitat most likely does not support an ungulate population because it does not provide protective cover that they prefer although they may graze on some of the terrestrial plants on occasion. The omnivorous deer mouse (*Peromyscus maniculatus*) was selected as the ROPC for the various feeding guilds of small mammals at the Site. Dietary composition for the deer mouse, with an

assumed area use factor of 100 percent, is assumed to be an equal mix of terrestrial invertebrates and terrestrial plant tissue in order to assess the potential exposures to a receptor ingesting a general mix of prey types at the Site.

- Mammalian Carnivores. Carnivores potentially present include omnivores such as the spotted and striped skunks, raccoon, and coyote (*Canis latrans*). A skunk was observed at the Site and fecal evidence of a carnivorous species was also observed at the Site. Since some of the COPECs are considered bioaccumulative compounds, assessing risks to an upper trophic level receptor is appropriate. Therefore, the coyote (*Canis latrans*) was selected as the ROPC for the mammalian carnivore feeding guild as it may feed at the Site on occasion as part of its larger home range. An area use factor of 100 percent was conservatively assumed per EPA (1997).

- Reptilian Carnivores. A representative reptilian predator for the Site is the rat snake (*Elaphe obsolete*), which has been observed at the Site. Rat snakes feed primarily on small mammals and eggs. An area use factor of 100 percent was conservatively assumed per EPA (1997).

- Avian Herbivores and Omnivores. In general, avian species are influenced by the same types of landscape components as mammals, although vegetation is by far the more important factor. Birds are generally less important than mammals in terrestrial risk assessments because they live in less intimate contact with the soil, are highly mobile, and in many cases are present only seasonally. Most small birds have flexible diets that emphasize specific types of plant or animal material during certain seasons and most species are opportunistic, feeding on whatever food source is most abundant or particularly nutritious/palatable at a given time. A generalized avian receptor, represented by the American robin (*Turdus migratorius*), was selected to represent the omnivorous feeding guild. An area use factor of 100 percent was conservatively assumed per EPA (1997).

- Avian Carnivores. Representative avian predators (raptors) for the Site include the red-tailed hawk (*Buteo jamaicensis*) although it has not been observed at the Site. It, however, may use the Site for hunting prey occasionally. Red-tailed hawks feed primarily on small rodents, snakes, and lizards although they are opportunistic and will

feed on other prey at times. An area use factor of 100 percent was conservatively assumed per EPA (1997).

3.1.2 Estuarine Wetland and Aquatic Receptors

- Benthos. Polychaetes burrow in and ingest sediment and have a greater exposure potential to sediment-bound chemicals than most epibenthos organisms such as shrimp and crab. Polychaetes are likely to be the most abundant class of benthic organisms found in the Intracoastal Waterway and, as such, *Capitella capitata* was chosen as the ROPC to represent this receptor class.

- Fish and Shellfish. Fiddler crabs (*Uca rapax*) and killifish (*Fundulus grandis*) were chosen as the ROPC to represent herbivorous or omnivorous species in the estuarine wetland and aquatic ecosystems, respectively. Fiddler crabs and their burrows are abundant at the Site. They eat detritus (dead or decomposing plant and animal matter) and serve as a food source for many wetland animals. It was assumed that their area use factor is 100 percent. The killifish was chosen to represent this feeding guild because it is likely to be present in the area of the Site and because it is an omnivorous fish that feeds primarily on organic detritus, small crustaceans, zooplankton, epiphytic algae, and polychaetes. Killifish may inhabit the Site for its entire life cycle; therefore, an area use factor of 100 percent was assumed.

- Carnivorous Fish. Black drum (*Pogonias cranius*) was selected as the first order carnivore ROPC because it is present in the Intracoastal Waterway and because it is an omnivorous carnivore that eats shrimp, crabs, small fish, benthic worms and algae. Per EPA (1997), an area use factor of 100 percent was conservatively assumed. The spotted seatrout (*Cynoscion nebulosus*) was chosen to represent a second order carnivorous fish species because it is present in the Intracoastal Waterway and because adult fish feed almost exclusively on other fish. It was conservatively assumed that the area use factor for the spotted seatrout is 100 percent per EPA (1997).

- Avian Carnivores. Sandpipers (*Calidris genus*) were chosen as first order avian carnivore ROPC because they have been observed at the Site. Although not observed at the Site, the green heron (*Butorides striatus*) was chosen as the second order avian

predator ROPC to assess food chain impacts. Sandpipers are migratory birds that feed on aquatic insects and larva, marine worms, small crabs, small mollusks, and other invertebrate prey items. An area use factor of 100 percent was conservatively assumed per EPA (1997). Green herons are migratory birds that feed on small fish, invertebrates, insects, frogs, and other small animals. Per EPA (1997), an area use factor of 100 percent was conservatively assumed for green herons as well.

3.2 SCREENING-LEVEL EXPOSURE ESTIMATES

In the exposure analysis, potential exposure of ecological receptors to COPECs was quantified. There are two basic routes of exposure for the COPECs and receptors at the Site: 1) ingestion from food and soil/sediment; and 2) direct contact. Quantification of exposure potential for both of these exposure routes requires data on chemical concentrations in environmental media (e.g., soil, sediment, prey items) and ingestion rates or contact information for each receptor and pathway. In addition, body weights, home range size, and other factors must be known for each of the receptors, as well as the chemical and physical properties of the COPECs.

Ecological receptors based on an ingestion pathway include birds, crustaceans, mammals, and fish. Receptors evaluated based on direct contact include earthworms in the terrestrial ecosystem and polychaetes and amphipods in the wetlands/aquatic ecosystem. Tables 22 and 23 provide exposure parameters for each receptor for terrestrial and estuarine wetland/aquatic receptors, respectively. In most instances, exposure parameters were chosen from regulatory or peer-reviewed literature. However, best professional judgment was used when information for a ROPC was not available. References for the selected values are shown in the tables and the references are included in Section 6.0.

Exposures via inhalation or dermal absorption were not evaluated for most receptors because of a lack of appropriate exposure and toxicity data and the uncertainty associated with these pathways (TNRCC, 2001). The exposure of animals to contaminants in soil by dermal contact is likely to be small due to barriers of fur, feathers, and epidermis. Therefore, the SLERA focused on the ingestion pathways as the primary exposure route for all vertebrates (unless direct contact was specifically noted and assessed).

For most receptors evaluated based on ingestion, exposure was quantified by estimating the daily dose (mg COPEC/kg body weight per day) that the receptor is expected to receive. For second order carnivorous fish, mammals, and birds exposed through ingestion, estimates of exposure were calculated using dietary concentration rather than daily dose. For the direct contact pathway (i.e., earthworm and polychaetes), the COPEC concentration in soil or sediment was used directly to estimate exposure.

EPA guidance (EPA, 1997) suggests conservatively using maximum concentrations in the SLERA, which is often performed when only limited data sets are available. During the scoping meeting with EPA, it was discussed that a 95% upper confidence limit (UCL) on the average concentration would more appropriately represent the exposure point concentration (EPC) given the extensive characterization and sampling that has been conducted at the Site during the RI. The general procedure that is recommended by EPA to estimate a 95% UCL (EPA, 2002a) was used as the EPC to represent the upper end of exposure. EPA's ProUCL Version 4 program (EPA, 2007a) was used to analyze dataset distribution and calculate average and 95% UCL concentrations. ProUCL calculates various estimates of the 95% UCL of the mean, and then makes a recommendation on which one should be selected as the best UCL estimate. If the average or 95% UCL is greater than the maximum detected concentration, the maximum measured concentration was used as the exposure point concentration (EPA, 2002).

Appendix A provides the ProUCL output when there were sufficient samples to run statistics (soil and sediment). It should be noted that for avian receptors, the exposure point concentration was based on surface soil data because it is unlikely that the avian ROPC is exposed to subsurface soils given their habitat preferences, activities, and feeding behavior. One-half of the sample detection limit was used for sample measurements below the sample detection limit. There were not enough pond sediment or surface water samples for statistical calculations so average and maximum measured concentrations were used in the evaluation for these media.

Both averages and 95% UCLs were used in the SLERA to provide a range of exposure point concentrations. The dose estimates using the 95% UCL EPC were considered to represent reasonable maximum exposure (RME).

The general equation used for estimating COPEC dose from the soil/sediment and food ingestion pathways is presented below:

For a soil and sediment pathway:

$$Dose_{soil/sediment} = \frac{C_{soil/sediment} \times IR_{soil/sediment} \times AF_{soil/sediment} \times AUF}{BW}$$

For a food (dose) pathway:

$$Dose_{food} = \frac{C_{food} \times IR_{food} \times AUF}{BW}$$

Where:

$C_{soil/sediment}$	=	chemical concentration in soil/sediment (mg/kg)
C_{food}	=	chemical concentration in food (mg/kg)
$IR_{soil/sediment}$	=	soil/sediment ingestion rate (kg/day)
IR_{food}	=	food ingestion rate (kg/day)
$AF_{soil/sediment}$ (unitless)	=	chemical bioavailability factor from soil/sediment
AUF	=	area-use factor (unitless)
BW	=	wildlife receptor body weight (kg)

It should be noted that the chemical bioavailability factor for all compounds in both soil and sediment was conservatively assumed to be 1 (i.e., 100% bioavailable for uptake). COPEC concentrations in food were estimated from soil/sediment concentrations using bioaccumulation factors (BAFs) or biota-sediment accumulation factors (BSAFs) with the following equation:

$$C_{food} = C_{soil/sediment} \times BAF \text{ (or BSAF if sediment)}$$

For those receptors exposed through both soil or sediment and dietary exposure routes, the dose was assumed to be additive with the equation:

$$Dose_{total} = Dose_{soil/sediment} + Dose_{food}$$

Various literature sources, including the Wildlife Exposure Factors Handbook (EPA, 1993), were reviewed to determine the types and amounts of prey ingested by the wildlife receptors. It was assumed that the deer mouse has incidental soil ingestion only, while the coyote and the red-tailed hawk predominantly have food ingestion with an incidental amount (i.e., 2%) of soil ingestion, and the American robin and rat snake are exposed through both food and soil sources. It was assumed that fiddler crabs, killifish, sandpipers, and black drum are exposed to COPECs via food and incidental ingestion of sediment while spotted seatrout and green heron are exposed via prey items.

Appendices C through I provide detailed intake (dose) calculations for each media and all receptors. For the purposes of the SLERA, the dose and estimated risks were assumed to be similar for the killifish and black drum due to the similarity in the toxicity reference values used to calculate risk and because they are both omnivores with a varied diet. Since dose is adjusted for body weight, the differences between their food intake and body weight should not mathematically make a difference. In addition, assuming the area use factor for both species is 100% makes the differences between their home ranges negligible for the purposes of the SLERA calculations.

3.3 TOXICITY REFERENCE VALUES

Species-specific toxicity reference values (TRVs) were determined using scientific literature and other available resources with selected benchmarks generally based on measurements of survival, growth or reproduction in the laboratory. A TRV was selected from the available scientific literature for each compound using the following criteria (EPA, 1997):

- Doses based on the receptor species selected for evaluation were used preferentially; however, if toxicity information was not available for the species, doses for animals within the same class as the receptor species were used.
- Data for reproductive or developmental effects were used preferentially over other endpoints. Reproductive and developmental effects represent a more sensitive measure of wildlife effects than mortality. Therefore, these effects were chosen in preference to the less sensitive mortality endpoint for assessing ecological risk to the ROPCs.

- Chronic data were used preferentially to sub-chronic or acute data, and no observable adverse effects levels (NOAELs) were used in preference to lowest observable adverse effects levels (LOAELs) and effects measurements.

Effects Range Low (ERL) and Effects Range Medium (ERM) values were used as sediment TRVs for benthic receptors, as was the midpoint between the ERL and ERM. In several instances, an Apparent Effects Threshold (AET) was used as the TRV because an ERL or ERM was not available. TRVs were not available for each receptor class or for each compound. Where appropriate, surrogate values were used for some species to species extrapolations and some within some chemical classes (e.g., DDT for DDE) for chemicals without TRVs. Because using surrogate values introduces considerable uncertainty into the risk assessment process, care was taken to only use surrogate values for chemicals with similar chemical structures or toxicities to minimize the uncertainty. The chemicals with no TRVs are discussed in the uncertainty section.

3.4 SCREENING-LEVEL HAZARD QUOTIENTS

The purpose of the risk characterization is to integrate the exposure and ecological effects analyses to determine if ecological receptors at the Site are potentially at risk from chemical exposure. In this section, the dose estimate is compared to the TRV to evaluate the potential for adverse health effects to the ROPC using a hazard quotient (HQ) approach. The HQ is a ratio of the estimated exposure concentration to the TRV where:

$$HQ = Dose / TRV$$

If the HQ is less than one, indicating the exposure concentration or dose is less than the TRV, adverse effects are considered highly unlikely. If the HQ is equal to or greater than one, a potential for adverse effects may exist. It should be noted that an HQ greater than one by itself does not indicate the magnitude or effect nor does it provide a measure of potential population-level effects (Menzie et al., 1992), and certainly should be evaluated based on the conservative nature of the assumptions. Because of this issue, HQs were calculated using NOAELs and ERLs initially and if the NOAEL-based HQ exceeds one, the HQ was also calculated using a LOAEL and ERM (when available) to provide a range of results to assist with risk management decisions.

HQs were calculated for individual PAHs as well as for total PAHs, LPAHs, and HPAHs. PAHs were classified as LPAH or HPAH according to Box 3-6 of TCEQ guidance (TCEQ, 2001).

Tables 24, 25, and 26 provide a summary of the HQs that exceed one for each media, receptor and COPEC for the South and North Areas and Background Areas, respectively. Appendices C through I provide the complete set of calculations for all compounds. Appendix J provides the risk calculations using LOAELs for a select group of compounds, media and receptors. A discussion of the results for each compound with a HQ greater than one follows for each media.

3.4.1 South Area Soil

As shown in Table 24, the NOAEL-based HQs for 4,4'-DDD, Aroclor-1254, copper, lead, and zinc exceed one for one or more terrestrial receptors. Zinc is the only compound with a LOAEL-based HQ greater than one for the earthworm receptor (the LOAEL-based HQ using the average EPC is 0.86; while the LOAEL-based HQ using the RME EPC is 1.52). The zinc LOAEL-based HQs for the deer mouse, coyote, rat snake, American robin, and red-tailed hawk receptors are below one.

3.4.2 North Area Soil

As shown in Table 25, the NOAEL-based HQ for dieldrin exceeds one for the deer mouse receptor (the NOAEL-based HQ is 0.16 for average EPC and 1.12 for the RME EPC). No LOAEL-based HQs are greater than one for any of the receptors.

3.4.3 Background Area Soil

As shown in Table 26, the NOAEL-based HQs for antimony, barium, and zinc exceed one for one or more terrestrial receptors. Barium and zinc have a LOAEL-based HQ greater than one for the earthworm receptor (the LOAEL-based HQ using the average EPC for barium is 1.01 and 0.46 for zinc; while the LOAEL-based HQs using the RME EPCs for barium and zinc are 1.52 and 1.8, respectively). The barium and zinc LOAEL-based HQs for the deer mouse, coyote, rat snake, American robin, and red-tailed hawk receptors are below one.

3.4.4 Intracoastal Waterway Sediment

As shown in Table 24, the ERL-based HQ using the RME EPC for 4,4'-DDT, benzo(a)anthracene, dibenz(a,h)anthracene, fluoranthene, fluorene, gamma-chlordane, phenanthrene, pyrene, HPAHs and total PAHs exceed one for the benthic receptor. The ERM-based HQs for the benthic receptor for these compounds were less than one. The only benchmark available for hexachlorobenzene was the AET, and both the average and RME HQs exceed one for benthic organisms. None of the other NOAEL or LOAEL-based HQs was above one for aquatic or estuarine receptors.

3.4.5 Intracoastal Waterway Background Sediment

As shown in Table 26, none of the NOAEL-based HQs for any compound for any receptor exceeds one.

3.4.6 North Area Wetlands Sediment

As shown in Table 25, the ERL-based HQ using the RME EPC for many individual PAHs, 4,4'-DDT, endrin aldehyde, gamma-chlordane, LPAH, HPAH, and total PAHs exceed one for the benthic receptor. There is not an ERL or ERM for benzo(g,h,i)perylene or indeno(1,2,3-cd)pyrene. The AET-based HQs for benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene were 1.11 and 1.28, respectively, for the RME benthic scenario, although the HQs for the average scenario were 0.29 and 0.33, respectively. The ERM-based HQs for dibenz(a,h)anthracene are 4.15 for the RME benthic scenario and 0.77 for the average benthic scenario. None of the NOAEL-based HQs exceed one for the aquatic or estuarine receptors.

3.4.7 Pond Sediment

As shown in Table 25, the ERL-based HQ for 4,4'-DDT exceeds one for the benthic receptor. None of the other compounds measured in pond sediment exceed the ERL-based or ERM-based HQ. None of the LOAEL-based HQs exceed one for the aquatic or estuarine receptors, although NOAEL-based HQ for the RME EPC exceeds one for nickel (1.13) for the sandpiper (average EPC results in a NOAEL-based HQ of 0.9).

3.4.8 Surface Water

As described in Section 2.6, dissolved boron measured in surface water in the Intracoastal Waterway; 4,4'-DDT, and dissolved boron, iron, and silver measured in surface water from the background area of the Intracoastal Waterway; acrolein and dissolved boron, copper, and manganese measured in surface water from the North Area wetlands; and dissolved boron, manganese, and silver measured in surface water from the ponds located in the North Area exceeded their screening level.

A hazard quotient risk approach was not used to evaluate the surface water data since there are few toxicity values that allow HQs to be calculated that are protective of effects from dietary exposure. However, additional evaluation of these compounds and their concentrations measured in surface water at the Site, and other measures of toxicity (i.e., the LC_{50} which represents mortality for 50 percent of the organisms tested under specified conditions) are discussed herein. LC_{50} data were obtained from EPA's ECOTOX database (EPA, 2009) by compound and were used to evaluate surface water data for potential direct toxicity to aquatic ROPCs. Data for studies conducted in marine water were used when available for species that are native to Texas. Only data for tests that were at least 96 hours in duration were used, unless otherwise noted. The lowest LC_{50} was selected for the most sensitive species (when a difference was observed). When enough data were available, a geometric mean of the dataset was calculated and used for the evaluation.

Additional quantitative evaluation was not conducted for the detected bioaccumulative compounds (ie., mercury, selenium, or thallium) since they were not measured above their respective screening criteria in surface water. Although they are considered bioaccumulative and food chain effects may be of concern for these compounds, the screening criteria used in Step 1 account for bioaccumulation in their derivation and, as such, comparing site concentrations to these values is adequately protective of food chain effects.

All compounds that were measured in excess of the screening criteria in Section 2.6 are listed below, and additional toxicity information is presented as well. Table 27 summarizes the results of the screening criteria and this risk evaluation. Conclusions of risk based on exceeding screening levels are discussed in more detail in Section 5.0.

Acrolein. Acrolein was measured in one of four surface water samples collected in the wetlands area at a concentration of 0.00929 mg/L. There was one LC_{50} study conducted in saline water and that was a 96-hour study performed with *Cyprinodon variegatus*, or sheepshead minnow, which is a native species found in Texas. Based on data obtained from EPA's ECOTOX database (EPA, 2009), the LC_{50} for this species was 0.43 mg/L.

Boron. The maximum measured concentrations of dissolved boron in surface water collected from the Intracoastal Waterway, the background area of the Intracoastal Waterway, the wetlands area, and the ponds were 4.99, 4.33, 2.75, and 3.33 mg/L, respectively. Based on LC_{50} data obtained from EPA's ECOTOX database (EPA, 2009), the range of LC_{50}s for the most sensitive species was 19 to 290 mg/L, with a geometric mean from the twelve tests of 86.5 mg/L. It should be noted that none of the studies available were conducted in saline water, and the test compound was boric acid. The most sensitive species was *Ictalurus punctatus*, or channel catfish and, while the study was conducted using freshwater under laboratory conditions for 120 hours (or more), this species is native to Texas and can live in brackish water.

Copper. The maximum measured concentration of dissolved copper in surface water collected from the wetlands area was 0.011 mg/L. There are numerous LC_{50} studies for copper in salt water listed on EPA's ECOTOX database (EPA, 2009). Of the several 96-hour tests for species that may be found in Texas, the lowest LC_{50} was 0.368 mg/L for the *Cyprinodon variegatus*, or sheepshead minnow. The other LC_{50}s ranged from 0.368 mg/L to as high as 8.4 mg/L for the striped bass (*Morone saxatilis*).

4,4'-DDT. DDT was measured in one of four surface water samples collected in the Intracoastal Waterway background area at a concentration of 0.000013 mg/L. There are over 280 LC_{50} studies listed on EPA's ECOTOX database (EPA, 2009) for DDT, most of which are freshwater studies or salt water studies conducted for less than a 96-hour duration or non-native species. The 96-hour LC_{50}s determined for DDT in saltwater for the Western mosquitofish or *Gambusia affinis*, striped bass or *Morone saxatilis*, and striped killifish or *Fundulus majalis* were 0.00045, 0.00053, or 0.001 mg/L, respectively. All of these species are native to Texas.

Iron. Iron was detected in one for four dissolved surface water samples collected in the Intracoastal Waterway background area at a concentration of 0.06 mg/L. Based on data from EPA's ECOTOX database (EPA, 2009), there were no studies in saline water for aquatic species

that are native to Texas. Therefore, LC_{50} studies conducted on *Ictalurus punctatus* or channel catfish, crayfish, *Gambusia affinis* or Western mosquitofish, and *Morone saxatilis* or striped bass were evaluated to determine a representative LC_{50} for iron. Upon visual inspection of the data for all tests conducted for 96-hours, it appeared that the striped bass was the more sensitive species since the LC_{50}s were lower by about a factor of two or more when compared to other species. Of the two tests, the LC_{50} for the lower replicate was 4 mg/L while the higher value was 6 mg/L.

Manganese. The maximum measured concentrations of dissolved manganese in surface water collected in the wetlands area and ponds were 0.33 and 1.06 mg/L. According to data obtained from EPA's ECOTOX database (EPA, 2009), the only LC_{50} study conducted for manganese or manganese chloride was a 72-hour test in *Asterias rubens*, or starfish. The LC_{50} obtained from this study was 50 mg/L while values of 100 and 200 mg/L were obtained for a similar study in starfish but the test durations were less than one day. Manganese chloride LC_{50}s for crayfish in freshwater ranged from 17 to 51 mg/L for studies of 96-hour or greater duration.

Silver. The maximum measured concentrations of dissolved silver in surface water collected from the Intracoastal Waterway background area and the ponds were 0.0058 and 0.0029 mg/L, respectively. All studies that were conducted using saline water used *Cyprinodon variegatus*, or sheepshead minnow, and were of 96 or more hours in duration. Based on LC_{50} data obtained from EPA's ECOTOX database (EPA, 2009), the range of LC_{50}s was 0.961 to 3.1 mg/L, with a geometric mean from the fourteen tests of 1.45 mg/L. It should be noted that the test compound for these studies was silver chloride. The most sensitive species was *Ictalurus punctatus* (channel catfish). The study was conducted using freshwater under laboratory conditions for 120 hours (or more). This species is native to Texas and can live in brackish water.

4.0 UNCERTAINTY ANALYSIS FOR STEPS 1 AND 2

This section describes the uncertainties associated with the methodology and results of the SLERA. Risk assessments (both ecological and human) necessarily require assumptions and extrapolations within each step of the analysis and this can lead to uncertainty in predicted risks. These uncertainties are generally the result of limitations in the available scientific data used in the exposure and risk models as well as their applicability to the Site. Accordingly, the key assumptions and uncertainties are thought to have the greatest influence on the ecological risks predicted for the Site and, as such, they are presented with a qualitative description of how the uncertainty may affect the evaluation and conclusions. This provides the risk manager with the appropriate context for understanding the level of confidence with the risk assessment results.

There are two principle sources of uncertainty – those resulting from natural variability and those resulting from data limitations. Both types of uncertainty are discussed as they relate to the three major steps of the SLERA: exposure assessment, effects characterization, and risk characterization.

4.1 EXPOSURE ANALYSIS UNCERTAINTY

This section primarily focuses on the uncertainties in the exposure analysis resulting from data limitations. There are three general categories of uncertainty that are discussed in this section: general exposure analysis uncertainties, receptor-specific uncertainties (i.e., uncertainties that are related to the receptors evaluated), and chemical specific uncertainties.

4.1.1 General Exposure Analysis Uncertainties

General exposure analysis uncertainties are those components of the exposure analysis that have not been or could not be well characterized for the assessment endpoints evaluated. Due to the conservative nature of the SLERA, it is believed that the overall impact of uncertainties related to the exposure analysis result in an overestimate of risk.

Data collected at the Site satisfied the goals described in the Work Plan (PBW, 2006a) and, thus, adequately characterized the Site's nature and extent of contamination. As described in the NEDR (PBW, 2009), hundreds of samples of soil, sediment, and surface water were collected for

the South Area, North Area, Intracoastal Waterway, and background soil, sediment, and surface water locations. Characterization was conducted for the entire Site and continued if a screening level was exceeded.

Overall, the data were determined to be of high quality. Data were collected and analyzed in accordance with approved procedures specified in the RI/FS Field Sampling Plan (PBW, 2006b) and were validated in accordance with approved validation procedures specified in the Quality Assurance Project Plan (QAPP) (PBW, 2006c). Very few of the data for any of the analytes were found to be unusable (ie., "R-flagged"). In instances where data were unusable, the analysis was conducted again (when possible) and the R-flagged datum was not used. Some of the data are qualified (ie., "J-flagged") as estimated because the measured concentration is above the sample detection limit but below the sample quantitation limit and/or due to minor quality control deficiencies. According to the *Guidance for Data Useability in Risk Assessment (Part A)* (EPA, 1992b), data that are qualified as estimated should be used for risk assessment purposes. Data quality was discussed in greater detail in the NEDR (PBW, 2009).

In light of the thoroughness of the site characterization and because of the high quality data, it is believed that the calculated average and 95% UCL of the mean values accurately represent Site concentrations for chronic exposure conditions, such as those assumed in this evaluation, and that little uncertainty was incurred in the assessment due to incomplete site characterization. Organisms with home ranges smaller than the Site such as the earthworm and deer mouse for terrestrial receptors and *Capitella capitata* and fiddler crab for aquatic/estuarine receptors may be exposed to a locally higher concentration than the mean or 95% UCL. However, since the assessment endpoint is based on community survival and productivity and not individual survival and productivity, it is acceptable to use summary statistics to represent community risks.

To assess impacts for groups of PAHs, such as total PAHs, LPAHs, and HPAHs, averages, maximums and 95% UCLs were identified for each individual PAH and added to derive a total PAH, LPAH, or HPAH average, maximum or 95% UCL for the class of compounds. This likely imparts unnecessary conservatism into the hazard quotient calculation because it assumes that the maximum measurement (or average, or 95% UCL) for every PAH falls within the same sample.

The assumptions regarding ecological exposure on the South Area of the Site pose a highly conservative bias given that it was assumed that wildlife populations use and are exposed to the

entire Site, and that these areas provide sufficient cover and/or foraging habitat to support these wildlife populations. The South Area was developed for industrial purposes and contains limited natural vegetative cover characteristic of viable ecological habitat. In many portions of the South Area, ground surface is covered by concrete slabs or the soil has been worked and there is a permeable cover such as gravel and/or oyster shell base that prevents nesting and foraging by many bird species, primarily insectivores and seed eaters. It should be noted, however, grasses and sparse weedy cover have grown since the operations at the Site have stopped, but this is a relatively small area when compared to the approximate 20-acre South Area. The developed and disturbed nature of the habitat at the South Area was not taken into consideration in the SLERA and, as such, risks are most likely overestimated for all receptors.

The same general uncertainty as described above applies to the risks associated with sediment from the Intracoastal Waterway since the area of the Intracoastal Waterway near the Site does not provide suitable habitat to encourage or keep fish and other ecological receptors at the Site as noted by USFWS (USFWS, 2005a). This conclusion was supported by observations during the fish sampling program when it took several weeks to catch the required number of fish (27) in the Intracoastal Waterway at the Site using gill nets. Fish were more plentiful (and thus more readily caught) in the background area that contained a higher quality habitat.

4.1.2 Receptor-Specific Uncertainties

Receptor-specific uncertainties include those parameters in the dose equation that have not been directly measured for receptors at the Site. Receptor-specific uncertainties applicable to both terrestrial and aquatic/estuarine receptors include the body weights and food and soil/sediment ingestion rates used to quantify exposure estimates. Often, the incidental soil/sediment ingestion rate was assumed to be a fraction of dietary intake since an alimentary study was not available to describe soil/sediment ingestion. Additionally, dietary fractions of all receptors were based on either literature data or best professional judgment. Many of the receptors evaluated in the SLERA, such as the deer mouse and American robin, have been reasonably well studied so this was not considered a major uncertainty.

Per EPA guidance (EPA, 1997), it was assumed that the area use factor for all receptors was 100%, which most likely overestimates exposure and risk for the more mobile receptors such as the red-tailed hawk, coyote, black drum, spotted seatrout, sandpiper, and green heron particularly

given the small size of the Site relative to the home range of these species. The conservatism is compounded with receptors that consume prey items since it was assumed that 100% of their prey comes from the Site as well.

4.1.3 Chemical-Specific Uncertainties

Chemical-specific uncertainties are those factors that are assumed for specific chemicals and generally relate to fate and transport modeling. These uncertainties should be considered in weighing the importance of the predicted risks for that chemical.

Bioaccumulation factors and biota-sediment accumulation factors were selected from available literature as noted in the toxicity tables provided in the appendices. They were not available for several of the compounds, and often the data available were sparse or of unknown quality. This makes assessing food chain effects in the evaluation difficult and sometimes uncertain. When appropriate, surrogate values for different chemicals and/or different receptors were used to allow for risks to be estimated for higher trophic level receptors when a chemical-specific value was not available. This approach imparts uncertainty into the evaluation although it is difficult to discern whether it leads to an over-estimation or under-estimation of potential risks.

Bioavailability was assumed to be 100% per EPA guidance (EPA, 1997) although it is well known that metals and some organic compounds are less than 100% bioavailable (EPA, 2007b). This assumption leads to an overestimation of risks, which can be significant.

4.2 EFFECTS CHARACTERIZATION UNCERTAINTY

This section describes the assumptions inherent to the use of chemical-specific TRVs for chemicals evaluated in the terrestrial and aquatic/estuarine systems and chemical-specific ERLs/ERMs for chemicals evaluated for sediment-dwelling benthic organisms. PAHs in sediment, as discussed prior, were also evaluated as a class (total PAHs) and as subclasses (LPAHs and HPAHs).

Most available toxicity data were for standard laboratory animals or domestic animals such as rats, mice, quail, mallards, trout, and fathead minnows. Thus, these animals were used as surrogates to represent the toxicity of chemicals to site-specific receptors. It is unknown how the

sensitivities of these surrogate organisms to toxicants compare to the sensitivities of the wildlife receptors evaluated at the Site. Using surrogate TRVs, therefore, may over- or underestimate toxicity and estimated risk to receptors at the Site.

The lack of screening values and toxicity data for several compounds imparts uncertainty on the evaluation although it is difficult to determine the significance of the uncertainty. It appears, however, that screening values and/or TRVs were available for the more toxic (relatively) and prevalent compounds (both frequency and concentration) at the Site. The exception to this is for surface water. Many compounds measured in surface water did not have screening values so it was not possible to assess the potential risks for many compounds nor the significance of this minimal evaluation. Many of the compounds measured, however, are naturally occurring and all compounds were measured at relatively low concentrations.

There are uncertainties in the PAH ERLs/ERMs used to assess risk to benthos. These values are based on effects to growth, survival, and/or benthic community indices for (largely) field collected sediments across the United States and should be used only as a screening tool (Long, et al., 1995). The use of field collected sediments imparts uncertainty in the establishment of these screening benchmarks and in any subsequent evaluation of sediment risk using these values because these sediments also contain concentrations of other chemicals that will affect sediment toxicity. The differences between the toxicity observed in the studies used to develop the ERLs/ERMs and site-specific measures of toxicity may be remarkable as observed at several site-specific studies where higher concentrations of PAHs did not result in toxicity (Alcoa, 2000 and Paine et al., 1996).

The AETs used to characterize risk for hexachlorobenzene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene are based on screening sediment benchmarks developed for Puget Sound using a bivalve study, a Microtox assay, and a Microtox assay, respectively (Buchman, 2008). Sediment toxicity is highly variable based on local sediment conditions and, therefore, predictions of risk from screening values can vary greatly.

4.3 RISK CHARACTERIZATION UNCERTAINTY

This section discusses uncertainties related to the risk characterization and the methodology used to estimate risk. The most significant general uncertainty associated with risk characterization is

how exposure to multiple chemicals was evaluated. Except for PAHs which are discussed below, additivity of effects to the various receptors from exposure to the multiple chemicals measured at the Site was not appropriate since these chemicals, for the most part, act via different mechanisms of toxicity. Furthermore, no evidence was found in the scientific literature to suggest that the toxicity of the compounds measured at the Site should be considered additive. Likewise, some metals are antagonistic but these effects were not considered either since the exact mechanisms are not well understood toxicologically nor is there an accepted method for quantifying this type of interaction in the risk assessment.

For PAHs, potential effects were assumed to be additive and, as such, risks were estimated for total PAHs, LPAHs, HPAHs, and for individual compounds as well. This multi-pronged evaluation increases the confidence in the risk predictions as it provides for several lines of evidence to draw conclusions.

5.0 SUMMARY AND CONCLUSIONS OF THE SLERA

The SLERA can be used to assess the need and, if required, the level of effort required to conduct a baseline ecological risk assessment, or to determine that no further action is necessary. The SLERA can also be used to focus subsequent phases of the investigation by eliminating compounds from further evaluation (EPA, 2001). This section presents the summary and conclusions of the SLERA.

5.1 SUMMARY OF RISK EVALUATION

The screening-level ecological risk assessment evaluated the potential for unacceptable risk for terrestrial and aquatic/estuarine receptors as a result of direct (incidental ingestion) and indirect (bioaccumulation/biomagnifications through the food chain) exposure to chemicals measured in soil and sediment at the Site. Only direct toxicity to surface water was evaluated for the aquatic receptors as discussed herein.

Summaries of all soil and sediment HQs greater than one are provided in Tables 24, 25, and 26 for the South Area, North Area, and background areas, respectively, while Appendices C through J provide detailed risk characterization calculations for all compounds. A summary of the surface water risk evaluation is provided in Table 27. Appendix K provides a list of all references cited in Appendices A though J.

5.1.1 Soil and Sediment

Several of the calculations result in an HQ greater than one using the NOAEL or ERL as the TRV, which suggests that there is a possible risk to these receptors via exposure to the COPEC in the media. Given the conservative nature of the evaluation, it is believed that they do not pose an unacceptable risk for receptors at the Site. The compounds with LOAEL- or ERM-based HQs greater than one are discussed further in this section. The LOAEL and ERM-based HQs provide point of departure above which adverse ecological risks are thought to be probable (as opposed to possible risks which can be predicted using NOAELs and ERLs) and, as such, the risk evaluation is focused on the media that have LOAEL and ERM-based HQs greater than one. Results of the screening-level ecological assessment indicate the following:

- The LOAEL-based HQs for zinc in soil from the South Area are 0.81 and 1.52 for the average and RME earthworm receptor scenarios, respectively. No other LOAEL-based HQs for South Area soils exceed 1 for the other ROPCs.

- None of the LOAEL-based HQs exceed 1 for soil from the North Area.

- The LOAEL-based HQs for zinc in soil from the background area are 0.46 and 1.80 for the average and RME earthworm receptor scenarios, respectively. The LOAEL-based HQs for barium in soil from the background are 1.01 and 1.52 for the average and RME earthworm receptor scenarios, respectively. The TRV used in the barium HQ calculation for the earthworm was based on an EC_{20} so there is not a different value for the NOAEL and LOAEL HQ estimates. No other LOAEL-based HQs for background area soils exceed 1 for the other ROPCs.

- The AET-based HQs for hexachlorobenzene in sediment in the Intracoastal Waterway are 1.67 and 2.10 for the average and RME benthic receptor scenarios, respectively. No other LOAEL or ERM-based HQs for Intracoastal Waterway sediment exceed 1 for the other ROPCs.

- No LOAEL or ERM-based HQs for background sediment in the Intracoastal Waterway exceed 1 for the other ROPCs.

- The ERM-based HQs for dibenz(a,h)anthracene in sediment from the North Area wetlands are 0.77 and 4.15 for the average and RME benthic receptor scenarios, respectively. No other LOAEL or ERM-based HQs for North Area wetlands sediment exceed 1 for the other ROPCs.

- None of the ERM or LOAEL-based HQs in pond sediment is greater than 1.

The LOAEL-based HQs for the RME exposure scenario for the earthworm receptor for the South Area and background soils exceed 1. The LOAEL-based HQs for the average exposure scenario for both areas are below 1, however. The comparison of means statistical evaluation described in Section 2.7 indicated that zinc concentrations in South Area soils are different (higher) than background area soils. The zinc 95% UCL for the background area is, however, higher than the 95% UCL for the South Area because the 95% UCL estimate is skewed due to the smaller data

set and variability. As a result, the zinc RME LOAEL-based HQ for the background area is higher than the zinc RME LOAEL-based HQ for the South Area. In any event, since the HQs are not significantly higher than 1, it is believed that zinc in soils at these two areas does not represent an appreciable risk to earthworms at either location.

Hexachlorobenzene was detected in one of sixteen sediment samples collected in the Intracoastal Waterway. The concentration at sample location IWSE07 (0.0319 mg/kg) exceeded the AET (0.006 mg/kg), which suggests a possible risk for the benthic receptor. It should be noted, however, that this single hexachlorobenzene detection was "J" flagged, which means it was an estimated value below the sample quantitation limit. Hexachlorobenzene was not measured above the sample detection limit (which was specified in Appendix D of the approved QAPP (PBW, 2006c)) at an adjacent sample location approximately 40 feet from IWSE07 or at the three other sediment sample locations in the same barge slip.

The ERM-based HQs for dibenz(a,h)anthracene ranged from 0.77 to 4.15 for the average and RME benthic receptor scenarios, respectively, which suggest that adverse benthic risks from sediment in the North Area are probable for the North Area wetland. So, while localized adverse effects may be possible at the sampling locations that exceed the screening criteria, it is unlikely that adverse risks are present for the benthic community of the North Area wetlands, which is roughly 15 acres in size and is part of a wetlands system that covers hundreds of acres. It should be noted that the ERM-based HQs for total PAHs and HPAHs are below one as are the NOAEL-based HQs for the fiddler crab, sandpiper and green heron receptors. Dibenz(a,h)anthracene is not considered bioaccumulative (TCEQ, 2001) and none of the risk estimates for the higher trophic level receptors have HQs greater than one for this compound.

Evaluating dibenz(a,h)anthracene closer reveals that six of forty-nine samples exceeded the TCEQ marine sediment Protective Concentration Limit (PCL) while five of six samples exceeded both the TCEQ Second Effects Level (SEL) for marine sediment and the midpoint of the PCL and SEL. However, none of the samples have total PAH concentrations exceeding the SEL. Consistent with TCEQ guidance (TCEQ, 2005), these individual PAHs were eliminated from further evaluation using the total PAH benchmark even though the individual dibenzo(a,h)anthracene benchmark was exceeded.

As noted in Section 2.0, there are no indications that the benthic community in these six locations is stressed or has been impacted by the dibenz(a,h)anthracene or other compounds present in the sediment. Based on these lines of evidence, it is unlikely that localized concentrations of dibenz(a,h)anthracene have an appreciable, adverse ecological effect on the benthic community of the North Area wetlands. It is unclear why the toxicity value for this compound is significantly lower than the benchmarks derived for the structurally similar PAHs but it is clear that this low value significantly impacts risk perception and should be taken in context with other benchmarks.

5.1.2 Surface Water

Surface water sampled near the Site in the Intracoastal Waterway were not measured at concentrations in excess of screening values, except for dissolved boron, whereas dissolved boron, iron, and silver, and 4,4'-DDT were measured in at least one surface water sample collected at the background location that exceeded screening levels. More compounds were measured in the samples collected from the background location than near the Site although the concentrations for those compounds measured at both areas were generally similar. Dissolved boron and silver concentrations measured in the ponds were less than that measured in surface water collected from the background area of the Intracoastal Waterway. Dissolved manganese was measured in pond surface water at a concentration greater than the benchmark. Dissolved boron, copper, and manganese, and acrolein were measured in excess of their screening criteria in one sample of surface water collected in the wetlands of the North Area.

While it is difficult to determine the significance of the above screening level comparisons since many occur in background areas, it is unlikely that adverse ecological effects are occurring due to Site-related chemicals measured in surface water at the Site. This conclusion is supported by the fact that all of the concentrations of compounds measured in surface water were well below the reported LC_{50}s, in all cases by more than an order of magnitude and sometimes several orders of magnitude and using a safety factor of at least an order of magnitude to convert an LC_{50} to a NOAEL is appropriately protective (Appendix C of TCEQ, 2001).

5.2 SELECTION OF COPECS FOR FURTHER EVALUATION

Identification of COPECs for the baseline ecological risk assessment (BERA) is one of the primary objectives of the SLERA. While a few COPECs in some media provide risk estimates

above a hazard quotient of one and/or exceeded screening criteria as explained below, further evaluation of these COPECs in a baseline ecological risk assessment is not recommended.

Much of this evaluation has relied on the use of screening criteria, which are derived to avoid underestimating risk. In addition, the risk estimates quantified in this report were based on conservative assumptions that, given uncertainty, were purposefully chosen to err on the side of conservatism and not underestimate risk. The weight of evidence conclusion for the SLERA is summarized below.

Because none of the compounds measured in Site soils, sediment or surface water pose a probable adverse ecological risk when taking into account uncertainty and background considerations, no compounds have been identified as COPECs for further evaluation in a BERA.

5.3 SCIENTIFIC MANAGEMENT DECISION POINT

The SLERA concludes with a SMDP and the three possible decisions at this point according to EPA (EPA, 1997) are:

1. There is adequate information to conclude that ecological risks are negligible and therefore no need for remediation on the basis of ecological risk;
2. The information is not adequate to make a decision at this point, and the ecological risk assessment process will continue to Step 3; or
3. The information indicates a potential for adverse ecological effects, and a more thorough assessment is warranted (i.e., continue to Step 3).

Based on the results of the SLERA, additional data are not needed to better characterize the nature and extent of contamination and potential ecological risks associated with the Site. Given the conservative evaluation and the conclusions of the SLERA presented herein, compounds measured in Site soil, sediment and surface water are not likely to pose an adverse risk. As such, additional characterization of ecological risks and remediation are not recommended for this Site and there is adequate information to conclude that adverse ecological risks are unlikely.

6.0 REFERENCES

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TABLE

TABLE 1
EXPOSURE POINT CONCENTRATION (mg/kg)
SOUTH AREA SURFACE SOIL*

Chemicals of Interest+	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark (1)	EPA Ecological Screening Level (2)	95% UCL	Statistic Used (3)	# of Detects/# of Samples
2-Methylnaphthalene	0.0293	0.501	0.0106	---	---	0.0784	97.5% Chebyshev	22 of 83
4,4'-DDD	0.0007894	0.0243	0.00264	---	---	0.0029	97.5% Chebyshev	5 of 83
4,4'-DDE	0.0019	0.0693	0.000428	---	---	0.0074	97.5% Chebyshev	17 of 83
4,4'-DDT	0.0038	0.0625	0.000281	---	0.021 (m)	0.014	99% Chebyshev	37 of 83
Acenaphthene	0.0595	1.69	0.0113	20 (p)	---	0.197	97.5% Chebyshev	26 of 83
Acenaphthylene	0.0382	0.935	0.0184	---	---	0.113	97.5% Chebyshev	19 of 83
Aluminum	5335	15200	414	---	---	5946	95% Student's-t	83 of 83
Anthracene	0.0961	2.46	0.0112	---	---	0.297	97.5% Chebyshev	37 of 83
Antimony	1.118	5.14	0.2	5 (p)	0.27 (m)	1.959	97.5% Chebyshev	72 of 83
Aroclor-1254	0.137	7.98	0.00334	---	---	0.726	97.5% Chebyshev	13 of 85
Arsenic	3.735	24.3	0.26	18 (p)	18 (p)	4.535	95% Approx. Gamma	71 of 83
Barium	345.2	2180	18.6	330 (i)	330 (i)	415.1	95% H-UCL	83 of 83
Benzo(a)anthracene	0.345	5.02	0.0286	---	---	1.211	99% Chebyshev	30 of 83
Benzo(a)pyrene	0.457	4.57	0.0103	---	---	1.457	99% Chebyshev	65 of 83
Benzo(b)fluoranthene	0.582	5.42	0.0408	---	---	1.638	95% H-UCL	61 of 83
Benzo(g,h,i)perylene	0.324	4.24	0.00989	---	---	1.095	99% Chebyshev	51 of 83
Benzo(k)fluoranthene	0.24	4.25	0.0195	---	---	0.651	97.5% Chebyshev	33 of 83
Beryllium	0.408	4.6	0.014	10 (p)	21 (m)	0.487	95% Approx. Gamma	82 of 83
Boron	4.662	54.4	2.43	0.5 (p)	---	9.663	97.5% Chebyshev	34 of 83
Butyl Benzyl Phthalate	0.0187	0.297	0.0129	---	---	0.0373	95% Chebyshev	6 of 83
Cadmium	0.464	9.71	0.023	32 (p)	0.36 (m)	1.71	99% Chebyshev	50 of 83
Carbazole	0.0612	1.54	0.0104	---	---	0.193	97.5% Chebyshev	29 of 83
Chromium	16.08	136	3.37	0.4 (i)	26 (a)	17.45	95% H-UCL	83 of 83
Chrysene	0.409	4.87	0.00932	---	---	1.322	99% Chebyshev	56 of 83
Cobalt	3.705	16	0.049	13 (p)	13 (p)	4.781	95% Chebyshev	82 of 83
Copper	27.98	216	1.55	61 (i)	28 (a)	32.45	95% H-UCL	83 of 83
Dibenz(a,h)anthracene	0.155	1.64	0.0639	---	---	0.363	97.5% Chebyshev	36 of 83
Dibenzofuran	0.0378	0.821	0.0167	---	---	0.111	97.5% Chebyshev	17 of 83
Dieldrin	0.000997	0.0205	0.000243	---	0.0049 (m)	0.003	97.5% Chebyshev	21 of 83
Di-n-butyl Phthalate	0.048	0.753	0.0368	200 (p)	---	0.0967	95% Chebyshev	9 of 83
Endosulfan Sulfate	0.002	0.0713	0.000456	---	---	0.0077	97.5% Chebyshev	17 of 83
Endrin Aldehyde	0.0023	0.0738	0.000497	---	---	0.0084	97.5% Chebyshev	22 of 83
Endrin Ketone	0.0016	0.02	0.000469	---	---	0.004	97.5% Chebyshev	18 of 83
Fluoranthene	0.799	14.2	0.0133	---	---	2.656	95% H-UCL	59 of 83
Fluorene	0.0515	1.11	0.00945	30 (i)	---	0.155	97.5% Chebyshev	28 of 83
gamma-Chlordane	0.00082679	0.0156	0.00071	---	---	0.0025	97.5% Chebyshev	8 of 83
Indeno(1,2,3-cd)pyrene	0.47	6.49	0.0634	---	---	1.115	97.5% Chebyshev	63 of 83
Iron	16285	77100	3450	---	---	17845	95% H-UCL	83 of 83
Lead	69.61	643	2.82	120 (p)	11 (a)	84.5	95% H-UCL	83 of 83
Lithium	7.856	28	0.65	2 (p)	---	9.055	95% Approx. Gamma	83 of 83
Manganese	257.4	892	59.3	500 (p)	220 (p)	281.1	95% Student's-t	83 of 83
Mercury	0.0227	0.66	0.0032	0.1 (i)	---	0.0254	95% H-UCL	37 of 83
Molybdenum	1.306	8.42	0.098	2 (p)	---	1.645	95% Approx. Gamma	71 of 83
Nickel	11.64	36.7	2.84	30 (p)	38 (p)	12.54	95% Approx. Gamma	83 of 83
Phenanthrene	0.512	12.6	0.0139	---	---	2.198	99% Chebyshev	57 of 83
Pyrene	0.533	8.47	0.0121	---	---	1.366	95% H-UCL	57 of 83
Strontium	70.61	527	16.5	---	---	101.2	95% Chebyshev	83 of 83
Tin	0.611	4.95	0.52	50 (p)	---	0.991	95% Chebyshev	23 of 83
Titanium	29.8	645	11.5	---	---	63	95% Chebyshev	83 of 83
Vanadium	13.76	45.6	5.42	2 (p)	7.8 (a)	14.84	95% Approx. Gamma	83 of 83
Zinc	601.2	4770	12.3	120 (i)	46 (a)	727.7	95% Approx. Gamma	83 of 83
LPAH	0.7866	19.296	0.07485	---	29 (i)	3.0384		
HPAH	4.314	59.17	0.27111	---	1.1 (m)	12.874		
Total PAH	5.1006	78.466	0.34596	---	---	15.9124		

Notes:
* Surface soil was collected from 0 to 0.5 ft. below ground surface.
+ Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.
(1) - From Table 3-4 of TCEQ, 2006.
(2) - From www.epa.gov/ecotox/ecossl.
(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.
(a) - avian
(i) - soil invertebrate
(m) - mammal
(p) - plant

TABLE 2
EXPOSURE POINT CONCENTRATION (mg/kg)
SOUTH AREA SOIL*

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark (1)	EPA Ecological Screening Level (2)	95% UCL	Statistic Used (3)	# of Detects/# of Samples
1,3,5-Trimethylbenzene	0.099	4.36	0.000267	—	—	0.532	97.5% Chebyshev	9 of 83
2-Butanone	0.00412	0.0226	0.000992	—	—	0.00925	97.5% Chebyshev	4 of 83
2-Hexanone	0.00406	0.0207	0.00109	—	—	0.0164	97.5% Chebyshev	8 of 83
2-Methylnaphthalene	0.0698	7.21	0.0106	—	—	0.341	97.5% Chebyshev	32 of 166
4,4'-DDD	0.00766	1.12	0.000369	—	—	0.0498	97.5% Chebyshev	21 of 166
4,4'-DDE	0.0017	0.0693	0.000428	—	—	0.0054	97.5% Chebyshev	22 of 166
4,4'-DDT	0.0037	0.113	0.000281	—	0.021 (m)	0.0125	99% Chebyshev	68 of 166
Acenaphthene	0.0419	1.69	0.0113	20 (p)	—	0.115	97.5% Chebyshev	35 of 166
Acenaphthylene	0.042	1.2	0.0172	—	—	0.114	97.5% Chebyshev	37 of 166
Acetone	0.0145	0.16	0.031	—	—	0.0491	99% Chebyshev	10 of 83
Aluminum	6452	15700	414	—	—	6914	95% Student's-t	166 of 166
Anthracene	0.0874	2.46	0.0112	—	—	0.21	97.5% Chebyshev	65 of 166
Antimony	1.023	5.51	0.2	5 (p)	0.27 (m)	1.576	97.5% Chebyshev	144 of 166
Aroclor-1254	0.205	11.5	0.00334	—	—	0.74	97.5% Chebyshev	25 of 170
Arsenic	3.331	24.3	0.23	18 (p)	18 (p)	4.916	97.5% Chebyshev	139 of 166
Barium	237.4	2180	18.6	330 (i)	330 (i)	330.4	95% Chebyshev	166 of 166
Benzene	0.004	0.0221	0.000339	—	—	0.0065	97.5% Chebyshev	72 of 83
Benzo(a)anthracene	0.268	5.02	0.0118	—	—	0.859	99% Chebyshev	44 of 166
Benzo(a)pyrene	0.347	4.88	0.00999	—	—	1.008	99% Chebyshev	113 of 166
Benzo(b)fluoranthene	0.466	5.97	0.0408	—	—	1.256	99% Chebyshev	102 of 166
Benzo(g,h,i)perylene	0.251	4.24	0.00989	—	—	0.545	97.5% Chebyshev	81 of 166
Benzo(k)fluoranthene	0.157	4.25	0.0158	—	—	0.378	97.5% Chebyshev	45 of 166
Beryllium	0.465	4.6	0.014	10 (p)	21 (m)	0.668	97.5% Chebyshev	165 of 166
Boron	4.811	54.4	2.43	0.5 (p)	—	7.387	97.5% Chebyshev	72 of 166
Butyl Benzyl Phthalate	0.0203	0.617	0.0129	—	—	0.0392	95% Chebyshev	10 of 166
Cadmium	0.335	9.71	0.023	32 (p)	0.36 (m)	0.751	97.5% Chebyshev	93 of 166
Carbazole	0.0459	1.54	0.0104	—	—	0.118	97.5% Chebyshev	42 of 166
Carbon Disulfide	0.0012	0.028	0.000987	—	—	0.004	97.5% Chebyshev	13 of 83
Chromium	13.53	136	2.03	0.4 (i)	26 (a)	17.75	95% Chebyshev	166 of 166
Chrysene	0.327	4.87	0.00901	—	—	0.938	99% Chebyshev	93 of 166
Cobalt	4.144	16	0.049	13 (p)	13 (p)	4.407	95% Student's-t	165 of 166
Copper	24.26	487	0.13	61 (i)	28 (a)	46.92	97.5% Chebyshev	164 of 166
Cyclohexane	0.266	21.7	0.000626	—	—	1.898	97.5% Chebyshev	47 of 83
Dibenz(a,h)anthracene	0.113	1.64	0.0619	—	—	0.236	97.5% Chebyshev	56 of 166
Dibenzofuran	0.0309	0.821	0.0167	—	—	0.0709	97.5% Chebyshev	23 of 166
Dieldrin	0.00090075	0.0205	0.000243	—	0.0049 (m)	0.0021	97.5% Chebyshev	33 of 166
Di-n-butyl Phthalate	0.0391	0.753	0.0311	200 (p)	—	0.0657	95% Chebyshev	11 of 166
Endosulfan Sulfate	0.0013	0.0713	0.0713	—	—	0.0042	97.5% Chebyshev	21 of 166
Endrin Aldehyde	0.0019	0.0738	0.000497	—	—	0.0055	97.5% Chebyshev	31 of 166
Endrin Ketone	0.0013	0.02	0.000469	—	—	0.0029	97.5% Chebyshev	25 of 166
Ethylbenzene	0.0038	0.105	0.000654	—	—	0.0127	97.5% Chebyshev	47 of 83
Fluoranthene	0.594	14.2	0.0133	—	—	1.886	99% Chebyshev	96 of 166
Fluorene	0.0442	1.11	0.00945	30 (i)	—	0.107	97.5% Chebyshev	41 of 166
gamma-Chlordane	0.00069043	0.0156	0.00071	—	—	0.0017	97.5% Chebyshev	12 of 166
Indeno(1,2,3-cd)pyrene	0.368	6.49	0.0574	—	—	0.761	97.5% Chebyshev	104 of 166
Iron	14277	77100	2410	—	—	17453	95% Chebyshev	166 of 166
Isopropylbenzene (cumene)	0.831	64.9	0.000318	—	—	8.618	99% Chebyshev	16 of 83
Lead	53.52	702	2.48	120 (p)	11 (a)	104	97.5% Chebyshev	166 of 166
Lithium	10.03	28.6	0.65	2 (p)	—	12.17	95% Chebyshev	166 of 166
m,p-Xylene	0.0347	2.56	0.000558	—	—	0.227	97.5% Chebyshev	53 of 83
Manganese	261.2	892	59.3	500 (p)	220 (p)	277.5	95% Student's-t	166 of 166
Mercury	0.0262	0.85	0.0026	0.1 (i)	—	0.0718	97.5% Chebyshev	73 of 166
Methylcyclohexane	0.0369	2.73	0.000223	—	—	0.242	97.5% Chebyshev	57 of 83
Molybdenum	0.89	10.4	0.088	2 (p)	—	1.61	97.5% Chebyshev	118 of 166
Naphthalene	0.323	19.2	0.00482	—	—	2.775	99% Chebyshev	8 of 83
Nickel	11.74	36.7	2.7	30 (p)	38 (p)	12.37	95% Student's-t	166 of 166
n-Propylbenzene	0.0237	1.8	0.00023	—	—	0.159	97.5% Chebyshev	14 of 83
o-Xylene	0.0132	0.84	0.000223	—	—	0.077	97.5% Chebyshev	32 of 83
Phenanthrene	0.401	12.6	0.0136	—	—	1.349	99% Chebyshev	95 of 166
Pyrene	0.432	8.47	0.0121	—	—	1.29	99% Chebyshev	98 of 166
Strontium	75.61	591	16.5	—	—	100.6	95% Chebyshev	166 of 166
Tin	0.616	6.48	0.52	50 (p)	—	0.91	95% Chebyshev	40 of 166
Titanium	25.77	645	4.02	—	—	32.21	95% Student's-t	166 of 166
Toluene	0.00574	0.0192	0.000721	—	—	0.0137	97.5% Chebyshev	69 of 83
Vanadium	14.4	45.6	4.73	2 (p)	7.8 (a)	15.17	95% Approx. Gamma	166 of 166
Xylene (total)	0.0479	3.4	0.000777	—	—	0.304	97.5% Chebyshev	53 of 83
Zinc	433.8	7650	6.17	120 (i)	46 (a)	815.2	97.5% Chebyshev	166 of 166
LPAH	1.0093	45.47	0.07817	—	29 (i)	5.011		
HPAH	3.323	60.03	0.24199	—	1.1 (m)	9.157		
Total PAH	4.3323	105.5	0.32016	—	—	14.168		

Notes:
* Soil was collected from 0 to 4 ft. below ground surface.
+ Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.
(1) - From Table 3-4 of TCEQ, 2006.
(2) - From www.epa.gov/ecotox/ecossl.
(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.
(a) - avian
(i) - soil invertebrate
(m) - mammal
(p) - plant

TABLE 3
EXPOSURE POINT CONCENTRATION (mg/kg)
NORTH AREA SURFACE SOIL*

Chemicals of Interest+	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark (1)	EPA Ecological Screening Level (2)	95% UCL	Statistic Used (3)	# of Detects/# of Samples
2-Methylnaphthalene	0.0123	0.053	0.01	---	---	0.0275	95% Chebyshev	3 of 18
4,4'-DDE	0.0011	0.0149	0.00216	---	---	0.0093	99% Chebyshev	2 of 18
4,4'-DDT	0.0012	0.0108	0.000597	---	0.021 (m)	0.0073	99% Chebyshev	7 of 18
Acenaphthene	0.0161	0.157	0.021	20 (p)	---	0.0528	95% Chebyshev	2 of 18
Acenaphthylene	0.0099	0.0555	0.0555	---	---	0.0234	95% Chebyshev	1 of 18
Aluminum	10673	16800	1810	---	---	12185	95% Student's-t	18 of 18
Anthracene	0.0257	0.264	0.00887	---	---	0.168	99% Chebyshev	4 of 18
Antimony	1.744	8.09	1.66	5 (p)	0.27 (m)	6.777	99% Chebyshev	9 of 18
Aroclor-1254	0.0037	0.0122	0.0122	---	---	0.0077	95% Chebyshev	1 of 18
Arsenic	2.522	5.69	0.54	18 (p)	18 (p)	2.999	95% Student's-t	17 of 18
Barium	145.2	476	46.1	330 (i)	330 (i)	264.2	95% Chebyshev	18 of 18
Benzo(a)anthracene	0.0715	1.18	1.18	---	---	0.72	99% Chebyshev	1 of 18
Benzo(a)pyrene	0.114	1.42	0.0135	---	---	0.888	99% Chebyshev	7 of 18
Benzo(b)fluoranthene	0.146	1.62	0.0487	---	---	0.352	95% Adjusted Gamma	8 of 18
Benzo(g,h,i)perylene	0.132	1.28	0.0237	---	---	0.842	99% Chebyshev	10 of 18
Benzo(k)fluoranthene	0.0689	0.799	0.011	---	---	0.505	99% Chebyshev	4 of 18
Beryllium	0.708	2.88	0.066	10 (p)	21 (m)	2.125	99% Chebyshev	17 of 18
Bis(2-ethylhexyl)phthalate	0.0462	0.239	0.0122	---	---	0.0978	95% Chebyshev	6 of 18
Boron	8.028	39.2	3.15	0.5 (p)	---	13.49	95% Approx. Gamma	13 of 18
Butyl Benzyl Phthalate	0.016	0.151	0.151	---	---	0.0514	95% Chebyshev	1 of 18
Cadmium	0.207	0.8	0.28	32 (p)	0.36 (m)	0.799	99% Chebyshev	8 of 18
Carbazole	0.0153	0.128	0.013	---	---	0.045	95% Chebyshev	4 of 18
Chromium	20.26	128	7.9	0.4 (i)	26 (a)	48.59	95% Student's-t	18 of 18
Chrysene	0.102	1.3	0.011	---	---	0.812	99% Chebyshev	7 of 18
Cobalt	5.789	7.87	2.81	13 (p)	13 (p)	6.406	95% Student's-t	18 of 18
Copper	24.13	200	5.9	61 (i)	28 (a)	70.01	95% Chebyshev	18 of 18
Dibenz(a,h)anthracene	0.0471	0.404	0.045	---	---	0.284	99% Chebyshev	4 of 18
Dibenzofuran	0.0129	0.0862	0.0862	---	---	0.0336	95% Chebyshev	1 of 18
Dieldrin	0.0004866	0.00545	0.00545	---	0.0049 (m)	0.0034	99% Chebyshev	1 of 18
Diethyl Phthalate	0.0113	0.011	0.011	100 (p)	---	0.0215	95% Chebyshev	1 of 18
Di-n-butyl Phthalate	0.0179	0.01	0.01	200 (p)	---	0.0357	95% Chebyshev	1 of 18
Di-n-octyl Phthalate	0.0144	0.123	0.0154	---	---	0.0428	95% Chebyshev	2 of 18
Endrin	0.000304	0.00149	0.00149	---	---	0.00076	95% Chebyshev	1 of 18
Endrin Ketone	0.000874	0.00966	0.00966	---	---	0.0031	95% Chebyshev	1 of 18
Fluoranthene	0.159	2.19	0.0214	---	---	1.358	99% Chebyshev	6 of 18
Fluorene	0.0163	0.141	0.017	30 (i)	---	0.0496	95% Chebyshev	3 of 18
Indeno(1,2,3-cd)pyrene	0.151	1.51	0.02	---	---	0.969	99% Chebyshev	9 of 18
Iron	19477	102000	8450	---	---	41127	95% Chebyshev	18 of 18
Lead	57.7	471	8.22	120 (p)	11 (a)	318.3	99% Chebyshev	18 of 18
Lithium	16.57	26.6	2.59	2 (p)	---	18.68	95% Student's-t	18 of 18
Manganese	369.5	1210	82.3	500 (p)	220 (p)	473.3	95% Approx. Gamma	18 of 18
Mercury	0.0126	0.064	0.006	0.1 (i)	---	0.0218	95% Approx. Gamma	8 of 18
Molybdenum	0.949	10.7	0.085	2 (p)	---	6.812	99% Chebyshev	11 of 18
Nickel	17.04	51.7	11.7	30 (p)	38 (p)	20.76	95% Student's-t	18 of 18
Phenanthrene	0.109	1.34	0.018	---	---	0.845	99% Chebyshev	7 of 18
Pyrene	0.147	1.87	0.0149	---	---	1.169	99% Chebyshev	8 of 18
Silver	0.0543	0.41	0.092	2 (p)	---	0.148	95% Chebyshev	2 of 18
Strontium	57.32	93.6	26.6	---	---	65.4	95% Student's-t	18 of 18
Thallium	0.109	0.63	0.63	1 (p)	---	0.273	95% Chebyshev	1 of 18
Tin	0.625	3.67	0.68	50 (p)	---	1.494	95% Chebyshev	4 of 18
Titanium	20.67	55.9	3.41	---	---	26.26	95% Approx. Gamma	18 of 18
Vanadium	19.66	45.8	7.85	2 (p)	7.8 (a)	23.4	95% Student's-t	18 of 18
Zinc	418.4	5640	29.5	120 (i)	46 (a)	3485	99% Chebyshev	18 of 18
LPAH	0.1893	2.0105	0.13037	---	29 (i)	1.1663		
HPAH	1.1385	13.573	1.3892	---	1.1 (m)	7.899		
Total PAH	1.3278	15.5835	1.51957	---	---	9.0653		

Notes:
* Surface soil was collected from 0 to 0.5 ft. below ground surface.
+ Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.
(1) - From Table 3-4 of TCEQ, 2006.
(2) - From www.epa.gov/ecotox/ecossl.
(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.
(a) - avian
(i) - soil invertebrate
(m) - mammal
(p) - plant

TABLE 4
EXPOSURE POINT CONCENTRATION (mg/kg)
NORTH AREA SOIL+

Chemicals of Interest**	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark [1]	EPA Ecological Screening Level [2]	95% UCL	Statistic Used [3]	# of Detects/# of Samples
1,1-Dichloroethane	0.0286	0.518	0.00161	—	—	0.299	99% Chebyshev	3 of 19
1,1-Dichloroethene	0.0179	0.313	0.00178	—	—	0.181	99% Chebyshev	2 of 19
1,2-Dichloroethane	0.0106	0.177	0.00231	—	—	0.103	99% Chebyshev	4 of 19
2-Butanone	0.0029	0.208	0.0017	—	—	0.121	99% Chebyshev	11 of 19
2-Methylnaphthalene	0.0103	0.053	0.01	—	—	0.0198	95% Chebyshev	4 of 36
4,4'-DDE	0.0007	0.0149	0.00216	—	—	0.0024	95% Chebyshev	2 of 36
4,4'-DDT	0.000704	0.0108	0.000597	—	0.021 (m)	0.0038	99% Chebyshev	7 of 36
Acenaphthene	0.0142	0.157	0.021	20 (p)	—	0.036	95% Chebyshev	4 of 36
Aluminum	11971	18300	1810	—	—	13092	95% Student's-t	36 of 36
Anthracene	0.0215	0.264	0.00887	—	—	0.107	99% Chebyshev	6 of 36
Antimony	1.416	8.09	1.66	5 (p)	0.27 (m)	4.366	99% Chebyshev	16 of 36
Aroclor-1254	0.0056	0.0938	0.0122	—	—	0.0168	95% Chebyshev	2 of 36
Arsenic	2.573	5.69	0.54	18 (p)	18 (p)	2.959	95% Student's-t	32 of 36
Barium	142.1	362	46.1	330 (i)	330 (i)	211.7	95% Student's-t	36 of 36
Benzene	0.0027	0.00632	0.00138	—	—	0.0034	95% Student's-t	12 of 19
Benzo(a)anthracene	0.068	1.18	0.0383	—	—	0.464	99% Chebyshev	4 of 36
Benzo(a)pyrene	0.0922	1.42	0.0135	—	—	0.554	99% Chebyshev	10 of 36
Benzo(b)fluoranthene	0.12	1.62	0.0487	—	—	0.649	99% Chebyshev	11 of 36
Benzo(g,h,i)perylene	0.0961	1.28	0.0237	—	—	0.494	99% Chebyshev	14 of 36
Benzo(k)fluoranthene	0.0601	0.799	0.068	—	—	0.341	99% Chebyshev	6 of 36
Beryllium	0.752	2.88	0.066	10 (p)	21 (m)	1.087	95% Chebyshev	35 of 36
Bis(2-ethylhexyl)phthalate	0.0428	0.239	0.0122	—	—	0.0753	95% Chebyshev	11 of 36
Boron	7.576	39.2	3.14	0.5 (p)	—	20.55	99% Chebyshev	26 of 36
Bromoform	0.0023	0.018	0.011	—	—	0.013	99% Chebyshev	2 of 19
Butyl Benzyl Phthalate	0.0125	0.151	0.054	—	—	0.031	95% Chebyshev	2 of 36
Cadmium	0.193	0.8	0.28	32 (p)	0.36 (m)	0.59	99% Chebyshev	15 of 36
Carbazole	0.0143	0.128	0.0108	—	—	0.0323	95% Chebyshev	7 of 36
Carbon Disulfide	0.0028	0.0284	0.00757	—	—	0.018	99% Chebyshev	3 of 19
Chromium	17.17	128	7.76	0.4 (i)	26 (a)	22.69	95% Student's-t	36 of 36
Chrysene	0.0885	1.3	0.0104	—	—	0.529	99% Chebyshev	11 of 36
cis-1,2-Dichloroethene	0.0541	0.999	0.0195	—	—	0.577	99% Chebyshev	2 of 19
Cobalt	6.318	10.3	2.81	13 (p)	13 (p)	6.808	95% Student's-t	36 of 36
Copper	18.7	200	4.59	61 (i)	28 (a)	41.87	95% Student's-t	36 of 36
Cyclohexane	0.0056	0.00185	0.000981	—	—	0.00185	Maximum*	5 of 19
Dibenz(a,h)anthracene	0.0384	0.404	0.045	—	—	0.177	99% Chebyshev	7 of 36
Dibenzofuran	0.0099	0.0862	0.015	—	—	0.0205	95% Chebyshev	2 of 36
Diethyl Phthalate	0.0097	0.011	0.00992	100 (p)	—	0.0118	95% Student's-t	2 of 36
Di-n-butyl Phthalate	0.0155	0.015	0.01	200 (p)	—	0.0248	95% Chebyshev	2 of 36
Di-n-octyl Phthalate	0.0115	0.123	0.0154	—	—	0.0264	95% Chebyshev	3 of 36
Ethylbenzene	0.0016	0.00502	0.00114	—	—	0.00502	Maximum*	5 of 19
Fluoranthene	0.146	2.19	0.0214	—	—	0.923	99% Chebyshev	9 of 36
Fluorene	0.0112	0.141	0.017	30 (i)	—	0.0282	95% Chebyshev	4 of 36
Indeno(1,2,3-cd)pyrene	0.133	1.51	0.02	—	—	0.577	99% Chebyshev	13 of 36
Iron	17531	102000	7120	—	—	21765	95% Student's-t	36 of 36
Lead	37.8	471	5.88	120 (p)	11 (a)	96.63	95% Chebyshev	36 of 36
Lithium	18.84	32.2	2.59	2 (p)	—	20.51	95% Student's-t	36 of 36
m,p-Xylene	0.002	0.00139	0.00132	—	—	0.00139	Maximum*	2 of 19
Manganese	347	1210	82.3	500 (p)	220 (p)	405.2	95% Approx. Gamma	36 of 36
Mercury	0.0094	0.064	0.0034	0.1 (i)	—	0.03	99% Chebyshev	13 of 36
Methylcyclohexane	0.0024	0.00278	0.0015	—	—	0.00278	Maximum*	6 of 19
Molybdenum	0.586	10.7	0.085	2 (p)	—	3.551	99% Chebyshev	21 of 36
Naphthalene	0.0236	0.148	0.0013	—	—	0.102	99% Chebyshev	6 of 19
Nickel	17.17	51.7	9.74	30 (p)	38 (p)	18.79	95% Student's-t	36 of 36
Phenanthrene	0.0998	1.34	0.018	—	—	0.595	99% Chebyshev	10 of 36
Pyrene	0.143	1.97	0.0149	—	—	0.879	99% Chebyshev	11 of 36
Silver	0.0473	0.41	0.092	2 (p)	—	0.103	95% Student's-t	3 of 36
Strontium	56.15	96.2	22.1	—	—	62.05	95% Student's-t	36 of 36
Tetrachloroethene	0.0127	0.223	0.00135	—	—	0.129	99% Chebyshev	3 of 19
Tin	0.47	3.67	0.68	50 (p)	—	0.926	95% Chebyshev	5 of 36
Titanium	20.83	57	3.41	—	—	24.83	95% Student's-t	36 of 36
Toluene	0.0046	0.0122	0.00134	200 (p)	—	0.0122	Maximum*	8 of 19
Vanadium	20.54	45.8	7.85	2 (p)	7.8 (a)	22.9	95% Student's-t	36 of 36
Xylene (total)	0.119	1.76	0.00139	—	—	0.372	95% Adjusted Gamma	8 of 19
Zinc	242.5	5640	21.1	120 (i)	46 (a)	1784	99% Chebyshev	36 of 36
LPAH	0.1806	2.103	0.07617	—	29 (i)	0.888		
HPAH	0.9853	13.673	0.3039	—	1.1 (m)	5.587		
Total PAH	1.1659	15.776	0.38007	—	—	6.475		

Notes:
* Recommended UCL exceeds maximum observation, so the maximum measured concentration was used as the EPC.
+ Soil was collected from 0 to 4 ft. below ground surface.
** Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.
(1) - From Table 3-4 of TCEQ, 2006.
(2) - From www.epa.gov/ecotox/ecossl.
(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.
(a) - avian
(i) - soil invertebrate
(m) - mammal
(p) - plant

TABLE 5
EXPOSURE POINT CONCENTRATION (mg/kg)
BACKGROUND SOIL+

Chemicals of Interest++	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark (1)	EPA Ecological Screening Level (2)	95% UCL	Statistic Used (3)	# of Detects/# of Samples
Antimony	0.953	2.19	0.25	5 (p)	0.27 (m)	2.19	Maximum*	5 of 10
Arsenic	3.438	5.9	0.24	18 (p)	18 (p)	4.477	95% Student's-t	10 of 10
Barium	333.1	1130	150	330 (i)	330 (i)	502.3	95% Approx. Gamma	10 of 10
Benzo(a)anthracene	0.0116	0.082	0.082	---	---	0.0457	95% Chebyshev	1 of 10
Benzo(a)pyrene	0.0122	0.076	0.076	---	---	0.0431	95% Chebyshev	1 of 10
Benzo(b)fluoranthene	0.00941	0.057	0.057	---	---	0.0325	95% Chebyshev	1 of 10
Benzo(g,h,i)perylene	0.0241	0.083	0.083	---	---	0.0527	95% Chebyshev	1 of 10
Benzo(k)fluoranthene	0.0158	0.106	0.106	---	---	0.0595	95% Chebyshev	1 of 10
Cadmium	0.0311	0.11	0.041	32 (p)	0.36 (m)	0.11	Maximum*	3 of 10
Carbazole	0.00512	0.011	0.011	---	---	0.00636	95% Student's-t	1 of 10
Chromium	15.2	20.1	10.7	0.4 (i)	26 (a)	16.95	95% Student's-t	10 of 10
Chrysene	0.0145	0.083	0.083	---	---	0.0477	95% Chebyshev	1 of 10
Copper	12.12	19.3	7.68	61 (i)	28 (a)	14.41	95% Student's-t	10 of 10
Fluoranthene	0.0208	0.156	0.156	---	---	0.156	Maximum*	1 of 10
Indeno(1,2,3-cd)pyrene	0.0551	0.417	0.417	---	---	0.417	Maximum*	1 of 10
Lead	13.43	15.2	11	120 (p)	11 (a)	14.33	95% Student's-t	10 of 10
Lithium	21.14	32.5	14.4	2 (p)	---	24.13	95% Student's-t	10 of 10
Manganese	377.4	551	284	500 (p)	220 (p)	431.8	95% Student's-t	10 of 10
Mercury	0.0213	0.03	0.015	0.1 (i)	---	0.0241	95% Student's-t	10 of 10
Molybdenum	0.522	0.68	0.42	2 (p)	---	0.565	95% Student's-t	10 of 10
Phenanthrene	0.0167	0.137	0.137	---	---	0.137	Maximum*	1 of 10
Pyrene	0.0218	0.127	0.127	---	---	0.0728	95% Chebyshev	1 of 10
Zinc	247	969	36.6	120 (i)	46 (a)	969	Maximum*	10 of 10
LPAH	0.0167	0.137	0.137	---	29 (i)	0.137		
HPAH	0.18531	1.187	1.187	---	1.1 (m)	0.927		
Total PAH	0.20201	1.324	1.324	---	---	1.064		

Notes:
* Recommended UCL exceeds maximum observation, so the maximum measured concentration was used as the EPC.
+ Soil was collected from 0 to 4 ft. below ground surface.
++ Chemicals of interest are any chemical measured in at least one sample.
(1) - From Table 3-4 of TCEQ, 2006.
(2) - From www.epa.gov/ecotox/ecossl.
(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.
(a) - avian
(i) - soil invertebrate
(m) - mammal
(p) - plant

TABLE 6
EXPOSURE POINT CONCENTRATION (mg/kg)
INTRACOASTAL WATERWAY SEDIMENT

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL (1)	TCEQ Second Effects Level for Sediment (2)	Average of TCEQ PCL and SEL (3)	EPA EcoTox Threshold (4)	95% UCL	Statistic Used (5)	# of Detects/# of Samples
1,2-Dichloroethane	4.10E-04	3.02E-03	3.02E-03	4.30E+00	2.58E+01	1.51E+01	—	1.10E-03	95% Chebyshev	1 of 16
1,2-Diphenylhydrazine/azobenzene	7.30E-03	3.17E-02	3.17E-02	—	—	—	—	1.03E-02	95% Student's-t	1 of 16
2-Methylnaphthalene	8.30E-03	1.88E-02	1.88E-02	7.00E-02	6.70E-01	3.70E-01	—	9.60E-03	95% Student's-t	1 of 16
3,3'-Dichlorobenzidine	4.08E-02	1.51E-01	1.51E-01	—	—	—	—	5.38E-02	95% Student's-t	1 of 16
4,4'-DDT	4.11E-04	3.32E-03	4.81E-04	1.19E-03	6.29E-02	3.20E-02	1.60E-03	2.30E-03	99% Chebyshev	4 of 17
4,6-Dinitro-2-methylphenol	1.70E-02	6.27E-02	6.27E-02	—	—	—	—	2.24E-02	95% Student's-t	1 of 16
Acenaphthylene	1.16E-02	6.31E-02	2.39E-02	1.60E-02	5.00E-01	2.58E-01	1.10E+00	2.73E-02	95% Chebyshev	2 of 16
Aluminum	6.85E+03	1.25E+04	3.90E+03	—	—	—	—	7.88E+03	95% Student's-t	16 of 16
Anthracene	2.01E-02	7.53E-02	2.36E-02	8.53E-02	1.10E+00	5.93E-01	—	4.24E-02	95% Chebyshev	6 of 16
Antimony	2.25E+00	8.14E+00	7.40E-01	—	—	—	—	2.99E+00	95% Approx. Gamma	16 of 16
Arsenic	4.03E+00	7.62E+00	2.41E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	4.64E+00	95% Student's-t	16 of 16
Atrazine (Aatrex)	1.79E-02	8.14E-02	8.14E-02	—	—	—	—	2.54E-02	95% Student's-t	1 of 16
Barium	2.15E+02	3.77E+02	1.16E+02	—	—	—	—	2.43E+02	95% Approx. Gamma	16 of 16
Benzo(a)anthracene	4.54E-02	3.95E-01	6.75E-02	2.61E-01	1.60E+00	9.31E-01	—	3.01E-01	99% Chebyshev	3 of 16
Benzo(a)pyrene	6.61E-02	4.45E-01	5.25E-02	4.30E-01	1.60E+00	1.02E+00	4.30E-01	3.52E-01	99% Chebyshev	6 of 16
Benzo(b)fluoranthene	1.00E-01	6.11E-01	3.24E-02	—	—	—	—	4.91E-01	99% Chebyshev	9 of 16
Benzo(g,h,i)perylene	6.61E-02	4.42E-01	1.73E-02	—	—	—	—	3.57E-01	99% Chebyshev	7 of 16
Benzo(k)fluoranthene	5.89E-02	3.18E-01	4.74E-02	—	—	—	—	2.71E-01	99% Chebyshev	6 of 16
Beryllium	4.63E-01	8.20E-01	2.90E-01	—	—	—	—	5.28E-01	95% Student's-t	16 of 16
Boron	1.20E+01	2.72E+01	1.25E+01	—	—	—	—	2.72E+01	Maximum*	10 of 16
Butyl Benzyl Phthalate	2.08E-02	2.02E-01	2.02E-01	—	—	—	1.10E+01	7.35E-02	95% Chebyshev	1 of 16
Carbazole	1.51E-02	8.61E-02	1.95E-02	—	—	—	—	3.84E-02	95% Chebyshev	3 of 16
Chloroform	9.02E-04	5.27E-03	5.04E-03	4.30E+00	2.58E+01	1.51E+01	—	5.00E-03	99% Chebyshev	2 of 16
Chromium	9.21E+00	1.44E+01	5.01E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	1.04E+01	95% Student's-t	16 of 16
Chrysene	7.74E-02	4.75E-01	1.37E-02	3.84E-01	2.80E+00	1.59E+00	—	1.53E-01	95% Approx. Gamma	10 of 16
Cobalt	4.39E+00	7.16E+00	3.05E+00	—	—	—	—	4.88E+00	95% Student's-t	16 of 16
Copper	7.11E+00	1.26E+01	3.28E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	8.43E+00	95% Student's-t	16 of 16
Cyclohexane	2.30E-03	1.92E-03	1.92E-03	—	—	—	—	2.90E-03	95% Approx. Gamma	1 of 16
Dibenz(a,h)anthracene	4.35E-02	2.35E-01	5.11E-02	6.34E-02	2.60E-01	1.62E-01	—	2.05E-01	99% Chebyshev	6 of 16
Dibenzofuran	1.23E-02	3.05E-02	2.66E-02	—	—	—	2.00E+00	1.52E-02	95% Student's-t	2 of 16
Diethyl Phthalate	1.35E-02	3.89E-02	3.89E-02	—	—	—	6.30E-01	1.66E-02	95% Student's-t	1 of 16
Di-n-octyl Phthalate	1.80E-02	1.92E-01	1.47E-02	—	—	—	—	6.86E-02	95% Chebyshev	2 of 16
Fluoranthene	1.13E-01	8.04E-01	2.22E-02	6.00E-01	5.10E+00	2.85E+00	1.40E+00	6.14E-01	99% Chebyshev	8 of 16
Fluorene	1.22E-02	4.60E-02	1.24E-02	1.90E-02	5.40E-01	2.80E-01	5.40E-01	2.43E-02	95% Chebyshev	4 of 16
gamma-Chlordane	3.13E-04	8.26E-04	6.38E-04	2.26E-03	4.79E-03	3.53E-03	—	5.70E-04	95% Chebyshev	4 of 16
Hexachlorobenzene	1.00E-02	3.19E-02	3.19E-02	—	—	—	—	1.26E-02	95% Student's-t	1 of 16
Indeno(1,2,3-cd)pyrene	7.22E-02	4.05E-01	5.56E-02	—	—	—	—	3.47E-01	99% Chebyshev	6 of 16
Iron	1.34E+04	2.82E+04	6.75E+03	—	—	—	—	1.60E+04	95% Approx. Gamma	16 of 16
Lead	1.16E+01	3.23E+01	5.00E+00	4.67E+01	2.18E+02	1.32E+02	4.70E+01	1.48E+01	95% Approx. Gamma	16 of 16
Isopropylbenzene (cumene)	1.00E-03	7.04E-03	4.64E-03	—	—	—	—	5.80E-03	99% Chebyshev	2 of 16
Lithium	1.05E+01	2.00E+01	6.40E+00	—	—	—	—	1.21E+01	95% Student's-t	16 of 16
Manganese	2.83E+02	4.74E+02	1.92E+02	—	—	—	—	3.22E+02	95% Student's-t	16 of 16
Mercury	2.01E-02	3.60E-02	1.10E-02	1.50E-01	7.10E-01	4.30E-01	1.50E-01	2.33E-02	95% Student's-t	16 of 16
Methylcyclohexane	9.51E-04	3.70E-03	3.70E-03	—	—	—	—	1.30E-03	95% Approx. Gamma	1 of 16
Molybdenum	6.67E-01	5.66E+00	1.40E-01	—	—	—	—	2.15E+00	95% Chebyshev	16 of 16
Nickel	9.59E+00	1.67E+01	5.80E+00	2.09E+01	5.16E+01	3.63E+01	2.10E+01	1.08E+01	95% Student's-t	16 of 16
n-Nitrosodiphenylamine	1.02E-02	4.34E-02	4.34E-02	—	—	—	—	1.41E-02	95% Student's-t	1 of 16
Phenanthrene	7.46E-02	5.08E-01	3.11E-02	2.40E-01	1.50E+00	8.70E-01	1.10E+00	3.88E-01	99% Chebyshev	8 of 16
Pyrene	1.30E-01	8.62E-01	1.76E-02	6.65E-01	2.60E+00	1.63E+00	6.60E-01	6.78E-01	99% Chebyshev	10 of 16
Silver	1.72E-01	5.40E-01	3.00E-01	—	—	—	—	3.76E-01	Maximum*	6 of 16
Strontium	4.49E+01	8.17E+01	3.28E+01	—	—	—	—	5.12E+01	95% Student's-t	16 of 16
Titanium	2.56E+01	3.66E+01	1.91E+01	—	—	—	—	2.78E+01	95% Student's-t	16 of 16
Toluene	1.40E-03	5.81E-03	5.81E-03	9.40E-01	5.66E+00	3.30E+00	6.70E-01	2.00E-03	95% Approx. Gamma	1 of 16
Vanadium	1.39E+01	2.12E+01	9.06E+00	—	—	—	—	1.54E+01	95% Student's-t	16 of 16
Zinc	4.54E+01	9.26E+01	1.80E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	5.41E+01	95% Student's-t	16 of 16
LPAH	1.27E-01	7.11E-01	1.10E-01	5.52E-01	3.16E+00	1.86E+00	—	4.92E-01		
HPAH	7.73E-01	4.99E+00	3.77E-01	1.70E+00	9.60E+00	5.65E+00	—	3.77E+00		
Total PAHs	8.99E-01	5.70E+00	4.87E-01	4.02E+00	4.48E+01	2.44E+01	4.00E+00	4.26E+00		

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.
* Chemicals of Interest are any chemical measured in at least one sample.
(1) - From Table 3-3 of TCEQ, 2006.
(2) - From Table A-2 of TCEQ, 2006.
(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.
(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.
(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 7
EXPOSURE POINT CONCENTRATION (mg/kg)
INTRACOASTAL WATERWAY BACKGROUND SEDIMENT

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL [(1)]	TCEQ Second Effects Level for Sediment [(2)]	Average of TCEQ PCL and SEL [(3)]	EPA EcoTox Threshold [(4)]	95% UCL	Statistic Used [(5)]	# of Detects/# of Samples
1,2,4-Trimethylbenzene	9.10E-04	3.91E-03	3.91E-03	2.16E+00	1.30E+01	7.56E+00	---	2.00E-03	95% Approx. Gamma	1 of 9
1,4-Dichlorobenzene	1.40E-03	4.11E-03	4.11E-03	7.00E-01	4.21E+00	2.46E+00	3.50E-01	2.80E-03	95% Approx. Gamma	1 of 9
2-Butanone	1.10E-03	2.16E-03	2.00E-03	---	---	---	---	1.70E-03	95% Student's-t	2 of 9
4,4'-DDT	1.56E-04	5.70E-04	5.70E-04	1.19E-03	6.29E-02	3.20E-02	1.60E-03	3.82E-04	95% Chebyshev	1 of 9
Aluminum	1.22E+04	2.18E+04	4.73E+03	---	---	---	---	1.65E+04	95% Student's-t	9 of 9
Antimony	4.02E+00	7.33E+00	1.68E+00	---	---	---	---	5.40E+00	95% Student's-t	9 of 9
Arsenic	5.81E+00	9.62E+00	2.36E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	7.74E+00	95% Student's-t	9 of 9
Barium	209.7.2	2.80E+02	1.11E+02	---	---	---	---	2.39E+02	95% Student's-t	9 of 9
Benzo(b)fluoranthene	8.70E-03	3.69E-02	3.69E-02	---	---	---	---	2.41E-02	95% Chebyshev	1 of 9
Beryllium	7.66E-01	1.32E+00	3.20E-01	---	---	---	---	1.02E+00	95% Student's-t	9 of 9
Boron	2.76E+01	4.79E+01	1.33E+01	---	---	---	---	3.56E+01	95% Student's-t	9 of 9
Carbon Disulfide	1.50E-03	8.41E-03	3.41E-03	---	---	---	---	4.80E-03	95% Approx. Gamma	2 of 9
Chromium	1.28E+01	2.25E+01	5.81E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	1.69E+01	95% Student's-t	9 of 9
cis-1,2-Dichloroethene	3.40E-03	2.84E-02	2.84E-02	---	---	---	---	3.45E-02	99% Chebyshev	1 of 9
Cobalt	6.70E+00	1.18E+01	3.32E+00	---	---	---	---	8.66E+00	95% Student's-t	9 of 9
Copper	8.14E+00	1.68E+01	2.68E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	1.13E+01	95% Student's-t	9 of 9
Iron	1.65E+04	2.79E+04	7.44E+03	---	---	---	---	2.15E+04	95% Student's-t	9 of 9
Lead	9.59E+00	1.45E+01	5.34E+00	4.67E+01	2.18E+02	1.32E+02	4.70E+01	1.18E+01	95% Student's-t	9 of 9
Lithium	2.14E+01	4.46E+01	7.29E+00	---	---	---	---	3.03E+01	95% Student's-t	9 of 9
Manganese	3.31E+02	4.42E+02	2.12E+02	---	---	---	---	3.86E+02	95% Student's-t	9 of 9
Mercury	1.76E-02	5.00E-02	6.50E-03	1.50E-01	7.10E-01	4.30E-01	1.50E-01	2.73E-02	95% Approx. Gamma	9 of 9
Molybdenum	2.41E-01	3.50E-01	1.60E-01	---	---	---	---	2.83E-01	95% Student's-t	9 of 9
Nickel	1.49E+01	2.73E+01	6.31E+00	2.09E+01	5.16E+01	3.63E+01	2.10E+01	1.99E+01	95% Student's-t	9 of 9
Strontium	5.92E+01	8.74E+01	3.48E+01	---	---	---	---	7.28E+01	95% Student's-t	9 of 9
Titanium	3.18E+01	5.45E+01	2.11E+01	---	---	---	---	3.83E+01	95% Student's-t	9 of 9
Trichloroethene	2.10E-03	1.59E-02	1.59E-02	1.47E+00	8.82E+00	5.15E+00	1.60E+00	4.30E-03	99% Chebyshev	1 of 9
Vanadium	2.02E+01	3.42E+01	1.02E+01	---	---	---	---	2.59E+01	95% Student's-t	9 of 9
Xylene	1.70E-03	3.35E-03	3.35E-03	---	---	---	---	2.60E-03	95% Student's-t	1 of 9
Zinc	3.60E+01	5.41E+01	1.93E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	4.45E+01	95% Student's-t	9 of 9
LPAH[++]				5.52E-01	3.16E+00	1.86E+00	---			
HPAH	8.70E-03	3.69E-02	3.69E-02	1.70E+00	9.60E+00	5.65E+00	---	2.41E-02		
Total PAHs	8.70E-03	3.69E-02	3.69E-02	4.02E+00	4.48E+01	2.44E+01	---	2.41E-02		

Notes:

[+] Chemicals of interest are any chemical measured in at least one sample.

[++] No LPAHs were detected in the samples.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 8
EXPOSURE POINT CONCENTRATION (mg/kg)
WETLAND SEDIMENT

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL [1]	TCEQ Second Effects Level for Sediment [2]	Average of TCEQ PCL and SEL [3]	EPA EcoTox Threshold [4]	95% UCL	Statistic Used [5]	# of Detects/# of Samples
1,2-Dichloroethane	2.49E-04	2.40E-03	1.83E-03	4.30E+00	2.58E+01	1.51E+01	---	5.90E-04	95% Chebyshev	3 of 48
2-Methylnaphthalene	2.46E-02	4.30E-01	1.22E-02	7.00E-02	6.70E-01	3.70E-01	---	1.16E-01	99% Chebyshev	4 of 48
4,4'-DDT	9.52E-04	9.22E-03	9.29E-04	1.19E-03	6.29E-02	3.20E-02	1.60E-03	2.20E-03	97.5% Chebyshev	16 of 55
Acenaphthene	1.95E-02	1.33E-01	1.60E-02	1.60E-02	5.00E-01	2.58E-01	1.10E+00	6.40E-02	99% Chebyshev	4 of 48
Acenaphthylene	3.14E-02	5.45E-01	2.91E-02	4.40E-02	6.40E-01	3.42E-01	---	1.65E-01	99% Chebyshev	4 of 48
Aluminum	1.32E+04	1.82E+04	3.40E+03	---	---	---	---	1.40E+04	95% Student's-t	48 of 48
Anthracene	2.88E-02	3.34E-01	8.38E-03	8.53E-02	1.10E+00	5.93E-01	---	1.26E-01	99% Chebyshev	8 of 48
Antimony[6]	1.15E+00	4.24E+00	4.60E-01	---	---	---	---	1.61E+00	95% Chebyshev	40 of 48
Arsenic	2.53E+00	1.28E+01	1.00E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	3.40E+00	95% Approx. Gamma	35 of 48
Barium	1.52E+02	8.20E+02	3.60E+01	---	---	---	---	2.38E+02	95% Chebyshev	48 of 48
Benzo(a)anthracene	5.43E-02	9.93E-01	5.46E-02	2.61E-01	1.60E+00	9.31E-01	---	3.06E-01	99% Chebyshev	5 of 48
Benzo(a)pyrene	1.04E-01	1.30E+00	1.76E-02	4.30E-01	1.60E+00	1.02E+00	4.30E-01	4.76E-01	99% Chebyshev	15 of 48
Benzo(b)fluoranthene	9.02E-02	1.36E+00	1.62E-02	---	---	---	---	4.31E-01	99% Chebyshev	19 of 48
Benzo(g,h,i)perylene	1.98E-01	1.94E+00	4.40E-02	---	---	---	---	7.55E-01	99% Chebyshev	24 of 48
Benzo(k)fluoranthene	6.59E-02	7.30E-01	6.92E-02	---	---	---	---	2.37E-01	99% Chebyshev	14 of 48
Beryllium	8.94E-01	1.37E+00	2.80E-01	---	---	---	---	9.43E-01	95% Student's-t	48 of 48
Boron[6]	1.45E+01	4.62E+01	5.17E+00	---	---	---	---	3.20E+01	99% Chebyshev	24 of 48
Cadmium	1.03E-01	4.80E-01	3.30E-02	1.20E+00	9.60E+00	5.40E+00	1.20E+00	3.13E-01	99% Chebyshev	20 of 48
Carbazole	1.92E-02	1.41E-01	1.58E-02	---	---	---	---	6.45E-02	99% Chebyshev	5 of 48
Carbon Disulfide	5.25E-04	6.99E-03	3.34E-03	---	---	---	---	2.60E-03	99% Chebyshev	4 of 48
Chromium	1.51E+01	4.46E+01	8.96E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	1.64E+01	95% Student's-t	48 of 48
Chromium VI	9.56E-01	4.04E+00	1.30E+00	---	---	---	---	3.36E+00	99% Chebyshev	6 of 25
Chrysene	2.17E-01	4.05E+00	1.10E-02	3.84E-01	2.80E+00	1.59E+00	---	1.24E+00	99% Chebyshev	19 of 48
Cobalt	6.98E+00	9.89E+00	3.00E+00	---	---	---	---	7.32E+00	95% Student's-t	48 of 48
Copper	1.45E+01	4.90E+01	5.44E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	1.66E+01	95% Student's-t	48 of 48
Dibenz(a,h)anthracene	2.03E-01	2.91E+00	1.29E-01	6.34E-02	2.60E-01	1.62E-01	---	1.10E+00	99% Chebyshev	6 of 48
Dibenzofuran	1.39E-02	8.00E-02	1.00E-02	---	---	---	2.00E+00	2.50E-02	95% Chebyshev	3 of 48
Endosulfan Sulfate	1.80E-03	6.00E-02	7.31E-03	---	---	---	5.40E-03	1.44E-02	99% Chebyshev	3 of 48
Endrin Aldehyde	1.00E-03	1.00E-02	5.66E-04	---	---	---	---	4.30E-03	99% Chebyshev	9 of 48
Endrin Ketone	7.85E-04	1.30E-02	3.29E-03	---	---	---	---	2.00E-03	95% Chebyshev	3 of 48
Fluoranthene	1.08E-01	2.17E+00	1.20E-02	6.00E-01	5.10E+00	2.85E+00	1.40E+00	6.37E-01	99% Chebyshev	13 of 48
Fluorene	1.86E-02	1.39E-01	1.50E-02	1.90E-02	5.40E-01	2.80E-01	5.40E-01	6.37E-02	99% Chebyshev	4 of 48
gamma-Chlordane	4.05E-04	3.60E-03	7.69E-04	2.26E-03	4.79E-03	3.53E-03	---	8.27E-04	95% Chebyshev	4 of 48
Indeno(1,2,3-cd)pyrene	2.01E-01	1.94E+00	6.28E-02	---	---	---	---	7.85E-01	99% Chebyshev	23 of 48
Iron	1.72E+04	6.09E+04	1.11E+04	---	---	---	---	1.88E+04	95% Student's-t	48 of 48
Lead	2.54E+01	2.37E+02	9.40E+00	4.67E+01	2.18E+02	1.32E+02	4.70E+01	4.68E+01	95% Chebyshev	48 of 48
Lithium	1.87E+01	2.76E+01	5.43E+00	---	---	---	---	1.96E+01	95% Student's-t	48 of 48
Manganese	3.32E+02	1.01E+03	8.76E+01	---	---	---	---	3.63E+02	95% Approx. Gamma	48 of 48
Mercury	1.99E-02	8.10E-02	6.10E-03	1.50E-01	7.10E-01	4.30E-01	1.50E-01	2.68E-02	95% H-UCL	26 of 48
Molybdenum	5.81E-01	3.24E+00	1.30E-01	---	---	---	---	7.63E-01	95% Approx. Gamma	38 of 48
Nickel	1.73E+01	2.77E+01	1.09E+01	2.09E+01	5.16E+01	3.63E+01	2.10E+01	1.81E+01	95% Student's-t	48 of 48
Phenanthrene	7.61E-02	1.30E+00	2.30E-02	2.40E-01	1.50E+00	8.70E-01	1.10E+00	4.32E-01	99% Chebyshev	12 of 48
Pyrene	1.54E-01	1.64E+00	1.59E-02	6.65E-01	2.60E+00	1.63E+00	6.60E-01	6.63E-01	99% Chebyshev	19 of 48
Strontium	6.70E+01	3.30E+02	1.88E+01	---	---	---	---	7.64E+01	95% H-UCL	48 of 48
Tin[6]	6.38E-01	4.61E+00	3.45E+00	---	---	---	---	1.26E+00	95% Chebyshev	4 of 48
Titanium	2.91E+01	6.87E+01	8.15E+00	---	---	---	---	3.27E+01	95% Approx. Gamma	48 of 48
Toluene	6.55E-04	2.14E-03	1.57E-03	9.40E-01	5.66E+00	3.30E+00	6.70E-01	1.20E-03	95% Chebyshev	3 of 48
Vanadium	2.17E+01	3.20E+01	9.02E+00	---	---	---	---	2.28E+01	95% Student's-t	48 of 48
Zinc	1.39E+02	9.03E+02	3.15E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	2.36E+02	95% Chebyshev	53 of 53
LPAH	1.99E-01	2.88E+00	1.04E-01	5.52E-01	3.16E+00	1.86E+00	---	9.67E-01		
HPAH	1.40E+00	1.90E+01	4.32E-01	1.70E+00	9.60E+00	5.65E+00	---	6.63E+00		
TOTAL PAHs	1.59E+00	2.19E+01	5.36E-01	4.02E+00	4.48E+01	1.18E+01	4.00E+00	7.60E+00		

Notes:

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(6) - Samples 2WSED8, SWSED10, 4WSED2, and 4WSED3 were re-analyzed for antimony, boron, and tin because they were measured at concentrations much higher than the rest of the data although QA/QC indicated that they were acceptable. The re-analysis was run twice with good concurrence between the two re-analyses but with very different values from the original so the first re-analyzed value was used in the UCL calculation.

TABLE 9
EXPOSURE POINT CONCENTRATION (mg/kg)
POND SEDIMENT

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL [(1)]	TCEQ Second Effects Level for Sediment [(2)]	Average of TCEQ PCL and SEL [(3)]	EPA EcoTox Threshold [(4)]	RME EPC	Statistic Used [(5)]	# of Detects/# of Samples
2,4,6-Trichlorophenol	1.75E-02	4.29E-02	4.29E-02	---	---	---	---	4.29E-02	RME EPC is max detect	1 of 8
4,4'-DDD	6.96E-03	6.76E-04	6.76E-04	1.22E-03	7.81E-03	4.52E-03	---	6.76E-04	RME EPC is max detect*	3 of 8
4,4'-DDT	4.16E-03	1.57E-03	1.11E-03	1.19E-03	6.29E-02	3.20E-02	1.60E-03	1.57E-03	RME EPC is max detect*	1 of 8
Acetone	2.38E-02	7.98E-02	7.98E-02	1.67E+02	1.00E+04	5.09E+03	---	7.98E-02	RME EPC is max detect	1 of 8
Aluminum	1.17E+04	1.63E+04	7.99E+03	---	---	---	---	1.63E+04	RME EPC is max detect	8 of 8
Antimony	7.95E-01	1.85E+00	3.30E-01	---	---	---	---	1.85E+00	RME EPC is max detect	8 of 8
Arsenic	1.74E+00	5.01E+00	3.39E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	5.01E+00	RME EPC is max detect	3 of 8
Barium	1.99E+02	4.17E+02	1.08E+02	---	---	---	---	4.17E+02	RME EPC is max detect	8 of 8
Benzo(b)fluoranthene	4.77E-02	1.06E-01	2.93E-02	---	---	---	---	1.06E-01	RME EPC is max detect	6 of 8
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	1.35E-01	---	---	---	---	1.35E-01	RME EPC is max detect	1 of 8
Benzo(k)fluoranthene	5.27E-02	1.30E-01	1.10E-01	---	---	---	---	1.30E-01	RME EPC is max detect	3 of 8
Beryllium	*8.34E-01*	*1.13E+00*	*5.80E-01*	---	---	---	---	*1.13E+00*	*RME EPC is max detect*	*8 of 8*
beta-BHC	7.96E-03	6.99E-04	6.99E-04	---	---	---	---	7.00E-04	RME EPC is max detect*	1 of 8
Boron	1.50E+01	2.84E+01	1.10E+01	---	---	---	---	2.84E+01	RME EPC is max detect	5 of 8
Bromomethane	8.90E-03	3.10E-02	1.40E-02	---	---	---	---	3.10E-02	RME EPC is max detect	2 of 8
Cadmium	1.47E-01	2.70E-01	1.90E-01	1.20E+00	9.60E+00	5.40E+00	1.20E+00	2.70E-01	RME EPC is max detect	5 of 8
Carbon Disulfide	1.40E-03	7.71E-03	7.71E-03	---	---	---	---	7.70E-03	RME EPC is max detect	1 of 8
Chromium	1.29E+01	2.01E+01	8.29E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	2.01E+01	RME EPC is max detect	8 of 8
Chrysene	9.50E-03	2.57E-02	2.57E-02	3.84E-01	2.80E+00	1.59E+00	---	2.57E-02	RME EPC is max detect	1 of 8
Cobalt	6.94E+00	8.99E+00	5.19E+00	---	---	---	---	8.99E+00	RME EPC is max detect	8 of 8
Copper	1.52E+01	2.68E+01	8.33E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	2.68E+01	RME EPC is max detect	8 of 8
Iron	1.53E+04	2.01E+04	1.13E+04	---	---	---	---	2.01E+04	RME EPC is max detect	8 of 8
Lead	1.75E+01	3.05E+01	1.06E+01	4.67E+01	2.18E+02	1.32E+02	4.70E+01	3.05E+01	RME EPC is max detect	8 of 8
Lithium	1.85E+01	2.37E+01	1.35E+01	---	---	---	---	2.37E+01	RME EPC is max detect	8 of 8
m,p-Cresol	1.49E-02	3.75E-02	3.75E-02	---	---	---	---	3.75E-02	RME EPC is max detect	1 of 8
Manganese	4.88E+02	7.11E+02	3.52E+02	---	---	---	---	7.11E+02	RME EPC is max detect	8 of 8
Methyl Iodide	8.10E-03	4.10E-02	4.10E-02	---	---	---	---	1.11E-02	RME EPC is max detect	1 of 8
Molybdenum	1.46E-01	6.00E-01	2.10E-01	---	---	---	---	6.00E-01	RME EPC is max detect	2 of 8
Nickel	1.63E+01	2.06E+01	1.23E+01	2.09E+01	5.16E+01	3.63E+01	2.10E+01	2.06E+01	RME EPC is max detect	8 of 8
Pyrene	1.47E-02	2.65E-02	2.01E-02	6.65E-01	2.60E+00	1.63E+00	6.60E-01	2.65E-02	RME EPC is max detect	3 of 8
Strontium	1.04E+02	1.81E+02	6.33E+01	---	---	---	---	1.81E+02	RME EPC is max detect	8 of 8
Titanium	3.00E+01	4.05E+01	1.91E+01	---	---	---	---	4.05E+01	RME EPC is max detect	8 of 8
Vanadium	2.18E+01	2.74E+01	1.68E+01	---	---	---	---	2.74E+01	RME EPC is max detect	8 of 8
Zinc	3.32E+02	9.99E+02	3.82E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	9.99E+02	RME EPC is max detect	8 of 8
LPAH[++]				---	---	---	---			
HPAHs	1.49E-01	4.23E-01	3.20E-01	1.70E+00	9.60E+00	5.65E+00		4.23E-01		
Total PAHs	1.49E-01	1.49E-01	1.49E-01	4.02E+00	4.48E+01	2.44E+01	4.00E+00	4.23E-01		

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected, and because J flag data were used in the risk assessment.

[+] Chemicals of interest are any chemical measured in at least one sample.

[++] No LPAHs were detected in the samples.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 10
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY SURFACE WATER (TOTAL)

Chemicals of Interest+	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water (1)	RME EPC	Statistic Used	# of Detects/# of Samples
Acrylonitrile	9.38E-04	2.10E-03	2.10E-03	2.91E-01	2.10E-03	RME EPC is max detect	1 of 4
Aluminum	4.05E-01	5.50E-01	2.80E-01	---	5.50E-01	RME EPC is max detect	4 of 4
Barium	2.40E-02	2.60E-02	2.20E-02	2.50E+01	2.60E-02	RME EPC is max detect	4 of 4
Boron	4.69E+00	4.81E+00	4.60E+00	---	4.81E+00	RME EPC is max detect	4 of 4
Chromium	7.98E-02	1.20E-01	7.00E-02	---	1.20E-01	RME EPC is max detect	4 of 4
Copper	6.53E-03	1.10E-02	9.10E-03	---	1.10E-02	RME EPC is max detect	2 of 4
Iron	4.63E-01	5.90E-01	3.20E-01	---	5.90E-01	RME EPC is max detect	4 of 4
Lithium	2.53E-01	2.70E-01	2.20E-01	---	2.70E-01	RME EPC is max detect	4 of 4
Manganese	4.03E-02	4.80E-02	3.30E-02	---	4.80E-02	RME EPC is max detect	4 of 4
Silver	2.80E-03	3.70E-03	2.80E-03	---	3.70E-03	RME EPC is max detect	3 of 4
Strontium	7.22E+00	7.35E+00	6.95E+00	---	7.35E+00	RME EPC is max detect	4 of 4
Titanium	3.90E-03	5.70E-03	2.00E-03	---	5.70E-03	RME EPC is max detect	4 of 4
Vanadium	4.25E-02	6.10E-02	3.50E-02	---	6.10E-02	RME EPC is max detect	4 of 4

Notes:

+ Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

TABLE 11
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY BACKGROUND SURFACE WATER (TOTAL)

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water [(1)]	RME EPC	Statistic Used	# of Detects/# of Samples
4,4'-DDD	3.30E-06	7.62E-06	3.60E-06	2.50E-05	7.62E-06	RME EPC is max detect	2 of 4
4,4'-DDT	4.93E-06	1.30E-05	1.30E-05	1.00E-06	1.30E-05	RME EPC is max detect	1 of 4
Acetone	1.47E-03	4.52E-03	4.52E-03	2.82E+02	4.52E-03	RME EPC is max detect	1 of 4
Aldrin	9.24E-06	1.10E-05	4.40E-06	6.50E-04 [(3)]	1.10E-05	RME EPC is max detect	4 of 4
Aluminum	2.44E-01	4.00E-01	2.10E-01	---	4.00E-01	RME EPC is max detect	4 of 4
Barium	1.96E-02	2.00E-02	2.00E-02	2.50E+01	2.00E-02	RME EPC is max detect	4 of 4
Benzo(g,h,i)perylene	1.20E-04	2.02E-04	2.02E-04	3.00E-01 [(3)]	2.02E-04	RME EPC is max detect	1 of 4
Benzo(k)fluoranthene	1.73E-04	3.11E-04	3.11E-04	3.00E-01 [(3)]	3.11E-04	RME EPC is max detect	1 of 4
Bis(ethylhexyl) Phthalate	4.17E-03	1.97E-02	1.94E-02	3.60E-01 [(2)]	1.97E-02	RME EPC is max detect	2 of 4
Boron	4.38E+00	4.50E+00	4.27E+00	---	4.50E+00	RME EPC is max detect	4 of 4
Chromium	7.84E-02	7.90E-02	7.80E-02	---	7.90E-02	RME EPC is max detect	4 of 4
Chromium VI	6.20E-03	1.10E-02	1.10E-02	---	1.10E-02	RME EPC is max detect	1 of 4
Chrysene	1.61E-04	3.68E-04	3.68E-04	3.00E-01 [(3)]	3.68E-04	RME EPC is max detect	1 of 4
Di-n-butyl Phthalate	6.70E-04	1.42E-03	8.28E-04	5.00E-03	1.42E-03	RME EPC is max detect	2 of 4
Di-n-octyl Phthalate	2.65E-04	6.50E-04	6.50E-04	3.4E-03 [(2)]	6.50E-04	RME EPC is max detect	1 of 4
Iron	3.40E-01	4.30E-01	3.40E-01	---	4.30E-01	RME EPC is max detect	4 of 4
Lithium	3.00E-01	3.40E-01	2.70E-01	---	3.40E-01	RME EPC is max detect	4 of 4
Manganese	3.60E-02	4.10E-02	3.40E-02	---	4.10E-02	RME EPC is max detect	4 of 4
Methoxyclor	3.66E-06	1.40E-05	1.40E-05	3.00E-05	1.40E-05	RME EPC is max detect	1 of 4
Molybdenum	2.72E-03	4.20E-03	1.80E-03	---	4.20E-03	RME EPC is max detect	2 of 4
Silver	5.43E-03	5.90E-03	4.70E-03	---	5.90E-03	RME EPC is max detect	4 of 4
Strontium	7.76E+00	8.31E+00	7.31E+00	---	8.31E+00	RME EPC is max detect	4 of 4
Titanium	2.98E-03	4.20E-03	2.40E-03	---	4.20E-03	RME EPC is max detect	4 of 4
Vanadium	4.14E-02	3.70E-02	1.10E-02	---	3.70E-02	RME EPC is max detect	4 of 4
LPAHs[++]				---			
HPAHs	4.55E-04	8.81E-04	8.81E-04	3.00E-01 [(3)]	8.81E-04		
Total PAHs	4.55E-04	4.55E-04	4.55E-04	3.00E-01 [(3)]	4.55E-04		

Notes:
[+] Chemicals of interest are any chemical measured in at least one sample.
[++] No LPAHs were detected in the samples.
(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.
(2) - Buchman, 2008.
(3) - Buchman, 2008 acute value for chemical class.

TABLE 12
EXPOSURE POINT CONCENTRATION (mg/L)
WETLAND SURFACE WATER (TOTAL)

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water [(1)]	RME EPC	Statistic Used	# of Detects/# of Samples
1,2-Dichloroethane	2.30E-03	3.85E-03	2.55E-03	5.65E+00	3.85E-03	RME EPC is max detect	3 of 4
Acrolein	1.21E-02	9.29E-03	9.29E-03	5.00E-03	9.30E-03	RME EPC is max detect*	1 of 4
Aluminum	5.08E-01	8.00E-01	1.70E-01	—	8.00E-01	RME EPC is max detect	4 of 4
Barium	2.20E-01	3.70E-01	1.50E-01	2.50E+01	3.70E-01	RME EPC is max detect	4 of 4
Boron	1.96E+00	2.42E+00	8.30E-01	---	2.42E+00	RME EPC is max detect	4 of 4
Chromium	1.49E-02	3.70E-02	2.00E-02	---	3.70E-02	RME EPC is max detect	2 of 4
Chromium VI	3.13E-03	8.00E-03	8.00E-03	---	8.00E-03	RME EPC is max detect	1 of 4
Copper	6.38E-03	1.10E-02	9.50E-03	---	1.10E-02	RME EPC is max detect	2 of 4
Iron	6.45E-01	1.08E+00	1.90E-01	---	1.08E+00	RME EPC is max detect	4 of 4
Lithium	1.89E-01	2.50E-01	5.70E-02	---	2.50E-01	RME EPC is max detect	4 of 4
Manganese	1.37E-01	3.40E-01	1.80E-02	—	3.40E-01	RME EPC is max detect	4 of 4
Mercury	3.75E-05	7.00E-05	4.00E-05	—	7.00E-05	RME EPC is max detect	2 of 4
Molybdenum	9.30E-03	1.50E-02	5.60E-03	—	1.50E-02	RME EPC is max detect	3 of 4
Nickel	1.10E-03	2.20E-03	1.20E-03	—	2.20E-03	RME EPC is max detect	2 of 4
Strontium	5.27E+00	6.64E+00	1.87E+00	—	6.64E+00	RME EPC is max detect	4 of 4
Titanium	6.40E-03	9.80E-03	2.40E-03	—	9.80E-03	RME EPC is max detect	4 of 4
Zinc	7.30E-03	2.20E-02	2.20E-02	—	2.20E-02	RME EPC is max detect	1 of 4

Notes:
*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected, and because J flag data were used in the risk assessment.
[+] Chemicals of interest are any chemical measured in at least one sample.
(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

TABLE 13
EXPOSURE POINT CONCENTRATION (mg/L)
POND SURFACE WATER (TOTAL)

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water [(1)]	RME EPC	Statistic Used	# of Detects/# of Samples
4-Chloroaniline	2.79E-04	8.23E-04	8.23E-04	1.29E-01 [(2)]	8.00E-04	RME EPC is max detect	1 of 6
Aluminum	9.13E-01	2.22E+00	4.10E-01	---	2.22E+00	RME EPC is max detect	5 of 6
Antimony	3.82E-03	7.60E-03	3.00E-03	---	7.60E-03	RME EPC is max detect	3 of 6
Arsenic	5.40E-03	1.30E-02	1.20E-02	---	1.30E-02	RME EPC is max detect	2 of 6
Barium	1.45E-01	1.90E-01	1.30E-01	2.50E+01	1.90E-01	RME EPC is max detect	6 of 6
Benzo(a)pyrene	1.12E-04	3.48E-04	3.48E-04	3.00E-01 [(3)]	3.00E-04	RME EPC is max detect	1 of 6
Benzo(b)fluoranthene	4.03E-04	1.81E-03	1.81E-03	3.00E-01 [(3)]	1.80E-03	RME EPC is max detect	1 of 6
Benzo(g,h,i)perylene	3.71E-04	1.73E-03	1.73E-03	3.00E-01 [(3)]	1.70E-03	RME EPC is max detect	1 of 6
Benzo(k)fluoranthene	2.06E-04	5.42E-04	5.42E-04	3.00E-01 [(3)]	5.00E-04	RME EPC is max detect	1 of 6
Bis(2-ethylhexyl)phthalate	1.92E-02	4.00E-02	2.90E-02	3.60E-01 [(2)]	4.00E-02	RME EPC is max detect	3 of 6
Boron	2.97E+00	3.52E+00	2.45E+00	---	3.52E+00	RME EPC is max detect	6 of 6
Chromium	8.50E-04	1.50E-03	1.50E-03	---	1.50E-03	RME EPC is max detect	1 of 6
Chromium VI	8.50E-03	1.60E-02	1.50E-02	---	1.60E-02	RME EPC is max detect	2 of 6
Chrysene	2.48E-04	7.10E-04	7.10E-04	3.00E-01 [(3)]	7.00E-04	RME EPC is max detect	1 of 6
Cobalt	9.12E-04	3.20E-03	5.20E-04	---	3.20E-03	RME EPC is max detect	2 of 6
Dibenz(a,h)anthracene	6.26E-04	3.04E-03	3.04E-03	3.00E-01 [(3)]	3.00E-03	RME EPC is max detect	1 of 6
Di-n-butyl Phthalate	3.12E-03	3.81E-03	1.07E-03	5.00E-03	3.80E-03	RME EPC is max detect	5 of 6
Indeno(1,2,3-cd)pyrene	6.73E-04	3.44E-03	3.44E-03	3.00E-01 [(3)]	3.40E-03	RME EPC is max detect	1 of 6
Iron	2.27E+00	6.67E+00	5.20E-01	---	6.67E+00	RME EPC is max detect	6 of 6
Lead	2.63E-03	1.10E-02	1.10E-02	---	1.10E-02	RME EPC is max detect	1 of 6
Lithium	1.16E-01	1.60E-01	6.70E-02	---	1.60E-01	RME EPC is max detect	6 of 6
Manganese	6.37E-01	1.44E+00	8.50E-02	---	1.44E+00	RME EPC is max detect	6 of 6
Molybdenum	8.73E-03	1.80E-02	1.30E-02	---	1.80E-02	RME EPC is max detect	3 of 6
Nickel	4.60E-03	7.90E-03	3.00E-03	---	7.90E-03	RME EPC is max detect	6 of 6
Selenium	4.26E-03	9.80E-03	9.80E-03	1.36E-01	9.80E-03	RME EPC is max detect	1 of 6
Silver	9.30E-03	1.50E-02	3.70E-03	---	1.50E-02	RME EPC is max detect	6 of 6
Strontium	4.47E+00	7.19E+00	1.77E+00	---	7.19E+00	RME EPC is max detect	6 of 6
Thallium	2.86E-03	7.70E-03	6.20E-03	2.13E-02	7.70E-03	RME EPC is max detect	2 of 6
Titanium	1.90E-02	4.40E-02	2.10E-03	---	4.40E-02	RME EPC is max detect	6 of 6
Vanadium	3.20E-03	8.40E-03	4.30E-03	---	8.40E-03	RME EPC is max detect	3 of 6
Zinc	1.20E-01	6.30E-01	2.70E-02	---	6.30E-01	RME EPC is max detect	3 of 6
LPAHs				---			
HPAHs	2.64E-03	1.16E-02	1.16E-02	3.00E-01 [(3)]	1.14E-02		
Total PAHs	2.64E-03	2.64E-03	2.64E-03	3.00E-01 [(3)]	2.64E-03		

Notes:

[+] Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

(2) - Buchman, 2008.

(3) - Buchman, 2008 acute value for chemical class.

TABLE 14
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest+	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water (1)	RME EPC	Statistic Used	# of Detects/# of Samples
Aluminum	6.48E-02	4.70E-02	4.70E-02	---	4.70E-02	RME EPC is max detect	1 of 4
Barium	2.63E-02	2.80E-02	2.30E-02	2.50E+01	2.80E-02	RME EPC is max detect	4 of 4
Boron	4.79E+00	4.99E+00	4.30E+00	1.20E+00 (2)	4.99E+00	RME EPC is max detect	4 of 4
Lithium	2.10E-01	2.20E-01	2.00E-01	---	2.20E-01	RME EPC is max detect	4 of 4
Manganese	4.85E-03	6.00E-03	2.50E-03	1.00E-01 (2)	6.00E-03	RME EPC is max detect	4 of 4
Nickel	2.63E-03	3.30E-03	1.30E-03	1.31E-02	3.30E-03	RME EPC is max detect	4 of 4
Selenium	4.25E-02	6.30E-02	2.80E-02	1.36E-01	6.30E-02	RME EPC is max detect	4 of 4
Strontium	8.04E+00	8.47E+00	7.36E+00	---	8.47E+00	RME EPC is max detect	4 of 4

Notes:
+ Chemicals of interest are any chemical measured in at least one sample.
(1) - From Table 3-2 of TCEQ.
(2) - Buchman, 2008.

TABLE 15
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY BACKGROUND SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water	RME EPC	Statistic Used	# of Detects/# of Samples
Barium	1.65E-02	1.90E-02	1.20E-02	2.50E+01	1.90E-02	RME EPC is max detect	4 of 4
Boron	3.98E+00	4.33E+00	3.04E+00	1.20E+00 (2)	4.33E+00	RME EPC is max detect	4 of 4
Chromium	7.38E-02	7.80E-02	6.40E-02	1.03E-01	7.80E-02	RME EPC is max detect	4 of 4
Iron	5.40E-02	6.00E-02	6.00E-02	5.00E-02 (2)	6.00E-02	RME EPC is max detect	1 of 4
Lithium	2.90E-01	3.90E-01	1.90E-01	---	3.90E-01	RME EPC is max detect	4 of 4
Manganese	1.53E-02	1.80E-02	1.10E-02	1.00E-01 (2)	1.80E-02	RME EPC is max detect	4 of 4
Molybdenum	3.68E-03	3.90E-03	3.90E-03	2.30E-02 (2)	3.90E-03	RME EPC is max detect	1 of 4
Silver	5.23E-03	5.80E-03	4.30E-03	1.90E-04	5.80E-03	RME EPC is max detect	4 of 4
Strontium	6.84E+00	7.46E+00	5.20E+00	---	7.46E+00	RME EPC is max detect	4 of 4
Vanadium	1.23E-02	1.50E-02	9.30E-03	5.00E-02 (2)	1.50E-02	RME EPC is max detect	4 of 4

Notes:
[+] Chemicals of interest are any chemical measured in at least one sample.
(1) - From Table 3-2 of TCEQ.
(2) - Buchman, 2008.

TABLE 16
EXPOSURE POINT CONCENTRATION (mg/L)
WETLAND SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water [(1)]	RME EPC	Statistic Used	# of Detects/# of Samples
Barium	3.20E-04	3.50E-01	1.40E-01	2.50E+01	3.50E-01	RME EPC is max detect	4 of 4
Boron	2.70E-02	2.75E+00	8.50E-01	1.20E+00 [(2)]	2.75E+00	RME EPC is max detect	4 of 4
Chromium	1.20E-03	3.70E-02	1.90E-02	1.03E-01	3.70E-02	RME EPC is max detect	2 of 4
Copper	2.50E-03	1.10E-02	5.30E-03	3.60E-03	1.10E-02	RME EPC is max detect	3 of 4
Lithium	3.50E-03	2.80E-01	5.70E-02	---	2.80E-01	RME EPC is max detect	4 of 4
Manganese	6.00E-04	3.30E-01	2.50E-02	1.00E-01 [(2)]	3.30E-01	RME EPC is max detect	4 of 4
Molybdenum	2.70E-03	1.70E-02	5.40E-03	2.30E-02 [(2)]	1.70E-02	RME EPC is max detect	3 of 4
Nickel	4.50E-04	1.30E-03	4.90E-04	1.31E-02	1.30E-03	RME EPC is max detect	2 of 4
Strontium	9.40E-04	7.01E+00	1.89E+00	---	7.01E+00	RME EPC is max detect	4 of 4

Notes:
[+] Chemicals of interest are any chemical measured in at least one sample.
(1) From Table 3-2 of TCEQ, 2006.
(2) - Buchman, 2008.

TABLE 17
EXPOSURE POINT CONCENTRATION (mg/L)
POND SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest[+]	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water [(1)]	RME EPC	Statistic Used	# of Detects/# of Samples
Antimony	3.50E-03	6.30E-03	3.10E-03	5.00E-01 [(2)]		RME EPC is max detect	3 of 6
Barium	1.25E-01	1.30E-01	1.20E-01	25		RME EPC is max detect	6 of 6
Boron	2.79E+00	3.33E+00	2.36E+00	1.20E+00 [(2)]		RME EPC is max detect	6 of 6
Lithium	1.45E-01	2.20E-01	8.00E-02	---		RME EPC is max detect	6 of 6
Manganese	4.65E-01	1.06E+00	6.60E-02	1.00E-01 [(2)]		RME EPC is max detect	6 of 6
Molybdenum	1.01E-02	1.90E-02	1.80E-02	2.30E-02 [(2)]		RME EPC is max detect	3 of 6
Nickel	1.43E-03	2.60E-03	1.90E-03	0.131		RME EPC is max detect	3 of 6
Silver	1.83E-03	2.90E-03	9.40E-04	0.00019		RME EPC is max detect	6 of 6
Strontium	4.32E+00	6.97E+00	1.78E+00	---		RME EPC is max detect	6 of 6
Thallium	1.53E-03	3.20E-03	1.40E-03	0.0213		RME EPC is max detect	3 of 6
Vanadium	7.58E-04	2.10E-03	2.10E-03	5.00E-02 [(2)]		RME EPC is max detect	1 of 6

Notes:
[+] Chemicals of interest are any chemical measured in at least one sample.
(1) From Table 3-2 of TCEQ, 2006.
(2) - Buchman, 2008.

TABLE 18
TERRESTRIAL HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Invertebrates	Earthworm	Protection of soil invertebrate community from uptake and direct toxic effects on detritivore abundance, diversity, productivity due to chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the abundance, diversity, productivity, and function? 2) Do soil-to-earthworm BAFs suggest uptake of chemicals?	Average and 95%UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Small mammalian herbivore	Deer mouse	Protection of the small mammal survival, growth, and reproduction due to uptake of chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-mammal BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Mammalian predator	Coyote	Protection of the mammalian predator survival, growth, and reproduction due to the uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-mammal BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Reptilian predator	Rat snake	Protection of the reptilian predator survival, growth, and reproduction due to the uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-mammal BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian herbivore/omnivore	American robin	Protection of the omnivorous avian survival, growth, and reproduction due to uptake of chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-avian omnivore BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian predator	Red-tailed hawk	Protection of carnivorous avian community population abundance, diversity, and productivity due to uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-higher trophic level BAFs suggest uptake of chemicals and/or bioaccumulation?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.

Notes:
SLERA -- Screening-Level Ecological Risk Assessment
BAF -- biota accumulation factor
BSAF -- biota to sediment accumulation factor
NOAEL -- no observable adverse effects level
95% UCL -- 95 percent upper confidence limit on the mean

TABLE 19
ESTUARINE WETLAND AND AQUATIC HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Benthos and zooplankton	Polychaetes	Protection of benthic invertebrate community from uptake and direct toxic effects on abundance, diversity, and productivity due to chemicals in sediment.	1) Does exposure to chemicals in sediment adversely affect the abundance, diversity, productivity, and function? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Fish and shellfish	Fiddler crab	Protection of invertebrate community abundance, diversity, and productivity due to uptake of chemicals in sediment.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Killifish	Protection of localized herbivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment and biota.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Carnivorous fish	Black drum	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment and prey items.	1) Does exposure to chemicals in sediment and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivorous fish? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals and/or bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Spotted seatrout	Protection of carnivorous fish survival, growth, and reproduction due to uptake of *chemicals in prey items.*	1) Does exposure to chemicals in prey items adversely affect the survival, growth, and reproduction of a second order carnivorous fish? 2) Does sediment-to-biota BSAF suggest bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian predator	Sandpiper	Protection of carnivorous avian survival, growth, and reproduction due to uptake of chemicals in sediment and prey items.	1) Does exposure to chemicals in sediment and/or prey items adversely affect the survival, growth,and reproduction of a first order carnivore? 2) Does sediment-to-biota BSAF suggestion uptake or bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Green heron	Protection of carnivorous avian survival, growth and reproduction due to uptake of chemicals in prey items.	1) Does exposure to chemicals in prey items adversely affect the survival, growth, and reproduction of a second order carnivore? 2) Does sediment-to-biota BSAF suggestion bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.

Notes:
SLERA – Screening-Level Ecological Risk Assessment
BAF – biota accumulation factor
BSAF – biota to sediment accumulation factor
NOAEL – no observable adverse effects level
95% UCL – 95 percent upper confidence limit on the mean

TABLE 20
BACKGROUND COMPARISONS

HYPOTHESIS TESTED: ARE SITE DATA STATISTICALLY DIFFERENT THAN BACKGROUND DATA?[1]							
CHEMICAL OF INTEREST[+]	SOUTH SURFACE SOIL	SOUTH SOIL	NORTH SURFACE SOIL	NORTH SOIL	ICWW SEDIMENT	WETLANDS SEDIMENT	POND SEDIMENT
Aluminum	NA	NA	NA	NA	Yes*	NA	NA
Antimony	No	No	No	No	Yes*	No	No
Arsenic	No	No	No	No	Yes*	No	Yes*
Barium	No	No	Yes*	Yes*	No	Yes*	No
Beryllium	NA	NA	NA	NA	Yes*	NA	NA
Boron	NA	NA	NA	NA	Yes*	NA	NA
Cadmium	No	No	**Yes**	Yes*	NA	**Yes**	**Yes**
Chromium	No	No	No	No	NA	No	No
Cobalt	NA	NA	NA	NA	Yes*	NA	NA
Copper	**Yes**	No	No	No	No	No	No
Iron	NA	NA	NA	NA	No	NA	No
Lead	**Yes**	No	No	No	No	No	**Yes**
Lithium	Yes*	Yes*	Yes*	No	Yes*	No	No
Manganese	Yes*	Yes*	No	No	No	No	**Yes**
Mercury	No	No	Yes*	Yes*	No	No	NA
Molybdenum	**Yes**	No	No	No	No	No	Yes*
Nickel	NA	NA	NA	NA	No	NA	NA
Strontium	NA	NA	NA	NA	Yes*	NA	NA
Titanium	NA	NA	NA	NA	Yes*	NA	NA
Vanadium	NA	NA	NA	NA	Yes*	NA	NA
Zinc	**Yes**	No	No	No	No	No	No

Notes:
[1] Detailed statistical procedures are outlined in Section 2.7 and calculations are provided in Appendix B.
* Statistical difference is due to background being greater than site.
[+] Chemicals of interest are any chemical measured in at least one sample.
NA - No analysis was performed for compound in background.

TABLE 21
COPECS IDENTIFIED IN STEP 1 AND QUANTITATIVELY EVALUATED IN STEP 2*

SOUTH AREA SOIL	NORTH AREA SOIL	BACKGROUND AREA SOIL	ICWW SEDIMENT	BACKGROUND ICWW SEDIMENT	WETLANDS SEDIMENT	POND SEDIMENT
2-Methylnaphthalene	2-Methylnaphthalene	Antimony	2-Methylnaphthalene	4,4'-DDT	2-Methylnaphthalene	4,4'-DDD
4,4-DDD	4,4'-DDE	Arsenic	4,4'-DDT	Arsenic	4,4'-DDT	4,4'-DDT
4,4'-DDE	4,4'-DDT	Barium	Acenaphthylene	Benzo(b)fluoranthene	Acenaphthene	Benzo(b)fluoranthene
4,4'-DDT	Acenaphthene	Benzo(a)anthracene	Anthracene	Copper	Acenaphthylene	Benzo(g,h,i)perylene
Acenaphthene	Acenaphthylene	Benzo(a)pyrene	Benzo(a)anthracene	Mercury	Anthracene	Benzo(k)fluoranthene
Acenaphthylene	Anthracene	Benzo(b)fluoranthene	Benzo(a)pyrene	Nickel	Benzo(a)anthracene	Cadmium
Anthracene	Aroclor-1254	Benzo(g,h,i)perylene	Benzo(b)fluoranthene	Zinc	Benzo(a)pyrene	Chrysene
Aroclor-1254	Benzo(a)anthracene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	LPAH	Benzo(b)fluoranthene	Nickel
Benzo(a)anthracene	Benzo(a)pyrene	Cadmium	Benzo(k)fluoranthene	HPAH	Benzo(g,h,i)perylene	Phenanthrene
Benzo(a)pyrene	Benzo(b)fluoranthene	Chromium	Chrysene	TOTAL PAHs	Benzo(k)fluoranthene	Pyrene
Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene		Cadmium	LPAH
Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Copper	Fluoranthene		Chrysene	HPAH
Benzo(k)fluoranthene	Boron	Fluoranthene	Fluorene		Dibenz(a,h)anthracene	TOTAL PAHs
Boron	Cadmium	Indeno(1,2,3-cd)pyrene	gamma-Chlordane		Endosulfan Sulfate	
Chrysene	Chrysene	Lead	Hexachlorobenzene		Endrin Aldehyde	
Cobalt	Dibenz(a,h)anthracene	Lithium	Indeno(1,2,3-cd)pyrene		Endrin Ketone	
Copper	Dieldrin	Manganese	Phenanthrene		Fluoranthene	
Dibenz(a,h)anthracene	Endrin	Mercury	Pyrene		Fluorene	
Dieldrin	Endrin Ketone	Molybdenum	LPAH		gamma-Chlordane	
Endrin Aldehyde	Fluoranthene	Phenanthrene	HPAH		Indeno(1,2,3-cd)pyrene	
Endrin Ketone	Fluorene	Pyrene	TOTAL PAHs		Nickel	
Fluoranthene	Indeno(1,2,3-cd)pyrene	Zinc			Phenanthrene	
Fluorene	Iron	LPAH			Pyrene	
gamma-Chlordane	Naphthalene	HPAH			LPAH	
Indeno(1,2,3-cd)pyrene	Nickel	TOTAL PAHs			HPAH	
Lead	Phenanthrene				TOTAL PAHs	
Molybdenum	Pyrene					
Naphthalene	Vanadium					
Nickel	LPAH					
Phenanthrene	HPAH					
Pyrene	TOTAL PAHs					
Vanadium						
Zinc						
LPAH						
HPAH						
TOTAL PAHs						

Notes:
* Surface water is not included in the table because they were evaluated differently given the lack of screening criteria and toxicity reference values.

TABLE 22
TERRESTRIAL EXPOSURE PARAMETERS

PARAMETER	Deer Mouse		Coyote		Rat Snake		American Robin		Red-Tailed Hawk	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Ingestion Rate for soil (kg/day)	2.13E-05	EPA, 1999*	NA		1.45E-04	EPA, 1993+	1.14E-03	EPA, 1999*	NA	
Bioavailability Factor in soil (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Area Use Factor (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Body Weight (kg)	1.48E-02	EPA, 1999	1.55E+01	EPA, 1993	1.39E-01	EPA, 1993	8.00E-02	EPA, 1999	9.60E-01	EPA, 1999
Ingestion Rate for food (kg/day)	8.87E-03	EPA, 1999*	1.55	EPA, 1993*	2.78E-03	EPA, 1993*	3.52E-02	EPA, 1999*	1.78E-01	EPA, 1999*
Dietary Fraction for arthropods (unitless)	5.60E-01	EPA, 1993	NA		2.00E-01	EPA, 1993	4.60E-01	EPA, 1993	NA	
Dietary Fraction for plants, etc. (unitless)	4.40E-01	EPA, 1993	NA		NA		8.00E-02	EPA, 1993	NA	
Dietary Fraction of small mammals (unitless)	NA		7.50E-01	EPA, 1993	6.20E-01	EPA, 1993	NA		7.85E-01	EPA, 1993
Dietary Fraction of birds (unitless)	NA		2.50E-01	EPA, 1993	1.80E-01	EPA, 1993	NA		3.80E-01	EPA, 1993
Dietary Fraction of earthworms (unitless)	NA		NA		NA		4.60E-01	EPA, 1993	NA	

Notes:
* Normalized for body weight.
NA - not applicable.
+ Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE 23
ESTUARINE WETLAND AND AQUATIC EXPOSURE PARAMETERS

PARAMETER	Fiddler Crab		Killifish		Black Drum		Spotted Seatrout		Sandpiper		Green Heron	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Ingestion Rate for soil (kg/day)	1.16E-08	Cammen, 1979			2.60E-03	Neill, 1998+	NA		2.10E-02	EPA, 1993	NA	
Bioavailability Factor in soil (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Area Use Factor (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Body Weight (kg)	9.00E-03	*			1.24	Alcoa, 2000	1.00E+00	TPWD, 2009**	2.15E-01	Dunning, 1993	3.75E-01	Dunning, 1993
Ingestion Rate for food (kg/day)	1.16E-08	Cammen, 1979			2.60E-02	Neill, 1998	2.60E-02	Prof. Judg.**	1.08E-01	EPA, 1993	1.13E-01	EPA, 1993
Dietary Fraction for invertebrates (unitless)	1.00E+00	TPWD, 2009**			NA		NA		NA		NA	
Dietary Fraction for worms (unitless)	NA				3.33E-01	Prof. Judg.**	NA		6.00E-01	Prof. Judg.**	NA	
Dietary Fraction of crabs (unitless)	NA				3.33E-01	Prof. Judg.**	NA		4.00E-01	Prof. Judg.**	2.50E-01	Kent, 1986
Dietary Fraction of fish (unitless)	NA				3.33E-01	Prof. Judg.**	1.00E+00	TPWD, 2009**	NA		7.50E-01	Kent, 1986

Notes:
* Estimated based on width/length equation for fiddler crabs.
** Because of the lack of information on dietary fractions for different species, best professional judgment was used as the basis for the assumption.
NA - not applicable.
+ Sediment ingestion was assumed to be 10% of dietary intake.
++ http://www.tpwd.state.tx.us

TABLE 24
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR THE SOUTH AREA

MEDIA	RECEPTOR	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE	AVERAGE HQ	RME HQ
Soil	Earthworm	*4,4'-DDD*	*NOAEL*	*1.78E-01*	*1.16E+00*
		Zinc	*NOAEL*	*3.62E+00*	*6.79E+00*
	Deer Mouse	*Aroclor-1254*	*NOAEL*	*5.07E-01*	*1.83E+00*
		Copper	*NOAEL*	*5.21E-01*	*1.01E+00*
		Zinc	*NOAEL*	*1.09E+00*	*2.05E+00*
	Coyote	None	NOAEL		
	Rat Snake	None	NOAEL		
	American Robin	*Aroclor-1254*	*NOAEL*	*5.32E-01*	*1.94E+00*
		Lead	*NOAEL*	*1.06E+00*	*1.61E+00*
		Zinc	*NOAEL*	*1.62E+00*	*2.95E+00*
	Red-Tailed Hawk	None	NOAEL		
	Earthworm	**Zinc**	**LOAEL**	**8.06E-01**	**1.52E+00**
	Deer Mouse	None	LOAEL		
	Coyote	None	LOAEL		
	Rat Snake	None	LOAEL		
	American Robin	None	LOAEL		
	Red-Tailed Hawk	None	LOAEL		
Intracoastal Waterway Sediment	Capitella Capitata	*4,4'-DDT*	*ERL*	*4.11E-01*	*2.30E+00*
		Benzo(a)anthracene	*ERL*	*1.74E-01*	*1.15E+00*
		Dibenz(a,h)anthracene	*ERL*	*6.86E-01*	*3.23E+00*
		Fluoranthene	*ERL*	*1.88E-01*	*1.02E+00*
		Fluorene	*ERL*	*6.42E-01*	*1.28E+00*
		gamma-Chlordane	*ERL*	*6.26E-01*	*1.14E+00*
		Hexachlorobenzene	*AET*	*1.67E+00*	*2.10E+00*
		Phenanthrene	*ERL*	*3.11E-01*	*1.62E+00*
		Pyrene	*ERL*	*1.95E-01*	*1.02E+00*
		HPAH	*ERL*	*4.54E-01*	*2.22E+00*
		Total PAHs	*ERL*	*2.24E-01*	*1.06E+00*
	Capitella Capitata	None	ERM		
	Fiddler Crab	None	NOAEL		
	Black Drum	None	NOAEL		
	Spotted Seatrout	None	NOAEL		
	Sandpiper	None	NOAEL		
	Green Heron	None	NOAEL		

Notes:
AET - apparent effects threshold
ERL - effects range low
ERM - effects range medium
HQ - hazard quotient
LOAEL - lowest observable adverse effects level
NOAEL - no observable adverse effects level
RME - reasonable maximum exposure

TABLE 25
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR THE NORTH AREA

MEDIA	RECEPTOR	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE	AVERAGE HQ	RME HQ
Soil	Earthworm	None	NOAEL		
	Deer Mouse	*Dieldrin*	*NOAEL*	*1.60E-01*	*1.12E+00*
	Coyote	None	NOAEL		
	Rat Snake	None	NOAEL		
	American Robin	None	NOAEL		
	Red-Tailed Hawk	None	NOAEL		
	Earthworm	None	LOAEL		
	Deer Mouse	None	LOAEL		
	Coyote	None	LOAEL		
	Rat Snake	None	LOAEL		
	American Robin	None	LOAEL		
	Red-Tailed Hawk	None	LOAEL		
Wetlands Sediment	Capitella Capitata	*2-Methylnaphthalene*	*ERL*	*2.84E-01*	*1.02E+00*
		4,4'-DDT	*ERL*	*9.07E-01*	*2.12E+00*
		Acenaphthylene	*ERL*	*1.02E+00*	*3.93E+00*
		Acenaphthene	*ERL*	*7.02E-01*	*3.68E+00*
		Anthracene	*ERL*	*3.92E-01*	*1.57E+00*
		Benzo(a)anthracene	*ERL*	*2.36E-01*	*1.19E+00*
		Benzo(a)pyrene	*ERL*	*2.37E-01*	*1.09E+00*
		Benzo(g,h,i)perylene	*AET*	*2.90E-01*	*1.11E+00*
		Chrysene	*ERL*	*5.55E-01*	*3.17E+00*
		Dibenz(a,h)anthracene	*ERL*	*3.14E+00*	*1.70E+01*
		Endrin Aldehyde	*ERL*	*3.90E-01*	*1.10E+00*
		Fluoranthene	*ERL*	*1.77E-01*	*1.04E+00*
		Fluorene	*ERL*	*9.63E-01*	*3.29E+00*
		gamma-Chlordane	*ERL*	*7.76E-01*	*1.57E+00*
		Indeno(1,2,3-cd)pyrene	*AET*	*3.28E-01*	*1.28E+00*
		Phenanthrene	*ERL*	*3.16E-01*	*1.77E+00*
		LPAH	*ERL*	*3.58E-01*	*1.66E+00*
		HPAH	*ERL*	*8.10E-01*	*3.83E+00*
		Total PAHs	*ERL*	*3.91E-01*	*1.85E+00*
	Fiddler Crab	None	NOAEL		
	Sandpiper	None	NOAEL		
	Green Heron	None	NOAEL		
	Capitella Capitata	**Dibenz(a,h)anthracene**	**ERM**	**7.65E-01**	**4.15E+00**
	Fiddler Crab	None	LOAEL		
	Sandpiper	None	LOAEL		
	Green Heron	None	LOAEL		
Pond Sediment	Capitella Capitata	*4,4-DDT**	*ERL*	*4.16E+00*	*1.47E+00*
	Fiddler Crab	None	NOAEL		
	Sandpiper	*Nickel*	*NOAEL*	*8.98E-01*	*1.13E+00*
	Green Heron	None	NOAEL		
	Capitella Capitata	None	ERM		
	Fiddler Crab	None	LOAEL		
	Sandpiper	None	LOAEL		
	Green Heron	None	LOAEL		

Notes:
* Average HQ is higher than RME HQ because the RME concentration was the maximum detected while the average concentration calculation contained 1/2 sample quantitation limits which sometimes were higher than the max. detect.
ERL - effects range low
ERM - effects range medium
HQ - hazard quotient
LOAEL - lowest observable adverse effects level
NOAEL - no observable adverse effects level
RME - reasonable maximum exposure

TABLE 26
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR THE BACKGROUND AREAS

MEDIA	RECEPTOR	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE	AVERAGE HQ	RME HQ
Soil	Earthworm	*Barium*	*NOAEL*	*1.01E+00*	*1.52E+00*
		Zinc	*NOAEL*	*2.06E+00*	*8.08E+00*
	Deer Mouse	*Antimony*	*NOAEL*	*9.76E-01*	*2.24E+00*
		Barium	*NOAEL*	*7.38E-01*	*1.11E+00*
		Zinc	*NOAEL*	*6.20E-01*	*2.43E+00*
	Coyote	None	NOAEL		
	Rat Snake	None	NOAEL		
	American Robin	*Antimony*	*NOAEL*	*8.41E-01*	*1.93E+00*
		Barium	*NOAEL*	*6.98E-01*	*1.05E+00*
		Zinc	*NOAEL*	*9.00E-01*	*3.53E+00*
	Red-Tailed Hawk	None	NOAEL		
	Earthworm	**Barium**	**LOAEL**	**1.01E+00**	**1.52E+00**
		Zinc	**LOAEL**	**4.59E-01**	**1.80E+00**
	Deer Mouse	None	LOAEL		
	Coyote	None	LOAEL		
	Rat Snake	None	LOAEL		
	American Robin	None	LOAEL		
	Red-Tailed Hawk	None	LOAEL		
Intracoastal Waterway Sediment	Capitella Capitata	None	NOAEL		
	Fiddler Crab	None	NOAEL		
	Black Drum	None	NOAEL		
	Spotted Seatrout	None	NOAEL		
	Sandpiper	None	NOAEL		
	Green Heron	None	NOAEL		

Notes:
AET - apparent effects threshold
HQ - hazard quotient
LOAEL - lowest observable adverse effects level
NOAEL - no observable adverse effects level
RME - reasonable maximum exposure

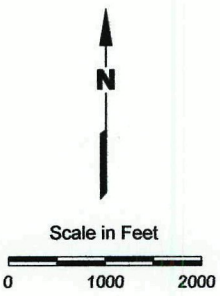
TABLE 27
SUMMARY OF SURFACE WATER DATA AND ECOLOGICAL BENCHMARKS

MEDIA	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	MAX CONCENTRATION (mg/L)	ECO BENCHMARK (mg/L)	LC_{50} (mg/L)*
Intracoastal Waterway Surface Water	Boron (dissolved)	4.99	1.2	86.5
Intracoastal Waterway Surface Water Background Area	Boron (dissolved)	4.33	1.2	86.5
	4,4'-DDT	0.000013	0.000001	0.00045
	Iron (dissolved)	0.06	0.05	4
	Silver (dissolved)	0.0058	0.00019	1.45
Wetland Area Surface Water	Acrolein	0.00929	0.005	0.43
	Boron (dissolved)	2.75	1.2	86.5
	Copper (dissolved)	0.011	0.0036	0.368
	Manganese (dissolved)	0.33	0.1	50
Pond Surface Water	Boron (dissolved)	3.33	1.2	86.5
	Manganese (dissolved)	1.06	0.1	50
	Silver (dissolved)	0.0029	0.00019	1.45

Notes:
* Additional discussion related to the LC50 concentration provided here can be found in Section 3.4.8 of the SLERA report. All values from EPA, 2009.

FIGURES

QUADRANGLE LOCATION



Source:
Base map taken from http://www.tnris.state.tx.us Freeport, Texas 7.5 min. U.S.G.S. quadrangle, 1974.

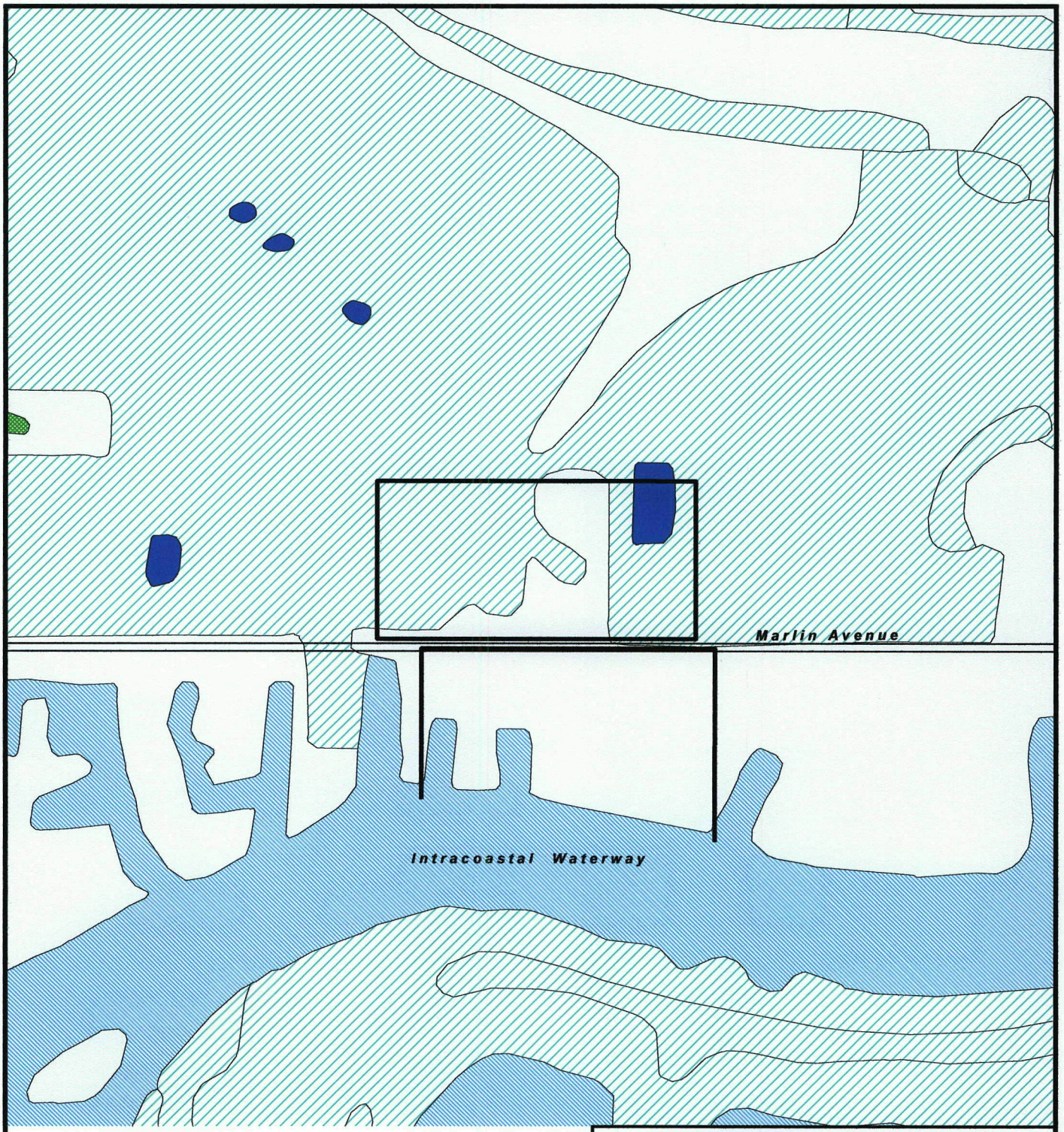
GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 1

SITE LOCATION MAP

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: EFP	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS



EXPLANATION

- Approx. Site Boundary
- Upland Area
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Pond

N

Approx. Scale in Feet

0 300 600

Source:
U.S. Fish & Wildlife Service, Wetlands Online Mapper, 2008.

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 2

WETLAND MAP

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: EFP	

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

EXPLANATION

- IWSE29 — Sediment Station
- IWSW20 — Surface Water Station
- BSS-1 — Approximate Background Soil Sample Location

Note:
Background fish tissue samples collected from throughout background area.

N

Approx. Scale in Feet

0 125 250

Source of photo: H-GAC, Texas aerial photograph, 2006.

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 3

SOIL AND INTRACOASTAL WATERWAY SEDIMENT AND SURFACE WATER BACKGROUND SAMPLE LOCATIONS

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: EFP	

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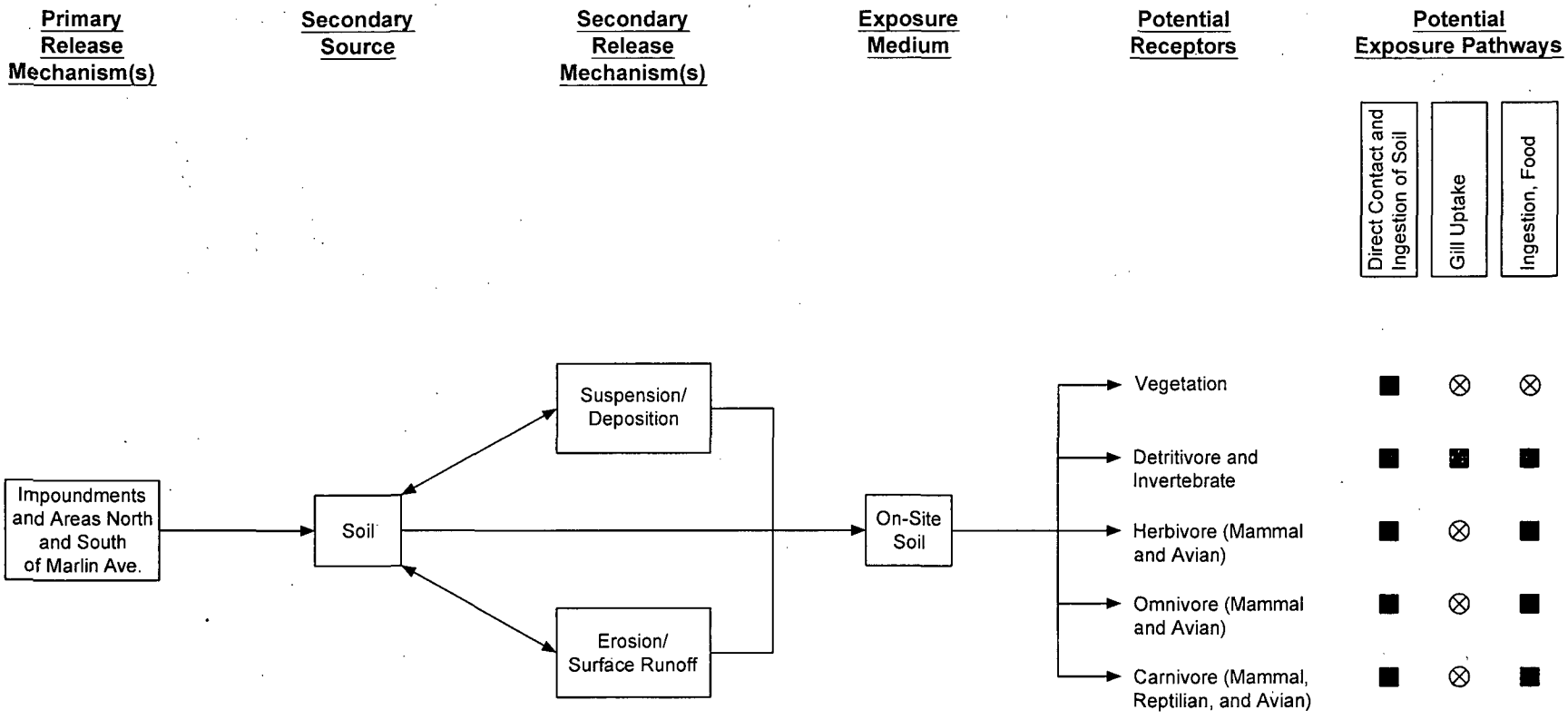

LEGEND

- ■ Pathway is potentially complete
- ⊠ Pathway is incomplete
- ⊗ Pathway is not viable

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 4

TERRESTRIAL ECOSYSTEM CONCEPTUAL SITE MODEL

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: KHT	

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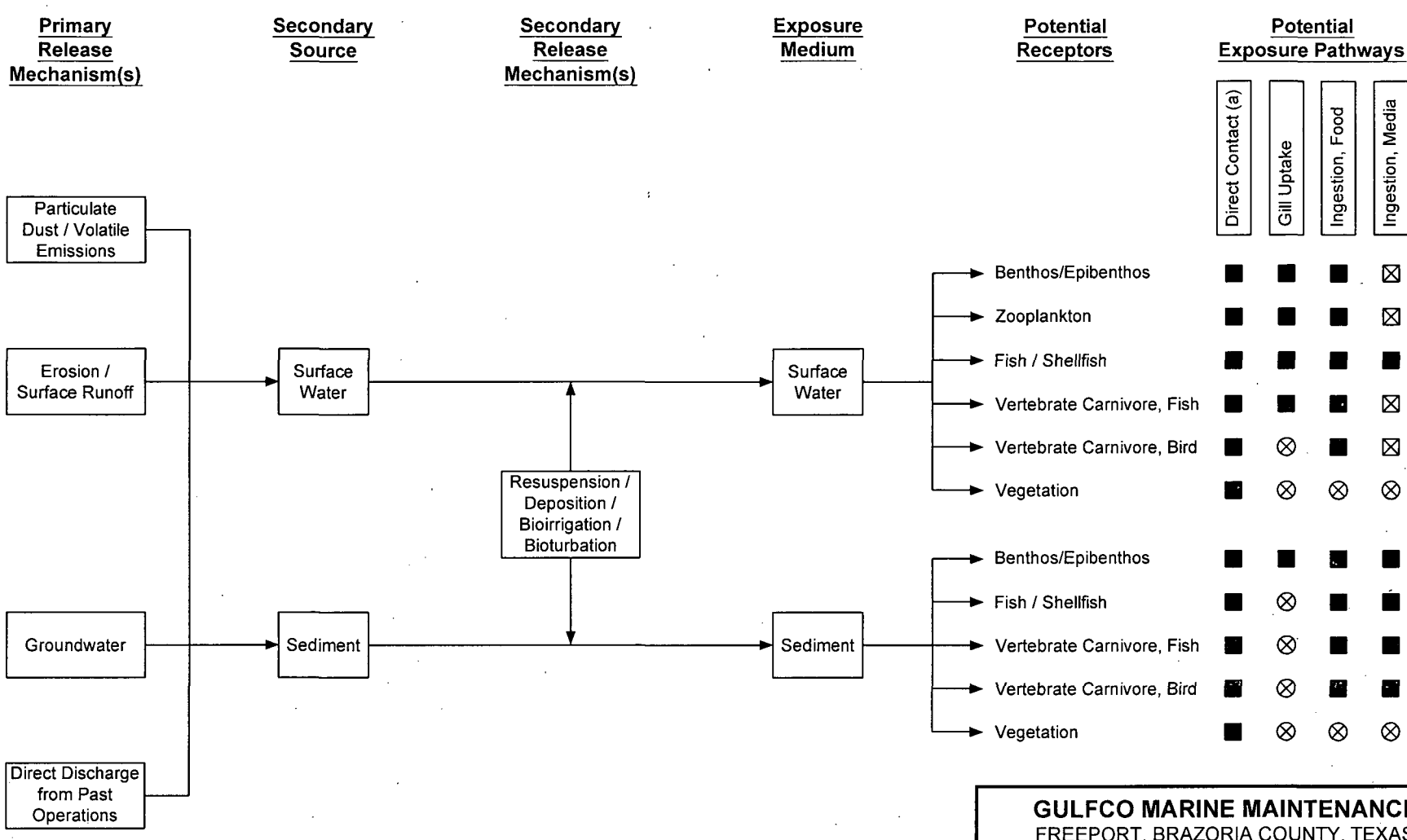

LEGEND

■ Pathway is potentially complete

⊠ Pathway is incomplete

⊗ Pathway is not viable

(a) Direct contact includes dermal absorption

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 5

AQUATIC ECOSYSTEM CONCEPTUAL SITE MODEL

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: KHT	

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EXPLANATION

- Gulfco Marine Maintenance Site Boundary (approximate)
- Zone 1 — Crab/Fish Tissue Sampling Zones
- Monitoring Well
- Temporary Piezometer
- CPT Piezometer Location
- Wetland Sediment Sample
- Pond or Intracoastal Waterway Sediment Sample
- Surface Water Sample
- Surface Soil Sample (0-1 in)
- Shallow Soil Sample
- Western Extent Soil Sample
- Zone B Soil Boring
- Deep Soil Boring Location
- Geotechnical Soil Sample

Scale in Feet

0 100 200

Source of photo: H-GAC, Texas aerial photograph, 2006.

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

PLATE 1

INVESTIGATION SAMPLE LOCATIONS

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: EFP	

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APPENDIX A
PRO UCL OUTPUT

APPENDIX A-1

SOUTH OF MARLIN SURFACE SOIL

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\95% detect frequency SURFACE
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (2-methylnaphthalene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	53

Raw Statistics		Log-transformed Statistics	
Minimum	0.0047	Minimum of Log Data	-5.354
Maximum	0.501	Maximum of Log Data	-0.691
Mean	0.0293	Mean of log Data	-4.479
Median	0.0055	SD of log Data	1.145
SD	0.0715		
Coefficient of Variation	2.438		
Skewness	5.333		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.365	Lilliefors Test Statistic	0.335
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0424	95% H-UCL	0.0295
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0363
95% Adjusted-CLT UCL	0.0472	97.5% Chebyshev (MVUE) UCL	0.0427
95% Modified-t UCL	0.0432	99% Chebyshev (MVUE) UCL	0.0552
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.628	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0467		
nu star	104.3		
Approximate Chi Square Value (.05)	81.71	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0423
Adjusted Chi Square Value	81.36	95% Jackknife UCL	0.0424
		95% Standard Bootstrap UCL	0.0424
Anderson-Darling Test Statistic	11.06	95% Bootstrap-t UCL	0.0633
Anderson-Darling 5% Critical Value	0.804	95% Hall's Bootstrap UCL	0.104
Kolmogorov-Smirnov Test Statistic	0.333	95% Percentile Bootstrap UCL	0.0432
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0486
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0636
		97.5% Chebyshev(Mean, Sd) UCL	0.0784
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.107
95% Approximate Gamma UCL	0.0374		
95% Adjusted Gamma UCL	0.0376		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0784

Result or 1/2 SDL (4,4'-ddd)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	55

Raw Statistics		Log-transformed Statistics	
Minimum	1.1750E-4	Minimum of Log Data	-9.049
Maximum	0.0243	Maximum of Log Data	-3.717
Mean	7.8940E-4	Mean of log Data	-8.519
Median	1.3300E-4	SD of log Data	1.087
SD	0.0030		
Coefficient of Variation	3.894		
Skewness	6.54		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.435	Lilliefors Test Statistic	0.428
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0013	95% H-UCL	4.7561E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.8317E-4
95% Adjusted-CLT UCL	0.0016	97.5% Chebyshev (MVUE) UCL	6.8130E-4
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	8.7406E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.458	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	76.06		
Approximate Chi Square Value (.05)	56.97	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0013
Adjusted Chi Square Value	56.68	95% Jackknife UCL	0.0013
		95% Standard Bootstrap UCL	0.0013
Anderson-Darling Test Statistic	22.2	95% Bootstrap-t UCL	0.0031
Anderson-Darling 5% Critical Value	0.827	95% Hall's Bootstrap UCL	0.0034
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	0.0014
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.0017
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0022
		97.5% Chebyshev(Mean, Sd) UCL	0.0029
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0041
95% Approximate Gamma UCL	0.0010		
95% Adjusted Gamma UCL	0.0010		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0029

Result or 1/2 SDL (4,4'-dde)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	65

Raw Statistics		Log-transformed Statistics	
Minimum	1.6300E-4	Minimum of Log Data	-8.722
Maximum	0.0693	Maximum of Log Data	-2.669
Mean	0.0019	Mean of log Data	-7.87
Median	1.8900E-4	SD of log Data	1.305
SD	0.0080		
Coefficient of Variation	4.214		
Skewness	7.636		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.414	Lilliefors Test Statistic	0.358
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0033	95% H-UCL	0.0012
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0041	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0034	99% Chebyshev (MVUE) UCL	0.0025
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0047		
nu star	66.7		
Approximate Chi Square Value (.05)	48.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0033
Adjusted Chi Square Value	48.63	95% Jackknife UCL	0.0033
		95% Standard Bootstrap UCL	0.0033
Anderson-Darling Test Statistic	15.79	95% Bootstrap-t UCL	0.0083
Anderson-Darling 5% Critical Value	0.84	95% Hall's Bootstrap UCL	0.0083
Kolmogorov-Smirnov Test Statistic	0.364	95% Percentile Bootstrap UCL	0.0035
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.0046
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0057
		97.5% Chebyshev(Mean, Sd) UCL	0.0074
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0107
95% Approximate Gamma UCL	0.0026		
95% Adjusted Gamma UCL	0.0026		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0074

Result or 1/2 SDL (4,4'-ddt)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	67

Raw Statistics		Log-transformed Statistics	
Minimum	6.2500E-5	Minimum of Log Data	-9.68

Maximum	0.0625	Maximum of Log Data	-2.773
Mean	0.0038	Mean of log Data	-7.704
Median	3.1700E-4	SD of log Data	2.095
SD	0.0092		
Coefficient of Variation	2.422		
Skewness	4.079		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.342	Lilliefors Test Statistic	0.255
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0055	95% H-UCL	0.0090
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0096
95% Adjusted-CLT UCL	0.006	97.5% Chebyshev (MVUE) UCL	0.0122
95% Modified-t UCL	0.0056	99% Chebyshev (MVUE) UCL	0.0173
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.315	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0122		
nu star	52.37		
Approximate Chi Square Value (.05)	36.75	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0055
Adjusted Chi Square Value	36.52	95% Jackknife UCL	0.0055
		95% Standard Bootstrap UCL	0.0055
Anderson-Darling Test Statistic	7.358	95% Bootstrap-t UCL	0.0063
Anderson-Darling 5% Critical Value	0.861	95% Hall's Bootstrap UCL	0.0066
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	0.0055
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0061
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0082
		97.5% Chebyshev(Mean, Sd) UCL	0.0102
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.014
95% Approximate Gamma UCL	0.0054		
95% Adjusted Gamma UCL	0.0055		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.014

Result or 1/2 SDL (acenaphthene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	67

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.438
Maximum	1.69	Maximum of Log Data	0.525
Mean	0.0595	Mean of log Data	-4.288
Median	0.0051	SD of log Data	1.443
SD	0.2		
Coefficient of Variation	3.372		

Skewness	7.061		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.392	Lilliefors Test Statistic	0.328
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0961	95% H-UCL	0.0597
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0734
95% Adjusted-CLT UCL	0.114	97.5% Chebyshev (MVUE) UCL	0.0887
95% Modified-t UCL	0.0989	99% Chebyshev (MVUE) UCL	0.119
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.434	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.137		
nu star	72.06		
Approximate Chi Square Value (.05)	53.51	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0956
Adjusted Chi Square Value	53.23	95% Jackknife UCL	0.0961
		95% Standard Bootstrap UCL	0.0952
Anderson-Darling Test Statistic	10.45	95% Bootstrap-t UCL	0.178
Anderson-Darling 5% Critical Value	0.832	95% Hall's Bootstrap UCL	0.236
Kolmogorov-Smirnov Test Statistic	0.313	95% Percentile Bootstrap UCL	0.0981
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.119
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.155
		97.5% Chebyshev(Mean, Sd) UCL	0.197
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.278
95% Approximate Gamma UCL	0.0801		
95% Adjusted Gamma UCL	0.0805		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.197

Result or 1/2 SDL (acenaphthylene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	46

Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.312
Maximum	0.935	Maximum of Log Data	-0.0672
Mean	0.0382	Mean of log Data	-4.444
Median	0.0057	SD of log Data	1.267
SD	0.11		
Coefficient of Variation	2.876		
Skewness	6.947		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.381	Lilliefors Test Statistic	0.384

Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0582	95% H-UCL	0.0372
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0459
95% Adjusted-CLT UCL	0.0678	97.5% Chebyshev (MVUE) UCL	0.0546
95% Modified-t UCL	0.0598	99% Chebyshev (MVUE) UCL	0.0717
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.522	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0731		
nu star	86.68		
Approximate Chi Square Value (.05)	66.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.058
Adjusted Chi Square Value	65.91	95% Jackknife UCL	0.0582
		95% Standard Bootstrap UCL	0.0584
Anderson-Darling Test Statistic	13.38	95% Bootstrap-t UCL	0.0853
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.132
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	0.0601
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0744
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0907
		97.5% Chebyshev(Mean, Sd) UCL	0.113
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.158
95% Approximate Gamma UCL	0.05		
95% Adjusted Gamma UCL	0.0502		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.113

Result or 1/2 SDL (aluminum)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	414	Minimum of Log Data	6.026
Maximum	15200	Maximum of Log Data	9.629
Mean	5335	Mean of log Data	8.345
Median	4650	SD of log Data	0.757
SD	3345		
Coefficient of Variation	0.627		
Skewness	0.744		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0927	Lilliefors Test Statistic	0.088
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5946	95% H-UCL	6635

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7839
95% Adjusted-CLT UCL	5971	97.5% Chebyshev (MVUE) UCL	8817
95% Modified-t UCL	5951	99% Chebyshev (MVUE) UCL	10737
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.187	Data appear Normal at 5% Significance Level	
Theta Star	2439		
nu star	363.1		
Approximate Chi Square Value (.05)	320	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	5939
Adjusted Chi Square Value	319.2	95% Jackknife UCL	5946
		95% Standard Bootstrap UCL	5930
Anderson-Darling Test Statistic	0.468	95% Bootstrap-t UCL	5983
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	5976
Kolmogorov-Smirnov Test Statistic	0.074	95% Percentile Bootstrap UCL	5953
Kolmogorov-Smirnov 5% Critical Value	0.0992	95% BCA Bootstrap UCL	5953
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6936
		97.5% Chebyshev(Mean, Sd) UCL	7628
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8989
95% Approximate Gamma UCL	6055		
95% Adjusted Gamma UCL	6068		
Potential UCL to Use		Use 95% Student's-t UCL	5946

[redacted]t or 1/2 SDL (anthracene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	63

Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.316
Maximum	2.46	Maximum of Log Data	0.9
Mean	0.0961	Mean of log Data	-3.855
Median	0.0112	SD of log Data	1.589
SD	0.293		
Coefficient of Variation	3.053		
Skewness	6.861		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.378	Lilliefors Test Statistic	0.25
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.15	95% H-UCL	0.123
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.15
95% Adjusted-CLT UCL	0.175	97.5% Chebyshev (MVUE) UCL	0.183
95% Modified-t UCL	0.154	99% Chebyshev (MVUE) UCL	0.249
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.422	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.227		
nu star	70.13		
Approximate Chi Square Value (.05)	51.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.149
Adjusted Chi Square Value	51.57	95% Jackknife UCL	0.15
		95% Standard Bootstrap UCL	0.15
Anderson-Darling Test Statistic	7.484	95% Bootstrap-t UCL	0.244
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.369
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	0.155
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.19
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.236
		97.5% Chebyshev(Mean, Sd) UCL	0.297
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.416
95% Approximate Gamma UCL	0.13		
95% Adjusted Gamma UCL	0.131		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.297

Result or 1/2 SDL (antimony)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	49

Raw Statistics		Log-transformed Statistics	
Minimum	0.095	Minimum of Log Data	-2.354
Maximum	5.14	Maximum of Log Data	1.637
Mean	1.118	Mean of log Data	-0.619
Median	0.23	SD of log Data	1.266
SD	1.228		
Coefficient of Variation	1.099		
Skewness	1.098		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.307	Lilliefors Test Statistic	0.281
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.342	95% H-UCL	1.703
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.102
95% Adjusted-CLT UCL	1.357	97.5% Chebyshev (MVUE) UCL	2.5
95% Modified-t UCL	1.345	99% Chebyshev (MVUE) UCL	3.283
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.79	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.414		
nu star	131.2		
Approximate Chi Square Value (.05)	105.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	1.339

Adjusted Chi Square Value	105.3	95% Jackknife UCL	1.342
		95% Standard Bootstrap UCL	1.334
Anderson-Darling Test Statistic	6.492	95% Bootstrap-t UCL	1.364
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	1.357
Kolmogorov-Smirnov Test Statistic	0.302	95% Percentile Bootstrap UCL	1.349
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	1.365
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.705
		97.5% Chebyshev(Mean, Sd) UCL	1.959
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.459
95% Approximate Gamma UCL	1.387		
95% Adjusted Gamma UCL	1.392		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.959

Result or 1/2 SDL (aroclor-1254)

General Statistics

Number of Valid Samples	86	Number of Unique Samples	63

Raw Statistics		Log-transformed Statistics	
Minimum	0.0016	Minimum of Log Data	-6.422
Maximum	7.98	Maximum of Log Data	2.077
Mean	0.137	Mean of log Data	-5.526
Median	0.0018	SD of log Data	1.783
SD	0.875		
Coefficient of Variation	6.368		
Skewness	8.719		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.446	Lilliefors Test Statistic	0.425
Lilliefors Critical Value	0.0955	Lilliefors Critical Value	0.0955
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.294	95% H-UCL	0.0354
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0417
95% Adjusted-CLT UCL	0.387	97.5% Chebyshev (MVUE) UCL	0.0517
95% Modified-t UCL	0.309	99% Chebyshev (MVUE) UCL	0.0714
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.207	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.663		
nu star	35.66		
Approximate Chi Square Value (.05)	22.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0472	95% CLT UCL	0.293
Adjusted Chi Square Value	22.82	95% Jackknife UCL	0.294
		95% Standard Bootstrap UCL	0.294
Anderson-Darling Test Statistic	23.56	95% Bootstrap-t UCL	1.17
Anderson-Darling 5% Critical Value	0.908	95% Hall's Bootstrap UCL	0.859
Kolmogorov-Smirnov Test Statistic	0.451	95% Percentile Bootstrap UCL	0.323

Kolmogorov-Smirnov 5% Critical Value	0.107	95% BCA Bootstrap UCL	0.45
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.548
		97.5% Chebyshev(Mean, Sd) UCL	0.726
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.076
95% Approximate Gamma UCL	0.213		
95% Adjusted Gamma UCL	0.215		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.726

Result or 1/2 SDL (arsenic)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	78

Raw Statistics		Log-transformed Statistics	
Minimum	0.085	Minimum of Log Data	-2.465
Maximum	24.3	Maximum of Log Data	3.19
Mean	3.735	Mean of log Data	0.735
Median	2.49	SD of log Data	1.257
SD	4.012		
Coefficient of Variation	1.074		
Skewness	2.522		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.186	Lilliefors Test Statistic	0.128
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.467	95% H-UCL	6.497
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.02
95% Adjusted-CLT UCL	4.589	97.5% Chebyshev (MVUE) UCL	9.533
95% Modified-t UCL	4.488	99% Chebyshev (MVUE) UCL	12.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.964	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.873		
nu star	160.1		
Approximate Chi Square Value (.05)	131.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	4.459
Adjusted Chi Square Value	131.4	95% Jackknife UCL	4.467
		95% Standard Bootstrap UCL	4.439
Anderson-Darling Test Statistic	0.324	95% Bootstrap-t UCL	4.598
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	4.764
Kolmogorov-Smirnov Test Statistic	0.061	95% Percentile Bootstrap UCL	4.487
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	4.531
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.654
		97.5% Chebyshev(Mean, Sd) UCL	6.485
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.116
95% Approximate Gamma UCL	4.535		

95% Adjusted Gamma UCL	4.551		
Potential UCL to Use		Use 95% Approximate Gamma UCL	4.535

Result or 1/2 SDL (barium)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	18.6	Minimum of Log Data	2.923
Maximum	2180	Maximum of Log Data	7.687
Mean	345.2	Mean of log Data	5.482
Median	206	SD of log Data	0.84
SD	349		
Coefficient of Variation	1.011		
Skewness	2.74		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.199	Lilliefors Test Statistic	0.096
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	408.9	95% H-UCL	415.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	496.4
95% Adjusted-CLT UCL	420.5	97.5% Chebyshev (MVUE) UCL	564
95% Modified-t UCL	410.9	99% Chebyshev (MVUE) UCL	696.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.478	Data appear Lognormal at 5% Significance Level	
Theta Star	233.6		
nu star	245.3		
Approximate Chi Square Value (.05)	210	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	408.2
Adjusted Chi Square Value	209.5	95% Jackknife UCL	408.9
		95% Standard Bootstrap UCL	409.3
Anderson-Darling Test Statistic	2.05	95% Bootstrap-t UCL	434.7
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	439
Kolmogorov-Smirnov Test Statistic	0.146	95% Percentile Bootstrap UCL	412.1
Kolmogorov-Smirnov 5% Critical Value	0.0998	95% BCA Bootstrap UCL	421.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	512.2
		97.5% Chebyshev(Mean, Sd) UCL	584.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	726.4
95% Approximate Gamma UCL	403.2		
95% Adjusted Gamma UCL	404.3		
Potential UCL to Use		Use 95% H-UCL	415.1

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	70

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.415
Maximum	5.02	Maximum of Log Data	1.613
Mean	0.345	Mean of log Data	-3.502
Median	0.0053	SD of log Data	2.25
SD	0.793		
Coefficient of Variation	2.297		
Skewness	3.493		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.364	Lilliefors Test Statistic	0.285
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.49	95% H-UCL	0.941
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.942
95% Adjusted-CLT UCL	0.524	97.5% Chebyshev (MVUE) UCL	1.202
95% Modified-t UCL	0.495	99% Chebyshev (MVUE) UCL	1.712
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.283	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.22		
nu star	46.96		
Approximate Chi Square Value (.05)	32.23	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.488
Adjusted Chi Square Value	32.02	95% Jackknife UCL	0.49
		95% Standard Bootstrap UCL	0.486
Anderson-Darling Test Statistic	9.314	95% Bootstrap-t UCL	0.547
Anderson-Darling 5% Critical Value	0.872	95% Hall's Bootstrap UCL	0.565
Kolmogorov-Smirnov Test Statistic	0.281	95% Percentile Bootstrap UCL	0.506
Kolmogorov-Smirnov 5% Critical Value	0.107	95% BCA Bootstrap UCL	0.532
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.724
		97.5% Chebyshev(Mean, Sd) UCL	0.888
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.211
95% Approximate Gamma UCL	0.503		
95% Adjusted Gamma UCL	0.506		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.211

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	80

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.419
Maximum	4.57	Maximum of Log Data	1.52
Mean	0.452	Mean of log Data	-2.692
Median	0.0514	SD of log Data	2.07
SD	0.92		
Coefficient of Variation	2.036		
Skewness	2.73		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.329	Lilliefors Test Statistic	0.106
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.62	95% H-UCL	1.269
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.37
95% Adjusted-CLT UCL	0.651	97.5% Chebyshev (MVUE) UCL	1.731
95% Modified-t UCL	0.625	99% Chebyshev (MVUE) UCL	2.44
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.349	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.296		
nu star	57.92		
Approximate Chi Square Value (.05)	41.43	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.618
Adjusted Chi Square Value	41.18	95% Jackknife UCL	0.62
		95% Standard Bootstrap UCL	0.621
Anderson-Darling Test Statistic	4.332	95% Bootstrap-t UCL	0.692
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	0.646
Kolmogorov-Smirnov Test Statistic	0.213	95% Percentile Bootstrap UCL	0.622
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.651
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.892
		97.5% Chebyshev(Mean, Sd) UCL	1.083
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.457
95% Approximate Gamma UCL	0.632		
95% Adjusted Gamma UCL	0.636		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.457

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	0.0033	Minimum of Log Data	-5.688
Maximum	5.42	Maximum of Log Data	1.69
Mean	0.582	Mean of log Data	-2.042
Median	0.113	SD of log Data	1.921

SD	1.074		
Coefficient of Variation	1.846		
Skewness	2.709		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.314	Lilliefors Test Statistic	0.0761
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.778	95% H-UCL	1.638
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.857
95% Adjusted-CLT UCL	0.813	97.5% Chebyshev (MVUE) UCL	2.326
95% Modified-t UCL	0.784	99% Chebyshev (MVUE) UCL	3.247
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.425	Data appear Lognormal at 5% Significance Level	
Theta Star	1.369		
nu star	70.59		
Approximate Chi Square Value (.05)	52.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.776
Adjusted Chi Square Value	51.97	95% Jackknife UCL	0.778
		95% Standard Bootstrap UCL	0.771
Anderson-Darling Test Statistic	2.74	95% Bootstrap-t UCL	0.839
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.821
Kolmogorov-Smirnov Test Statistic	0.166	95% Percentile Bootstrap UCL	0.79
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.827
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.096
		97.5% Chebyshev(Mean, Sd) UCL	1.318
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.755
95% Approximate Gamma UCL	0.786		
95% Adjusted Gamma UCL	0.79		
Potential UCL to Use		Use 95% H-UCL	1.638

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	73

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.418
Maximum	4.24	Maximum of Log Data	1.445
Mean	0.324	Mean of log Data	-2.987
Median	0.0493	SD of log Data	2.033
SD	0.706		
Coefficient of Variation	2.182		
Skewness	3.466		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.326	Lilliefors Test Statistic	0.179
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.452	95% H-UCL	0.854
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.934
95% Adjusted-CLT UCL	0.483	97.5% Chebyshev (MVUE) UCL	1.178
95% Modified-t UCL	0.457	99% Chebyshev (MVUE) UCL	1.657
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.355	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.911		
nu star	58.96		
Approximate Chi Square Value (.05)	42.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.451
Adjusted Chi Square Value	42.05	95% Jackknife UCL	0.452
		95% Standard Bootstrap UCL	0.449
Anderson-Darling Test Statistic	4.478	95% Bootstrap-t UCL	0.498
Anderson-Darling 5% Critical Value	0.852	95% Hall's Bootstrap UCL	0.504
Kolmogorov-Smirnov Test Statistic	0.172	95% Percentile Bootstrap UCL	0.453
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.499
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.661
		97.5% Chebyshev(Mean, Sd) UCL	0.807
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.095
95% Approximate Gamma UCL	0.451		
95% Adjusted Gamma UCL	0.454		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.095

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	59

Raw Statistics		Log-transformed Statistics	
Minimum	0.0068	Minimum of Log Data	-4.984
Maximum	4.25	Maximum of Log Data	1.447
Mean	0.24	Mean of log Data	-3.413
Median	0.0081	SD of log Data	1.887
SD	0.601		
Coefficient of Variation	2.507		
Skewness	4.388		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.349	Lilliefors Test Statistic	0.3
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.349	95% H-UCL	0.381
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.437
95% Adjusted-CLT UCL	0.382	97.5% Chebyshev (MVUE) UCL	0.546
95% Modified-t UCL	0.355	99% Chebyshev (MVUE) UCL	0.76
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.336	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.713		
nu star	55.81		
Approximate Chi Square Value (.05)	39.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.348
Adjusted Chi Square Value	39.4	95% Jackknife UCL	0.349
		95% Standard Bootstrap UCL	0.348
Anderson-Darling Test Statistic	9.793	95% Bootstrap-t UCL	0.407
Anderson-Darling 5% Critical Value	0.856	95% Hall's Bootstrap UCL	0.464
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	0.356
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.389
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.527
		97.5% Chebyshev(Mean, Sd) UCL	0.651
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.896
95% Approximate Gamma UCL	0.337		
95% Adjusted Gamma UCL	0.339		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.651

Result or 1/2 SDL (beryllium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	60
Raw Statistics		Log-transformed Statistics	
Minimum	0.0015	Minimum of Log Data	-6.47
Maximum	4.6	Maximum of Log Data	1.526
Mean	0.408	Mean of log Data	-1.368
Median	0.32	SD of log Data	1.136
SD	0.525		
Coefficient of Variation	1.287		
Skewness	6.344		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.22	Lilliefors Test Statistic	0.159
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.504	95% H-UCL	0.653
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.803
95% Adjusted-CLT UCL	0.546	97.5% Chebyshev (MVUE) UCL	0.943
95% Modified-t UCL	0.511	99% Chebyshev (MVUE) UCL	1.218

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.163	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.351		
nu star	193.1		
Approximate Chi Square Value (.05)	162	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.503
Adjusted Chi Square Value	161.5	95% Jackknife UCL	0.504
		95% Standard Bootstrap UCL	0.502
Anderson-Darling Test Statistic	0.998	95% Bootstrap-t UCL	0.59
Anderson-Darling 5% Critical Value	0.778	95% Hall's Bootstrap UCL	0.909
Kolmogorov-Smirnov Test Statistic	0.096	95% Percentile Bootstrap UCL	0.512
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.577
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.659
		97.5% Chebyshev(Mean, Sd) UCL	0.768
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.982
95% Approximate Gamma UCL	0.487		
95% Adjusted Gamma UCL	0.488		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.487

Result or 1/2 SDL (biphenyl)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	44

Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.318
Maximum	0.0807	Maximum of Log Data	-2.517
Mean	0.015	Mean of log Data	-4.739
Median	0.0056	SD of log Data	0.899
SD	0.0197		
Coefficient of Variation	1.313		
Skewness	1.973		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.433	Lilliefors Test Statistic	0.415
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0186	95% H-UCL	0.0162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0195
95% Adjusted-CLT UCL	0.019	97.5% Chebyshev (MVUE) UCL	0.0223
95% Modified-t UCL	0.0186	99% Chebyshev (MVUE) UCL	0.0279

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.035	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0145		
nu star	171.9		

Approximate Chi Square Value (.05)	142.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0185
Adjusted Chi Square Value	142.1	95% Jackknife UCL	0.0186
		95% Standard Bootstrap UCL	0.0185
Anderson-Darling Test Statistic	16.91	95% Bootstrap-t UCL	0.0193
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.0188
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	0.0186
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0191
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0244
		97.5% Chebyshev(Mean, Sd) UCL	0.0285
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0365
95% Approximate Gamma UCL	0.0181		
95% Adjusted Gamma UCL	0.0181		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0244

Result or 1/2 SDL (boron)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	63

Raw Statistics		Log-transformed Statistics	
Minimum	0.475	Minimum of Log Data	-0.744
Maximum	54.4	Maximum of Log Data	3.996
Mean	4.662	Mean of log Data	0.66
Median	1.07	SD of log Data	1.351
SD	7.296		
Coefficient of Variation	1.565		
Skewness	4.319		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.283	Lilliefors Test Statistic	0.261
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.994	95% H-UCL	7.093
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.751
95% Adjusted-CLT UCL	6.384	97.5% Chebyshev (MVUE) UCL	10.49
95% Modified-t UCL	6.057	99% Chebyshev (MVUE) UCL	13.92
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.672	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.938		
nu star	111.5		
Approximate Chi Square Value (.05)	88.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	5.979
Adjusted Chi Square Value	87.78	95% Jackknife UCL	5.994
		95% Standard Bootstrap UCL	6.015
Anderson-Darling Test Statistic	5.465	95% Bootstrap-t UCL	6.686

Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	12.01
Kolmogorov-Smirnov Test Statistic	0.251	95% Percentile Bootstrap UCL	6.051
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	6.577
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.152
		97.5% Chebyshev(Mean, Sd) UCL	9.663
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.63
95% Approximate Gamma UCL	5.898		
95% Adjusted Gamma UCL	5.922		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	9.663

Result or 1/2 SDL (butyl benzyl phthalate)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	45

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0054	Minimum of Log Data	-5.212
Maximum	0.297	Maximum of Log Data	-1.214
Mean	0.0187	Mean of log Data	-4.645
Median	0.0062	SD of log Data	0.914
SD	0.0388		
Coefficient of Variation	2.069		
Skewness	5.405		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.381	Lilliefors Test Statistic	0.407
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0258	95% H-UCL	0.0181
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0219
95% Adjusted-CLT UCL	0.0284	97.5% Chebyshev (MVUE) UCL	0.0251
95% Modified-t UCL	0.0262	99% Chebyshev (MVUE) UCL	0.0314
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.854	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0219		
nu star	141.8		
Approximate Chi Square Value (.05)	115.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0257
Adjusted Chi Square Value	114.9	95% Jackknife UCL	0.0258
		95% Standard Bootstrap UCL	0.0257
Anderson-Darling Test Statistic	16.12	95% Bootstrap-t UCL	0.0343
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	0.0581
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0265
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0297
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0373
		97.5% Chebyshev(Mean, Sd) UCL	0.0453

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0611
95% Approximate Gamma UCL	0.0231		
95% Adjusted Gamma UCL	0.0231		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0373

Result or 1/2 SDL (cadmium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	47

Raw Statistics		Log-transformed Statistics	
Minimum	0.0085	Minimum of Log Data	-4.768
Maximum	9.71	Maximum of Log Data	2.273
Mean	0.464	Mean of log Data	-2.309
Median	0.23	SD of log Data	2.023
SD	1.141		
Coefficient of Variation	2.458		
Skewness	6.868		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.345	Lilliefors Test Statistic	0.221
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.672	95% H-UCL	1.636
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.796
95% Adjusted-CLT UCL	0.771	97.5% Chebyshev (MVUE) UCL	2.263
95% Modified-t UCL	0.688	99% Chebyshev (MVUE) UCL	3.181
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.416	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.116		
nu star	69.03		
Approximate Chi Square Value (.05)	50.91	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.67
Adjusted Chi Square Value	50.63	95% Jackknife UCL	0.672
		95% Standard Bootstrap UCL	0.665
Anderson-Darling Test Statistic	3.831	95% Bootstrap-t UCL	1.001
Anderson-Darling 5% Critical Value	0.837	95% Hall's Bootstrap UCL	1.548
Kolmogorov-Smirnov Test Statistic	0.195	95% Percentile Bootstrap UCL	0.696
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.822
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.01
		97.5% Chebyshev(Mean, Sd) UCL	1.246
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.71
95% Approximate Gamma UCL	0.629		
95% Adjusted Gamma UCL	0.633		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.71

Result or 1/2 SDL (carbazole)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	68

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.444
Maximum	1.54	Maximum of Log Data	0.432
Mean	0.0612	Mean of log Data	-4.243
Median	0.0051	SD of log Data	1.457
SD	0.192		
Coefficient of Variation	3.132		
Skewness	6.428		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.383	Lilliefors Test Statistic	0.302
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0962	95% H-UCL	0.0641
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0787
95% Adjusted-CLT UCL	0.112	97.5% Chebyshev (MVUE) UCL	0.0953
95% Modified-t UCL	0.0987	99% Chebyshev (MVUE) UCL	0.128
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.438	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.14		
nu star	72.73		
Approximate Chi Square Value (.05)	54.09	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0958
Adjusted Chi Square Value	53.81	95% Jackknife UCL	0.0962
		95% Standard Bootstrap UCL	0.0954
Anderson-Darling Test Statistic	9.829	95% Bootstrap-t UCL	0.171
Anderson-Darling 5% Critical Value	0.831	95% Hall's Bootstrap UCL	0.246
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	0.0994
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.123
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.153
		97.5% Chebyshev(Mean, Sd) UCL	0.193
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.27
95% Approximate Gamma UCL	0.0823		
95% Adjusted Gamma UCL	0.0827		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.193

Result or 1/2 SDL (chromium)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	75

Raw Statistics		Log-transformed Statistics	
Minimum	3.37	Minimum of Log Data	1.215
Maximum	136	Maximum of Log Data	4.913
Mean	16.08	Mean of log Data	2.58
Median	12.6	SD of log Data	0.568
SD	15.7		
Coefficient of Variation	0.977		
Skewness	5.833		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.227	Lilliefors Test Statistic	0.0598
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18.94	95% H-UCL	17.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.97
95% Adjusted-CLT UCL	20.09	97.5% Chebyshev (MVUE) UCL	21.91
95% Modified-t UCL	19.13	99% Chebyshev (MVUE) UCL	25.74
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.597	Data appear Lognormal at 5% Significance Level	
Theta Star	6.19		
nu star	431.1		
Approximate Chi Square Value (.05)	384	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	18.91
Adjusted Chi Square Value	383.2	95% Jackknife UCL	18.94
		95% Standard Bootstrap UCL	18.82
Anderson-Darling Test Statistic	2.059	95% Bootstrap-t UCL	21.55
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	31.63
Kolmogorov-Smirnov Test Statistic	0.113	95% Percentile Bootstrap UCL	19.12
Kolmogorov-Smirnov 5% Critical Value	0.099	95% BCA Bootstrap UCL	20.49
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23.59
		97.5% Chebyshev(Mean, Sd) UCL	26.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	33.22
95% Approximate Gamma UCL	18.05		
95% Adjusted Gamma UCL	18.09		
Potential UCL to Use		Use 95% H-UCL	17.45

Result or 1/2 SDL (chrysene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	82

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.47
Maximum	4.87	Maximum of Log Data	1.583

Mean	0.409	Mean of log Data	-2.736
Median	0.0493	SD of log Data	2.052
SD	0.836		
Coefficient of Variation	2.044		
Skewness	3.079		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.322	Lilliefors Test Statistic	0.0982
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.562	95% H-UCL	1.156
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.256
95% Adjusted-CLT UCL	0.593	97.5% Chebyshev (MVUE) UCL	1.586
95% Modified-t UCL	0.567	99% Chebyshev (MVUE) UCL	2.233
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.142		
nu star	59.42		
Approximate Chi Square Value (.05)	42.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.56
Adjusted Chi Square Value	42.45	95% Jackknife UCL	0.562
		95% Standard Bootstrap UCL	0.557
Anderson-Darling Test Statistic	3.941	95% Bootstrap-t UCL	0.617
Anderson-Darling 5% Critical Value	0.851	95% Hall's Bootstrap UCL	0.604
Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	0.57
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.607
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.809
		97.5% Chebyshev(Mean, Sd) UCL	0.982
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.322
95% Approximate Gamma UCL	0.569		
95% Adjusted Gamma UCL	0.572		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.322

Result or 1/2 SDL (cobalt)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	0.0125	Minimum of Log Data	-4.382
Maximum	16	Maximum of Log Data	2.773
Mean	3.705	Mean of log Data	1.069
Median	3.49	SD of log Data	0.946
SD	2.249		
Coefficient of Variation	0.607		
Skewness	2.18		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.107	Lilliefors Test Statistic	0.182
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4.116	95% H-UCL	5.716
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.921
95% Adjusted-CLT UCL	4.175	97.5% Chebyshev (MVUE) UCL	7.962
95% Modified-t UCL	4.126	99% Chebyshev (MVUE) UCL	10
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.153	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.721		
nu star	357.5		
Approximate Chi Square Value (.05)	314.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	4.111
Adjusted Chi Square Value	313.9	95% Jackknife UCL	4.116
		95% Standard Bootstrap UCL	4.118
Anderson-Darling Test Statistic	1.75	95% Bootstrap-t UCL	4.185
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	4.256
Kolmogorov-Smirnov Test Statistic	0.112	95% Percentile Bootstrap UCL	4.137
Kolmogorov-Smirnov 5% Critical Value	0.0993	95% BCA Bootstrap UCL	4.198
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.781
		97.5% Chebyshev(Mean, Sd) UCL	5.247
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.161
95% Approximate Gamma UCL	4.21		
95% Adjusted Gamma UCL	4.219		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	4.781

Result or 1/2 SDL (copper)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	78
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.55	Minimum of Log Data	0.438
Maximum	216	Maximum of Log Data	5.375
Mean	27.98	Mean of log Data	2.929
Median	16.4	SD of log Data	0.844
SD	35.35		
Coefficient of Variation	1.263		
Skewness	3.794		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.26	Lilliefors Test Statistic	0.0827
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973

Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	34.43	95% H-UCL	32.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.82
95% Adjusted-CLT UCL	36.09	97.5% Chebyshev (MVUE) UCL	44.12
95% Modified-t UCL	34.7	99% Chebyshev (MVUE) UCL	54.55
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.342	Data appear Lognormal at 5% Significance Level	
Theta Star	20.85		
nu star	222.7		
Approximate Chi Square Value (.05)	189.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	34.36
Adjusted Chi Square Value	188.6	95% Jackknife UCL	34.43
		95% Standard Bootstrap UCL	34.22
Anderson-Darling Test Statistic	3.103	95% Bootstrap-t UCL	37.53
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	39.93
Kolmogorov-Smirnov Test Statistic	0.147	95% Percentile Bootstrap UCL	34.91
Kolmogorov-Smirnov 5% Critical Value	0.1	95% BCA Bootstrap UCL	36.81
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	44.89
		97.5% Chebyshev(Mean, Sd) UCL	52.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	66.58
95% Approximate Gamma UCL	32.94		
95% Adjusted Gamma UCL	33.04		
Potential UCL to Use		Use 95% H-UCL	32.45

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	78

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.466
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.155	Mean of log Data	-3.578
Median	0.0061	SD of log Data	1.966
SD	0.303		
Coefficient of Variation	1.952		
Skewness	3.008		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.31	Lilliefors Test Statistic	0.299
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.21	95% H-UCL	0.396
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.443

95% Adjusted-CLT UCL	0.222	97.5% Chebyshev (MVUE) UCL	0.556
95% Modified-t UCL	0.212	99% Chebyshev (MVUE) UCL	0.779
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.408		
nu star	63.11		
Approximate Chi Square Value (.05)	45.83	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.21
Adjusted Chi Square Value	45.57	95% Jackknife UCL	0.21
		95% Standard Bootstrap UCL	0.21
Anderson-Darling Test Statistic	6.569	95% Bootstrap-t UCL	0.229
Anderson-Darling 5% Critical Value	0.846	95% Hall's Bootstrap UCL	0.225
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	0.214
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.222
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.3
		97.5% Chebyshev(Mean, Sd) UCL	0.363
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.486
95% Approximate Gamma UCL	0.214		
95% Adjusted Gamma UCL	0.215		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.363

Result or 1/2 SDL (dibenzofuran)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	48
Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.083
Maximum	0.821	Maximum of Log Data	-0.197
Mean	0.0378	Mean of log Data	-4.288
Median	0.0071	SD of log Data	1.133
SD	0.107		
Coefficient of Variation	2.831		
Skewness	6.111		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.384	Lilliefors Test Statistic	0.376
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0574	95% H-UCL	0.0351
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0431
95% Adjusted-CLT UCL	0.0656	97.5% Chebyshev (MVUE) UCL	0.0506
95% Modified-t UCL	0.0587	99% Chebyshev (MVUE) UCL	0.0653
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.594	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0636		
nu star	98.68		
Approximate Chi Square Value (.05)	76.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0572
Adjusted Chi Square Value	76.42	95% Jackknife UCL	0.0574
		95% Standard Bootstrap UCL	0.0568
Anderson-Darling Test Statistic	13.02	95% Bootstrap-t UCL	0.104
Anderson-Darling 5% Critical Value	0.808	95% Hall's Bootstrap UCL	0.15
Kolmogorov-Smirnov Test Statistic	0.378	95% Percentile Bootstrap UCL	0.0589
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0688
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0891
		97.5% Chebyshev(Mean, Sd) UCL	0.111
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.155
95% Approximate Gamma UCL	0.0486		
95% Adjusted Gamma UCL	0.0488		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.111

Result or 1/2 SDL (dieldrin)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	57

Raw Statistics		Log-transformed Statistics	
Minimum	7.0000E-5	Minimum of Log Data	-9.567
Maximum	0.0205	Maximum of Log Data	-3.887
Mean	9.9705E-4	Mean of log Data	-8.475
Median	8.3000E-5	SD of log Data	1.456
SD	0.0030		
Coefficient of Variation	3.053		
Skewness	5.171		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.38	Lilliefors Test Statistic	0.314
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0015	95% H-UCL	9.2982E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0011
95% Adjusted-CLT UCL	0.0017	97.5% Chebyshev (MVUE) UCL	0.0013
95% Modified-t UCL	0.0015	99% Chebyshev (MVUE) UCL	0.0018
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.411	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0024		
nu star	68.17		
Approximate Chi Square Value (.05)	50.17	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0015
Adjusted Chi Square Value	49.9	95% Jackknife UCL	0.0015

		95% Standard Bootstrap UCL	0.0015
Anderson-Darling Test Statistic	12.18	95% Bootstrap-t UCL	0.0022
Anderson-Darling 5% Critical Value	0.838	95% Hall's Bootstrap UCL	0.0035
Kolmogorov-Smirnov Test Statistic	0.309	95% Percentile Bootstrap UCL	0.0016
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.0018
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0024
		97.5% Chebyshev(Mean, Sd) UCL	0.0030
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0043
95% Approximate Gamma UCL	0.0013		
95% Adjusted Gamma UCL	0.0013		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0030

Result or 1/2 SDL (di-n-butyl phthalate)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	55

Raw Statistics		Log-transformed Statistics	
Minimum	0.0126	Minimum of Log Data	-4.378
Maximum	0.753	Maximum of Log Data	-0.284
Mean	0.048	Mean of log Data	-3.781
Median	0.0143	SD of log Data	0.966
SD	0.102		
Coefficient of Variation	2.121		
Skewness	4.995		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.375	Lilliefors Test Statistic	0.401
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0666	95% H-UCL	0.0459
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0558
95% Adjusted-CLT UCL	0.0729	97.5% Chebyshev (MVUE) UCL	0.0643
95% Modified-t UCL	0.0676	99% Chebyshev (MVUE) UCL	0.081
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.777	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0618		
nu star	129		
Approximate Chi Square Value (.05)	103.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0664
Adjusted Chi Square Value	103.4	95% Jackknife UCL	0.0666
		95% Standard Bootstrap UCL	0.0664
Anderson-Darling Test Statistic	15.92	95% Bootstrap-t UCL	0.0837
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	0.129
Kolmogorov-Smirnov Test Statistic	0.421	95% Percentile Bootstrap UCL	0.0691
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	0.074

Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0967
		97.5% Chebyshev(Mean, Sd) UCL	0.118
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.159
95% Approximate Gamma UCL	0.0597		
95% Adjusted Gamma UCL	0.0599		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0967

Result or 1/2 SDL (endosulfan sulfate)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	63

Raw Statistics		Log-transformed Statistics	
Minimum	1.3250E-4	Minimum of Log Data	-8.929
Maximum	0.0713	Maximum of Log Data	-2.641
Mean	0.002	Mean of log Data	-8.01
Median	1.5450E-4	SD of log Data	1.391
SD	0.0084		
Coefficient of Variation	4.216		
Skewness	7.243		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.424	Lilliefors Test Statistic	0.34
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0035	95% H-UCL	0.0013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0016
95% Adjusted-CLT UCL	0.0043	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0036	99% Chebyshev (MVUE) UCL	0.0025
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.365	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0054		
nu star	60.65		
Approximate Chi Square Value (.05)	43.74	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0035
Adjusted Chi Square Value	43.48	95% Jackknife UCL	0.0035
		95% Standard Bootstrap UCL	0.0035
Anderson-Darling Test Statistic	15.84	95% Bootstrap-t UCL	0.0080
Anderson-Darling 5% Critical Value	0.849	95% Hall's Bootstrap UCL	0.0090
Kolmogorov-Smirnov Test Statistic	0.343	95% Percentile Bootstrap UCL	0.0036
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0047
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0060
		97.5% Chebyshev(Mean, Sd) UCL	0.0077
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0112
95% Approximate Gamma UCL	0.0027		
95% Adjusted Gamma UCL	0.0027		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0077

Result or 1/2 SDL (endrin aldehyde)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	69

Raw Statistics		Log-transformed Statistics	
Minimum	1.6800E-4	Minimum of Log Data	-8.692
Maximum	0.0738	Maximum of Log Data	-2.606
Mean	0.0023	Mean of log Data	-7.729
Median	1.9500E-4	SD of log Data	1.421
SD	0.0089		
Coefficient of Variation	3.782		
Skewness	6.88		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.403	Lilliefors Test Statistic	0.36
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0039	95% H-UCL	0.0018
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0022
95% Adjusted-CLT UCL	0.0047	97.5% Chebyshev (MVUE) UCL	0.0027
95% Modified-t UCL	0.0041	99% Chebyshev (MVUE) UCL	0.0036
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.387	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0061		
nu star	64.22		
Approximate Chi Square Value (.05)	46.78	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0039
Adjusted Chi Square Value	46.52	95% Jackknife UCL	0.0039
		95% Standard Bootstrap UCL	0.0039
Anderson-Darling Test Statistic	14.52	95% Bootstrap-t UCL	0.0074
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.0097
Kolmogorov-Smirnov Test Statistic	0.363	95% Percentile Bootstrap UCL	0.0041
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.0050
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0066
		97.5% Chebyshev(Mean, Sd) UCL	0.0084
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0121
95% Approximate Gamma UCL	0.0032		
95% Adjusted Gamma UCL	0.0032		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0084

Result or 1/2 SDL (endrin ketone)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	67

Raw Statistics		Log-transformed Statistics	
Minimum	2.1300E-4	Minimum of Log Data	-8.454
Maximum	0.02	Maximum of Log Data	-3.912
Mean	0.0016	Mean of log Data	-7.554
Median	2.4500E-4	SD of log Data	1.31
SD	0.0034		
Coefficient of Variation	2.05		
Skewness	3.169		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.359	Lilliefors Test Statistic	0.362
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0023	95% H-UCL	0.0017
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0022
95% Adjusted-CLT UCL	0.0024	97.5% Chebyshev (MVUE) UCL	0.0026
95% Modified-t UCL	0.0023	99% Chebyshev (MVUE) UCL	0.0034
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.528	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0031		
nu star	87.68		
Approximate Chi Square Value (.05)	67.09	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0023
Adjusted Chi Square Value	66.77	95% Jackknife UCL	0.0023
		95% Standard Bootstrap UCL	0.0023
Anderson-Darling Test Statistic	13.72	95% Bootstrap-t UCL	0.0025
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.0024
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	0.0023
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0025
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0033
		97.5% Chebyshev(Mean, Sd) UCL	0.0040
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0054
95% Approximate Gamma UCL	0.0021		
95% Adjusted Gamma UCL	0.0022		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0040

[redacted] or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	78

Raw Statistics		Log-transformed Statistics	

Minimum	0.0053	Minimum of Log Data	-5.231
Maximum	14.2	Maximum of Log Data	2.653
Mean	0.799	Mean of log Data	-2.284
Median	0.0748	SD of log Data	2.188
SD	1.943		
Coefficient of Variation	2.431		
Skewness	4.772		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.341	Lilliefors Test Statistic	0.089
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.154	95% H-UCL	2.656
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.735
95% Adjusted-CLT UCL	1.269	97.5% Chebyshev (MVUE) UCL	3.477
95% Modified-t UCL	1.173	99% Chebyshev (MVUE) UCL	4.936
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.326	Data appear Lognormal at 5% Significance Level	
Theta Star	2.453		
nu star	54.08		
Approximate Chi Square Value (.05)	38.19	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	1.15
Adjusted Chi Square Value	37.95	95% Jackknife UCL	1.154
		95% Standard Bootstrap UCL	1.149
Anderson-Darling Test Statistic	3.83	95% Bootstrap-t UCL	1.4
Anderson-Darling 5% Critical Value	0.859	95% Hall's Bootstrap UCL	2.632
Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	1.187
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	1.304
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.729
		97.5% Chebyshev(Mean, Sd) UCL	2.131
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.921
95% Approximate Gamma UCL	1.132		
95% Adjusted Gamma UCL	1.139		
Potential UCL to Use		Use 95% H-UCL	2.656

Result or 1/2 SDL (fluorene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	76

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.449
Maximum	1.11	Maximum of Log Data	0.104
Mean	0.0515	Mean of log Data	-4.291
Median	0.0050	SD of log Data	1.395
SD	0.152		

Coefficient of Variation	2.942		
Skewness	5.801		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.378	Lilliefors Test Statistic	0.312
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0792	95% H-UCL	0.0544
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.067
95% Adjusted-CLT UCL	0.0902	97.5% Chebyshev (MVUE) UCL	0.0807
95% Modified-t UCL	0.0809	99% Chebyshev (MVUE) UCL	0.108
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.473	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.109		
nu star	78.47		
Approximate Chi Square Value (.05)	59.06	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0789
Adjusted Chi Square Value	58.76	95% Jackknife UCL	0.0792
		95% Standard Bootstrap UCL	0.0786
Anderson-Darling Test Statistic	9.551	95% Bootstrap-t UCL	0.138
Anderson-Darling 5% Critical Value	0.823	95% Hall's Bootstrap UCL	0.208
Kolmogorov-Smirnov Test Statistic	0.297	95% Percentile Bootstrap UCL	0.0817
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.0957
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.124
		97.5% Chebyshev(Mean, Sd) UCL	0.155
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.217
95% Approximate Gamma UCL	0.0684		
95% Adjusted Gamma UCL	0.0688		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.155

Result or 1/2 SDL (gamma-chlordane)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	57

Raw Statistics		Log-transformed Statistics	
Minimum	1.1000E-4	Minimum of Log Data	-9.115
Maximum	0.0156	Maximum of Log Data	-4.16
Mean	8.2679E-4	Mean of log Data	-8.449
Median	1.2500E-4	SD of log Data	1.205
SD	0.0024		
Coefficient of Variation	2.992		
Skewness	4.837		

Relevant UCL Statistics

Normal Distribution Test	Lognormal Distribution Test

Lilliefors Test Statistic	0.411	Lilliefors Test Statistic	0.4
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0012	95% H-UCL	6.1126E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.5378E-4
95% Adjusted-CLT UCL	0.0014	97.5% Chebyshev (MVUE) UCL	8.9135E-4
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	0.0011
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.465	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	77.18		
Approximate Chi Square Value (.05)	57.94	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0012
Adjusted Chi Square Value	57.65	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	19.32	95% Bootstrap-t UCL	0.0017
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.0019
Kolmogorov-Smirnov Test Statistic	0.428	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.0015
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0020
		97.5% Chebyshev(Mean, Sd) UCL	0.0025
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0035
95% Approximate Gamma UCL	0.0011		
95% Adjusted Gamma UCL	0.0011		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0025

Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	78

Raw Statistics		Log-transformed Statistics	
Minimum	0.0071	Minimum of Log Data	-4.948
Maximum	6.49	Maximum of Log Data	1.87
Mean	0.47	Mean of log Data	-2.172
Median	0.11	SD of log Data	1.821
SD	0.94		
Coefficient of Variation	2		
Skewness	3.998		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.319	Lilliefors Test Statistic	0.156
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	

95% Student's-t UCL	0.642	95% H-UCL	1.122
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.305
95% Adjusted-CLT UCL	0.688	97.5% Chebyshev (MVUE) UCL	1.624
95% Modified-t UCL	0.649	99% Chebyshev (MVUE) UCL	2.251
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.446	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.053		
nu star	74.09		
Approximate Chi Square Value (.05)	55.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.64
Adjusted Chi Square Value	54.98	95% Jackknife UCL	0.642
		95% Standard Bootstrap UCL	0.638
Anderson-Darling Test Statistic	3.485	95% Bootstrap-t UCL	0.722
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	0.812
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	0.656
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.92
		97.5% Chebyshev(Mean, Sd) UCL	1.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.497
95% Approximate Gamma UCL	0.63		
95% Adjusted Gamma UCL	0.634		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.115

Result or 1/2 SDL (iron)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	73
Raw Statistics		Log-transformed Statistics	
Minimum	3450	Minimum of Log Data	8.146
Maximum	77100	Maximum of Log Data	11.25
Mean	16285	Mean of log Data	9.548
Median	13400	SD of log Data	0.52
SD	11193		
Coefficient of Variation	0.687		
Skewness	3.11		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.205	Lilliefors Test Statistic	0.0958
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18329	95% H-UCL	17845
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20231
95% Adjusted-CLT UCL	18754	97.5% Chebyshev (MVUE) UCL	22055
95% Modified-t UCL	18399	99% Chebyshev (MVUE) UCL	25638

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.376	Data appear Lognormal at 5% Significance Level	
Theta Star	4824		
nu star	560.3		
Approximate Chi Square Value (.05)	506.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	18306
Adjusted Chi Square Value	505.5	95% Jackknife UCL	18329
		95% Standard Bootstrap UCL	18299
Anderson-Darling Test Statistic	2.12	95% Bootstrap-t UCL	18935
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	19503
Kolmogorov-Smirnov Test Statistic	0.137	95% Percentile Bootstrap UCL	18453
Kolmogorov-Smirnov 5% Critical Value	0.0987	95% BCA Bootstrap UCL	18869
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21640
		97.5% Chebyshev(Mean, Sd) UCL	23957
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28509
95% Approximate Gamma UCL	18019		
95% Adjusted Gamma UCL	18051		
Potential UCL to Use		Use 95% H-UCL	17845

Result or 1/2 SDL (lead)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	80

Raw Statistics		Log-transformed Statistics	
Minimum	2.82	Minimum of Log Data	1.037
Maximum	643	Maximum of Log Data	6.466
Mean	69.61	Mean of log Data	3.584
Median	34.4	SD of log Data	1.077
SD	112.8		
Coefficient of Variation	1.62		
Skewness	3.653		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.277	Lilliefors Test Statistic	0.0781
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	90.2	95% H-UCL	84.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	103.5
95% Adjusted-CLT UCL	95.27	97.5% Chebyshev (MVUE) UCL	120.8
95% Modified-t UCL	91.03	99% Chebyshev (MVUE) UCL	154.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.864	Data appear Lognormal at 5% Significance Level	
Theta Star	80.56		
nu star	143.4		
Approximate Chi Square Value (.05)	116.8	Nonparametric Statistics	

Adjusted Level of Significance	0.0471	95% CLT UCL	89.97
Adjusted Chi Square Value	116.3	95% Jackknife UCL	90.2
		95% Standard Bootstrap UCL	89.75
Anderson-Darling Test Statistic	3.258	95% Bootstrap-t UCL	100.5
Anderson-Darling 5% Critical Value	0.787	95% Hall's Bootstrap UCL	94.9
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	91.31
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	95.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	123.6
		97.5% Chebyshev(Mean, Sd) UCL	146.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	192.8
95% Approximate Gamma UCL	85.51		
95% Adjusted Gamma UCL	85.82		
Potential UCL to Use		Use 95% H-UCL	84.5

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	80

Raw Statistics		Log-transformed Statistics	
Minimum	0.65	Minimum of Log Data	-0.431
Maximum	28	Maximum of Log Data	3.332
Mean	7.856	Mean of log Data	1.76
Median	6.44	SD of log Data	0.847
SD	5.715		
Coefficient of Variation	0.728		
Skewness	1.032		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.148	Lilliefors Test Statistic	0.0724
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.899	95% H-UCL	10.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.11
95% Adjusted-CLT UCL	8.963	97.5% Chebyshev (MVUE) UCL	13.77
95% Modified-t UCL	8.911	99% Chebyshev (MVUE) UCL	17.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.749	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.492		
nu star	290.3		
Approximate Chi Square Value (.05)	251.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	8.887
Adjusted Chi Square Value	251.2	95% Jackknife UCL	8.899
		95% Standard Bootstrap UCL	8.869
Anderson-Darling Test Statistic	0.362	95% Bootstrap-t UCL	9.045
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	9.048

Kolmogorov-Smirnov Test Statistic	0.0621	95% Percentile Bootstrap UCL	8.862
Kolmogorov-Smirnov 5% Critical Value	0.0996	95% BCA Bootstrap UCL	9.001
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.59
		97.5% Chebyshev(Mean, Sd) UCL	11.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.1
95% Approximate Gamma UCL	9.055		
95% Adjusted Gamma UCL	9.078		
Potential UCL to Use		Use 95% Approximate Gamma UCL	9.055

Result or 1/2 SDL (manganese)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	71

Raw Statistics		Log-transformed Statistics	
Minimum	59.3	Minimum of Log Data	4.083
Maximum	892	Maximum of Log Data	6.793
Mean	257.4	Mean of log Data	5.455
Median	224	SD of log Data	0.426
SD	129.3		
Coefficient of Variation	0.502		
Skewness	2.305		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.196	Lilliefors Test Statistic	0.102
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	281.1	95% H-UCL	278.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	310.2
95% Adjusted-CLT UCL	284.6	97.5% Chebyshev (MVUE) UCL	333.7
95% Modified-t UCL	281.7	99% Chebyshev (MVUE) UCL	379.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.208	Data do not follow a Discernable Distribution (0.05)	
Theta Star	49.43		
nu star	864.6		
Approximate Chi Square Value (.05)	797.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	280.8
Adjusted Chi Square Value	796.2	95% Jackknife UCL	281.1
		95% Standard Bootstrap UCL	280.6
Anderson-Darling Test Statistic	1.874	95% Bootstrap-t UCL	288.2
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	288.5
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	282.3
Kolmogorov-Smirnov 5% Critical Value	0.0983	95% BCA Bootstrap UCL	286.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	319.3
		97.5% Chebyshev(Mean, Sd) UCL	346.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	398.7

95% Approximate Gamma UCL	279.1		
95% Adjusted Gamma UCL	279.5		
Potential UCL to Use		Use 95% Student's-t UCL	281.1
		or 95% Modified-t UCL	281.7

Result or 1/2 SDL (mercury)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	55

Raw Statistics		Log-transformed Statistics	
Minimum	0.001	Minimum of Log Data	-6.908
Maximum	0.66	Maximum of Log Data	-0.416
Mean	0.0227	Mean of log Data	-4.95
Median	0.0065	SD of log Data	1.339
SD	0.0752		
Coefficient of Variation	3.315		
Skewness	7.742		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.387	Lilliefors Test Statistic	0.0883
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0364	95% H-UCL	0.0254
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0314
95% Adjusted-CLT UCL	0.0437	97.5% Chebyshev (MVUE) UCL	0.0376
95% Modified-t UCL	0.0376	99% Chebyshev (MVUE) UCL	0.0498
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.528	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0429		
nu star	87.68		
Approximate Chi Square Value (.05)	67.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0362
Adjusted Chi Square Value	66.78	95% Jackknife UCL	0.0364
		95% Standard Bootstrap UCL	0.0365
Anderson-Darling Test Statistic	5.016	95% Bootstrap-t UCL	0.0699
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.0863
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	0.0377
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0485
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0586
		97.5% Chebyshev(Mean, Sd) UCL	0.0742
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.105
95% Approximate Gamma UCL	0.0296		
95% Adjusted Gamma UCL	0.0298		
Potential UCL to Use		Use 95% H-UCL	0.0254

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	67

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	8.42	Maximum of Log Data	2.131
Mean	1.306	Mean of log Data	-0.575
Median	0.91	SD of log Data	1.522
SD	1.588		
Coefficient of Variation	1.216		
Skewness	2.126		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.23	Lilliefors Test Statistic	0.136
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.596	95% H-UCL	2.859
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.492
95% Adjusted-CLT UCL	1.637	97.5% Chebyshev (MVUE) UCL	4.25
95% Modified-t UCL	1.603	99% Chebyshev (MVUE) UCL	5.739
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.698	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.872		
nu star	115.8		
Approximate Chi Square Value (.05)	91.98	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	1.593
Adjusted Chi Square Value	91.61	95% Jackknife UCL	1.596
		95% Standard Bootstrap UCL	1.589
Anderson-Darling Test Statistic	0.65	95% Bootstrap-t UCL	1.662
Anderson-Darling 5% Critical Value	0.797	95% Hall's Bootstrap UCL	1.639
Kolmogorov-Smirnov Test Statistic	0.0752	95% Percentile Bootstrap UCL	1.596
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	1.645
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.066
		97.5% Chebyshev(Mean, Sd) UCL	2.395
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.041
95% Approximate Gamma UCL	1.645		
95% Adjusted Gamma UCL	1.652		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1.645

Result or 1/2 SDL (nickel)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	67

Raw Statistics		Log-transformed Statistics	
Minimum	2.84	Minimum of Log Data	1.044
Maximum	36.7	Maximum of Log Data	3.603
Mean	11.64	Mean of log Data	2.373
Median	11.2	SD of log Data	0.411
SD	4.938		
Coefficient of Variation	0.424		
Skewness	1.825		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.13	Lilliefors Test Statistic	0.0874
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.54	95% H-UCL	12.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.05
95% Adjusted-CLT UCL	12.65	97.5% Chebyshev (MVUE) UCL	15.08
95% Modified-t UCL	12.56	99% Chebyshev (MVUE) UCL	17.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.095	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.91		
nu star	1012		
Approximate Chi Square Value (.05)	938.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	12.53
Adjusted Chi Square Value	937.7	95% Jackknife UCL	12.54
		95% Standard Bootstrap UCL	12.55
Anderson-Darling Test Statistic	0.505	95% Bootstrap-t UCL	12.68
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	12.78
Kolmogorov-Smirnov Test Statistic	0.0926	95% Percentile Bootstrap UCL	12.53
Kolmogorov-Smirnov 5% Critical Value	0.0982	95% BCA Bootstrap UCL	12.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14
		97.5% Chebyshev(Mean, Sd) UCL	15.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.03
95% Approximate Gamma UCL	12.54		
95% Adjusted Gamma UCL	12.56		
Potential UCL to Use		Use 95% Approximate Gamma UCL	12.54

Result or 1/2 SDL (phenanthrene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	74

Raw Statistics		Log-transformed Statistics	
Minimum	0.0057	Minimum of Log Data	-5.159
Maximum	12.6	Maximum of Log Data	2.534

Mean	0.512	Mean of log Data	-2.572
Median	0.063	SD of log Data	2.001
SD	1.543		
Coefficient of Variation	3.013		
Skewness	6.446		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.371	Lilliefors Test Statistic	0.132
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.794	95% H-UCL	1.186
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.312
95% Adjusted-CLT UCL	0.919	97.5% Chebyshev (MVUE) UCL	1.651
95% Modified-t UCL	0.814	99% Chebyshev (MVUE) UCL	2.317
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.348	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.472		
nu star	57.78		
Approximate Chi Square Value (.05)	41.31	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.791
Adjusted Chi Square Value	41.06	95% Jackknife UCL	0.794
		95% Standard Bootstrap UCL	0.795
Anderson-Darling Test Statistic	4.225	95% Bootstrap-t UCL	1.251
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	1.967
Kolmogorov-Smirnov Test Statistic	0.182	95% Percentile Bootstrap UCL	0.802
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.965
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.251
		97.5% Chebyshev(Mean, Sd) UCL	1.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.198
95% Approximate Gamma UCL	0.717		
95% Adjusted Gamma UCL	0.721		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2.198

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	76

Raw Statistics		Log-transformed Statistics	
Minimum	0.0055	Minimum of Log Data	-5.194
Maximum	8.47	Maximum of Log Data	2.137
Mean	0.533	Mean of log Data	-2.413
Median	0.075	SD of log Data	1.994
SD	1.209		
Coefficient of Variation	2.27		
Skewness	4.319		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.333	Lilliefors Test Statistic	0.0815
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.754	95% H-UCL	1.366
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.514
95% Adjusted-CLT UCL	0.818	97.5% Chebyshev (MVUE) UCL	1.905
95% Modified-t UCL	0.764	99% Chebyshev (MVUE) UCL	2.672
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.368	Data appear Lognormal at 5% Significance Level	
Theta Star	1.449		
nu star	61.04		
Approximate Chi Square Value (.05)	44.07	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.751
Adjusted Chi Square Value	43.82	95% Jackknife UCL	0.754
		95% Standard Bootstrap UCL	0.753
Anderson-Darling Test Statistic	3.7	95% Bootstrap-t UCL	0.873
Anderson-Darling 5% Critical Value	0.849	95% Hall's Bootstrap UCL	1.429
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	0.764
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.821
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.112
		97.5% Chebyshev(Mean, Sd) UCL	1.362
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.854
95% Approximate Gamma UCL	0.738		
95% Adjusted Gamma UCL	0.742		
Potential UCL to Use		Use 95% H-UCL	1.366

Result or 1/2 SDL (selenium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.21	Minimum of Log Data	-1.561
Maximum	0.48	Maximum of Log Data	-0.734
Mean	0.258	Mean of log Data	-1.377
Median	0.24	SD of log Data	0.202
SD	0.0663		
Coefficient of Variation	0.257		
Skewness	2.645		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.363	Lilliefors Test Statistic	0.322
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.27	95% H-UCL	0.267
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.282
95% Adjusted-CLT UCL	0.272	97.5% Chebyshev (MVUE) UCL	0.293
95% Modified-t UCL	0.271	99% Chebyshev (MVUE) UCL	0.315
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.56	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0126		
nu star	3413		
Approximate Chi Square Value (.05)	3278	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.27
Adjusted Chi Square Value	3276	95% Jackknife UCL	0.27
		95% Standard Bootstrap UCL	0.27
Anderson-Darling Test Statistic	13.15	95% Bootstrap-t UCL	0.274
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.272
Kolmogorov-Smirnov Test Statistic	0.338	95% Percentile Bootstrap UCL	0.271
Kolmogorov-Smirnov 5% Critical Value	0.0978	95% BCA Bootstrap UCL	0.273
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.29
		97.5% Chebyshev(Mean, Sd) UCL	0.304
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.331
95% Approximate Gamma UCL	0.269		
95% Adjusted Gamma UCL	0.269		
Potential UCL to Use		Use 95% Student's-t UCL	0.27
		or 95% Modified-t UCL	0.271

Result or 1/2 SDL (silver)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	24
Raw Statistics		Log-transformed Statistics	
Minimum	0.0235	Minimum of Log Data	-3.751
Maximum	0.99	Maximum of Log Data	-0.0101
Mean	0.0573	Mean of log Data	-3.388
Median	0.0265	SD of log Data	0.715
SD	0.125		
Coefficient of Variation	2.178		
Skewness	5.862		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.439	Lilliefors Test Statistic	0.413
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.08	95% H-UCL	0.0511

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0599
95% Adjusted-CLT UCL	0.0892	97.5% Chebyshev (MVUE) UCL	0.0671
95% Modified-t UCL	0.0815	99% Chebyshev (MVUE) UCL	0.081
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.053	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0544		
nu star	174.9		
Approximate Chi Square Value (.05)	145.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0798
Adjusted Chi Square Value	144.8	95% Jackknife UCL	0.08
		95% Standard Bootstrap UCL	0.0798
Anderson-Darling Test Statistic	21.47	95% Bootstrap-t UCL	0.108
Anderson-Darling 5% Critical Value	0.78	95% Hall's Bootstrap UCL	0.151
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	0.0815
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0919
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.117
		97.5% Chebyshev(Mean, Sd) UCL	0.143
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.193
95% Approximate Gamma UCL	0.0689		
95% Adjusted Gamma UCL	0.0691		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.117

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	76
Raw Statistics		Log-transformed Statistics	
Minimum	16.5	Minimum of Log Data	2.803
Maximum	527	Maximum of Log Data	6.267
Mean	70.61	Mean of log Data	4.06
Median	57.3	SD of log Data	0.583
SD	63.98		
Coefficient of Variation	0.906		
Skewness	5.044		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.241	Lilliefors Test Statistic	0.105
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	82.29	95% H-UCL	77.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.08
95% Adjusted-CLT UCL	86.31	97.5% Chebyshev (MVUE) UCL	97.96
95% Modified-t UCL	82.94	99% Chebyshev (MVUE) UCL	115.4
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	2.606	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.1		
nu star	432.5		
Approximate Chi Square Value (.05)	385.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	82.16
Adjusted Chi Square Value	384.5	95% Jackknife UCL	82.29
		95% Standard Bootstrap UCL	81.58
Anderson-Darling Test Statistic	2.313	95% Bootstrap-t UCL	91.45
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	135.7
Kolmogorov-Smirnov Test Statistic	0.156	95% Percentile Bootstrap UCL	82.83
Kolmogorov-Smirnov 5% Critical Value	0.099	95% BCA Bootstrap UCL	86.92
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.2
		97.5% Chebyshev(Mean, Sd) UCL	114.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	140.5
95% Approximate Gamma UCL	79.26		
95% Adjusted Gamma UCL	79.42		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	101.2

Result or 1/2 SDL (tin)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	35

Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.47
Maximum	4.95	Maximum of Log Data	1.599
Mean	0.611	Mean of log Data	-0.898
Median	0.265	SD of log Data	0.768
SD	0.793		
Coefficient of Variation	1.296		
Skewness	3.22		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.325	Lilliefors Test Statistic	0.334
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.756	95% H-UCL	0.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.769
95% Adjusted-CLT UCL	0.787	97.5% Chebyshev (MVUE) UCL	0.866
95% Modified-t UCL	0.761	99% Chebyshev (MVUE) UCL	1.057
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.458		
nu star	221.4		
Approximate Chi Square Value (.05)	188	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.755

Adjusted Chi Square Value	187.4	95% Jackknife UCL	0.756
		95% Standard Bootstrap UCL	0.756
Anderson-Darling Test Statistic	11.5	95% Bootstrap-t UCL	0.816
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	0.816
Kolmogorov-Smirnov Test Statistic	0.339	95% Percentile Bootstrap UCL	0.768
Kolmogorov-Smirnov 5% Critical Value	0.1	95% BCA Bootstrap UCL	0.802
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.991
		97.5% Chebyshev(Mean, Sd) UCL	1.155
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.477
95% Approximate Gamma UCL	0.72		
95% Adjusted Gamma UCL	0.722		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.991

Result or 1/2 SDL (titanium)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	71

Raw Statistics		Log-transformed Statistics	
Minimum	11.5	Minimum of Log Data	2.442
Maximum	645	Maximum of Log Data	6.469
Mean	29.8	Mean of log Data	3.055
Median	19.5	SD of log Data	0.544
SD	69.4		
Coefficient of Variation	2.329		
Skewness	8.71		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.396	Lilliefors Test Statistic	0.193
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	42.47	95% H-UCL	27.51
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.33
95% Adjusted-CLT UCL	50.11	97.5% Chebyshev (MVUE) UCL	34.27
95% Modified-t UCL	43.68	99% Chebyshev (MVUE) UCL	40.05
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.568	Data do not follow a Discernable Distribution (0.05)	
Theta Star	19.01		
nu star	260.3		
Approximate Chi Square Value (.05)	223.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	42.33
Adjusted Chi Square Value	223.3	95% Jackknife UCL	42.47
		95% Standard Bootstrap UCL	42.22
Anderson-Darling Test Statistic	11.79	95% Bootstrap-t UCL	96.34
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	87.12
Kolmogorov-Smirnov Test Statistic	0.289	95% Percentile Bootstrap UCL	44.62

Kolmogorov-Smirnov 5% Critical Value	0.0998	95% BCA Bootstrap UCL	53.78
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	63
		97.5% Chebyshev(Mean, Sd) UCL	77.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105.6
95% Approximate Gamma UCL	34.64		
95% Adjusted Gamma UCL	34.73		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	63

Result or 1/2 SDL (vanadium)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	67

Raw Statistics		Log-transformed Statistics	
Minimum	5.42	Minimum of Log Data	1.69
Maximum	45.6	Maximum of Log Data	3.82
Mean	13.76	Mean of log Data	2.538
Median	12.9	SD of log Data	0.404
SD	6.248		
Coefficient of Variation	0.454		
Skewness	2.186		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.113	Lilliefors Test Statistic	0.0671
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.9	95% H-UCL	14.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.46
95% Adjusted-CLT UCL	15.06	97.5% Chebyshev (MVUE) UCL	17.65
95% Modified-t UCL	14.93	99% Chebyshev (MVUE) UCL	19.98
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.932	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.319		
nu star	984.6		
Approximate Chi Square Value (.05)	912.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	14.89
Adjusted Chi Square Value	911.6	95% Jackknife UCL	14.9
		95% Standard Bootstrap UCL	14.89
Anderson-Darling Test Statistic	0.532	95% Bootstrap-t UCL	15.15
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	15.36
Kolmogorov-Smirnov Test Statistic	0.0752	95% Percentile Bootstrap UCL	14.94
Kolmogorov-Smirnov 5% Critical Value	0.0982	95% BCA Bootstrap UCL	15.03
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.75
		97.5% Chebyshev(Mean, Sd) UCL	18.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.58
95% Approximate Gamma UCL	14.84		

95% Adjusted Gamma UCL	14.86		
Potential UCL to Use		Use 95% Approximate Gamma UCL	14.84

Result or 1/2 SDL (zinc)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	81

Raw Statistics		Log-transformed Statistics	
Minimum	12.3	Minimum of Log Data	2.51
Maximum	4770	Maximum of Log Data	8.47
Mean	601.2	Mean of log Data	5.837
Median	455	SD of log Data	1.203
SD	672.8		
Coefficient of Variation	1.119		
Skewness	3.386		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.191	Lilliefors Test Statistic	0.146
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	724.1	95% H-UCL	976.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1204
95% Adjusted-CLT UCL	752	97.5% Chebyshev (MVUE) UCL	1423
95% Modified-t UCL	728.6	99% Chebyshev (MVUE) UCL	1855
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.996	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	603.9		
nu star	165.3		
Approximate Chi Square Value (.05)	136.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	722.7
Adjusted Chi Square Value	136.1	95% Jackknife UCL	724.1
		95% Standard Bootstrap UCL	717.7
Anderson-Darling Test Statistic	0.442	95% Bootstrap-t UCL	763
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	816.5
Kolmogorov-Smirnov Test Statistic	0.0769	95% Percentile Bootstrap UCL	727.9
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	758.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	923.1
		97.5% Chebyshev(Mean, Sd) UCL	1062
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1336
95% Approximate Gamma UCL	727.7		
95% Adjusted Gamma UCL	730.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	727.7

APPENDIX A-2

SOUTH OF MARLIN SOIL

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\95% detect frequency soil S of ma
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (1,3,5-trimethylbenzene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	58

Raw Statistics		Log-transformed Statistics	
Minimum	3.7000E-5	Minimum of Log Data	-10.2
Maximum	4.36	Maximum of Log Data	1.472
Mean	0.099	Mean of log Data	-8.82
Median	7.4500E-5	SD of log Data	1.986
SD	0.632		
Coefficient of Variation	6.391		
Skewness	6.366		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.535	Lilliefors Test Statistic	0.397
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.214	95% H-UCL	0.0022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0024
95% Adjusted-CLT UCL	0.265	97.5% Chebyshev (MVUE) UCL	0.0030
95% Modified-t UCL	0.223	99% Chebyshev (MVUE) UCL	0.0043
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.125	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.79		
nu star	20.8		
Approximate Chi Square Value (.05)	11.44	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.213
Adjusted Chi Square Value	11.32	95% Jackknife UCL	0.214
		95% Standard Bootstrap UCL	0.212
Anderson-Darling Test Statistic	28.64	95% Bootstrap-t UCL	67.91
Anderson-Darling 5% Critical Value	0.984	95% Hall's Bootstrap UCL	42.63
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	0.211
Kolmogorov-Smirnov 5% Critical Value	0.112	95% BCA Bootstrap UCL	0.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.402
		97.5% Chebyshev(Mean, Sd) UCL	0.532
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.79
95% Approximate Gamma UCL	0.18		
95% Adjusted Gamma UCL	0.182		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.532

Result or 1/2 SDL (2-butanone)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	81

Raw Statistics		Log-transformed Statistics	
Minimum	7.1500E-5	Minimum of Log Data	-9.546
Maximum	0.06	Maximum of Log Data	-2.813
Mean	0.0041	Mean of log Data	-6.321
Median	0.0019	SD of log Data	1.38
SD	0.0074		
Coefficient of Variation	1.818		
Skewness	5.537		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.294	Lilliefors Test Statistic	0.133
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0054	95% H-UCL	0.0069
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0085
95% Adjusted-CLT UCL	0.006	97.5% Chebyshev (MVUE) UCL	0.0103
95% Modified-t UCL	0.0055	99% Chebyshev (MVUE) UCL	0.0137

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.708	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0058		
nu star	117.5		
Approximate Chi Square Value (.05)	93.51	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0054
Adjusted Chi Square Value	93.13	95% Jackknife UCL	0.0054
		95% Standard Bootstrap UCL	0.0054
Anderson-Darling Test Statistic	1.855	95% Bootstrap-t UCL	0.0068
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	0.0111
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	0.0055
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	0.0064
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0077
		97.5% Chebyshev(Mean, Sd) UCL	0.0092
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0123
95% Approximate Gamma UCL	0.0051		
95% Adjusted Gamma UCL	0.0052		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0092

Result or 1/2 SDL (2-hexanone)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	1.8900E-4	Minimum of Log Data	-8.574
Maximum	0.159	Maximum of Log Data	-1.842
Mean	0.0040	Mean of log Data	-7.35
Median	3.7750E-4	SD of log Data	1.34
SD	0.018		
Coefficient of Variation	4.426		
Skewness	7.989		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.415	Lilliefors Test Statistic	0.399
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0073	95% H-UCL	0.0023
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0028
95% Adjusted-CLT UCL	0.0091	97.5% Chebyshev (MVUE) UCL	0.0034
95% Modified-t UCL	0.0076	99% Chebyshev (MVUE) UCL	0.0045
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0113		
nu star	59.38		
Approximate Chi Square Value (.05)	42.66	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0073
Adjusted Chi Square Value	42.41	95% Jackknife UCL	0.0073
		95% Standard Bootstrap UCL	0.0072
Anderson-Darling Test Statistic	20.58	95% Bootstrap-t UCL	0.0146
Anderson-Darling 5% Critical Value	0.851	95% Hall's Bootstrap UCL	0.0179
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	0.0078
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0102
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0127
		97.5% Chebyshev(Mean, Sd) UCL	0.0164
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0237
95% Approximate Gamma UCL	0.0056		
95% Adjusted Gamma UCL	0.0056		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0164

Re[redacted]t or 1/2 SDL (2-methylnaphthalene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	84

Raw Statistics		Log-transformed Statistics	
Minimum	0.0047	Minimum of Log Data	-5.354

Maximum	7.21	Maximum of Log Data	1.975
Mean	0.0694	Mean of log Data	-4.533
Median	0.0056	SD of log Data	1.209
SD	0.561		
Coefficient of Variation	8.087		
Skewness	12.66		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.454	Lilliefors Test Statistic	0.354
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.141	95% H-UCL	0.0278
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0338
95% Adjusted-CLT UCL	0.187	97.5% Chebyshev (MVUE) UCL	0.0389
95% Modified-t UCL	0.149	99% Chebyshev (MVUE) UCL	0.0488
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.357	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.194		
nu star	118.4		
Approximate Chi Square Value (.05)	94.29	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.141
Adjusted Chi Square Value	94.11	95% Jackknife UCL	0.141
		95% Standard Bootstrap UCL	0.146
Anderson-Darling Test Statistic	6.024E+28	95% Bootstrap-t UCL	0.686
Anderson-Darling 5% Critical Value	0.854	95% Hall's Bootstrap UCL	0.403
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	0.155
Kolmogorov-Smirnov 5% Critical Value	0.078	95% BCA Bootstrap UCL	0.205
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.259
		97.5% Chebyshev(Mean, Sd) UCL	0.341
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.503
95% Approximate Gamma UCL	0.0871		
95% Adjusted Gamma UCL	0.0873		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.341

Result or 1/2 SDL (4,4'-ddd)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	100

Raw Statistics		Log-transformed Statistics	
Minimum	1.1750E-4	Minimum of Log Data	-9.049
Maximum	1.12	Maximum of Log Data	0.113
Mean	0.0076	Mean of log Data	-8.292
Median	1.3950E-4	SD of log Data	1.373
SD	0.0869		
Coefficient of Variation	11.34		

Skewness	12.86		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.473	Lilliefors Test Statistic	0.396
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0188	95% H-UCL	8.4016E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0010
95% Adjusted-CLT UCL	0.026	97.5% Chebyshev (MVUE) UCL	0.0012
95% Modified-t UCL	0.0199	99% Chebyshev (MVUE) UCL	0.0015
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.213	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0359		
nu star	70.78		
Approximate Chi Square Value (.05)	52.41	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0188
Adjusted Chi Square Value	52.28	95% Jackknife UCL	0.0188
		95% Standard Bootstrap UCL	0.0185
Anderson-Darling Test Statistic	48.45	95% Bootstrap-t UCL	0.31
Anderson-Darling 5% Critical Value	0.908	95% Hall's Bootstrap UCL	0.188
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	0.0211
Kolmogorov-Smirnov 5% Critical Value	0.08	95% BCA Bootstrap UCL	0.0345
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0371
		97.5% Chebyshev(Mean, Sd) UCL	0.0498
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0748
95% Approximate Gamma UCL	0.0104		
95% Adjusted Gamma UCL	0.0104		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0498

Result or 1/2 SDL (4,4'-dde)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	113

Raw Statistics		Log-transformed Statistics	
Minimum	1.6300E-4	Minimum of Log Data	-8.722
Maximum	0.0693	Maximum of Log Data	-2.669
Mean	0.0017	Mean of log Data	-7.973
Median	1.9425E-4	SD of log Data	1.22
SD	0.0076		
Coefficient of Variation	4.484		
Skewness	7.741		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.42	Lilliefors Test Statistic	0.379

Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0026	95% H-UCL	9.0739E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0011
95% Adjusted-CLT UCL	0.0030	97.5% Chebyshev (MVUE) UCL	0.0012
95% Modified-t UCL	0.0027	99% Chebyshev (MVUE) UCL	0.0016
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.407	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0041		
nu star	135.2		
Approximate Chi Square Value (.05)	109.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0026
Adjusted Chi Square Value	109.1	95% Jackknife UCL	0.0026
		95% Standard Bootstrap UCL	0.0026
Anderson-Darling Test Statistic	36.49	95% Bootstrap-t UCL	0.0043
Anderson-Darling 5% Critical Value	0.842	95% Hall's Bootstrap UCL	0.0063
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	0.0027
Kolmogorov-Smirnov 5% Critical Value	0.0775	95% BCA Bootstrap UCL	0.0032
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0042
		97.5% Chebyshev(Mean, Sd) UCL	0.0054
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0075
95% Approximate Gamma UCL	0.0021		
95% Adjusted Gamma UCL	0.0021		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0054

Result or 1/2 SDL (4,4'-ddt)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	114

Raw Statistics		Log-transformed Statistics	
Minimum	6.2500E-5	Minimum of Log Data	-9.68
Maximum	0.113	Maximum of Log Data	-2.18
Mean	0.0037	Mean of log Data	-7.782
Median	1.1075E-4	SD of log Data	2.033
SD	0.0114		
Coefficient of Variation	3.045		
Skewness	6.653		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.373	Lilliefors Test Statistic	0.27
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0051	95% H-UCL	0.0054

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0067
95% Adjusted-CLT UCL	0.0056	97.5% Chebyshev (MVUE) UCL	0.0083
95% Modified-t UCL	0.0052	99% Chebyshev (MVUE) UCL	0.0114
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.311	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.012		
nu star	103.2		
Approximate Chi Square Value (.05)	80.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0051
Adjusted Chi Square Value	80.63	95% Jackknife UCL	0.0051
		95% Standard Bootstrap UCL	0.0051
Anderson-Darling Test Statistic	16.11	95% Bootstrap-t UCL	0.0064
Anderson-Darling 5% Critical Value	0.866	95% Hall's Bootstrap UCL	0.0114
Kolmogorov-Smirnov Test Statistic	0.256	95% Percentile Bootstrap UCL	0.0052
Kolmogorov-Smirnov 5% Critical Value	0.0785	95% BCA Bootstrap UCL	0.0058
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0075
		97.5% Chebyshev(Mean, Sd) UCL	0.0092
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0125
95% Approximate Gamma UCL	0.0047		
95% Adjusted Gamma UCL	0.0047		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0125

R[redacted] or 1/2 SDL (acenaphthene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	108

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.438
Maximum	1.69	Maximum of Log Data	0.525
Mean	0.0419	Mean of log Data	-4.516
Median	0.0052	SD of log Data	1.296
SD	0.15		
Coefficient of Variation	3.573		
Skewness	8.834		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.401	Lilliefors Test Statistic	0.359
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0611	95% H-UCL	0.0324
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0397
95% Adjusted-CLT UCL	0.0696	97.5% Chebyshev (MVUE) UCL	0.046
95% Modified-t UCL	0.0625	99% Chebyshev (MVUE) UCL	0.0584
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.472	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0889		
nu star	156.6		
Approximate Chi Square Value (.05)	128.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.061
Adjusted Chi Square Value	128.4	95% Jackknife UCL	0.0611
		95% Standard Bootstrap UCL	0.0611
Anderson-Darling Test Statistic	27.1	95% Bootstrap-t UCL	0.0864
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.133
Kolmogorov-Smirnov Test Statistic	0.369	95% Percentile Bootstrap UCL	0.0627
Kolmogorov-Smirnov 5% Critical Value	0.0768	95% BCA Bootstrap UCL	0.0746
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0926
		97.5% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.158
95% Approximate Gamma UCL	0.051		
95% Adjusted Gamma UCL	0.0511		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.115

Result or 1/2 SDL (acenaphthylene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.312
Maximum	1.2	Maximum of Log Data	0.182
Mean	0.042	Mean of log Data	-4.467
Median	0.0058	SD of log Data	1.213
SD	0.149		
Coefficient of Variation	3.543		
Skewness	6.646		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.402	Lilliefors Test Statistic	0.365
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0612	95% H-UCL	0.0299
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0364
95% Adjusted-CLT UCL	0.0674	97.5% Chebyshev (MVUE) UCL	0.0418
95% Modified-t UCL	0.0621	99% Chebyshev (MVUE) UCL	0.0526
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.486	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0865		
nu star	161.3		
Approximate Chi Square Value (.05)	133	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.061

Adjusted Chi Square Value	132.7	95% Jackknife UCL	0.0612
		95% Standard Bootstrap UCL	0.0608
Anderson-Darling Test Statistic	28.55	95% Bootstrap-t UCL	0.0779
Anderson-Darling 5% Critical Value	0.822	95% Hall's Bootstrap UCL	0.0621
Kolmogorov-Smirnov Test Statistic	0.375	95% Percentile Bootstrap UCL	0.0624
Kolmogorov-Smirnov 5% Critical Value	0.0767	95% BCA Bootstrap UCL	0.0687
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0924
		97.5% Chebyshev(Mean, Sd) UCL	0.114
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.157
95% Approximate Gamma UCL	0.051		
95% Adjusted Gamma UCL	0.0511		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.114

Result or 1/2 SDL (acetone)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	77

Raw Statistics		Log-transformed Statistics	
Minimum	8.5500E-5	Minimum of Log Data	-9.367
Maximum	0.16	Maximum of Log Data	-1.833
Mean	0.0145	Mean of log Data	-6.403
Median	0.0021	SD of log Data	2.342
SD	0.0317		
Coefficient of Variation	2.181		
Skewness	3.374		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.328	Lilliefors Test Statistic	0.26
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0203	95% H-UCL	0.0684
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0654
95% Adjusted-CLT UCL	0.0216	97.5% Chebyshev (MVUE) UCL	0.0838
95% Modified-t UCL	0.0205	99% Chebyshev (MVUE) UCL	0.12
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.312	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0466		
nu star	51.74		
Approximate Chi Square Value (.05)	36.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0202
Adjusted Chi Square Value	35.99	95% Jackknife UCL	0.0203
		95% Standard Bootstrap UCL	0.0204
Anderson-Darling Test Statistic	5.243	95% Bootstrap-t UCL	0.0229
Anderson-Darling 5% Critical Value	0.862	95% Hall's Bootstrap UCL	0.0216
Kolmogorov-Smirnov Test Statistic	0.246	95% Percentile Bootstrap UCL	0.0206

Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0217
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0297
		97.5% Chebyshev(Mean, Sd) UCL	0.0362
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0491
95% Approximate Gamma UCL	0.0207		
95% Adjusted Gamma UCL	0.0209		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0491

Result or 1/2 SDL (aluminum)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	149

Raw Statistics		**Log-transformed Statistics**	
Minimum	414	Minimum of Log Data	6.026
Maximum	15700	Maximum of Log Data	9.661
Mean	6452	Mean of log Data	8.565
Median	6175	SD of log Data	0.718
SD	3601		
Coefficient of Variation	0.558		
Skewness	0.362		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.0643	Lilliefors Test Statistic	0.106
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	6914	95% H-UCL	7566
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8609
95% Adjusted-CLT UCL	6920	97.5% Chebyshev (MVUE) UCL	9402
95% Modified-t UCL	6916	99% Chebyshev (MVUE) UCL	10961
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.531	Data appear Normal at 5% Significance Level	
Theta Star	2550		
nu star	840.1		
Approximate Chi Square Value (.05)	773.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	6912
Adjusted Chi Square Value	773.3	95% Jackknife UCL	6914
		95% Standard Bootstrap UCL	6909
Anderson-Darling Test Statistic	1.49	95% Bootstrap-t UCL	6915
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	6904
Kolmogorov-Smirnov Test Statistic	0.0875	95% Percentile Bootstrap UCL	6905
Kolmogorov-Smirnov 5% Critical Value	0.0731	95% BCA Bootstrap UCL	6915
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7670
		97.5% Chebyshev(Mean, Sd) UCL	8197
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9233
95% Approximate Gamma UCL	7004		

95% Adjusted Gamma UCL	7009		
Potential UCL to Use		Use 95% Student's-t UCL	6914

Result or 1/2 SDL (anthracene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	103

Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.316
Maximum	2.46	Maximum of Log Data	0.9
Mean	0.0874	Mean of log Data	-4.023
Median	0.0060	SD of log Data	1.563
SD	0.254		
Coefficient of Variation	2.9		
Skewness	6.356		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.372	Lilliefors Test Statistic	0.273
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.12	95% H-UCL	0.0843
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.105
95% Adjusted-CLT UCL	0.13	97.5% Chebyshev (MVUE) UCL	0.125
95% Modified-t UCL	0.122	99% Chebyshev (MVUE) UCL	0.164
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.409	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.214		
nu star	135.9		
Approximate Chi Square Value (.05)	110	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.12
Adjusted Chi Square Value	109.8	95% Jackknife UCL	0.12
		95% Standard Bootstrap UCL	0.12
Anderson-Darling Test Statistic	20.06	95% Bootstrap-t UCL	0.142
Anderson-Darling 5% Critical Value	0.841	95% Hall's Bootstrap UCL	0.173
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	0.122
Kolmogorov-Smirnov 5% Critical Value	0.0775	95% BCA Bootstrap UCL	0.136
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.173
		97.5% Chebyshev(Mean, Sd) UCL	0.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.283
95% Approximate Gamma UCL	0.108		
95% Adjusted Gamma UCL	0.108		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.21

Result or 1/2 SDL (antimony)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	83

Raw Statistics		Log-transformed Statistics	
Minimum	0.095	Minimum of Log Data	-2.354
Maximum	5.51	Maximum of Log Data	1.707
Mean	1.023	Mean of log Data	-0.654
Median	0.24	SD of log Data	1.192
SD	1.14		
Coefficient of Variation	1.114		
Skewness	1.329		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.291	Lilliefors Test Statistic	0.262
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.17	95% H-UCL	1.313
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.594
95% Adjusted-CLT UCL	1.179	97.5% Chebyshev (MVUE) UCL	1.829
95% Modified-t UCL	1.171	99% Chebyshev (MVUE) UCL	2.291
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.856	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.196		
nu star	284.1		
Approximate Chi Square Value (.05)	246	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	1.169
Adjusted Chi Square Value	245.7	95% Jackknife UCL	1.17
		95% Standard Bootstrap UCL	1.169
Anderson-Darling Test Statistic	12.23	95% Bootstrap-t UCL	1.179
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	1.185
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL	1.179
Kolmogorov-Smirnov 5% Critical Value	0.0749	95% BCA Bootstrap UCL	1.169
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.409
		97.5% Chebyshev(Mean, Sd) UCL	1.576
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.904
95% Approximate Gamma UCL	1.182		
95% Adjusted Gamma UCL	1.183		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.576

Result or 1/2 SDL (aroclor-1254)

General Statistics

Number of Valid Samples	174	Number of Unique Samples	115

Raw Statistics		Log-transformed Statistics	
Minimum	0.0016	Minimum of Log Data	-6.422
Maximum	11.5	Maximum of Log Data	2.442
Mean	0.205	Mean of log Data	-5.38
Median	0.0019	SD of log Data	1.955
SD	1.131		
Coefficient of Variation	5.523		
Skewness	8.01		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.443	Lilliefors Test Statistic	0.402
Lilliefors Critical Value	0.0672	Lilliefors Critical Value	0.0672
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.347	95% H-UCL	0.0496
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0618
95% Adjusted-CLT UCL	0.401	97.5% Chebyshev (MVUE) UCL	0.0754
95% Modified-t UCL	0.355	99% Chebyshev (MVUE) UCL	0.102
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.195	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.049		
nu star	67.95		
Approximate Chi Square Value (.05)	49.98	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.346
Adjusted Chi Square Value	49.85	95% Jackknife UCL	0.347
		95% Standard Bootstrap UCL	0.344
Anderson-Darling Test Statistic	46.09	95% Bootstrap-t UCL	0.573
Anderson-Darling 5% Critical Value	0.922	95% Hall's Bootstrap UCL	0.86
Kolmogorov-Smirnov Test Statistic	0.437	95% Percentile Bootstrap UCL	0.36
Kolmogorov-Smirnov 5% Critical Value	0.0782	95% BCA Bootstrap UCL	0.439
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.578
		97.5% Chebyshev(Mean, Sd) UCL	0.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.058
95% Approximate Gamma UCL	0.278		
95% Adjusted Gamma UCL	0.279		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.74

Result or 1/2 SDL (arsenic)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	146

Raw Statistics		Log-transformed Statistics	
Minimum	0.085	Minimum of Log Data	-2.465
Maximum	24.3	Maximum of Log Data	3.19
Mean	3.331	Mean of log Data	0.67
Median	2.68	SD of log Data	1.225

SD	3.269		
Coefficient of Variation	0.981		
Skewness	2.631		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.16	Lilliefors Test Statistic	0.155
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.751	95% H-UCL	5.182
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.311
95% Adjusted-CLT UCL	3.804	97.5% Chebyshev (MVUE) UCL	7.266
95% Modified-t UCL	3.76	99% Chebyshev (MVUE) UCL	9.141
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.057	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.15		
nu star	351.1		
Approximate Chi Square Value (.05)	308.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	3.749
Adjusted Chi Square Value	308.3	95% Jackknife UCL	3.751
		95% Standard Bootstrap UCL	3.736
Anderson-Darling Test Statistic	1.15	95% Bootstrap-t UCL	3.826
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	3.838
Kolmogorov-Smirnov Test Statistic	0.0872	95% Percentile Bootstrap UCL	3.765
Kolmogorov-Smirnov 5% Critical Value	0.0744	95% BCA Bootstrap UCL	3.782
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.437
		97.5% Chebyshev(Mean, Sd) UCL	4.916
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.856
95% Approximate Gamma UCL	3.789		
95% Adjusted Gamma UCL	3.793		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	4.916

Result or 1/2 SDL (barium)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	135

Raw Statistics		Log-transformed Statistics	
Minimum	18.6	Minimum of Log Data	2.923
Maximum	2180	Maximum of Log Data	7.687
Mean	237.4	Mean of log Data	5.104
Median	139.5	SD of log Data	0.789
SD	274.8		
Coefficient of Variation	1.158		
Skewness	3.69		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.276	Lilliefors Test Statistic	0.126
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	272.7	95% H-UCL	254.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	292.4
95% Adjusted-CLT UCL	279	97.5% Chebyshev (MVUE) UCL	321.9
95% Modified-t UCL	273.7	99% Chebyshev (MVUE) UCL	379.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.489	Data do not follow a Discernable Distribution (0.05)	
Theta Star	159.4		
nu star	494.5		
Approximate Chi Square Value (.05)	443.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	272.5
Adjusted Chi Square Value	443.5	95% Jackknife UCL	272.7
		95% Standard Bootstrap UCL	271.5
Anderson-Darling Test Statistic	7.901	95% Bootstrap-t UCL	282.1
Anderson-Darling 5% Critical Value	0.771	95% Hall's Bootstrap UCL	283.4
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	274.8
Kolmogorov-Smirnov 5% Critical Value	0.0738	95% BCA Bootstrap UCL	279.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	330.4
		97.5% Chebyshev(Mean, Sd) UCL	370.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	449.6
95% Approximate Gamma UCL	264.4		
95% Adjusted Gamma UCL	264.7		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	330.4

Result or 1/2 SDL (benzene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	78

Raw Statistics		Log-transformed Statistics	
Minimum	4.7500E-5	Minimum of Log Data	-9.955
Maximum	0.0221	Maximum of Log Data	-3.812
Mean	0.0040	Mean of log Data	-5.975
Median	0.0032	SD of log Data	1.26
SD	0.0036		
Coefficient of Variation	0.883		
Skewness	2.64		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.135	Lilliefors Test Statistic	0.182
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0047	95% H-UCL	0.0079
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0098
95% Adjusted-CLT UCL	0.0048	97.5% Chebyshev (MVUE) UCL	0.0117
95% Modified-t UCL	0.0047	99% Chebyshev (MVUE) UCL	0.0153
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.16	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0035		
nu star	192.5		
Approximate Chi Square Value (.05)	161.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0047
Adjusted Chi Square Value	160.9	95% Jackknife UCL	0.0047
		95% Standard Bootstrap UCL	0.0047
Anderson-Darling Test Statistic	1.58	95% Bootstrap-t UCL	0.0049
Anderson-Darling 5% Critical Value	0.778	95% Hall's Bootstrap UCL	0.0050
Kolmogorov-Smirnov Test Statistic	0.114	95% Percentile Bootstrap UCL	0.0047
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0049
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0058
		97.5% Chebyshev(Mean, Sd) UCL	0.0065
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0080
95% Approximate Gamma UCL	0.0048		
95% Adjusted Gamma UCL	0.0048		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0065

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	110

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.415
Maximum	5.02	Maximum of Log Data	1.613
Mean	0.268	Mean of log Data	-3.885
Median	0.0054	SD of log Data	2.05
SD	0.765		
Coefficient of Variation	2.854		
Skewness	4.224		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.395	Lilliefors Test Statistic	0.315
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.366	95% H-UCL	0.281
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.347
95% Adjusted-CLT UCL	0.386	97.5% Chebyshev (MVUE) UCL	0.427
95% Modified-t UCL	0.369	99% Chebyshev (MVUE) UCL	0.584

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.272	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.986		
nu star	90.22		
Approximate Chi Square Value (.05)	69.32	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.366
Adjusted Chi Square Value	69.16	95% Jackknife UCL	0.366
		95% Standard Bootstrap UCL	0.362
Anderson-Darling Test Statistic	26.03	95% Bootstrap-t UCL	0.399
Anderson-Darling 5% Critical Value	0.881	95% Hall's Bootstrap UCL	0.394
Kolmogorov-Smirnov Test Statistic	0.324	95% Percentile Bootstrap UCL	0.37
Kolmogorov-Smirnov 5% Critical Value	0.0791	95% BCA Bootstrap UCL	0.385
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.527
		97.5% Chebyshev(Mean, Sd) UCL	0.639
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.859
95% Approximate Gamma UCL	0.349		
95% Adjusted Gamma UCL	0.35		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.859

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	137

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.419
Maximum	4.88	Maximum of Log Data	1.585
Mean	0.347	Mean of log Data	-3.193
Median	0.0253	SD of log Data	2.033
SD	0.856		
Coefficient of Variation	2.468		
Skewness	3.524		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.348	Lilliefors Test Statistic	0.137
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.457	95% H-UCL	0.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.666
95% Adjusted-CLT UCL	0.475	97.5% Chebyshev (MVUE) UCL	0.819
95% Modified-t UCL	0.46	99% Chebyshev (MVUE) UCL	1.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.318	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.09		
nu star	105.6		

Approximate Chi Square Value (.05)	82.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.456
Adjusted Chi Square Value	82.71	95% Jackknife UCL	0.457
		95% Standard Bootstrap UCL	0.456
Anderson-Darling Test Statistic	13.58	95% Bootstrap-t UCL	0.481
Anderson-Darling 5% Critical Value	0.864	95% Hall's Bootstrap UCL	0.476
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	0.46
Kolmogorov-Smirnov 5% Critical Value	0.0784	95% BCA Bootstrap UCL	0.482
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.636
		97.5% Chebyshev(Mean, Sd) UCL	0.762
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.008
95% Approximate Gamma UCL	0.442		
95% Adjusted Gamma UCL	0.443		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.008

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	145

Raw Statistics		Log-transformed Statistics	
Minimum	0.0033	Minimum of Log Data	-5.688
Maximum	5.97	Maximum of Log Data	1.787
Mean	0.466	Mean of log Data	-2.669
Median	0.0825	SD of log Data	2.179
SD	1.023		
Coefficient of Variation	2.192		
Skewness	3.432		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.325	Lilliefors Test Statistic	0.16
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.598	95% H-UCL	1.322
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.605
95% Adjusted-CLT UCL	0.62	97.5% Chebyshev (MVUE) UCL	1.992
95% Modified-t UCL	0.601	99% Chebyshev (MVUE) UCL	2.752
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.35	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.332		
nu star	116.2		
Approximate Chi Square Value (.05)	92.33	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.597
Adjusted Chi Square Value	92.15	95% Jackknife UCL	0.598
		95% Standard Bootstrap UCL	0.6
Anderson-Darling Test Statistic	6.109	95% Bootstrap-t UCL	0.629

Anderson-Darling 5% Critical Value	0.856	95% Hall's Bootstrap UCL	0.624
Kolmogorov-Smirnov Test Statistic	0.144	95% Percentile Bootstrap UCL	0.604
Kolmogorov-Smirnov 5% Critical Value	0.0781	95% BCA Bootstrap UCL	0.609
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.812
		97.5% Chebyshev(Mean, Sd) UCL	0.962
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.256
95% Approximate Gamma UCL	0.587		
95% Adjusted Gamma UCL	0.588		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.256

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	125

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.418
Maximum	4.24	Maximum of Log Data	1.445
Mean	0.251	Mean of log Data	-3.365
Median	0.026	SD of log Data	1.982
SD	0.606		
Coefficient of Variation	2.415		
Skewness	3.815		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.342	Lilliefors Test Statistic	0.221
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.329	95% H-UCL	0.401
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.497
95% Adjusted-CLT UCL	0.343	97.5% Chebyshev (MVUE) UCL	0.609
95% Modified-t UCL	0.331	99% Chebyshev (MVUE) UCL	0.83
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.338	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.742		
nu star	112.4		
Approximate Chi Square Value (.05)	88.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.328
Adjusted Chi Square Value	88.72	95% Jackknife UCL	0.329
		95% Standard Bootstrap UCL	0.331
Anderson-Darling Test Statistic	13.2	95% Bootstrap-t UCL	0.352
Anderson-Darling 5% Critical Value	0.859	95% Hall's Bootstrap UCL	0.347
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	0.329
Kolmogorov-Smirnov 5% Critical Value	0.0782	95% BCA Bootstrap UCL	0.342
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.456
		97.5% Chebyshev(Mean, Sd) UCL	0.545

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.719
95% Approximate Gamma UCL	0.317		
95% Adjusted Gamma UCL	0.318		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.545

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	92

Raw Statistics		Log-transformed Statistics	
Minimum	0.0068	Minimum of Log Data	-4.984
Maximum	4.25	Maximum of Log Data	1.447
Mean	0.157	Mean of log Data	-3.763
Median	0.0082	SD of log Data	1.667
SD	0.457		
Coefficient of Variation	2.917		
Skewness	5.523		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.372	Lilliefors Test Statistic	0.335
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.215	95% H-UCL	0.134
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.168
95% Adjusted-CLT UCL	0.231	97.5% Chebyshev (MVUE) UCL	0.201
95% Modified-t UCL	0.218	99% Chebyshev (MVUE) UCL	0.266
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.35	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.448		
nu star	116.1		
Approximate Chi Square Value (.05)	92.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.215
Adjusted Chi Square Value	92.03	95% Jackknife UCL	0.215
		95% Standard Bootstrap UCL	0.212
Anderson-Darling Test Statistic	26.6	95% Bootstrap-t UCL	0.241
Anderson-Darling 5% Critical Value	0.856	95% Hall's Bootstrap UCL	0.263
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	0.219
Kolmogorov-Smirnov 5% Critical Value	0.0781	95% BCA Bootstrap UCL	0.234
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.311
		97.5% Chebyshev(Mean, Sd) UCL	0.378
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.509
95% Approximate Gamma UCL	0.197		
95% Adjusted Gamma UCL	0.197		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.378

Result or 1/2 SDL (beryllium)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	86

Raw Statistics		Log-transformed Statistics	
Minimum	0.0015	Minimum of Log Data	-6.47
Maximum	4.6	Maximum of Log Data	1.526
Mean	0.465	Mean of log Data	-1.111
Median	0.415	SD of log Data	1.003
SD	0.42		
Coefficient of Variation	0.903		
Skewness	5.93		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.153	Lilliefors Test Statistic	0.151
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.519	95% H-UCL	0.644
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.764
95% Adjusted-CLT UCL	0.534	97.5% Chebyshev (MVUE) UCL	0.86
95% Modified-t UCL	0.521	99% Chebyshev (MVUE) UCL	1.049
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.57	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.296		
nu star	521.2		
Approximate Chi Square Value (.05)	469.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.518
Adjusted Chi Square Value	468.9	95% Jackknife UCL	0.519
		95% Standard Bootstrap UCL	0.518
Anderson-Darling Test Statistic	2.638	95% Bootstrap-t UCL	0.544
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	0.772
Kolmogorov-Smirnov Test Statistic	0.0955	95% Percentile Bootstrap UCL	0.52
Kolmogorov-Smirnov 5% Critical Value	0.0737	95% BCA Bootstrap UCL	0.535
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.607
		97.5% Chebyshev(Mean, Sd) UCL	0.668
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.789
95% Approximate Gamma UCL	0.516		
95% Adjusted Gamma UCL	0.517		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.668

Result or 1/2 SDL (biphenyl)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	69

Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.318
Maximum	1.02	Maximum of Log Data	0.0198
Mean	0.0219	Mean of log Data	-4.728
Median	0.0057	SD of log Data	0.949
SD	0.085		
Coefficient of Variation	3.873		
Skewness	10.41		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.421	Lilliefors Test Statistic	0.405
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0328	95% H-UCL	0.0162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0191
95% Adjusted-CLT UCL	0.0385	97.5% Chebyshev (MVUE) UCL	0.0214
95% Modified-t UCL	0.0337	99% Chebyshev (MVUE) UCL	0.0259
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.662	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0332		
nu star	219.7		
Approximate Chi Square Value (.05)	186.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0328
Adjusted Chi Square Value	186.1	95% Jackknife UCL	0.0328
		95% Standard Bootstrap UCL	0.0328
Anderson-Darling Test Statistic	33.77	95% Bootstrap-t UCL	0.0641
Anderson-Darling 5% Critical Value	0.804	95% Hall's Bootstrap UCL	0.0786
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	0.0344
Kolmogorov-Smirnov 5% Critical Value	0.0757	95% BCA Bootstrap UCL	0.0415
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0507
		97.5% Chebyshev(Mean, Sd) UCL	0.0631
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0875
95% Approximate Gamma UCL	0.0259		
95% Adjusted Gamma UCL	0.0259		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0507

Result or 1/2 SDL (boron)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	114

Raw Statistics		Log-transformed Statistics	
Minimum	0.475	Minimum of Log Data	-0.744
Maximum	54.4	Maximum of Log Data	3.996

Mean	4.811	Mean of log Data	0.742
Median	1.475	SD of log Data	1.361
SD	6.242		
Coefficient of Variation	1.298		
Skewness	3.515		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.244	Lilliefors Test Statistic	0.253
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.612	95% H-UCL	6.904
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.515
95% Adjusted-CLT UCL	5.749	97.5% Chebyshev (MVUE) UCL	9.929
95% Modified-t UCL	5.634	99% Chebyshev (MVUE) UCL	12.71
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.716	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.716		
nu star	237.8		
Approximate Chi Square Value (.05)	203.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	5.608
Adjusted Chi Square Value	202.9	95% Jackknife UCL	5.612
		95% Standard Bootstrap UCL	5.63
Anderson-Darling Test Statistic	11.51	95% Bootstrap-t UCL	5.814
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	5.949
Kolmogorov-Smirnov Test Statistic	0.252	95% Percentile Bootstrap UCL	5.594
Kolmogorov-Smirnov 5% Critical Value	0.0754	95% BCA Bootstrap UCL	5.756
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.923
		97.5% Chebyshev(Mean, Sd) UCL	7.837
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.632
95% Approximate Gamma UCL	5.633		
95% Adjusted Gamma UCL	5.64		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	7.837

Result or 1/2 SDL (butyl benzyl phthalate)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	69

Raw Statistics		Log-transformed Statistics	
Minimum	0.0054	Minimum of Log Data	-5.212
Maximum	0.617	Maximum of Log Data	-0.483
Mean	0.0203	Mean of log Data	-4.633
Median	0.0064	SD of log Data	0.906
SD	0.0558		
Coefficient of Variation	2.752		
Skewness	8.42		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.395	Lilliefors Test Statistic	0.392
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0274	95% H-UCL	0.017
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0199
95% Adjusted-CLT UCL	0.0304	97.5% Chebyshev (MVUE) UCL	0.0222
95% Modified-t UCL	0.0279	99% Chebyshev (MVUE) UCL	0.0266
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.797	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0255		
nu star	264.5		
Approximate Chi Square Value (.05)	227.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0274
Adjusted Chi Square Value	227.5	95% Jackknife UCL	0.0274
		95% Standard Bootstrap UCL	0.0273
Anderson-Darling Test Statistic	32.49	95% Bootstrap-t UCL	0.0361
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	0.058
Kolmogorov-Smirnov Test Statistic	0.418	95% Percentile Bootstrap UCL	0.0288
Kolmogorov-Smirnov 5% Critical Value	0.0751	95% BCA Bootstrap UCL	0.0313
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0392
		97.5% Chebyshev(Mean, Sd) UCL	0.0473
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0634
95% Approximate Gamma UCL	0.0235		
95% Adjusted Gamma UCL	0.0236		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0392

Result or 1/2 SDL (cadmium)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	76
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0085	Minimum of Log Data	-4.768
Maximum	9.71	Maximum of Log Data	2.273
Mean	0.335	Mean of log Data	-2.576
Median	0.11	SD of log Data	1.888
SD	0.859		
Coefficient of Variation	2.561		
Skewness	8.46		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.352	Lilliefors Test Statistic	0.227
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.446	95% H-UCL	0.709
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.884
95% Adjusted-CLT UCL	0.492	97.5% Chebyshev (MVUE) UCL	1.077
95% Modified-t UCL	0.453	99% Chebyshev (MVUE) UCL	1.454
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.433	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.773		
nu star	143.9		
Approximate Chi Square Value (.05)	117.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.445
Adjusted Chi Square Value	117	95% Jackknife UCL	0.446
		95% Standard Bootstrap UCL	0.446
Anderson-Darling Test Statistic	8.005	95% Bootstrap-t UCL	0.55
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.893
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	0.452
Kolmogorov-Smirnov 5% Critical Value	0.0772	95% BCA Bootstrap UCL	0.511
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.626
		97.5% Chebyshev(Mean, Sd) UCL	0.751
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.998
95% Approximate Gamma UCL	0.412		
95% Adjusted Gamma UCL	0.412		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.751

Result or 1/2 SDL (carbazole)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	112

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.444
Maximum	1.54	Maximum of Log Data	0.432
Mean	0.0459	Mean of log Data	-4.438
Median	0.0052	SD of log Data	1.335
SD	0.148		
Coefficient of Variation	3.227		
Skewness	7.508		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.389	Lilliefors Test Statistic	0.328
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0649	95% H-UCL	0.0372
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0458

95% Adjusted-CLT UCL	0.0719	97.5% Chebyshev (MVUE) UCL	0.0533
95% Modified-t UCL	0.066	99% Chebyshev (MVUE) UCL	0.068
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.468	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0981		
nu star	155.3		
Approximate Chi Square Value (.05)	127.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0648
Adjusted Chi Square Value	127.3	95% Jackknife UCL	0.0649
		95% Standard Bootstrap UCL	0.0653
Anderson-Darling Test Statistic	24.68	95% Bootstrap-t UCL	0.0833
Anderson-Darling 5% Critical Value	0.827	95% Hall's Bootstrap UCL	0.137
Kolmogorov-Smirnov Test Statistic	0.334	95% Percentile Bootstrap UCL	0.0656
Kolmogorov-Smirnov 5% Critical Value	0.0769	95% BCA Bootstrap UCL	0.0769
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.096
		97.5% Chebyshev(Mean, Sd) UCL	0.118
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.16
95% Approximate Gamma UCL	0.0559		
95% Adjusted Gamma UCL	0.056		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.118

Result or 1/2 SDL (carbon disulfide)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	52

Raw Statistics		**Log-transformed Statistics**	
Minimum	2.5000E-5	Minimum of Log Data	-10.6
Maximum	0.028	Maximum of Log Data	-3.576
Mean	0.0012	Mean of log Data	-8.944
Median	5.1000E-5	SD of log Data	1.844
SD	0.0039		
Coefficient of Variation	3.144		
Skewness	5.355		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.387	Lilliefors Test Statistic	0.389
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0019	95% H-UCL	0.0013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0022	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0020	99% Chebyshev (MVUE) UCL	0.0027
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.3	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0042		
nu star	49.81		
Approximate Chi Square Value (.05)	34.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0019
Adjusted Chi Square Value	34.38	95% Jackknife UCL	0.0019
		95% Standard Bootstrap UCL	0.0019
Anderson-Darling Test Statistic	16.26	95% Bootstrap-t UCL	0.0031
Anderson-Darling 5% Critical Value	0.865	95% Hall's Bootstrap UCL	0.0053
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0020
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0023
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0031
		97.5% Chebyshev(Mean, Sd) UCL	0.004
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0056
95% Approximate Gamma UCL	0.0018		
95% Adjusted Gamma UCL	0.0018		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.004

Result or 1/2 SDL (chromium)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	144

Raw Statistics		Log-transformed Statistics	
Minimum	2.03	Minimum of Log Data	0.708
Maximum	136	Maximum of Log Data	4.913
Mean	13.53	Mean of log Data	2.41
Median	10.55	SD of log Data	0.582
SD	12.49		
Coefficient of Variation	0.923		
Skewness	6.346		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.215	Lilliefors Test Statistic	0.0792
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.13	95% H-UCL	14.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.96
95% Adjusted-CLT UCL	15.63	97.5% Chebyshev (MVUE) UCL	17.17
95% Modified-t UCL	15.21	99% Chebyshev (MVUE) UCL	19.54
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.677	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.053		
nu star	888.9		
Approximate Chi Square Value (.05)	820.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	15.12
Adjusted Chi Square Value	820.1	95% Jackknife UCL	15.13

		95% Standard Bootstrap UCL	15.12
Anderson-Darling Test Statistic	3.733	95% Bootstrap-t UCL	16.06
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	22.32
Kolmogorov-Smirnov Test Statistic	0.112	95% Percentile Bootstrap UCL	15.26
Kolmogorov-Smirnov 5% Critical Value	0.073	95% BCA Bootstrap UCL	15.89
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.75
		97.5% Chebyshev(Mean, Sd) UCL	19.58
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.17
95% Approximate Gamma UCL	14.65		
95% Adjusted Gamma UCL	14.66		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	17.75

Result or 1/2 SDL (chrysene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	151

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.47
Maximum	4.87	Maximum of Log Data	1.583
Mean	0.327	Mean of log Data	-3.244
Median	0.0291	SD of log Data	2.065
SD	0.79		
Coefficient of Variation	2.415		
Skewness	3.488		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.347	Lilliefors Test Statistic	0.14
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.429	95% H-UCL	0.555
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.683
95% Adjusted-CLT UCL	0.446	97.5% Chebyshev (MVUE) UCL	0.841
95% Modified-t UCL	0.432	99% Chebyshev (MVUE) UCL	1.153
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.319	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.027		
nu star	105.9		
Approximate Chi Square Value (.05)	83.11	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.428
Adjusted Chi Square Value	82.93	95% Jackknife UCL	0.429
		95% Standard Bootstrap UCL	0.43
Anderson-Darling Test Statistic	12.67	95% Bootstrap-t UCL	0.449
Anderson-Darling 5% Critical Value	0.864	95% Hall's Bootstrap UCL	0.452
Kolmogorov-Smirnov Test Statistic	0.207	95% Percentile Bootstrap UCL	0.438
Kolmogorov-Smirnov 5% Critical Value	0.0784	95% BCA Bootstrap UCL	0.453

Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.595
		97.5% Chebyshev(Mean, Sd) UCL	0.711
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.938
95% Approximate Gamma UCL	0.417		
95% Adjusted Gamma UCL	0.418		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.938

Result or 1/2 SDL (cobalt)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	146

Raw Statistics		Log-transformed Statistics	
Minimum	0.0125	Minimum of Log Data	-4.382
Maximum	16	Maximum of Log Data	2.773
Mean	4.144	Mean of log Data	1.255
Median	3.965	SD of log Data	0.754
SD	2.047		
Coefficient of Variation	0.494		
Skewness	1.346		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0667	Lilliefors Test Statistic	0.143
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.407	95% H-UCL	5.234
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.989
95% Adjusted-CLT UCL	4.423	97.5% Chebyshev (MVUE) UCL	6.567
95% Modified-t UCL	4.41	99% Chebyshev (MVUE) UCL	7.703
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.105	Data appear Normal at 5% Significance Level	
Theta Star	1.335		
nu star	1031		
Approximate Chi Square Value (.05)	957.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	4.406
Adjusted Chi Square Value	956.8	95% Jackknife UCL	4.407
		95% Standard Bootstrap UCL	4.41
Anderson-Darling Test Statistic	2.317	95% Bootstrap-t UCL	4.422
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	4.447
Kolmogorov-Smirnov Test Statistic	0.0839	95% Percentile Bootstrap UCL	4.392
Kolmogorov-Smirnov 5% Critical Value	0.0729	95% BCA Bootstrap UCL	4.432
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.837
		97.5% Chebyshev(Mean, Sd) UCL	5.137
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.725
95% Approximate Gamma UCL	4.462		
95% Adjusted Gamma UCL	4.465		

Potential UCL to Use		Use 95% Student's-t UCL	4.407

Result or 1/2 SDL (copper)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	147

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	487	Maximum of Log Data	6.188
Mean	24.26	Mean of log Data	2.524
Median	11.85	SD of log Data	1.207
SD	46.76		
Coefficient of Variation	1.928		
Skewness	6.907		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.302	Lilliefors Test Statistic	0.17
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30.26	95% H-UCL	32.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.17
95% Adjusted-CLT UCL	32.31	97.5% Chebyshev (MVUE) UCL	45.02
95% Modified-t UCL	30.58	99% Chebyshev (MVUE) UCL	56.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.89		
nu star	288.8		
Approximate Chi Square Value (.05)	250.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	30.23
Adjusted Chi Square Value	250.1	95% Jackknife UCL	30.26
		95% Standard Bootstrap UCL	30.08
Anderson-Darling Test Statistic	7.347	95% Bootstrap-t UCL	34.38
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	54.38
Kolmogorov-Smirnov Test Statistic	0.163	95% Percentile Bootstrap UCL	30.56
Kolmogorov-Smirnov 5% Critical Value	0.0749	95% BCA Bootstrap UCL	33.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.08
		97.5% Chebyshev(Mean, Sd) UCL	46.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	60.37
95% Approximate Gamma UCL	27.97		
95% Adjusted Gamma UCL	28.01		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	46.92

Result or 1/2 SDL (cyclohexane)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	74

Raw Statistics		Log-transformed Statistics	
Minimum	4.4350E-4	Minimum of Log Data	-7.721
Maximum	21.7	Maximum of Log Data	3.077
Mean	0.266	Mean of log Data	-6.38
Median	0.0014	SD of log Data	1.598
SD	2.381		
Coefficient of Variation	8.952		
Skewness	9.11		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.517	Lilliefors Test Statistic	0.265
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.701	95% H-UCL	0.0101
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0122
95% Adjusted-CLT UCL	0.975	97.5% Chebyshev (MVUE) UCL	0.0149
95% Modified-t UCL	0.744	99% Chebyshev (MVUE) UCL	0.0203
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.154	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.724		
nu star	25.61		
Approximate Chi Square Value (.05)	15.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.696
Adjusted Chi Square Value	14.94	95% Jackknife UCL	0.701
		95% Standard Bootstrap UCL	0.692
Anderson-Darling Test Statistic	25.11	95% Bootstrap-t UCL	98.46
Anderson-Darling 5% Critical Value	0.956	95% Hall's Bootstrap UCL	48.51
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	0.789
Kolmogorov-Smirnov 5% Critical Value	0.11	95% BCA Bootstrap UCL	1.052
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.405
		97.5% Chebyshev(Mean, Sd) UCL	1.898
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.867
95% Approximate Gamma UCL	0.452		
95% Adjusted Gamma UCL	0.456		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.898

R[redacted]t or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	130

Raw Statistics		Log-transformed Statistics	

Minimum	0.0042	Minimum of Log Data	-5.466
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.113	Mean of log Data	-3.906
Median	0.0052	SD of log Data	1.817
SD	0.252		
Coefficient of Variation	2.229		
Skewness	3.609		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.333	Lilliefors Test Statistic	0.325
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.146	95% H-UCL	0.159
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.199
95% Adjusted-CLT UCL	0.151	97.5% Chebyshev (MVUE) UCL	0.242
95% Modified-t UCL	0.147	99% Chebyshev (MVUE) UCL	0.324
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.298		
nu star	126.3		
Approximate Chi Square Value (.05)	101.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.145
Adjusted Chi Square Value	101.2	95% Jackknife UCL	0.146
		95% Standard Bootstrap UCL	0.146
Anderson-Darling Test Statistic	18.02	95% Bootstrap-t UCL	0.153
Anderson-Darling 5% Critical Value	0.848	95% Hall's Bootstrap UCL	0.151
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	0.148
Kolmogorov-Smirnov 5% Critical Value	0.0778	95% BCA Bootstrap UCL	0.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.199
		97.5% Chebyshev(Mean, Sd) UCL	0.236
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.308
95% Approximate Gamma UCL	0.141		
95% Adjusted Gamma UCL	0.141		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.236

Result or 1/2 SDL (dibenzofuran)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	77

Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.083
Maximum	0.821	Maximum of Log Data	-0.197
Mean	0.0309	Mean of log Data	-4.369
Median	0.0073	SD of log Data	1.051
SD	0.0826		

Coefficient of Variation	2.671		
Skewness	7.081		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.382	Lilliefors Test Statistic	0.383
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0415	95% H-UCL	0.0263
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0314
95% Adjusted-CLT UCL	0.0452	97.5% Chebyshev (MVUE) UCL	0.0356
95% Modified-t UCL	0.0421	99% Chebyshev (MVUE) UCL	0.0437
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.672	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.046		
nu star	223.1		
Approximate Chi Square Value (.05)	189.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0414
Adjusted Chi Square Value	189.2	95% Jackknife UCL	0.0415
		95% Standard Bootstrap UCL	0.0416
Anderson-Darling Test Statistic	29.15	95% Bootstrap-t UCL	0.0517
Anderson-Darling 5% Critical Value	0.803	95% Hall's Bootstrap UCL	0.0884
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	0.0425
Kolmogorov-Smirnov 5% Critical Value	0.0757	95% BCA Bootstrap UCL	0.0466
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0588
		97.5% Chebyshev(Mean, Sd) UCL	0.0709
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0947
95% Approximate Gamma UCL	0.0364		
95% Adjusted Gamma UCL	0.0364		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0709

Result or 1/2 SDL (dieldrin)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	96

Raw Statistics		Log-transformed Statistics	
Minimum	7.0000E-5	Minimum of Log Data	-9.567
Maximum	0.0205	Maximum of Log Data	-3.887
Mean	9.0075E-4	Mean of log Data	-8.536
Median	8.5500E-5	SD of log Data	1.433
SD	0.0025		
Coefficient of Variation	2.865		
Skewness	5.111		

Relevant UCL Statistics

Normal Distribution Test	Lognormal Distribution Test

Lilliefors Test Statistic	0.374	Lilliefors Test Statistic	0.346
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0012	95% H-UCL	7.2952E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.0453E-4
95% Adjusted-CLT UCL	0.0013	97.5% Chebyshev (MVUE) UCL	0.0010
95% Modified-t UCL	0.0012	99% Chebyshev (MVUE) UCL	0.0013
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.424	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0021		
nu star	140.6		
Approximate Chi Square Value (.05)	114.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0012
Adjusted Chi Square Value	114	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	27.17	95% Bootstrap-t UCL	0.0014
Anderson-Darling 5% Critical Value	0.838	95% Hall's Bootstrap UCL	0.0013
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	0.0012
Kolmogorov-Smirnov 5% Critical Value	0.0773	95% BCA Bootstrap UCL	0.0013
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0017
		97.5% Chebyshev(Mean, Sd) UCL	0.0021
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0028
95% Approximate Gamma UCL	0.0011		
95% Adjusted Gamma UCL	0.0011		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0021

Result or 1/2 SDL (di-n-butyl phthalate)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	89
Raw Statistics		Log-transformed Statistics	
Minimum	0.0126	Minimum of Log Data	-4.378
Maximum	0.753	Maximum of Log Data	-0.284
Mean	0.0391	Mean of log Data	-3.85
Median	0.0146	SD of log Data	0.856
SD	0.0785		
Coefficient of Variation	2.007		
Skewness	5.86		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.405	Lilliefors Test Statistic	0.398
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	

95% Student's-t UCL	0.0492	95% H-UCL	0.0352
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0409
95% Adjusted-CLT UCL	0.0521	97.5% Chebyshev (MVUE) UCL	0.0453
95% Modified-t UCL	0.0497	99% Chebyshev (MVUE) UCL	0.054
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.941	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0416		
nu star	312.3		
Approximate Chi Square Value (.05)	272.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0491
Adjusted Chi Square Value	272.1	95% Jackknife UCL	0.0492
		95% Standard Bootstrap UCL	0.0492
Anderson-Darling Test Statistic	34.67	95% Bootstrap-t UCL	0.0549
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	0.0617
Kolmogorov-Smirnov Test Statistic	0.428	95% Percentile Bootstrap UCL	0.0497
Kolmogorov-Smirnov 5% Critical Value	0.0747	95% BCA Bootstrap UCL	0.0524
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0657
		97.5% Chebyshev(Mean, Sd) UCL	0.0772
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0998
95% Approximate Gamma UCL	0.0448		
95% Adjusted Gamma UCL	0.0449		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0657

Result or 1/2 SDL (endosulfan sulfate)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	105

Raw Statistics		**Log-transformed Statistics**	
Minimum	1.3250E-4	Minimum of Log Data	-8.929
Maximum	0.0713	Maximum of Log Data	-2.641
Mean	0.0013	Mean of log Data	-8.164
Median	1.5825E-4	SD of log Data	1.216
SD	0.0061		
Coefficient of Variation	4.659		
Skewness	9.667		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.423	Lilliefors Test Statistic	0.372
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0021	95% H-UCL	7.4558E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.0731E-4
95% Adjusted-CLT UCL	0.0024	97.5% Chebyshev (MVUE) UCL	0.0010
95% Modified-t UCL	0.0021	99% Chebyshev (MVUE) UCL	0.0013

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.422	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0031		
nu star	140		
Approximate Chi Square Value (.05)	113.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0021
Adjusted Chi Square Value	113.5	95% Jackknife UCL	0.0021
		95% Standard Bootstrap UCL	0.0021
Anderson-Darling Test Statistic	34.91	95% Bootstrap-t UCL	0.0036
Anderson-Darling 5% Critical Value	0.838	95% Hall's Bootstrap UCL	0.0048
Kolmogorov-Smirnov Test Statistic	0.398	95% Percentile Bootstrap UCL	0.0021
Kolmogorov-Smirnov 5% Critical Value	0.0774	95% BCA Bootstrap UCL	0.0026
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0033
		97.5% Chebyshev(Mean, Sd) UCL	0.0042
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0060
95% Approximate Gamma UCL	0.0016		
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0042

Result or 1/2 SDL (endrin aldehyde)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	117

Raw Statistics		Log-transformed Statistics	
Minimum	1.6800E-4	Minimum of Log Data	-8.692
Maximum	0.0738	Maximum of Log Data	-2.606
Mean	0.0019	Mean of log Data	-7.839
Median	2.0050E-4	SD of log Data	1.344
SD	0.0073		
Coefficient of Variation	3.692		
Skewness	7.123		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.402	Lilliefors Test Statistic	0.383
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0029	95% H-UCL	0.0012
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0032	97.5% Chebyshev (MVUE) UCL	0.0018
95% Modified-t UCL	0.0029	99% Chebyshev (MVUE) UCL	0.0023

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0049		
nu star	133.4		
Approximate Chi Square Value (.05)	107.7	Nonparametric Statistics	

Adjusted Level of Significance	0.0486	95% CLT UCL	0.0029
Adjusted Chi Square Value	107.5	95% Jackknife UCL	0.0029
		95% Standard Bootstrap UCL	0.0029
Anderson-Darling Test Statistic	33.76	95% Bootstrap-t UCL	0.0036
Anderson-Darling 5% Critical Value	0.843	95% Hall's Bootstrap UCL	0.0062
Kolmogorov-Smirnov Test Statistic	0.409	95% Percentile Bootstrap UCL	0.003
Kolmogorov-Smirnov 5% Critical Value	0.0776	95% BCA Bootstrap UCL	0.0032
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0044
		97.5% Chebyshev(Mean, Sd) UCL	0.0055
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0076
95% Approximate Gamma UCL	0.0024		
95% Adjusted Gamma UCL	0.0024		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0055

Result or 1/2 SDL (endrin ketone)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	121

Raw Statistics		Log-transformed Statistics	
Minimum	2.1300E-4	Minimum of Log Data	-8.454
Maximum	0.0241	Maximum of Log Data	-3.726
Mean	0.0013	Mean of log Data	-7.664
Median	2.5250E-4	SD of log Data	1.185
SD	0.0032		
Coefficient of Variation	2.337		
Skewness	4.403		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.362	Lilliefors Test Statistic	0.376
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0017	95% H-UCL	0.0011
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0014
95% Adjusted-CLT UCL	0.0018	97.5% Chebyshev (MVUE) UCL	0.0016
95% Modified-t UCL	0.0018	99% Chebyshev (MVUE) UCL	0.0020
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.571	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0024		
nu star	189.7		
Approximate Chi Square Value (.05)	158.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0017
Adjusted Chi Square Value	158.6	95% Jackknife UCL	0.0017
		95% Standard Bootstrap UCL	0.0017
Anderson-Darling Test Statistic	30.37	95% Bootstrap-t UCL	0.0019
Anderson-Darling 5% Critical Value	0.813	95% Hall's Bootstrap UCL	0.0019

Kolmogorov-Smirnov Test Statistic	0.398	95% Percentile Bootstrap UCL	0.0017
Kolmogorov-Smirnov 5% Critical Value	0.0762	95% BCA Bootstrap UCL	0.0018
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0024
		97.5% Chebyshev(Mean, Sd) UCL	0.0029
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0038
95% Approximate Gamma UCL	0.0016		
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0029

Result or 1/2 SDL (ethylbenzene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	74

Raw Statistics		Log-transformed Statistics	
Minimum	7.7000E-5	Minimum of Log Data	-9.472
Maximum	0.105	Maximum of Log Data	-2.254
Mean	0.0038	Mean of log Data	-7.113
Median	0.0016	SD of log Data	1.759
SD	0.0129		
Coefficient of Variation	3.35		
Skewness	6.622		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.392	Lilliefors Test Statistic	0.2
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0062	95% H-UCL	0.0069
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0081
95% Adjusted-CLT UCL	0.0072	97.5% Chebyshev (MVUE) UCL	0.0101
95% Modified-t UCL	0.0063	99% Chebyshev (MVUE) UCL	0.014
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.413	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0093		
nu star	68.55		
Approximate Chi Square Value (.05)	50.49	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0061
Adjusted Chi Square Value	50.22	95% Jackknife UCL	0.0062
		95% Standard Bootstrap UCL	0.0061
Anderson-Darling Test Statistic	5.613	95% Bootstrap-t UCL	0.0094
Anderson-Darling 5% Critical Value	0.838	95% Hall's Bootstrap UCL	0.0082
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	0.0064
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.0074
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.01
		97.5% Chebyshev(Mean, Sd) UCL	0.0127
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0179

95% Approximate Gamma UCL	0.0052		
95% Adjusted Gamma UCL	0.0052		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0127

Result or 1/2 SDL (fluoranthene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	131

Raw Statistics		Log-transformed Statistics	
Minimum	0.0053	Minimum of Log Data	-5.231
Maximum	14.2	Maximum of Log Data	2.653
Mean	0.594	Mean of log Data	-2.889
Median	0.0409	SD of log Data	2.179
SD	1.674		
Coefficient of Variation	2.82		
Skewness	5.022		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.363	Lilliefors Test Statistic	0.148
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.809	95% H-UCL	1.062
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.289
95% Adjusted-CLT UCL	0.861	97.5% Chebyshev (MVUE) UCL	1.6
95% Modified-t UCL	0.817	99% Chebyshev (MVUE) UCL	2.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.291	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.039		
nu star	96.67		
Approximate Chi Square Value (.05)	74.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.807
Adjusted Chi Square Value	74.82	95% Jackknife UCL	0.809
		95% Standard Bootstrap UCL	0.811
Anderson-Darling Test Statistic	13.04	95% Bootstrap-t UCL	0.906
Anderson-Darling 5% Critical Value	0.872	95% Hall's Bootstrap UCL	0.935
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	0.823
Kolmogorov-Smirnov 5% Critical Value	0.0788	95% BCA Bootstrap UCL	0.89
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.16
		97.5% Chebyshev(Mean, Sd) UCL	1.405
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.886
95% Approximate Gamma UCL	0.765		
95% Adjusted Gamma UCL	0.767		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.886

Result or 1/2 SDL (fluorene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	120

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.449
Maximum	1.11	Maximum of Log Data	0.104
Mean	0.0442	Mean of log Data	-4.461
Median	0.0051	SD of log Data	1.337
SD	0.129		
Coefficient of Variation	2.919		
Skewness	5.759		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.379	Lilliefors Test Statistic	0.34
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0607	95% H-UCL	0.0365
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0449
95% Adjusted-CLT UCL	0.0654	97.5% Chebyshev (MVUE) UCL	0.0523
95% Modified-t UCL	0.0615	99% Chebyshev (MVUE) UCL	0.0667
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.472	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0935		
nu star	156.9		
Approximate Chi Square Value (.05)	128.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0606
Adjusted Chi Square Value	128.7	95% Jackknife UCL	0.0607
		95% Standard Bootstrap UCL	0.0605
Anderson-Darling Test Statistic	25.32	95% Bootstrap-t UCL	0.069
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.0687
Kolmogorov-Smirnov Test Statistic	0.349	95% Percentile Bootstrap UCL	0.0617
Kolmogorov-Smirnov 5% Critical Value	0.0768	95% BCA Bootstrap UCL	0.065
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0878
		97.5% Chebyshev(Mean, Sd) UCL	0.107
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.144
95% Approximate Gamma UCL	0.0538		
95% Adjusted Gamma UCL	0.0539		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.107

Result or 1/2 SDL (gamma-chlordane)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	95

Raw Statistics		Log-transformed Statistics	
Minimum	1.1000E-4	Minimum of Log Data	-9.115
Maximum	0.0156	Maximum of Log Data	-4.16
Mean	6.9043E-4	Mean of log Data	-8.462
Median	1.3050E-4	SD of log Data	1.117
SD	0.0020		
Coefficient of Variation	3.004		
Skewness	5.46		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.403	Lilliefors Test Statistic	0.401
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.5669E-4	95% H-UCL	4.8009E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.7780E-4
95% Adjusted-CLT UCL	0.0010	97.5% Chebyshev (MVUE) UCL	6.5819E-4
95% Modified-t UCL	9.6806E-4	99% Chebyshev (MVUE) UCL	8.1611E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.526	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
nu star	174.6		
Approximate Chi Square Value (.05)	145	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	9.5520E-4
Adjusted Chi Square Value	144.8	95% Jackknife UCL	9.5669E-4
		95% Standard Bootstrap UCL	9.5122E-4
Anderson-Darling Test Statistic	37.97	95% Bootstrap-t UCL	0.0011
Anderson-Darling 5% Critical Value	0.817	95% Hall's Bootstrap UCL	0.0010
Kolmogorov-Smirnov Test Statistic	0.436	95% Percentile Bootstrap UCL	9.6795E-4
Kolmogorov-Smirnov 5% Critical Value	0.0764	95% BCA Bootstrap UCL	0.0010
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0013
		97.5% Chebyshev(Mean, Sd) UCL	0.0017
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0022
95% Approximate Gamma UCL	8.3116E-4		
95% Adjusted Gamma UCL	8.3251E-4		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0017

Result or 1/2 SDL (heptachlorobiphenyl (170))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	5.4000E-5	Minimum of Log Data	-9.827
Maximum	0.0112	Maximum of Log Data	-4.492
Mean	5.0765E-4	Mean of log Data	-9.29

Median	6.0500E-5	SD of log Data	1.109
SD	0.0021		
Coefficient of Variation	4.214		
Skewness	5.179		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.22	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0012	95% H-UCL	3.0157E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.4359E-4
95% Adjusted-CLT UCL	0.0016	97.5% Chebyshev (MVUE) UCL	4.2093E-4
95% Modified-t UCL	0.0012	99% Chebyshev (MVUE) UCL	5.7284E-4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.37	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
nu star	19.96		
Approximate Chi Square Value (.05)	10.82	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0011
Adjusted Chi Square Value	10.39	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0011
Anderson-Darling Test Statistic	7.791	95% Bootstrap-t UCL	0.0215
Anderson-Darling 5% Critical Value	0.833	95% Hall's Bootstrap UCL	0.0127
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0023
		97.5% Chebyshev(Mean, Sd) UCL	0.0030
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0046
95% Approximate Gamma UCL	9.3640E-4		
95% Adjusted Gamma UCL	9.7515E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0046

Result or 1/2 SDL (heptachlorobiphenyl (180))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	21

Raw Statistics		Log-transformed Statistics	
Minimum	5.7500E-5	Minimum of Log Data	-9.764
Maximum	0.0183	Maximum of Log Data	-4.001
Mean	8.0478E-4	Mean of log Data	-9.025
Median	6.6000E-5	SD of log Data	1.215
SD	0.0035		
Coefficient of Variation	4.347		
Skewness	5.186		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.219	Shapiro Wilk Test Statistic	0.6
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0019	95% H-UCL	4.8616E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.3266E-4
95% Adjusted-CLT UCL	0.0026	97.5% Chebyshev (MVUE) UCL	6.5892E-4
95% Modified-t UCL	0.0020	99% Chebyshev (MVUE) UCL	9.0693E-4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.339	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0023		
nu star	18.3		
Approximate Chi Square Value (.05)	9.605	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0019
Adjusted Chi Square Value	9.203	95% Jackknife UCL	0.0019
		95% Standard Bootstrap UCL	0.0018
Anderson-Darling Test Statistic	6.864	95% Bootstrap-t UCL	0.0297
Anderson-Darling 5% Critical Value	0.841	95% Hall's Bootstrap UCL	0.0148
Kolmogorov-Smirnov Test Statistic	0.394	95% Percentile Bootstrap UCL	0.0021
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0028
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0037
		97.5% Chebyshev(Mean, Sd) UCL	0.0050
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0075
95% Approximate Gamma UCL	0.0015		
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0075

Result or 1/2 SDL (heptachlorobiphenyl (183))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.6000E-5	Minimum of Log Data	-9.626
Maximum	0.0058	Maximum of Log Data	-5.148
Mean	3.0648E-4	Mean of log Data	-9.286
Median	7.3500E-5	SD of log Data	0.928
SD	0.0011		
Coefficient of Variation	3.607		
Skewness	5.118		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.228	Shapiro Wilk Test Statistic	0.339
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.6932E-4	95% H-UCL	2.2061E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.6206E-4
95% Adjusted-CLT UCL	8.8028E-4	97.5% Chebyshev (MVUE) UCL	3.1504E-4
95% Modified-t UCL	7.0424E-4	99% Chebyshev (MVUE) UCL	4.1912E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.493	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.2145E-4		
nu star	26.63		
Approximate Chi Square Value (.05)	15.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	6.5639E-4
Adjusted Chi Square Value	15.33	95% Jackknife UCL	6.6932E-4
		95% Standard Bootstrap UCL	6.4808E-4
Anderson-Darling Test Statistic	9.122	95% Bootstrap-t UCL	0.0818
Anderson-Darling 5% Critical Value	0.805	95% Hall's Bootstrap UCL	0.0174
Kolmogorov-Smirnov Test Statistic	0.544	95% Percentile Bootstrap UCL	7.3128E-4
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	9.6457E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0012
		97.5% Chebyshev(Mean, Sd) UCL	0.0016
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0024
95% Approximate Gamma UCL	5.1442E-4		
95% Adjusted Gamma UCL	5.3225E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0012

Result or 1/2 SDL (heptachlorobiphenyl (187))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	5.1000E-5	Minimum of Log Data	-9.884
Maximum	0.0134	Maximum of Log Data	-4.313
Mean	5.9919E-4	Mean of log Data	-9.225
Median	5.8000E-5	SD of log Data	1.173
SD	0.0025		
Coefficient of Variation	4.273		
Skewness	5.183		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.221	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0014	95% H-UCL	3.6512E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.0685E-4
95% Adjusted-CLT UCL	0.0019	97.5% Chebyshev (MVUE) UCL	5.0141E-4

95% Modified-t UCL	0.0015	99% Chebyshev (MVUE) UCL	6.8716E-4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.353	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	19.06		
Approximate Chi Square Value (.05)	10.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0014
Adjusted Chi Square Value	9.748	95% Jackknife UCL	0.0014
		95% Standard Bootstrap UCL	0.0013
Anderson-Darling Test Statistic	7.089	95% Bootstrap-t UCL	0.0208
Anderson-Darling 5% Critical Value	0.837	95% Hall's Bootstrap UCL	0.0119
Kolmogorov-Smirnov Test Statistic	0.368	95% Percentile Bootstrap UCL	0.0015
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0027
		97.5% Chebyshev(Mean, Sd) UCL	0.0036
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0055
95% Approximate Gamma UCL	0.0011		
95% Adjusted Gamma UCL	0.0011		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0055

Result or 1/2 SDL (hexachlorobiphenyl (128))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	21

Raw Statistics		Log-transformed Statistics	
Minimum	8.5500E-5	Minimum of Log Data	-9.367
Maximum	0.0083	Maximum of Log Data	-4.784
Mean	4.5378E-4	Mean of log Data	-8.867
Median	9.6000E-5	SD of log Data	0.978
SD	0.0015		
Coefficient of Variation	3.498		
Skewness	5.123		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.243	Shapiro Wilk Test Statistic	0.519
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.7482E-4	95% H-UCL	3.6365E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.2833E-4
95% Adjusted-CLT UCL	0.0012	97.5% Chebyshev (MVUE) UCL	5.1775E-4
95% Modified-t UCL	0.0010	99% Chebyshev (MVUE) UCL	6.9340E-4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.502	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.0347E-4		

nu star	27.12		
Approximate Chi Square Value (.05)	16.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	9.5626E-4
Adjusted Chi Square Value	15.71	95% Jackknife UCL	9.7482E-4
		95% Standard Bootstrap UCL	9.3325E-4
Anderson-Darling Test Statistic	7.104	95% Bootstrap-t UCL	0.0092
Anderson-Darling 5% Critical Value	0.804	95% Hall's Bootstrap UCL	0.0059
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	0.0010
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	0.0014
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0017
		97.5% Chebyshev(Mean, Sd) UCL	0.0023
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0034
95% Approximate Gamma UCL	7.5756E-4		
95% Adjusted Gamma UCL	7.8353E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0017

Result or 1/2 SDL (hexachlorobiphenyl (138))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	25

Raw Statistics		Log-transformed Statistics	
Minimum	1.2950E-4	Minimum of Log Data	-8.952
Maximum	0.0432	Maximum of Log Data	-3.142
Mean	0.0019	Mean of log Data	-8.156
Median	1.4700E-4	SD of log Data	1.28
SD	0.0082		
Coefficient of Variation	4.258		
Skewness	5.179		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.226	Shapiro Wilk Test Statistic	0.632
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0046	95% H-UCL	0.0013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0014
95% Adjusted-CLT UCL	0.0062	97.5% Chebyshev (MVUE) UCL	0.0017
95% Modified-t UCL	0.0049	99% Chebyshev (MVUE) UCL	0.0024
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.337	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0057		
nu star	18.22		
Approximate Chi Square Value (.05)	9.547	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0045
Adjusted Chi Square Value	9.146	95% Jackknife UCL	0.0046
		95% Standard Bootstrap UCL	0.0044

Anderson-Darling Test Statistic	6.365	95% Bootstrap-t UCL	0.0502
Anderson-Darling 5% Critical Value	0.841	95% Hall's Bootstrap UCL	0.0307
Kolmogorov-Smirnov Test Statistic	0.346	95% Percentile Bootstrap UCL	0.0051
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0067
Data not Gamma Distributed at 5% Significance Level		95% *Chebyshev(Mean, Sd)* UCL	0.0088
		97.5% Chebyshev(Mean, Sd) UCL	0.0119
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0177
95% Approximate Gamma UCL	0.0037		
95% Adjusted Gamma UCL	0.0038		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0177

Result or 1/2 SDL (hexachlorobiphenyl (153))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	20

Raw Statistics		Log-transformed Statistics	
Minimum	6.2500E-5	Minimum of Log Data	-9.68
Maximum	0.0501	Maximum of Log Data	-2.994
Mean	0.0026	Mean of log Data	-8.616
Median	7.0500E-5	SD of log Data	1.726
SD	0.0099		
Coefficient of Variation	3.801		
Skewness	4.646		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.287	Shapiro Wilk Test Statistic	0.653
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0058	95% H-UCL	0.0026
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0020
95% Adjusted-CLT UCL	0.0075	97.5% Chebyshev (MVUE) UCL	0.0026
95% Modified-t UCL	0.0061	99% Chebyshev (MVUE) UCL	0.0037
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.259	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	0.01		
nu star	14.01		
Approximate Chi Square Value (.05)	6.579	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0057
Adjusted Chi Square Value	6.254	95% Jackknife UCL	0.0058
		95% Standard Bootstrap UCL	0.0056
Anderson-Darling Test Statistic	6.082	95% Bootstrap-t UCL	0.0897
Anderson-Darling 5% Critical Value	0.868	95% Hall's Bootstrap UCL	0.0577
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	0.0063
Kolmogorov-Smirnov 5% Critical Value	0.184	95% BCA Bootstrap UCL	0.0093
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0109

		97.5% Chebyshev(Mean, Sd) UCL	0.0145
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0216
95% Approximate Gamma UCL	0.0055		
95% Adjusted Gamma UCL	0.0058		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0216

Result or 1/2 SDL (hexachlorobiphenyl (156))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	6.6000E-5	Minimum of Log Data	-9.626
Maximum	0.0061	Maximum of Log Data	-5.095
Mean	3.2159E-4	Mean of log Data	-9.254
Median	7.3500E-5	SD of log Data	0.942
SD	0.0011		
Coefficient of Variation	3.626		
Skewness	5.125		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.23	Shapiro Wilk Test Statistic	0.382
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.0436E-4	95% H-UCL	2.3267E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.7581E-4
95% Adjusted-CLT UCL	9.2722E-4	97.5% Chebyshev (MVUE) UCL	3.3207E-4
95% Modified-t UCL	7.4124E-4	99% Chebyshev (MVUE) UCL	4.4259E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.488	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.5941E-4		
nu star	26.34		
Approximate Chi Square Value (.05)	15.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	6.9072E-4
Adjusted Chi Square Value	15.11	95% Jackknife UCL	7.0436E-4
		95% Standard Bootstrap UCL	6.9254E-4
Anderson-Darling Test Statistic	8.678	95% Bootstrap-t UCL	0.0174
Anderson-Darling 5% Critical Value	0.805	95% Hall's Bootstrap UCL	0.0164
Kolmogorov-Smirnov Test Statistic	0.512	95% Percentile Bootstrap UCL	7.5100E-4
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	9.9581E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0013
		97.5% Chebyshev(Mean, Sd) UCL	0.0017
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0025
95% Approximate Gamma UCL	5.4159E-4		
95% Adjusted Gamma UCL	5.6048E-4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0013

[redacted] or 1/2 SDL (indeno(1,2,3-cd)pyrene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	136

Raw Statistics		Log-transformed Statistics	
Minimum	0.0071	Minimum of Log Data	-4.948
Maximum	6.49	Maximum of Log Data	1.87
Mean	0.368	Mean of log Data	-2.635
Median	0.0845	SD of log Data	1.884
SD	0.812		
Coefficient of Variation	2.21		
Skewness	4.251		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.335	Lilliefors Test Statistic	0.202
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.472	95% H-UCL	0.661
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.824
95% Adjusted-CLT UCL	0.494	97.5% Chebyshev (MVUE) UCL	1.003
95% Modified-t UCL	0.475	99% Chebyshev (MVUE) UCL	1.355
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.399	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.921		
nu star	132.4		
Approximate Chi Square Value (.05)	106.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.471
Adjusted Chi Square Value	106.7	95% Jackknife UCL	0.472
		95% Standard Bootstrap UCL	0.474
Anderson-Darling Test Statistic	9.141	95% Bootstrap-t UCL	0.514
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.526
Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	0.476
Kolmogorov-Smirnov 5% Critical Value	0.0776	95% BCA Bootstrap UCL	0.493
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.642
		97.5% Chebyshev(Mean, Sd) UCL	0.761
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.995
95% Approximate Gamma UCL	0.456		
95% Adjusted Gamma UCL	0.456		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.761

Result or 1/2 SDL (iron)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	125

Raw Statistics		Log-transformed Statistics	
Minimum	2410	Minimum of Log Data	7.787
Maximum	77100	Maximum of Log Data	11.25
Mean	14277	Mean of log Data	9.418
Median	12400	SD of log Data	0.533
SD	9389		
Coefficient of Variation	0.658		
Skewness	3.268		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.205	Lilliefors Test Statistic	0.0905
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15482	95% H-UCL	15314
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16907
95% Adjusted-CLT UCL	15673	97.5% Chebyshev (MVUE) UCL	18087
95% Modified-t UCL	15513	99% Chebyshev (MVUE) UCL	20403
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.478	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4105		
nu star	1155		
Approximate Chi Square Value (.05)	1077	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	15475
Adjusted Chi Square Value	1076	95% Jackknife UCL	15482
		95% Standard Bootstrap UCL	15452
Anderson-Darling Test Statistic	3.183	95% Bootstrap-t UCL	15756
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	15776
Kolmogorov-Smirnov Test Statistic	0.127	95% Percentile Bootstrap UCL	15528
Kolmogorov-Smirnov 5% Critical Value	0.0728	95% BCA Bootstrap UCL	15729
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17453
		97.5% Chebyshev(Mean, Sd) UCL	18828
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21528
95% Approximate Gamma UCL	15309		
95% Adjusted Gamma UCL	15319		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	17453

Result or 1/2 SDL (isopropylbenzene (cumene))

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	64

Raw Statistics		Log-transformed Statistics	
Minimum	3.5000E-5	Minimum of Log Data	-10.26

Maximum	64.9	Maximum of Log Data	4.173
Mean	0.831	Mean of log Data	-8.404
Median	7.2000E-5	SD of log Data	2.525
SD	7.13		
Coefficient of Variation	8.582		
Skewness	9.065		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.514	Lilliefors Test Statistic	0.367
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.133	95% H-UCL	0.0167
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0143
95% Adjusted-CLT UCL	2.95	97.5% Chebyshev (MVUE) UCL	0.0185
95% Modified-t UCL	2.263	99% Chebyshev (MVUE) UCL	0.0267
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.103	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.035		
nu star	17.17		
Approximate Chi Square Value (.05)	8.79	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	2.118
Adjusted Chi Square Value	8.684	95% Jackknife UCL	2.133
		95% Standard Bootstrap UCL	2.092
Anderson-Darling Test Statistic	26.04	95% Bootstrap-t UCL	375
Anderson-Darling 5% Critical Value	1.026	95% Hall's Bootstrap UCL	363.5
Kolmogorov-Smirnov Test Statistic	0.415	95% Percentile Bootstrap UCL	2.393
Kolmogorov-Smirnov 5% Critical Value	0.113	95% BCA Bootstrap UCL	3.957
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.242
		97.5% Chebyshev(Mean, Sd) UCL	5.719
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.618
95% Approximate Gamma UCL	1.622		
95% Adjusted Gamma UCL	1.642		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	8.618

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	145

Raw Statistics		Log-transformed Statistics	
Minimum	2.48	Minimum of Log Data	0.908
Maximum	702	Maximum of Log Data	6.554
Mean	53.52	Mean of log Data	3.186
Median	17.1	SD of log Data	1.12
SD	104.2		
Coefficient of Variation	1.947		

Skewness	4.276		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.312	Lilliefors Test Statistic	0.138
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	66.9	95% H-UCL	55.13
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.37
95% Adjusted-CLT UCL	69.69	97.5% Chebyshev (MVUE) UCL	75.62
95% Modified-t UCL	67.35	99% Chebyshev (MVUE) UCL	93.79
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.744	Data do not follow a Discernable Distribution (0.05)	
Theta Star	71.97		
nu star	246.9		
Approximate Chi Square Value (.05)	211.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	66.82
Adjusted Chi Square Value	211.2	95% Jackknife UCL	66.9
		95% Standard Bootstrap UCL	66.45
Anderson-Darling Test Statistic	10.55	95% Bootstrap-t UCL	72.98
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	69.81
Kolmogorov-Smirnov Test Statistic	0.191	95% Percentile Bootstrap UCL	67.23
Kolmogorov-Smirnov 5% Critical Value	0.0753	95% BCA Bootstrap UCL	70.24
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.78
		97.5% Chebyshev(Mean, Sd) UCL	104
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134
95% Approximate Gamma UCL	62.47		
95% Adjusted Gamma UCL	62.56		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	104

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	145

Raw Statistics		Log-transformed Statistics	
Minimum	0.65	Minimum of Log Data	-0.431
Maximum	28.6	Maximum of Log Data	3.353
Mean	10.03	Mean of log Data	2.054
Median	9.02	SD of log Data	0.791
SD	6.299		
Coefficient of Variation	0.628		
Skewness	0.63		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.101	Lilliefors Test Statistic	0.092

Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.84	95% H-UCL	12.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.87
95% Adjusted-CLT UCL	10.86	97.5% Chebyshev (MVUE) UCL	15.27
95% Modified-t UCL	10.85	99% Chebyshev (MVUE) UCL	18.02
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.103	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.77		
nu star	698.3		
Approximate Chi Square Value (.05)	638	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	10.84
Adjusted Chi Square Value	637.5	95% Jackknife UCL	10.84
		95% Standard Bootstrap UCL	10.82
Anderson-Darling Test Statistic	1.059	95% Bootstrap-t UCL	10.91
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	10.87
Kolmogorov-Smirnov Test Statistic	0.0795	95% Percentile Bootstrap UCL	10.86
Kolmogorov-Smirnov 5% Critical Value	0.0733	95% BCA Bootstrap UCL	10.85
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.17
		97.5% Chebyshev(Mean, Sd) UCL	13.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.9
95% Approximate Gamma UCL	10.98		
95% Adjusted Gamma UCL	10.99		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.17

Result or 1/2 SDL (m,p-xylene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	81

Raw Statistics		Log-transformed Statistics	
Minimum	9.1000E-5	Minimum of Log Data	-9.305
Maximum	2.56	Maximum of Log Data	0.94
Mean	0.0347	Mean of log Data	-6.851
Median	0.0011	SD of log Data	1.646
SD	0.281		
Coefficient of Variation	8.104		
Skewness	9.073		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.485	Lilliefors Test Statistic	0.175
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.086	95% H-UCL	0.0069

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0083
95% Adjusted-CLT UCL	0.118	97.5% Chebyshev (MVUE) UCL	0.0103
95% Modified-t UCL	0.0911	99% Chebyshev (MVUE) UCL	0.0141
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.21	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.165		
nu star	34.84		
Approximate Chi Square Value (.05)	22.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0854
Adjusted Chi Square Value	22.16	95% Jackknife UCL	0.086
		95% Standard Bootstrap UCL	0.0857
Anderson-Darling Test Statistic	18.54	95% Bootstrap-t UCL	2.137
Anderson-Darling 5% Critical Value	0.906	95% Hall's Bootstrap UCL	1.249
Kolmogorov-Smirnov Test Statistic	0.41	95% Percentile Bootstrap UCL	0.0961
Kolmogorov-Smirnov 5% Critical Value	0.108	95% BCA Bootstrap UCL	0.156
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.169
		97.5% Chebyshev(Mean, Sd) UCL	0.227
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.342
95% Approximate Gamma UCL	0.0541		
95% Adjusted Gamma UCL	0.0545		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.227

Result or 1/2 SDL (manganese)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	133

Raw Statistics		Log-transformed Statistics	
Minimum	59.3	Minimum of Log Data	4.083
Maximum	892	Maximum of Log Data	6.793
Mean	261.2	Mean of log Data	5.47
Median	224.5	SD of log Data	0.429
SD	127.4		
Coefficient of Variation	0.488		
Skewness	2.072		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.146	Lilliefors Test Statistic	0.0718
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	277.5	95% H-UCL	276.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	299.4
95% Adjusted-CLT UCL	279.2	97.5% Chebyshev (MVUE) UCL	316.4
95% Modified-t UCL	277.8	99% Chebyshev (MVUE) UCL	349.9
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	5.314	Data do not follow a Discernable Distribution (0.05)	
Theta Star	49.15		
nu star	1764		
Approximate Chi Square Value (.05)	1668	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	277.5
Adjusted Chi Square Value	1667	95% Jackknife UCL	277.5
		95% Standard Bootstrap UCL	277.3
Anderson-Darling Test Statistic	2.43	95% Bootstrap-t UCL	279
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	280.1
Kolmogorov-Smirnov Test Statistic	0.0858	95% Percentile Bootstrap UCL	278.6
Kolmogorov-Smirnov 5% Critical Value	0.0725	95% BCA Bootstrap UCL	278.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	304.3
		97.5% Chebyshev(Mean, Sd) UCL	323
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	359.6
95% Approximate Gamma UCL	276.3		
95% Adjusted Gamma UCL	276.4		
Potential UCL to Use		Use 95% Student's-t UCL	277.5
		or 95% Modified-t UCL	277.8

Result or 1/2 SDL (mercury)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	94

Raw Statistics		Log-transformed Statistics	
Minimum	0.001	Minimum of Log Data	-6.908
Maximum	0.85	Maximum of Log Data	-0.163
Mean	0.0262	Mean of log Data	-4.969
Median	0.0068	SD of log Data	1.332
SD	0.0941		
Coefficient of Variation	3.59		
Skewness	6.891		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.394	Lilliefors Test Statistic	0.0972
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0383	95% H-UCL	0.0218
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0268
95% Adjusted-CLT UCL	0.0424	97.5% Chebyshev (MVUE) UCL	0.0312
95% Modified-t UCL	0.0389	99% Chebyshev (MVUE) UCL	0.0398
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.477	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.055		
nu star	158.3		
Approximate Chi Square Value (.05)	130.2	Nonparametric Statistics	

Adjusted Level of Significance	0.0486	95% CLT UCL	0.0382
Adjusted Chi Square Value	130	95% Jackknife UCL	0.0383
		95% Standard Bootstrap UCL	0.0378
Anderson-Darling Test Statistic	14.93	95% Bootstrap-t UCL	0.0543
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.0842
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	0.0396
Kolmogorov-Smirnov 5% Critical Value	0.0768	95% BCA Bootstrap UCL	0.0435
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.058
		97.5% Chebyshev(Mean, Sd) UCL	0.0718
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0988
95% Approximate Gamma UCL	0.0319		
95% Adjusted Gamma UCL	0.0319		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0718

Result or 1/2 SDL (methylcyclohexane)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	77

Raw Statistics		**Log-transformed Statistics**	
Minimum	1.3750E-4	Minimum of Log Data	-8.892
Maximum	2.73	Maximum of Log Data	1.004
Mean	0.0369	Mean of log Data	-6.534
Median	0.0019	SD of log Data	1.611
SD	0.299		
Coefficient of Variation	8.123		
Skewness	9.089		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.494	Lilliefors Test Statistic	0.199
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0915	95% H-UCL	0.0088
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0108
95% Adjusted-CLT UCL	0.126	97.5% Chebyshev (MVUE) UCL	0.0132
95% Modified-t UCL	0.097	99% Chebyshev (MVUE) UCL	0.0179
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.224	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.165		
nu star	37.11		
Approximate Chi Square Value (.05)	24.17	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0909
Adjusted Chi Square Value	23.98	95% Jackknife UCL	0.0915
		95% Standard Bootstrap UCL	0.0909
Anderson-Darling Test Statistic	18.27	95% Bootstrap-t UCL	1.459
Anderson-Darling 5% Critical Value	0.9	95% Hall's Bootstrap UCL	1.338

Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	0.102
Kolmogorov-Smirnov 5% Critical Value	0.108	95% BCA Bootstrap UCL	0.168
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.18
		97.5% Chebyshev(Mean, Sd) UCL	0.242
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.364
95% Approximate Gamma UCL	0.0566		
95% Adjusted Gamma UCL	0.057		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.242

Result or 1/2 SDL (molybdenum)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	102

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	10.4	Maximum of Log Data	2.342
Mean	0.89	Mean of log Data	-1.228
Median	0.305	SD of log Data	1.597
SD	1.488		
Coefficient of Variation	1.671		
Skewness	3.38		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.282	Lilliefors Test Statistic	0.164
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.081	95% H-UCL	1.474
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.842
95% Adjusted-CLT UCL	1.113	97.5% Chebyshev (MVUE) UCL	2.192
95% Modified-t UCL	1.086	99% Chebyshev (MVUE) UCL	2.881
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.555	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.604		
nu star	184.3		
Approximate Chi Square Value (.05)	153.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	1.08
Adjusted Chi Square Value	153.7	95% Jackknife UCL	1.081
		95% Standard Bootstrap UCL	1.082
Anderson-Darling Test Statistic	4.333	95% Bootstrap-t UCL	1.129
Anderson-Darling 5% Critical Value	0.814	95% Hall's Bootstrap UCL	1.133
Kolmogorov-Smirnov Test Statistic	0.131	95% Percentile Bootstrap UCL	1.094
Kolmogorov-Smirnov 5% Critical Value	0.0763	95% BCA Bootstrap UCL	1.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.394
		97.5% Chebyshev(Mean, Sd) UCL	1.611
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.039

95% Approximate Gamma UCL	1.066		
95% Adjusted Gamma UCL	1.068		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.611

Result or 1/2 SDL (naphthalene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	79

Raw Statistics		Log-transformed Statistics	
Minimum	1.3600E-4	Minimum of Log Data	-8.903
Maximum	19.2	Maximum of Log Data	2.955
Mean	0.323	Mean of log Data	-6.969
Median	0.0013	SD of log Data	2.216
SD	2.245		
Coefficient of Variation	6.94		
Skewness	7.803		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.511	Lilliefors Test Statistic	0.208
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.733	95% H-UCL	0.0266
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0271
95% Adjusted-CLT UCL	0.954	97.5% Chebyshev (MVUE) UCL	0.0345
95% Modified-t UCL	0.768	99% Chebyshev (MVUE) UCL	0.049
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.137	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.362		
nu star	22.74		
Approximate Chi Square Value (.05)	12.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.729
Adjusted Chi Square Value	12.76	95% Jackknife UCL	0.733
		95% Standard Bootstrap UCL	0.735
Anderson-Darling Test Statistic	21.77	95% Bootstrap-t UCL	52.02
Anderson-Darling 5% Critical Value	0.973	95% Hall's Bootstrap UCL	53.32
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.785
Kolmogorov-Smirnov 5% Critical Value	0.111	95% BCA Bootstrap UCL	1.047
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.397
		97.5% Chebyshev(Mean, Sd) UCL	1.862
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.775
95% Approximate Gamma UCL	0.57		
95% Adjusted Gamma UCL	0.576		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2.775

Result or 1/2 SDL (nickel)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	120

Raw Statistics		Log-transformed Statistics	
Minimum	2.7	Minimum of Log Data	0.993
Maximum	36.7	Maximum of Log Data	3.603
Mean	11.74	Mean of log Data	2.374
Median	11.65	SD of log Data	0.441
SD	4.874		
Coefficient of Variation	0.415		
Skewness	1.176		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0957	Lilliefors Test Statistic	0.107
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.37	95% H-UCL	12.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.68
95% Adjusted-CLT UCL	12.4	97.5% Chebyshev (MVUE) UCL	14.47
95% Modified-t UCL	12.37	99% Chebyshev (MVUE) UCL	16.04
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.687	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.064		
nu star	1888		
Approximate Chi Square Value (.05)	1788	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	12.36
Adjusted Chi Square Value	1787	95% Jackknife UCL	12.37
		95% Standard Bootstrap UCL	12.37
Anderson-Darling Test Statistic	1.205	95% Bootstrap-t UCL	12.42
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	12.45
Kolmogorov-Smirnov Test Statistic	0.0793	95% Percentile Bootstrap UCL	12.38
Kolmogorov-Smirnov 5% Critical Value	0.0725	95% BCA Bootstrap UCL	12.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.39
		97.5% Chebyshev(Mean, Sd) UCL	14.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.5
95% Approximate Gamma UCL	12.4		
95% Adjusted Gamma UCL	12.4		
Potential UCL to Use		Use 95% Student's-t UCL	12.37
		or 95% Modified-t UCL	12.37

Result or 1/2 SDL (nonachlorobiphenyl (206))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	5.6500E-5	Minimum of Log Data	-9.781
Maximum	0.0048	Maximum of Log Data	-5.335
Mean	3.0406E-4	Mean of log Data	-9.327
Median	6.3000E-5	SD of log Data	1.068
SD	9.3907E-4		
Coefficient of Variation	3.088		
Skewness	4.659		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.294	Shapiro Wilk Test Statistic	0.423
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	6.1230E-4	95% H-UCL	2.6973E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.1099E-4
95% Adjusted-CLT UCL	7.7447E-4	97.5% Chebyshev (MVUE) UCL	3.7949E-4
95% Modified-t UCL	6.3931E-4	99% Chebyshev (MVUE) UCL	5.1405E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.482	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.3045E-4		
nu star	26.04		
Approximate Chi Square Value (.05)	15.41	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	6.0132E-4
Adjusted Chi Square Value	14.89	95% Jackknife UCL	6.1230E-4
		95% Standard Bootstrap UCL	5.9026E-4
Anderson-Darling Test Statistic	8.142	95% Bootstrap-t UCL	0.0025
Anderson-Darling 5% Critical Value	0.806	95% Hall's Bootstrap UCL	0.0027
Kolmogorov-Smirnov Test Statistic	0.527	95% Percentile Bootstrap UCL	6.4078E-4
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	9.0915E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0010
		97.5% Chebyshev(Mean, Sd) UCL	0.0014
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0021
95% Approximate Gamma UCL	5.1377E-4		
95% Adjusted Gamma UCL	5.3182E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0021

Result or 1/2 SDL (n-propylbenzene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	57

Raw Statistics		Log-transformed Statistics	
Minimum	3.2000E-5	Minimum of Log Data	-10.35
Maximum	1.8	Maximum of Log Data	0.588

Mean	0.0237	Mean of log Data	-8.883
Median	6.6000E-5	SD of log Data	1.815
SD	0.198		
Coefficient of Variation	8.331		
Skewness	9.058		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.503	Lilliefors Test Statistic	0.353
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0598	95% H-UCL	0.0013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0825	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0634	99% Chebyshev (MVUE) UCL	0.0027
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.152	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.156		
nu star	25.26		
Approximate Chi Square Value (.05)	14.81	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0594
Adjusted Chi Square Value	14.67	95% Jackknife UCL	0.0598
		95% Standard Bootstrap UCL	0.0596
Anderson-Darling Test Statistic	25.64	95% Bootstrap-t UCL	1.155
Anderson-Darling 5% Critical Value	0.958	95% Hall's Bootstrap UCL	1.125
Kolmogorov-Smirnov Test Statistic	0.434	95% Percentile Bootstrap UCL	0.0671
Kolmogorov-Smirnov 5% Critical Value	0.111	95% BCA Bootstrap UCL	0.11
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.118
		97.5% Chebyshev(Mean, Sd) UCL	0.159
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.24
95% Approximate Gamma UCL	0.0405		
95% Adjusted Gamma UCL	0.0409		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.159

Result or 1/2 SDL (o-xylene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	71

Raw Statistics		Log-transformed Statistics	
Minimum	4.0000E-5	Minimum of Log Data	-10.13
Maximum	0.84	Maximum of Log Data	-0.174
Mean	0.0132	Mean of log Data	-8.136
Median	9.5000E-5	SD of log Data	1.904
SD	0.0931		
Coefficient of Variation	7.053		
Skewness	8.784		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.476	Lilliefors Test Statistic	0.243
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0302	95% H-UCL	0.0035
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0040
95% Adjusted-CLT UCL	0.0405	97.5% Chebyshev (MVUE) UCL	0.0050
95% Modified-t UCL	0.0318	99% Chebyshev (MVUE) UCL	0.0070
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.195	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0676		
nu star	32.4		
Approximate Chi Square Value (.05)	20.39	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.03
Adjusted Chi Square Value	20.22	95% Jackknife UCL	0.0302
		95% Standard Bootstrap UCL	0.03
Anderson-Darling Test Statistic	18.03	95% Bootstrap-t UCL	0.241
Anderson-Darling 5% Critical Value	0.916	95% Hall's Bootstrap UCL	0.239
Kolmogorov-Smirnov Test Statistic	0.354	95% Percentile Bootstrap UCL	0.0331
Kolmogorov-Smirnov 5% Critical Value	0.109	95% BCA Bootstrap UCL	0.0461
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0577
		97.5% Chebyshev(Mean, Sd) UCL	0.077
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.115
95% Approximate Gamma UCL	0.021		
95% Adjusted Gamma UCL	0.0211		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.077

Result or 1/2 SDL (pentachlorobiphenyl (101))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	22
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.8500E-5	Minimum of Log Data	-9.225
Maximum	0.0445	Maximum of Log Data	-3.112
Mean	0.0024	Mean of log Data	-8.262
Median	1.0650E-4	SD of log Data	1.554
SD	0.0088		
Coefficient of Variation	3.661		
Skewness	4.618		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.292	Shapiro Wilk Test Statistic	0.664
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0052	95% H-UCL	0.0023
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0020
95% Adjusted-CLT UCL	0.0068	97.5% Chebyshev (MVUE) UCL	0.0026
95% Modified-t UCL	0.0055	99% Chebyshev (MVUE) UCL	0.0037
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.298	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0080		
nu star	16.11		
Approximate Chi Square Value (.05)	8.038	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0051
Adjusted Chi Square Value	7.674	95% Jackknife UCL	0.0052
		95% Standard Bootstrap UCL	0.0051
Anderson-Darling Test Statistic	5.88	95% Bootstrap-t UCL	0.0709
Anderson-Darling 5% Critical Value	0.851	95% Hall's Bootstrap UCL	0.0384
Kolmogorov-Smirnov Test Statistic	0.348	95% Percentile Bootstrap UCL	0.0054
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	0.0078
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0097
		97.5% Chebyshev(Mean, Sd) UCL	0.013
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0193
95% Approximate Gamma UCL	0.0048		
95% Adjusted Gamma UCL	0.0050		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0193

Result or 1/2 SDL (pentachlorobiphenyl (105))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	20
Raw Statistics		Log-transformed Statistics	
Minimum	8.5500E-5	Minimum of Log Data	-9.367
Maximum	0.0149	Maximum of Log Data	-4.206
Mean	6.7935E-4	Mean of log Data	-8.953
Median	9.5000E-5	SD of log Data	1.063
SD	0.0028		
Coefficient of Variation	4.189		
Skewness	5.174		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.217	Shapiro Wilk Test Statistic	0.386
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0016	95% H-UCL	3.8825E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.4827E-4

95% Adjusted-CLT UCL	0.0021	97.5% Chebyshev (MVUE) UCL	5.4673E-4
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	7.4014E-4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.378	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0018		
nu star	20.4		
Approximate Chi Square Value (.05)	11.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0015
Adjusted Chi Square Value	10.71	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0015
Anderson-Darling Test Statistic	8.853	95% Bootstrap-t UCL	0.0351
Anderson-Darling 5% Critical Value	0.831	95% Hall's Bootstrap UCL	0.0349
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	0.0017
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	0.0028
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0030
		97.5% Chebyshev(Mean, Sd) UCL	0.0041
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0061
95% Approximate Gamma UCL	0.0012		
95% Adjusted Gamma UCL	0.0012		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0061

Result or 1/2 SDL (pentachlorobiphenyl (118))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	24

Raw Statistics		Log-transformed Statistics	
Minimum	1.4100E-4	Minimum of Log Data	-8.867
Maximum	0.0363	Maximum of Log Data	-3.316
Mean	0.0016	Mean of log Data	-8.275
Median	1.5900E-4	SD of log Data	1.154
SD	0.0069		
Coefficient of Variation	4.326		
Skewness	5.184		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.218	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0038	95% H-UCL	9.1008E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0010
95% Adjusted-CLT UCL	0.0052	97.5% Chebyshev (MVUE) UCL	0.0012
95% Modified-t UCL	0.0041	99% Chebyshev (MVUE) UCL	0.0017

Gamma Distribution Test		Data Distribution
k star (bias corrected)	0.348	Data do not follow a Discernable Distribution (0.05)

Theta Star	0.0046		
nu star	18.77		
Approximate Chi Square Value (.05)	9.953	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0038
Adjusted Chi Square Value	9.542	95% Jackknife UCL	0.0038
		95% Standard Bootstrap UCL	0.0037
Anderson-Darling Test Statistic	7.604	95% Bootstrap-t UCL	0.0662
Anderson-Darling 5% Critical Value	0.839	95% Hall's Bootstrap UCL	0.0422
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	0.0042
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0068
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0074
		97.5% Chebyshev(Mean, Sd) UCL	0.0099
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0149
95% Approximate Gamma UCL	0.0030		
95% Adjusted Gamma UCL	0.0031		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0149

Result or 1/2 SDL (pentachlorobiphenyl (87))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	23
Raw Statistics		Log-transformed Statistics	
Minimum	1.1750E-4	Minimum of Log Data	-9.049
Maximum	0.0257	Maximum of Log Data	-3.661
Mean	0.0014	Mean of log Data	-8.363
Median	1.3200E-4	SD of log Data	1.31
SD	0.0050		
Coefficient of Variation	3.554		
Skewness	4.689		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.287	Shapiro Wilk Test Statistic	0.547
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0030	95% H-UCL	0.0011
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0012
95% Adjusted-CLT UCL	0.0039	97.5% Chebyshev (MVUE) UCL	0.0015
95% Modified-t UCL	0.0032	99% Chebyshev (MVUE) UCL	0.0021
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.353	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0040		
nu star	19.06		
Approximate Chi Square Value (.05)	10.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0030
Adjusted Chi Square Value	9.747	95% Jackknife UCL	0.0030

		95% Standard Bootstrap UCL	0.0030
Anderson-Darling Test Statistic	7.038	95% Bootstrap-t UCL	0.0322
Anderson-Darling 5% Critical Value	0.837	95% Hall's Bootstrap UCL	0.0278
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	0.0032
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0042
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0056
		97.5% Chebyshev(Mean, Sd) UCL	0.0074
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0111
95% Approximate Gamma UCL	0.0026		
95% Adjusted Gamma UCL	0.0027		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0111

Result or 1/2 SDL (phenanthrene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	128

Raw Statistics		Log-transformed Statistics	
Minimum	0.0057	Minimum of Log Data	-5.159
Maximum	12.6	Maximum of Log Data	2.534
Mean	0.401	Mean of log Data	-3.001
Median	0.0421	SD of log Data	2.017
SD	1.228		
Coefficient of Variation	3.064		
Skewness	6.986		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.374	Lilliefors Test Statistic	0.185
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.559	95% H-UCL	0.628
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.776
95% Adjusted-CLT UCL	0.613	97.5% Chebyshev (MVUE) UCL	0.954
95% Modified-t UCL	0.567	99% Chebyshev (MVUE) UCL	1.302
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.324	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.237		
nu star	107.6		
Approximate Chi Square Value (.05)	84.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.558
Adjusted Chi Square Value	84.47	95% Jackknife UCL	0.559
		95% Standard Bootstrap UCL	0.56
Anderson-Darling Test Statistic	12.32	95% Bootstrap-t UCL	0.677
Anderson-Darling 5% Critical Value	0.862	95% Hall's Bootstrap UCL	1.18
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	0.578
Kolmogorov-Smirnov 5% Critical Value	0.0784	95% BCA Bootstrap UCL	0.651

Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.816
		97.5% Chebyshev(Mean, Sd) UCL	0.996
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.349
95% Approximate Gamma UCL	0.51		
95% Adjusted Gamma UCL	0.511		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.349

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	134

Raw Statistics		Log-transformed Statistics	
Minimum	0.0055	Minimum of Log Data	-5.194
Maximum	8.47	Maximum of Log Data	2.137
Mean	0.432	Mean of log Data	-2.891
Median	0.0414	SD of log Data	2.024
SD	1.11		
Coefficient of Variation	2.57		
Skewness	4.384		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.35	Lilliefors Test Statistic	0.128
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.575	95% H-UCL	0.714
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.882
95% Adjusted-CLT UCL	0.605	97.5% Chebyshev (MVUE) UCL	1.084
95% Modified-t UCL	0.58	99% Chebyshev (MVUE) UCL	1.481
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.329	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.314		
nu star	109.2		
Approximate Chi Square Value (.05)	86.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.574
Adjusted Chi Square Value	85.87	95% Jackknife UCL	0.575
		95% Standard Bootstrap UCL	0.576
Anderson-Darling Test Statistic	11.49	95% Bootstrap-t UCL	0.618
Anderson-Darling 5% Critical Value	0.861	95% Hall's Bootstrap UCL	0.616
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	0.575
Kolmogorov-Smirnov 5% Critical Value	0.0783	95% BCA Bootstrap UCL	0.613
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.808
		97.5% Chebyshev(Mean, Sd) UCL	0.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.29
95% Approximate Gamma UCL	0.548		
95% Adjusted Gamma UCL	0.549		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.29

Result or 1/2 SDL (selenium)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	32

Raw Statistics		Log-transformed Statistics	
Minimum	0.21	Minimum of Log Data	-1.561
Maximum	1.13	Maximum of Log Data	0.122
Mean	0.28	Mean of log Data	-1.319
Median	0.25	SD of log Data	0.267
SD	0.119		
Coefficient of Variation	0.426		
Skewness	4.859		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.378	Lilliefors Test Statistic	0.329
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.296	95% H-UCL	0.287
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.302
95% Adjusted-CLT UCL	0.299	97.5% Chebyshev (MVUE) UCL	0.313
95% Modified-t UCL	0.296	99% Chebyshev (MVUE) UCL	0.335
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.6	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0265		
nu star	3518		
Approximate Chi Square Value (.05)	3381	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.296
Adjusted Chi Square Value	3380	95% Jackknife UCL	0.296
		95% Standard Bootstrap UCL	0.296
Anderson-Darling Test Statistic	26.48	95% Bootstrap-t UCL	0.302
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	0.304
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	0.297
Kolmogorov-Smirnov 5% Critical Value	0.0723	95% BCA Bootstrap UCL	0.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.321
		97.5% Chebyshev(Mean, Sd) UCL	0.338
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.372
95% Approximate Gamma UCL	0.292		
95% Adjusted Gamma UCL	0.292		
Potential UCL to Use		Use 95% Student's-t UCL	0.296
		or 95% Modified-t UCL	0.296

Result or 1/2 SDL (silver)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	40

Raw Statistics		Log-transformed Statistics	
Minimum	0.0235	Minimum of Log Data	-3.751
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.063	Mean of log Data	-3.356
Median	0.028	SD of log Data	0.716
SD	0.165		
Coefficient of Variation	2.624		
Skewness	7.044		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.441	Lilliefors Test Statistic	0.376
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0843	95% H-UCL	0.0502
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0571
95% Adjusted-CLT UCL	0.0916	97.5% Chebyshev (MVUE) UCL	0.0623
95% Modified-t UCL	0.0854	99% Chebyshev (MVUE) UCL	0.0726
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.964	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0654		
nu star	320.2		
Approximate Chi Square Value (.05)	279.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0841
Adjusted Chi Square Value	279.4	95% Jackknife UCL	0.0843
		95% Standard Bootstrap UCL	0.0843
Anderson-Darling Test Statistic	42.85	95% Bootstrap-t UCL	0.104
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	0.11
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	0.0863
Kolmogorov-Smirnov 5% Critical Value	0.0746	95% BCA Bootstrap UCL	0.0949
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.119
		97.5% Chebyshev(Mean, Sd) UCL	0.143
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.191
95% Approximate Gamma UCL	0.0721		
95% Adjusted Gamma UCL	0.0722		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.119

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	151

Raw Statistics		Log-transformed Statistics	
Minimum	16.5	Minimum of Log Data	2.803
Maximum	591	Maximum of Log Data	6.382
Mean	75.61	Mean of log Data	4.107
Median	58.1	SD of log Data	0.59
SD	73.75		
Coefficient of Variation	0.975		
Skewness	4.41		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.27	Lilliefors Test Statistic	0.138
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	85.08	95% H-UCL	78.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	87.8
95% Adjusted-CLT UCL	87.12	97.5% Chebyshev (MVUE) UCL	94.53
95% Modified-t UCL	85.41	99% Chebyshev (MVUE) UCL	107.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.405	Data do not follow a Discernable Distribution (0.05)	
Theta Star	31.44		
nu star	798.4		
Approximate Chi Square Value (.05)	733.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	85.03
Adjusted Chi Square Value	733.3	95% Jackknife UCL	85.08
		95% Standard Bootstrap UCL	84.96
Anderson-Darling Test Statistic	7.98	95% Bootstrap-t UCL	88.74
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	88.35
Kolmogorov-Smirnov Test Statistic	0.195	95% Percentile Bootstrap UCL	85.62
Kolmogorov-Smirnov 5% Critical Value	0.0732	95% BCA Bootstrap UCL	87.31
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	100.6
		97.5% Chebyshev(Mean, Sd) UCL	111.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	132.6
95% Approximate Gamma UCL	82.27		
95% Adjusted Gamma UCL	82.33		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	100.6

Result or 1/2 SDL (tetrachlorobiphenyl (44))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	20

Raw Statistics		Log-transformed Statistics	
Minimum	6.3000E-5	Minimum of Log Data	-9.672
Maximum	0.0198	Maximum of Log Data	-3.922
Mean	9.3370E-4	Mean of log Data	-8.97
Median	7.0500E-5	SD of log Data	1.344

SD	0.0037		
Coefficient of Variation	4.064		
Skewness	5.095		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.245	Shapiro Wilk Test Statistic	0.554
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0021	95% H-UCL	6.8092E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.0103E-4
95% Adjusted-CLT UCL	0.0029	97.5% Chebyshev (MVUE) UCL	8.7638E-4
95% Modified-t UCL	0.0023	99% Chebyshev (MVUE) UCL	0.0012
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.326	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0028		
nu star	17.61		
Approximate Chi Square Value (.05)	9.108	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0021
Adjusted Chi Square Value	8.718	95% Jackknife UCL	0.0021
		95% Standard Bootstrap UCL	0.0021
Anderson-Darling Test Statistic	7.003	95% Bootstrap-t UCL	0.0254
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.0165
Kolmogorov-Smirnov Test Statistic	0.445	95% Percentile Bootstrap UCL	0.0023
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.0031
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0041
		97.5% Chebyshev(Mean, Sd) UCL	0.0054
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0082
95% Approximate Gamma UCL	0.0018		
95% Adjusted Gamma UCL	0.0018		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0082

Result or 1/2 SDL (tetrachlorobiphenyl (52))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	24

Raw Statistics		Log-transformed Statistics	
Minimum	9.9500E-5	Minimum of Log Data	-9.215
Maximum	0.0336	Maximum of Log Data	-3.393
Mean	0.0017	Mean of log Data	-8.357
Median	1.1300E-4	SD of log Data	1.409
SD	0.0065		
Coefficient of Variation	3.771		
Skewness	4.868		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.274	Shapiro Wilk Test Statistic	0.632
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0038	95% H-UCL	0.0014
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0014
95% Adjusted-CLT UCL	0.0050	97.5% Chebyshev (MVUE) UCL	0.0018
95% Modified-t UCL	0.0040	99% Chebyshev (MVUE) UCL	0.0025
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.326	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0053		
nu star	17.59		
Approximate Chi Square Value (.05)	9.095	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0037
Adjusted Chi Square Value	8.705	95% Jackknife UCL	0.0038
		95% Standard Bootstrap UCL	0.0037
Anderson-Darling Test Statistic	6.223	95% Bootstrap-t UCL	0.049
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.0272
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	0.0041
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.0059
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0072
		97.5% Chebyshev(Mean, Sd) UCL	0.0095
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0142
95% Approximate Gamma UCL	0.0033		
95% Adjusted Gamma UCL	0.0034		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0142

Result or 1/2 SDL (tin)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	57

Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.47
Maximum	6.48	Maximum of Log Data	1.869
Mean	0.616	Mean of log Data	-0.912
Median	0.27	SD of log Data	0.764
SD	0.868		
Coefficient of Variation	1.409		
Skewness	3.697		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.33	Lilliefors Test Statistic	0.34
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.727	95% H-UCL	0.605
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.693
95% Adjusted-CLT UCL	0.748	97.5% Chebyshev (MVUE) UCL	0.761
95% Modified-t UCL	0.731	99% Chebyshev (MVUE) UCL	0.894
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.292	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.477		
nu star	428.9		
Approximate Chi Square Value (.05)	381.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.727
Adjusted Chi Square Value	381.5	95% Jackknife UCL	0.727
		95% Standard Bootstrap UCL	0.727
Anderson-Darling Test Statistic	26.15	95% Bootstrap-t UCL	0.759
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	0.758
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	0.73
Kolmogorov-Smirnov 5% Critical Value	0.0741	95% BCA Bootstrap UCL	0.751
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.91
		97.5% Chebyshev(Mean, Sd) UCL	1.037
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.286
95% Approximate Gamma UCL	0.692		
95% Adjusted Gamma UCL	0.693		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.91

Result or 1/2 SDL (titanium)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	114
Raw Statistics		Log-transformed Statistics	
Minimum	4.02	Minimum of Log Data	1.391
Maximum	645	Maximum of Log Data	6.469
Mean	25.77	Mean of log Data	3.014
Median	19	SD of log Data	0.484
SD	50.15		
Coefficient of Variation	1.946		
Skewness	11.61		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.375	Lilliefors Test Statistic	0.177
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.21	95% H-UCL	24.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.84
95% Adjusted-CLT UCL	35.92	97.5% Chebyshev (MVUE) UCL	28.55
95% Modified-t UCL	32.8	99% Chebyshev (MVUE) UCL	31.91

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.243	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.49		
nu star	744.8		
Approximate Chi Square Value (.05)	682.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	32.17
Adjusted Chi Square Value	681.9	95% Jackknife UCL	32.21
		95% Standard Bootstrap UCL	32.2
Anderson-Darling Test Statistic	6.024E+28	95% Bootstrap-t UCL	48.92
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	55.9
Kolmogorov-Smirnov Test Statistic	0.272	95% Percentile Bootstrap UCL	33.3
Kolmogorov-Smirnov 5% Critical Value	0.0732	95% BCA Bootstrap UCL	37.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	42.74
		97.5% Chebyshev(Mean, Sd) UCL	50.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	64.5
95% Approximate Gamma UCL	28.13		
95% Adjusted Gamma UCL	28.15		
Potential UCL to Use		Use 95% Student's-t UCL	32.21
		or 95% Modified-t UCL	32.8

Result or 1/2 SDL (toluene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	80

Raw Statistics		Log-transformed Statistics	
Minimum	2.6100E-4	Minimum of Log Data	-8.251
Maximum	0.106	Maximum of Log Data	-2.249
Mean	0.0057	Mean of log Data	-5.738
Median	0.0036	SD of log Data	1.082
SD	0.0117		
Coefficient of Variation	2.033		
Skewness	7.835		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.351	Lilliefors Test Statistic	0.143
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0078	95% H-UCL	0.0076
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0093
95% Adjusted-CLT UCL	0.0090	97.5% Chebyshev (MVUE) UCL	0.0109
95% Modified-t UCL	0.0080	99% Chebyshev (MVUE) UCL	0.014
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.972	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0059		

nu star	161.4		
Approximate Chi Square Value (.05)	133	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0078
Adjusted Chi Square Value	132.5	95% Jackknife UCL	0.0078
		95% Standard Bootstrap UCL	0.0079
Anderson-Darling Test Statistic	2.348	95% Bootstrap-t UCL	0.0117
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.0159
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	0.0080
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0096
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0113
		97.5% Chebyshev(Mean, Sd) UCL	0.0137
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0185
95% Approximate Gamma UCL	0.0069		
95% Adjusted Gamma UCL	0.0069		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0137

Result or 1/2 SDL (total moisture)

General Statistics

Number of Valid Samples	4	Number of Unique Samples	4

Raw Statistics		Log-transformed Statistics	
Minimum	4.47	Minimum of Log Data	1.497
Maximum	7.34	Maximum of Log Data	1.993
Mean	5.813	Mean of log Data	1.742
Median	5.72	SD of log Data	0.22
SD	1.274		
Coefficient of Variation	0.219		
Skewness	0.304		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical Value	0.748	Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.312	95% H-UCL	8.384
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.589
95% Adjusted-CLT UCL	6.964	97.5% Chebyshev (MVUE) UCL	9.791
95% Modified-t UCL	7.328	99% Chebyshev (MVUE) UCL	12.15
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.11	Data appear Normal at 5% Significance Level	
Theta Star	0.817		
nu star	56.88		
Approximate Chi Square Value (.05)	40.55	Nonparametric Statistics	
Adjusted Level of Significance	N/A	95% CLT UCL	6.861
Adjusted Chi Square Value	N/A	95% Jackknife UCL	7.312
		95% Standard Bootstrap UCL	6.714

Anderson-Darling Test Statistic	0.239	95% Bootstrap-t UCL	9.165
Anderson-Darling 5% Critical Value	0.657	95% Hall's Bootstrap UCL	8.868
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	6.785
Kolmogorov-Smirnov 5% Critical Value	0.394	95% BCA Bootstrap UCL	6.575
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.59
		97.5% Chebyshev(Mean, Sd) UCL	9.792
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.15
95% Approximate Gamma UCL	8.154		
95% Adjusted Gamma UCL	N/A		
Potential UCL to Use		Use 95% Student's-t UCL	7.312

Result or 1/2 SDL (trichloroethene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	58

Raw Statistics		Log-transformed Statistics	
Minimum	4.0500E-5	Minimum of Log Data	-10.11
Maximum	0.034	Maximum of Log Data	-3.381
Mean	9.2984E-4	Mean of log Data	-8.979
Median	8.0500E-5	SD of log Data	1.34
SD	0.0039		
Coefficient of Variation	4.295		
Skewness	7.315		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.47	Lilliefors Test Statistic	0.421
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0016	95% H-UCL	4.5311E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.5915E-4
95% Adjusted-CLT UCL	0.0020	97.5% Chebyshev (MVUE) UCL	6.6982E-4
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	8.8721E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0027		
nu star	55.48		
Approximate Chi Square Value (.05)	39.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0016
Adjusted Chi Square Value	39.12	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0016
Anderson-Darling Test Statistic	23.85	95% Bootstrap-t UCL	0.0031
Anderson-Darling 5% Critical Value	0.857	95% Hall's Bootstrap UCL	0.0041
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	0.0017
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0028

		97.5% Chebyshev(Mean, Sd) UCL	0.0036
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0052
95% Approximate Gamma UCL	0.0013		
95% Adjusted Gamma UCL	0.0013		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0036

Result or 1/2 SDL (vanadium)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	117

Raw Statistics		Log-transformed Statistics	
Minimum	4.73	Minimum of Log Data	1.554
Maximum	45.6	Maximum of Log Data	3.82
Mean	14.4	Mean of log Data	2.588
Median	13.75	SD of log Data	0.406
SD	5.905		
Coefficient of Variation	0.41		
Skewness	1.359		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0803	Lilliefors Test Statistic	0.0508
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.16	95% H-UCL	15.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.5
95% Adjusted-CLT UCL	15.21	97.5% Chebyshev (MVUE) UCL	17.39
95% Modified-t UCL	15.17	99% Chebyshev (MVUE) UCL	19.14
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.31	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.283		
nu star	2095		
Approximate Chi Square Value (.05)	1989	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	15.16
Adjusted Chi Square Value	1989	95% Jackknife UCL	15.16
		95% Standard Bootstrap UCL	15.16
Anderson-Darling Test Statistic	0.304	95% Bootstrap-t UCL	15.19
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	15.26
Kolmogorov-Smirnov Test Statistic	0.0346	95% Percentile Bootstrap UCL	15.16
Kolmogorov-Smirnov 5% Critical Value	0.0725	95% BCA Bootstrap UCL	15.19
ta appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.4
		97.5% Chebyshev(Mean, Sd) UCL	17.27
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.96
95% Approximate Gamma UCL	15.17		
95% Adjusted Gamma UCL	15.17		

Potential UCL to Use		Use 95% Approximate Gamma UCL	15.17

Result or 1/2 SDL (xylene (total))

General Statistics

Number of Valid Samples	83	Number of Unique Samples	77

Raw Statistics		Log-transformed Statistics	
Minimum	1.3050E-4	Minimum of Log Data	-8.944
Maximum	3.4	Maximum of Log Data	1.224
Mean	0.0479	Mean of log Data	-6.555
Median	0.0014	SD of log Data	1.685
SD	0.374		
Coefficient of Variation	7.807		
Skewness	9.027		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.472	Lilliefors Test Statistic	0.197
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.116	95% H-UCL	0.0102
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0122
95% Adjusted-CLT UCL	0.159	97.5% Chebyshev (MVUE) UCL	0.0151
95% Modified-t UCL	0.123	99% Chebyshev (MVUE) UCL	0.0207
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.209	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.229		
nu star	34.62		
Approximate Chi Square Value (.05)	22.16	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.115
Adjusted Chi Square Value	21.99	95% Jackknife UCL	0.116
		95% Standard Bootstrap UCL	0.115
Anderson-Darling Test Statistic	18.38	95% Bootstrap-t UCL	1.896
Anderson-Darling 5% Critical Value	0.907	95% Hall's Bootstrap UCL	1.317
Kolmogorov-Smirnov Test Statistic	0.399	95% Percentile Bootstrap UCL	0.129
Kolmogorov-Smirnov 5% Critical Value	0.108	95% BCA Bootstrap UCL	0.179
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.227
		97.5% Chebyshev(Mean, Sd) UCL	0.304
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.456
95% Approximate Gamma UCL	0.0748		
95% Adjusted Gamma UCL	0.0754		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.304

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	159

Raw Statistics		Log-transformed Statistics	
Minimum	6.17	Minimum of Log Data	1.82
Maximum	7650	Maximum of Log Data	8.942
Mean	433.8	Mean of log Data	5.141
Median	192.5	SD of log Data	1.438
SD	786.8		
Coefficient of Variation	1.814		
Skewness	5.977		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.293	Lilliefors Test Statistic	0.0981
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	534.8	95% H-UCL	640.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	793.9
95% Adjusted-CLT UCL	564.5	97.5% Chebyshev (MVUE) UCL	932.2
95% Modified-t UCL	539.6	99% Chebyshev (MVUE) UCL	1204
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.647	Data do not follow a Discernable Distribution (0.05)	
Theta Star	670.5		
nu star	214.8		
Approximate Chi Square Value (.05)	181.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0486	95% CLT UCL	534.3
Adjusted Chi Square Value	181.6	95% Jackknife UCL	534.8
		95% Standard Bootstrap UCL	533.1
Anderson-Darling Test Statistic	3.192	95% Bootstrap-t UCL	586.2
Anderson-Darling 5% Critical Value	0.805	95% Hall's Bootstrap UCL	949.7
Kolmogorov-Smirnov Test Statistic	0.111	95% Percentile Bootstrap UCL	544.3
Kolmogorov-Smirnov 5% Critical Value	0.0758	95% BCA Bootstrap UCL	573.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	700
		97.5% Chebyshev(Mean, Sd) UCL	815.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1041
95% Approximate Gamma UCL	512.3		
95% Adjusted Gamma UCL	513.1		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	815.2

APPENDIX A-3

NORTH OF MARLIN SURFACE SOIL

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\eco\Tables for Revisited SLERA\surface soil N or Marlin aug 2008.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 DL (2-methylnaphthalene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.053	Maximum of Log Data	-2.937
Mean	0.0123	Mean of log Data	-4.795
Median	0.0059	SD of log Data	0.772
SD	0.0148		
Coefficient of Variation	1.21		
Skewness	2.182		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.528	Shapiro Wilk Test Statistic	0.605
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0184	95% H-UCL	0.0173
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0202
95% Adjusted-CLT UCL	0.02	97.5% Chebyshev (MVUE) UCL	0.0242
95% Modified-t UCL	0.0187	99% Chebyshev (MVUE) UCL	0.0321
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.211	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0101		
nu star	43.61		
Approximate Chi Square Value (.05)	29.47	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.018
Adjusted Chi Square Value	28.35	95% Jackknife UCL	0.0184
		95% Standard Bootstrap UCL	0.0178
Anderson-Darling Test Statistic	3.817	95% Bootstrap-t UCL	0.0243
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	0.0176
Kolmogorov-Smirnov Test Statistic	0.442	95% Percentile Bootstrap UCL	0.0186
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.0202
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0275
		97.5% Chebyshev(Mean, Sd) UCL	0.0341
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0471
95% Approximate Gamma UCL	0.0182		
95% Adjusted Gamma UCL	0.0189		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0275

Result or 1/2 DL (4,4'-dde)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	1.9150E-4	Minimum of Log Data	-8.561
Maximum	0.0149	Maximum of Log Data	-4.206
Mean	0.0011	Mean of log Data	-8.002
Median	2.1175E-4	SD of log Data	1.162
SD	0.0034		
Coefficient of Variation	2.898		
Skewness	4.099		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.324	Shapiro Wilk Test Statistic	0.529
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0026	95% H-UCL	0.0014
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0014
95% Adjusted-CLT UCL	0.0033	97.5% Chebyshev (MVUE) UCL	0.0018
95% Modified-t UCL	0.0027	99% Chebyshev (MVUE) UCL	0.0025
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.454	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0026		
nu star	16.33		
Approximate Chi Square Value (.05)	8.194	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0025
Adjusted Chi Square Value	7.645	95% Jackknife UCL	0.0026
		95% Standard Bootstrap UCL	0.0024
Anderson-Darling Test Statistic	4.607	95% Bootstrap-t UCL	0.0141
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	0.0144
Kolmogorov-Smirnov Test Statistic	0.483	95% Percentile Bootstrap UCL	0.0027
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0037
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0047
		97.5% Chebyshev(Mean, Sd) UCL	0.0062
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0093
95% Approximate Gamma UCL	0.0023		
95% Adjusted Gamma UCL	0.0025		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0093

Result or 1/2 DL (4,4'-ddt)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	7.4000E-5	Minimum of Log Data	-9.511
Maximum	0.0108	Maximum of Log Data	-4.528
Mean	0.0012	Mean of log Data	-7.956
Median	2.7225E-4	SD of log Data	1.604
SD	0.0026		
Coefficient of Variation	2.045		
Skewness	3.311		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.51	Shapiro Wilk Test Statistic	0.856
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0023	95% H-UCL	0.0052
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0032
95% Adjusted-CLT UCL	0.0027	97.5% Chebyshev (MVUE) UCL	0.0042
95% Modified-t UCL	0.0024	99% Chebyshev (MVUE) UCL	0.0060
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.448	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0028		
nu star	16.14		
Approximate Chi Square Value (.05)	8.064	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0022
Adjusted Chi Square Value	7.52	95% Jackknife UCL	0.0023
		95% Standard Bootstrap UCL	0.0022
Anderson-Darling Test Statistic	1.361	95% Bootstrap-t UCL	0.0055
Anderson-Darling 5% Critical Value	0.801	95% Hall's Bootstrap UCL	0.0066
Kolmogorov-Smirnov Test Statistic	0.238	95% Percentile Bootstrap UCL	0.0023
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0029
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0039
		97.5% Chebyshev(Mean, Sd) UCL	0.0051
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0073
95% Approximate Gamma UCL	0.0025		
95% Adjusted Gamma UCL	0.0027		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0073

Re[redacted] or 1/2 DL (acenaphthene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298

Maximum	0.157	Maximum of Log Data	-1.852
Mean	0.0161	Mean of log Data	-4.856
Median	0.0055	SD of log Data	0.897
SD	0.0358		
Coefficient of Variation	2.227		
Skewness	4.027		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.518
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0307	95% H-UCL	0.0201
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0227
95% Adjusted-CLT UCL	0.0385	97.5% Chebyshev (MVUE) UCL	0.0276
95% Modified-t UCL	0.0321	99% Chebyshev (MVUE) UCL	0.0373
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.717	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0224		
nu star	25.83		
Approximate Chi Square Value (.05)	15.25	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0299
Adjusted Chi Square Value	14.47	95% Jackknife UCL	0.0307
		95% Standard Bootstrap UCL	0.0291
Anderson-Darling Test Statistic	4.505	95% Bootstrap-t UCL	0.111
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	0.114
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	0.032
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0427
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0528
		97.5% Chebyshev(Mean, Sd) UCL	0.0687
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0999
95% Approximate Gamma UCL	0.0272		
95% Adjusted Gamma UCL	0.0287		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0528

Result or 1/2 DL (acenaphthylene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0038	Minimum of Log Data	-5.562
Maximum	0.0555	Maximum of Log Data	-2.891
Mean	0.0099	Mean of log Data	-4.972
Median	0.0060	SD of log Data	0.693
SD	0.0131		
Coefficient of Variation	1.324		

Skewness	3.101		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.443	Shapiro Wilk Test Statistic	0.613
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0153	95% H-UCL	0.0128
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0152
95% Adjusted-CLT UCL	0.0174	97.5% Chebyshev (MVUE) UCL	0.0181
95% Modified-t UCL	0.0157	99% Chebyshev (MVUE) UCL	0.0236
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.325	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0074		
nu star	47.68		
Approximate Chi Square Value (.05)	32.83	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.015
Adjusted Chi Square Value	31.65	95% Jackknife UCL	0.0153
		95% Standard Bootstrap UCL	0.0146
Anderson-Darling Test Statistic	3.815	95% Bootstrap-t UCL	0.0698
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	0.0705
Kolmogorov-Smirnov Test Statistic	0.469	95% Percentile Bootstrap UCL	0.0155
Kolmogorov-Smirnov 5% Critical Value	0.207	95% BCA Bootstrap UCL	0.0171
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0234
		97.5% Chebyshev(Mean, Sd) UCL	0.0292
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0407
95% Approximate Gamma UCL	0.0144		
95% Adjusted Gamma UCL	0.0149		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0234

Result or 1/2 DL (aluminum)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	1810	Minimum of Log Data	7.501
Maximum	16800	Maximum of Log Data	9.729
Mean	10673	Mean of log Data	9.189
Median	10300	SD of log Data	0.496
SD	3687		
Coefficient of Variation	0.345		
Skewness	-0.368		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Test Statistic	0.767

Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12185	95% H-UCL	14135
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16791
95% Adjusted-CLT UCL	12022	97.5% Chebyshev (MVUE) UCL	19299
95% Modified-t UCL	12172	99% Chebyshev (MVUE) UCL	24226
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.015	Data appear Normal at 5% Significance Level	
Theta Star	2128		
nu star	180.5		
Approximate Chi Square Value (.05)	150.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	12103
Adjusted Chi Square Value	147.8	95% Jackknife UCL	12185
		95% Standard Bootstrap UCL	12068
Anderson-Darling Test Statistic	0.664	95% Bootstrap-t UCL	12127
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	12096
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	12042
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	11983
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14461
		97.5% Chebyshev(Mean, Sd) UCL	16100
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19319
95% Approximate Gamma UCL	12807		
95% Adjusted Gamma UCL	13035		
Potential UCL to Use		Use 95% Student's-t UCL	12185

Result or 1/2 DL (anthracene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0037	Minimum of Log Data	-5.594
Maximum	0.264	Maximum of Log Data	-1.332
Mean	0.0257	Mean of log Data	-4.612
Median	0.0061	SD of log Data	1.094
SD	0.0609		
Coefficient of Variation	2.366		
Skewness	3.946		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.38	Shapiro Wilk Test Statistic	0.67
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0507	95% H-UCL	0.0379

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0389
95% Adjusted-CLT UCL	0.0636	97.5% Chebyshev (MVUE) UCL	0.0484
95% Modified-t UCL	0.0529	99% Chebyshev (MVUE) UCL	0.0668
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.573	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0449		
nu star	20.61		
Approximate Chi Square Value (.05)	11.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0493
Adjusted Chi Square Value	10.64	95% Jackknife UCL	0.0507
		95% Standard Bootstrap UCL	0.0491
Anderson-Darling Test Statistic	3.451	95% Bootstrap-t UCL	0.147
Anderson-Darling 5% Critical Value	0.787	95% Hall's Bootstrap UCL	0.129
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	0.0529
Kolmogorov-Smirnov 5% Critical Value	0.213	95% BCA Bootstrap UCL	0.07
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0882
		97.5% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.168
95% Approximate Gamma UCL	0.0469		
95% Adjusted Gamma UCL	0.0498		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.168

Result or 1/2 DL (antimony)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.095	Minimum of Log Data	-2.354
Maximum	8.09	Maximum of Log Data	2.091
Mean	1.744	Mean of log Data	-0.535
Median	0.893	SD of log Data	1.721
SD	2.146		
Coefficient of Variation	1.231		
Skewness	1.659		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.768	Shapiro Wilk Test Statistic	0.775
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.624	95% H-UCL	12.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.755
95% Adjusted-CLT UCL	2.787	97.5% Chebyshev (MVUE) UCL	8.738
95% Modified-t UCL	2.657	99% Chebyshev (MVUE) UCL	12.63
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.512	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.403		
nu star	18.45		
Approximate Chi Square Value (.05)	9.713	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	2.576
Adjusted Chi Square Value	9.109	95% Jackknife UCL	2.624
		95% Standard Bootstrap UCL	2.581
Anderson-Darling Test Statistic	1.671	95% Bootstrap-t UCL	3.048
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	3.327
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	2.6
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	2.801
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.949
		97.5% Chebyshev(Mean, Sd) UCL	4.903
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.777
95% Approximate Gamma UCL	3.311		
95% Adjusted Gamma UCL	3.531		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	6.777

Result or 1/2 DL (aroclor-1254)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0019	Minimum of Log Data	-6.258
Maximum	0.0155	Maximum of Log Data	-4.167
Mean	0.0037	Mean of log Data	-5.839
Median	0.0021	SD of log Data	0.633
SD	0.0038		
Coefficient of Variation	1.01		
Skewness	2.557		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.541	Shapiro Wilk Test Statistic	0.674
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0053	95% H-UCL	0.0049
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0059
95% Adjusted-CLT UCL	0.0058	97.5% Chebyshev (MVUE) UCL	0.0069
95% Modified-t UCL	0.0054	99% Chebyshev (MVUE) UCL	0.0089
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.76	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0021		
nu star	63.37		
Approximate Chi Square Value (.05)	46.06	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0052

Adjusted Chi Square Value	44.64	95% Jackknife UCL	0.0053
		95% Standard Bootstrap UCL	0.0052
Anderson-Darling Test Statistic	2.954	95% Bootstrap-t UCL	0.0098
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.0115
Kolmogorov-Smirnov Test Statistic	0.342	95% Percentile Bootstrap UCL	0.0053
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	0.0058
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0077
		97.5% Chebyshev(Mean, Sd) UCL	0.0094
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0127
95% Approximate Gamma UCL	0.0052		
95% Adjusted Gamma UCL	0.0053		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0077

Result or 1/2 DL (arsenic)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	5.69	Maximum of Log Data	1.739
Mean	2.522	Mean of log Data	0.778
Median	2.525	SD of log Data	0.654
SD	1.164		
Coefficient of Variation	0.461		
Skewness	0.663		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.773
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.999	95% H-UCL	3.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.546
95% Adjusted-CLT UCL	3.019	97.5% Chebyshev (MVUE) UCL	5.362
95% Modified-t UCL	3.006	99% Chebyshev (MVUE) UCL	6.966
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3	Data appear Normal at 5% Significance Level	
Theta Star	0.841		
nu star	108		
Approximate Chi Square Value (.05)	85.02	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	2.973
Adjusted Chi Square Value	83.06	95% Jackknife UCL	2.999
		95% Standard Bootstrap UCL	2.965
Anderson-Darling Test Statistic	1.238	95% Bootstrap-t UCL	3.063
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	3.234
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	2.938

Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	2.979
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.718
		97.5% Chebyshev(Mean, Sd) UCL	4.235
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.251
95% Approximate Gamma UCL	3.204		
95% Adjusted Gamma UCL	3.28		
Potential UCL to Use		Use 95% Student's-t UCL	2.999

Result or 1/2 DL (barium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	46.1	Minimum of Log Data	3.831
Maximum	476	Maximum of Log Data	6.165
Mean	145.2	Mean of log Data	4.783
Median	114	SD of log Data	0.59
SD	115.8		
Coefficient of Variation	0.798		
Skewness	2.357		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.641	Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	192.6	95% H-UCL	192.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	229.8
95% Adjusted-CLT UCL	206.3	97.5% Chebyshev (MVUE) UCL	268.4
95% Modified-t UCL	195.2	99% Chebyshev (MVUE) UCL	344.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.308	Data do not follow a Discernable Distribution (0.05)	
Theta Star	62.88		
nu star	83.1		
Approximate Chi Square Value (.05)	63.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	190.1
Adjusted Chi Square Value	61.42	95% Jackknife UCL	192.6
		95% Standard Bootstrap UCL	188.9
Anderson-Darling Test Statistic	1.375	95% Bootstrap-t UCL	291.7
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	491.8
Kolmogorov-Smirnov Test Statistic	0.275	95% Percentile Bootstrap UCL	192.6
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	203.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	264.2
		97.5% Chebyshev(Mean, Sd) UCL	315.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	416.8
95% Approximate Gamma UCL	191.2		

95% Adjusted Gamma UCL	196.4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	264.2

Result or 1/2 DL (benzo(a)anthracene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0025	Minimum of Log Data	-5.985
Maximum	1.18	Maximum of Log Data	0.166
Mean	0.0715	Mean of log Data	-4.973
Median	0.0055	SD of log Data	1.392
SD	0.277		
Coefficient of Variation	3.872		
Skewness	4.239		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.264	Shapiro Wilk Test Statistic	0.534
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.185	95% H-UCL	0.0551
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0442
95% Adjusted-CLT UCL	0.248	97.5% Chebyshev (MVUE) UCL	0.0562
95% Modified-t UCL	0.196	99% Chebyshev (MVUE) UCL	0.0797
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.284	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.252		
nu star	10.21		
Approximate Chi Square Value (.05)	4.075	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.179
Adjusted Chi Square Value	3.71	95% Jackknife UCL	0.185
		95% Standard Bootstrap UCL	0.177
Anderson-Darling Test Statistic	5.324	95% Bootstrap-t UCL	14.79
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	7.368
Kolmogorov-Smirnov Test Statistic	0.52	95% Percentile Bootstrap UCL	0.201
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	0.266
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.356
		97.5% Chebyshev(Mean, Sd) UCL	0.479
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.72
95% Approximate Gamma UCL	0.179		
95% Adjusted Gamma UCL	0.197		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.72

Result or 1/2 DL (benzo(a)pyrene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.403
Maximum	1.42	Maximum of Log Data	0.351
Mean	0.114	Mean of log Data	-4.036
Median	0.0057	SD of log Data	1.734
SD	0.33		
Coefficient of Variation	2.903		
Skewness	4.073		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.36	Shapiro Wilk Test Statistic	0.746
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.249	95% H-UCL	0.405
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.209
95% Adjusted-CLT UCL	0.322	97.5% Chebyshev (MVUE) UCL	0.27
95% Modified-t UCL	0.262	99% Chebyshev (MVUE) UCL	0.391
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.337	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.338		
nu star	12.12		
Approximate Chi Square Value (.05)	5.306	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.242
Adjusted Chi Square Value	4.879	95% Jackknife UCL	0.249
		95% Standard Bootstrap UCL	0.239
Anderson-Darling Test Statistic	2.633	95% Bootstrap-t UCL	0.832
Anderson-Darling 5% Critical Value	0.83	95% Hall's Bootstrap UCL	0.709
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	0.264
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.353
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.453
		97.5% Chebyshev(Mean, Sd) UCL	0.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.888
95% Approximate Gamma UCL	0.26		
95% Adjusted Gamma UCL	0.283		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.888

Result or 1/2 DL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.625
Maximum	1.62	Maximum of Log Data	0.482
Mean	0.146	Mean of log Data	-3.661
Median	0.0228	SD of log Data	1.923
SD	0.374		
Coefficient of Variation	2.566		
Skewness	4.004		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.398	Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.299	95% H-UCL	1.165
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.436
95% Adjusted-CLT UCL	0.38	97.5% Chebyshev (MVUE) UCL	0.569
95% Modified-t UCL	0.313	99% Chebyshev (MVUE) UCL	0.829
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.355	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.411		
nu star	12.79		
Approximate Chi Square Value (.05)	5.752	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.291
Adjusted Chi Square Value	5.305	95% Jackknife UCL	0.299
		95% Standard Bootstrap UCL	0.287
Anderson-Darling Test Statistic	1.361	95% Bootstrap-t UCL	0.79
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.816
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	0.32
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.412
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.531
		97.5% Chebyshev(Mean, Sd) UCL	0.697
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.024
95% Approximate Gamma UCL	0.324		
95% Adjusted Gamma UCL	0.352		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	0.352

Result or 1/2 DL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0051	Minimum of Log Data	-5.269
Maximum	1.28	Maximum of Log Data	0.247
Mean	0.132	Mean of log Data	-3.564
Median	0.0239	SD of log Data	1.755

SD	0.303		
Coefficient of Variation	2.288		
Skewness	3.593		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.468	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.256	95% H-UCL	0.698
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.349
95% Adjusted-CLT UCL	0.314	97.5% Chebyshev (MVUE) UCL	0.452
95% Modified-t UCL	0.267	99% Chebyshev (MVUE) UCL	0.654
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.39	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.34		
nu star	14.03		
Approximate Chi Square Value (.05)	6.589	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.25
Adjusted Chi Square Value	6.105	95% Jackknife UCL	0.256
		95% Standard Bootstrap UCL	0.241
Anderson-Darling Test Statistic	1.426	95% Bootstrap-t UCL	0.568
Anderson-Darling 5% Critical Value	0.816	95% Hall's Bootstrap UCL	0.625
Kolmogorov-Smirnov Test Statistic	0.237	95% Percentile Bootstrap UCL	0.258
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	0.346
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.443
		97.5% Chebyshev(Mean, Sd) UCL	0.578
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.842
95% Approximate Gamma UCL	0.282		
95% Adjusted Gamma UCL	0.304		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.842

Result or 1/2 DL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0055	Minimum of Log Data	-5.203
Maximum	0.799	Maximum of Log Data	-0.224
Mean	0.0689	Mean of log Data	-4.071
Median	0.0087	SD of log Data	1.38
SD	0.186		
Coefficient of Variation	2.698		
Skewness	3.985		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.374	Shapiro Wilk Test Statistic	0.711
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.145	95% H-UCL	0.132
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.107
95% Adjusted-CLT UCL	0.185	97.5% Chebyshev (MVUE) UCL	0.136
95% Modified-t UCL	0.152	99% Chebyshev (MVUE) UCL	0.192
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.421	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.164		
nu star	15.17		
Approximate Chi Square Value (.05)	7.377	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.141
Adjusted Chi Square Value	6.86	95% Jackknife UCL	0.145
		95% Standard Bootstrap UCL	0.138
Anderson-Darling Test Statistic	3.135	95% Bootstrap-t UCL	0.537
Anderson-Darling 5% Critical Value	0.808	95% Hall's Bootstrap UCL	0.407
Kolmogorov-Smirnov Test Statistic	0.418	95% Percentile Bootstrap UCL	0.152
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.201
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.26
		97.5% Chebyshev(Mean, Sd) UCL	0.342
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.505
95% Approximate Gamma UCL	0.142		
95% Adjusted Gamma UCL	0.152		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.505

Result or 1/2 DL (beryllium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.013	Minimum of Log Data	-4.343
Maximum	2.88	Maximum of Log Data	1.058
Mean	0.708	Mean of log Data	-0.74
Median	0.645	SD of log Data	1.172
SD	0.604		
Coefficient of Variation	0.854		
Skewness	2.849		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.673	Shapiro Wilk Test Statistic	0.749
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.956	95% H-UCL	2.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.115
95% Adjusted-CLT UCL	1.044	97.5% Chebyshev (MVUE) UCL	2.644
95% Modified-t UCL	0.972	99% Chebyshev (MVUE) UCL	3.682
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.213	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.584		
nu star	43.65		
Approximate Chi Square Value (.05)	29.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.942
Adjusted Chi Square Value	28.39	95% Jackknife UCL	0.956
		95% Standard Bootstrap UCL	0.937
Anderson-Darling Test Statistic	1.404	95% Bootstrap-t UCL	1.129
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	2.056
Kolmogorov-Smirnov Test Statistic	0.251	95% Percentile Bootstrap UCL	0.954
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	1.031
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.329
		97.5% Chebyshev(Mean, Sd) UCL	1.597
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.125
95% Approximate Gamma UCL	1.047		
95% Adjusted Gamma UCL	1.088		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2.125

Result or 1/2 DL (bis(2-ethylhexyl)phthalate)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.0122	Minimum of Log Data	-4.406
Maximum	0.239	Maximum of Log Data	-1.431
Mean	0.0462	Mean of log Data	-3.333
Median	0.0302	SD of log Data	0.638
SD	0.0502		
Coefficient of Variation	1.087		
Skewness	3.679		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.51	Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0668	95% H-UCL	0.0612
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.073
95% Adjusted-CLT UCL	0.0766	97.5% Chebyshev (MVUE) UCL	0.0859
95% Modified-t UCL	0.0685	99% Chebyshev (MVUE) UCL	0.111

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0259		
nu star	64.09		
Approximate Chi Square Value (.05)	46.67	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0657
Adjusted Chi Square Value	45.25	95% Jackknife UCL	0.0668
		95% Standard Bootstrap UCL	0.0646
Anderson-Darling Test Statistic	1.396	95% Bootstrap-t UCL	0.104
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.139
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	0.0682
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	0.0799
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0978
		97.5% Chebyshev(Mean, Sd) UCL	0.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.164
95% Approximate Gamma UCL	0.0634		
95% Adjusted Gamma UCL	0.0654		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0978

Result or 1/2 DL (boron)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.555	Minimum of Log Data	-0.589
Maximum	39.2	Maximum of Log Data	3.669
Mean	8.028	Mean of log Data	1.381
Median	5.12	SD of log Data	1.371
SD	9.477		
Coefficient of Variation	1.18		
Skewness	2.32		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.742	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.91	95% H-UCL	29.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.56
95% Adjusted-CLT UCL	13.01	97.5% Chebyshev (MVUE) UCL	31.16
95% Modified-t UCL	12.12	99% Chebyshev (MVUE) UCL	44.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.738	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	10.88		
nu star	26.55		

Approximate Chi Square Value (.05)	15.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	11.7
Adjusted Chi Square Value	15.01	95% Jackknife UCL	11.91
		95% Standard Bootstrap UCL	11.67
Anderson-Darling Test Statistic	0.516	95% Bootstrap-t UCL	15.02
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	27.35
Kolmogorov-Smirnov Test Statistic	0.174	95% Percentile Bootstrap UCL	12.15
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	13.52
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.76
		97.5% Chebyshev(Mean, Sd) UCL	21.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.25
95% Approximate Gamma UCL	13.49		
95% Adjusted Gamma UCL	14.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	13.49

Result or 1/2 DL (butyl benzyl phthalate)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.389
Maximum	0.151	Maximum of Log Data	-1.89
Mean	0.016	Mean of log Data	-4.8
Median	0.0067	SD of log Data	0.851
SD	0.0344		
Coefficient of Variation	2.146		
Skewness	3.972		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.543
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0302	95% H-UCL	0.0196
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0225
95% Adjusted-CLT UCL	0.0375	97.5% Chebyshev (MVUE) UCL	0.0272
95% Modified-t UCL	0.0314	99% Chebyshev (MVUE) UCL	0.0365
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.769	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0209		
nu star	27.67		
Approximate Chi Square Value (.05)	16.67	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0294
Adjusted Chi Square Value	15.85	95% Jackknife UCL	0.0302
		95% Standard Bootstrap UCL	0.0295
Anderson-Darling Test Statistic	4.475	95% Bootstrap-t UCL	0.385

Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	0.242
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	0.0308
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	0.0403
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0514
		97.5% Chebyshev(Mean, Sd) UCL	0.0667
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0968
95% Approximate Gamma UCL	0.0266		
95% Adjusted Gamma UCL	0.028		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0514

Result or 1/2 DL (cadmium)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.003	Minimum of Log Data	-5.809
Maximum	0.8	Maximum of Log Data	-0.223
Mean	0.207	Mean of log Data	-3.089
Median	0.0135	SD of log Data	2.132
SD	0.252		
Coefficient of Variation	1.218		
Skewness	0.938		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.779	Shapiro Wilk Test Statistic	0.811
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.31	95% H-UCL	4.758
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.167
95% Adjusted-CLT UCL	0.319	97.5% Chebyshev (MVUE) UCL	1.534
95% Modified-t UCL	0.313	99% Chebyshev (MVUE) UCL	2.253
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.395	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.524		
nu star	14.22		
Approximate Chi Square Value (.05)	6.721	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.305
Adjusted Chi Square Value	6.231	95% Jackknife UCL	0.31
		95% Standard Bootstrap UCL	0.3
Anderson-Darling Test Statistic	1.701	95% Bootstrap-t UCL	0.33
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.319
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	0.303
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	0.312
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.466
		97.5% Chebyshev(Mean, Sd) UCL	0.578

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.799
95% Approximate Gamma UCL	0.438		
95% Adjusted Gamma UCL	0.473		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.799

Result or 1/2 DL (carbazole)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0048	Minimum of Log Data	-5.334
Maximum	0.128	Maximum of Log Data	-2.056
Mean	0.0153	Mean of log Data	-4.778
Median	0.0055	SD of log Data	0.879
SD	0.0289		
Coefficient of Variation	1.885		
Skewness	3.888		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.401	Shapiro Wilk Test Statistic	0.656
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0272	95% H-UCL	0.021
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0239
95% Adjusted-CLT UCL	0.0332	97.5% Chebyshev (MVUE) UCL	0.029
95% Modified-t UCL	0.0282	99% Chebyshev (MVUE) UCL	0.0391
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.841	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0182		
nu star	30.27		
Approximate Chi Square Value (.05)	18.71	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0265
Adjusted Chi Square Value	17.84	95% Jackknife UCL	0.0272
		95% Standard Bootstrap UCL	0.0262
Anderson-Darling Test Statistic	3.213	95% Bootstrap-t UCL	0.0712
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	0.0646
Kolmogorov-Smirnov Test Statistic	0.404	95% Percentile Bootstrap UCL	0.0278
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	0.0357
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.045
		97.5% Chebyshev(Mean, Sd) UCL	0.0579
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0831
95% Approximate Gamma UCL	0.0248		
95% Adjusted Gamma UCL	0.026		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.045

Result or 1/2 DL (chromium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	7.9	Minimum of Log Data	2.067
Maximum	128	Maximum of Log Data	4.852
Mean	20.26	Mean of log Data	2.683
Median	11.6	SD of log Data	0.658
SD	27.58		
Coefficient of Variation	1.361		
Skewness	3.912		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.425	Shapiro Wilk Test Statistic	0.74
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	31.56	95% H-UCL	25.79
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.69
95% Adjusted-CLT UCL	37.35	97.5% Chebyshev (MVUE) UCL	36.22
95% Modified-t UCL	32.56	99% Chebyshev (MVUE) UCL	47.08
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.441	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.06		
nu star	51.88		
Approximate Chi Square Value (.05)	36.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	30.95
Adjusted Chi Square Value	35.09	95% Jackknife UCL	31.56
		95% Standard Bootstrap UCL	30.82
Anderson-Darling Test Statistic	2.456	95% Bootstrap-t UCL	67.02
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	67.3
Kolmogorov-Smirnov Test Statistic	0.331	95% Percentile Bootstrap UCL	32.34
Kolmogorov-Smirnov 5% Critical Value	0.207	95% BCA Bootstrap UCL	39.83
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48.59
		97.5% Chebyshev(Mean, Sd) UCL	60.85
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	84.93
95% Approximate Gamma UCL	28.92		
95% Adjusted Gamma UCL	29.95		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	48.59

Result or 1/2 DL (chrysene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.392
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.102	Mean of log Data	-4.114
Median	0.0051	SD of log Data	1.687
SD	0.302		
Coefficient of Variation	2.951		
Skewness	4.085		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.354	Shapiro Wilk Test Statistic	0.77
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.226	95% H-UCL	0.319
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.177
95% Adjusted-CLT UCL	0.293	97.5% Chebyshev (MVUE) UCL	0.229
95% Modified-t UCL	0.238	99% Chebyshev (MVUE) UCL	0.33
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.34	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.301		
nu star	12.25		
Approximate Chi Square Value (.05)	5.394	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.22
Adjusted Chi Square Value	4.962	95% Jackknife UCL	0.226
		95% Standard Bootstrap UCL	0.215
Anderson-Darling Test Statistic	2.54	95% Bootstrap-t UCL	0.797
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	0.622
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	0.242
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.324
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.413
		97.5% Chebyshev(Mean, Sd) UCL	0.548
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.812
95% Approximate Gamma UCL	0.233		
95% Adjusted Gamma UCL	0.253		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.812

Result or 1/2 DL (cobalt)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	2.81	Minimum of Log Data	1.033
Maximum	7.87	Maximum of Log Data	2.063

Mean	5.789	Mean of log Data	1.718
Median	5.84	SD of log Data	0.299
SD	1.506		
Coefficient of Variation	0.26		
Skewness	-0.505		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	6.406	95% H-UCL	6.668
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.623
95% Adjusted-CLT UCL	6.328	97.5% Chebyshev (MVUE) UCL	8.407
95% Modified-t UCL	6.399	99% Chebyshev (MVUE) UCL	9.946
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.08	Data appear Normal at 5% Significance Level	
Theta Star	0.522		
nu star	399		
Approximate Chi Square Value (.05)	353.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	6.373
Adjusted Chi Square Value	349.6	95% Jackknife UCL	6.406
		95% Standard Bootstrap UCL	6.355
Anderson-Darling Test Statistic	0.559	95% Bootstrap-t UCL	6.36
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	6.317
Kolmogorov-Smirnov Test Statistic	0.143	95% Percentile Bootstrap UCL	6.351
Kolmogorov-Smirnov 5% Critical Value	0.203	95% BCA Bootstrap UCL	6.292
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.336
		97.5% Chebyshev(Mean, Sd) UCL	8.006
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.321
95% Approximate Gamma UCL	6.53		
95% Adjusted Gamma UCL	6.607		
Potential UCL to Use		Use 95% Student's-t UCL	6.406

Result or 1/2 DL (copper)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	5.9	Minimum of Log Data	1.775
Maximum	200	Maximum of Log Data	5.298
Mean	24.13	Mean of log Data	2.621
Median	9.895	SD of log Data	0.865
SD	44.66		
Coefficient of Variation	1.851		
Skewness	4.008		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.401	Shapiro Wilk Test Statistic	0.799
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	42.44	95% H-UCL	33.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.28
95% Adjusted-CLT UCL	52.07	97.5% Chebyshev (MVUE) UCL	46.43
95% Modified-t UCL	44.1	99% Chebyshev (MVUE) UCL	62.43
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.889	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.13		
nu star	32.02		
Approximate Chi Square Value (.05)	20.09	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	41.44
Adjusted Chi Square Value	19.18	95% Jackknife UCL	42.44
		95% Standard Bootstrap UCL	41.19
Anderson-Darling Test Statistic	2.14	95% Bootstrap-t UCL	104.9
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	104
Kolmogorov-Smirnov Test Statistic	0.271	95% Percentile Bootstrap UCL	44.28
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	55.66
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.01
		97.5% Chebyshev(Mean, Sd) UCL	89.86
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	128.9
95% Approximate Gamma UCL	38.46		
95% Adjusted Gamma UCL	40.28		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	70.01

Result or 1/2 DL (dibenz(a,h)anthracene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0034	Minimum of Log Data	-5.674
Maximum	0.404	Maximum of Log Data	-0.906
Mean	0.0471	Mean of log Data	-4.462
Median	0.0054	SD of log Data	1.498
SD	0.101		
Coefficient of Variation	2.145		
Skewness	3.017		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.7
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0885	95% H-UCL	0.125
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0889
95% Adjusted-CLT UCL	0.104	97.5% Chebyshev (MVUE) UCL	0.114
95% Modified-t UCL	0.0913	99% Chebyshev (MVUE) UCL	0.162
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.419	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.112		
nu star	15.07		
Approximate Chi Square Value (.05)	7.313	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0862
Adjusted Chi Square Value	6.798	95% Jackknife UCL	0.0885
		95% Standard Bootstrap UCL	0.0843
Anderson-Darling Test Statistic	3.091	95% Bootstrap-t UCL	0.148
Anderson-Darling 5% Critical Value	0.809	95% Hall's Bootstrap UCL	0.18
Kolmogorov-Smirnov Test Statistic	0.429	95% Percentile Bootstrap UCL	0.088
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.105
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.151
		97.5% Chebyshev(Mean, Sd) UCL	0.196
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.284
95% Approximate Gamma UCL	0.0971		
95% Adjusted Gamma UCL	0.104		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.284

Result or 1/2 DL (dibenzofuran)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0030	Minimum of Log Data	-5.799
Maximum	0.0862	Maximum of Log Data	-2.451
Mean	0.0129	Mean of log Data	-4.835
Median	0.0075	SD of log Data	0.834
SD	0.0201		
Coefficient of Variation	1.556		
Skewness	3.331		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.449	Shapiro Wilk Test Statistic	0.726
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0212	95% H-UCL	0.0183
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0212

95% Adjusted-CLT UCL	0.0247	97.5% Chebyshev (MVUE) UCL	0.0256
95% Modified-t UCL	0.0218	99% Chebyshev (MVUE) UCL	0.0342

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.006	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0129		
nu star	36.23		
Approximate Chi Square Value (.05)	23.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0207
Adjusted Chi Square Value	22.47	95% Jackknife UCL	0.0212
		95% Standard Bootstrap UCL	0.0206
Anderson-Darling Test Statistic	3.039	95% Bootstrap-t UCL	0.0773
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	0.0886
Kolmogorov-Smirnov Test Statistic	0.443	95% Percentile Bootstrap UCL	0.0213
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.0258
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0336
		97.5% Chebyshev(Mean, Sd) UCL	0.0426
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0602
95% Approximate Gamma UCL	0.02		
95% Adjusted Gamma UCL	0.0209		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0336

Result or 1/2 DL (dieldrin)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	8.2500E-5	Minimum of Log Data	-9.403
Maximum	0.0054	Maximum of Log Data	-5.212
Mean	4.8661E-4	Mean of log Data	-8.757
Median	9.1250E-5	SD of log Data	1.152
SD	0.0012		
Coefficient of Variation	2.608		
Skewness	3.946		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.362	Shapiro Wilk Test Statistic	0.621
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0010	95% H-UCL	6.8487E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.7672E-4
95% Adjusted-CLT UCL	0.0012	97.5% Chebyshev (MVUE) UCL	8.4448E-4
95% Modified-t UCL	0.0010	99% Chebyshev (MVUE) UCL	0.0011

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.499	Data do not follow a Discernable Distribution (0.05)	

Theta Star	9.7586E-4		
nu star	17.95		
Approximate Chi Square Value (.05)	9.356	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	9.7856E-4
Adjusted Chi Square Value	8.764	95% Jackknife UCL	0.0010
		95% Standard Bootstrap UCL	9.7408E-4
Anderson-Darling Test Statistic	3.815	95% Bootstrap-t UCL	0.0056
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	0.0043
Kolmogorov-Smirnov Test Statistic	0.405	95% Percentile Bootstrap UCL	0.0010
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.0013
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0017
		97.5% Chebyshev(Mean, Sd) UCL	0.0023
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0034
95% Approximate Gamma UCL	9.3369E-4		
95% Adjusted Gamma UCL	9.9676E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0034

Result or 1/2 DL (diethyl phthalate)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.578
Maximum	0.0498	Maximum of Log Data	-3
Mean	0.0113	Mean of log Data	-4.651
Median	0.0093	SD of log Data	0.521
SD	0.0098		
Coefficient of Variation	0.874		
Skewness	3.836		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.447	Shapiro Wilk Test Statistic	0.715
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0154	95% H-UCL	0.0142
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0169
95% Adjusted-CLT UCL	0.0174	97.5% Chebyshev (MVUE) UCL	0.0195
95% Modified-t UCL	0.0157	99% Chebyshev (MVUE) UCL	0.0246
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.625	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0043		
nu star	94.5		
Approximate Chi Square Value (.05)	73.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0151
Adjusted Chi Square Value	71.27	95% Jackknife UCL	0.0154

		95% Standard Bootstrap UCL	0.0151
Anderson-Darling Test Statistic	2.778	95% Bootstrap-t UCL	0.0257
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.0367
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	0.0158
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	0.018
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0215
		97.5% Chebyshev(Mean, Sd) UCL	0.0259
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0345
95% Approximate Gamma UCL	0.0146		
95% Adjusted Gamma UCL	0.015		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0215

Result or 1/2 DL (di-n-butyl phthalate)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0039	Minimum of Log Data	-5.525
Maximum	0.0835	Maximum of Log Data	-2.483
Mean	0.0179	Mean of log Data	-4.275
Median	0.0155	SD of log Data	0.702
SD	0.0173		
Coefficient of Variation	0.966		
Skewness	3.497		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.528	Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.025	95% H-UCL	0.0261
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0309
95% Adjusted-CLT UCL	0.0282	97.5% Chebyshev (MVUE) UCL	0.0367
95% Modified-t UCL	0.0256	99% Chebyshev (MVUE) UCL	0.0481
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.805	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0099		
nu star	65		
Approximate Chi Square Value (.05)	47.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0246
Adjusted Chi Square Value	46.01	95% Jackknife UCL	0.025
		95% Standard Bootstrap UCL	0.0245
Anderson-Darling Test Statistic	1.882	95% Bootstrap-t UCL	0.0357
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.0579
Kolmogorov-Smirnov Test Statistic	0.305	95% Percentile Bootstrap UCL	0.0254
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	0.0302

Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0357
		97.5% Chebyshev(Mean, Sd) UCL	0.0434
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0585
95% Approximate Gamma UCL	0.0246		
95% Adjusted Gamma UCL	0.0253		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0357

Result or 1/2 DL (di-n-octyl phthalate)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.463
Maximum	0.123	Maximum of Log Data	-2.096
Mean	0.0144	Mean of log Data	-4.844
Median	0.0047	SD of log Data	0.879
SD	0.0276		
Coefficient of Variation	1.926		
Skewness	3.985		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.391	Shapiro Wilk Test Statistic	0.708
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0257	95% H-UCL	0.0197
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0224
95% Adjusted-CLT UCL	0.0316	97.5% Chebyshev (MVUE) UCL	0.0272
95% Modified-t UCL	0.0267	99% Chebyshev (MVUE) UCL	0.0366
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.842	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0171		
nu star	30.3		
Approximate Chi Square Value (.05)	18.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0251
Adjusted Chi Square Value	17.86	95% Jackknife UCL	0.0257
		95% Standard Bootstrap UCL	0.0253
Anderson-Darling Test Statistic	2.764	95% Bootstrap-t UCL	0.075
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	0.0654
Kolmogorov-Smirnov Test Statistic	0.319	95% Percentile Bootstrap UCL	0.0273
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	0.0341
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0428
		97.5% Chebyshev(Mean, Sd) UCL	0.0551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0792
95% Approximate Gamma UCL	0.0232		
95% Adjusted Gamma UCL	0.0244		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0428

Result or 1/2 DL (endrin)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	1.0000E-4	Minimum of Log Data	-9.21
Maximum	0.0014	Maximum of Log Data	-6.509
Mean	3.0408E-4	Mean of log Data	-8.649
Median	1.1075E-4	SD of log Data	0.908
SD	4.4300E-4		
Coefficient of Variation	1.457		
Skewness	2.426		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.511	Shapiro Wilk Test Statistic	0.646
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.8573E-4	95% H-UCL	4.6104E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.1891E-4
95% Adjusted-CLT UCL	5.3964E-4	97.5% Chebyshev (MVUE) UCL	6.3236E-4
95% Modified-t UCL	4.9568E-4	99% Chebyshev (MVUE) UCL	8.5520E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.906	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.3553E-4		
nu star	32.63		
Approximate Chi Square Value (.05)	20.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	4.7583E-4
Adjusted Chi Square Value	19.65	95% Jackknife UCL	4.8573E-4
		95% Standard Bootstrap UCL	4.7115E-4
Anderson-Darling Test Statistic	3.335	95% Bootstrap-t UCL	9.7138E-4
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	0.0011
Kolmogorov-Smirnov Test Statistic	0.413	95% Percentile Bootstrap UCL	4.9036E-4
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	5.6164E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.5922E-4
		97.5% Chebyshev(Mean, Sd) UCL	9.5616E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0013
95% Approximate Gamma UCL	4.8233E-4		
95% Adjusted Gamma UCL	5.0484E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	7.5922E-4

Result or 1/2 DL (endrin aldehyde)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	1.9750E-4	Minimum of Log Data	-8.53
Maximum	0.0016	Maximum of Log Data	-6.413
Mean	3.3575E-4	Mean of log Data	-8.206
Median	2.1825E-4	SD of log Data	0.538
SD	3.4111E-4		
Coefficient of Variation	1.016		
Skewness	3.689		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.628
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4.7561E-4	95% H-UCL	4.1301E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.9211E-4
95% Adjusted-CLT UCL	5.4269E-4	97.5% Chebyshev (MVUE) UCL	5.6981E-4
95% Modified-t UCL	4.8726E-4	99% Chebyshev (MVUE) UCL	7.2243E-4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.175	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.5434E-4		
nu star	78.31		
Approximate Chi Square Value (.05)	58.93	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	4.6800E-4
Adjusted Chi Square Value	57.31	95% Jackknife UCL	4.7561E-4
		95% Standard Bootstrap UCL	4.6765E-4
Anderson-Darling Test Statistic	3.127	95% Bootstrap-t UCL	9.5486E-4
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	9.2712E-4
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	4.8614E-4
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	5.9244E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.8620E-4
		97.5% Chebyshev(Mean, Sd) UCL	8.3784E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0011
95% Approximate Gamma UCL	4.4622E-4		
95% Adjusted Gamma UCL	4.5878E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.8620E-4

R[redacted]or 1/2 DL (endrin ketone)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	

Minimum	2.4750E-4	Minimum of Log Data	-8.304
Maximum	0.0096	Maximum of Log Data	-4.64
Mean	8.7406E-4	Mean of log Data	-7.889
Median	2.7375E-4	SD of log Data	0.918
SD	0.0022		
Coefficient of Variation	2.531		
Skewness	4.128		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.312	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0017	95% H-UCL	0.001
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0011
95% Adjusted-CLT UCL	0.0022	97.5% Chebyshev (MVUE) UCL	0.0013
95% Modified-t UCL	0.0018	99% Chebyshev (MVUE) UCL	0.0018
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.631	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
nu star	22.7		
Approximate Chi Square Value (.05)	12.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0017
Adjusted Chi Square Value	12.16	95% Jackknife UCL	0.0017
		95% Standard Bootstrap UCL	0.0017
Anderson-Darling Test Statistic	4.879	95% Bootstrap-t UCL	0.0203
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.0194
Kolmogorov-Smirnov Test Statistic	0.476	95% Percentile Bootstrap UCL	0.0018
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	0.0028
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0031
		97.5% Chebyshev(Mean, Sd) UCL	0.0041
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0060
95% Approximate Gamma UCL	0.0015		
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0031

Result or 1/2 DL (fluoranthene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0033	Minimum of Log Data	-5.69
Maximum	2.19	Maximum of Log Data	0.784
Mean	0.159	Mean of log Data	-3.978
Median	0.0064	SD of log Data	1.767
SD	0.511		

Coefficient of Variation	3.208		
Skewness	4.123		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.334	Shapiro Wilk Test Statistic	0.777
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.369	95% H-UCL	0.481
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.236
95% Adjusted-CLT UCL	0.483	97.5% Chebyshev (MVUE) UCL	0.305
95% Modified-t UCL	0.389	99% Chebyshev (MVUE) UCL	0.443
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.303	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.526		
nu star	10.9		
Approximate Chi Square Value (.05)	4.51	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.358
Adjusted Chi Square Value	4.122	95% Jackknife UCL	0.369
		95% Standard Bootstrap UCL	0.357
Anderson-Darling Test Statistic	2.855	95% Bootstrap-t UCL	1.743
Anderson-Darling 5% Critical Value	0.838	95% Hall's Bootstrap UCL	1.443
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL	0.392
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	0.53
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.685
		97.5% Chebyshev(Mean, Sd) UCL	0.912
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.358
95% Approximate Gamma UCL	0.385		
95% Adjusted Gamma UCL	0.421		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.358

Result or 1/2 DL (fluorene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0034	Minimum of Log Data	-5.671
Maximum	0.141	Maximum of Log Data	-1.959
Mean	0.0163	Mean of log Data	-4.835
Median	0.0054	SD of log Data	0.973
SD	0.0324		
Coefficient of Variation	1.986		
Skewness	3.744		

Relevant UCL Statistics

Normal Distribution Test	Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.679
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0296	95% H-UCL	0.0236
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0259
95% Adjusted-CLT UCL	0.0361	97.5% Chebyshev (MVUE) UCL	0.0318
95% Modified-t UCL	0.0307	99% Chebyshev (MVUE) UCL	0.0433
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.722	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0226		
nu star	25.98		
Approximate Chi Square Value (.05)	15.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0289
Adjusted Chi Square Value	14.58	95% Jackknife UCL	0.0296
		95% Standard Bootstrap UCL	0.0283
Anderson-Darling Test Statistic	3.308	95% Bootstrap-t UCL	0.0734
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	0.0694
Kolmogorov-Smirnov Test Statistic	0.441	95% Percentile Bootstrap UCL	0.0303
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0394
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0496
		97.5% Chebyshev(Mean, Sd) UCL	0.064
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0923
95% Approximate Gamma UCL	0.0276		
95% Adjusted Gamma UCL	0.0291		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0496

Result or 1/2 DL (indeno(1,2,3-cd)pyrene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.0082	Minimum of Log Data	-4.798
Maximum	1.51	Maximum of Log Data	0.412
Mean	0.151	Mean of log Data	-3.227
Median	0.0338	SD of log Data	1.61
SD	0.349		
Coefficient of Variation	2.305		
Skewness	3.88		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.433	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	

95% Student's-t UCL	0.294	95% H-UCL	0.604
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.373
95% Adjusted-CLT UCL	0.367	97.5% Chebyshev (MVUE) UCL	0.48
95% Modified-t UCL	0.307	99% Chebyshev (MVUE) UCL	0.691
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.435	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.347		
nu star	15.68		
Approximate Chi Square Value (.05)	7.735	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.286
Adjusted Chi Square Value	7.204	95% Jackknife UCL	0.294
		95% Standard Bootstrap UCL	0.283
Anderson-Darling Test Statistic	1.422	95% Bootstrap-t UCL	0.715
Anderson-Darling 5% Critical Value	0.805	95% Hall's Bootstrap UCL	0.755
Kolmogorov-Smirnov Test Statistic	0.238	95% Percentile Bootstrap UCL	0.31
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.406
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.509
		97.5% Chebyshev(Mean, Sd) UCL	0.664
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.969
95% Approximate Gamma UCL	0.306		
95% Adjusted Gamma UCL	0.329		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.969

Result or 1/2 DL (iron)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		**Log-transformed Statistics**	
Minimum	8450	Minimum of Log Data	9.042
Maximum	102000	Maximum of Log Data	11.53
Mean	19477	Mean of log Data	9.653
Median	14700	SD of log Data	0.564
SD	21073		
Coefficient of Variation	1.082		
Skewness	3.929		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.446	Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	28117	95% H-UCL	24305
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28989
95% Adjusted-CLT UCL	32561	97.5% Chebyshev (MVUE) UCL	33713
95% Modified-t UCL	28884	99% Chebyshev (MVUE) UCL	42995

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.024	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9622		
nu star	72.87		
Approximate Chi Square Value (.05)	54.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	27646
Adjusted Chi Square Value	52.67	95% Jackknife UCL	28117
		95% Standard Bootstrap UCL	27363
Anderson-Darling Test Statistic	1.88	95% Bootstrap-t UCL	50030
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	59925
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL	29158
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	34109
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	41127
		97.5% Chebyshev(Mean, Sd) UCL	50495
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	68897
95% Approximate Gamma UCL	26179		
95% Adjusted Gamma UCL	26946		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	41127

Result or 1/2 DL (lead)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	8.22	Minimum of Log Data	2.107
Maximum	471	Maximum of Log Data	6.155
Mean	57.7	Mean of log Data	3.182
Median	17.1	SD of log Data	1.161
SD	111.1		
Coefficient of Variation	1.926		
Skewness	3.403		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.491	Shapiro Wilk Test Statistic	0.821
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	103.3	95% H-UCL	107
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	105.1
95% Adjusted-CLT UCL	123.2	97.5% Chebyshev (MVUE) UCL	131.2
95% Modified-t UCL	106.8	99% Chebyshev (MVUE) UCL	182.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.615	Data do not follow a Discernable Distribution (0.05)	
Theta Star	93.85		
nu star	22.13		
Approximate Chi Square Value (.05)	12.44	Nonparametric Statistics	

Adjusted Level of Significance	0.0357	95% CLT UCL	100.8
Adjusted Chi Square Value	11.74	95% Jackknife UCL	103.3
		95% Standard Bootstrap UCL	99.39
Anderson-Darling Test Statistic	2.108	95% Bootstrap-t UCL	197
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	232.9
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	105.7
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	130.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	171.9
		97.5% Chebyshev(Mean, Sd) UCL	221.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	318.3
95% Approximate Gamma UCL	102.7		
95% Adjusted Gamma UCL	108.7		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	318.3

Result or 1/2 DL (lithium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	2.59	Minimum of Log Data	0.952
Maximum	26.6	Maximum of Log Data	3.281
Mean	16.57	Mean of log Data	2.729
Median	16.15	SD of log Data	0.49
SD	5.136		
Coefficient of Variation	0.31		
Skewness	-0.697		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.671
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18.68	95% H-UCL	21.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.08
95% Adjusted-CLT UCL	18.35	97.5% Chebyshev (MVUE) UCL	29.95
95% Modified-t UCL	18.64	99% Chebyshev (MVUE) UCL	37.54
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.486	Data appear Normal at 5% Significance Level	
Theta Star	3.021		
nu star	197.5		
Approximate Chi Square Value (.05)	166	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	18.56
Adjusted Chi Square Value	163.2	95% Jackknife UCL	18.68
		95% Standard Bootstrap UCL	18.51
Anderson-Darling Test Statistic	1.234	95% Bootstrap-t UCL	18.55
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	18.52

Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	18.41
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	18.37
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.85
		97.5% Chebyshev(Mean, Sd) UCL	24.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.62
95% Approximate Gamma UCL	19.72		
95% Adjusted Gamma UCL	20.05		
Potential UCL to Use		Use 95% Student's-t UCL	18.68

Result or 1/2 DL (manganese)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	82.3	Minimum of Log Data	4.41
Maximum	1210	Maximum of Log Data	7.098
Mean	369.5	Mean of log Data	5.754
Median	296	SD of log Data	0.565
SD	247.7		
Coefficient of Variation	0.67		
Skewness	2.484		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.741	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	471	95% H-UCL	493.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	588.4
95% Adjusted-CLT UCL	502	97.5% Chebyshev (MVUE) UCL	684.4
95% Modified-t UCL	476.7	99% Chebyshev (MVUE) UCL	872.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.813	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	131.3		
nu star	101.3		
Approximate Chi Square Value (.05)	79.05	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	465.5
Adjusted Chi Square Value	77.16	95% Jackknife UCL	471
		95% Standard Bootstrap UCL	461.6
Anderson-Darling Test Statistic	0.663	95% Bootstrap-t UCL	536.8
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	887
Kolmogorov-Smirnov Test Statistic	0.172	95% Percentile Bootstrap UCL	465.4
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	499.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	623.9
		97.5% Chebyshev(Mean, Sd) UCL	734
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	950.3

95% Approximate Gamma UCL	473.3		
95% Adjusted Gamma UCL	484.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	473.3

Result or 1/2 DL (mercury)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0011	Minimum of Log Data	-6.768
Maximum	0.064	Maximum of Log Data	-2.749
Mean	0.0126	Mean of log Data	-5.156
Median	0.0074	SD of log Data	1.364
SD	0.0163		
Coefficient of Variation	1.295		
Skewness	2.2		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0193	95% H-UCL	0.0425
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0351
95% Adjusted-CLT UCL	0.0211	97.5% Chebyshev (MVUE) UCL	0.0445
95% Modified-t UCL	0.0196	99% Chebyshev (MVUE) UCL	0.063
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.673	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0187		
nu star	24.24		
Approximate Chi Square Value (.05)	14.04	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0189
Adjusted Chi Square Value	13.29	95% Jackknife UCL	0.0193
		95% Standard Bootstrap UCL	0.0187
Anderson-Darling Test Statistic	0.775	95% Bootstrap-t UCL	0.0246
Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	0.0464
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	0.0192
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0209
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0294
		97.5% Chebyshev(Mean, Sd) UCL	0.0366
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0509
95% Approximate Gamma UCL	0.0218		
95% Adjusted Gamma UCL	0.023		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0218

Result or 1/2 DL (molybdenum)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	10.7	Maximum of Log Data	2.37
Mean	0.949	Mean of log Data	-1.744
Median	0.11	SD of log Data	1.698
SD	2.5		
Coefficient of Variation	2.636		
Skewness	3.897		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.406	Shapiro Wilk Test Statistic	0.851
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.974	95% H-UCL	3.547
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.934
95% Adjusted-CLT UCL	2.496	97.5% Chebyshev (MVUE) UCL	2.499
95% Modified-t UCL	2.064	99% Chebyshev (MVUE) UCL	3.609
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.363	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.616		
nu star	13.05		
Approximate Chi Square Value (.05)	5.929	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	1.918
Adjusted Chi Square Value	5.473	95% Jackknife UCL	1.974
		95% Standard Bootstrap UCL	1.909
Anderson-Darling Test Statistic	1.907	95% Bootstrap-t UCL	5.875
Anderson-Darling 5% Critical Value	0.823	95% Hall's Bootstrap UCL	5.186
Kolmogorov-Smirnov Test Statistic	0.276	95% Percentile Bootstrap UCL	2.078
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	2.807
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.517
		97.5% Chebyshev(Mean, Sd) UCL	4.629
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.812
95% Approximate Gamma UCL	2.088		
95% Adjusted Gamma UCL	2.262		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	6.812

Result or 1/2 DL (nickel)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	11.7	Minimum of Log Data	2.46
Maximum	51.7	Maximum of Log Data	3.945
Mean	17.04	Mean of log Data	2.762
Median	14.6	SD of log Data	0.343
SD	9.054		
Coefficient of Variation	0.531		
Skewness	3.644		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.519	Shapiro Wilk Test Statistic	0.727
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	20.76	95% H-UCL	19.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.75
95% Adjusted-CLT UCL	22.51	97.5% Chebyshev (MVUE) UCL	25.35
95% Modified-t UCL	21.06	99% Chebyshev (MVUE) UCL	30.46
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.852	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.912		
nu star	210.7		
Approximate Chi Square Value (.05)	178.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	20.55
Adjusted Chi Square Value	175.2	95% Jackknife UCL	20.76
		95% Standard Bootstrap UCL	20.4
Anderson-Darling Test Statistic	1.832	95% Bootstrap-t UCL	27.42
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	33.85
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	20.86
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	23.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.35
		97.5% Chebyshev(Mean, Sd) UCL	30.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	38.28
95% Approximate Gamma UCL	20.16		
95% Adjusted Gamma UCL	20.49		
Potential UCL to Use		Use 95% Student's-t UCL	20.76
		or 95% Modified-t UCL	21.06

Result or 1/2 DL (phenanthrene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.614
Maximum	1.34	Maximum of Log Data	0.293

Mean	0.109	Mean of log Data	-3.947
Median	0.0071	SD of log Data	1.591
SD	0.314		
Coefficient of Variation	2.872		
Skewness	3.979		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.37	Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.238	95% H-UCL	0.276
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.175
95% Adjusted-CLT UCL	0.305	97.5% Chebyshev (MVUE) UCL	0.225
95% Modified-t UCL	0.249	99% Chebyshev (MVUE) UCL	0.324
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.356	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.307		
nu star	12.81		
Approximate Chi Square Value (.05)	5.764	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.231
Adjusted Chi Square Value	5.316	95% Jackknife UCL	0.238
		95% Standard Bootstrap UCL	0.23
Anderson-Darling Test Statistic	2.6	95% Bootstrap-t UCL	0.851
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.793
Kolmogorov-Smirnov Test Statistic	0.318	95% Percentile Bootstrap UCL	0.249
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.341
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.431
		97.5% Chebyshev(Mean, Sd) UCL	0.571
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.845
95% Approximate Gamma UCL	0.243		
95% Adjusted Gamma UCL	0.263		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.845

Result or 1/2 DL (pyrene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0061	Minimum of Log Data	-5.099
Maximum	1.87	Maximum of Log Data	0.626
Mean	0.147	Mean of log Data	-3.778
Median	0.0109	SD of log Data	1.68
SD	0.436		
Coefficient of Variation	2.972		
Skewness	4.066		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.357	Shapiro Wilk Test Statistic	0.795
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.325	95% H-UCL	0.436
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.244
95% Adjusted-CLT UCL	0.421	97.5% Chebyshev (MVUE) UCL	0.315
95% Modified-t UCL	0.342	99% Chebyshev (MVUE) UCL	0.455
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.337	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.435		
nu star	12.14		
Approximate Chi Square Value (.05)	5.319	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.316
Adjusted Chi Square Value	4.891	95% Jackknife UCL	0.325
		95% Standard Bootstrap UCL	0.317
Anderson-Darling Test Statistic	2.472	95% Bootstrap-t UCL	1.188
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	0.978
Kolmogorov-Smirnov Test Statistic	0.28	95% Percentile Bootstrap UCL	0.343
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.465
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.594
		97.5% Chebyshev(Mean, Sd) UCL	0.788
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.169
95% Approximate Gamma UCL	0.335		
95% Adjusted Gamma UCL	0.364		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.169

Result or 1/2 DL (silver)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	14
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0135	Minimum of Log Data	-4.305
Maximum	0.41	Maximum of Log Data	-0.892
Mean	0.0543	Mean of log Data	-3.38
Median	0.03	SD of log Data	0.781
SD	0.0909		
Coefficient of Variation	1.676		
Skewness	3.94		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.398	Shapiro Wilk Test Statistic	0.734
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0915	95% H-UCL	0.0721
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0843
95% Adjusted-CLT UCL	0.111	97.5% Chebyshev (MVUE) UCL	0.101
95% Modified-t UCL	0.0948	99% Chebyshev (MVUE) UCL	0.134
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.048	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0517		
nu star	37.74		
Approximate Chi Square Value (.05)	24.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0895
Adjusted Chi Square Value	23.66	95% Jackknife UCL	0.0915
		95% Standard Bootstrap UCL	0.0886
Anderson-Darling Test Statistic	2.923	95% Bootstrap-t UCL	0.231
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	0.2
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	0.0964
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.148
		97.5% Chebyshev(Mean, Sd) UCL	0.188
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.267
95% Approximate Gamma UCL	0.083		
95% Adjusted Gamma UCL	0.0865		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.148

Result or 1/2 DL (strontium)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	26.6	Minimum of Log Data	3.281
Maximum	93.6	Maximum of Log Data	4.539
Mean	57.32	Mean of log Data	3.989
Median	52.85	SD of log Data	0.364
SD	19.7		
Coefficient of Variation	0.344		
Skewness	0.325		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.4	95% H-UCL	68.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.37

95% Adjusted-CLT UCL	65.34	97.5% Chebyshev (MVUE) UCL	88.84
95% Modified-t UCL	65.45	99% Chebyshev (MVUE) UCL	107.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.18	Data appear Normal at 5% Significance Level	
Theta Star	7.983		
nu star	258.5		
Approximate Chi Square Value (.05)	222.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	64.96
Adjusted Chi Square Value	219	95% Jackknife UCL	65.4
		95% Standard Bootstrap UCL	64.93
Anderson-Darling Test Statistic	0.455	95% Bootstrap-t UCL	66.2
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	65.45
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	64.92
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	64.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.56
		97.5% Chebyshev(Mean, Sd) UCL	86.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	103.5
95% Approximate Gamma UCL	66.66		
95% Adjusted Gamma UCL	67.64		
Potential UCL to Use		Use 95% Student's-t UCL	65.4

[redacted] or 1/2 DL (thallium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.0455	Minimum of Log Data	-3.09
Maximum	0.63	Maximum of Log Data	-0.462
Mean	0.109	Mean of log Data	-2.67
Median	0.05	SD of log Data	0.771
SD	0.16		
Coefficient of Variation	1.47		
Skewness	2.87		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.56
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.174	95% H-UCL	0.144
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.169
95% Adjusted-CLT UCL	0.198	97.5% Chebyshev (MVUE) UCL	0.202
95% Modified-t UCL	0.178	99% Chebyshev (MVUE) UCL	0.268
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.078	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.101		
nu star	38.82		
Approximate Chi Square Value (.05)	25.55	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.171
Adjusted Chi Square Value	24.52	95% Jackknife UCL	0.174
		95% Standard Bootstrap UCL	0.168
Anderson-Darling Test Statistic	4.13	95% Bootstrap-t UCL	0.76
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	0.596
Kolmogorov-Smirnov Test Statistic	0.397	95% Percentile Bootstrap UCL	0.167
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.196
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.273
		97.5% Chebyshev(Mean, Sd) UCL	0.344
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.483
95% Approximate Gamma UCL	0.165		
95% Adjusted Gamma UCL	0.172		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.273

Result or 1/2 DL (tin)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.195	Minimum of Log Data	-1.635
Maximum	3.67	Maximum of Log Data	1.3
Mean	0.625	Mean of log Data	-0.897
Median	0.295	SD of log Data	0.805
SD	0.846		
Coefficient of Variation	1.354		
Skewness	3.137		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.533	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.972	95% H-UCL	0.897
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.043
95% Adjusted-CLT UCL	1.111	97.5% Chebyshev (MVUE) UCL	1.256
95% Modified-t UCL	0.996	99% Chebyshev (MVUE) UCL	1.673
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.131	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.552		
nu star	40.73		
Approximate Chi Square Value (.05)	27.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.953
Adjusted Chi Square Value	26.04	95% Jackknife UCL	0.972

		95% Standard Bootstrap UCL	0.958
Anderson-Darling Test Statistic	2.399	95% Bootstrap-t UCL	1.597
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	2.128
Kolmogorov-Smirnov Test Statistic	0.388	95% Percentile Bootstrap UCL	0.998
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	1.139
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.494
		97.5% Chebyshev(Mean, Sd) UCL	1.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.609
95% Approximate Gamma UCL	0.939		
95% Adjusted Gamma UCL	0.978		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.494

Result or 1/2 DL (titanium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17

Raw Statistics		Log-transformed Statistics	
Minimum	3.41	Minimum of Log Data	1.227
Maximum	55.9	Maximum of Log Data	4.024
Mean	20.67	Mean of log Data	2.882
Median	18.7	SD of log Data	0.591
SD	11.65		
Coefficient of Variation	0.563		
Skewness	1.656		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.45	95% H-UCL	28.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.38
95% Adjusted-CLT UCL	26.33	97.5% Chebyshev (MVUE) UCL	40.17
95% Modified-t UCL	25.63	99% Chebyshev (MVUE) UCL	51.53
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.002	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	6.886		
nu star	108.1		
Approximate Chi Square Value (.05)	85.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	25.19
Adjusted Chi Square Value	83.12	95% Jackknife UCL	25.45
		95% Standard Bootstrap UCL	25.01
Anderson-Darling Test Statistic	0.339	95% Bootstrap-t UCL	27.18
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	31.11
Kolmogorov-Smirnov Test Statistic	0.11	95% Percentile Bootstrap UCL	25.41
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	26.43

Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	32.64
		97.5% Chebyshev(Mean, Sd) UCL	37.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	47.99
95% Approximate Gamma UCL	26.26		
95% Adjusted Gamma UCL	26.88		
Potential UCL to Use		Use 95% Approximate Gamma UCL	26.26

Result or 1/2 DL (vanadium)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	7.85	Minimum of Log Data	2.061
Maximum	45.8	Maximum of Log Data	3.824
Mean	19.66	Mean of log Data	2.884
Median	18.65	SD of log Data	0.449
SD	9.126		
Coefficient of Variation	0.464		
Skewness	1.322		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	23.4	95% H-UCL	24.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.98
95% Adjusted-CLT UCL	23.91	97.5% Chebyshev (MVUE) UCL	33.02
95% Modified-t UCL	23.51	99% Chebyshev (MVUE) UCL	40.95
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.562	Data appear Normal at 5% Significance Level	
Theta Star	4.309		
nu star	164.2		
Approximate Chi Square Value (.05)	135.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	23.2
Adjusted Chi Square Value	133.1	95% Jackknife UCL	23.4
		95% Standard Bootstrap UCL	23.08
Anderson-Darling Test Statistic	0.2	95% Bootstrap-t UCL	24.27
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	25.56
Kolmogorov-Smirnov Test Statistic	0.0982	95% Percentile Bootstrap UCL	23.38
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	23.66
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29.03
		97.5% Chebyshev(Mean, Sd) UCL	33.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.06
95% Approximate Gamma UCL	23.81		
95% Adjusted Gamma UCL	24.26		

Potential UCL to Use		Use 95% Student's-t UCL	23.4

[redacted] or 1/2 DL (zinc)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	29.5	Minimum of Log Data	3.384
Maximum	5640	Maximum of Log Data	8.638
Mean	418.4	Mean of log Data	4.562
Median	53.95	SD of log Data	1.321
SD	1308		
Coefficient of Variation	3.125		
Skewness	4.195		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.313	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	954.5	95% H-UCL	630.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	542.9
95% Adjusted-CLT UCL	1251	97.5% Chebyshev (MVUE) UCL	686.4
95% Modified-t UCL	1005	99% Chebyshev (MVUE) UCL	968.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.403	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1037		
nu star	14.52		
Approximate Chi Square Value (.05)	6.931	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0357	95% CLT UCL	925.3
Adjusted Chi Square Value	6.432	95% Jackknife UCL	954.5
		95% Standard Bootstrap UCL	894.1
Anderson-Darling Test Statistic	2.911	95% Bootstrap-t UCL	5665
Anderson-Darling 5% Critical Value	0.813	95% Hall's Bootstrap UCL	3753
Kolmogorov-Smirnov Test Statistic	0.278	95% Percentile Bootstrap UCL	1025
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	1352
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1762
		97.5% Chebyshev(Mean, Sd) UCL	2343
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3485
95% Approximate Gamma UCL	876.6		
95% Adjusted Gamma UCL	944.6		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	3485

APPENDIX A-4

NORTH OF MARLIN SOIL

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\eco\Tables for Revisited SLERA\soil N of Marlin aug 2008.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 DL (1,1-dichloroethane)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	6.4000E-5	Minimum of Log Data	-9.657
Maximum	0.518	Maximum of Log Data	-0.658
Mean	0.0286	Mean of log Data	-7.963
Median	8.7000E-5	SD of log Data	2.504
SD	0.119		
Coefficient of Variation	4.147		
Skewness	4.355		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.258	Shapiro Wilk Test Statistic	0.689
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0757	95% H-UCL	0.172
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0196
95% Adjusted-CLT UCL	0.102	97.5% Chebyshev (MVUE) UCL	0.026
95% Modified-t UCL	0.0803	99% Chebyshev (MVUE) UCL	0.0385
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.179	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.16		
nu star	6.805		
Approximate Chi Square Value (.05)	2.064	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0733
Adjusted Chi Square Value	1.844	95% Jackknife UCL	0.0757
		95% Standard Bootstrap UCL	0.0709
Anderson-Darling Test Statistic	4.123	95% Bootstrap-t UCL	2.611
Anderson-Darling 5% Critical Value	0.899	95% Hall's Bootstrap UCL	1.441
Kolmogorov-Smirnov Test Statistic	0.386	95% Percentile Bootstrap UCL	0.0826
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	0.111
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.147
		97.5% Chebyshev(Mean, Sd) UCL	0.198
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.299
95% Approximate Gamma UCL	0.0942		
95% Adjusted Gamma UCL	0.105		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.299

Result or 1/2 DL (1,1-dichloroethene)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	1.4500E-4	Minimum of Log Data	-8.839
Maximum	0.313	Maximum of Log Data	-1.162
Mean	0.0179	Mean of log Data	-7.528
Median	1.9050E-4	SD of log Data	2.12
SD	0.0715		
Coefficient of Variation	3.989		
Skewness	4.348		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.267	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0464	95% H-UCL	0.0481
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0135
95% Adjusted-CLT UCL	0.0624	97.5% Chebyshev (MVUE) UCL	0.0177
95% Modified-t UCL	0.0491	99% Chebyshev (MVUE) UCL	0.026
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.211	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0851		
nu star	8.005		
Approximate Chi Square Value (.05)	2.738	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0449
Adjusted Chi Square Value	2.476	95% Jackknife UCL	0.0464
		95% Standard Bootstrap UCL	0.0439
Anderson-Darling Test Statistic	4.354	95% Bootstrap-t UCL	0.671
Anderson-Darling 5% Critical Value	0.884	95% Hall's Bootstrap UCL	0.399
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0504
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.0673
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0894
		97.5% Chebyshev(Mean, Sd) UCL	0.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.181
95% Approximate Gamma UCL	0.0524		
95% Adjusted Gamma UCL	0.058		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.181

Result or 1/2 DL (1,2-dichloroethane)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	4.6000E-5	Minimum of Log Data	-9.987
Maximum	0.177	Maximum of Log Data	-1.732
Mean	0.0106	Mean of log Data	-8.083
Median	6.2500E-5	SD of log Data	2.49
SD	0.0404		
Coefficient of Variation	3.799		
Skewness	4.329		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.282	Shapiro Wilk Test Statistic	0.741
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0267	95% H-UCL	0.143
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0169
95% Adjusted-CLT UCL	0.0357	97.5% Chebyshev (MVUE) UCL	0.0223
95% Modified-t UCL	0.0282	99% Chebyshev (MVUE) UCL	0.0331
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.209	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0508		
nu star	7.952		
Approximate Chi Square Value (.05)	2.708	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0259
Adjusted Chi Square Value	2.447	95% Jackknife UCL	0.0267
		95% Standard Bootstrap UCL	0.0255
Anderson-Darling Test Statistic	3.162	95% Bootstrap-t UCL	0.349
Anderson-Darling 5% Critical Value	0.885	95% Hall's Bootstrap UCL	0.153
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	0.0291
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	0.0389
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.051
		97.5% Chebyshev(Mean, Sd) UCL	0.0685
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.103
95% Approximate Gamma UCL	0.0312		
95% Adjusted Gamma UCL	0.0345		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.103

[redacted]or 1/2 DL (2-butanone)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	1.2600E-4	Minimum of Log Data	-8.979

Maximum	0.208	Maximum of Log Data	-1.57
Mean	0.0139	Mean of log Data	-6.223
Median	0.0029	SD of log Data	1.907
SD	0.0471		
Coefficient of Variation	3.378		
Skewness	4.338		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.288	Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0327	95% H-UCL	0.0777
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0326
95% Adjusted-CLT UCL	0.0432	97.5% Chebyshev (MVUE) UCL	0.0424
95% Modified-t UCL	0.0344	99% Chebyshev (MVUE) UCL	0.0618
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.326	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0427		
nu star	12.4		
Approximate Chi Square Value (.05)	5.488	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0317
Adjusted Chi Square Value	5.091	95% Jackknife UCL	0.0327
		95% Standard Bootstrap UCL	0.0315
Anderson-Darling Test Statistic	2.196	95% Bootstrap-t UCL	0.25
Anderson-Darling 5% Critical Value	0.834	95% Hall's Bootstrap UCL	0.129
Kolmogorov-Smirnov Test Statistic	0.356	95% Percentile Bootstrap UCL	0.0353
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.0466
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.061
		97.5% Chebyshev(Mean, Sd) UCL	0.0814
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.121
95% Approximate Gamma UCL	0.0315		
95% Adjusted Gamma UCL	0.0339		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.121

Result or 1/2 DL (2-methylnaphthalene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.053	Maximum of Log Data	-2.937
Mean	0.0103	Mean of log Data	-4.915
Median	0.0059	SD of log Data	0.663
SD	0.0131		
Coefficient of Variation	1.267		

Skewness	2.781		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.416	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.014	95% H-UCL	0.0115
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0138
95% Adjusted-CLT UCL	0.015	97.5% Chebyshev (MVUE) UCL	0.0158
95% Modified-t UCL	0.0142	99% Chebyshev (MVUE) UCL	0.0198
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.491	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0069		
nu star	107.3		
Approximate Chi Square Value (.05)	84.44	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0139
Adjusted Chi Square Value	83.51	95% Jackknife UCL	0.014
		95% Standard Bootstrap UCL	0.0138
Anderson-Darling Test Statistic	9.26	95% Bootstrap-t UCL	0.0166
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	0.0135
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	0.0141
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.0152
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0198
		97.5% Chebyshev(Mean, Sd) UCL	0.024
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.032
95% Approximate Gamma UCL	0.0131		
95% Adjusted Gamma UCL	0.0133		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0198

Result or 1/2 DL (4,4'-dde)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	31
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.8950E-4	Minimum of Log Data	-8.571
Maximum	0.0149	Maximum of Log Data	-4.206
Mean	7.0636E-4	Mean of log Data	-8.216
Median	2.1150E-4	SD of log Data	0.842
SD	0.0024		
Coefficient of Variation	3.483		
Skewness	5.808		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.222	Shapiro Wilk Test Statistic	0.415

Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0014	95% H-UCL	5.2862E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.4086E-4
95% Adjusted-CLT UCL	0.0018	97.5% Chebyshev (MVUE) UCL	7.5362E-4
95% Modified-t UCL	0.0014	99% Chebyshev (MVUE) UCL	9.7511E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.603	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0011		
nu star	43.4		
Approximate Chi Square Value (.05)	29.29	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0013
Adjusted Chi Square Value	28.77	95% Jackknife UCL	0.0014
		95% Standard Bootstrap UCL	0.0013
Anderson-Darling Test Statistic	10.81	95% Bootstrap-t UCL	0.0475
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	0.0081
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	0.0015
Kolmogorov-Smirnov 5% Critical Value	0.154	95% BCA Bootstrap UCL	0.0020
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0024
		97.5% Chebyshev(Mean, Sd) UCL	0.0032
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0047
95% Approximate Gamma UCL	0.0010		
95% Adjusted Gamma UCL	0.0010		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0024

Result or 1/2 DL (4,4'-ddt)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	28
Raw Statistics		Log-transformed Statistics	
Minimum	7.3000E-5	Minimum of Log Data	-9.525
Maximum	0.0108	Maximum of Log Data	-4.528
Mean	7.0422E-4	Mean of log Data	-8.523
Median	8.3500E-5	SD of log Data	1.323
SD	0.0019		
Coefficient of Variation	2.703		
Skewness	4.722		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.372	Shapiro Wilk Test Statistic	0.755
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0012	95% H-UCL	8.9022E-4

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.001
95% Adjusted-CLT UCL	0.0014	97.5% Chebyshev (MVUE) UCL	0.0012
95% Modified-t UCL	0.0012	99% Chebyshev (MVUE) UCL	0.0017
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.479	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0014		
nu star	34.46		
Approximate Chi Square Value (.05)	22.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0012
Adjusted Chi Square Value	21.58	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	4.944	95% Bootstrap-t UCL	0.0028
Anderson-Darling 5% Critical Value	0.812	95% Hall's Bootstrap UCL	0.0032
Kolmogorov-Smirnov Test Statistic	0.31	95% Percentile Bootstrap UCL	0.0012
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	0.0016
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0020
		97.5% Chebyshev(Mean, Sd) UCL	0.0026
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0038
95% Approximate Gamma UCL	0.0011		
95% Adjusted Gamma UCL	0.0011		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0038

Result or 1/2 DL (acenaphthene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.3
Maximum	0.157	Maximum of Log Data	-1.852
Mean	0.0142	Mean of log Data	-4.898
Median	0.0055	SD of log Data	0.825
SD	0.03		
Coefficient of Variation	2.115		
Skewness	4.095		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.345	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0227	95% H-UCL	0.0143
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0173
95% Adjusted-CLT UCL	0.0261	97.5% Chebyshev (MVUE) UCL	0.0203
95% Modified-t UCL	0.0232	99% Chebyshev (MVUE) UCL	0.0262
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.85	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0167		
nu star	61.21		
Approximate Chi Square Value (.05)	44.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0224
Adjusted Chi Square Value	43.56	95% Jackknife UCL	0.0227
		95% Standard Bootstrap UCL	0.0222
Anderson-Darling Test Statistic	9.363	95% Bootstrap-t UCL	0.0524
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.0561
Kolmogorov-Smirnov Test Statistic	0.497	95% Percentile Bootstrap UCL	0.0229
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	0.0271
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.036
		97.5% Chebyshev(Mean, Sd) UCL	0.0455
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.064
95% Approximate Gamma UCL	0.0197		
95% Adjusted Gamma UCL	0.02		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.036

Result or 1/2 DL (aluminum)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	32

Raw Statistics		Log-transformed Statistics	
Minimum	1810	Minimum of Log Data	7.501
Maximum	18300	Maximum of Log Data	9.815
Mean	11971	Mean of log Data	9.317
Median	11700	SD of log Data	0.437
SD	3979		
Coefficient of Variation	0.332		
Skewness	-0.25		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.962	Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13092	95% H-UCL	14053
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16219
95% Adjusted-CLT UCL	13032	97.5% Chebyshev (MVUE) UCL	17956
95% Modified-t UCL	13087	99% Chebyshev (MVUE) UCL	21367
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.424	Data appear Normal at 5% Significance Level	
Theta Star	1863		
nu star	462.6		
Approximate Chi Square Value (.05)	413.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	13062

Adjusted Chi Square Value	411.6	95% Jackknife UCL	13092
		95% Standard Bootstrap UCL	13034
Anderson-Darling Test Statistic	0.592	95% Bootstrap-t UCL	13062
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	13058
Kolmogorov-Smirnov Test Statistic	0.0919	95% Percentile Bootstrap UCL	13052
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	13052
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14862
		97.5% Chebyshev(Mean, Sd) UCL	16113
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18569
95% Approximate Gamma UCL	13385		
95% Adjusted Gamma UCL	13453		
Potential UCL to Use		Use 95% Student's-t UCL	13092

Result or 1/2 DL (anthracene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	24

Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.594
Maximum	0.264	Maximum of Log Data	-1.332
Mean	0.0215	Mean of log Data	-4.761
Median	0.006	SD of log Data	1.024
SD	0.0516		
Coefficient of Variation	2.397		
Skewness	4.003		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.372	Shapiro Wilk Test Statistic	0.624
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0361	95% H-UCL	0.022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0264
95% Adjusted-CLT UCL	0.0418	97.5% Chebyshev (MVUE) UCL	0.0317
95% Modified-t UCL	0.037	99% Chebyshev (MVUE) UCL	0.0422

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.623	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0346		
nu star	44.87		
Approximate Chi Square Value (.05)	30.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0357
Adjusted Chi Square Value	29.96	95% Jackknife UCL	0.0361
		95% Standard Bootstrap UCL	0.0361
Anderson-Darling Test Statistic	7.709	95% Bootstrap-t UCL	0.0846
Anderson-Darling 5% Critical Value	0.797	95% Hall's Bootstrap UCL	0.0941
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	0.037

Kolmogorov-Smirnov 5% Critical Value	0.154	95% BCA Bootstrap UCL	0.0437
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0591
		97.5% Chebyshev(Mean, Sd) UCL	0.0753
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.107
95% Approximate Gamma UCL	0.0317		
95% Adjusted Gamma UCL	0.0323		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.107

Result or 1/2 DL (antimony)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	23

Raw Statistics		Log-transformed Statistics	
Minimum	0.095	Minimum of Log Data	-2.354
Maximum	8.09	Maximum of Log Data	2.091
Mean	1.416	Mean of log Data	-0.752
Median	0.125	SD of log Data	1.642
SD	1.779		
Coefficient of Variation	1.256		
Skewness	1.716		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.738	Shapiro Wilk Test Statistic	0.731
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.917	95% H-UCL	4.438
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.311
95% Adjusted-CLT UCL	1.994	97.5% Chebyshev (MVUE) UCL	5.452
95% Modified-t UCL	1.931	99% Chebyshev (MVUE) UCL	7.692
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.538	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.632		
nu star	38.74		
Approximate Chi Square Value (.05)	25.48	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.904
Adjusted Chi Square Value	25	95% Jackknife UCL	1.917
		95% Standard Bootstrap UCL	1.915
Anderson-Darling Test Statistic	4.128	95% Bootstrap-t UCL	2.065
Anderson-Darling 5% Critical Value	0.806	95% Hall's Bootstrap UCL	2.167
Kolmogorov-Smirnov Test Statistic	0.349	95% Percentile Bootstrap UCL	1.93
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	2.035
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.708
		97.5% Chebyshev(Mean, Sd) UCL	3.267
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.366
95% Approximate Gamma UCL	2.152		

95% Adjusted Gamma UCL	2.195		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	4.366

Result or 1/2 DL (aroclor-1254)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	34

Raw Statistics		Log-transformed Statistics	
Minimum	0.0019	Minimum of Log Data	-6.269
Maximum	0.0938	Maximum of Log Data	-2.367
Mean	0.0056	Mean of log Data	-5.848
Median	0.0021	SD of log Data	0.763
SD	0.0154		
Coefficient of Variation	2.735		
Skewness	5.714		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.254	Shapiro Wilk Test Statistic	0.554
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0099	95% H-UCL	0.0050
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0061
95% Adjusted-CLT UCL	0.0124	97.5% Chebyshev (MVUE) UCL	0.0071
95% Modified-t UCL	0.0104	99% Chebyshev (MVUE) UCL	0.0091
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.826	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0068		
nu star	59.44		
Approximate Chi Square Value (.05)	42.71	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0098
Adjusted Chi Square Value	42.07	95% Jackknife UCL	0.0099
		95% Standard Bootstrap UCL	0.0097
Anderson-Darling Test Statistic	8.285	95% Bootstrap-t UCL	0.0476
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.0303
Kolmogorov-Smirnov Test Statistic	0.394	95% Percentile Bootstrap UCL	0.0107
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	0.0152
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0168
		97.5% Chebyshev(Mean, Sd) UCL	0.0216
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0311
95% Approximate Gamma UCL	0.0078		
95% Adjusted Gamma UCL	0.0079		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0168

Result or 1/2 DL (arsenic)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	32

Raw Statistics		Log-transformed Statistics	
Minimum	0.105	Minimum of Log Data	-2.254
Maximum	5.69	Maximum of Log Data	1.739
Mean	2.573	Mean of log Data	0.673
Median	2.53	SD of log Data	0.969
SD	1.369		
Coefficient of Variation	0.532		
Skewness	0.256		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.732
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.959	95% H-UCL	4.613
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.572
95% Adjusted-CLT UCL	2.959	97.5% Chebyshev (MVUE) UCL	6.652
95% Modified-t UCL	2.96	99% Chebyshev (MVUE) UCL	8.772
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.84	Data appear Normal at 5% Significance Level	
Theta Star	1.399		
nu star	132.5		
Approximate Chi Square Value (.05)	106.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	2.948
Adjusted Chi Square Value	105.8	95% Jackknife UCL	2.959
		95% Standard Bootstrap UCL	2.934
Anderson-Darling Test Statistic	2.399	95% Bootstrap-t UCL	2.955
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	2.96
Kolmogorov-Smirnov Test Statistic	0.231	95% Percentile Bootstrap UCL	2.938
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	2.961
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.567
		97.5% Chebyshev(Mean, Sd) UCL	3.998
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.843
95% Approximate Gamma UCL	3.189		
95% Adjusted Gamma UCL	3.221		
Potential UCL to Use		Use 95% Student's-t UCL	2.959

Result or 1/2 DL (barium)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	31

Raw Statistics		Log-transformed Statistics	
Minimum	46.1	Minimum of Log Data	3.831
Maximum	476	Maximum of Log Data	6.165
Mean	142.1	Mean of log Data	4.802
Median	121	SD of log Data	0.53
SD	95.9		
Coefficient of Variation	0.675		
Skewness	2.311		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.718	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	169.1	95% H-UCL	166.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	196.1
95% Adjusted-CLT UCL	174.9	97.5% Chebyshev (MVUE) UCL	220.5
95% Modified-t UCL	170.1	99% Chebyshev (MVUE) UCL	268.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.139	Data do not follow a Discernable Distribution (0.05)	
Theta Star	45.26		
nu star	226		
Approximate Chi Square Value (.05)	192.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	168.4
Adjusted Chi Square Value	190.8	95% Jackknife UCL	169.1
		95% Standard Bootstrap UCL	168
Anderson-Darling Test Statistic	1.456	95% Bootstrap-t UCL	180.8
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	182.1
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	168.2
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	175.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	211.7
		97.5% Chebyshev(Mean, Sd) UCL	241.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	301.1
95% Approximate Gamma UCL	167.1		
95% Adjusted Gamma UCL	168.3		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	211.7

Result or 1/2 DL (benzo(a)anthracene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	25

Raw Statistics		Log-transformed Statistics	
Minimum	0.0025	Minimum of Log Data	-5.985
Maximum	1.18	Maximum of Log Data	0.166
Mean	0.068	Mean of log Data	-4.862
Median	0.0055	SD of log Data	1.45

SD	0.239		
Coefficient of Variation	3.512		
Skewness	4.117		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.304	Shapiro Wilk Test Statistic	0.587
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.135	95% H-UCL	0.0457
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.049
95% Adjusted-CLT UCL	0.163	97.5% Chebyshev (MVUE) UCL	0.0612
95% Modified-t UCL	0.14	99% Chebyshev (MVUE) UCL	0.085
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.307	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.222		
nu star	22.1		
Approximate Chi Square Value (.05)	12.41	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.134
Adjusted Chi Square Value	12.08	95% Jackknife UCL	0.135
		95% Standard Bootstrap UCL	0.133
Anderson-Darling Test Statistic	9.41	95% Bootstrap-t UCL	0.491
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	0.61
Kolmogorov-Smirnov Test Statistic	0.502	95% Percentile Bootstrap UCL	0.137
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	0.176
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.242
		97.5% Chebyshev(Mean, Sd) UCL	0.317
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.464
95% Approximate Gamma UCL	0.121		
95% Adjusted Gamma UCL	0.124		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.464

Result or 1/2 DL (benzo(a)pyrene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	28

Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.403
Maximum	1.42	Maximum of Log Data	0.351
Mean	0.0922	Mean of log Data	-4.333
Median	0.0056	SD of log Data	1.62
SD	0.278		
Coefficient of Variation	3.017		
Skewness	4.117		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.361	Shapiro Wilk Test Statistic	0.651
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.171	95% H-UCL	0.117
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.115
95% Adjusted-CLT UCL	0.203	97.5% Chebyshev (MVUE) UCL	0.145
95% Modified-t UCL	0.176	99% Chebyshev (MVUE) UCL	0.205
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.335	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.275		
nu star	24.15		
Approximate Chi Square Value (.05)	13.96	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.169
Adjusted Chi Square Value	13.61	95% Jackknife UCL	0.171
		95% Standard Bootstrap UCL	0.168
Anderson-Darling Test Statistic	6.99	95% Bootstrap-t UCL	0.5
Anderson-Darling 5% Critical Value	0.847	95% Hall's Bootstrap UCL	0.495
Kolmogorov-Smirnov Test Statistic	0.422	95% Percentile Bootstrap UCL	0.175
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.217
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.294
		97.5% Chebyshev(Mean, Sd) UCL	0.382
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.554
95% Approximate Gamma UCL	0.16		
95% Adjusted Gamma UCL	0.164		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.554

Result or 1/2 DL (benzo(b)fluoranthene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	32

Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.625
Maximum	1.62	Maximum of Log Data	0.482
Mean	0.12	Mean of log Data	-4.074
Median	0.0062	SD of log Data	1.886
SD	0.319		
Coefficient of Variation	2.649		
Skewness	3.981		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.412	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.21	95% H-UCL	0.315
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.257
95% Adjusted-CLT UCL	0.245	97.5% Chebyshev (MVUE) UCL	0.329
95% Modified-t UCL	0.216	99% Chebyshev (MVUE) UCL	0.471
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.36		
nu star	24.08		
Approximate Chi Square Value (.05)	13.91	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.208
Adjusted Chi Square Value	13.56	95% Jackknife UCL	0.21
		95% Standard Bootstrap UCL	0.207
Anderson-Darling Test Statistic	4.213	95% Bootstrap-t UCL	0.469
Anderson-Darling 5% Critical Value	0.847	95% Hall's Bootstrap UCL	0.615
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	0.214
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.267
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.352
		97.5% Chebyshev(Mean, Sd) UCL	0.452
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.649
95% Approximate Gamma UCL	0.208		
95% Adjusted Gamma UCL	0.214		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.649

Result or 1/2 DL (benzo(g,h,i)perylene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	29

Raw Statistics		Log-transformed Statistics	
Minimum	0.0046	Minimum of Log Data	-5.368
Maximum	1.28	Maximum of Log Data	0.247
Mean	0.0961	Mean of log Data	-4.016
Median	0.0058	SD of log Data	1.685
SD	0.24		
Coefficient of Variation	2.497		
Skewness	4.019		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.756
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.164	95% H-UCL	0.19
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.18
95% Adjusted-CLT UCL	0.191	97.5% Chebyshev (MVUE) UCL	0.228
95% Modified-t UCL	0.168	99% Chebyshev (MVUE) UCL	0.323

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.253		
nu star	27.35		
Approximate Chi Square Value (.05)	16.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.162
Adjusted Chi Square Value	16.03	95% Jackknife UCL	0.164
		95% Standard Bootstrap UCL	0.162
Anderson-Darling Test Statistic	4.565	95% Bootstrap-t UCL	0.284
Anderson-Darling 5% Critical Value	0.836	95% Hall's Bootstrap UCL	0.403
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	0.173
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.206
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.27
		97.5% Chebyshev(Mean, Sd) UCL	0.346
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.494
95% Approximate Gamma UCL	0.16		
95% Adjusted Gamma UCL	0.164		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.494

Result or 1/2 DL (benzo(k)fluoranthene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	25

Raw Statistics		Log-transformed Statistics	
Minimum	0.0055	Minimum of Log Data	-5.203
Maximum	0.799	Maximum of Log Data	-0.224
Mean	0.0601	Mean of log Data	-4.26
Median	0.0085	SD of log Data	1.298
SD	0.169		
Coefficient of Variation	2.819		
Skewness	3.875		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.357	Shapiro Wilk Test Statistic	0.62
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.108	95% H-UCL	0.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0682
95% Adjusted-CLT UCL	0.126	97.5% Chebyshev (MVUE) UCL	0.0841
95% Modified-t UCL	0.111	99% Chebyshev (MVUE) UCL	0.115

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.428	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.141		
nu star	30.79		

Approximate Chi Square Value (.05)	19.12	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.107
Adjusted Chi Square Value	18.7	95% Jackknife UCL	0.108
		95% Standard Bootstrap UCL	0.104
Anderson-Darling Test Statistic	7.875	95% Bootstrap-t UCL	0.283
Anderson-Darling 5% Critical Value	0.824	95% Hall's Bootstrap UCL	0.309
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	0.106
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	0.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.183
		97.5% Chebyshev(Mean, Sd) UCL	0.236
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.341
95% Approximate Gamma UCL	0.0968		
95% Adjusted Gamma UCL	0.099		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.341

Result or 1/2 DL (beryllium)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	28

Raw Statistics		Log-transformed Statistics	
Minimum	0.013	Minimum of Log Data	-4.343
Maximum	2.88	Maximum of Log Data	1.058
Mean	0.752	Mean of log Data	-0.509
Median	0.695	SD of log Data	0.881
SD	0.461		
Coefficient of Variation	0.613		
Skewness	2.77		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.702
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.882	95% H-UCL	1.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.503
95% Adjusted-CLT UCL	0.916	97.5% Chebyshev (MVUE) UCL	1.776
95% Modified-t UCL	0.888	99% Chebyshev (MVUE) UCL	2.312
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.199	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.342		
nu star	158.3		
Approximate Chi Square Value (.05)	130.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.879
Adjusted Chi Square Value	129.1	95% Jackknife UCL	0.882
		95% Standard Bootstrap UCL	0.874
Anderson-Darling Test Statistic	2.229	95% Bootstrap-t UCL	0.94

Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	1.53
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	0.885
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	0.921
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.087
		97.5% Chebyshev(Mean, Sd) UCL	1.232
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.516
95% Approximate Gamma UCL	0.914		
95% Adjusted Gamma UCL	0.923		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.087

Result or 1/2 DL (bis(2-ethylhexyl)phthalate)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	34

Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	0.239	Maximum of Log Data	-1.431
Mean	0.0428	Mean of log Data	-3.438
Median	0.0282	SD of log Data	0.703
SD	0.0446		
Coefficient of Variation	1.041		
Skewness	3.194		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0554	95% H-UCL	0.0527
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0635
95% Adjusted-CLT UCL	0.0593	97.5% Chebyshev (MVUE) UCL	0.0733
95% Modified-t UCL	0.0561	99% Chebyshev (MVUE) UCL	0.0926
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.75	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0245		
nu star	126		
Approximate Chi Square Value (.05)	101.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0551
Adjusted Chi Square Value	100.1	95% Jackknife UCL	0.0554
		95% Standard Bootstrap UCL	0.0548
Anderson-Darling Test Statistic	2.221	95% Bootstrap-t UCL	0.0674
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	0.0691
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	0.0562
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.0599
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0753
		97.5% Chebyshev(Mean, Sd) UCL	0.0893

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.117
95% Approximate Gamma UCL	0.0534		
95% Adjusted Gamma UCL	0.054		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0753

Result or 1/2 DL (boron)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	35

Raw Statistics		Log-transformed Statistics	
Minimum	0.555	Minimum of Log Data	-0.589
Maximum	39.2	Maximum of Log Data	3.669
Mean	7.576	Mean of log Data	1.383
Median	5.27	SD of log Data	1.32
SD	7.826		
Coefficient of Variation	1.033		
Skewness	2.044		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.801	Shapiro Wilk Test Statistic	0.863
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.779	95% H-UCL	17.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.02
95% Adjusted-CLT UCL	10.2	97.5% Chebyshev (MVUE) UCL	24.73
95% Modified-t UCL	9.853	99% Chebyshev (MVUE) UCL	33.99
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.852	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.892		
nu star	61.34		
Approximate Chi Square Value (.05)	44.33	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	9.721
Adjusted Chi Square Value	43.67	95% Jackknife UCL	9.779
		95% Standard Bootstrap UCL	9.629
Anderson-Darling Test Statistic	1.037	95% Bootstrap-t UCL	10.46
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	10.98
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	9.74
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	10.28
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.26
		97.5% Chebyshev(Mean, Sd) UCL	15.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.55
95% Approximate Gamma UCL	10.48		
95% Adjusted Gamma UCL	10.64		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.55

Result or 1/2 DL (bromoform)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	6.8500E-5	Minimum of Log Data	-9.589
Maximum	0.018	Maximum of Log Data	-4.017
Mean	0.0023	Mean of log Data	-8.057
Median	9.2500E-5	SD of log Data	2.053
SD	0.0046		
Coefficient of Variation	1.992		
Skewness	2.642		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.687
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0042	95% H-UCL	0.0217
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0069
95% Adjusted-CLT UCL	0.0048	97.5% Chebyshev (MVUE) UCL	0.0091
95% Modified-t UCL	0.0043	99% Chebyshev (MVUE) UCL	0.0133
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.32	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0073		
nu star	12.14		
Approximate Chi Square Value (.05)	5.322	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0041
Adjusted Chi Square Value	4.931	95% Jackknife UCL	0.0042
		95% Standard Bootstrap UCL	0.0040
Anderson-Darling Test Statistic	2.937	95% Bootstrap-t UCL	0.0072
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.0119
Kolmogorov-Smirnov Test Statistic	0.421	95% Percentile Bootstrap UCL	0.0042
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.0049
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0070
		97.5% Chebyshev(Mean, Sd) UCL	0.0090
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.013
95% Approximate Gamma UCL	0.0053		
95% Adjusted Gamma UCL	0.0057		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.013

Result or 1/2 DL (butyl benzyl phthalate)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	29

Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.389
Maximum	0.151	Maximum of Log Data	-1.89
Mean	0.0125	Mean of log Data	-4.877
Median	0.0067	SD of log Data	0.703
SD	0.0255		
Coefficient of Variation	2.039		
Skewness	4.982		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.307	Shapiro Wilk Test Statistic	0.519
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0197	95% H-UCL	0.0125
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.015
95% Adjusted-CLT UCL	0.0233	97.5% Chebyshev (MVUE) UCL	0.0174
95% Modified-t UCL	0.0203	99% Chebyshev (MVUE) UCL	0.0219
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.069	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0117		
nu star	76.97		
Approximate Chi Square Value (.05)	57.76	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0195
Adjusted Chi Square Value	57	95% Jackknife UCL	0.0197
		95% Standard Bootstrap UCL	0.0194
Anderson-Darling Test Statistic	8.924	95% Bootstrap-t UCL	0.0398
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	0.0422
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	0.0203
Kolmogorov-Smirnov 5% Critical Value	0.151	95% BCA Bootstrap UCL	0.0245
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.031
		97.5% Chebyshev(Mean, Sd) UCL	0.0391
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0548
95% Approximate Gamma UCL	0.0167		
95% Adjusted Gamma UCL	0.0169		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.031

Result or 1/2 DL (cadmium)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	26

Raw Statistics		Log-transformed Statistics	
Minimum	0.003	Minimum of Log Data	-5.809
Maximum	0.8	Maximum of Log Data	-0.223

Mean	0.193	Mean of log Data	-3.263
Median	0.0105	SD of log Data	2.139
SD	0.239		
Coefficient of Variation	1.24		
Skewness	0.849		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.76	Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.26	95% H-UCL	1.572
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.004
95% Adjusted-CLT UCL	0.265	97.5% Chebyshev (MVUE) UCL	1.302
95% Modified-t UCL	0.261	99% Chebyshev (MVUE) UCL	1.887
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.39	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.494		
nu star	28.11		
Approximate Chi Square Value (.05)	17.02	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.259
Adjusted Chi Square Value	16.62	95% Jackknife UCL	0.26
		95% Standard Bootstrap UCL	0.257
Anderson-Darling Test Statistic	3.561	95% Bootstrap-t UCL	0.269
Anderson-Darling 5% Critical Value	0.833	95% Hall's Bootstrap UCL	0.264
Kolmogorov-Smirnov Test Statistic	0.313	95% Percentile Bootstrap UCL	0.261
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.262
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.367
		97.5% Chebyshev(Mean, Sd) UCL	0.442
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.59
95% Approximate Gamma UCL	0.319		
95% Adjusted Gamma UCL	0.326		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.59

Result or 1/2 DL (carbon disulfide)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	4.4000E-5	Minimum of Log Data	-10.03
Maximum	0.0284	Maximum of Log Data	-3.561
Mean	0.0028	Mean of log Data	-8.197
Median	5.8000E-5	SD of log Data	2.3
SD	0.0066		
Coefficient of Variation	2.34		
Skewness	3.51		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.733
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0054	95% H-UCL	0.0531
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.01
95% Adjusted-CLT UCL	0.0066	97.5% Chebyshev (MVUE) UCL	0.0132
95% Modified-t UCL	0.0057	99% Chebyshev (MVUE) UCL	0.0195
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.284	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.01		
nu star	10.8		
Approximate Chi Square Value (.05)	4.45	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0053
Adjusted Chi Square Value	4.098	95% Jackknife UCL	0.0054
		95% Standard Bootstrap UCL	0.0051
Anderson-Darling Test Statistic	2.428	95% Bootstrap-t UCL	0.0102
Anderson-Darling 5% Critical Value	0.845	95% Hall's Bootstrap UCL	0.0129
Kolmogorov-Smirnov Test Statistic	0.384	95% Percentile Bootstrap UCL	0.0055
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0075
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0095
		97.5% Chebyshev(Mean, Sd) UCL	0.0124
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.018
95% Approximate Gamma UCL	0.0069		
95% Adjusted Gamma UCL	0.0075		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.018

Result or 1/2 DL (chromium)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	33
Raw Statistics		**Log-transformed Statistics**	
Minimum	7.76	Minimum of Log Data	2.049
Maximum	128	Maximum of Log Data	4.852
Mean	17.17	Mean of log Data	2.651
Median	12.8	SD of log Data	0.489
SD	19.6		
Coefficient of Variation	1.142		
Skewness	5.455		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.365	Shapiro Wilk Test Statistic	0.777
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.69	95% H-UCL	18.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.82
95% Adjusted-CLT UCL	25.72	97.5% Chebyshev (MVUE) UCL	24.38
95% Modified-t UCL	23.18	99% Chebyshev (MVUE) UCL	29.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.545	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.745		
nu star	183.3		
Approximate Chi Square Value (.05)	153	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	22.54
Adjusted Chi Square Value	151.7	95% Jackknife UCL	22.69
		95% Standard Bootstrap UCL	22.43
Anderson-Darling Test Statistic	3.618	95% Bootstrap-t UCL	37.28
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	43.24
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	23.43
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	27.01
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.41
		97.5% Chebyshev(Mean, Sd) UCL	37.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	49.67
95% Approximate Gamma UCL	20.57		
95% Adjusted Gamma UCL	20.74		
Potential UCL to Use		Use 95% Student's-t UCL	22.69
		or 95% Modified-t UCL	23.18

Result or 1/2 DL (chrysene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	33
Raw Statistics		Log-transformed Statistics	
Minimum	0.0040	Minimum of Log Data	-5.502
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.0885	Mean of log Data	-4.382
Median	0.0050	SD of log Data	1.633
SD	0.265		
Coefficient of Variation	3.001		
Skewness	3.989		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.361	Shapiro Wilk Test Statistic	0.683
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.163	95% H-UCL	0.115

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.112
95% Adjusted-CLT UCL	0.193	97.5% Chebyshev (MVUE) UCL	0.142
95% Modified-t UCL	0.168	99% Chebyshev (MVUE) UCL	0.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.265		
nu star	24.07		
Approximate Chi Square Value (.05)	13.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.161
Adjusted Chi Square Value	13.55	95% Jackknife UCL	0.163
		95% Standard Bootstrap UCL	0.163
Anderson-Darling Test Statistic	6.548	95% Bootstrap-t UCL	0.475
Anderson-Darling 5% Critical Value	0.847	95% Hall's Bootstrap UCL	0.489
Kolmogorov-Smirnov Test Statistic	0.37	95% Percentile Bootstrap UCL	0.166
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.204
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.281
		97.5% Chebyshev(Mean, Sd) UCL	0.365
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.529
95% Approximate Gamma UCL	0.153		
95% Adjusted Gamma UCL	0.157		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.529

Result or 1/2 DL (cis-1,2-dichloroethene)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	5.1000E-5	Minimum of Log Data	-9.884
Maximum	0.999	Maximum of Log Data	-0.001
Mean	0.0541	Mean of log Data	-8.276
Median	6.7000E-5	SD of log Data	2.711
SD	0.229		
Coefficient of Variation	4.232		
Skewness	4.356		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.253	Shapiro Wilk Test Statistic	0.631
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.145	95% H-UCL	0.356
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0226
95% Adjusted-CLT UCL	0.197	97.5% Chebyshev (MVUE) UCL	0.03
95% Modified-t UCL	0.154	99% Chebyshev (MVUE) UCL	0.0446
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.157	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.345		
nu star	5.949		
Approximate Chi Square Value (.05)	1.614	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.14
Adjusted Chi Square Value	1.426	95% Jackknife UCL	0.145
		95% Standard Bootstrap UCL	0.138
Anderson-Darling Test Statistic	4.69	95% Bootstrap-t UCL	12.24
Anderson-Darling 5% Critical Value	0.908	95% Hall's Bootstrap UCL	7.38
Kolmogorov-Smirnov Test Statistic	0.426	95% Percentile Bootstrap UCL	0.159
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.213
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.283
		97.5% Chebyshev(Mean, Sd) UCL	0.382
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.577
95% Approximate Gamma UCL	0.199		
95% Adjusted Gamma UCL	0.226		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.577

Result or 1/2 DL (cobalt)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	2.81	Minimum of Log Data	1.033
Maximum	10.3	Maximum of Log Data	2.332
Mean	6.318	Mean of log Data	1.803
Median	6.115	SD of log Data	0.3
SD	1.743		
Coefficient of Variation	0.276		
Skewness	0.102		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.982	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.808	95% H-UCL	6.944
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.739
95% Adjusted-CLT UCL	6.801	97.5% Chebyshev (MVUE) UCL	8.346
95% Modified-t UCL	6.809	99% Chebyshev (MVUE) UCL	9.538

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.41	Data appear Normal at 5% Significance Level	
Theta Star	0.553		
nu star	821.8		
Approximate Chi Square Value (.05)	756.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	6.795

Adjusted Chi Square Value	753.4	95% Jackknife UCL	6.808
		95% Standard Bootstrap UCL	6.782
Anderson-Darling Test Statistic	0.303	95% Bootstrap-t UCL	6.811
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	6.819
Kolmogorov-Smirnov Test Statistic	0.0941	95% Percentile Bootstrap UCL	6.799
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	6.809
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.584
		97.5% Chebyshev(Mean, Sd) UCL	8.132
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.208
95% Approximate Gamma UCL	6.865		
95% Adjusted Gamma UCL	6.891		
Potential UCL to Use		Use 95% Student's-t UCL	6.808

Result or 1/2 DL (copper)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	34

Raw Statistics		Log-transformed Statistics	
Minimum	4.59	Minimum of Log Data	1.524
Maximum	200	Maximum of Log Data	5.298
Mean	18.7	Mean of log Data	2.553
Median	10.05	SD of log Data	0.689
SD	31.9		
Coefficient of Variation	1.705		
Skewness	5.536		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.347	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27.68	95% H-UCL	20.73
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.92
95% Adjusted-CLT UCL	32.69	97.5% Chebyshev (MVUE) UCL	28.71
95% Modified-t UCL	28.5	99% Chebyshev (MVUE) UCL	36.16
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.37	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.65		
nu star	98.64		
Approximate Chi Square Value (.05)	76.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	27.45
Adjusted Chi Square Value	75.85	95% Jackknife UCL	27.68
		95% Standard Bootstrap UCL	27.43
Anderson-Darling Test Statistic	2.951	95% Bootstrap-t UCL	50.7
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	60.07
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	28.98

Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	36.21
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	41.87
		97.5% Chebyshev(Mean, Sd) UCL	51.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	71.6
95% Approximate Gamma UCL	24.04		
95% Adjusted Gamma UCL	24.32		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	41.87

Result or 1/2 DL (cyclohexane)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	4.8100E-4	Minimum of Log Data	-7.64
Maximum	0.0255	Maximum of Log Data	-3.669
Mean	0.0056	Mean of log Data	-6.457
Median	6.3000E-4	SD of log Data	1.497
SD	0.0096		
Coefficient of Variation	1.696		
Skewness	1.55		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.553	Shapiro Wilk Test Statistic	0.705
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0094	95% H-UCL	0.016
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.012
95% Adjusted-CLT UCL	0.0101	97.5% Chebyshev (MVUE) UCL	0.0153
95% Modified-t UCL	0.0096	99% Chebyshev (MVUE) UCL	0.0218
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.452	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0125		
nu star	17.18		
Approximate Chi Square Value (.05)	8.804	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0092
Adjusted Chi Square Value	8.282	95% Jackknife UCL	0.0094
		95% Standard Bootstrap UCL	0.0090
Anderson-Darling Test Statistic	3.232	95% Bootstrap-t UCL	0.0118
Anderson-Darling 5% Critical Value	0.804	95% Hall's Bootstrap UCL	0.0083
Kolmogorov-Smirnov Test Statistic	0.355	95% Percentile Bootstrap UCL	0.0094
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	0.0105
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0153
		97.5% Chebyshev(Mean, Sd) UCL	0.0194
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0276
95% Approximate Gamma UCL	0.0111		

95% Adjusted Gamma UCL	0.0118		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0276
Recommended UCL exceeds the maximum observation			

Result or 1/2 DL (dibenz(a,h)anthracene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	26

Raw Statistics		Log-transformed Statistics	
Minimum	0.0034	Minimum of Log Data	-5.674
Maximum	0.404	Maximum of Log Data	-0.906
Mean	0.0384	Mean of log Data	-4.616
Median	0.0054	SD of log Data	1.398
SD	0.0833		
Coefficient of Variation	2.166		
Skewness	3.088		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.49	Shapiro Wilk Test Statistic	0.646
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0619	95% H-UCL	0.052
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0571
95% Adjusted-CLT UCL	0.0689	97.5% Chebyshev (MVUE) UCL	0.0709
95% Modified-t UCL	0.0631	99% Chebyshev (MVUE) UCL	0.0982
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.451	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0852		
nu star	32.49		
Approximate Chi Square Value (.05)	20.46	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0613
Adjusted Chi Square Value	20.02	95% Jackknife UCL	0.0619
		95% Standard Bootstrap UCL	0.0615
Anderson-Darling Test Statistic	7.096	95% Bootstrap-t UCL	0.0836
Anderson-Darling 5% Critical Value	0.819	95% Hall's Bootstrap UCL	0.0724
Kolmogorov-Smirnov Test Statistic	0.456	95% Percentile Bootstrap UCL	0.0633
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	0.0733
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0989
		97.5% Chebyshev(Mean, Sd) UCL	0.125
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.177
95% Approximate Gamma UCL	0.0611		
95% Adjusted Gamma UCL	0.0624		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.177

Result or 1/2 DL (dibenzofuran)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	27

Raw Statistics		Log-transformed Statistics	
Minimum	0.0030	Minimum of Log Data	-5.799
Maximum	0.0862	Maximum of Log Data	-2.451
Mean	0.0099	Mean of log Data	-4.945
Median	0.0075	SD of log Data	0.667
SD	0.0145		
Coefficient of Variation	1.457		
Skewness	4.686		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.375	Shapiro Wilk Test Statistic	0.732
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.014	95% H-UCL	0.0112
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0135
95% Adjusted-CLT UCL	0.0159	97.5% Chebyshev (MVUE) UCL	0.0155
95% Modified-t UCL	0.0143	99% Chebyshev (MVUE) UCL	0.0194
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.523	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0065		
nu star	109.7		
Approximate Chi Square Value (.05)	86.51	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0139
Adjusted Chi Square Value	85.57	95% Jackknife UCL	0.014
		95% Standard Bootstrap UCL	0.0137
Anderson-Darling Test Statistic	5.17	95% Bootstrap-t UCL	0.0303
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	0.0344
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	0.0141
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.0172
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0205
		97.5% Chebyshev(Mean, Sd) UCL	0.025
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.034
95% Approximate Gamma UCL	0.0126		
95% Adjusted Gamma UCL	0.0128		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0205

Result or 1/2 DL (diethyl phthalate)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	29

Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.578
Maximum	0.0498	Maximum of Log Data	-3
Mean	0.0097	Mean of log Data	-4.752
Median	0.0092	SD of log Data	0.448
SD	0.0072		
Coefficient of Variation	0.743		
Skewness	5.035		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.712
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0118	95% H-UCL	0.011
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0127
95% Adjusted-CLT UCL	0.0128	97.5% Chebyshev (MVUE) UCL	0.0141
95% Modified-t UCL	0.012	99% Chebyshev (MVUE) UCL	0.0168
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.92	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0024		
nu star	282.3		
Approximate Chi Square Value (.05)	244.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0117
Adjusted Chi Square Value	242.7	95% Jackknife UCL	0.0118
		95% Standard Bootstrap UCL	0.0117
Anderson-Darling Test Statistic	4.813	95% Bootstrap-t UCL	0.0146
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.0208
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL	0.012
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.0135
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.015
		97.5% Chebyshev(Mean, Sd) UCL	0.0173
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0218
95% Approximate Gamma UCL	0.0113		
95% Adjusted Gamma UCL	0.0113		
Potential UCL to Use		Use 95% Student's-t UCL	0.0118
		or 95% Modified-t UCL	0.012

Result or 1/2 DL (di-n-butyl phthalate)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	31

Raw Statistics		Log-transformed Statistics	
Minimum	0.0039	Minimum of Log Data	-5.525
Maximum	0.0835	Maximum of Log Data	-2.483

Mean	0.0155	Mean of log Data	-4.358
Median	0.0154	SD of log Data	0.624
SD	0.0128		
Coefficient of Variation	0.822		
Skewness	4.448		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.486	Shapiro Wilk Test Statistic	0.744
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0191	95% H-UCL	0.0192
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.023
95% Adjusted-CLT UCL	0.0207	97.5% Chebyshev (MVUE) UCL	0.0262
95% Modified-t UCL	0.0194	99% Chebyshev (MVUE) UCL	0.0326
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.534	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0061		
nu star	182.4		
Approximate Chi Square Value (.05)	152.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.019
Adjusted Chi Square Value	150.9	95% Jackknife UCL	0.0191
		95% Standard Bootstrap UCL	0.0189
Anderson-Darling Test Statistic	4.3	95% Bootstrap-t UCL	0.0225
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	0.035
Kolmogorov-Smirnov Test Statistic	0.308	95% Percentile Bootstrap UCL	0.0195
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	0.0214
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0248
		97.5% Chebyshev(Mean, Sd) UCL	0.0288
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0367
95% Approximate Gamma UCL	0.0186		
95% Adjusted Gamma UCL	0.0188		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0248

Result or 1/2 DL (di-n-octyl phthalate)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	30

Raw Statistics		Log-transformed Statistics	
Minimum	0.0041	Minimum of Log Data	-5.48
Maximum	0.123	Maximum of Log Data	-2.096
Mean	0.0115	Mean of log Data	-4.921
Median	0.0047	SD of log Data	0.76
SD	0.0205		
Coefficient of Variation	1.774		
Skewness	4.971		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.376	Shapiro Wilk Test Statistic	0.707
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0173	95% H-UCL	0.0128
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0155
95% Adjusted-CLT UCL	0.0202	97.5% Chebyshev (MVUE) UCL	0.018
95% Modified-t UCL	0.0178	99% Chebyshev (MVUE) UCL	0.023
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.146	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0101		
nu star	82.54		
Approximate Chi Square Value (.05)	62.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0171
Adjusted Chi Square Value	61.81	95% Jackknife UCL	0.0173
		95% Standard Bootstrap UCL	0.0172
Anderson-Darling Test Statistic	5.068	95% Bootstrap-t UCL	0.0314
Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	0.0385
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	0.0178
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	0.0216
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0264
		97.5% Chebyshev(Mean, Sd) UCL	0.0328
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0455
95% Approximate Gamma UCL	0.0152		
95% Adjusted Gamma UCL	0.0154		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0264

Result or 1/2 DL (ethylbenzene)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	8.7000E-5	Minimum of Log Data	-9.35
Maximum	0.0050	Maximum of Log Data	-5.294
Mean	0.0016	Mean of log Data	-7.578
Median	1.1400E-4	SD of log Data	1.78
SD	0.0019		
Coefficient of Variation	1.168		
Skewness	0.735		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.748
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0024	95% H-UCL	0.0128
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0065
95% Adjusted-CLT UCL	0.0024	97.5% Chebyshev (MVUE) UCL	0.0085
95% Modified-t UCL	0.0024	99% Chebyshev (MVUE) UCL	0.0123
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.484	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0034		
nu star	18.4		
Approximate Chi Square Value (.05)	9.677	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0024
Adjusted Chi Square Value	9.127	95% Jackknife UCL	0.0024
		95% Standard Bootstrap UCL	0.0023
Anderson-Darling Test Statistic	2.006	95% Bootstrap-t UCL	0.0025
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	0.0023
Kolmogorov-Smirnov Test Statistic	0.336	95% Percentile Bootstrap UCL	0.0024
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.0024
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0036
		97.5% Chebyshev(Mean, Sd) UCL	0.0044
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0061
95% Approximate Gamma UCL	0.0031		
95% Adjusted Gamma UCL	0.0033		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0061
Recommended UCL exceeds the maximum observation			

Result or 1/2 DL (fluoranthene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	26
Raw Statistics		Log-transformed Statistics	
Minimum	0.0033	Minimum of Log Data	-5.69
Maximum	2.19	Maximum of Log Data	0.784
Mean	0.146	Mean of log Data	-4.243
Median	0.0063	SD of log Data	1.752
SD	0.469		
Coefficient of Variation	3.217		
Skewness	3.949		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.339	Shapiro Wilk Test Statistic	0.697
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.278	95% H-UCL	0.181

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.164
95% Adjusted-CLT UCL	0.329	97.5% Chebyshev (MVUE) UCL	0.209
95% Modified-t UCL	0.286	99% Chebyshev (MVUE) UCL	0.296
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.292	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.499		
nu star	21		
Approximate Chi Square Value (.05)	11.59	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.274
Adjusted Chi Square Value	11.27	95% Jackknife UCL	0.278
		95% Standard Bootstrap UCL	0.271
Anderson-Darling Test Statistic	6.927	95% Bootstrap-t UCL	0.911
Anderson-Darling 5% Critical Value	0.858	95% Hall's Bootstrap UCL	0.856
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	0.281
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	0.352
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.486
		97.5% Chebyshev(Mean, Sd) UCL	0.633
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.923
95% Approximate Gamma UCL	0.264		
95% Adjusted Gamma UCL	0.271		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.923

Result or 1/2 DL (fluorene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	25
Raw Statistics		Log-transformed Statistics	
Minimum	0.0034	Minimum of Log Data	-5.674
Maximum	0.141	Maximum of Log Data	-1.959
Mean	0.0112	Mean of log Data	-5.042
Median	0.0053	SD of log Data	0.774
SD	0.0235		
Coefficient of Variation	2.098		
Skewness	5.169		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.329	Shapiro Wilk Test Statistic	0.623
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0178	95% H-UCL	0.0115
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.014
95% Adjusted-CLT UCL	0.0212	97.5% Chebyshev (MVUE) UCL	0.0163
95% Modified-t UCL	0.0183	99% Chebyshev (MVUE) UCL	0.0208
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.978	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0114		
nu star	70.43		
Approximate Chi Square Value (.05)	52.11	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0176
Adjusted Chi Square Value	51.39	95% Jackknife UCL	0.0178
		95% Standard Bootstrap UCL	0.0176
Anderson-Darling Test Statistic	7.344	95% Bootstrap-t UCL	0.035
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	0.0372
Kolmogorov-Smirnov Test Statistic	0.454	95% Percentile Bootstrap UCL	0.0181
Kolmogorov-Smirnov 5% Critical Value	0.151	95% BCA Bootstrap UCL	0.0227
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0282
		97.5% Chebyshev(Mean, Sd) UCL	0.0356
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0501
95% Approximate Gamma UCL	0.0151		
95% Adjusted Gamma UCL	0.0153		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0282

Result or 1/2 DL (indeno(1,2,3-cd)pyrene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	28

Raw Statistics		Log-transformed Statistics	
Minimum	0.007	Minimum of Log Data	-4.962
Maximum	1.51	Maximum of Log Data	0.412
Mean	0.113	Mean of log Data	-3.647
Median	0.0092	SD of log Data	1.563
SD	0.279		
Coefficient of Variation	2.469		
Skewness	4.199		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.427	Shapiro Wilk Test Statistic	0.762
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.192	95% H-UCL	0.201
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.204
95% Adjusted-CLT UCL	0.225	97.5% Chebyshev (MVUE) UCL	0.257
95% Modified-t UCL	0.197	99% Chebyshev (MVUE) UCL	0.361
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.423	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.268		
nu star	30.45		
Approximate Chi Square Value (.05)	18.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.19

Adjusted Chi Square Value	18.43	95% Jackknife UCL	0.192
		95% Standard Bootstrap UCL	0.19
Anderson-Darling Test Statistic	4.43	95% Bootstrap-t UCL	0.396
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.517
Kolmogorov-Smirnov Test Statistic	0.35	95% Percentile Bootstrap UCL	0.198
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	0.243
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.316
		97.5% Chebyshev(Mean, Sd) UCL	0.404
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.577
95% Approximate Gamma UCL	0.183		
95% Adjusted Gamma UCL	0.187		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.577

Result or 1/2 DL (iron)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	32

Raw Statistics		**Log-transformed Statistics**	
Minimum	7120	Minimum of Log Data	8.871
Maximum	102000	Maximum of Log Data	11.53
Mean	17531	Mean of log Data	9.638
Median	15350	SD of log Data	0.436
SD	15039		
Coefficient of Variation	0.858		
Skewness	5.318		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.41	Shapiro Wilk Test Statistic	0.824
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	21765	95% H-UCL	19358
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22337
95% Adjusted-CLT UCL	24027	97.5% Chebyshev (MVUE) UCL	24726
95% Modified-t UCL	22136	99% Chebyshev (MVUE) UCL	29419
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.588	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4885		
nu star	258.4		
Approximate Chi Square Value (.05)	222.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	21653
Adjusted Chi Square Value	220.6	95% Jackknife UCL	21765
		95% Standard Bootstrap UCL	21576
Anderson-Darling Test Statistic	2.629	95% Bootstrap-t UCL	29376
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	38680
Kolmogorov-Smirnov Test Statistic	0.213	95% Percentile Bootstrap UCL	22237

Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	24682
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28456
		97.5% Chebyshev(Mean, Sd) UCL	33183
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42470
95% Approximate Gamma UCL	20389		
95% Adjusted Gamma UCL	20529		
Potential UCL to Use		Use 95% Student's-t UCL	21765
		or 95% Modified-t UCL	22136

Result or 1/2 DL (lead)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	31

Raw Statistics		Log-transformed Statistics	
Minimum	5.88	Minimum of Log Data	1.772
Maximum	471	Maximum of Log Data	6.155
Mean	37.8	Mean of log Data	2.932
Median	15.2	SD of log Data	0.931
SD	80.99		
Coefficient of Variation	2.143		
Skewness	4.731		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Test Statistic	0.781
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.6	95% H-UCL	41.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	50.42
95% Adjusted-CLT UCL	71.37	97.5% Chebyshev (MVUE) UCL	59.92
95% Modified-t UCL	62.38	99% Chebyshev (MVUE) UCL	78.59
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.79	Data do not follow a Discernable Distribution (0.05)	
Theta Star	47.83		
nu star	56.89		
Approximate Chi Square Value (.05)	40.55	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	60
Adjusted Chi Square Value	39.93	95% Jackknife UCL	60.6
		95% Standard Bootstrap UCL	60.09
Anderson-Darling Test Statistic	5.207	95% Bootstrap-t UCL	105.3
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	130.3
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	61.68
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	78.41
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	96.63
		97.5% Chebyshev(Mean, Sd) UCL	122.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	172.1

95% Approximate Gamma UCL	53.02		
95% Adjusted Gamma UCL	53.86		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	96.63

Result or 1/2 DL (lithium)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	33

Raw Statistics		Log-transformed Statistics	
Minimum	2.59	Minimum of Log Data	0.952
Maximum	32.2	Maximum of Log Data	3.472
Mean	18.84	Mean of log Data	2.869
Median	18.55	SD of log Data	0.424
SD	5.952		
Coefficient of Variation	0.316		
Skewness	0.0191		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.789
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20.51	95% H-UCL	22.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	25.35
95% Adjusted-CLT UCL	20.47	97.5% Chebyshev (MVUE) UCL	27.99
95% Modified-t UCL	20.51	99% Chebyshev (MVUE) UCL	33.19
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.068	Data appear Normal at 5% Significance Level	
Theta Star	2.665		
nu star	508.9		
Approximate Chi Square Value (.05)	457.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	20.47
Adjusted Chi Square Value	455.4	95% Jackknife UCL	20.51
		95% Standard Bootstrap UCL	20.44
Anderson-Darling Test Statistic	0.738	95% Bootstrap-t UCL	20.48
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	20.47
Kolmogorov-Smirnov Test Statistic	0.121	95% Percentile Bootstrap UCL	20.44
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	20.45
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23.16
		97.5% Chebyshev(Mean, Sd) UCL	25.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.71
95% Approximate Gamma UCL	20.95		
95% Adjusted Gamma UCL	21.05		
Potential UCL to Use		Use 95% Student's-t UCL	20.51

Result or 1/2 DL (m,p-xylene)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	1.6050E-4	Minimum of Log Data	-8.737
Maximum	0.0091	Maximum of Log Data	-4.694
Mean	0.0020	Mean of log Data	-7.556
Median	2.0500E-4	SD of log Data	1.604
SD	0.0034		
Coefficient of Variation	1.668		
Skewness	1.515		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0034	95% H-UCL	0.0073
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0048
95% Adjusted-CLT UCL	0.0036	97.5% Chebyshev (MVUE) UCL	0.0062
95% Modified-t UCL	0.0035	99% Chebyshev (MVUE) UCL	0.0089
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.428	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0048		
nu star	16.25		
Approximate Chi Square Value (.05)	8.141	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0033
Adjusted Chi Square Value	7.642	95% Jackknife UCL	0.0034
		95% Standard Bootstrap UCL	0.0033
Anderson-Darling Test Statistic	3.262	95% Bootstrap-t UCL	0.0041
Anderson-Darling 5% Critical Value	0.81	95% Hall's Bootstrap UCL	0.0030
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.0034
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0036
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0055
		97.5% Chebyshev(Mean, Sd) UCL	0.0070
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0099
95% Approximate Gamma UCL	0.0041		
95% Adjusted Gamma UCL	0.0044		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0099
Recommended UCL exceeds the maximum observation			

Result or 1/2 DL (manganese)

General Statistics			

Number of Valid Samples	36	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	82.3	Minimum of Log Data	4.41
Maximum	1210	Maximum of Log Data	7.098
Mean	347	Mean of log Data	5.709
Median	289.5	SD of log Data	0.542
SD	204.1		
Coefficient of Variation	0.588		
Skewness	2.242		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	404.5	95% H-UCL	417.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	491.6
95% Adjusted-CLT UCL	416.6	97.5% Chebyshev (MVUE) UCL	553.9
95% Modified-t UCL	406.6	99% Chebyshev (MVUE) UCL	676.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.417	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	101.6		
nu star	246		
Approximate Chi Square Value (.05)	210.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	403
Adjusted Chi Square Value	209.2	95% Jackknife UCL	404.5
		95% Standard Bootstrap UCL	401.3
Anderson-Darling Test Statistic	0.549	95% Bootstrap-t UCL	424.9
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	467
Kolmogorov-Smirnov Test Statistic	0.11	95% Percentile Bootstrap UCL	405.4
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	417.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	495.3
		97.5% Chebyshev(Mean, Sd) UCL	559.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	685.4
95% Approximate Gamma UCL	405.2		
95% Adjusted Gamma UCL	408.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	405.2

Result or 1/2 DL (mercury)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	23

Raw Statistics		Log-transformed Statistics	
Minimum	0.0011	Minimum of Log Data	-6.768
Maximum	0.064	Maximum of Log Data	-2.749

Mean	0.0094	Mean of log Data	-5.346
Median	0.0074	SD of log Data	1.23
SD	0.0124		
Coefficient of Variation	1.306		
Skewness	2.923		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.667	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.013	95% H-UCL	0.0177
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0205
95% Adjusted-CLT UCL	0.0139	97.5% Chebyshev (MVUE) UCL	0.0251
95% Modified-t UCL	0.0131	99% Chebyshev (MVUE) UCL	0.0342
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.803	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0118		
nu star	57.82		
Approximate Chi Square Value (.05)	41.34	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0129
Adjusted Chi Square Value	40.7	95% Jackknife UCL	0.013
		95% Standard Bootstrap UCL	0.0128
Anderson-Darling Test Statistic	1.891	95% Bootstrap-t UCL	0.0153
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	0.0288
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	0.0132
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	0.0141
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0185
		97.5% Chebyshev(Mean, Sd) UCL	0.0224
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.03
95% Approximate Gamma UCL	0.0133		
95% Adjusted Gamma UCL	0.0135		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.03

Result or 1/2 DL (methylcyclohexane)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.4950E-4	Minimum of Log Data	-8.808
Maximum	0.0085	Maximum of Log Data	-4.762
Mean	0.0024	Mean of log Data	-7.039
Median	0.0015	SD of log Data	1.607
SD	0.0030		
Coefficient of Variation	1.259		
Skewness	1.227		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.726	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0036	95% H-UCL	0.0125
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0081
95% Adjusted-CLT UCL	0.0038	97.5% Chebyshev (MVUE) UCL	0.0105
95% Modified-t UCL	0.0037	99% Chebyshev (MVUE) UCL	0.0151
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.541	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0045		
nu star	20.57		
Approximate Chi Square Value (.05)	11.27	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0036
Adjusted Chi Square Value	10.67	95% Jackknife UCL	0.0036
		95% Standard Bootstrap UCL	0.0035
Anderson-Darling Test Statistic	1.396	95% Bootstrap-t UCL	0.0040
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	0.0035
Kolmogorov-Smirnov Test Statistic	0.289	95% Percentile Bootstrap UCL	0.0037
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.0039
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0055
		97.5% Chebyshev(Mean, Sd) UCL	0.0068
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0095
95% Approximate Gamma UCL	0.0044		
95% Adjusted Gamma UCL	0.0047		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0095
Recommended UCL exceeds the maximum observation			

Result or 1/2 DL (molybdenum)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	28
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	10.7	Maximum of Log Data	2.37
Mean	0.586	Mean of log Data	-1.916
Median	0.115	SD of log Data	1.44
SD	1.788		
Coefficient of Variation	3.054		
Skewness	5.477		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.321	Shapiro Wilk Test Statistic	0.86

Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.089	95% H-UCL	0.851
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.917
95% Adjusted-CLT UCL	1.367	97.5% Chebyshev (MVUE) UCL	1.144
95% Modified-t UCL	1.135	99% Chebyshev (MVUE) UCL	1.589
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.445	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.316		
nu star	32.04		
Approximate Chi Square Value (.05)	20.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.076
Adjusted Chi Square Value	19.67	95% Jackknife UCL	1.089
		95% Standard Bootstrap UCL	1.077
Anderson-Darling Test Statistic	3.324	95% Bootstrap-t UCL	2.845
Anderson-Darling 5% Critical Value	0.82	95% Hall's Bootstrap UCL	2.784
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	1.164
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	1.557
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.885
		97.5% Chebyshev(Mean, Sd) UCL	2.447
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.551
95% Approximate Gamma UCL	0.933		
95% Adjusted Gamma UCL	0.954		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	3.551

Result or 1/2 DL (naphthalene)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		**Log-transformed Statistics**	
Minimum	1.5800E-4	Minimum of Log Data	-8.753
Maximum	0.251	Maximum of Log Data	-1.382
Mean	0.0236	Mean of log Data	-6.08
Median	0.0018	SD of log Data	2.079
SD	0.0644		
Coefficient of Variation	2.734		
Skewness	3.147		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.407	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0492	95% H-UCL	0.173

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0529
95% Adjusted-CLT UCL	0.0593	97.5% Chebyshev (MVUE) UCL	0.0693
95% Modified-t UCL	0.051	99% Chebyshev (MVUE) UCL	0.102
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.285	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0827		
nu star	10.82		
Approximate Chi Square Value (.05)	4.458	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0479
Adjusted Chi Square Value	4.107	95% Jackknife UCL	0.0492
		95% Standard Bootstrap UCL	0.0476
Anderson-Darling Test Statistic	2.192	95% Bootstrap-t UCL	0.506
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.25
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL	0.05
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.063
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.088
		97.5% Chebyshev(Mean, Sd) UCL	0.116
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.171
95% Approximate Gamma UCL	0.0571		
95% Adjusted Gamma UCL	0.062		
Potential UCL to Use		Use 99% Chebyshev (MVUE) UCL	0.102

Result or 1/2 DL (nickel)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	32
Raw Statistics		Log-transformed Statistics	
Minimum	9.74	Minimum of Log Data	2.276
Maximum	51.7	Maximum of Log Data	3.945
Mean	17.17	Mean of log Data	2.795
Median	16	SD of log Data	0.288
SD	6.788		
Coefficient of Variation	0.395		
Skewness	3.881		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.637	Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.08	95% H-UCL	18.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.67
95% Adjusted-CLT UCL	19.82	97.5% Chebyshev (MVUE) UCL	22.24
95% Modified-t UCL	19.21	99% Chebyshev (MVUE) UCL	25.32
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	9.72	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	1.767		
nu star	699.9		
Approximate Chi Square Value (.05)	639.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	19.03
Adjusted Chi Square Value	636.9	95% Jackknife UCL	19.08
		95% Standard Bootstrap UCL	18.99
Anderson-Darling Test Statistic	1.205	95% Bootstrap-t UCL	20.64
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	27.37
Kolmogorov-Smirnov Test Statistic	0.146	95% Percentile Bootstrap UCL	19.15
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	19.93
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.1
		97.5% Chebyshev(Mean, Sd) UCL	24.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.43
95% Approximate Gamma UCL	18.79		
95% Adjusted Gamma UCL	18.87		
Potential UCL to Use		Use 95% Approximate Gamma UCL	18.79

Result or 1/2 DL (phenanthrene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	30

Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.614
Maximum	1.34	Maximum of Log Data	0.293
Mean	0.0998	Mean of log Data	-4.194
Median	0.007	SD of log Data	1.57
SD	0.299		
Coefficient of Variation	2.991		
Skewness	3.832		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.354	Shapiro Wilk Test Statistic	0.743
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.184	95% H-UCL	0.119
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.12
95% Adjusted-CLT UCL	0.216	97.5% Chebyshev (MVUE) UCL	0.151
95% Modified-t UCL	0.189	99% Chebyshev (MVUE) UCL	0.212

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.344	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.29		
nu star	24.76		
Approximate Chi Square Value (.05)	14.43	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.182

Adjusted Chi Square Value	14.07	95% Jackknife UCL	0.184
		95% Standard Bootstrap UCL	0.182
Anderson-Darling Test Statistic	6.276	95% Bootstrap-t UCL	0.515
Anderson-Darling 5% Critical Value	0.845	95% Hall's Bootstrap UCL	0.538
Kolmogorov-Smirnov Test Statistic	0.359	95% Percentile Bootstrap UCL	0.187
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.218
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.317
		97.5% Chebyshev(Mean, Sd) UCL	0.411
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.595
95% Approximate Gamma UCL	0.171		
95% Adjusted Gamma UCL	0.176		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.595

Result or 1/2 DL (pyrene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	28

Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.424
Maximum	1.97	Maximum of Log Data	0.678
Mean	0.143	Mean of log Data	-4.094
Median	0.0067	SD of log Data	1.701
SD	0.444		
Coefficient of Variation	3.103		
Skewness	3.879		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.703
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.268	95% H-UCL	0.184
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.172
95% Adjusted-CLT UCL	0.316	97.5% Chebyshev (MVUE) UCL	0.218
95% Modified-t UCL	0.276	99% Chebyshev (MVUE) UCL	0.309
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.461		
nu star	22.31		
Approximate Chi Square Value (.05)	12.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.265
Adjusted Chi Square Value	12.24	95% Jackknife UCL	0.268
		95% Standard Bootstrap UCL	0.261
Anderson-Darling Test Statistic	6.595	95% Bootstrap-t UCL	0.852
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	0.824
Kolmogorov-Smirnov Test Statistic	0.37	95% Percentile Bootstrap UCL	0.268

Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	0.336
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.465
		97.5% Chebyshev(Mean, Sd) UCL	0.605
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.879
95% Approximate Gamma UCL	0.254		
95% Adjusted Gamma UCL	0.261		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.879

Result or 1/2 DL (silver)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	20

Raw Statistics		Log-transformed Statistics	
Minimum	0.0135	Minimum of Log Data	-4.305
Maximum	0.41	Maximum of Log Data	-0.892
Mean	0.0473	Mean of log Data	-3.473
Median	0.0298	SD of log Data	0.718
SD	0.0773		
Coefficient of Variation	1.632		
Skewness	4.047		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.382	Shapiro Wilk Test Statistic	0.695
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0691	95% H-UCL	0.0518
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0625
95% Adjusted-CLT UCL	0.0778	97.5% Chebyshev (MVUE) UCL	0.0723
95% Modified-t UCL	0.0705	99% Chebyshev (MVUE) UCL	0.0915
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.233	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0384		
nu star	88.81		
Approximate Chi Square Value (.05)	68.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0685
Adjusted Chi Square Value	67.26	95% Jackknife UCL	0.0691
		95% Standard Bootstrap UCL	0.068
Anderson-Darling Test Statistic	6.224	95% Bootstrap-t UCL	0.157
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	0.157
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	0.0709
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	0.0811
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.103
		97.5% Chebyshev(Mean, Sd) UCL	0.128
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.175
95% Approximate Gamma UCL	0.0617		

95% Adjusted Gamma UCL	0.0625		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.103

Result or 1/2 DL (strontium)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	35

Raw Statistics		Log-transformed Statistics	
Minimum	22.1	Minimum of Log Data	3.096
Maximum	96.2	Maximum of Log Data	4.566
Mean	56.15	Mean of log Data	3.952
Median	53	SD of log Data	0.412
SD	20.95		
Coefficient of Variation	0.373		
Skewness	0.15		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.954	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	62.05	95% H-UCL	64.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	73.96
95% Adjusted-CLT UCL	61.98	97.5% Chebyshev (MVUE) UCL	81.51
95% Modified-t UCL	62.06	99% Chebyshev (MVUE) UCL	96.36
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.163	Data appear Normal at 5% Significance Level	
Theta Star	9.111		
nu star	443.7		
Approximate Chi Square Value (.05)	395.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	61.89
Adjusted Chi Square Value	393.8	95% Jackknife UCL	62.05
		95% Standard Bootstrap UCL	61.71
Anderson-Darling Test Statistic	0.492	95% Bootstrap-t UCL	62.12
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	62.04
Kolmogorov-Smirnov Test Statistic	0.106	95% Percentile Bootstrap UCL	61.53
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	61.57
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	71.37
		97.5% Chebyshev(Mean, Sd) UCL	77.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	90.89
95% Approximate Gamma UCL	62.93		
95% Adjusted Gamma UCL	63.26		
Potential UCL to Use		Use 95% Student's-t UCL	62.05

Result or 1/2 DL (tetrachloroethene)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18

Raw Statistics		Log-transformed Statistics	
Minimum	7.7500E-5	Minimum of Log Data	-9.465
Maximum	0.223	Maximum of Log Data	-1.501
Mean	0.0127	Mean of log Data	-7.936
Median	1.0500E-4	SD of log Data	2.239
SD	0.0509		
Coefficient of Variation	4.004		
Skewness	4.351		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.264	Shapiro Wilk Test Statistic	0.689
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.033	95% H-UCL	0.0528
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0115
95% Adjusted-CLT UCL	0.0444	97.5% Chebyshev (MVUE) UCL	0.0151
95% Modified-t UCL	0.0349	99% Chebyshev (MVUE) UCL	0.0222
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.208	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0612		
nu star	7.9		
Approximate Chi Square Value (.05)	2.677	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0319
Adjusted Chi Square Value	2.419	95% Jackknife UCL	0.033
		95% Standard Bootstrap UCL	0.0313
Anderson-Darling Test Statistic	3.918	95% Bootstrap-t UCL	0.477
Anderson-Darling 5% Critical Value	0.885	95% Hall's Bootstrap UCL	0.346
Kolmogorov-Smirnov Test Statistic	0.388	95% Percentile Bootstrap UCL	0.036
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	0.0482
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0637
		97.5% Chebyshev(Mean, Sd) UCL	0.0857
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.129
95% Approximate Gamma UCL	0.0375		
95% Adjusted Gamma UCL	0.0416		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.129

Result or 1/2 DL (tin)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	20

Raw Statistics		Log-transformed Statistics	
Minimum	0.195	Minimum of Log Data	-1.635
Maximum	3.67	Maximum of Log Data	1.3
Mean	0.47	Mean of log Data	-1.072
Median	0.285	SD of log Data	0.642
SD	0.628		
Coefficient of Variation	1.334		
Skewness	4.232		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.431	Shapiro Wilk Test Statistic	0.665
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.647	95% H-UCL	0.524
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.627
95% Adjusted-CLT UCL	0.721	97.5% Chebyshev (MVUE) UCL	0.718
95% Modified-t UCL	0.659	99% Chebyshev (MVUE) UCL	0.896
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.594	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.295		
nu star	114.8		
Approximate Chi Square Value (.05)	91.06	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.642
Adjusted Chi Square Value	90.1	95% Jackknife UCL	0.647
		95% Standard Bootstrap UCL	0.636
Anderson-Darling Test Statistic	6.272	95% Bootstrap-t UCL	0.881
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	1.225
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	0.664
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.747
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.926
		97.5% Chebyshev(Mean, Sd) UCL	1.124
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.511
95% Approximate Gamma UCL	0.593		
95% Adjusted Gamma UCL	0.599		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.926

Result or 1/2 DL (titanium)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	33

Raw Statistics		Log-transformed Statistics	
Minimum	3.41	Minimum of Log Data	1.227
Maximum	57	Maximum of Log Data	4.043
Mean	20.83	Mean of log Data	2.854
Median	17.95	SD of log Data	0.641

SD	12.9		
Coefficient of Variation	0.619		
Skewness	1.414		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.46	95% H-UCL	26.55
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.75
95% Adjusted-CLT UCL	24.9	97.5% Chebyshev (MVUE) UCL	36.33
95% Modified-t UCL	24.54	99% Chebyshev (MVUE) UCL	45.33
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.679	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.774		
nu star	192.9		
Approximate Chi Square Value (.05)	161.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	24.36
Adjusted Chi Square Value	160.5	95% Jackknife UCL	24.46
		95% Standard Bootstrap UCL	24.39
Anderson-Darling Test Statistic	0.489	95% Bootstrap-t UCL	25.42
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	25.08
Kolmogorov-Smirnov Test Statistic	0.105	95% Percentile Bootstrap UCL	24.46
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	24.77
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.19
		97.5% Chebyshev(Mean, Sd) UCL	34.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.21
95% Approximate Gamma UCL	24.83		
95% Adjusted Gamma UCL	25.03		
Potential UCL to Use		Use 95% Approximate Gamma UCL	24.83

Result or 1/2 DL (toluene)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	2.3900E-4	Minimum of Log Data	-8.339
Maximum	0.0127	Maximum of Log Data	-4.366
Mean	0.0046	Mean of log Data	-6.263
Median	0.0036	SD of log Data	1.613
SD	0.0047		
Coefficient of Variation	1.03		
Skewness	0.722		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.82
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0065	95% H-UCL	0.0275
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0179
95% Adjusted-CLT UCL	0.0066	97.5% Chebyshev (MVUE) UCL	0.023
95% Modified-t UCL	0.0065	99% Chebyshev (MVUE) UCL	0.0331
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.608	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0076		
nu star	23.11		
Approximate Chi Square Value (.05)	13.18	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0064
Adjusted Chi Square Value	12.52	95% Jackknife UCL	0.0065
		95% Standard Bootstrap UCL	0.0064
Anderson-Darling Test Statistic	1.109	95% Bootstrap-t UCL	0.0069
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	0.0065
Kolmogorov-Smirnov Test Statistic	0.238	95% Percentile Bootstrap UCL	0.0064
Kolmogorov-Smirnov 5% Critical Value	0.207	95% BCA Bootstrap UCL	0.0065
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0094
		97.5% Chebyshev(Mean, Sd) UCL	0.0115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0156
95% Approximate Gamma UCL	0.0081		
95% Adjusted Gamma UCL	0.0085		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0156
Recommended UCL exceeds the maximum observation			

Result or 1/2 DL (vanadium)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	33

Raw Statistics		Log-transformed Statistics	
Minimum	7.85	Minimum of Log Data	2.061
Maximum	45.8	Maximum of Log Data	3.824
Mean	20.54	Mean of log Data	2.936
Median	19.55	SD of log Data	0.434
SD	8.387		
Coefficient of Variation	0.408		
Skewness	0.649		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.9	95% H-UCL	23.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.39
95% Adjusted-CLT UCL	23	97.5% Chebyshev (MVUE) UCL	30.3
95% Modified-t UCL	22.93	99% Chebyshev (MVUE) UCL	36.03
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.487	Data appear Normal at 5% Significance Level	
Theta Star	3.743		
nu star	395.1		
Approximate Chi Square Value (.05)	350	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	22.84
Adjusted Chi Square Value	348.1	95% Jackknife UCL	22.9
		95% Standard Bootstrap UCL	22.8
Anderson-Darling Test Statistic	0.319	95% Bootstrap-t UCL	23.04
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	23.09
Kolmogorov-Smirnov Test Statistic	0.0966	95% Percentile Bootstrap UCL	22.82
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	23.08
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.63
		97.5% Chebyshev(Mean, Sd) UCL	29.27
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	34.45
95% Approximate Gamma UCL	23.19		
95% Adjusted Gamma UCL	23.31		
Potential UCL to Use		Use 95% Student's-t UCL	22.9

Result or 1/2 DL (xylene (total))

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19

Raw Statistics		Log-transformed Statistics	
Minimum	2.3100E-4	Minimum of Log Data	-8.373
Maximum	1.76	Maximum of Log Data	0.565
Mean	0.119	Mean of log Data	-5.435
Median	0.0031	SD of log Data	2.87
SD	0.4		
Coefficient of Variation	3.368		
Skewness	4.273		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.318	Shapiro Wilk Test Statistic	0.862
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.278	95% H-UCL	14.31
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.553
95% Adjusted-CLT UCL	0.366	97.5% Chebyshev (MVUE) UCL	0.737

95% Modified-t UCL	0.293	99% Chebyshev (MVUE) UCL	1.099
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.22	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.54		
nu star	8.358		
Approximate Chi Square Value (.05)	2.944	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.27
Adjusted Chi Square Value	2.67	95% Jackknife UCL	0.278
		95% Standard Bootstrap UCL	0.264
Anderson-Darling Test Statistic	1.648	95% Bootstrap-t UCL	1.513
Anderson-Darling 5% Critical Value	0.879	95% Hall's Bootstrap UCL	0.904
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	0.303
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.401
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.519
		97.5% Chebyshev(Mean, Sd) UCL	0.692
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.032
95% Approximate Gamma UCL	0.337		
95% Adjusted Gamma UCL	0.372		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	0.372

Result or 1/2 DL (zinc)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	21.1	Minimum of Log Data	3.049
Maximum	5640	Maximum of Log Data	8.638
Mean	242.5	Mean of log Data	4.287
Median	49.05	SD of log Data	1.039
SD	929.4		
Coefficient of Variation	3.833		
Skewness	5.918		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.228	Shapiro Wilk Test Statistic	0.776
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	504.2	95% H-UCL	191.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	229.8
95% Adjusted-CLT UCL	660.5	97.5% Chebyshev (MVUE) UCL	276.5
95% Modified-t UCL	529.7	99% Chebyshev (MVUE) UCL	368.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.499	Data do not follow a Discernable Distribution (0.05)	
Theta Star	486.3		

nu star	35.9		
Approximate Chi Square Value (.05)	23.19	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	497.3
Adjusted Chi Square Value	22.72	95% Jackknife UCL	504.2
		95% Standard Bootstrap UCL	499.1
Anderson-Darling Test Statistic	6.288	95% Bootstrap-t UCL	2637
Anderson-Darling 5% Critical Value	0.81	95% Hall's Bootstrap UCL	1588
Kolmogorov-Smirnov Test Statistic	0.315	95% Percentile Bootstrap UCL	550.3
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	832.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	917.7
		97.5% Chebyshev(Mean, Sd) UCL	1210
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1784
95% Approximate Gamma UCL	375.4		
95% Adjusted Gamma UCL	383.1		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1784

APPENDIX A-5

BACKGROUND SOIL

General UCL Statistics for Full Data Sets

User Selected Options
From File J:\1352 - Gulfco RI\risk\eco\Tables for Revisited SLERA\background soil table.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Result or 1/2 SDL (antimony)

General Statistics
Number of Valid Samples 10 Number of Unique Samples 10

Raw Statistics
Minimum 0.125
Maximum 2.19
Mean 0.953
Median 0.815
SD 0.878
Coefficient of Variation 0.921
Skewness 0.157

Log-transformed Statistics
Minimum of Log Data -2.079
Maximum of Log Data 0.784
Mean of log Data -0.711
SD of log Data 1.345

Relevant UCL Statistics
Normal Distribution Test
Shapiro Wilk Test Statistic 0.775
Shapiro Wilk Critical Value 0.842
Data not Normal at 5% Significance Level

Lognormal Distribution Test
Shapiro Wilk Test Statistic 0.726
Shapiro Wilk Critical Value 0.842
Data not Lognormal at 5% Significance Level

Assuming Normal Distribution
95% Student's-t UCL 1.462
95% UCLs (Adjusted for Skewness)
95% Adjusted-CLT UCL 1.424
95% Modified-t UCL 1.464

Assuming Lognormal Distribution
95% H-UCL 6.827
95% Chebyshev (MVUE) UCL 3.117
97.5% Chebyshev (MVUE) UCL 4.01
99% Chebyshev (MVUE) UCL 5.765

Gamma Distribution Test
k star (bias corrected) 0.685
Theta Star 1.39
nu star 13.71
Approximate Chi Square Value (.05) 6.373
Adjusted Level of Significance 0.0267
Adjusted Chi Square Value 5.527

Anderson-Darling Test Statistic 1.346
Anderson-Darling 5% Critical Value 0.752
Kolmogorov-Smirnov Test Statistic 0.329
Kolmogorov-Smirnov 5% Critical Value 0.275
Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution
95% Approximate Gamma UCL 2.05
95% Adjusted Gamma UCL 2.364

Data Distribution
Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics
95% CLT UCL 1.41
95% Jackknife UCL 1.462
95% Standard Bootstrap UCL 1.381
95% Bootstrap-t UCL 1.452
95% Hall's Bootstrap UCL 1.306
95% Percentile Bootstrap UCL 1.394
95% BCA Bootstrap UCL 1.416
95% Chebyshev(Mean, Sd) UCL 2.163
97.5% Chebyshev(Mean, Sd) UCL 2.687
99% Chebyshev(Mean, Sd) UCL 3.715

Potential UCL to Use
Recommended UCL exceeds the maximum observation

Use 99% Chebyshev (Mean, Sd) UCL 3.715

Result or 1/2 SDL (arsenic)

General Statistics
Number of Valid Samples 10 Number of Unique Samples 10

Raw Statistics
Minimum 0.24
Maximum 5.9
Mean 3.438
Median 3.625
SD 1.792
Coefficient of Variation 0.521
Skewness -0.35

Log-transformed Statistics
Minimum of Log Data -1.427
Maximum of Log Data 1.775
Mean of log Data 0.985
SD of log Data 0.947

Relevant UCL Statistics
Normal Distribution Test
Shapiro Wilk Test Statistic 0.946
Shapiro Wilk Critical Value 0.842
Data appear Normal at 5% Significance Level

Lognormal Distribution Test
Shapiro Wilk Test Statistic 0.749
Shapiro Wilk Critical Value 0.842
Data not Lognormal at 5% Significance Level

Assuming Normal Distribution
95% Student's-t UCL 4.477
95% UCLs (Adjusted for Skewness)
95% Adjusted-CLT UCL 4.303
95% Modified-t UCL 4.466

Assuming Lognormal Distribution
95% H-UCL 10.79
95% Chebyshev (MVUE) UCL 9.349
97.5% Chebyshev (MVUE) UCL 11.68
99% Chebyshev (MVUE) UCL 16.27

Gamma Distribution Test
k star (bias corrected) 1.572
Theta Star 2.187
nu star 31.44

Data Distribution
Data appear Normal at 5% Significance Level

Approximate Chi Square Value (.05)	19.63	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	4.37
Adjusted Chi Square Value	18.03	95% Jackknife UCL	4.477
		95% Standard Bootstrap UCL	4.299
Anderson-Darling Test Statistic	0.699	95% Bootstrap-t UCL	4.371
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	4.292
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	4.299
Kolmogorov-Smirnov 5% Critical Value	0.27	95% BCA Bootstrap UCL	4.27
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.908
		97.5% Chebyshev(Mean, Sd) UCL	6.976
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.075
95% Approximate Gamma UCL	5.507		
95% Adjusted Gamma UCL	5.997		
Potential UCL to Use		Use 95% Student's-t UCL	4.477

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	150	Minimum of Log Data	5.011
Maximum	1130	Maximum of Log Data	7.03
Mean	333.1	Mean of log Data	5.617
Median	259	SD of log Data	0.571
SD	288.1		
Coefficient of Variation	0.865		
Skewness	2.844		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.59	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	500.1	95% H-UCL	504
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	573.9
95% Adjusted-CLT UCL	570.5	97.5% Chebyshev (MVUE) UCL	684.7
95% Modified-t UCL	513.7	99% Chebyshev (MVUE) UCL	902.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.005	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	166.1		
nu star	40.11		
Approximate Chi Square Value (.05)	26.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	482.9
Adjusted Chi Square Value	24.7	95% Jackknife UCL	500.1
		95% Standard Bootstrap UCL	476.3
Anderson-Darling Test Statistic	1.01	95% Bootstrap-t UCL	877.8
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	1100
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	505.4
Kolmogorov-Smirnov 5% Critical Value	0.269	95% BCA Bootstrap UCL	601.4
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	730.2
		97.5% Chebyshev(Mean, Sd) UCL	902
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1239
95% Approximate Gamma UCL	502.3		
95% Adjusted Gamma UCL	540.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	502.3

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.00323	Minimum of Log Data	-5.735
Maximum	0.082	Maximum of Log Data	-2.501
Mean	0.0116	Mean of log Data	-5.267
Median	0.00381	SD of log Data	0.979
SD	0.0247		
Coefficient of Variation	2.125		
Skewness	3.16		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.383	Shapiro Wilk Test Statistic	0.478
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.026	95% H-UCL	0.0226

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0189
95% Adjusted-CLT UCL	0.0328	97.5% Chebyshev (MVUE) UCL	0.0236
95% Modified-t UCL	0.0273	99% Chebyshev (MVUE) UCL	0.033
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.583	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.02		
nu star	11.66		
Approximate Chi Square Value (.05)	5.004	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0245
Adjusted Chi Square Value	4.271	95% Jackknife UCL	0.026
		95% Standard Bootstrap UCL	0.0238
Anderson-Darling Test Statistic	2.903	95% Bootstrap-t UCL	0.543
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	0.258
Kolmogorov-Smirnov Test Statistic	0.513	95% Percentile Bootstrap UCL	0.0272
Kolmogorov-Smirnov 5% Critical Value	0.276	95% BCA Bootstrap UCL	0.0351
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0457
		97.5% Chebyshev(Mean, Sd) UCL	0.0605
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0894
95% Approximate Gamma UCL	0.0271		
95% Adjusted Gamma UCL	0.0318		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0457

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	7
Raw Statistics		Log-transformed Statistics	
Minimum	0.00434	Minimum of Log Data	-5.44
Maximum	0.076	Maximum of Log Data	-2.577
Mean	0.0122	Mean of log Data	-5.008
Median	0.005	SD of log Data	0.863
SD	0.0224		
Coefficient of Variation	1.833		
Skewness	3.157		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.391	Shapiro Wilk Test Statistic	0.495
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0252	95% H-UCL	0.0219
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0207
95% Adjusted-CLT UCL	0.0314	97.5% Chebyshev (MVUE) UCL	0.0257
95% Modified-t UCL	0.0264	99% Chebyshev (MVUE) UCL	0.0354
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.739	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0165		
nu star	14.78		
Approximate Chi Square Value (.05)	7.109	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0239
Adjusted Chi Square Value	6.207	95% Jackknife UCL	0.0252
		95% Standard Bootstrap UCL	0.0233
Anderson-Darling Test Statistic	2.773	95% Bootstrap-t UCL	0.307
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.171
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	0.0263
Kolmogorov-Smirnov 5% Critical Value	0.274	95% BCA Bootstrap UCL	0.0334
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0431
		97.5% Chebyshev(Mean, Sd) UCL	0.0565
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0828
95% Approximate Gamma UCL	0.0254		
95% Adjusted Gamma UCL	0.0291		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0431

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.00349	Minimum of Log Data	-5.658
Maximum	0.057	Maximum of Log Data	-2.865
Mean	0.00941	Mean of log Data	-5.234
Median	0.00411	SD of log Data	0.84
SD	0.0167		
Coefficient of Variation	1.777		
Skewness	3.157		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.393	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0191	95% H-UCL	0.0166
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.016
95% Adjusted-CLT UCL	0.0238	97.5% Chebyshev (MVUE) UCL	0.0198
95% Modified-t UCL	0.02	99% Chebyshev (MVUE) UCL	0.0272
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.777	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0121		
nu star	15.53		
Approximate Chi Square Value (.05)	7.632	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0181
Adjusted Chi Square Value	6.692	95% Jackknife UCL	0.0191
		95% Standard Bootstrap UCL	0.0179
Anderson-Darling Test Statistic	2.757	95% Bootstrap-t UCL	0.231
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.116
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	0.02
Kolmogorov-Smirnov 5% Critical Value	0.274	95% BCA Bootstrap UCL	0.0252
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0325
		97.5% Chebyshev(Mean, Sd) UCL	0.0424
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.062
95% Approximate Gamma UCL	0.0192		
95% Adjusted Gamma UCL	0.0218		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0325

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	0.083	Maximum of Log Data	-2.489
Mean	0.0241	Mean of log Data	-3.896
Median	0.0173	SD of log Data	0.508
SD	0.0208		
Coefficient of Variation	0.866		
Skewness	3.104		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.458	Shapiro Wilk Test Statistic	0.581
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0361	95% H-UCL	0.0337
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0391
95% Adjusted-CLT UCL	0.0418	97.5% Chebyshev (MVUE) UCL	0.0461
95% Modified-t UCL	0.0372	99% Chebyshev (MVUE) UCL	0.0599
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.254	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0107		
nu star	45.09		
Approximate Chi Square Value (.05)	30.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0349
Adjusted Chi Square Value	28.63	95% Jackknife UCL	0.0361
		95% Standard Bootstrap UCL	0.034
Anderson-Darling Test Statistic	2.124	95% Bootstrap-t UCL	0.111
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.0864
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	0.0365
Kolmogorov-Smirnov 5% Critical Value	0.268	95% BCA Bootstrap UCL	0.038
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0527
		97.5% Chebyshev(Mean, Sd) UCL	0.0652
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0895
95% Approximate Gamma UCL	0.0353		
95% Adjusted Gamma UCL	0.0379		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0527

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples	10	Number of Unique Samples	7
Raw Statistics		Log-transformed Statistics	

Minimum	0.00493	Minimum of Log Data	-5.313
Maximum	0.106	Maximum of Log Data	-2.244
Mean	0.0158	Mean of log Data	-4.861
Median	0.00575	SD of log Data	0.927
SD	0.0317		
Coefficient of Variation	2		
Skewness	3.16		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.386	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0342	95% H-UCL	0.0296
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0263
95% Adjusted-CLT UCL	0.043	97.5% Chebyshev (MVUE) UCL	0.0328
95% Modified-t UCL	0.0359	99% Chebyshev (MVUE) UCL	0.0455
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.644	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0246		
nu star	12.88		
Approximate Chi Square Value (.05)	5.815	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0323
Adjusted Chi Square Value	5.014	95% Jackknife UCL	0.0342
		95% Standard Bootstrap UCL	0.0311
Anderson-Darling Test Statistic	2.864	95% Bootstrap-t UCL	0.608
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	0.269
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	0.0358
Kolmogorov-Smirnov 5% Critical Value	0.275	95% BCA Bootstrap UCL	0.046
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0595
		97.5% Chebyshev(Mean, Sd) UCL	0.0784
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.116
95% Approximate Gamma UCL	0.0351		
95% Adjusted Gamma UCL	0.0407		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0595

Result or 1/2 SDL (cadmium)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.0075	Minimum of Log Data	-4.893
Maximum	0.11	Maximum of Log Data	-2.207
Mean	0.0311	Mean of log Data	-4.091
Median	0.0095	SD of log Data	1.081
SD	0.0398		
Coefficient of Variation	1.283		
Skewness	1.571		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.641	Shapiro Wilk Test Statistic	0.713
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0541	95% H-UCL	0.0974
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.071
95% Adjusted-CLT UCL	0.0585	97.5% Chebyshev (MVUE) UCL	0.0898
95% Modified-t UCL	0.0552	99% Chebyshev (MVUE) UCL	0.127
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.725	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0428		
nu star	14.5		
Approximate Chi Square Value (.05)	6.912	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0518
Adjusted Chi Square Value	6.025	95% Jackknife UCL	0.0541
		95% Standard Bootstrap UCL	0.0507
Anderson-Darling Test Statistic	1.584	95% Bootstrap-t UCL	0.105
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.0699
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.0515
Kolmogorov-Smirnov 5% Critical Value	0.274	95% BCA Bootstrap UCL	0.0581
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.086
		97.5% Chebyshev(Mean, Sd) UCL	0.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.156
95% Approximate Gamma UCL	0.0651		
95% Adjusted Gamma UCL	0.0747		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.156

Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (carbazole)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.00376	Minimum of Log Data	-5.583
Maximum	0.011	Maximum of Log Data	-4.51
Mean	0.00512	Mean of log Data	-5.328
Median	0.00443	SD of log Data	0.312
SD	0.00214		
Coefficient of Variation	0.418		
Skewness	2.781		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.608	Shapiro Wilk Test Statistic	0.731
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.00636	95% H-UCL	0.00627
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.00727
95% Adjusted-CLT UCL	0.00687	97.5% Chebyshev (MVUE) UCL	0.00822
95% Modified-t UCL	0.00646	99% Chebyshev (MVUE) UCL	0.0101
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.758	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.57E-04		
nu star	135.2		
Approximate Chi Square Value (.05)	109.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.00623
Adjusted Chi Square Value	105.3	95% Jackknife UCL	0.00636
		95% Standard Bootstrap UCL	0.0062
Anderson-Darling Test Statistic	1.249	95% Bootstrap-t UCL	0.00912
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	0.0106
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL	0.00636
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	0.00679
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.00807
		97.5% Chebyshev(Mean, Sd) UCL	0.00934
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0119
95% Approximate Gamma UCL	0.00633		
95% Adjusted Gamma UCL	0.00657		
Potential UCL to Use		Use 95% Student's-t UCL	0.00636
		or 95% Modified-t UCL	0.00646

Result or 1/2 SDL (chromium)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	10.7	Minimum of Log Data	2.37
Maximum	20.1	Maximum of Log Data	3.001
Mean	15.2	Mean of log Data	2.703
Median	14.15	SD of log Data	0.199
SD	3.02		
Coefficient of Variation	0.199		
Skewness	0.27		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.95	95% H-UCL	17.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.39
95% Adjusted-CLT UCL	16.86	97.5% Chebyshev (MVUE) UCL	21.21
95% Modified-t UCL	16.96	99% Chebyshev (MVUE) UCL	24.77
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.81	Data appear Normal at 5% Significance Level	
Theta Star	0.767		
nu star	396.2		
Approximate Chi Square Value (.05)	351.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	16.77
Adjusted Chi Square Value	343.7	95% Jackknife UCL	16.95
		95% Standard Bootstrap UCL	16.7
Anderson-Darling Test Statistic	0.388	95% Bootstrap-t UCL	17.01

Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	16.75
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	16.71
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	16.74
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.36
		97.5% Chebyshev(Mean, Sd) UCL	21.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.7
95% Approximate Gamma UCL	17.15		
95% Adjusted Gamma UCL	17.52		
Potential UCL to Use		Use 95% Student's-t UCL	16.95

Result or 1/2 SDL (chrysene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	6
Raw Statistics		Log-transformed Statistics	
Minimum	0.006	Minimum of Log Data	-5.116
Maximum	0.083	Maximum of Log Data	-2.489
Mean	0.0145	Mean of log Data	-4.742
Median	0.00675	SD of log Data	0.8
SD	0.0241		
Coefficient of Variation	1.668		
Skewness	3.156		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.395	Shapiro Wilk Test Statistic	0.493
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0284	95% H-UCL	0.0247
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0247
95% Adjusted-CLT UCL	0.0351	97.5% Chebyshev (MVUE) UCL	0.0305
95% Modified-t UCL	0.0297	99% Chebyshev (MVUE) UCL	0.0417
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.856	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0169		
nu star	17.12		
Approximate Chi Square Value (.05)	8.758	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.027
Adjusted Chi Square Value	7.74	95% Jackknife UCL	0.0284
		95% Standard Bootstrap UCL	0.0264
Anderson-Darling Test Statistic	2.737	95% Bootstrap-t UCL	0.307
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.154
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	0.0296
Kolmogorov-Smirnov 5% Critical Value	0.273	95% BCA Bootstrap UCL	0.0372
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0477
		97.5% Chebyshev(Mean, Sd) UCL	0.062
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0903
95% Approximate Gamma UCL	0.0282		
95% Adjusted Gamma UCL	0.032		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0477

Result or 1/2 SDL (copper)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	7.68	Minimum of Log Data	2.039
Maximum	19.3	Maximum of Log Data	2.96
Mean	12.12	Mean of log Data	2.449
Median	10.8	SD of log Data	0.313
SD	3.955		
Coefficient of Variation	0.326		
Skewness	0.802		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.41	95% H-UCL	14.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.35
95% Adjusted-CLT UCL	14.51	97.5% Chebyshev (MVUE) UCL	19.63
95% Modified-t UCL	14.46	99% Chebyshev (MVUE) UCL	24.1
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	7.922	Data appear Normal at 5% Significance Level	
Theta Star	1.529		
nu star	158.4		
Approximate Chi Square Value (.05)	130.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	14.17
Adjusted Chi Square Value	125.9	95% Jackknife UCL	14.41
		95% Standard Bootstrap UCL	14.08
Anderson-Darling Test Statistic	0.317	95% Bootstrap-t UCL	15.03
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	14.63
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	14.04
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	14.54
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.57
		97.5% Chebyshev(Mean, Sd) UCL	19.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.56
95% Approximate Gamma UCL	14.73		
95% Adjusted Gamma UCL	15.25		
Potential UCL to Use		Use 95% Student's-t UCL	14.41

Result or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	7
Raw Statistics		Log-transformed Statistics	
Minimum	0.00486	Minimum of Log Data	-5.328
Maximum	0.156	Maximum of Log Data	-1.858
Mean	0.0208	Mean of log Data	-4.834
Median	0.00575	SD of log Data	1.053
SD	0.0475		
Coefficient of Variation	2.286		
Skewness	3.161		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.38	Shapiro Wilk Test Statistic	0.477
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0483	95% H-UCL	0.0428
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0324
95% Adjusted-CLT UCL	0.0615	97.5% Chebyshev (MVUE) UCL	0.0409
95% Modified-t UCL	0.0508	99% Chebyshev (MVUE) UCL	0.0575
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.513	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0405		
nu star	10.26		
Approximate Chi Square Value (.05)	4.106	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0455
Adjusted Chi Square Value	3.456	95% Jackknife UCL	0.0483
		95% Standard Bootstrap UCL	0.0443
Anderson-Darling Test Statistic	2.929	95% Bootstrap-t UCL	1.171
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	0.527
Kolmogorov-Smirnov Test Statistic	0.515	95% Percentile Bootstrap UCL	0.0508
Kolmogorov-Smirnov 5% Critical Value	0.278	95% BCA Bootstrap UCL	0.0659
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0863
		97.5% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.17
95% Approximate Gamma UCL	0.0519		
95% Adjusted Gamma UCL	0.0617		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.17
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.0125	Minimum of Log Data	-4.382
Maximum	0.417	Maximum of Log Data	-0.875
Mean	0.0551	Mean of log Data	-3.88
Median	0.0148	SD of log Data	1.063
SD	0.127		
Coefficient of Variation	2.308		
Skewness	3.161		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.379	Shapiro Wilk Test Statistic	0.47
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842

Data not Normal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	0.129
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	0.164
95% Modified-t UCL	0.136

Gamma Distribution Test

k star (bias corrected)	0.505
Theta Star	0.109
nu star	10.09
Approximate Chi Square Value (.05)	4
Adjusted Level of Significance	0.0267
Adjusted Chi Square Value	3.36
Anderson-Darling Test Statistic	2.966
Anderson-Darling 5% Critical Value	0.767
Kolmogorov-Smirnov Test Statistic	0.523
Kolmogorov-Smirnov 5% Critical Value	0.278
Data not Gamma Distributed at 5% Significance Level	

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.139
95% Adjusted Gamma UCL	0.166

Potential UCL to Use

Recommended UCL exceeds the maximum observation

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution

95% H-UCL	0.114
95% Chebyshev (MVUE) UCL	0.0853
97.5% Chebyshev (MVUE) UCL	0.108
99% Chebyshev (MVUE) UCL	0.152

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL	0.121
95% Jackknife UCL	0.129
95% Standard Bootstrap UCL	0.119
95% Bootstrap-t UCL	3.62
95% Hall's Bootstrap UCL	1.642
95% Percentile Bootstrap UCL	0.135
95% BCA Bootstrap UCL	0.175
95% Chebyshev(Mean, Sd) UCL	0.23
97.5% Chebyshev(Mean, Sd) UCL	0.306
99% Chebyshev(Mean, Sd) UCL	0.455

Use 99% Chebyshev (Mean, Sd) UCL 0.455

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples	10	Number of Unique Samples	9

Raw Statistics

Minimum	11
Maximum	15.2
Mean	13.43
Median	13.35
SD	1.547
Coefficient of Variation	0.115
Skewness	-0.326

Log-transformed Statistics

Minimum of Log Data	2.398
Maximum of Log Data	2.721
Mean of log Data	2.591
SD of log Data	0.118

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level	

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.842
Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution

95% Student's-t UCL	14.33
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	14.18
95% Modified-t UCL	14.32

Gamma Distribution Test

k star (bias corrected)	57
Theta Star	0.236
nu star	1140
Approximate Chi Square Value (.05)	1063
Adjusted Level of Significance	0.0267
Adjusted Chi Square Value	1050
Anderson-Darling Test Statistic	0.379
Anderson-Darling 5% Critical Value	0.724
Kolmogorov-Smirnov Test Statistic	0.169
Kolmogorov-Smirnov 5% Critical Value	0.266
Data appear Gamma Distributed at 5% Significance Level	

Assuming Gamma Distribution

95% Approximate Gamma UCL	14.41
95% Adjusted Gamma UCL	14.59

Potential UCL to Use

Assuming Lognormal Distribution

95% H-UCL	14.43
95% Chebyshev (MVUE) UCL	15.62
97.5% Chebyshev (MVUE) UCL	16.56
99% Chebyshev (MVUE) UCL	18.42

Data Distribution

Data appear Normal at 5% Significance Level

Nonparametric Statistics

95% CLT UCL	14.23
95% Jackknife UCL	14.33
95% Standard Bootstrap UCL	14.18
95% Bootstrap-t UCL	14.21
95% Hall's Bootstrap UCL	14.11
95% Percentile Bootstrap UCL	14.17
95% BCA Bootstrap UCL	14.15
95% Chebyshev(Mean, Sd) UCL	15.56
97.5% Chebyshev(Mean, Sd) UCL	16.49
99% Chebyshev(Mean, Sd) UCL	18.3

Use 95% Student's-t UCL 14.33

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples	10	Number of Unique Samples	10

Raw Statistics

Minimum	14.4
Maximum	32.5
Mean	21.14

Log-transformed Statistics

Minimum of Log Data	2.667
Maximum of Log Data	3.481
Mean of log Data	3.027

Median	19.9	SD of log Data	0.229
SD	5.166		
Coefficient of Variation	0.244		
Skewness	1.214		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.13	95% H-UCL	24.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.82
95% Adjusted-CLT UCL	24.5	97.5% Chebyshev (MVUE) UCL	30.72
95% Modified-t UCL	24.24	99% Chebyshev (MVUE) UCL	36.42
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.43	Data appear Normal at 5% Significance Level	
Theta Star	1.465		
nu star	288.6		
Approximate Chi Square Value (.05)	250.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	23.83
Adjusted Chi Square Value	244.1	95% Jackknife UCL	24.13
		95% Standard Bootstrap UCL	23.71
Anderson-Darling Test Statistic	0.311	95% Bootstrap-t UCL	26.29
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	40.64
Kolmogorov-Smirnov Test Statistic	0.2	95% Percentile Bootstrap UCL	23.88
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	24.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.26
		97.5% Chebyshev(Mean, Sd) UCL	31.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.39
95% Approximate Gamma UCL	24.38		
95% Adjusted Gamma UCL	25		
Potential UCL to Use		Use 95% Student's-t UCL	24.13

Result or 1/2 SDL (manganese)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	284	Minimum of Log Data	5.649
Maximum	551	Maximum of Log Data	6.312
Mean	377.4	Mean of log Data	5.909
Median	333	SD of log Data	0.227
SD	93.76		
Coefficient of Variation	0.248		
Skewness	1.28		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.843
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	431.8	95% H-UCL	436.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	495.4
95% Adjusted-CLT UCL	439	97.5% Chebyshev (MVUE) UCL	546.6
95% Modified-t UCL	433.8	99% Chebyshev (MVUE) UCL	647.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.38	Data appear Lognormal at 5% Significance Level	
Theta Star	26.25		
nu star	287.6		
Approximate Chi Square Value (.05)	249.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	426.2
Adjusted Chi Square Value	243.1	95% Jackknife UCL	431.8
		95% Standard Bootstrap UCL	422.7
Anderson-Darling Test Statistic	0.85	95% Bootstrap-t UCL	494.2
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	681.2
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	425.6
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	436.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	506.6
		97.5% Chebyshev(Mean, Sd) UCL	562.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	672.4
95% Approximate Gamma UCL	435.3		
95% Adjusted Gamma UCL	446.4		
Potential UCL to Use		Use 95% Student's-t UCL	431.8
		or 95% Modified-t UCL	433.8
		or 95% H-UCL	436.5

Result or 1/2 SDL (mercury)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	0.03	Maximum of Log Data	-3.507
Mean	0.0213	Mean of log Data	-3.871
Median	0.0195	SD of log Data	0.217
SD	0.00479		
Coefficient of Variation	0.225		
Skewness	0.734		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.908	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0241	95% H-UCL	0.0245
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0277
95% Adjusted-CLT UCL	0.0242	97.5% Chebyshev (MVUE) UCL	0.0305
95% Modified-t UCL	0.0241	99% Chebyshev (MVUE) UCL	0.0359
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	16.3	Data appear Normal at 5% Significance Level	
Theta Star	0.00131		
nu star	326.1		
Approximate Chi Square Value (.05)	285.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0238
Adjusted Chi Square Value	278.6	95% Jackknife UCL	0.0241
		95% Standard Bootstrap UCL	0.0236
Anderson-Darling Test Statistic	0.458	95% Bootstrap-t UCL	0.0246
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	0.024
Kolmogorov-Smirnov Test Statistic	0.2	95% Percentile Bootstrap UCL	0.0238
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	0.0239
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0279
		97.5% Chebyshev(Mean, Sd) UCL	0.0308
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0364
95% Approximate Gamma UCL	0.0243		
95% Adjusted Gamma UCL	0.0249		
Potential UCL to Use		Use 95% Student's-t UCL	0.0241

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.42	Minimum of Log Data	-0.868
Maximum	0.68	Maximum of Log Data	-0.386
Mean	0.522	Mean of log Data	-0.659
Median	0.505	SD of log Data	0.137
SD	0.0739		
Coefficient of Variation	0.142		
Skewness	0.94		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.565	95% H-UCL	0.568
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.621
95% Adjusted-CLT UCL	0.568	97.5% Chebyshev (MVUE) UCL	0.663
95% Modified-t UCL	0.566	99% Chebyshev (MVUE) UCL	0.747
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	40.85	Data appear Normal at 5% Significance Level	
Theta Star	0.0128		
nu star	817		
Approximate Chi Square Value (.05)	751.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.56
Adjusted Chi Square Value	740.8	95% Jackknife UCL	0.565
		95% Standard Bootstrap UCL	0.56
Anderson-Darling Test Statistic	0.217	95% Bootstrap-t UCL	0.579
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	0.59
Kolmogorov-Smirnov Test Statistic	0.153	95% Percentile Bootstrap UCL	0.558
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	0.561

Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.624
		97.5% Chebyshev(Mean, Sd) UCL	0.668
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.755
95% Approximate Gamma UCL	0.567		
95% Adjusted Gamma UCL	0.576		
Potential UCL to Use		Use 95% Student's-t UCL	0.565

Result or 1/2 SDL (phenanthrene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.00286	Minimum of Log Data	-5.859
Maximum	0.137	Maximum of Log Data	-1.988
Mean	0.0167	Mean of log Data	-5.327
Median	0.00336	SD of log Data	1.179
SD	0.0423		
Coefficient of Variation	2.525		
Skewness	3.162		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.375	Shapiro Wilk Test Statistic	0.459
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0412	95% H-UCL	0.0383
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0239
95% Adjusted-CLT UCL	0.053	97.5% Chebyshev (MVUE) UCL	0.0304
95% Modified-t UCL	0.0435	99% Chebyshev (MVUE) UCL	0.0432
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.425	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0394		
nu star	8.497		
Approximate Chi Square Value (.05)	3.026	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0387
Adjusted Chi Square Value	2.487	95% Jackknife UCL	0.0412
		95% Standard Bootstrap UCL	0.0378
Anderson-Darling Test Statistic	3.041	95% Bootstrap-t UCL	1.724
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	0.748
Kolmogorov-Smirnov Test Statistic	0.53	95% Percentile Bootstrap UCL	0.0434
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	0.0568
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.075
		97.5% Chebyshev(Mean, Sd) UCL	0.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.15
95% Approximate Gamma UCL	0.047		
95% Adjusted Gamma UCL	0.0572		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.15
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (pyrene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	7
Raw Statistics		Log-transformed Statistics	
Minimum	0.0085	Minimum of Log Data	-4.768
Maximum	0.127	Maximum of Log Data	-2.064
Mean	0.0218	Mean of log Data	-4.347
Median	0.01	SD of log Data	0.811
SD	0.037		
Coefficient of Variation	1.696		
Skewness	3.156		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.396	Shapiro Wilk Test Statistic	0.501
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0432	95% H-UCL	0.0376
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0373
95% Adjusted-CLT UCL	0.0535	97.5% Chebyshev (MVUE) UCL	0.046
95% Modified-t UCL	0.0452	99% Chebyshev (MVUE) UCL	0.063
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.834	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0262		

nu star	16.67		
Approximate Chi Square Value (.05)	8.437	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.041
Adjusted Chi Square Value	7.441	95% Jackknife UCL	0.0432
		95% Standard Bootstrap UCL	0.0404
Anderson-Darling Test Statistic	2.722	95% Bootstrap-t UCL	0.464
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	0.239
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	0.0452
Kolmogorov-Smirnov 5% Critical Value	0.273	95% BCA Bootstrap UCL	0.0564
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0728
		97.5% Chebyshev(Mean, Sd) UCL	0.0948
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.138
95% Approximate Gamma UCL	0.0431		
95% Adjusted Gamma UCL	0.0488		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0728

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	36.6	Minimum of Log Data	3.6
Maximum	969	Maximum of Log Data	6.876
Mean	247	Mean of log Data	4.667
Median	75.5	SD of log Data	1.272
SD	364.6		
Coefficient of Variation	1.476		
Skewness	1.694		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.62	Shapiro Wilk Test Statistic	0.795
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	458.3	95% H-UCL	1141
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	602.7
95% Adjusted-CLT UCL	502.6	97.5% Chebyshev (MVUE) UCL	772.1
95% Modified-t UCL	468.6	99% Chebyshev (MVUE) UCL	1105
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.567	Data do not follow a Discernable Distribution (0.05)	
Theta Star	435.3		
nu star	11.35		
Approximate Chi Square Value (.05)	4.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	436.6
Adjusted Chi Square Value	4.085	95% Jackknife UCL	458.3
		95% Standard Bootstrap UCL	426.1
Anderson-Darling Test Statistic	1.247	95% Bootstrap-t UCL	1346
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	1691
Kolmogorov-Smirnov Test Statistic	0.346	95% Percentile Bootstrap UCL	430.3
Kolmogorov-Smirnov 5% Critical Value	0.277	95% BCA Bootstrap UCL	496.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	749.5
		97.5% Chebyshev(Mean, Sd) UCL	967
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1394
95% Approximate Gamma UCL	583.8		
95% Adjusted Gamma UCL	685.9		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1394
Recommended UCL exceeds the maximum observation			

APPENDIX A-6

INTRACOASTAL WATERWAY SEDIMENT

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\IWSE Data - Just site data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (1,2-dichloroethane)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	9.2000E-5	Minimum of Log Data	-9.294
Maximum	0.0030	Maximum of Log Data	-5.802
Mean	4.1025E-4	Mean of log Data	-8.349
Median	1.7900E-4	SD of log Data	0.893
SD	7.0923E-4		
Coefficient of Variation	1.729		
Skewness	3.752		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.432	Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.2108E-4	95% H-UCL	6.3456E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.0066E-4
95% Adjusted-CLT UCL	8.7963E-4	97.5% Chebyshev (MVUE) UCL	8.5627E-4
95% Modified-t UCL	7.4880E-4	99% Chebyshev (MVUE) UCL	0.0011
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.889	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.6126E-4		
nu star	28.46		
Approximate Chi Square Value (.05)	17.29	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	7.0189E-4
Adjusted Chi Square Value	16.3	95% Jackknife UCL	7.2108E-4
		95% Standard Bootstrap UCL	6.9181E-4
Anderson-Darling Test Statistic	1.681	95% Bootstrap-t UCL	0.0016
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	0.0017
Kolmogorov-Smirnov Test Statistic	0.283	95% Percentile Bootstrap UCL	7.4878E-4
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9.6719E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0011
		97.5% Chebyshev(Mean, Sd) UCL	0.0015
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0021
95% Approximate Gamma UCL	6.7541E-4		
95% Adjusted Gamma UCL	7.1630E-4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0011

Result or 1/2 SDL (1,2diphenylhydrazine/azobenzen)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.0050	Minimum of Log Data	-5.288
Maximum	0.0317	Maximum of Log Data	-3.451
Mean	0.0073	Mean of log Data	-5.056
Median	0.0054	SD of log Data	0.447
SD	0.0065		
Coefficient of Variation	0.883		
Skewness	3.903		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.369	Shapiro Wilk Test Statistic	0.515
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0103	95% H-UCL	0.0088
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0105
95% Adjusted-CLT UCL	0.0118	97.5% Chebyshev (MVUE) UCL	0.012
95% Modified-t UCL	0.0105	99% Chebyshev (MVUE) UCL	0.015
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.896	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0025		
nu star	92.68		
Approximate Chi Square Value (.05)	71.48	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0101
Adjusted Chi Square Value	69.36	95% Jackknife UCL	0.0103
		95% Standard Bootstrap UCL	0.0099
Anderson-Darling Test Statistic	3.453	95% Bootstrap-t UCL	0.0268
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.0205
Kolmogorov-Smirnov Test Statistic	0.376	95% Percentile Bootstrap UCL	0.0106
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0124
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0145
		97.5% Chebyshev(Mean, Sd) UCL	0.0176
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0236
95% Approximate Gamma UCL	0.0095		
95% Adjusted Gamma UCL	0.0098		
Potential UCL to Use		Use 95% Student's-t UCL	0.0103
		or 95% Modified-t UCL	0.0105

Result or 1/2 SDL (2-methylnaphthalene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.0066	Minimum of Log Data	-5.021
Maximum	0.0188	Maximum of Log Data	-3.974
Mean	0.0083	Mean of log Data	-4.828
Median	0.0073	SD of log Data	0.261
SD	0.0029		
Coefficient of Variation	0.357		
Skewness	3.264		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.566	Shapiro Wilk Test Statistic	0.699
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0096	95% H-UCL	0.0093
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0106
95% Adjusted-CLT UCL	0.0102	97.5% Chebyshev (MVUE) UCL	0.0117
95% Modified-t UCL	0.0097	99% Chebyshev (MVUE) UCL	0.0137

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.55	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.8871E-4		
nu star	337.5		
Approximate Chi Square Value (.05)	295.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0095
Adjusted Chi Square Value	291.5	95% Jackknife UCL	0.0096
		95% Standard Bootstrap UCL	0.0094
Anderson-Darling Test Statistic	1.783	95% Bootstrap-t UCL	0.0116
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.0139
Kolmogorov-Smirnov Test Statistic	0.24	95% Percentile Bootstrap UCL	0.0096
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0104
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0116
		97.5% Chebyshev(Mean, Sd) UCL	0.013
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0157
95% Approximate Gamma UCL	0.0094		
95% Adjusted Gamma UCL	0.0096		
Potential UCL to Use		Use 95% Student's-t UCL	0.0096
		or 95% Modified-t UCL	0.0097

Result or 1/2 SDL (3,3'-dichlorobenzidine)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0293	Minimum of Log Data	-3.53
Maximum	0.151	Maximum of Log Data	-1.89
Mean	0.0408	Mean of log Data	-3.312
Median	0.0316	SD of log Data	0.4
SD	0.0297		
Coefficient of Variation	0.729		
Skewness	3.845		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.396	Shapiro Wilk Test Statistic	0.541
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0538	95% H-UCL	0.0483
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0568
95% Adjusted-CLT UCL	0.0607	97.5% Chebyshev (MVUE) UCL	0.0643
95% Modified-t UCL	0.055	99% Chebyshev (MVUE) UCL	0.0792
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.785	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0108		
nu star	121.1		
Approximate Chi Square Value (.05)	96.71	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.053
Adjusted Chi Square Value	94.23	95% Jackknife UCL	0.0538
		95% Standard Bootstrap UCL	0.0527
Anderson-Darling Test Statistic	3.16	95% Bootstrap-t UCL	0.108
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.0974
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	0.0553
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0628
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0732
		97.5% Chebyshev(Mean, Sd) UCL	0.0872
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.115
95% Approximate Gamma UCL	0.0511		
95% Adjusted Gamma UCL	0.0524		
Potential UCL to Use		Use 95% Student's-t UCL	0.0538
		or 95% Modified-t UCL	0.055

Result or 1/2 SDL (4,4'-ddt)

General Statistics

Number of Valid Samples	17	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	8.8500E-5	Minimum of Log Data	-9.333
Maximum	0.0033	Maximum of Log Data	-5.708
Mean	4.1103E-4	Mean of log Data	-8.608

Median	1.0250E-4	SD of log Data	1.086
SD	7.9620E-4		
Coefficient of Variation	1.937		
Skewness	3.45		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.467	Shapiro Wilk Test Statistic	0.714
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.4817E-4	95% H-UCL	7.0721E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.1445E-4
95% Adjusted-CLT UCL	9.0131E-4	97.5% Chebyshev (MVUE) UCL	8.8812E-4
95% Modified-t UCL	7.7510E-4	99% Chebyshev (MVUE) UCL	0.0012
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.648	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.3401E-4		
nu star	22.04		
Approximate Chi Square Value (.05)	12.37	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0346	95% CLT UCL	7.2866E-4
Adjusted Chi Square Value	11.61	95% Jackknife UCL	7.4817E-4
		95% Standard Bootstrap UCL	7.1836E-4
Anderson-Darling Test Statistic	2.621	95% Bootstrap-t UCL	0.0018
Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	0.0018
Kolmogorov-Smirnov Test Statistic	0.375	95% Percentile Bootstrap UCL	7.5694E-4
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	9.4576E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0012
		97.5% Chebyshev(Mean, Sd) UCL	0.0016
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0023
95% Approximate Gamma UCL	7.3242E-4		
95% Adjusted Gamma UCL	7.8005E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0023

Result or 1/2 SDL (4,6-dinitro-2-methylphenol)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0123	Minimum of Log Data	-4.402
Maximum	0.0627	Maximum of Log Data	-2.769
Mean	0.017	Mean of log Data	-4.186
Median	0.0132	SD of log Data	0.399
SD	0.0123		
Coefficient of Variation	0.725		
Skewness	3.843		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.396	Shapiro Wilk Test Statistic	0.542
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0224	95% H-UCL	0.0201
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0237
95% Adjusted-CLT UCL	0.0252	97.5% Chebyshev (MVUE) UCL	0.0268
95% Modified-t UCL	0.0229	99% Chebyshev (MVUE) UCL	0.033
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.812	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0044		
nu star	122		
Approximate Chi Square Value (.05)	97.49	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0221
Adjusted Chi Square Value	95	95% Jackknife UCL	0.0224
		95% Standard Bootstrap UCL	0.022
Anderson-Darling Test Statistic	3.154	95% Bootstrap-t UCL	0.0447
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.0405
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	0.023
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0264
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0304
		97.5% Chebyshev(Mean, Sd) UCL	0.0363
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0477
95% Approximate Gamma UCL	0.0213		
95% Adjusted Gamma UCL	0.0218		
Potential UCL to Use		Use 95% Student's-t UCL	0.0224
		or 95% Modified-t UCL	0.0229

Result or 1/2 SDL (acenaphthene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0061	Minimum of Log Data	-5.099
Maximum	0.0631	Maximum of Log Data	-2.763
Mean	0.0116	Mean of log Data	-4.757
Median	0.0067	SD of log Data	0.628
SD	0.0144		
Coefficient of Variation	1.248		
Skewness	3.498		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.423	Shapiro Wilk Test Statistic	0.58
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0179	95% H-UCL	0.0149
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0177
95% Adjusted-CLT UCL	0.0208	97.5% Chebyshev (MVUE) UCL	0.0209
95% Modified-t UCL	0.0184	99% Chebyshev (MVUE) UCL	0.0272
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.535	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0075		
nu star	49.11		
Approximate Chi Square Value (.05)	34.02	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0175
Adjusted Chi Square Value	32.6	95% Jackknife UCL	0.0179
		95% Standard Bootstrap UCL	0.0174
Anderson-Darling Test Statistic	3.332	95% Bootstrap-t UCL	0.0819
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.0483
Kolmogorov-Smirnov Test Statistic	0.415	95% Percentile Bootstrap UCL	0.0177
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.0211
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0273
		97.5% Chebyshev(Mean, Sd) UCL	0.034
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0474
95% Approximate Gamma UCL	0.0167		
95% Adjusted Gamma UCL	0.0174		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0273

Result or 1/2 SDL (aluminum)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	3900	Minimum of Log Data	8.269
Maximum	12500	Maximum of Log Data	9.433
Mean	6854	Mean of log Data	8.781
Median	6345	SD of log Data	0.331
SD	2346		
Coefficient of Variation	0.342		
Skewness	0.876		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7882	95% H-UCL	8081
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9351

95% Adjusted-CLT UCL	7956	97.5% Chebyshev (MVUE) UCL	10434
95% Modified-t UCL	7904	99% Chebyshev (MVUE) UCL	12562
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.977	Data appear Normal at 5% Significance Level	
Theta Star	859.3		
nu star	255.3		
Approximate Chi Square Value (.05)	219.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	7819
Adjusted Chi Square Value	215.5	95% Jackknife UCL	7882
		95% Standard Bootstrap UCL	7774
Anderson-Darling Test Statistic	0.237	95% Bootstrap-t UCL	8066
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	8093
Kolmogorov-Smirnov Test Statistic	0.116	95% Percentile Bootstrap UCL	7798
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	7883
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9411
		97.5% Chebyshev(Mean, Sd) UCL	10517
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12689
95% Approximate Gamma UCL	7980		
95% Adjusted Gamma UCL	8120		
Potential UCL to Use		Use 95% Student's-t UCL	7882

Result or 1/2 SDL (anthracene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0067	Minimum of Log Data	-5.006
Maximum	0.0753	Maximum of Log Data	-2.586
Mean	0.0201	Mean of log Data	-4.283
Median	0.0089	SD of log Data	0.838
SD	0.0205		
Coefficient of Variation	1.017		
Skewness	1.776		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.711	Shapiro Wilk Test Statistic	0.805
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0291	95% H-UCL	0.0335
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0378
95% Adjusted-CLT UCL	0.0309	97.5% Chebyshev (MVUE) UCL	0.0459
95% Modified-t UCL	0.0294	99% Chebyshev (MVUE) UCL	0.0619
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.24	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0162		
nu star	39.69		
Approximate Chi Square Value (.05)	26.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0285
Adjusted Chi Square Value	25.02	95% Jackknife UCL	0.0291
		95% Standard Bootstrap UCL	0.0283
Anderson-Darling Test Statistic	1.546	95% Bootstrap-t UCL	0.0368
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	0.0337
Kolmogorov-Smirnov Test Statistic	0.323	95% Percentile Bootstrap UCL	0.0289
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.0317
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0424
		97.5% Chebyshev(Mean, Sd) UCL	0.052
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.071
95% Approximate Gamma UCL	0.0304		
95% Adjusted Gamma UCL	0.0319		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0424

Result or 1/2 SDL (antimony)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.74	Minimum of Log Data	-0.301
Maximum	8.14	Maximum of Log Data	2.097
Mean	2.245	Mean of log Data	0.629
Median	1.75	SD of log Data	0.57
SD	1.751		
Coefficient of Variation	0.78		
Skewness	2.813		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.675	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.012	95% H-UCL	3.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.591
95% Adjusted-CLT UCL	3.294	97.5% Chebyshev (MVUE) UCL	4.201
95% Modified-t UCL	3.064	99% Chebyshev (MVUE) UCL	5.399
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.429	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.924		
nu star	77.73		
Approximate Chi Square Value (.05)	58.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	2.965
Adjusted Chi Square Value	56.52	95% Jackknife UCL	3.012

		95% Standard Bootstrap UCL	2.935
Anderson-Darling Test Statistic	0.73	95% Bootstrap-t UCL	3.9
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	5.856
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	3.061
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	3.384
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.153
		97.5% Chebyshev(Mean, Sd) UCL	4.979
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.601
95% Approximate Gamma UCL	2.987		
95% Adjusted Gamma UCL	3.088		
Potential UCL to Use		Use 95% Approximate Gamma UCL	2.987

Result or 1/2 SDL (arsenic)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	2.41	Minimum of Log Data	0.88
Maximum	7.62	Maximum of Log Data	2.031
Mean	4.026	Mean of log Data	1.341
Median	3.805	SD of log Data	0.327
SD	1.4		
Coefficient of Variation	0.348		
Skewness	1.175		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.64	95% H-UCL	4.732
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.471
95% Adjusted-CLT UCL	4.712	97.5% Chebyshev (MVUE) UCL	6.099
95% Modified-t UCL	4.657	99% Chebyshev (MVUE) UCL	7.332
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.049	Data appear Normal at 5% Significance Level	
Theta Star	0.5		
nu star	257.6		
Approximate Chi Square Value (.05)	221.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	4.602
Adjusted Chi Square Value	217.6	95% Jackknife UCL	4.64
		95% Standard Bootstrap UCL	4.587
Anderson-Darling Test Statistic	0.318	95% Bootstrap-t UCL	4.811
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	4.939
Kolmogorov-Smirnov Test Statistic	0.15	95% Percentile Bootstrap UCL	4.618
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	4.696

Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.552
		97.5% Chebyshev(Mean, Sd) UCL	6.212
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.508
95% Approximate Gamma UCL	4.684		
95% Adjusted Gamma UCL	4.766		
Potential UCL to Use		Use 95% Student's-t UCL	4.64

Result or 1/2 SDL (atrazine (aatrex))

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.012	Minimum of Log Data	-4.423
Maximum	0.0814	Maximum of Log Data	-2.508
Mean	0.0179	Mean of log Data	-4.189
Median	0.0129	SD of log Data	0.466
SD	0.017		
Coefficient of Variation	0.951		
Skewness	3.921		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.359	Shapiro Wilk Test Statistic	0.502
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0254	95% H-UCL	0.0216
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0255
95% Adjusted-CLT UCL	0.0294	97.5% Chebyshev (MVUE) UCL	0.0293
95% Modified-t UCL	0.0261	99% Chebyshev (MVUE) UCL	0.0368
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.613	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0068		
nu star	83.62		
Approximate Chi Square Value (.05)	63.55	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0249
Adjusted Chi Square Value	61.56	95% Jackknife UCL	0.0254
		95% Standard Bootstrap UCL	0.0247
Anderson-Darling Test Statistic	3.587	95% Bootstrap-t UCL	0.0697
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.0528
Kolmogorov-Smirnov Test Statistic	0.387	95% Percentile Bootstrap UCL	0.0264
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	0.0308
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0365
		97.5% Chebyshev(Mean, Sd) UCL	0.0445
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0603
95% Approximate Gamma UCL	0.0236		
95% Adjusted Gamma UCL	0.0243		

Potential UCL to Use		Use 95% Student's-t UCL	0.0254
		or 95% Modified-t UCL	0.0261

Result or 1/2 SDL (barium)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	116	Minimum of Log Data	4.754
Maximum	377	Maximum of Log Data	5.932
Mean	215.3	Mean of log Data	5.339
Median	198	SD of log Data	0.263
SD	59.65		
Coefficient of Variation	0.277		
Skewness	1.296		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	241.4	95% H-UCL	244.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	277.3
95% Adjusted-CLT UCL	244.9	97.5% Chebyshev (MVUE) UCL	304.2
95% Modified-t UCL	242.2	99% Chebyshev (MVUE) UCL	357.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	12.47	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	17.27		
nu star	398.9		
Approximate Chi Square Value (.05)	353.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	239.8
Adjusted Chi Square Value	348.8	95% Jackknife UCL	241.4
		95% Standard Bootstrap UCL	239.4
Anderson-Darling Test Statistic	0.562	95% Bootstrap-t UCL	250.3
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	261.9
Kolmogorov-Smirnov Test Statistic	0.17	95% Percentile Bootstrap UCL	240
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	244.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	280.3
		97.5% Chebyshev(Mean, Sd) UCL	308.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	363.6
95% Approximate Gamma UCL	242.8		
95% Adjusted Gamma UCL	246.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	242.8

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.075
Maximum	0.395	Maximum of Log Data	-0.929
Mean	0.0454	Mean of log Data	-4.365
Median	0.0069	SD of log Data	1.321
SD	0.103		
Coefficient of Variation	2.258		
Skewness	3.108		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.454	Shapiro Wilk Test Statistic	0.591
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0904	95% H-UCL	0.092
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0734
95% Adjusted-CLT UCL	0.109	97.5% Chebyshev (MVUE) UCL	0.0931
95% Modified-t UCL	0.0937	99% Chebyshev (MVUE) UCL	0.132
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.447	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.102		
nu star	14.31		
Approximate Chi Square Value (.05)	6.785	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0876
Adjusted Chi Square Value	6.203	95% Jackknife UCL	0.0904
		95% Standard Bootstrap UCL	0.0863
Anderson-Darling Test Statistic	3.576	95% Bootstrap-t UCL	0.28
Anderson-Darling 5% Critical Value	0.797	95% Hall's Bootstrap UCL	0.328
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	0.0904
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.118
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.157
		97.5% Chebyshev(Mean, Sd) UCL	0.206
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.301
95% Approximate Gamma UCL	0.0958		
95% Adjusted Gamma UCL	0.105		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.301

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.083
Maximum	0.445	Maximum of Log Data	-0.81
Mean	0.0661	Mean of log Data	-3.88
Median	0.0078	SD of log Data	1.521
SD	0.115		
Coefficient of Variation	1.737		
Skewness	2.722		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.764
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.116	95% H-UCL	0.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.168
95% Adjusted-CLT UCL	0.134	97.5% Chebyshev (MVUE) UCL	0.215
95% Modified-t UCL	0.12	99% Chebyshev (MVUE) UCL	0.309
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.48	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.138		
nu star	15.36		
Approximate Chi Square Value (.05)	7.512	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.113
Adjusted Chi Square Value	6.895	95% Jackknife UCL	0.116
		95% Standard Bootstrap UCL	0.113
Anderson-Darling Test Statistic	1.831	95% Bootstrap-t UCL	0.184
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	0.279
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	0.117
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.144
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.191
		97.5% Chebyshev(Mean, Sd) UCL	0.245
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.352
95% Approximate Gamma UCL	0.135		
95% Adjusted Gamma UCL	0.147		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.352

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.443
Maximum	0.611	Maximum of Log Data	-0.493
Mean	0.1	Mean of log Data	-3.526
Median	0.0371	SD of log Data	1.76

SD	0.157		
Coefficient of Variation	1.565		
Skewness	2.573		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.66	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.169	95% H-UCL	0.867
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.367
95% Adjusted-CLT UCL	0.192	97.5% Chebyshev (MVUE) UCL	0.476
95% Modified-t UCL	0.173	99% Chebyshev (MVUE) UCL	0.692
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.461	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.218		
nu star	14.74		
Approximate Chi Square Value (.05)	7.082	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.165
Adjusted Chi Square Value	6.485	95% Jackknife UCL	0.169
		95% Standard Bootstrap UCL	0.164
Anderson-Darling Test Statistic	0.881	95% Bootstrap-t UCL	0.234
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	0.418
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	0.169
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.193
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.271
		97.5% Chebyshev(Mean, Sd) UCL	0.345
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.491
95% Approximate Gamma UCL	0.209		
95% Adjusted Gamma UCL	0.228		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.491

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.083
Maximum	0.442	Maximum of Log Data	-0.816
Mean	0.0661	Mean of log Data	-3.851
Median	0.0086	SD of log Data	1.48
SD	0.117		
Coefficient of Variation	1.766		
Skewness	2.643		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.594	Shapiro Wilk Test Statistic	0.805
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.117	95% H-UCL	0.244
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.161
95% Adjusted-CLT UCL	0.135	97.5% Chebyshev (MVUE) UCL	0.206
95% Modified-t UCL	0.121	99% Chebyshev (MVUE) UCL	0.294
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.135		
nu star	15.66		
Approximate Chi Square Value (.05)	7.726	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.114
Adjusted Chi Square Value	7.099	95% Jackknife UCL	0.117
		95% Standard Bootstrap UCL	0.112
Anderson-Darling Test Statistic	1.602	95% Bootstrap-t UCL	0.217
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	0.304
Kolmogorov-Smirnov Test Statistic	0.303	95% Percentile Bootstrap UCL	0.117
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	0.142
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.193
		97.5% Chebyshev(Mean, Sd) UCL	0.248
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.357
95% Approximate Gamma UCL	0.134		
95% Adjusted Gamma UCL	0.146		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.357

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0095	Minimum of Log Data	-4.651
Maximum	0.318	Maximum of Log Data	-1.146
Mean	0.0589	Mean of log Data	-3.644
Median	0.0122	SD of log Data	1.253
SD	0.0853		
Coefficient of Variation	1.447		
Skewness	2.204		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.659	Shapiro Wilk Test Statistic	0.773
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0963	95% H-UCL	0.157
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.135
95% Adjusted-CLT UCL	0.107	97.5% Chebyshev (MVUE) UCL	0.17
95% Modified-t UCL	0.0983	99% Chebyshev (MVUE) UCL	0.24
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.641	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0919		
nu star	20.52		
Approximate Chi Square Value (.05)	11.24	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.094
Adjusted Chi Square Value	10.46	95% Jackknife UCL	0.0963
		95% Standard Bootstrap UCL	0.0921
Anderson-Darling Test Statistic	1.775	95% Bootstrap-t UCL	0.129
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	0.122
Kolmogorov-Smirnov Test Statistic	0.35	95% Percentile Bootstrap UCL	0.0958
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	0.108
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.152
		97.5% Chebyshev(Mean, Sd) UCL	0.192
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.271
95% Approximate Gamma UCL	0.108		
95% Adjusted Gamma UCL	0.116		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.271

Result or 1/2 SDL (beryllium)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.29	Minimum of Log Data	-1.238
Maximum	0.82	Maximum of Log Data	-0.198
Mean	0.463	Mean of log Data	-0.815
Median	0.42	SD of log Data	0.307
SD	0.149		
Coefficient of Variation	0.322		
Skewness	0.894		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.528	95% H-UCL	0.539
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.619
95% Adjusted-CLT UCL	0.533	97.5% Chebyshev (MVUE) UCL	0.687
95% Modified-t UCL	0.53	99% Chebyshev (MVUE) UCL	0.821

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.119	Data appear Normal at 5% Significance Level	
Theta Star	0.0508		
nu star	291.8		
Approximate Chi Square Value (.05)	253.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.524
Adjusted Chi Square Value	249.2	95% Jackknife UCL	0.528
		95% Standard Bootstrap UCL	0.523
Anderson-Darling Test Statistic	0.452	95% Bootstrap-t UCL	0.541
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	0.541
Kolmogorov-Smirnov Test Statistic	0.161	95% Percentile Bootstrap UCL	0.523
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.532
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.625
		97.5% Chebyshev(Mean, Sd) UCL	0.696
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.834
95% Approximate Gamma UCL	0.534		
95% Adjusted Gamma UCL	0.542		
Potential UCL to Use		Use 95% Student's-t UCL	0.528

Result or 1/2 SDL (boron)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.675	Minimum of Log Data	-0.393
Maximum	27.2	Maximum of Log Data	3.303
Mean	12.04	Mean of log Data	1.699
Median	13.45	SD of log Data	1.616
SD	9.92		
Coefficient of Variation	0.824		
Skewness	-0.0194		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.856	Shapiro Wilk Test Statistic	0.735
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.39	95% H-UCL	97.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	52.5
95% Adjusted-CLT UCL	16.11	97.5% Chebyshev (MVUE) UCL	67.76
95% Modified-t UCL	16.39	99% Chebyshev (MVUE) UCL	97.73

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.657	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.32		
nu star	21.03		

Approximate Chi Square Value (.05)	11.62	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	16.12
Adjusted Chi Square Value	10.83	95% Jackknife UCL	16.39
		95% Standard Bootstrap UCL	16.06
Anderson-Darling Test Statistic	1.705	95% Bootstrap-t UCL	16.58
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	16.03
Kolmogorov-Smirnov Test Statistic	0.288	95% Percentile Bootstrap UCL	15.89
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	15.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.85
		97.5% Chebyshev(Mean, Sd) UCL	27.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	36.72
95% Approximate Gamma UCL	21.81		
95% Adjusted Gamma UCL	23.4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	36.72
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (butyl benzyl phthalate)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.0076	Minimum of Log Data	-4.873
Maximum	0.202	Maximum of Log Data	-1.599
Mean	0.0208	Mean of log Data	-4.553
Median	0.0082	SD of log Data	0.798
SD	0.0483		
Coefficient of Variation	2.323		
Skewness	3.996		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.292	Shapiro Wilk Test Statistic	0.405
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.042	95% H-UCL	0.0238
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0273
95% Adjusted-CLT UCL	0.0536	97.5% Chebyshev (MVUE) UCL	0.033
95% Modified-t UCL	0.044	99% Chebyshev (MVUE) UCL	0.0442
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.743	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.028		
nu star	23.78		
Approximate Chi Square Value (.05)	13.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0407
Adjusted Chi Square Value	12.82	95% Jackknife UCL	0.042
		95% Standard Bootstrap UCL	0.0398

Anderson-Darling Test Statistic	4.868	95% Bootstrap-t UCL	0.642
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	0.369
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	0.0449
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.0575
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0735
		97.5% Chebyshev(Mean, Sd) UCL	0.0963
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.141
95% Approximate Gamma UCL	0.0362		
95% Adjusted Gamma UCL	0.0386		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0735

Result or 1/2 SDL (carbazole)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0060	Minimum of Log Data	-5.108
Maximum	0.0861	Maximum of Log Data	-2.452
Mean	0.0151	Mean of log Data	-4.632
Median	0.0069	SD of log Data	0.79
SD	0.0214		
Coefficient of Variation	1.413		
Skewness	2.948		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.49	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0245	95% H-UCL	0.0217
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0249
95% Adjusted-CLT UCL	0.0281	97.5% Chebyshev (MVUE) UCL	0.0301
95% Modified-t UCL	0.0252	99% Chebyshev (MVUE) UCL	0.0402
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.076	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0141		
nu star	34.44		
Approximate Chi Square Value (.05)	22.01	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0239
Adjusted Chi Square Value	20.89	95% Jackknife UCL	0.0245
		95% Standard Bootstrap UCL	0.0235
Anderson-Darling Test Statistic	3.042	95% Bootstrap-t UCL	0.0644
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	0.0724
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	0.0249
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	0.0304
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0384

		97.5% Chebyshev(Mean, Sd) UCL	0.0485
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0683
95% Approximate Gamma UCL	0.0237		
95% Adjusted Gamma UCL	0.025		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0384

Result or 1/2 SDL (chloroform)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	1.1400E-4	Minimum of Log Data	-9.079
Maximum	0.0052	Maximum of Log Data	-5.246
Mean	9.0178E-4	Mean of log Data	-7.93
Median	2.2100E-4	SD of log Data	1.189
SD	0.0016		
Coefficient of Variation	1.851		
Skewness	2.462		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.486	Shapiro Wilk Test Statistic	0.796
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0016	95% H-UCL	0.0018
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0016
95% Adjusted-CLT UCL	0.0018	97.5% Chebyshev (MVUE) UCL	0.0021
95% Modified-t UCL	0.0016	99% Chebyshev (MVUE) UCL	0.0029
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.58	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0015		
nu star	18.56		
Approximate Chi Square Value (.05)	9.799	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0015
Adjusted Chi Square Value	9.081	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0015
Anderson-Darling Test Statistic	2.224	95% Bootstrap-t UCL	0.0066
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.0061
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	0.0015
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.0018
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0027
		97.5% Chebyshev(Mean, Sd) UCL	0.0035
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0050
95% Approximate Gamma UCL	0.0017		
95% Adjusted Gamma UCL	0.0018		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0050

Result or 1/2 SDL (chromium)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	5.01	Minimum of Log Data	1.611
Maximum	14.4	Maximum of Log Data	2.667
Mean	9.214	Mean of log Data	2.177
Median	10.19	SD of log Data	0.314
SD	2.644		
Coefficient of Variation	0.287		
Skewness	-0.17		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.873
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.37	95% H-UCL	10.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.44
95% Adjusted-CLT UCL	10.27	97.5% Chebyshev (MVUE) UCL	13.83
95% Modified-t UCL	10.37	99% Chebyshev (MVUE) UCL	16.55
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.542	Data appear Normal at 5% Significance Level	
Theta Star	0.966		
nu star	305.3		
Approximate Chi Square Value (.05)	265.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.3
Adjusted Chi Square Value	261.7	95% Jackknife UCL	10.37
		95% Standard Bootstrap UCL	10.24
Anderson-Darling Test Statistic	0.99	95% Bootstrap-t UCL	10.32
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	10.26
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	10.21
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	10.2
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.09
		97.5% Chebyshev(Mean, Sd) UCL	13.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.79
95% Approximate Gamma UCL	10.58		
95% Adjusted Gamma UCL	10.75		
Potential UCL to Use		Use 95% Student's-t UCL	10.37

Result or 1/2 SDL (chrysene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0054	Minimum of Log Data	-5.212
Maximum	0.475	Maximum of Log Data	-0.744
Mean	0.0774	Mean of log Data	-3.614
Median	0.0177	SD of log Data	1.522
SD	0.123		
Coefficient of Variation	1.585		
Skewness	2.577		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.649	Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.131	95% H-UCL	0.353
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.219
95% Adjusted-CLT UCL	0.149	97.5% Chebyshev (MVUE) UCL	0.281
95% Modified-t UCL	*0.134*	*99% Chebyshev (MVUE) UCL*	*0.404*
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.519	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.149		
nu star	16.62		
Approximate Chi Square Value (.05)	8.399	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.128
Adjusted Chi Square Value	7.741	95% Jackknife UCL	0.131
		95% Standard Bootstrap UCL	0.125
Anderson-Darling Test Statistic	0.903	95% Bootstrap-t UCL	0.186
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	0.311
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	0.126
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	0.16
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.211
		97.5% Chebyshev(Mean, Sd) UCL	0.269
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.382
95% Approximate Gamma UCL	0.153		
95% Adjusted Gamma UCL	0.166		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.153

R[redacted]or 1/2 SDL (cobalt)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	3.05	Minimum of Log Data	1.115

Maximum	7.16	Maximum of Log Data	1.969
Mean	4.385	Mean of log Data	1.449
Median	4.06	SD of log Data	0.245
SD	1.131		
Coefficient of Variation	0.258		
Skewness	0.956		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4.881	95% H-UCL	4.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.562
95% Adjusted-CLT UCL	4.922	97.5% Chebyshev (MVUE) UCL	6.073
95% Modified-t UCL	4.892	99% Chebyshev (MVUE) UCL	7.077
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.16	Data appear Normal at 5% Significance Level	
Theta Star	0.31		
nu star	453.1		
Approximate Chi Square Value (.05)	404.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	4.85
Adjusted Chi Square Value	399.6	95% Jackknife UCL	4.881
		95% Standard Bootstrap UCL	4.824
Anderson-Darling Test Statistic	0.352	95% Bootstrap-t UCL	4.955
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	4.97
Kolmogorov-Smirnov Test Statistic	0.129	95% Percentile Bootstrap UCL	4.846
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	4.865
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.618
		97.5% Chebyshev(Mean, Sd) UCL	6.151
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.198
95% Approximate Gamma UCL	4.909		
95% Adjusted Gamma UCL	4.973		
Potential UCL to Use		Use 95% Student's-t UCL	4.881

Result or 1/2 SDL (copper)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	3.28	Minimum of Log Data	1.188
Maximum	12.6	Maximum of Log Data	2.534
Mean	7.112	Mean of log Data	1.87
Median	6.655	SD of log Data	0.456
SD	2.997		
Coefficient of Variation	0.421		

Skewness	0.299		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.425	95% H-UCL	9.125
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.8
95% Adjusted-CLT UCL	8.404	97.5% Chebyshev (MVUE) UCL	12.38
95% Modified-t UCL	8.435	99% Chebyshev (MVUE) UCL	15.48
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.602	Data appear Normal at 5% Significance Level	
Theta Star	1.546		
nu star	147.3		
Approximate Chi Square Value (.05)	120.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	8.344
Adjusted Chi Square Value	117.4	95% Jackknife UCL	8.425
		95% Standard Bootstrap UCL	8.292
Anderson-Darling Test Statistic	0.46	95% Bootstrap-t UCL	8.485
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	8.39
Kolmogorov-Smirnov Test Statistic	0.168	95% Percentile Bootstrap UCL	8.258
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	8.299
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.38
		97.5% Chebyshev(Mean, Sd) UCL	11.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.57
95% Approximate Gamma UCL	8.712		
95% Adjusted Gamma UCL	8.918		
Potential UCL to Use		Use 95% Student's-t UCL	8.425

Result or 1/2 SDL (cyclohexane)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		**Log-transformed Statistics**	
Minimum	8.9500E-4	Minimum of Log Data	-7.019
Maximum	0.0042	Maximum of Log Data	-5.46
Mean	0.0023	Mean of log Data	-6.214
Median	0.0017	SD of log Data	0.55
SD	0.0013		
Coefficient of Variation	0.561		
Skewness	0.694		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.793	Shapiro Wilk Test Statistic	0.872

Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0028	95% H-UCL	0.0031
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0037
95% Adjusted-CLT UCL	0.0029	97.5% Chebyshev (MVUE) UCL	0.0043
95% Modified-t UCL	0.0028	99% Chebyshev (MVUE) UCL	0.0055
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.996	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	7.7140E-4		
nu star	95.86		
Approximate Chi Square Value (.05)	74.28	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0028
Adjusted Chi Square Value	72.12	95% Jackknife UCL	0.0028
		95% Standard Bootstrap UCL	0.0028
Anderson-Darling Test Statistic	1.082	95% Bootstrap-t UCL	0.0029
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.0027
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	0.0028
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0029
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0037
		97.5% Chebyshev(Mean, Sd) UCL	0.0043
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0055
95% Approximate Gamma UCL	0.0029		
95% Adjusted Gamma UCL	0.0030		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0029

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0059	Minimum of Log Data	-5.133
Maximum	0.235	Maximum of Log Data	-1.448
Mean	0.0435	Mean of log Data	-4.041
Median	0.0078	SD of log Data	1.342
SD	0.0649		
Coefficient of Variation	1.491		
Skewness	2.176		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.766
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0719	95% H-UCL	0.135

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.105
95% Adjusted-CLT UCL	0.0796	97.5% Chebyshev (MVUE) UCL	0.133
95% Modified-t UCL	0.0734	99% Chebyshev (MVUE) UCL	0.189
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.587	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0742		
nu star	18.77		
Approximate Chi Square Value (.05)	9.952	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0702
Adjusted Chi Square Value	9.227	95% Jackknife UCL	0.0719
		95% Standard Bootstrap UCL	0.0692
Anderson-Darling Test Statistic	1.818	95% Bootstrap-t UCL	0.106
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.19
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	0.0702
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	0.0813
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.114
		97.5% Chebyshev(Mean, Sd) UCL	0.145
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.205
95% Approximate Gamma UCL	0.0821		
95% Adjusted Gamma UCL	0.0885		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.205

Result or 1/2 SDL (dibenzofuran)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0086	Minimum of Log Data	-4.75
Maximum	0.0305	Maximum of Log Data	-3.49
Mean	0.0123	Mean of log Data	-4.486
Median	0.0096	SD of log Data	0.386
SD	0.0065		
Coefficient of Variation	0.534		
Skewness	2.369		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.579	Shapiro Wilk Test Statistic	0.678
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0152	95% H-UCL	0.0147
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0172
95% Adjusted-CLT UCL	0.016	97.5% Chebyshev (MVUE) UCL	0.0195
95% Modified-t UCL	0.0153	99% Chebyshev (MVUE) UCL	0.0239
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	4.848	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0025		
nu star	155.2		
Approximate Chi Square Value (.05)	127.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.015
Adjusted Chi Square Value	124.5	95% Jackknife UCL	0.0152
		95% Standard Bootstrap UCL	0.0149
Anderson-Darling Test Statistic	2.403	95% Bootstrap-t UCL	0.0241
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	0.0298
Kolmogorov-Smirnov Test Statistic	0.304	95% Percentile Bootstrap UCL	0.015
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0162
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0194
		97.5% Chebyshev(Mean, Sd) UCL	0.0225
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0286
95% Approximate Gamma UCL	0.015		
95% Adjusted Gamma UCL	0.0153		
Potential UCL to Use		Use 95% Student's-t UCL	0.0152
		or 95% Modified-t UCL	0.0153

Result or 1/2 SDL (diethyl phthalate)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.0104	Minimum of Log Data	-4.566
Maximum	0.0389	Maximum of Log Data	-3.247
Mean	0.0135	Mean of log Data	-4.369
Median	0.0112	SD of log Data	0.326
SD	0.0069		
Coefficient of Variation	0.513		
Skewness	3.652		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.461	Shapiro Wilk Test Statistic	0.602
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0166	95% H-UCL	0.0157
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0181
95% Adjusted-CLT UCL	0.0181	97.5% Chebyshev (MVUE) UCL	0.0202
95% Modified-t UCL	0.0169	99% Chebyshev (MVUE) UCL	0.0242
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.232	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0021		
nu star	199.4		
Approximate Chi Square Value (.05)	167.8	Nonparametric Statistics	

Adjusted Level of Significance	0.0335	95% CLT UCL	0.0164
Adjusted Chi Square Value	164.5	95% Jackknife UCL	0.0166
		95% Standard Bootstrap UCL	0.0162
Anderson-Darling Test Statistic	2.57	95% Bootstrap-t UCL	0.0251
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.0261
Kolmogorov-Smirnov Test Statistic	0.283	95% Percentile Bootstrap UCL	0.0167
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0185
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0211
		97.5% Chebyshev(Mean, Sd) UCL	0.0244
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0308
95% Approximate Gamma UCL	0.0161		
95% Adjusted Gamma UCL	0.0164		
Potential UCL to Use		Use 95% Student's-t UCL	0.0166
		or 95% Modified-t UCL	0.0169

Result or 1/2 SDL (di-n-octyl phthalate)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	13

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0051	Minimum of Log Data	-5.279
Maximum	0.192	Maximum of Log Data	-1.65
Mean	0.018	Mean of log Data	-4.875
Median	0.0056	SD of log Data	0.9
SD	0.0465		
Coefficient of Variation	2.577		
Skewness	3.983		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.303	Shapiro Wilk Test Statistic	0.476
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0384	95% H-UCL	0.0208
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0228
95% Adjusted-CLT UCL	0.0495	97.5% Chebyshev (MVUE) UCL	0.0279
95% Modified-t UCL	0.0403	99% Chebyshev (MVUE) UCL	0.038
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.613	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0294		
nu star	19.61		
Approximate Chi Square Value (.05)	10.57	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0371
Adjusted Chi Square Value	9.817	95% Jackknife UCL	0.0384
		95% Standard Bootstrap UCL	0.0368
Anderson-Darling Test Statistic	4.473	95% Bootstrap-t UCL	0.744

Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	0.313
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	0.041
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	0.0529
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0686
		97.5% Chebyshev(Mean, Sd) UCL	0.0906
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.134
95% Approximate Gamma UCL	0.0335		
95% Adjusted Gamma UCL	0.036		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0686

Result or 1/2 SDL (fluoranthene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0068	Minimum of Log Data	-4.984
Maximum	0.804	Maximum of Log Data	-0.218
Mean	0.113	Mean of log Data	-3.442
Median	0.016	SD of log Data	1.651
SD	0.201		
Coefficient of Variation	1.786		
Skewness	3.01		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.577	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.201	95% H-UCL	0.642
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.327
95% Adjusted-CLT UCL	0.236	97.5% Chebyshev (MVUE) UCL	0.423
95% Modified-t UCL	0.207	99% Chebyshev (MVUE) UCL	0.611
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.451	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.25		
nu star	14.44		
Approximate Chi Square Value (.05)	6.872	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.196
Adjusted Chi Square Value	6.285	95% Jackknife UCL	0.201
		95% Standard Bootstrap UCL	0.194
Anderson-Darling Test Statistic	1.352	95% Bootstrap-t UCL	0.306
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	0.492
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	0.201
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.236
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.332
		97.5% Chebyshev(Mean, Sd) UCL	0.427

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.614
95% Approximate Gamma UCL	0.237		
95% Adjusted Gamma UCL	0.259		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.614

Result or 1/2 SDL (fluorene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.006	Minimum of Log Data	-5.116
Maximum	0.046	Maximum of Log Data	-3.079
Mean	0.0122	Mean of log Data	-4.65
Median	0.0073	SD of log Data	0.63
SD	0.0111		
Coefficient of Variation	0.916		
Skewness	2.347		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.612	Shapiro Wilk Test Statistic	0.739
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.017	95% H-UCL	0.0167
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0198
95% Adjusted-CLT UCL	0.0185	97.5% Chebyshev (MVUE) UCL	0.0233
95% Modified-t UCL	0.0173	99% Chebyshev (MVUE) UCL	0.0304
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.859	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0065		
nu star	59.5		
Approximate Chi Square Value (.05)	42.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0167
Adjusted Chi Square Value	41.15	95% Jackknife UCL	0.017
		95% Standard Bootstrap UCL	0.0166
Anderson-Darling Test Statistic	2.153	95% Bootstrap-t UCL	0.022
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	0.018
Kolmogorov-Smirnov Test Statistic	0.349	95% Percentile Bootstrap UCL	0.0169
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.0194
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0243
		97.5% Chebyshev(Mean, Sd) UCL	0.0295
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0398
95% Approximate Gamma UCL	0.0169		
95% Adjusted Gamma UCL	0.0176		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0243

Result or 1/2 SDL (gamma-chlordane)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	1.5950E-4	Minimum of Log Data	-8.743
Maximum	8.2600E-4	Maximum of Log Data	-7.099
Mean	3.1319E-4	Mean of log Data	-8.275
Median	1.9550E-4	SD of log Data	0.615
SD	2.3598E-4		
Coefficient of Variation	0.753		
Skewness	1.351		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.664	Shapiro Wilk Test Statistic	0.719
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4.1661E-4	95% H-UCL	4.3515E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.1626E-4
95% Adjusted-CLT UCL	4.3152E-4	97.5% Chebyshev (MVUE) UCL	6.0830E-4
95% Modified-t UCL	4.1993E-4	99% Chebyshev (MVUE) UCL	7.8909E-4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.133	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.4684E-4		
nu star	68.25		
Approximate Chi Square Value (.05)	50.24	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	4.1022E-4
Adjusted Chi Square Value	48.48	95% Jackknife UCL	4.1661E-4
		95% Standard Bootstrap UCL	4.0927E-4
Anderson-Darling Test Statistic	2.341	95% Bootstrap-t UCL	4.9207E-4
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	3.9193E-4
Kolmogorov-Smirnov Test Statistic	0.362	95% Percentile Bootstrap UCL	4.1500E-4
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	4.2356E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.7034E-4
		97.5% Chebyshev(Mean, Sd) UCL	6.8160E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.0017E-4
95% Approximate Gamma UCL	4.2550E-4		
95% Adjusted Gamma UCL	4.4092E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.7034E-4

Result or 1/2 SDL (hexachlorobenzene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.0075	Minimum of Log Data	-4.893
Maximum	0.0319	Maximum of Log Data	-3.445
Mean	0.01	Mean of log Data	-4.686
Median	0.0081	SD of log Data	0.355
SD	0.0059		
Coefficient of Variation	0.593		
Skewness	3.745		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.433	Shapiro Wilk Test Statistic	0.579
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0126	95% H-UCL	0.0117
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0136
95% Adjusted-CLT UCL	0.014	97.5% Chebyshev (MVUE) UCL	0.0153
95% Modified-t UCL	0.0129	99% Chebyshev (MVUE) UCL	0.0186
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.058	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0019		
nu star	161.9		
Approximate Chi Square Value (.05)	133.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0125
Adjusted Chi Square Value	130.5	95% Jackknife UCL	0.0126
		95% Standard Bootstrap UCL	0.0123
Anderson-Darling Test Statistic	2.793	95% Bootstrap-t UCL	0.0208
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	0.021
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	0.0128
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0146
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0165
		97.5% Chebyshev(Mean, Sd) UCL	0.0193
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0248
95% Approximate Gamma UCL	0.0122		
95% Adjusted Gamma UCL	0.0124		
Potential UCL to Use		Use 95% Student's-t UCL	0.0126
		or 95% Modified-t UCL	0.0129

[redacted]or 1/2 SDL (indeno(1,2,3-cd)pyrene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0099	Minimum of Log Data	-4.615

Maximum	0.405	Maximum of Log Data	-0.904
Mean	0.0722	Mean of log Data	-3.552
Median	0.0126	SD of log Data	1.335
SD	0.111		
Coefficient of Variation	1.532		
Skewness	2.205		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.644	Shapiro Wilk Test Statistic	0.769
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.121	95% H-UCL	0.215
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.169
95% Adjusted-CLT UCL	0.134	97.5% Chebyshev (MVUE) UCL	0.215
95% Modified-t UCL	0.123	99% Chebyshev (MVUE) UCL	0.304
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.577	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.125		
nu star	18.48		
Approximate Chi Square Value (.05)	9.738	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.118
Adjusted Chi Square Value	9.022	95% Jackknife UCL	0.121
		95% Standard Bootstrap UCL	0.117
Anderson-Darling Test Statistic	1.828	95% Bootstrap-t UCL	0.173
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.141
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	0.12
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.134
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.193
		97.5% Chebyshev(Mean, Sd) UCL	0.245
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.347
95% Approximate Gamma UCL	0.137		
95% Adjusted Gamma UCL	0.148		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.347

Result or 1/2 SDL (iron)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	6750	Minimum of Log Data	8.817
Maximum	28200	Maximum of Log Data	10.25
Mean	13352	Mean of log Data	9.427
Median	13200	SD of log Data	0.389
SD	5546		
Coefficient of Variation	0.415		

Skewness	1.341		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15782	95% H-UCL	16280
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19078
95% Adjusted-CLT UCL	16129	97.5% Chebyshev (MVUE) UCL	21568
95% Modified-t UCL	15860	99% Chebyshev (MVUE) UCL	26460
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.759	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2318		
nu star	184.3		
Approximate Chi Square Value (.05)	153.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	15632
Adjusted Chi Square Value	150.7	95% Jackknife UCL	15782
		95% Standard Bootstrap UCL	15544
Anderson-Darling Test Statistic	0.495	95% Bootstrap-t UCL	16816
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	18440
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	15673
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	16268
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19395
		97.5% Chebyshev(Mean, Sd) UCL	22010
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27146
95% Approximate Gamma UCL	15989		
95% Adjusted Gamma UCL	16325		
Potential UCL to Use		Use 95% Approximate Gamma UCL	15989

Result or 1/2 SDL (isopropylbenzene (cumene))

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	1.2400E-4	Minimum of Log Data	-8.995
Maximum	0.0070	Maximum of Log Data	-4.956
Mean	0.0010	Mean of log Data	-7.845
Median	2.4000E-4	SD of log Data	1.198
SD	0.0019		
Coefficient of Variation	1.926		
Skewness	2.71		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.493	Shapiro Wilk Test Statistic	0.804

Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0018	95% H-UCL	0.0020
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0018
95% Adjusted-CLT UCL	0.0021	97.5% Chebyshev (MVUE) UCL	0.0023
95% Modified-t UCL	0.0019	99% Chebyshev (MVUE) UCL	0.0032
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.566	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	18.12		
Approximate Chi Square Value (.05)	9.479	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0018
Adjusted Chi Square Value	8.774	95% Jackknife UCL	0.0018
		95% Standard Bootstrap UCL	0.0018
Anderson-Darling Test Statistic	2.176	95% Bootstrap-t UCL	0.0081
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	0.0068
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	0.0018
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.0022
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0031
		97.5% Chebyshev(Mean, Sd) UCL	0.0040
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0058
95% Approximate Gamma UCL	0.0019		
95% Adjusted Gamma UCL	0.0020		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0058

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	32.3	Maximum of Log Data	3.475
Mean	11.56	Mean of log Data	2.311
Median	10.03	SD of log Data	0.512
SD	7.161		
Coefficient of Variation	0.62		
Skewness	2.013		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.774	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.69	95% H-UCL	15.11

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.95
95% Adjusted-CLT UCL	15.46	97.5% Chebyshev (MVUE) UCL	20.79
95% Modified-t UCL	14.84	99% Chebyshev (MVUE) UCL	26.37
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.16	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.657		
nu star	101.1		
Approximate Chi Square Value (.05)	78.92	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	14.5
Adjusted Chi Square Value	76.69	95% Jackknife UCL	14.69
		95% Standard Bootstrap UCL	14.4
Anderson-Darling Test Statistic	0.574	95% Bootstrap-t UCL	17.86
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	31.55
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	14.56
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	15.63
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.36
		97.5% Chebyshev(Mean, Sd) UCL	22.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29.37
95% Approximate Gamma UCL	14.81		
95% Adjusted Gamma UCL	15.24		
Potential UCL to Use		Use 95% Approximate Gamma UCL	14.81

Result or 1/2 SDL (lithium)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	20	Maximum of Log Data	2.996
Mean	10.53	Mean of log Data	2.306
Median	9.88	SD of log Data	0.314
SD	3.559		
Coefficient of Variation	0.338		
Skewness	1.247		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.894	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.09	95% H-UCL	12.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.16
95% Adjusted-CLT UCL	12.29	97.5% Chebyshev (MVUE) UCL	15.73
95% Modified-t UCL	12.14	99% Chebyshev (MVUE) UCL	18.83
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	8.624	Data appear Normal at 5% Significance Level	
Theta Star	1.221		
nu star	276		
Approximate Chi Square Value (.05)	238.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	12
Adjusted Chi Square Value	234.5	95% Jackknife UCL	12.09
		95% Standard Bootstrap UCL	11.95
Anderson-Darling Test Statistic	0.319	95% Bootstrap-t UCL	12.55
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	12.89
Kolmogorov-Smirnov Test Statistic	0.119	95% Percentile Bootstrap UCL	11.96
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	12.23
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.41
		97.5% Chebyshev(Mean, Sd) UCL	16.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.39
95% Approximate Gamma UCL	12.19		
95% Adjusted Gamma UCL	12.39		
Potential UCL to Use		Use 95% Student's-t UCL	12.09

Result or 1/2 SDL (manganese)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	192	Minimum of Log Data	5.257
Maximum	474	Maximum of Log Data	6.161
Mean	283.3	Mean of log Data	5.603
Median	275	SD of log Data	0.301
SD	87.59		
Coefficient of Variation	0.309		
Skewness	0.667		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	321.6	95% H-UCL	328.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	377.1
95% Adjusted-CLT UCL	323.2	97.5% Chebyshev (MVUE) UCL	417.8
95% Modified-t UCL	322.2	99% Chebyshev (MVUE) UCL	497.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.583	Data appear Normal at 5% Significance Level	
Theta Star	29.56		
nu star	306.7		
Approximate Chi Square Value (.05)	267.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	319.3

Adjusted Chi Square Value	262.9	95% Jackknife UCL	321.6
		95% Standard Bootstrap UCL	318.6
Anderson-Darling Test Statistic	0.707	95% Bootstrap-t UCL	324.1
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	322.7
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	319.3
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	322.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	378.7
		97.5% Chebyshev(Mean, Sd) UCL	420
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	501.1
95% Approximate Gamma UCL	325.2		
95% Adjusted Gamma UCL	330.4		
Potential UCL to Use		Use 95% Student's-t UCL	321.6

Result or 1/2 SDL (mercury)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.011	Minimum of Log Data	-4.51
Maximum	0.036	Maximum of Log Data	-3.324
Mean	0.0201	Mean of log Data	-3.972
Median	0.02	SD of log Data	0.367
SD	0.0073		
Coefficient of Variation	0.368		
Skewness	0.618		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0233	95% H-UCL	0.0242
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0282
95% Adjusted-CLT UCL	0.0234	97.5% Chebyshev (MVUE) UCL	0.0318
95% Modified-t UCL	0.0233	99% Chebyshev (MVUE) UCL	0.0387
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.623	Data appear Normal at 5% Significance Level	
Theta Star	0.0030		
nu star	211.9		
Approximate Chi Square Value (.05)	179.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0231
Adjusted Chi Square Value	175.8	95% Jackknife UCL	0.0233
		95% Standard Bootstrap UCL	0.023
Anderson-Darling Test Statistic	0.386	95% Bootstrap-t UCL	0.0239
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.0237
Kolmogorov-Smirnov Test Statistic	0.149	95% Percentile Bootstrap UCL	0.0229

Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0231
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0281
		97.5% Chebyshev(Mean, Sd) UCL	0.0316
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0384
95% Approximate Gamma UCL	0.0237		
95% Adjusted Gamma UCL	0.0242		
Potential UCL to Use		Use 95% Student's-t UCL	0.0233

Result or 1/2 SDL (methylcyclohexane)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	2.9950E-4	Minimum of Log Data	-8.113
Maximum	0.0037	Maximum of Log Data	-5.599
Mean	9.5050E-4	Mean of log Data	-7.232
Median	5.8250E-4	SD of log Data	0.724
SD	8.5690E-4		
Coefficient of Variation	0.902		
Skewness	2.396		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.699	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0013	95% H-UCL	0.0014
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0016
95% Adjusted-CLT UCL	0.0014	97.5% Chebyshev (MVUE) UCL	0.0020
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	0.0026
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.649	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.7638E-4		
nu star	52.77		
Approximate Chi Square Value (.05)	37.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0013
Adjusted Chi Square Value	35.59	95% Jackknife UCL	0.0013
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	0.885	95% Bootstrap-t UCL	0.0016
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.0027
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.0014
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0018
		97.5% Chebyshev(Mean, Sd) UCL	0.0022
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0030
95% Approximate Gamma UCL	0.0013		

95% Adjusted Gamma UCL	0.0014		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0013

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	5.66	Maximum of Log Data	1.733
Mean	0.667	Mean of log Data	-1.108
Median	0.24	SD of log Data	0.95
SD	1.358		
Coefficient of Variation	2.036		
Skewness	3.761		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.407	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.262	95% H-UCL	0.991
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.064
95% Adjusted-CLT UCL	1.566	97.5% Chebyshev (MVUE) UCL	1.308
95% Modified-t UCL	1.315	99% Chebyshev (MVUE) UCL	1.788
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.724	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.922		
nu star	23.15		
Approximate Chi Square Value (.05)	13.21	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	1.225
Adjusted Chi Square Value	12.36	95% Jackknife UCL	1.262
		95% Standard Bootstrap UCL	1.201
Anderson-Darling Test Statistic	2.348	95% Bootstrap-t UCL	4.4
Anderson-Darling 5% Critical Value	0.771	95% Hall's Bootstrap UCL	3.298
Kolmogorov-Smirnov Test Statistic	0.318	95% Percentile Bootstrap UCL	1.306
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	1.687
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.146
		97.5% Chebyshev(Mean, Sd) UCL	2.786
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.044
95% Approximate Gamma UCL	1.169		
95% Adjusted Gamma UCL	1.25		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.146

Result or 1/2 SDL (nickel)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	5.8	Minimum of Log Data	1.758
Maximum	16.7	Maximum of Log Data	2.815
Mean	9.589	Mean of log Data	2.223
Median	9.93	SD of log Data	0.283
SD	2.741		
Coefficient of Variation	0.286		
Skewness	0.821		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.79	95% H-UCL	11.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.58
95% Adjusted-CLT UCL	10.87	97.5% Chebyshev (MVUE) UCL	13.88
95% Modified-t UCL	10.81	99% Chebyshev (MVUE) UCL	16.42
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.02	Data appear Normal at 5% Significance Level	
Theta Star	0.87		
nu star	352.6		
Approximate Chi Square Value (.05)	310.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.72
Adjusted Chi Square Value	305.5	95% Jackknife UCL	10.79
		95% Standard Bootstrap UCL	10.7
Anderson-Darling Test Statistic	0.57	95% Bootstrap-t UCL	10.95
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	11.23
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	10.69
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	10.77
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.58
		97.5% Chebyshev(Mean, Sd) UCL	13.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.41
95% Approximate Gamma UCL	10.9		
95% Adjusted Gamma UCL	11.07		
Potential UCL to Use		Use 95% Student's-t UCL	10.79

Result or 1/2 SDL (n-nitrosodiphenylamine)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.0069	Minimum of Log Data	-4.969
Maximum	0.0434	Maximum of Log Data	-3.137
Mean	0.0102	Mean of log Data	-4.738
Median	0.0075	SD of log Data	0.446
SD	0.0089		
Coefficient of Variation	0.879		
Skewness	3.902		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.369	Shapiro Wilk Test Statistic	0.514
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0141	95% H-UCL	0.0122
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0144
95% Adjusted-CLT UCL	0.0162	97.5% Chebyshev (MVUE) UCL	0.0165
95% Modified-t UCL	0.0144	99% Chebyshev (MVUE) UCL	0.0205
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.914	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0034		
nu star	93.24		
Approximate Chi Square Value (.05)	71.97	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0138
Adjusted Chi Square Value	69.85	95% Jackknife UCL	0.0141
		95% Standard Bootstrap UCL	0.0137
Anderson-Darling Test Statistic	3.455	95% Bootstrap-t UCL	0.0353
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.0281
Kolmogorov-Smirnov Test Statistic	0.374	95% Percentile Bootstrap UCL	0.0145
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.017
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0199
		97.5% Chebyshev(Mean, Sd) UCL	0.0241
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0324
95% Approximate Gamma UCL	0.0132		
95% Adjusted Gamma UCL	0.0136		
Potential UCL to Use		Use 95% Student's-t UCL	0.0141
		or 95% Modified-t UCL	0.0144

Result or 1/2 SDL (phenanthrene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0076	Minimum of Log Data	-4.88
Maximum	0.508	Maximum of Log Data	-0.677
Mean	0.0746	Mean of log Data	-3.548

Median	0.021	SD of log Data	1.383
SD	0.126		
Coefficient of Variation	1.691		
Skewness	3.037		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.13	95% H-UCL	0.248
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.184
95% Adjusted-CLT UCL	0.152	97.5% Chebyshev (MVUE) UCL	0.235
95% Modified-t UCL	0.134	99% Chebyshev (MVUE) UCL	0.334
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.564	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.132		
nu star	18.03		
Approximate Chi Square Value (.05)	9.415	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.126
Adjusted Chi Square Value	8.713	95% Jackknife UCL	0.13
		95% Standard Bootstrap UCL	0.126
Anderson-Darling Test Statistic	1.118	95% Bootstrap-t UCL	0.204
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	0.315
Kolmogorov-Smirnov Test Statistic	0.267	95% Percentile Bootstrap UCL	0.133
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.212
		97.5% Chebyshev(Mean, Sd) UCL	0.272
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.388
95% Approximate Gamma UCL	0.143		
95% Adjusted Gamma UCL	0.154		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.388

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.0073	Minimum of Log Data	-4.92
Maximum	0.862	Maximum of Log Data	-0.149
Mean	0.13	Mean of log Data	-3.251
Median	0.023	SD of log Data	1.632
SD	0.22		
Coefficient of Variation	1.697		
Skewness	2.746		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.869
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.227	95% H-UCL	0.729
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.383
95% Adjusted-CLT UCL	0.261	97.5% Chebyshev (MVUE) UCL	0.495
95% Modified-t UCL	0.233	99% Chebyshev (MVUE) UCL	0.714
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.465	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.279		
nu star	14.89		
Approximate Chi Square Value (.05)	7.184	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.221
Adjusted Chi Square Value	6.582	95% Jackknife UCL	0.227
		95% Standard Bootstrap UCL	0.218
Anderson-Darling Test Statistic	1.081	95% Bootstrap-t UCL	0.336
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	0.545
Kolmogorov-Smirnov Test Statistic	0.241	95% Percentile Bootstrap UCL	0.226
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.264
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.37
		97.5% Chebyshev(Mean, Sd) UCL	0.474
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.678
95% Approximate Gamma UCL	0.269		
95% Adjusted Gamma UCL	0.294		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.678

Result or 1/2 SDL (silver)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0335	Minimum of Log Data	-3.396
Maximum	0.54	Maximum of Log Data	-0.616
Mean	0.172	Mean of log Data	-2.392
Median	0.0448	SD of log Data	1.164
SD	0.184		
Coefficient of Variation	1.07		
Skewness	0.821		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.731	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.252	95% H-UCL	0.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.409
95% Adjusted-CLT UCL	0.257	97.5% Chebyshev (MVUE) UCL	0.512
95% Modified-t UCL	0.254	99% Chebyshev (MVUE) UCL	0.716
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.792	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.217		
nu star	25.36		
Approximate Chi Square Value (.05)	14.88	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.247
Adjusted Chi Square Value	13.98	95% Jackknife UCL	0.252
		95% Standard Bootstrap UCL	0.247
Anderson-Darling Test Statistic	2.15	95% Bootstrap-t UCL	0.273
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	0.245
Kolmogorov-Smirnov Test Statistic	0.368	95% Percentile Bootstrap UCL	0.246
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.254
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.372
		97.5% Chebyshev(Mean, Sd) UCL	0.459
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.629
95% Approximate Gamma UCL	0.293		
95% Adjusted Gamma UCL	0.312		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.629
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	32.8	Minimum of Log Data	3.49
Maximum	81.7	Maximum of Log Data	4.403
Mean	44.86	Mean of log Data	3.765
Median	39.85	SD of log Data	0.274
SD	14.43		
Coefficient of Variation	0.322		
Skewness	1.805		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.754	Shapiro Wilk Test Statistic	0.838
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	51.19	95% H-UCL	51.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.14

95% Adjusted-CLT UCL	52.54	97.5% Chebyshev (MVUE) UCL	63.96
95% Modified-t UCL	51.46	99% Chebyshev (MVUE) UCL	75.39

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.61	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.23		
nu star	339.4		
Approximate Chi Square Value (.05)	297.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	50.8
Adjusted Chi Square Value	293.2	95% Jackknife UCL	51.19
		95% Standard Bootstrap UCL	50.44
Anderson-Darling Test Statistic	1.15	95% Bootstrap-t UCL	57.32
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	81.83
Kolmogorov-Smirnov Test Statistic	0.261	95% Percentile Bootstrap UCL	50.68
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	51.96
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	60.59
		97.5% Chebyshev(Mean, Sd) UCL	67.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	80.77
95% Approximate Gamma UCL	51.14		
95% Adjusted Gamma UCL	51.92		
Potential UCL to Use		Use 95% Student's-t UCL	51.19
		or 95% Modified-t UCL	51.46

Result or 1/2 SDL (titanium)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	19.1	Minimum of Log Data	2.95
Maximum	36.6	Maximum of Log Data	3.6
Mean	25.58	Mean of log Data	3.225
Median	23.95	SD of log Data	0.186
SD	5.051		
Coefficient of Variation	0.198		
Skewness	1.084		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27.79	95% H-UCL	27.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.76
95% Adjusted-CLT UCL	28.02	97.5% Chebyshev (MVUE) UCL	33
95% Modified-t UCL	27.85	99% Chebyshev (MVUE) UCL	37.42

Gamma Distribution Test	Data Distribution

k star (bias corrected)	24.34	Data appear Normal at 5% Significance Level	
Theta Star	1.051		
nu star	778.8		
Approximate Chi Square Value (.05)	715.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	27.65
Adjusted Chi Square Value	708.1	95% Jackknife UCL	27.79
		95% Standard Bootstrap UCL	27.65
Anderson-Darling Test Statistic	0.584	95% Bootstrap-t UCL	28.45
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	28.66
Kolmogorov-Smirnov Test Statistic	0.202	95% Percentile Bootstrap UCL	27.66
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	27.93
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.08
		97.5% Chebyshev(Mean, Sd) UCL	33.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	38.14
95% Approximate Gamma UCL	27.86		
95% Adjusted Gamma UCL	28.13		
Potential UCL to Use		Use 95% Student's-t UCL	27.79

Result or 1/2 SDL (toluene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	4.4500E-4	Minimum of Log Data	-7.717
Maximum	0.0058	Maximum of Log Data	-5.148
Mean	0.0014	Mean of log Data	-6.833
Median	8.6250E-4	SD of log Data	0.733
SD	0.0013		
Coefficient of Variation	0.937		
Skewness	2.533		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.679	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0020	95% H-UCL	0.0021
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0025
95% Adjusted-CLT UCL	0.0022	97.5% Chebyshev (MVUE) UCL	0.0030
95% Modified-t UCL	0.0020	99% Chebyshev (MVUE) UCL	0.0040
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.593	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	8.9869E-4		
nu star	50.99		
Approximate Chi Square Value (.05)	35.59	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0019

Adjusted Chi Square Value	34.13	95% Jackknife UCL	0.0020
		95% Standard Bootstrap UCL	0.0019
Anderson-Darling Test Statistic	0.909	95% Bootstrap-t UCL	0.0025
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	0.0041
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	0.0019
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.0022
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0028
		97.5% Chebyshev(Mean, Sd) UCL	0.0035
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0047
95% Approximate Gamma UCL	0.0020		
95% Adjusted Gamma UCL	0.0021		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0020

Result or 1/2 SDL (vanadium)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics		Log-transformed Statistics	
Minimum	9.06	Minimum of Log Data	2.204
Maximum	21.2	Maximum of Log Data	3.054
Mean	13.86	Mean of log Data	2.599
Median	13.45	SD of log Data	0.251
SD	3.523		
Coefficient of Variation	0.254		
Skewness	0.54		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.4	95% H-UCL	15.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.67
95% Adjusted-CLT UCL	15.44	97.5% Chebyshev (MVUE) UCL	19.32
95% Modified-t UCL	15.42	99% Chebyshev (MVUE) UCL	22.56
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.89	Data appear Normal at 5% Significance Level	
Theta Star	0.998		
nu star	444.4		
Approximate Chi Square Value (.05)	396.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	15.31
Adjusted Chi Square Value	391.4	95% Jackknife UCL	15.4
		95% Standard Bootstrap UCL	15.26
Anderson-Darling Test Statistic	0.338	95% Bootstrap-t UCL	15.59
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	15.42
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	15.34

Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	15.42
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.7
		97.5% Chebyshev(Mean, Sd) UCL	19.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.62
95% Approximate Gamma UCL	15.53		
95% Adjusted Gamma UCL	15.74		
Potential UCL to Use		Use 95% Student's-t UCL	15.4

Result or 1/2 SDL (zinc)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15

Raw Statistics		Log-transformed Statistics	
Minimum	18	Minimum of Log Data	2.89
Maximum	92.6	Maximum of Log Data	4.528
Mean	45.36	Mean of log Data	3.722
Median	43.6	SD of log Data	0.454
SD	19.88		
Coefficient of Variation	0.438		
Skewness	0.681		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.07	95% H-UCL	57.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	68.57
95% Adjusted-CLT UCL	54.44	97.5% Chebyshev (MVUE) UCL	78.56
95% Modified-t UCL	54.21	99% Chebyshev (MVUE) UCL	98.18
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.539	Data appear Normal at 5% Significance Level	
Theta Star	9.992		
nu star	145.3		
Approximate Chi Square Value (.05)	118.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	53.53
Adjusted Chi Square Value	115.7	95% Jackknife UCL	54.07
		95% Standard Bootstrap UCL	53.04
Anderson-Darling Test Statistic	0.399	95% Bootstrap-t UCL	55.53
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	55.68
Kolmogorov-Smirnov Test Statistic	0.163	95% Percentile Bootstrap UCL	53.4
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	54.04
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	67.02
		97.5% Chebyshev(Mean, Sd) UCL	76.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	94.81
95% Approximate Gamma UCL	55.64		

95% Adjusted Gamma UCL	56.97		
Potential UCL to Use		Use 95% Student's-t UCL	54.07

APPENDIX A-7

BACKGROUND SEDIMENT INTRACOASTAL WATERWAY

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\ISWE data - JUST BACKGROUN
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (1,2,4-trimethylbenzene)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	1.6000E-4	Minimum of Log Data	-8.74
Maximum	0.0039	Maximum of Log Data	-5.544
Mean	9.1039E-4	Mean of log Data	-7.594
Median	3.6200E-4	SD of log Data	1.097
SD	0.0012		
Coefficient of Variation	1.33		
Skewness	2.32		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.677	Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0016	95% H-UCL	0.0036
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0022
95% Adjusted-CLT UCL	0.0019	97.5% Chebyshev (MVUE) UCL	0.0028
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	0.004

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.725	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0012		
nu star	13.06		
Approximate Chi Square Value (.05)	5.932	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0015
Adjusted Chi Square Value	4.957	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0015
Anderson-Darling Test Statistic	0.564	95% Bootstrap-t UCL	0.0033
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.0043
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	0.0015
Kolmogorov-Smirnov 5% Critical Value	0.287	95% BCA Bootstrap UCL	0.0018
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0026
		97.5% Chebyshev(Mean, Sd) UCL	0.0034
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0049
95% Approximate Gamma UCL	0.002		
95% Adjusted Gamma UCL	0.0024		

Potential UCL to Use		Use 95% Approximate Gamma UCL	0.002

Result or 1/2 SDL (1,4-dichlorobenzene)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	3.4050E-4	Minimum of Log Data	-7.985
Maximum	0.0041	Maximum of Log Data	-5.494
Mean	0.0014	Mean of log Data	-6.917
Median	7.7000E-4	SD of log Data	0.947
SD	0.0013		
Coefficient of Variation	0.936		
Skewness	1.198		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0023	95% H-UCL	0.0045
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0035
95% Adjusted-CLT UCL	0.0024	97.5% Chebyshev (MVUE) UCL	0.0044
95% Modified-t UCL	0.0023	99% Chebyshev (MVUE) UCL	0.0061
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.015	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0014		
nu star	18.26		
Approximate Chi Square Value (.05)	9.58	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0022
Adjusted Chi Square Value	8.288	95% Jackknife UCL	0.0023
		95% Standard Bootstrap UCL	0.0021
Anderson-Darling Test Statistic	0.467	95% Bootstrap-t UCL	0.0031
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	0.0030
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	0.0022
Kolmogorov-Smirnov 5% Critical Value	0.285	95% BCA Bootstrap UCL	0.0023
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0034
		97.5% Chebyshev(Mean, Sd) UCL	0.0043
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0060
95% Approximate Gamma UCL	0.0028		
95% Adjusted Gamma UCL	0.0032		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0028

Result or 1/2 SDL (2-butanone)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	2.5250E-4	Minimum of Log Data	-8.284
Maximum	0.0024	Maximum of Log Data	-6.02
Mean	0.0011	Mean of log Data	-7.04
Median	0.0011	SD of log Data	0.879
SD	8.4810E-4		
Coefficient of Variation	0.718		
Skewness	0.348		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.9
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0017	95% H-UCL	0.0033
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0028
95% Adjusted-CLT UCL	0.0016	97.5% Chebyshev (MVUE) UCL	0.0035
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	0.0048

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.288	**Data appear Normal at 5% Significance Level**	
Theta Star	9.1690E-4		
nu star	23.19		
Approximate Chi Square Value (.05)	13.23	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0016
Adjusted Chi Square Value	11.68	95% Jackknife UCL	0.0017
		95% Standard Bootstrap UCL	0.0016
Anderson-Darling Test Statistic	0.402	95% Bootstrap-t UCL	0.0017
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.0015
Kolmogorov-Smirnov Test Statistic	0.179	95% Percentile Bootstrap UCL	0.0016
Kolmogorov-Smirnov 5% Critical Value	0.283	95% BCA Bootstrap UCL	0.0016
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0024
		97.5% Chebyshev(Mean, Sd) UCL	0.0029
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0039
95% Approximate Gamma UCL	0.0020		
95% Adjusted Gamma UCL	0.0023		
Potential UCL to Use		Use 95% Student's-t UCL	0.0017

Result for 1/2 SDL (4,4'-ddt)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	9.1500E-5	Minimum of Log Data	-9.299

Maximum	5.7000E-4	Maximum of Log Data	-7.47
Mean	1.5550E-4	Mean of log Data	-8.988
Median	1.0450E-4	SD of log Data	0.576
SD	1.5569E-4		
Coefficient of Variation	1.001		
Skewness	2.981		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.443	Shapiro Wilk Test Statistic	0.531
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.5201E-4	95% H-UCL	2.4166E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.6745E-4
95% Adjusted-CLT UCL	2.9597E-4	97.5% Chebyshev (MVUE) UCL	3.2068E-4
95% Modified-t UCL	2.6060E-4	99% Chebyshev (MVUE) UCL	4.2525E-4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.697	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.1636E-5		
nu star	30.54		
Approximate Chi Square Value (.05)	18.92	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	2.4086E-4
Adjusted Chi Square Value	17.02	95% Jackknife UCL	2.5201E-4
		95% Standard Bootstrap UCL	2.3684E-4
Anderson-Darling Test Statistic	2.237	95% Bootstrap-t UCL	0.0012
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	9.1506E-4
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	2.5644E-4
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	2.6300E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.8172E-4
		97.5% Chebyshev(Mean, Sd) UCL	4.7960E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.7188E-4
95% Approximate Gamma UCL	2.5102E-4		
95% Adjusted Gamma UCL	2.7908E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.8172E-4

Result or 1/2 SDL (aluminum)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	4730	Minimum of Log Data	8.462
Maximum	21800	Maximum of Log Data	9.99
Mean	12213	Mean of log Data	9.255
Median	10800	SD of log Data	0.604
SD	6892		
Coefficient of Variation	0.564		

Skewness	0.403		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16486	95% H-UCL	21311
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23251
95% Adjusted-CLT UCL	16322	97.5% Chebyshev (MVUE) UCL	28003
95% Modified-t UCL	16537	99% Chebyshev (MVUE) UCL	37338
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.326	Data appear Normal at 5% Significance Level	
Theta Star	5252		
nu star	41.86		
Approximate Chi Square Value (.05)	28.03	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	15992
Adjusted Chi Square Value	25.67	95% Jackknife UCL	16486
		95% Standard Bootstrap UCL	15701
Anderson-Darling Test Statistic	0.414	95% Bootstrap-t UCL	16891
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	15366
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	15822
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	16030
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22228
		97.5% Chebyshev(Mean, Sd) UCL	26561
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	35073
95% Approximate Gamma UCL	18240		
95% Adjusted Gamma UCL	19920		
Potential UCL to Use		Use 95% Student's-t UCL	16486

Result or 1/2 SDL (antimony)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.68	Minimum of Log Data	0.519
Maximum	7.33	Maximum of Log Data	1.992
Mean	4.023	Mean of log Data	1.251
Median	2.83	SD of log Data	0.568
SD	2.215		
Coefficient of Variation	0.55		
Skewness	0.488		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.897

Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.396	95% H-UCL	6.669
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.407
95% Adjusted-CLT UCL	5.366	97.5% Chebyshev (MVUE) UCL	8.87
95% Modified-t UCL	5.416	99% Chebyshev (MVUE) UCL	11.74
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.544	Data appear Normal at 5% Significance Level	
Theta Star	1.581		
nu star	45.79		
Approximate Chi Square Value (.05)	31.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	5.238
Adjusted Chi Square Value	28.76	95% Jackknife UCL	5.396
		95% Standard Bootstrap UCL	5.174
Anderson-Darling Test Statistic	0.505	95% Bootstrap-t UCL	5.62
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	5.015
Kolmogorov-Smirnov Test Statistic	0.233	95% Percentile Bootstrap UCL	5.182
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	5.207
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.241
		97.5% Chebyshev(Mean, Sd) UCL	8.634
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.37
95% Approximate Gamma UCL	5.892		
95% Adjusted Gamma UCL	6.407		
Potential UCL to Use		Use 95% Student's-t UCL	5.396

Result or 1/2 SDL (arsenic)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	2.36	Minimum of Log Data	0.859
Maximum	9.62	Maximum of Log Data	2.264
Mean	5.813	Mean of log Data	1.623
Median	4.63	SD of log Data	0.566
SD	3.107		
Coefficient of Variation	0.534		
Skewness	0.351		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.739	95% H-UCL	9.637

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.71
95% Adjusted-CLT UCL	7.646	97.5% Chebyshev (MVUE) UCL	12.83
95% Modified-t UCL	7.759	99% Chebyshev (MVUE) UCL	16.97
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.603	Data appear Normal at 5% Significance Level	
Theta Star	2.233		
nu star	46.86		
Approximate Chi Square Value (.05)	32.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	7.517
Adjusted Chi Square Value	29.61	95% Jackknife UCL	7.739
		95% Standard Bootstrap UCL	7.435
Anderson-Darling Test Statistic	0.558	95% Bootstrap-t UCL	8.086
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	7.147
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	7.476
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	7.543
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.33
		97.5% Chebyshev(Mean, Sd) UCL	12.28
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.12
95% Approximate Gamma UCL	8.473		
95% Adjusted Gamma UCL	9.202		
Potential UCL to Use		Use 95% Student's-t UCL	7.739

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	111	Minimum of Log Data	4.71
Maximum	280	Maximum of Log Data	5.635
Mean	209.7	Mean of log Data	5.318
Median	201	SD of log Data	0.263
SD	47.73		
Coefficient of Variation	0.228		
Skewness	-0.775		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	239.2	95% H-UCL	253.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	291.1
95% Adjusted-CLT UCL	231.4	97.5% Chebyshev (MVUE) UCL	326
95% Modified-t UCL	238.6	99% Chebyshev (MVUE) UCL	394.7
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	12.22	Data appear Normal at 5% Significance Level	
Theta Star	17.15		
nu star	220		
Approximate Chi Square Value (.05)	186.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	235.8
Adjusted Chi Square Value	180.2	95% Jackknife UCL	239.2
		95% Standard Bootstrap UCL	233.9
Anderson-Darling Test Statistic	0.517	95% Bootstrap-t UCL	234.2
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	233.5
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	233
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	230.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	279
		97.5% Chebyshev(Mean, Sd) UCL	309
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	368
95% Approximate Gamma UCL	247.1		
95% Adjusted Gamma UCL	256		
Potential UCL to Use		Use 95% Student's-t UCL	239.2

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.394
Maximum	0.0369	Maximum of Log Data	-3.3
Mean	0.0087	Mean of log Data	-5.045
Median	0.0054	SD of log Data	0.66
SD	0.0106		
Coefficient of Variation	1.213		
Skewness	2.99		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.429	Shapiro Wilk Test Statistic	0.512
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0153	95% H-UCL	0.0146
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0154
95% Adjusted-CLT UCL	0.0183	97.5% Chebyshev (MVUE) UCL	0.0187
95% Modified-t UCL	0.0159	99% Chebyshev (MVUE) UCL	0.0252
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.273	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0068		
nu star	22.92		
Approximate Chi Square Value (.05)	13.03	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0145

Adjusted Chi Square Value	11.49	95% Jackknife UCL	0.0153
		95% Standard Bootstrap UCL	0.0141
Anderson-Darling Test Statistic	2.375	95% Bootstrap-t UCL	0.111
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.0773
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	0.0157
Kolmogorov-Smirnov 5% Critical Value	0.283	95% BCA Bootstrap UCL	0.016
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0241
		97.5% Chebyshev(Mean, Sd) UCL	0.0307
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0438
95% Approximate Gamma UCL	0.0153		
95% Adjusted Gamma UCL	0.0174		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0241

Result or 1/2 SDL (beryllium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	1.32	Maximum of Log Data	0.278
Mean	0.766	Mean of log Data	-0.403
Median	0.69	SD of log Data	0.566
SD	0.403		
Coefficient of Variation	0.527		
Skewness	0.315		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.016	95% H-UCL	1.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.412
95% Adjusted-CLT UCL	1.002	97.5% Chebyshev (MVUE) UCL	1.69
95% Modified-t UCL	1.018	99% Chebyshev (MVUE) UCL	2.237
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.633	Data appear Normal at 5% Significance Level	
Theta Star	0.291		
nu star	47.4		
Approximate Chi Square Value (.05)	32.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.987
Adjusted Chi Square Value	30.03	95% Jackknife UCL	1.016
		95% Standard Bootstrap UCL	0.976
Anderson-Darling Test Statistic	0.424	95% Bootstrap-t UCL	1.035
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	0.942
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	0.979

Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	0.992
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.351
		97.5% Chebyshev(Mean, Sd) UCL	1.605
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.103
95% Approximate Gamma UCL	1.113		
95% Adjusted Gamma UCL	1.208		
Potential UCL to Use		Use 95% Student's-t UCL	1.016

Result or 1/2 SDL (boron)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	13.3	Minimum of Log Data	2.588
Maximum	47.9	Maximum of Log Data	3.869
Mean	27.64	Mean of log Data	3.222
Median	26	SD of log Data	0.472
SD	12.82		
Coefficient of Variation	0.464		
Skewness	0.532		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.59	95% H-UCL	40.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.85
95% Adjusted-CLT UCL	35.48	97.5% Chebyshev (MVUE) UCL	55.15
95% Modified-t UCL	35.71	99% Chebyshev (MVUE) UCL	71.47
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.598	Data appear Normal at 5% Significance Level	
Theta Star	7.684		
nu star	64.76		
Approximate Chi Square Value (.05)	47.24	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	34.67
Adjusted Chi Square Value	44.1	95% Jackknife UCL	35.59
		95% Standard Bootstrap UCL	34.22
Anderson-Darling Test Statistic	0.301	95% Bootstrap-t UCL	37.24
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	35.13
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	34.61
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	34.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.26
		97.5% Chebyshev(Mean, Sd) UCL	54.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	70.15
95% Approximate Gamma UCL	37.89		

95% Adjusted Gamma UCL	40.59		
Potential UCL to Use		Use 95% Student's-t UCL	35.59

Result or 1/2 SDL (carbon disulfide)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	8.8000E-5	Minimum of Log Data	-9.338
Maximum	0.0084	Maximum of Log Data	-4.778
Mean	0.0015	Mean of log Data	-7.728
Median	4.0500E-4	SD of log Data	1.636
SD	0.0027		
Coefficient of Variation	1.789		
Skewness	2.348		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.612	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0032	95% H-UCL	0.0283
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0044
95% Adjusted-CLT UCL	0.0038	97.5% Chebyshev (MVUE) UCL	0.0058
95% Modified-t UCL	0.0034	99% Chebyshev (MVUE) UCL	0.0084
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.41	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0037		
nu star	7.375		
Approximate Chi Square Value (.05)	2.378	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0030
Adjusted Chi Square Value	1.825	95% Jackknife UCL	0.0032
		95% Standard Bootstrap UCL	0.0030
Anderson-Darling Test Statistic	0.768	95% Bootstrap-t UCL	0.0153
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	0.0118
Kolmogorov-Smirnov Test Statistic	0.256	95% Percentile Bootstrap UCL	0.0031
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	0.0039
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0055
		97.5% Chebyshev(Mean, Sd) UCL	0.0073
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0108
95% Approximate Gamma UCL	0.0048		
95% Adjusted Gamma UCL	0.0062		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0048

Result or 1/2 SDL (chromium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.81	Minimum of Log Data	1.76
Maximum	22.5	Maximum of Log Data	3.114
Mean	12.81	Mean of log Data	2.43
Median	11.1	SD of log Data	0.527
SD	6.512		
Coefficient of Variation	0.508		
Skewness	0.444		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16.85	95% H-UCL	20.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.82
95% Adjusted-CLT UCL	16.73	97.5% Chebyshev (MVUE) UCL	27.14
95% Modified-t UCL	16.9	99% Chebyshev (MVUE) UCL	35.62
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.941	Data appear Normal at 5% Significance Level	
Theta Star	4.356		
nu star	52.95		
Approximate Chi Square Value (.05)	37.23	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	16.38
Adjusted Chi Square Value	34.47	95% Jackknife UCL	16.85
		95% Standard Bootstrap UCL	16.18
Anderson-Darling Test Statistic	0.391	95% Bootstrap-t UCL	17.33
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	15.96
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	16.21
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	16.55
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.28
		97.5% Chebyshev(Mean, Sd) UCL	26.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	34.41
95% Approximate Gamma UCL	18.22		
95% Adjusted Gamma UCL	19.68		
Potential UCL to Use		Use 95% Student's-t UCL	16.85

Result or 1/2 SDL (cis-1,2-dichloroethene)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	1.0200E-4	Minimum of Log Data	-9.191
Maximum	0.0284	Maximum of Log Data	-3.561
Mean	0.0034	Mean of log Data	-7.775
Median	2.3050E-4	SD of log Data	1.763
SD	0.0093		
Coefficient of Variation	2.706		
Skewness	2.995		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.415	Shapiro Wilk Test Statistic	0.777
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0092	95% H-UCL	0.0514
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0052
95% Adjusted-CLT UCL	0.0119	97.5% Chebyshev (MVUE) UCL	0.0068
95% Modified-t UCL	0.0097	99% Chebyshev (MVUE) UCL	0.01
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.29	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0119		
nu star	5.211		
Approximate Chi Square Value (.05)	1.251	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0085
Adjusted Chi Square Value	0.892	95% Jackknife UCL	0.0092
		95% Standard Bootstrap UCL	0.0083
Anderson-Darling Test Statistic	1.687	95% Bootstrap-t UCL	0.189
Anderson-Darling 5% Critical Value	0.803	95% Hall's Bootstrap UCL	0.106
Kolmogorov-Smirnov Test Statistic	0.384	95% Percentile Bootstrap UCL	0.0096
Kolmogorov-Smirnov 5% Critical Value	0.301	95% BCA Bootstrap UCL	0.0128
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0171
		97.5% Chebyshev(Mean, Sd) UCL	0.0229
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0345
95% Approximate Gamma UCL	0.0144		
95% Adjusted Gamma UCL	0.0202		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0345
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (cobalt)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	3.32	Minimum of Log Data	1.2
Maximum	11.8	Maximum of Log Data	2.468
Mean	6.698	Mean of log Data	1.8

Median	5.92	SD of log Data	0.481
SD	3.165		
Coefficient of Variation	0.473		
Skewness	0.508		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.66	95% H-UCL	9.999
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.45
95% Adjusted-CLT UCL	8.624	97.5% Chebyshev (MVUE) UCL	13.5
95% Modified-t UCL	8.69	99% Chebyshev (MVUE) UCL	17.53
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.458	Data appear Normal at 5% Significance Level	
Theta Star	1.937		
nu star	62.24		
Approximate Chi Square Value (.05)	45.09	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	8.433
Adjusted Chi Square Value	42.03	95% Jackknife UCL	8.66
		95% Standard Bootstrap UCL	8.395
Anderson-Darling Test Statistic	0.361	95% Bootstrap-t UCL	9.077
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	8.427
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	8.376
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	8.624
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.3
		97.5% Chebyshev(Mean, Sd) UCL	13.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.2
95% Approximate Gamma UCL	9.245		
95% Adjusted Gamma UCL	9.918		
Potential UCL to Use		Use 95% Student's-t UCL	8.66

Result or 1/2 SDL (copper)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	2.68	Minimum of Log Data	0.986
Maximum	16.8	Maximum of Log Data	2.821
Mean	8.138	Mean of log Data	1.902
Median	6.87	SD of log Data	0.676
SD	5.165		
Coefficient of Variation	0.635		
Skewness	0.626		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.34	95% H-UCL	15.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.4
95% Adjusted-CLT UCL	11.35	97.5% Chebyshev (MVUE) UCL	19.95
95% Modified-t UCL	11.4	99% Chebyshev (MVUE) UCL	26.94
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.895	Data appear Normal at 5% Significance Level	
Theta Star	4.294		
nu star	34.11		
Approximate Chi Square Value (.05)	21.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	10.97
Adjusted Chi Square Value	19.7	95% Jackknife UCL	11.34
		95% Standard Bootstrap UCL	10.88
Anderson-Darling Test Statistic	0.31	95% Bootstrap-t UCL	12.32
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	11.26
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	10.93
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	11.27
ata appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.64
		97.5% Chebyshev(Mean, Sd) UCL	18.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.27
95% Approximate Gamma UCL	12.76		
95% Adjusted Gamma UCL	14.09		
Potential UCL to Use		Use 95% Student's-t UCL	11.34

Result or 1/2 SDL (iron)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	7440	Minimum of Log Data	8.915
Maximum	27900	Maximum of Log Data	10.24
Mean	16496	Mean of log Data	9.596
Median	15000	SD of log Data	0.518
SD	8097		
Coefficient of Variation	0.491		
Skewness	0.325		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21515	95% H-UCL	25764
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	29179
95% Adjusted-CLT UCL	21247	97.5% Chebyshev (MVUE) UCL	34648
95% Modified-t UCL	21563	99% Chebyshev (MVUE) UCL	45392
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.072	Data appear Normal at 5% Significance Level	
Theta Star	5370		
nu star	55.3		
Approximate Chi Square Value (.05)	39.21	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	20935
Adjusted Chi Square Value	36.37	95% Jackknife UCL	21515
		95% Standard Bootstrap UCL	20682
Anderson-Darling Test Statistic	0.415	95% Bootstrap-t UCL	22181
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	20333
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	20913
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	21189
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28260
		97.5% Chebyshev(Mean, Sd) UCL	33351
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43351
95% Approximate Gamma UCL	23264		
95% Adjusted Gamma UCL	25080		
Potential UCL to Use		Use 95% Student's-t UCL	21515

Result or 1/2 SDL (lead)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.34	Minimum of Log Data	1.675
Maximum	14.5	Maximum of Log Data	2.674
Mean	9.587	Mean of log Data	2.194
Median	9.2	SD of log Data	0.393
SD	3.603		
Coefficient of Variation	0.376		
Skewness	0.161		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.82	95% H-UCL	13.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.14
95% Adjusted-CLT UCL	11.63	97.5% Chebyshev (MVUE) UCL	17.53

95% Modified-t UCL	11.83	99% Chebyshev (MVUE) UCL	22.23
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.179	Data appear Normal at 5% Significance Level	
Theta Star	1.851		
nu star	93.21		
Approximate Chi Square Value (.05)	71.95	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	11.56
Adjusted Chi Square Value	68.02	95% Jackknife UCL	11.82
		95% Standard Bootstrap UCL	11.48
Anderson-Darling Test Statistic	0.417	95% Bootstrap-t UCL	12.11
Anderson-Darling 5% Critical Value	0.722	95% Hall's Bootstrap UCL	11.28
Kolmogorov-Smirnov Test Statistic	0.182	95% Percentile Bootstrap UCL	11.45
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	11.54
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.82
		97.5% Chebyshev(Mean, Sd) UCL	17.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.54
95% Approximate Gamma UCL	12.42		
95% Adjusted Gamma UCL	13.14		
Potential UCL to Use		Use 95% Student's-t UCL	11.82

Result or 1/2 SDL (lithium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	7.29	Minimum of Log Data	1.987
Maximum	44.6	Maximum of Log Data	3.798
Mean	21.4	Mean of log Data	2.852
Median	17.1	SD of log Data	0.697
SD	14.41		
Coefficient of Variation	0.673		
Skewness	0.724		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.868	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30.33	95% H-UCL	42.41
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43.59
95% Adjusted-CLT UCL	30.54	97.5% Chebyshev (MVUE) UCL	53.19
95% Modified-t UCL	30.52	99% Chebyshev (MVUE) UCL	72.04
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.757	Data appear Normal at 5% Significance Level	
Theta Star	12.18		

nu star	31.63		
Approximate Chi Square Value (.05)	19.78	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	29.3
Adjusted Chi Square Value	17.83	95% Jackknife UCL	30.33
		95% Standard Bootstrap UCL	28.98
Anderson-Darling Test Statistic	0.391	95% Bootstrap-t UCL	32.35
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	30.14
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	29.69
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	30.27
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	42.33
		97.5% Chebyshev(Mean, Sd) UCL	51.39
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	69.18
95% Approximate Gamma UCL	34.22		
95% Adjusted Gamma UCL	37.96		
Potential UCL to Use		Use 95% Student's-t UCL	30.33

Result or 1/2 SDL (manganese)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	212	Minimum of Log Data	5.357
Maximum	442	Maximum of Log Data	6.091
Mean	330.7	Mean of log Data	5.767
Median	321	SD of log Data	0.284
SD	88.99		
Coefficient of Variation	0.269		
Skewness	-0.147		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.899
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	385.8	95% H-UCL	406.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	468.4
95% Adjusted-CLT UCL	377.9	97.5% Chebyshev (MVUE) UCL	527.8
95% Modified-t UCL	385.6	99% Chebyshev (MVUE) UCL	644.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.817	Data appear Normal at 5% Significance Level	
Theta Star	33.68		
nu star	176.7		
Approximate Chi Square Value (.05)	147	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	379.5
Adjusted Chi Square Value	141.2	95% Jackknife UCL	385.8
		95% Standard Bootstrap UCL	376.9

Anderson-Darling Test Statistic	0.414	95% Bootstrap-t UCL	383.3
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	371.3
Kolmogorov-Smirnov Test Statistic	0.197	95% Percentile Bootstrap UCL	379.1
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	377.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	460
		97.5% Chebyshev(Mean, Sd) UCL	515.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	625.8
95% Approximate Gamma UCL	397.6		
95% Adjusted Gamma UCL	413.7		
Potential UCL to Use		Use 95% Student's-t UCL	385.8

Result or 1/2 SDL (mercury)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	0.05	Maximum of Log Data	-2.996
Mean	0.0176	Mean of log Data	-4.227
Median	0.016	SD of log Data	0.613
SD	0.0132		
Coefficient of Variation	0.753		
Skewness	2.163		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0258	95% H-UCL	0.0302
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0328
95% Adjusted-CLT UCL	0.0282	97.5% Chebyshev (MVUE) UCL	0.0396
95% Modified-t UCL	0.0263	99% Chebyshev (MVUE) UCL	0.0529
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.962	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0089		
nu star	35.32		
Approximate Chi Square Value (.05)	22.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0248
Adjusted Chi Square Value	20.62	95% Jackknife UCL	0.0258
		95% Standard Bootstrap UCL	0.0244
Anderson-Darling Test Statistic	0.431	95% Bootstrap-t UCL	0.0357
Anderson-Darling 5% Critical Value	0.727	95% Hall's Bootstrap UCL	0.0574
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	0.0249
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	0.0283
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0368

		97.5% Chebyshev(Mean, Sd) UCL	0.0452
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0615
95% Approximate Gamma UCL	0.0273		
95% Adjusted Gamma UCL	0.0301		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0273

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.16	Minimum of Log Data	-1.833
Maximum	0.35	Maximum of Log Data	-1.05
Mean	0.241	Mean of log Data	-1.458
Median	0.24	SD of log Data	0.282
SD	0.0675		
Coefficient of Variation	0.28		
Skewness	0.35		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.283	95% H-UCL	0.296
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.34
95% Adjusted-CLT UCL	0.281	97.5% Chebyshev (MVUE) UCL	0.383
95% Modified-t UCL	0.283	99% Chebyshev (MVUE) UCL	0.468
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.681	Data appear Normal at 5% Significance Level	
Theta Star	0.0249		
nu star	174.3		
Approximate Chi Square Value (.05)	144.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.278
Adjusted Chi Square Value	139	95% Jackknife UCL	0.283
		95% Standard Bootstrap UCL	0.276
Anderson-Darling Test Statistic	0.283	95% Bootstrap-t UCL	0.292
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	0.278
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	0.276
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	0.274
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.339
		97.5% Chebyshev(Mean, Sd) UCL	0.382
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.465
95% Approximate Gamma UCL	0.29		
95% Adjusted Gamma UCL	0.302		

Potential UCL to Use		Use 95% Student's-t UCL	0.283

t or 1/2 SDL (nickel)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	6.31	Minimum of Log Data	1.842
Maximum	27.3	Maximum of Log Data	3.307
Mean	14.91	Mean of log Data	2.562
Median	13	SD of log Data	0.571
SD	8.111		
Coefficient of Variation	0.544		
Skewness	0.452		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.94	95% H-UCL	24.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.58
95% Adjusted-CLT UCL	19.79	97.5% Chebyshev (MVUE) UCL	33.04
95% Modified-t UCL	20.01	99% Chebyshev (MVUE) UCL	43.78
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.55	Data appear Normal at 5% Significance Level	
Theta Star	5.847		
nu star	45.91		
Approximate Chi Square Value (.05)	31.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	19.36
Adjusted Chi Square Value	28.85	95% Jackknife UCL	19.94
		95% Standard Bootstrap UCL	19.01
Anderson-Darling Test Statistic	0.395	95% Bootstrap-t UCL	20.34
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	19.01
Kolmogorov-Smirnov Test Statistic	0.172	95% Percentile Bootstrap UCL	19.16
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	19.24
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.7
		97.5% Chebyshev(Mean, Sd) UCL	31.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.81
95% Approximate Gamma UCL	21.83		
95% Adjusted Gamma UCL	23.73		
Potential UCL to Use		Use 95% Student's-t UCL	19.94

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	34.8	Minimum of Log Data	3.55
Maximum	87.4	Maximum of Log Data	4.47
Mean	59.17	Mean of log Data	4.015
Median	59.3	SD of log Data	0.388
SD	22.06		
Coefficient of Variation	0.373		
Skewness	0.141		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.854	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	72.84	95% H-UCL	80.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.89
95% Adjusted-CLT UCL	71.63	97.5% Chebyshev (MVUE) UCL	107.5
95% Modified-t UCL	72.9	99% Chebyshev (MVUE) UCL	136.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.29	**Data appear Normal at 5% Significance Level**	
Theta Star	11.18		
nu star	95.22		
Approximate Chi Square Value (.05)	73.71	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	71.26
Adjusted Chi Square Value	69.73	95% Jackknife UCL	72.84
		95% Standard Bootstrap UCL	70.57
Anderson-Darling Test Statistic	0.641	95% Bootstrap-t UCL	73.19
Anderson-Darling 5% Critical Value	0.722	95% Hall's Bootstrap UCL	68.52
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	70.6
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	71.02
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.22
		97.5% Chebyshev(Mean, Sd) UCL	105.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	132.3
95% Approximate Gamma UCL	76.43		
95% Adjusted Gamma UCL	80.79		
Potential UCL to Use		Use 95% Student's-t UCL	72.84

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	21.1	Minimum of Log Data	3.049

Maximum	54.5	Maximum of Log Data	3.998
Mean	31.79	Mean of log Data	3.417
Median	28.6	SD of log Data	0.297
SD	10.49		
Coefficient of Variation	0.33		
Skewness	1.471		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	38.29	95% H-UCL	39.38
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	45.43
95% Adjusted-CLT UCL	39.37	97.5% Chebyshev (MVUE) UCL	51.38
95% Modified-t UCL	38.58	99% Chebyshev (MVUE) UCL	63.05
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	8.159	Data appear Normal at 5% Significance Level	
Theta Star	3.896		
nu star	146.9		
Approximate Chi Square Value (.05)	119.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	37.54
Adjusted Chi Square Value	114.7	95% Jackknife UCL	38.29
		95% Standard Bootstrap UCL	37.2
Anderson-Darling Test Statistic	0.42	95% Bootstrap-t UCL	44.39
Anderson-Darling 5% Critical Value	0.722	95% Hall's Bootstrap UCL	71.05
Kolmogorov-Smirnov Test Statistic	0.239	95% Percentile Bootstrap UCL	37.59
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	39.23
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	47.03
		97.5% Chebyshev(Mean, Sd) UCL	53.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	66.58
95% Approximate Gamma UCL	38.95		
95% Adjusted Gamma UCL	40.7		
Potential UCL to Use		Use 95% Student's-t UCL	38.29

Result or 1/2 SDL (trichloroethene)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.4300E-4	Minimum of Log Data	-8.853
Maximum	0.0159	Maximum of Log Data	-4.141
Mean	0.0021	Mean of log Data	-7.537
Median	3.2350E-4	SD of log Data	1.495
SD	0.0051		
Coefficient of Variation	2.351		

Skewness	2.966		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.454	Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0053	95% H-UCL	0.0178
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0043
95% Adjusted-CLT UCL	0.0068	97.5% Chebyshev (MVUE) UCL	0.0055
95% Modified-t UCL	0.0056	99% Chebyshev (MVUE) UCL	0.0081
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.378	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0058		
nu star	6.802		
Approximate Chi Square Value (.05)	2.063	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0050
Adjusted Chi Square Value	1.558	95% Jackknife UCL	0.0053
		95% Standard Bootstrap UCL	0.0047
Anderson-Darling Test Statistic	1.313	95% Bootstrap-t UCL	0.0421
Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	0.0252
Kolmogorov-Smirnov Test Statistic	0.319	95% Percentile Bootstrap UCL	0.0054
Kolmogorov-Smirnov 5% Critical Value	0.296	95% BCA Bootstrap UCL	0.0072
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0096
		97.5% Chebyshev(Mean, Sd) UCL	0.0129
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0193
95% Approximate Gamma UCL	0.0072		
95% Adjusted Gamma UCL	0.0095		
Potential UCL to Use		Use 95% Chebyshev (MVUE) UCL	0.0043

Result or 1/2 SDL (vanadium)

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9

Raw Statistics		Log-transformed Statistics	
Minimum	10.2	Minimum of Log Data	2.322
Maximum	34.2	Maximum of Log Data	3.532
Mean	20.21	Mean of log Data	2.913
Median	19.1	SD of log Data	0.461
SD	9.135		
Coefficient of Variation	0.452		
Skewness	0.468		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk Test Statistic	0.919

Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.87	95% H-UCL	29.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.92
95% Adjusted-CLT UCL	25.73	97.5% Chebyshev (MVUE) UCL	39.86
95% Modified-t UCL	25.95	99% Chebyshev (MVUE) UCL	51.51
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.758	Data appear Normal at 5% Significance Level	
Theta Star	5.378		
nu star	67.64		
Approximate Chi Square Value (.05)	49.71	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	25.22
Adjusted Chi Square Value	46.49	95% Jackknife UCL	25.87
		95% Standard Bootstrap UCL	25
Anderson-Darling Test Statistic	0.366	95% Bootstrap-t UCL	26.93
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	25.05
Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	25.01
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	25.46
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.48
		97.5% Chebyshev(Mean, Sd) UCL	39.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50.51
95% Approximate Gamma UCL	27.5		
95% Adjusted Gamma UCL	29.41		
Potential UCL to Use		Use 95% Student's-t UCL	25.87

Result or 1/2 SDL (xylene (total))

General Statistics

Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	4.6250E-4	Minimum of Log Data	-7.679
Maximum	0.0044	Maximum of Log Data	-5.414
Mean	0.0017	Mean of log Data	-6.668
Median	0.0010	SD of log Data	0.863
SD	0.0014		
Coefficient of Variation	0.818		
Skewness	0.955		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.862	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0026	95% H-UCL	0.0046

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0040
95% Adjusted-CLT UCL	0.0027	97.5% Chebyshev (MVUE) UCL	0.005
95% Modified-t UCL	0.0026	99% Chebyshev (MVUE) UCL	0.0069
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.218	Data appear Normal at 5% Significance Level	
Theta Star	0.0014		
nu star	21.93		
Approximate Chi Square Value (.05)	12.29	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0025
Adjusted Chi Square Value	10.79	95% Jackknife UCL	0.0026
		95% Standard Bootstrap UCL	0.0024
Anderson-Darling Test Statistic	0.43	95% Bootstrap-t UCL	0.0030
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.0027
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	0.0025
Kolmogorov-Smirnov 5% Critical Value	0.283	95% BCA Bootstrap UCL	0.0026
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0038
		97.5% Chebyshev(Mean, Sd) UCL	0.0047
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0064
95% Approximate Gamma UCL	0.0031		
95% Adjusted Gamma UCL	0.0035		
Potential UCL to Use		Use 95% Student's-t UCL	0.0026

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	19.3	Minimum of Log Data	2.96
Maximum	54.1	Maximum of Log Data	3.991
Mean	36.04	Mean of log Data	3.515
Median	34.1	SD of log Data	0.404
SD	13.68		
Coefficient of Variation	0.379		
Skewness	0.0735		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	44.52	95% H-UCL	49.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	57.54
95% Adjusted-CLT UCL	43.66	97.5% Chebyshev (MVUE) UCL	66.8
95% Modified-t UCL	44.54	99% Chebyshev (MVUE) UCL	84.99
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	4.975	Data appear Normal at 5% Significance Level	
Theta Star	7.246		
nu star	89.54		
Approximate Chi Square Value (.05)	68.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	43.54
Adjusted Chi Square Value	64.89	95% Jackknife UCL	44.52
		95% Standard Bootstrap UCL	42.93
Anderson-Darling Test Statistic	0.426	95% Bootstrap-t UCL	44.54
Anderson-Darling 5% Critical Value	0.722	95% Hall's Bootstrap UCL	42.26
Kolmogorov-Smirnov Test Statistic	0.197	95% Percentile Bootstrap UCL	42.99
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	43.54
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	55.91
		97.5% Chebyshev(Mean, Sd) UCL	64.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	81.4
95% Approximate Gamma UCL	46.96		
95% Adjusted Gamma UCL	49.74		
Potential UCL to Use		Use 95% Student's-t UCL	44.52

APPENDIX A-8

NORTH OF MARLIN SEDIMENT

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\Copy of north wetland detections
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (1,2-dichloroethane)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	40

Raw Statistics		Log-transformed Statistics	
Minimum	6.1500E-5	Minimum of Log Data	-9.696
Maximum	0.0024	Maximum of Log Data	-6.032
Mean	2.4915E-4	Mean of log Data	-9.1
Median	7.6250E-5	SD of log Data	0.927
SD	5.4106E-4		
Coefficient of Variation	2.172		
Skewness	3.34		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.373	Shapiro Wilk Test Statistic	0.564
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.8018E-4	95% H-UCL	2.3239E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.8326E-4
95% Adjusted-CLT UCL	4.1783E-4	97.5% Chebyshev (MVUE) UCL	3.3255E-4
95% Modified-t UCL	3.8646E-4	99% Chebyshev (MVUE) UCL	4.2936E-4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.713	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.4927E-4		
nu star	68.48		
Approximate Chi Square Value (.05)	50.43	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	3.7760E-4
Adjusted Chi Square Value	49.95	95% Jackknife UCL	3.8018E-4
		95% Standard Bootstrap UCL	3.7454E-4
Anderson-Darling Test Statistic	11.29	95% Bootstrap-t UCL	4.7307E-4
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	3.6616E-4
Kolmogorov-Smirnov Test Statistic	0.392	95% Percentile Bootstrap UCL	3.8040E-4
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	4.2357E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.8956E-4
		97.5% Chebyshev(Mean, Sd) UCL	7.3685E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0010
95% Approximate Gamma UCL	3.3830E-4		
95% Adjusted Gamma UCL	3.4156E-4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.8956E-4

Result or 1/2 SDL (2-methylnaphthalene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	33

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.46
Maximum	0.43	Maximum of Log Data	-0.844
Mean	0.0246	Mean of log Data	-4.637
Median	0.006	SD of log Data	1.069
SD	0.0639		
Coefficient of Variation	2.595		
Skewness	5.712		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.343	Shapiro Wilk Test Statistic	0.691
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0401	95% H-UCL	0.0249
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0304
95% Adjusted-CLT UCL	0.0479	97.5% Chebyshev (MVUE) UCL	0.0362
95% Modified-t UCL	0.0414	99% Chebyshev (MVUE) UCL	0.0477
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.627	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0392		
nu star	60.23		
Approximate Chi Square Value (.05)	43.38	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0398
Adjusted Chi Square Value	42.94	95% Jackknife UCL	0.0401
		95% Standard Bootstrap UCL	0.0398
Anderson-Darling Test Statistic	8.232	95% Bootstrap-t UCL	0.0684
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	0.0914
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	0.0421
Kolmogorov-Smirnov 5% Critical Value	0.134	95% BCA Bootstrap UCL	0.0572
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0648
		97.5% Chebyshev(Mean, Sd) UCL	0.0822
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.116
95% Approximate Gamma UCL	0.0342		
95% Adjusted Gamma UCL	0.0345		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.116

Result or 1/2 SDL (4,4'-ddt)

General Statistics			
Number of Valid Samples	56	Number of Unique Samples	52

Raw Statistics		Log-transformed Statistics	
Minimum	7.7000E-5	Minimum of Log Data	-9.472
Maximum	0.0092	Maximum of Log Data	-4.686
Mean	9.5155E-4	Mean of log Data	-7.784
Median	3.5500E-4	SD of log Data	1.284
SD	0.0015		
Coefficient of Variation	1.597		
Skewness	3.563		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.287	Lilliefors Test Statistic	0.142
Lilliefors Critical Value	0.118	Lilliefors Critical Value	0.118
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0012	95% H-UCL	0.0014
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0018
95% Adjusted-CLT UCL	0.0013	97.5% Chebyshev (MVUE) UCL	0.0021
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	0.0029
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
nu star	78.45		
Approximate Chi Square Value (.05)	59.05	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0457	95% CLT UCL	0.0012
Adjusted Chi Square Value	58.6	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	2.244	95% Bootstrap-t UCL	0.0015
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	0.0018
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	0.0014
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0018
		97.5% Chebyshev(Mean, Sd) UCL	0.0022
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0029
95% Approximate Gamma UCL	0.0012		
95% Adjusted Gamma UCL	0.0012		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0022

[redacted]or 1/2 SDL (acenaphthene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	34

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.46

Maximum	0.133	Maximum of Log Data	-2.017
Mean	0.0195	Mean of log Data	-4.671
Median	0.0055	SD of log Data	1.034
SD	0.031		
Coefficient of Variation	1.59		
Skewness	2.314		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.546	Shapiro Wilk Test Statistic	0.667
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.027	95% H-UCL	0.0228
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0278
95% Adjusted-CLT UCL	0.0285	97.5% Chebyshev (MVUE) UCL	0.0331
95% Modified-t UCL	0.0273	99% Chebyshev (MVUE) UCL	0.0434
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.771	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0253		
nu star	74.06		
Approximate Chi Square Value (.05)	55.24	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0269
Adjusted Chi Square Value	54.74	95% Jackknife UCL	0.027
		95% Standard Bootstrap UCL	0.0267
Anderson-Darling Test Statistic	8.594	95% Bootstrap-t UCL	0.0293
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	0.0276
Kolmogorov-Smirnov Test Statistic	0.357	95% Percentile Bootstrap UCL	0.0272
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0296
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.039
		97.5% Chebyshev(Mean, Sd) UCL	0.0475
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.064
95% Approximate Gamma UCL	0.0261		
95% Adjusted Gamma UCL	0.0264		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.064

Result or 1/2 SDL (acenaphthylene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.591
Maximum	0.545	Maximum of Log Data	-0.607
Mean	0.0314	Mean of log Data	-4.703
Median	0.0063	SD of log Data	1.137
SD	0.0928		
Coefficient of Variation	2.957		

Skewness	4.65		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.333	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0539	95% H-UCL	0.0261
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0316
95% Adjusted-CLT UCL	0.063	97.5% Chebyshev (MVUE) UCL	0.038
95% Modified-t UCL	0.0554	99% Chebyshev (MVUE) UCL	0.0505
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.492	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0638		
nu star	47.23		
Approximate Chi Square Value (.05)	32.46	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0534
Adjusted Chi Square Value	32.08	95% Jackknife UCL	0.0539
		95% Standard Bootstrap UCL	0.0527
Anderson-Darling Test Statistic	10.36	95% Bootstrap-t UCL	0.117
Anderson-Darling 5% Critical Value	0.813	95% Hall's Bootstrap UCL	0.136
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	0.0551
Kolmogorov-Smirnov 5% Critical Value	0.135	95% BCA Bootstrap UCL	0.0662
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0898
		97.5% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.165
95% Approximate Gamma UCL	0.0457		
95% Adjusted Gamma UCL	0.0462		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.165

Result or 1/2 SDL (aluminum)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	38

Raw Statistics		Log-transformed Statistics	
Minimum	3400	Minimum of Log Data	8.132
Maximum	19200	Maximum of Log Data	9.863
Mean	13229	Mean of log Data	9.454
Median	13650	SD of log Data	0.296
SD	3162		
Coefficient of Variation	0.239		
Skewness	-0.611		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.854

Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13995	95% H-UCL	14384
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15840
95% Adjusted-CLT UCL	13936	97.5% Chebyshev (MVUE) UCL	16931
95% Modified-t UCL	13988	99% Chebyshev (MVUE) UCL	19075
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.16	Data appear Normal at 5% Significance Level	
Theta Star	1005		
nu star	1264		
Approximate Chi Square Value (.05)	1182	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	13980
Adjusted Chi Square Value	1180	95% Jackknife UCL	13995
		95% Standard Bootstrap UCL	13978
Anderson-Darling Test Statistic	0.922	95% Bootstrap-t UCL	13984
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	13975
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	13979
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	13943
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15218
		97.5% Chebyshev(Mean, Sd) UCL	16079
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17770
95% Approximate Gamma UCL	14141		
95% Adjusted Gamma UCL	14170		
Potential UCL to Use		Use 95% Student's-t UCL	13995

Result or 1/2 SDL (anthracene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39

Raw Statistics		Log-transformed Statistics	
Minimum	0.0029	Minimum of Log Data	-5.821
Maximum	0.334	Maximum of Log Data	-1.097
Mean	0.0288	Mean of log Data	-4.661
Median	0.0060	SD of log Data	1.197
SD	0.0678		
Coefficient of Variation	2.358		
Skewness	3.546		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.418	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0452	95% H-UCL	0.0302

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0364
95% Adjusted-CLT UCL	0.0502	97.5% Chebyshev (MVUE) UCL	0.044
95% Modified-t UCL	0.046	99% Chebyshev (MVUE) UCL	0.0589
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.54	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0533		
nu star	51.83		
Approximate Chi Square Value (.05)	36.3	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0448
Adjusted Chi Square Value	35.89	95% Jackknife UCL	0.0452
		95% Standard Bootstrap UCL	0.0446
Anderson-Darling Test Statistic	7.224	95% Bootstrap-t UCL	0.0585
Anderson-Darling 5% Critical Value	0.809	95% Hall's Bootstrap UCL	0.0447
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL	0.0466
Kolmogorov-Smirnov 5% Critical Value	0.135	95% BCA Bootstrap UCL	0.0521
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0714
		97.5% Chebyshev(Mean, Sd) UCL	0.0899
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.126
95% Approximate Gamma UCL	0.0411		
95% Adjusted Gamma UCL	0.0415		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.126

Re[illegible]t or 1/2 SDL (antimony)

General Statistics			
Number of Valid Samples	47	Number of Unique Samples	35
Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	4.24	Maximum of Log Data	1.445
Mean	1.154	Mean of log Data	-0.151
Median	1.14	SD of log Data	0.938
SD	0.724		
Coefficient of Variation	0.627		
Skewness	1.485		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.863	Shapiro Wilk Test Statistic	0.756
Shapiro Wilk Critical Value	0.946	Shapiro Wilk Critical Value	0.946
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.331	95% H-UCL	1.826
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.226
95% Adjusted-CLT UCL	1.352	97.5% Chebyshev (MVUE) UCL	2.619
95% Modified-t UCL	1.335	99% Chebyshev (MVUE) UCL	3.39
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	1.745	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.661		
nu star	164.1		
Approximate Chi Square Value (.05)	135.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0449	95% CLT UCL	1.328
Adjusted Chi Square Value	134.6	95% Jackknife UCL	1.331
		95% Standard Bootstrap UCL	1.329
Anderson-Darling Test Statistic	3.362	95% Bootstrap-t UCL	1.348
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	1.387
Kolmogorov-Smirnov Test Statistic	0.237	95% Percentile Bootstrap UCL	1.331
Kolmogorov-Smirnov 5% Critical Value	0.131	95% BCA Bootstrap UCL	1.357
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.614
		97.5% Chebyshev(Mean, Sd) UCL	1.814
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.205
95% Approximate Gamma UCL	1.398		
95% Adjusted Gamma UCL	1.406		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.614

Result or 1/2 SDL (arsenic)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	47

Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	12.8	Maximum of Log Data	2.549
Mean	2.534	Mean of log Data	0.199
Median	2.19	SD of log Data	1.521
SD	2.465		
Coefficient of Variation	0.973		
Skewness	1.753		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.131	95% H-UCL	7.442
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.391
95% Adjusted-CLT UCL	3.215	97.5% Chebyshev (MVUE) UCL	10.42
95% Modified-t UCL	3.146	99% Chebyshev (MVUE) UCL	14.42
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.774	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	3.273		
nu star	74.32		
Approximate Chi Square Value (.05)	55.47	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	3.119

Adjusted Chi Square Value	54.96	95% Jackknife UCL	3.131
		95% Standard Bootstrap UCL	3.105
Anderson-Darling Test Statistic	1.067	95% Bootstrap-t UCL	3.239
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	3.333
Kolmogorov-Smirnov Test Statistic	0.13	95% Percentile Bootstrap UCL	3.167
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	3.266
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.085
		97.5% Chebyshev(Mean, Sd) UCL	4.756
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.074
95% Approximate Gamma UCL	3.395		
95% Adjusted Gamma UCL	3.427		
Potential UCL to Use		Use 95% Approximate Gamma UCL	3.395

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	46

Raw Statistics		Log-transformed Statistics	
Minimum	36	Minimum of Log Data	3.584
Maximum	820	Maximum of Log Data	6.709
Mean	151.7	Mean of log Data	4.792
Median	102.5	SD of log Data	0.623
SD	136.5		
Coefficient of Variation	0.899		
Skewness	3.09		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.653	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	184.8	95% H-UCL	175.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	207
95% Adjusted-CLT UCL	193.5	97.5% Chebyshev (MVUE) UCL	233.6
95% Modified-t UCL	186.2	99% Chebyshev (MVUE) UCL	285.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.194	Data do not follow a Discernable Distribution (0.05)	
Theta Star	69.14		
nu star	210.7		
Approximate Chi Square Value (.05)	178.1	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	184.1
Adjusted Chi Square Value	177.1	95% Jackknife UCL	184.8
		95% Standard Bootstrap UCL	184
Anderson-Darling Test Statistic	2.597	95% Bootstrap-t UCL	203.2
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	214
Kolmogorov-Smirnov Test Statistic	0.219	95% Percentile Bootstrap UCL	186.1

Kolmogorov-Smirnov 5% Critical Value	0.129	95% BCA Bootstrap UCL	192.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	237.6
		97.5% Chebyshev(Mean, Sd) UCL	274.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	347.7
95% Approximate Gamma UCL	179.5		
95% Adjusted Gamma UCL	180.4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	237.6

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.0025	Minimum of Log Data	-5.98
Maximum	0.993	Maximum of Log Data	-0.00702
Mean	0.0543	Mean of log Data	-4.585
Median	0.0056	SD of log Data	1.428
SD	0.175		
Coefficient of Variation	3.226		
Skewness	4.654		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.325	Shapiro Wilk Test Statistic	0.751
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0967	95% H-UCL	0.0509
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0589
95% Adjusted-CLT UCL	0.114	97.5% Chebyshev (MVUE) UCL	0.0726
95% Modified-t UCL	0.0995	99% Chebyshev (MVUE) UCL	0.0996
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.384	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.141		
nu star	36.84		
Approximate Chi Square Value (.05)	23.95	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0959
Adjusted Chi Square Value	23.62	95% Jackknife UCL	0.0967
		95% Standard Bootstrap UCL	0.095
Anderson-Darling Test Statistic	8.124	95% Bootstrap-t UCL	0.27
Anderson-Darling 5% Critical Value	0.839	95% Hall's Bootstrap UCL	0.288
Kolmogorov-Smirnov Test Statistic	0.375	95% Percentile Bootstrap UCL	0.1
Kolmogorov-Smirnov 5% Critical Value	0.137	95% BCA Bootstrap UCL	0.116
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.164
		97.5% Chebyshev(Mean, Sd) UCL	0.212
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.306
95% Approximate Gamma UCL	0.0835		

95% Adjusted Gamma UCL	0.0847		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.306

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	32

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.447
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.104	Mean of log Data	-4.13
Median	0.0058	SD of log Data	1.695
SD	0.259		
Coefficient of Variation	2.493		
Skewness	3.36		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.455	Shapiro Wilk Test Statistic	0.725
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.167	95% H-UCL	0.148
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.156
95% Adjusted-CLT UCL	0.185	97.5% Chebyshev (MVUE) UCL	0.196
95% Modified-t UCL	0.17	99% Chebyshev (MVUE) UCL	0.275
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.35	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.297		
nu star	33.64		
Approximate Chi Square Value (.05)	21.37	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.165
Adjusted Chi Square Value	21.07	95% Jackknife UCL	0.167
		95% Standard Bootstrap UCL	0.165
Anderson-Darling Test Statistic	7.481	95% Bootstrap-t UCL	0.225
Anderson-Darling 5% Critical Value	0.848	95% Hall's Bootstrap UCL	0.193
Kolmogorov-Smirnov Test Statistic	0.326	95% Percentile Bootstrap UCL	0.168
Kolmogorov-Smirnov 5% Critical Value	0.138	95% BCA Bootstrap UCL	0.197
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.267
		97.5% Chebyshev(Mean, Sd) UCL	0.338
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.476
95% Approximate Gamma UCL	0.164		
95% Adjusted Gamma UCL	0.166		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.476

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	43

Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.581
Maximum	1.36	Maximum of Log Data	0.307
Mean	0.0902	Mean of log Data	-4.019
Median	0.0119	SD of log Data	1.65
SD	0.237		
Coefficient of Variation	2.63		
Skewness	4.175		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.148	95% H-UCL	0.148
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.159
95% Adjusted-CLT UCL	0.169	97.5% Chebyshev (MVUE) UCL	0.2
95% Modified-t UCL	0.151	99% Chebyshev (MVUE) UCL	0.279
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.395	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.228		
nu star	37.94		
Approximate Chi Square Value (.05)	24.84	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.146
Adjusted Chi Square Value	24.51	95% Jackknife UCL	0.148
		95% Standard Bootstrap UCL	0.146
Anderson-Darling Test Statistic	4.515	95% Bootstrap-t UCL	0.261
Anderson-Darling 5% Critical Value	0.836	95% Hall's Bootstrap UCL	0.168
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	0.151
Kolmogorov-Smirnov 5% Critical Value	0.137	95% BCA Bootstrap UCL	0.175
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.239
		97.5% Chebyshev(Mean, Sd) UCL	0.304
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.431
95% Approximate Gamma UCL	0.138		
95% Adjusted Gamma UCL	0.14		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.431

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	38

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.446
Maximum	1.94	Maximum of Log Data	0.663
Mean	0.198	Mean of log Data	-3.047
Median	0.0648	SD of log Data	1.783
SD	0.388		
Coefficient of Variation	1.959		
Skewness	3.146		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.548	Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.292	95% H-UCL	0.546
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.553
95% Adjusted-CLT UCL	0.317	97.5% Chebyshev (MVUE) UCL	0.699
95% Modified-t UCL	0.296	99% Chebyshev (MVUE) UCL	0.986
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.438	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.453		
nu star	42.01		
Approximate Chi Square Value (.05)	28.16	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.29
Adjusted Chi Square Value	27.8	95% Jackknife UCL	0.292
		95% Standard Bootstrap UCL	0.29
Anderson-Darling Test Statistic	1.962	95% Bootstrap-t UCL	0.352
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.364
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	0.296
Kolmogorov-Smirnov 5% Critical Value	0.136	95% BCA Bootstrap UCL	0.325
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.442
		97.5% Chebyshev(Mean, Sd) UCL	0.548
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.755
95% Approximate Gamma UCL	0.296		
95% Adjusted Gamma UCL	0.299		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.755

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	30

Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.73	Maximum of Log Data	-0.315
Mean	0.0659	Mean of log Data	-3.783
Median	0.009	SD of log Data	1.455

SD	0.119		
Coefficient of Variation	1.813		
Skewness	4.12		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.538	Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0948	95% H-UCL	0.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.138
95% Adjusted-CLT UCL	0.105	97.5% Chebyshev (MVUE) UCL	0.171
95% Modified-t UCL	0.0965	99% Chebyshev (MVUE) UCL	0.235
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.561	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.117		
nu star	53.85		
Approximate Chi Square Value (.05)	37.99	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0942
Adjusted Chi Square Value	37.57	95% Jackknife UCL	0.0948
		95% Standard Bootstrap UCL	0.0947
Anderson-Darling Test Statistic	4.058	95% Bootstrap-t UCL	0.121
Anderson-Darling 5% Critical Value	0.807	95% Hall's Bootstrap UCL	0.229
Kolmogorov-Smirnov Test Statistic	0.333	95% Percentile Bootstrap UCL	0.0971
Kolmogorov-Smirnov 5% Critical Value	0.134	95% BCA Bootstrap UCL	0.112
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.141
		97.5% Chebyshev(Mean, Sd) UCL	0.174
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.237
95% Approximate Gamma UCL	0.0934		
95% Adjusted Gamma UCL	0.0944		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.237

Result or 1/2 SDL (beryllium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.28	Minimum of Log Data	-1.273
Maximum	1.37	Maximum of Log Data	0.315
Mean	0.894	Mean of log Data	-0.144
Median	0.93	SD of log Data	0.269
SD	0.206		
Coefficient of Variation	0.23		
Skewness	-0.364		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.983	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.943	95% H-UCL	0.962
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.051
95% Adjusted-CLT UCL	0.941	97.5% Chebyshev (MVUE) UCL	1.118
95% Modified-t UCL	0.943	99% Chebyshev (MVUE) UCL	1.249
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	15.18	Data appear Normal at 5% Significance Level	
Theta Star	0.0589		
nu star	1457		
Approximate Chi Square Value (.05)	1369	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.942
Adjusted Chi Square Value	1367	95% Jackknife UCL	0.943
		95% Standard Bootstrap UCL	0.942
Anderson-Darling Test Statistic	0.763	95% Bootstrap-t UCL	0.939
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	0.939
Kolmogorov-Smirnov Test Statistic	0.149	95% Percentile Bootstrap UCL	0.942
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	0.938
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.023
		97.5% Chebyshev(Mean, Sd) UCL	1.079
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.189
95% Approximate Gamma UCL	0.951		
95% Adjusted Gamma UCL	0.953		
Potential UCL to Use		Use 95% Student's-t UCL	0.943

Result or 1/2 SDL (boron)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	46

Raw Statistics		Log-transformed Statistics	
Minimum	0.58	Minimum of Log Data	-0.545
Maximum	46.2	Maximum of Log Data	3.833
Mean	14.49	Mean of log Data	2.02
Median	11.4	SD of log Data	1.466
SD	12.22		
Coefficient of Variation	0.844		
Skewness	0.839		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.8
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.45	95% H-UCL	40.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.66
95% Adjusted-CLT UCL	17.62	97.5% Chebyshev (MVUE) UCL	57.72
95% Modified-t UCL	17.48	99% Chebyshev (MVUE) UCL	79.44
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.853	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.98		
nu star	81.9		
Approximate Chi Square Value (.05)	62.05	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	17.39
Adjusted Chi Square Value	61.51	95% Jackknife UCL	17.45
		95% Standard Bootstrap UCL	17.3
Anderson-Darling Test Statistic	1.863	95% Bootstrap-t UCL	17.73
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	17.66
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	17.35
Kolmogorov-Smirnov 5% Critical Value	0.132	95% BCA Bootstrap UCL	17.58
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.18
		97.5% Chebyshev(Mean, Sd) UCL	25.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.04
95% Approximate Gamma UCL	19.12		
95% Adjusted Gamma UCL	19.29		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	32.04

Result or 1/2 SDL (cadmium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	35

Raw Statistics		Log-transformed Statistics	
Minimum	0.0029	Minimum of Log Data	-5.843
Maximum	0.48	Maximum of Log Data	-0.734
Mean	0.103	Mean of log Data	-3.439
Median	0.0158	SD of log Data	1.593
SD	0.146		
Coefficient of Variation	1.423		
Skewness	1.467		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.869
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.138	95% H-UCL	0.231
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.254
95% Adjusted-CLT UCL	0.142	97.5% Chebyshev (MVUE) UCL	0.317
95% Modified-t UCL	0.139	99% Chebyshev (MVUE) UCL	0.442

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.52	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.198		
nu star	49.9		
Approximate Chi Square Value (.05)	34.68	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.137
Adjusted Chi Square Value	34.29	95% Jackknife UCL	0.138
		95% Standard Bootstrap UCL	0.139
Anderson-Darling Test Statistic	3.459	95% Bootstrap-t UCL	0.148
Anderson-Darling 5% Critical Value	0.81	95% Hall's Bootstrap UCL	0.144
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL	0.137
Kolmogorov-Smirnov 5% Critical Value	0.135	95% BCA Bootstrap UCL	0.142
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.195
		97.5% Chebyshev(Mean, Sd) UCL	0.235
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.313
95% Approximate Gamma UCL	0.148		
95% Adjusted Gamma UCL	0.15		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.313

Result or 1/2 SDL (carbazole)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	35

Raw Statistics		Log-transformed Statistics	
Minimum	0.0040	Minimum of Log Data	-5.507
Maximum	0.141	Maximum of Log Data	-1.959
Mean	0.0192	Mean of log Data	-4.698
Median	0.0055	SD of log Data	1.042
SD	0.0315		
Coefficient of Variation	1.637		
Skewness	2.515		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.683
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0269	95% H-UCL	0.0225
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0274
95% Adjusted-CLT UCL	0.0285	97.5% Chebyshev (MVUE) UCL	0.0326
95% Modified-t UCL	0.0271	99% Chebyshev (MVUE) UCL	0.0428

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.759	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0253		
nu star	72.88		

Approximate Chi Square Value (.05)	54.22	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0267
Adjusted Chi Square Value	53.72	95% Jackknife UCL	0.0269
		95% Standard Bootstrap UCL	0.0266
Anderson-Darling Test Statistic	8.173	95% Bootstrap-t UCL	0.0305
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	0.0283
Kolmogorov-Smirnov Test Statistic	0.369	95% Percentile Bootstrap UCL	0.0274
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0287
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0391
		97.5% Chebyshev(Mean, Sd) UCL	0.0476
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0645
95% Approximate Gamma UCL	0.0259		
95% Adjusted Gamma UCL	0.0261		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0645

Result or 1/2 SDL (carbon disulfide)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	38

Raw Statistics		Log-transformed Statistics	
Minimum	5.9000E-5	Minimum of Log Data	-9.738
Maximum	0.0069	Maximum of Log Data	-4.963
Mean	5.2498E-4	Mean of log Data	-9.042
Median	7.1500E-5	SD of log Data	1.244
SD	0.0014		
Coefficient of Variation	2.753		
Skewness	3.417		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.369	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.7506E-4	95% H-UCL	4.1104E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.9331E-4
95% Adjusted-CLT UCL	9.7810E-4	97.5% Chebyshev (MVUE) UCL	5.9875E-4
95% Modified-t UCL	8.9220E-4	99% Chebyshev (MVUE) UCL	8.0588E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.422	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0012		
nu star	40.53		
Approximate Chi Square Value (.05)	26.94	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	8.6816E-4
Adjusted Chi Square Value	26.6	95% Jackknife UCL	8.7506E-4
		95% Standard Bootstrap UCL	8.6161E-4
Anderson-Darling Test Statistic	12.67	95% Bootstrap-t UCL	0.0011

Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	8.5064E-4
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	9.0636E-4
Kolmogorov-Smirnov 5% Critical Value	0.136	95% BCA Bootstrap UCL	9.8527E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0014
		97.5% Chebyshev(Mean, Sd) UCL	0.0018
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0026
95% Approximate Gamma UCL	7.8974E-4		
95% Adjusted Gamma UCL	7.9995E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0026

Result or 1/2 SDL (chromium)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	42

Raw Statistics		Log-transformed Statistics	
Minimum	8.96	Minimum of Log Data	2.193
Maximum	44.6	Maximum of Log Data	3.798
Mean	15.07	Mean of log Data	2.667
Median	14.1	SD of log Data	0.286
SD	5.536		
Coefficient of Variation	0.367		
Skewness	3.399		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.716	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.41	95% H-UCL	16.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.73
95% Adjusted-CLT UCL	16.81	97.5% Chebyshev (MVUE) UCL	18.91
95% Modified-t UCL	16.48	99% Chebyshev (MVUE) UCL	21.24
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.44	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.443		
nu star	1003		
Approximate Chi Square Value (.05)	930.2	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	16.39
Adjusted Chi Square Value	928	95% Jackknife UCL	16.41
		95% Standard Bootstrap UCL	16.4
Anderson-Darling Test Statistic	1.41	95% Bootstrap-t UCL	17.14
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	22.68
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	16.47
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	16.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.56
		97.5% Chebyshev(Mean, Sd) UCL	20.06

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.02
95% Approximate Gamma UCL	16.25		
95% Adjusted Gamma UCL	16.29		
Potential UCL to Use		Use 95% Student's-t UCL	16.41
		or 95% Modified-t UCL	16.48

Result or 1/2 SDL (chromium vi)

General Statistics

Number of Valid Samples	25	Number of Unique Samples	25

Raw Statistics		Log-transformed Statistics	
Minimum	0.181	Minimum of Log Data	-1.712
Maximum	4.04	Maximum of Log Data	1.396
Mean	0.956	Mean of log Data	-0.684
Median	0.284	SD of log Data	1.105
SD	1.207		
Coefficient of Variation	1.263		
Skewness	1.817		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.672	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.369	95% H-UCL	1.686
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.894
95% Adjusted-CLT UCL	1.447	97.5% Chebyshev (MVUE) UCL	2.326
95% Modified-t UCL	1.383	99% Chebyshev (MVUE) UCL	3.174
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.831	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.15		
nu star	41.53		
Approximate Chi Square Value (.05)	27.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0395	95% CLT UCL	1.353
Adjusted Chi Square Value	26.99	95% Jackknife UCL	1.369
		95% Standard Bootstrap UCL	1.353
Anderson-Darling Test Statistic	2.142	95% Bootstrap-t UCL	1.559
Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	1.396
Kolmogorov-Smirnov Test Statistic	0.254	95% Percentile Bootstrap UCL	1.33
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	1.459
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.008
		97.5% Chebyshev(Mean, Sd) UCL	2.463
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.358
95% Approximate Gamma UCL	1.43		
95% Adjusted Gamma UCL	1.47		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	3.358

[redacted] or 1/2 SDL (chrysene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39

Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.579
Maximum	4.05	Maximum of Log Data	1.399
Mean	0.217	Mean of log Data	-3.867
Median	0.0077	SD of log Data	1.845
SD	0.715		
Coefficient of Variation	3.295		
Skewness	4.448		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.809
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.39	95% H-UCL	0.284
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.278
95% Adjusted-CLT UCL	0.457	97.5% Chebyshev (MVUE) UCL	0.353
95% Modified-t UCL	0.401	99% Chebyshev (MVUE) UCL	0.499
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.291	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.746		
nu star	27.93		
Approximate Chi Square Value (.05)	16.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.387
Adjusted Chi Square Value	16.61	95% Jackknife UCL	0.39
		95% Standard Bootstrap UCL	0.386
Anderson-Darling Test Statistic	6.798	95% Bootstrap-t UCL	0.914
Anderson-Darling 5% Critical Value	0.864	95% Hall's Bootstrap UCL	1.021
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	0.395
Kolmogorov-Smirnov 5% Critical Value	0.139	95% BCA Bootstrap UCL	0.484
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.667
		97.5% Chebyshev(Mean, Sd) UCL	0.861
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.244
95% Approximate Gamma UCL	0.359		
95% Adjusted Gamma UCL	0.365		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.244

Result or 1/2 SDL (cobalt)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	46

Raw Statistics		Log-transformed Statistics	
Minimum	3	Minimum of Log Data	1.099
Maximum	9.89	Maximum of Log Data	2.292
Mean	6.977	Mean of log Data	1.92
Median	7.29	SD of log Data	0.223
SD	1.408		
Coefficient of Variation	0.202		
Skewness	-0.339		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.973	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.318	95% H-UCL	7.397
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.977
95% Adjusted-CLT UCL	7.3	97.5% Chebyshev (MVUE) UCL	8.405
95% Modified-t UCL	7.316	99% Chebyshev (MVUE) UCL	9.245
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	21.03	Data appear Normal at 5% Significance Level	
Theta Star	0.332		
nu star	2019		
Approximate Chi Square Value (.05)	1915	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	7.311
Adjusted Chi Square Value	1912	95% Jackknife UCL	7.318
		95% Standard Bootstrap UCL	7.303
Anderson-Darling Test Statistic	0.753	95% Bootstrap-t UCL	7.303
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	7.301
Kolmogorov-Smirnov Test Statistic	0.15	95% Percentile Bootstrap UCL	7.294
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	7.295
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.863
		97.5% Chebyshev(Mean, Sd) UCL	8.246
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.999
95% Approximate Gamma UCL	7.353		
95% Adjusted Gamma UCL	7.365		
Potential UCL to Use		Use 95% Student's-t UCL	7.318

Result or 1/2 SDL (copper)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	44

Raw Statistics		Log-transformed Statistics	
Minimum	5.44	Minimum of Log Data	1.694

Maximum	49	Maximum of Log Data	3.892
Mean	14.49	Mean of log Data	2.553
Median	13.15	SD of log Data	0.471
SD	8.49		
Coefficient of Variation	0.586		
Skewness	2.371		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.755	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16.55	95% H-UCL	16.31
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.75
95% Adjusted-CLT UCL	16.96	97.5% Chebyshev (MVUE) UCL	20.66
95% Modified-t UCL	16.62	99% Chebyshev (MVUE) UCL	24.43
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.055	Data appear Lognormal at 5% Significance Level	
Theta Star	3.574		
nu star	389.3		
Approximate Chi Square Value (.05)	344.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	16.51
Adjusted Chi Square Value	343.3	95% Jackknife UCL	16.55
		95% Standard Bootstrap UCL	16.5
Anderson-Darling Test Statistic	1.342	95% Bootstrap-t UCL	17.15
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	17.64
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	16.71
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	17.17
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.83
		97.5% Chebyshev(Mean, Sd) UCL	22.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.68
95% Approximate Gamma UCL	16.37		
95% Adjusted Gamma UCL	16.43		
Potential UCL to Use		Use 95% Student's-t UCL	16.55
		or 95% Modified-t UCL	16.62
		or 95% H-UCL	16.31

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39

Raw Statistics		Log-transformed Statistics	
Minimum	0.0031	Minimum of Log Data	-5.752
Maximum	2.91	Maximum of Log Data	1.068
Mean	0.203	Mean of log Data	-3.828
Median	0.0188	SD of log Data	1.8

SD	0.625		
Coefficient of Variation	3.076		
Skewness	3.829		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.355	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.354	95% H-UCL	0.262
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.263
95% Adjusted-CLT UCL	0.405	97.5% Chebyshev (MVUE) UCL	0.333
95% Modified-t UCL	0.363	99% Chebyshev (MVUE) UCL	0.47
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.302	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.672		
nu star	29.01		
Approximate Chi Square Value (.05)	17.72	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.351
Adjusted Chi Square Value	17.44	95% Jackknife UCL	0.354
		95% Standard Bootstrap UCL	0.356
Anderson-Darling Test Statistic	6.795	95% Bootstrap-t UCL	0.558
Anderson-Darling 5% Critical Value	0.86	95% Hall's Bootstrap UCL	0.358
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	0.371
Kolmogorov-Smirnov 5% Critical Value	0.139	95% BCA Bootstrap UCL	0.421
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.596
		97.5% Chebyshev(Mean, Sd) UCL	0.766
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.1
95% Approximate Gamma UCL	0.333		
95% Adjusted Gamma UCL	0.338		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.1

Result or 1/2 SDL (dibenzofuran)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39

Raw Statistics		Log-transformed Statistics	
Minimum	0.0025	Minimum of Log Data	-5.98
Maximum	0.08	Maximum of Log Data	-2.526
Mean	0.0139	Mean of log Data	-4.779
Median	0.0079	SD of log Data	0.932
SD	0.0176		
Coefficient of Variation	1.267		
Skewness	2.343		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.626	Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0182	95% H-UCL	0.0176
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0215
95% Adjusted-CLT UCL	0.019	97.5% Chebyshev (MVUE) UCL	0.0253
95% Modified-t UCL	0.0183	99% Chebyshev (MVUE) UCL	0.0326
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.075	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0129		
nu star	103.2		
Approximate Chi Square Value (.05)	80.74	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0181
Adjusted Chi Square Value	80.12	95% Jackknife UCL	0.0182
		95% Standard Bootstrap UCL	0.0179
Anderson-Darling Test Statistic	3.619	95% Bootstrap-t UCL	0.0192
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	0.0184
Kolmogorov-Smirnov Test Statistic	0.281	95% Percentile Bootstrap UCL	0.0181
Kolmogorov-Smirnov 5% Critical Value	0.131	95% BCA Bootstrap UCL	0.0191
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.025
		97.5% Chebyshev(Mean, Sd) UCL	0.0298
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0392
95% Approximate Gamma UCL	0.0178		
95% Adjusted Gamma UCL	0.0179		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.025

Result or 1/2 SDL (endosulfan sulfate)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	45

Raw Statistics		Log-transformed Statistics	
Minimum	1.4450E-4	Minimum of Log Data	-8.842
Maximum	0.06	Maximum of Log Data	-2.813
Mean	0.0018	Mean of log Data	-8.104
Median	2.1800E-4	SD of log Data	1.163
SD	0.0087		
Coefficient of Variation	4.664		
Skewness	6.541		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.213	Shapiro Wilk Test Statistic	0.552
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0039	95% H-UCL	9.0895E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0011
95% Adjusted-CLT UCL	0.0052	97.5% Chebyshev (MVUE) UCL	0.0013
95% Modified-t UCL	0.0041	99% Chebyshev (MVUE) UCL	0.0017
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.357	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0052		
nu star	34.27		
Approximate Chi Square Value (.05)	21.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0039
Adjusted Chi Square Value	21.57	95% Jackknife UCL	0.0039
		95% Standard Bootstrap UCL	0.0039
Anderson-Darling Test Statistic	13.04	95% Bootstrap-t UCL	0.0147
Anderson-Darling 5% Critical Value	0.846	95% Hall's Bootstrap UCL	0.0151
Kolmogorov-Smirnov Test Statistic	0.466	95% Percentile Bootstrap UCL	0.0042
Kolmogorov-Smirnov 5% Critical Value	0.138	95% BCA Bootstrap UCL	0.0067
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0073
		97.5% Chebyshev(Mean, Sd) UCL	0.0097
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0144
95% Approximate Gamma UCL	0.0029		
95% Adjusted Gamma UCL	0.0029		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0144

Result or 1/2 SDL (endrin aldehyde)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	46

Raw Statistics		Log-transformed Statistics	
Minimum	1.9700E-4	Minimum of Log Data	-8.532
Maximum	0.01	Maximum of Log Data	-4.605
Mean	0.0010	Mean of log Data	-7.755
Median	2.8000E-4	SD of log Data	1.09
SD	0.0022		
Coefficient of Variation	2.063		
Skewness	3.106		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.449	Shapiro Wilk Test Statistic	0.678
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0016	95% H-UCL	0.0011
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0013
95% Adjusted-CLT UCL	0.0017	97.5% Chebyshev (MVUE) UCL	0.0016
95% Modified-t UCL	0.0016	99% Chebyshev (MVUE) UCL	0.0021

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.626	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	60.13		
Approximate Chi Square Value (.05)	43.3	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0016
Adjusted Chi Square Value	42.86	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0016
Anderson-Darling Test Statistic	8.68	95% Bootstrap-t UCL	0.0019
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	0.0017
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	0.0016
Kolmogorov-Smirnov 5% Critical Value	0.134	95% BCA Bootstrap UCL	0.0017
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0025
		97.5% Chebyshev(Mean, Sd) UCL	0.0031
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0043
95% Approximate Gamma UCL	0.0015		
95% Adjusted Gamma UCL	0.0015		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0043

Result or 1/2 SDL (endrin ketone)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	47

Raw Statistics		Log-transformed Statistics	
Minimum	1.8950E-4	Minimum of Log Data	-8.571
Maximum	0.013	Maximum of Log Data	-4.343
Mean	7.8543E-4	Mean of log Data	-7.945
Median	2.7550E-4	SD of log Data	0.865
SD	0.0020		
Coefficient of Variation	2.622		
Skewness	5.076		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.31	Shapiro Wilk Test Statistic	0.565
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0012	95% H-UCL	6.7884E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.2500E-4
95% Adjusted-CLT UCL	0.0015	97.5% Chebyshev (MVUE) UCL	9.6143E-4
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	0.0012

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.719	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0010		
nu star	68.98		

Approximate Chi Square Value (.05)	50.86	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0012
Adjusted Chi Square Value	50.38	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	11.56	95% Bootstrap-t UCL	0.0024
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	0.0028
Kolmogorov-Smirnov Test Statistic	0.412	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0016
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0020
		97.5% Chebyshev(Mean, Sd) UCL	0.0026
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0037
95% Approximate Gamma UCL	0.0010		
95% Adjusted Gamma UCL	0.0010		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0020

Result or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	34

Raw Statistics		Log-transformed Statistics	
Minimum	0.0032	Minimum of Log Data	-5.734
Maximum	2.17	Maximum of Log Data	0.775
Mean	0.108	Mean of log Data	-4.039
Median	0.0065	SD of log Data	1.566
SD	0.368		
Coefficient of Variation	3.399		
Skewness	4.909		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.309	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.198	95% H-UCL	0.119
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.132
95% Adjusted-CLT UCL	0.236	97.5% Chebyshev (MVUE) UCL	0.165
95% Modified-t UCL	0.204	99% Chebyshev (MVUE) UCL	0.229
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.302		
nu star	34.4		
Approximate Chi Square Value (.05)	21.98	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.196
Adjusted Chi Square Value	21.67	95% Jackknife UCL	0.198
		95% Standard Bootstrap UCL	0.196
Anderson-Darling Test Statistic	6.501	95% Bootstrap-t UCL	0.656

Anderson-Darling 5% Critical Value	0.846	95% Hall's Bootstrap UCL	0.596
Kolmogorov-Smirnov Test Statistic	0.282	95% Percentile Bootstrap UCL	0.206
Kolmogorov-Smirnov 5% Critical Value	0.138	95% BCA Bootstrap UCL	0.264
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.34
		97.5% Chebyshev(Mean, Sd) UCL	0.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.637
95% Approximate Gamma UCL	0.17		
95% Adjusted Gamma UCL	0.172		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.637

Result or 1/2 SDL (fluorene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	38

Raw Statistics		Log-transformed Statistics	
Minimum	0.0033	Minimum of Log Data	-5.715
Maximum	0.139	Maximum of Log Data	-1.973
Mean	0.0186	Mean of log Data	-4.783
Median	0.0055	SD of log Data	1.084
SD	0.0314		
Coefficient of Variation	1.687		
Skewness	2.593		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.73
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0262	95% H-UCL	0.022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0268
95% Adjusted-CLT UCL	0.0279	97.5% Chebyshev (MVUE) UCL	0.0321
95% Modified-t UCL	0.0265	99% Chebyshev (MVUE) UCL	0.0423
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.717	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0259		
nu star	68.81		
Approximate Chi Square Value (.05)	50.71	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.026
Adjusted Chi Square Value	50.23	95% Jackknife UCL	0.0262
		95% Standard Bootstrap UCL	0.0258
Anderson-Darling Test Statistic	7.338	95% Bootstrap-t UCL	0.0295
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	0.0286
Kolmogorov-Smirnov Test Statistic	0.359	95% Percentile Bootstrap UCL	0.0263
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0287
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0383
		97.5% Chebyshev(Mean, Sd) UCL	0.0469

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0637
95% Approximate Gamma UCL	0.0252		
95% Adjusted Gamma UCL	0.0255		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0637

Result or 1/2 SDL (gamma-chlordane)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	45

Raw Statistics		Log-transformed Statistics	
Minimum	1.2000E-4	Minimum of Log Data	-9.028
Maximum	0.0036	Maximum of Log Data	-5.627
Mean	4.0476E-4	Mean of log Data	-8.298
Median	2.1800E-4	SD of log Data	0.781
SD	6.7074E-4		
Coefficient of Variation	1.657		
Skewness	3.738		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.435	Shapiro Wilk Test Statistic	0.75
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.6720E-4	95% H-UCL	4.2977E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.1879E-4
95% Adjusted-CLT UCL	6.1982E-4	97.5% Chebyshev (MVUE) UCL	5.9820E-4
95% Modified-t UCL	5.7591E-4	99% Chebyshev (MVUE) UCL	7.5419E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.11	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.6480E-4		
nu star	106.5		
Approximate Chi Square Value (.05)	83.7	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	5.6400E-4
Adjusted Chi Square Value	83.07	95% Jackknife UCL	5.6720E-4
		95% Standard Bootstrap UCL	5.6162E-4
Anderson-Darling Test Statistic	6.585	95% Bootstrap-t UCL	7.3616E-4
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	6.0334E-4
Kolmogorov-Smirnov Test Statistic	0.299	95% Percentile Bootstrap UCL	5.7445E-4
Kolmogorov-Smirnov 5% Critical Value	0.131	95% BCA Bootstrap UCL	6.5255E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.2676E-4
		97.5% Chebyshev(Mean, Sd) UCL	0.0010
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0013
95% Approximate Gamma UCL	5.1511E-4		
95% Adjusted Gamma UCL	5.1899E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.2676E-4

Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	40

Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	1.94	Maximum of Log Data	0.663
Mean	0.201	Mean of log Data	-3.037
Median	0.0629	SD of log Data	1.674
SD	0.407		
Coefficient of Variation	2.025		
Skewness	2.987		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.299	95% H-UCL	0.419
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.446
95% Adjusted-CLT UCL	0.324	97.5% Chebyshev (MVUE) UCL	0.56
95% Modified-t UCL	0.304	99% Chebyshev (MVUE) UCL	0.784
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.437	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.46		
nu star	41.91		
Approximate Chi Square Value (.05)	28.07	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.297
Adjusted Chi Square Value	27.72	95% Jackknife UCL	0.299
		95% Standard Bootstrap UCL	0.294
Anderson-Darling Test Statistic	3.169	95% Bootstrap-t UCL	0.344
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.329
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	0.308
Kolmogorov-Smirnov 5% Critical Value	0.136	95% BCA Bootstrap UCL	0.325
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.457
		97.5% Chebyshev(Mean, Sd) UCL	0.567
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.785
95% Approximate Gamma UCL	0.3		
95% Adjusted Gamma UCL	0.304		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.785

Result or 1/2 SDL (iron)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	37

Raw Statistics		Log-transformed Statistics	
Minimum	11100	Minimum of Log Data	9.315
Maximum	60900	Maximum of Log Data	11.02
Mean	17152	Mean of log Data	9.71
Median	16650	SD of log Data	0.25
SD	6903		
Coefficient of Variation	0.402		
Skewness	5.582		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.466	Shapiro Wilk Test Statistic	0.759
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18824	95% H-UCL	18113
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19692
95% Adjusted-CLT UCL	19649	97.5% Chebyshev (MVUE) UCL	20862
95% Modified-t UCL	18958	99% Chebyshev (MVUE) UCL	23161
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.83	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1450		
nu star	1135		
Approximate Chi Square Value (.05)	1058	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	18791
Adjusted Chi Square Value	1056	95% Jackknife UCL	18824
		95% Standard Bootstrap UCL	18743
Anderson-Darling Test Statistic	3.403	95% Bootstrap-t UCL	20880
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	25732
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	18919
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	20054
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21495
		97.5% Chebyshev(Mean, Sd) UCL	23374
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27065
95% Approximate Gamma UCL	18404		
95% Adjusted Gamma UCL	18444		
Potential UCL to Use		Use 95% Student's-t UCL	18824
		or 95% Modified-t UCL	18958

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	45

Raw Statistics		Log-transformed Statistics	
Minimum	9.4	Minimum of Log Data	2.241

Maximum	237	Maximum of Log Data	5.468
Mean	25.36	Mean of log Data	2.969
Median	16.7	SD of log Data	0.571
SD	34.13		
Coefficient of Variation	1.346		
Skewness	5.449		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.385	Shapiro Wilk Test Statistic	0.778
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	33.62	95% H-UCL	26.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.57
95% Adjusted-CLT UCL	37.6	97.5% Chebyshev (MVUE) UCL	35.35
95% Modified-t UCL	34.27	99% Chebyshev (MVUE) UCL	42.77
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.932	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.13		
nu star	185.5		
Approximate Chi Square Value (.05)	155	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	33.46
Adjusted Chi Square Value	154.1	95% Jackknife UCL	33.62
		95% Standard Bootstrap UCL	33.36
Anderson-Darling Test Statistic	5.696	95% Bootstrap-t UCL	50.53
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	62.18
Kolmogorov-Smirnov Test Statistic	0.264	95% Percentile Bootstrap UCL	34.16
Kolmogorov-Smirnov 5% Critical Value	0.129	95% BCA Bootstrap UCL	39.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.83
		97.5% Chebyshev(Mean, Sd) UCL	56.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	74.38
95% Approximate Gamma UCL	30.35		
95% Adjusted Gamma UCL	30.52		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	46.83

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	43
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.43	Minimum of Log Data	1.692
Maximum	27.6	Maximum of Log Data	3.318
Mean	18.65	Mean of log Data	2.9
Median	18.75	SD of log Data	0.25
SD	3.754		
Coefficient of Variation	0.201		

Skewness	-0.745		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Test Statistic	0.819
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	19.56	95% H-UCL	19.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.73
95% Adjusted-CLT UCL	19.48	97.5% Chebyshev (MVUE) UCL	23.03
95% Modified-t UCL	19.55	99% Chebyshev (MVUE) UCL	25.57
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	18.42	Data appear Normal at 5% Significance Level	
Theta Star	1.013		
nu star	1768		
Approximate Chi Square Value (.05)	1671	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	19.55
Adjusted Chi Square Value	1668	95% Jackknife UCL	19.56
		95% Standard Bootstrap UCL	19.55
Anderson-Darling Test Statistic	1.236	95% Bootstrap-t UCL	19.53
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	19.55
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	19.51
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	19.49
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.02
		97.5% Chebyshev(Mean, Sd) UCL	22.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.05
95% Approximate Gamma UCL	19.73		
95% Adjusted Gamma UCL	19.77		
Potential UCL to Use		Use 95% Student's-t UCL	19.56

Result or 1/2 SDL (manganese)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	48

Raw Statistics		Log-transformed Statistics	
Minimum	87.6	Minimum of Log Data	4.473
Maximum	1010	Maximum of Log Data	6.918
Mean	331.8	Mean of log Data	5.638
Median	275	SD of log Data	0.583
SD	205.9		
Coefficient of Variation	0.621		
Skewness	1.558		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.856	Shapiro Wilk Test Statistic	0.975

Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	381.7	95% H-UCL	392.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	461.4
95% Adjusted-CLT UCL	387.8	97.5% Chebyshev (MVUE) UCL	517.6
95% Modified-t UCL	382.8	99% Chebyshev (MVUE) UCL	627.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.977	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	111.4		
nu star	285.8		
Approximate Chi Square Value (.05)	247.7	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	380.7
Adjusted Chi Square Value	246.6	95% Jackknife UCL	381.7
		95% Standard Bootstrap UCL	380.3
Anderson-Darling Test Statistic	0.491	95% Bootstrap-t UCL	391.8
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	391.7
Kolmogorov-Smirnov Test Statistic	0.116	95% Percentile Bootstrap UCL	382.9
Kolmogorov-Smirnov 5% Critical Value	0.129	95% BCA Bootstrap UCL	389.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	461.3
		97.5% Chebyshev(Mean, Sd) UCL	517.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	627.5
95% Approximate Gamma UCL	382.9		
95% Adjusted Gamma UCL	384.6		
Potential UCL to Use		Use 95% Approximate Gamma UCL	382.9

Result or 1/2 SDL (mercury)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	36

Raw Statistics		Log-transformed Statistics	
Minimum	0.0012	Minimum of Log Data	-6.685
Maximum	0.081	Maximum of Log Data	-2.513
Mean	0.0199	Mean of log Data	-4.305
Median	0.0113	SD of log Data	0.893
SD	0.0194		
Coefficient of Variation	0.974		
Skewness	1.757		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.756	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0246	95% H-UCL	0.0268

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0327
95% Adjusted-CLT UCL	0.0253	97.5% Chebyshev (MVUE) UCL	0.0382
95% Modified-t UCL	0.0247	99% Chebyshev (MVUE) UCL	0.0491
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.356	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0147		
nu star	130.2		
Approximate Chi Square Value (.05)	104.8	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0245
Adjusted Chi Square Value	104.1	95% Jackknife UCL	0.0246
		95% Standard Bootstrap UCL	0.0245
Anderson-Darling Test Statistic	1.641	95% Bootstrap-t UCL	0.0254
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	0.0252
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	0.0247
Kolmogorov-Smirnov 5% Critical Value	0.13	95% BCA Bootstrap UCL	0.0254
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0321
		97.5% Chebyshev(Mean, Sd) UCL	0.0374
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0478
95% Approximate Gamma UCL	0.0247		
95% Adjusted Gamma UCL	0.0249		
Potential UCL to Use		Use 95% H-UCL	0.0268

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	3.24	Maximum of Log Data	1.176
Mean	0.581	Mean of log Data	-1.175
Median	0.38	SD of log Data	1.255
SD	0.677		
Coefficient of Variation	1.166		
Skewness	2.313		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.726	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.745	95% H-UCL	1.094
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.312
95% Adjusted-CLT UCL	0.776	97.5% Chebyshev (MVUE) UCL	1.593
95% Modified-t UCL	0.75	99% Chebyshev (MVUE) UCL	2.147
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.88	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.66		
nu star	84.46		
Approximate Chi Square Value (.05)	64.28	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.741
Adjusted Chi Square Value	63.73	95% Jackknife UCL	0.745
		95% Standard Bootstrap UCL	0.738
Anderson-Darling Test Statistic	0.995	95% Bootstrap-t UCL	0.793
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	0.796
Kolmogorov-Smirnov Test Statistic	0.126	95% Percentile Bootstrap UCL	0.746
Kolmogorov-Smirnov 5% Critical Value	0.132	95% BCA Bootstrap UCL	0.777
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.006
		97.5% Chebyshev(Mean, Sd) UCL	1.191
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.553
95% Approximate Gamma UCL	0.763		
95% Adjusted Gamma UCL	0.769		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.763

Result or 1/2 SDL (nickel)

General Statistics			
Number of Valid Samples	50	Number of Unique Samples	43

Raw Statistics		Log-transformed Statistics	
Minimum	10.9	Minimum of Log Data	2.389
Maximum	27.7	Maximum of Log Data	3.321
Mean	17.29	Mean of log Data	2.831
Median	17.3	SD of log Data	0.197
SD	3.391		
Coefficient of Variation	0.196		
Skewness	0.421		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18.09	95% H-UCL	18.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.41
95% Adjusted-CLT UCL	18.11	97.5% Chebyshev (MVUE) UCL	20.33
95% Modified-t UCL	18.09	99% Chebyshev (MVUE) UCL	22.13

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.02	Data appear Normal at 5% Significance Level	
Theta Star	0.691		
nu star	2502		
Approximate Chi Square Value (.05)	2387	Nonparametric Statistics	
Adjusted Level of Significance	0.0452	95% CLT UCL	18.07

Adjusted Chi Square Value	2383	95% Jackknife UCL	18.09
		95% Standard Bootstrap UCL	18.07
Anderson-Darling Test Statistic	0.338	95% Bootstrap-t UCL	18.09
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	18.12
Kolmogorov-Smirnov Test Statistic	0.0827	95% Percentile Bootstrap UCL	18.04
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	18.05
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.38
		97.5% Chebyshev(Mean, Sd) UCL	20.28
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.06
95% Approximate Gamma UCL	18.12		
95% Adjusted Gamma UCL	18.15		
Potential UCL to Use		Use 95% Student's-t UCL	18.09

Result or 1/2 SDL (phenanthrene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	41

Raw Statistics		Log-transformed Statistics	
Minimum	0.0030	Minimum of Log Data	-5.783
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.0761	Mean of log Data	-4.26
Median	0.0070	SD of log Data	1.508
SD	0.248		
Coefficient of Variation	3.26		
Skewness	4.606		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.309	Shapiro Wilk Test Statistic	0.84
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.136	95% H-UCL	0.0837
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0947
95% Adjusted-CLT UCL	0.16	97.5% Chebyshev (MVUE) UCL	0.118
95% Modified-t UCL	0.14	99% Chebyshev (MVUE) UCL	0.162
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.381	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.2		
nu star	36.62		
Approximate Chi Square Value (.05)	23.77	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.135
Adjusted Chi Square Value	23.45	95% Jackknife UCL	0.136
		95% Standard Bootstrap UCL	0.136
Anderson-Darling Test Statistic	5.99	95% Bootstrap-t UCL	0.472
Anderson-Darling 5% Critical Value	0.84	95% Hall's Bootstrap UCL	0.43
Kolmogorov-Smirnov Test Statistic	0.276	95% Percentile Bootstrap UCL	0.139

Kolmogorov-Smirnov 5% Critical Value	0.137	95% BCA Bootstrap UCL	0.161
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.232
		97.5% Chebyshev(Mean, Sd) UCL	0.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.432
95% Approximate Gamma UCL	0.117		
95% Adjusted Gamma UCL	0.119		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.432

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	38

Raw Statistics		Log-transformed Statistics	
Minimum	0.0040	Minimum of Log Data	-5.502
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.154	Mean of log Data	-3.58
Median	0.0113	SD of log Data	1.729
SD	0.355		
Coefficient of Variation	2.305		
Skewness	3.1		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.48	Shapiro Wilk Test Statistic	0.843
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.24	95% H-UCL	0.279
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.29
95% Adjusted-CLT UCL	0.263	97.5% Chebyshev (MVUE) UCL	0.366
95% Modified-t UCL	0.244	99% Chebyshev (MVUE) UCL	0.514
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.377	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.408		
nu star	36.18		
Approximate Chi Square Value (.05)	23.41	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.238
Adjusted Chi Square Value	23.1	95% Jackknife UCL	0.24
		95% Standard Bootstrap UCL	0.236
Anderson-Darling Test Statistic	4.849	95% Bootstrap-t UCL	0.29
Anderson-Darling 5% Critical Value	0.841	95% Hall's Bootstrap UCL	0.247
Kolmogorov-Smirnov Test Statistic	0.256	95% Percentile Bootstrap UCL	0.242
Kolmogorov-Smirnov 5% Critical Value	0.137	95% BCA Bootstrap UCL	0.272
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.377
		97.5% Chebyshev(Mean, Sd) UCL	0.474
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.663
95% Approximate Gamma UCL	0.238		

95% Adjusted Gamma UCL	0.241		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.663

Result or 1/2 SDL (strontium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	47

Raw Statistics		Log-transformed Statistics	
Minimum	18.8	Minimum of Log Data	2.934
Maximum	330	Maximum of Log Data	5.799
Mean	67	Mean of log Data	4.025
Median	54	SD of log Data	0.557
SD	52.81		
Coefficient of Variation	0.788		
Skewness	3.229		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.671	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	79.79	95% H-UCL	76.38
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.28
95% Adjusted-CLT UCL	83.33	97.5% Chebyshev (MVUE) UCL	99.75
95% Modified-t UCL	80.38	99% Chebyshev (MVUE) UCL	120.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.764	Data appear Lognormal at 5% Significance Level	
Theta Star	24.24		
nu star	265.3		
Approximate Chi Square Value (.05)	228.6	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	79.53
Adjusted Chi Square Value	227.6	95% Jackknife UCL	79.79
		95% Standard Bootstrap UCL	79.52
Anderson-Darling Test Statistic	1.725	95% Bootstrap-t UCL	87.35
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	98.08
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	80.25
Kolmogorov-Smirnov 5% Critical Value	0.129	95% BCA Bootstrap UCL	84.92
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	100.2
		97.5% Chebyshev(Mean, Sd) UCL	114.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	142.8
95% Approximate Gamma UCL	77.76		
95% Adjusted Gamma UCL	78.12		
Potential UCL to Use		Use 95% H-UCL	76.38

Result or 1/2 SDL (tin)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	31

Raw Statistics		Log-transformed Statistics	
Minimum	0.2	Minimum of Log Data	-1.609
Maximum	4.61	Maximum of Log Data	1.528
Mean	0.638	Mean of log Data	-0.895
Median	0.3	SD of log Data	0.728
SD	0.991		
Coefficient of Variation	1.554		
Skewness	3.165		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.408	Shapiro Wilk Test Statistic	0.62
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.877	95% H-UCL	0.663
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.795
95% Adjusted-CLT UCL	0.943	97.5% Chebyshev (MVUE) UCL	0.911
95% Modified-t UCL	0.888	99% Chebyshev (MVUE) UCL	1.137
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.199	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.532		
nu star	115.1		
Approximate Chi Square Value (.05)	91.31	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	0.873
Adjusted Chi Square Value	90.65	95% Jackknife UCL	0.877
		95% Standard Bootstrap UCL	0.87
Anderson-Darling Test Statistic	9.6	95% Bootstrap-t UCL	1.091
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	0.828
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	0.872
Kolmogorov-Smirnov 5% Critical Value	0.131	95% BCA Bootstrap UCL	0.958
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.261
		97.5% Chebyshev(Mean, Sd) UCL	1.531
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.061
95% Approximate Gamma UCL	0.803		
95% Adjusted Gamma UCL	0.809		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.261

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	44

Raw Statistics		Log-transformed Statistics	
Minimum	8.15	Minimum of Log Data	2.098
Maximum	68.7	Maximum of Log Data	4.23
Mean	29.14	Mean of log Data	3.267
Median	28	SD of log Data	0.465
SD	13.88		
Coefficient of Variation	0.476		
Skewness	1.065		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	32.5	95% H-UCL	33.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.06
95% Adjusted-CLT UCL	32.77	97.5% Chebyshev (MVUE) UCL	41.92
95% Modified-t UCL	32.55	99% Chebyshev (MVUE) UCL	49.49
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.618	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	6.31		
nu star	443.3		
Approximate Chi Square Value (.05)	395.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.045	95% CLT UCL	32.44
Adjusted Chi Square Value	394.1	95% Jackknife UCL	32.5
		95% Standard Bootstrap UCL	32.46
Anderson-Darling Test Statistic	0.49	95% Bootstrap-t UCL	32.95
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	32.98
Kolmogorov-Smirnov Test Statistic	0.109	95% Percentile Bootstrap UCL	32.54
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	32.94
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37.87
		97.5% Chebyshev(Mean, Sd) UCL	41.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	49.08
95% Approximate Gamma UCL	32.66		
95% Adjusted Gamma UCL	32.78		
Potential UCL to Use		Use 95% Approximate Gamma UCL	32.66

Result or 1/2 SDL (toluene)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	44

Raw Statistics		Log-transformed Statistics	
Minimum	2.9700E-4	Minimum of Log Data	-8.122
Maximum	0.0064	Maximum of Log Data	-5.051
Mean	6.5492E-4	Mean of log Data	-7.638
Median	3.6725E-4	SD of log Data	0.612

SD	9.3955E-4		
Coefficient of Variation	1.435		
Skewness	5.23		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.385	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.8247E-4	95% H-UCL	6.9234E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.1723E-4
95% Adjusted-CLT UCL	9.8737E-4	97.5% Chebyshev (MVUE) UCL	9.2061E-4
95% Modified-t UCL	8.9953E-4	99% Chebyshev (MVUE) UCL	0.0011
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.68	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.8993E-4		
nu star	161.2		
Approximate Chi Square Value (.05)	132.9	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	8.7798E-4
Adjusted Chi Square Value	132.1	95% Jackknife UCL	8.8247E-4
		95% Standard Bootstrap UCL	8.7005E-4
Anderson-Darling Test Statistic	7.505	95% Bootstrap-t UCL	0.0011
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	0.0016
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	8.8796E-4
Kolmogorov-Smirnov 5% Critical Value	0.13	95% BCA Bootstrap UCL	0.0010
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0012
		97.5% Chebyshev(Mean, Sd) UCL	0.0015
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.002
95% Approximate Gamma UCL	7.9468E-4		
95% Adjusted Gamma UCL	7.9947E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0012

Result or 1/2 SDL (vanadium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	9.02	Minimum of Log Data	2.199
Maximum	32	Maximum of Log Data	3.466
Mean	21.65	Mean of log Data	3.05
Median	21.75	SD of log Data	0.233
SD	4.554		
Coefficient of Variation	0.21		
Skewness	-0.279		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.985	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.75	95% H-UCL	23.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.91
95% Adjusted-CLT UCL	22.7	97.5% Chebyshev (MVUE) UCL	26.31
95% Modified-t UCL	22.74	99% Chebyshev (MVUE) UCL	29.05
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.24	Data appear Normal at 5% Significance Level	
Theta Star	1.125		
nu star	1847		
Approximate Chi Square Value (.05)	1748	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	22.73
Adjusted Chi Square Value	1745	95% Jackknife UCL	22.75
		95% Standard Bootstrap UCL	22.71
Anderson-Darling Test Statistic	0.627	95% Bootstrap-t UCL	22.7
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	22.7
Kolmogorov-Smirnov Test Statistic	0.102	95% Percentile Bootstrap UCL	22.73
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	22.76
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24.51
		97.5% Chebyshev(Mean, Sd) UCL	25.75
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.19
95% Approximate Gamma UCL	22.87		
95% Adjusted Gamma UCL	22.91		
Potential UCL to Use		Use 95% Student's-t UCL	22.75

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	53	Number of Unique Samples	53

Raw Statistics		Log-transformed Statistics	
Minimum	31.5	Minimum of Log Data	3.45
Maximum	903	Maximum of Log Data	6.806
Mean	139.1	Mean of log Data	4.558
Median	84.3	SD of log Data	0.795
SD	160.9		
Coefficient of Variation	1.157		
Skewness	2.989		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.28	Lilliefors Test Statistic	0.133
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	176.1	95% H-UCL	165.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	199.2
95% Adjusted-CLT UCL	185.2	97.5% Chebyshev (MVUE) UCL	229.1
95% Modified-t UCL	177.6	99% Chebyshev (MVUE) UCL	288
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.4	Data do not follow a Discernable Distribution (0.05)	
Theta Star	99.32		
nu star	148.4		
Approximate Chi Square Value (.05)	121.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0455	95% CLT UCL	175.5
Adjusted Chi Square Value	120.6	95% Jackknife UCL	176.1
		95% Standard Bootstrap UCL	175
Anderson-Darling Test Statistic	2.607	95% Bootstrap-t UCL	193.4
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	198.1
Kolmogorov-Smirnov Test Statistic	0.185	95% Percentile Bootstrap UCL	178.3
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	187.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	235.5
		97.5% Chebyshev(Mean, Sd) UCL	277.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	359
95% Approximate Gamma UCL	170.2		
95% Adjusted Gamma UCL	171.2		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	235.5

APPENDIX A-9

POND SEDIMENT

	General UCL Statistics for Full Data Sets
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\eco\draft for PRP review\Appendices\Data\Pond sediment data.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (2,4,6-trichlorophenol)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0125	Minimum of Log Data	-4.382
Maximum	0.0429	Maximum of Log Data	-3.149
Mean	0.0175	Mean of log Data	-4.145
Median	0.0135	SD of log Data	0.414
SD	0.0104		
Coefficient of Variation	0.595		
Skewness	2.728		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.534	Shapiro Wilk Test Statistic	0.62
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0244	95% H-UCL	0.0245
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.028
95% Adjusted-CLT UCL	0.0273	97.5% Chebyshev (MVUE) UCL	0.0328
95% Modified-t UCL	0.025	99% Chebyshev (MVUE) UCL	0.0421

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.43	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0050		
nu star	54.87		
Approximate Chi Square Value (.05)	38.85	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0235
Adjusted Chi Square Value	35.47	95% Jackknife UCL	0.0244
		95% Standard Bootstrap UCL	0.0231
Anderson-Darling Test Statistic	1.566	95% Bootstrap-t UCL	0.064
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	0.0513
Kolmogorov-Smirnov Test Statistic	0.368	95% Percentile Bootstrap UCL	0.0244
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	0.0254
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0334
		97.5% Chebyshev(Mean, Sd) UCL	0.0404
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.054
95% Approximate Gamma UCL	0.0246		
95% Adjusted Gamma UCL	0.027		

Potential UCL to Use		Use 95% Student's-t UCL	0.0244
		or 95% Modified-t UCL	0.025

Result or 1/2 SDL (4,4'-ddd)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	2.2750E-4	Minimum of Log Data	-8.388
Maximum	0.013	Maximum of Log Data	-4.343
Mean	0.0069	Mean of log Data	-5.828
Median	0.01	SD of log Data	1.831
SD	0.0055		
Coefficient of Variation	0.794		
Skewness	-0.527		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.727
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0107	95% H-UCL	0.873
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0401
95% Adjusted-CLT UCL	0.0097	97.5% Chebyshev (MVUE) UCL	0.0529
95% Modified-t UCL	0.0106	99% Chebyshev (MVUE) UCL	0.0779
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.522	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0133		
nu star	8.359		
Approximate Chi Square Value (.05)	2.945	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0102
Adjusted Chi Square Value	2.195	95% Jackknife UCL	0.0107
		95% Standard Bootstrap UCL	0.0099
Anderson-Darling Test Statistic	1.169	95% Bootstrap-t UCL	0.0101
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.0092
Kolmogorov-Smirnov Test Statistic	0.388	95% Percentile Bootstrap UCL	0.0098
Kolmogorov-Smirnov 5% Critical Value	0.305	95% BCA Bootstrap UCL	0.0097
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0155
		97.5% Chebyshev(Mean, Sd) UCL	0.0192
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0264
95% Approximate Gamma UCL	0.0197		
95% Adjusted Gamma UCL	0.0265		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0264
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (4,4'-ddt)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0011	Minimum of Log Data	-6.803
Maximum	0.007	Maximum of Log Data	-4.962
Mean	0.0041	Mean of log Data	-5.717
Median	0.0055	SD of log Data	0.81
SD	0.0024		
Coefficient of Variation	0.588		
Skewness	-0.488		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.754
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0058	95% H-UCL	0.0116
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0098
95% Adjusted-CLT UCL	0.0054	97.5% Chebyshev (MVUE) UCL	0.0123
95% Modified-t UCL	0.0057	99% Chebyshev (MVUE) UCL	0.017

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.507	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0027		
nu star	24.12		
Approximate Chi Square Value (.05)	13.94	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0055
Adjusted Chi Square Value	12.03	95% Jackknife UCL	0.0058
		95% Standard Bootstrap UCL	0.0054
Anderson-Darling Test Statistic	1.03	95% Bootstrap-t UCL	0.0056
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	0.0052
Kolmogorov-Smirnov Test Statistic	0.37	95% Percentile Bootstrap UCL	0.0054
Kolmogorov-Smirnov 5% Critical Value	0.297	95% BCA Bootstrap UCL	0.0053
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0079
		97.5% Chebyshev(Mean, Sd) UCL	0.0095
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0128
95% Approximate Gamma UCL	0.0072		
95% Adjusted Gamma UCL	0.0083		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0079

Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (acetone)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	3.2850E-4	Minimum of Log Data	-8.021
Maximum	0.0798	Maximum of Log Data	-2.528
Mean	0.0238	Mean of log Data	-4.85
Median	0.0213	SD of log Data	2.123
SD	0.0264		
Coefficient of Variation	1.11		
Skewness	1.474		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0415	95% H-UCL	15.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.17
95% Adjusted-CLT UCL	0.0444	97.5% Chebyshev (MVUE) UCL	0.226
95% Modified-t UCL	0.0423	99% Chebyshev (MVUE) UCL	0.335
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.434	Data appear Normal at 5% Significance Level	
Theta Star	0.0549		
nu star	6.942		
Approximate Chi Square Value (.05)	2.139	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0392
Adjusted Chi Square Value	1.53	95% Jackknife UCL	0.0415
		95% Standard Bootstrap UCL	0.0381
Anderson-Darling Test Statistic	0.394	95% Bootstrap-t UCL	0.0495
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	0.108
Kolmogorov-Smirnov Test Statistic	0.201	95% Percentile Bootstrap UCL	0.0394
Kolmogorov-Smirnov 5% Critical Value	0.308	95% BCA Bootstrap UCL	0.0428
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0645
		97.5% Chebyshev(Mean, Sd) UCL	0.0822
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.117
95% Approximate Gamma UCL	0.0773		
95% Adjusted Gamma UCL	0.108		
Potential UCL to Use		Use 95% Student's-t UCL	0.0415

Result or 1/2 SDL (aluminum)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	7990	Minimum of Log Data	8.986
Maximum	16300	Maximum of Log Data	9.699
Mean	11748	Mean of log Data	9.334

Median	11550	SD of log Data	0.293
SD	3382		
Coefficient of Variation	0.288		
Skewness	0.211		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk Test Statistic	0.89
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14013	95% H-UCL	14847
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17068
95% Adjusted-CLT UCL	13810	97.5% Chebyshev (MVUE) UCL	19369
95% Modified-t UCL	14028	99% Chebyshev (MVUE) UCL	23889
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.618	Data appear Normal at 5% Significance Level	
Theta Star	1363		
nu star	137.9		
Approximate Chi Square Value (.05)	111.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	13714
Adjusted Chi Square Value	105.8	95% Jackknife UCL	14013
		95% Standard Bootstrap UCL	13557
Anderson-Darling Test Statistic	0.421	95% Bootstrap-t UCL	14142
Anderson-Darling 5% Critical Value	0.715	95% Hall's Bootstrap UCL	13477
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	13574
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	13561
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16959
		97.5% Chebyshev(Mean, Sd) UCL	19214
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23644
95% Approximate Gamma UCL	14494		
95% Adjusted Gamma UCL	15310		
Potential UCL to Use		Use 95% Student's-t UCL	14013

Result or 1/2 SDL (antimony)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.33	Minimum of Log Data	-1.109
Maximum	1.85	Maximum of Log Data	0.615
Mean	0.795	Mean of log Data	-0.487
Median	0.4	SD of log Data	0.75
SD	0.618		
Coefficient of Variation	0.778		
Skewness	0.887		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk Test Statistic	0.765
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.209	95% H-UCL	1.849
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.7
95% Adjusted-CLT UCL	1.228	97.5% Chebyshev (MVUE) UCL	2.098
95% Modified-t UCL	1.221	99% Chebyshev (MVUE) UCL	2.879
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.392	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.571		
nu star	22.27		
Approximate Chi Square Value (.05)	12.54	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	1.154
Adjusted Chi Square Value	10.74	95% Jackknife UCL	1.209
		95% Standard Bootstrap UCL	1.128
Anderson-Darling Test Statistic	1.02	95% Bootstrap-t UCL	1.349
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	1.025
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	1.158
Kolmogorov-Smirnov 5% Critical Value	0.297	95% BCA Bootstrap UCL	1.173
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.748
		97.5% Chebyshev(Mean, Sd) UCL	2.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.97
95% Approximate Gamma UCL	1.412		
95% Adjusted Gamma UCL	1.648		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.748

Result or 1/2 SDL (arsenic)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	5.01	Maximum of Log Data	1.611
Mean	1.735	Mean of log Data	-0.633
Median	0.168	SD of log Data	1.74
SD	2.233		
Coefficient of Variation	1.287		
Skewness	0.794		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.706	Shapiro Wilk Test Statistic	0.695
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.231	95% H-UCL	92.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.274
95% Adjusted-CLT UCL	3.27	97.5% Chebyshev (MVUE) UCL	8.245
95% Modified-t UCL	3.268	99% Chebyshev (MVUE) UCL	12.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.415	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.176		
nu star	6.648		
Approximate Chi Square Value (.05)	1.979	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	3.034
Adjusted Chi Square Value	1.401	95% Jackknife UCL	3.231
		95% Standard Bootstrap UCL	2.918
Anderson-Darling Test Statistic	1.258	95% Bootstrap-t UCL	4.026
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	2.692
Kolmogorov-Smirnov Test Statistic	0.385	95% Percentile Bootstrap UCL	2.917
Kolmogorov-Smirnov 5% Critical Value	0.308	95% BCA Bootstrap UCL	3.081
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.176
		97.5% Chebyshev(Mean, Sd) UCL	6.665
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.59
95% Approximate Gamma UCL	5.827		
95% Adjusted Gamma UCL	8.231		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	9.59

Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (barium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	108	Minimum of Log Data	4.682
Maximum	417	Maximum of Log Data	6.033
Mean	198.6	Mean of log Data	5.149
Median	128.5	SD of log Data	0.553
SD	119.4		
Coefficient of Variation	0.601		
Skewness	1.058		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.803
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	278.6	95% H-UCL	337.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	366.1

95% Adjusted-CLT UCL	284.9	97.5% Chebyshev (MVUE) UCL	439.5
95% Modified-t UCL	281.2	99% Chebyshev (MVUE) UCL	583.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.374	Data do not follow a Discernable Distribution (0.05)	
Theta Star	83.68		
nu star	37.98		
Approximate Chi Square Value (.05)	24.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	268
Adjusted Chi Square Value	22.22	95% Jackknife UCL	278.6
		95% Standard Bootstrap UCL	262.5
Anderson-Darling Test Statistic	0.846	95% Bootstrap-t UCL	326.6
Anderson-Darling 5% Critical Value	0.72	95% Hall's Bootstrap UCL	250.9
Kolmogorov-Smirnov Test Statistic	0.3	95% Percentile Bootstrap UCL	263.6
Kolmogorov-Smirnov 5% Critical Value	0.296	95% BCA Bootstrap UCL	275.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	382.6
		97.5% Chebyshev(Mean, Sd) UCL	462.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	618.5
95% Approximate Gamma UCL	303.4		
95% Adjusted Gamma UCL	339.5		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	382.6

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.106	Maximum of Log Data	-2.244
Mean	0.0477	Mean of log Data	-3.502
Median	0.0338	SD of log Data	1.186
SD	0.0385		
Coefficient of Variation	0.808		
Skewness	0.434		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0735	95% H-UCL	0.364
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.154
95% Adjusted-CLT UCL	0.0723	97.5% Chebyshev (MVUE) UCL	0.197
95% Modified-t UCL	0.0738	99% Chebyshev (MVUE) UCL	0.282
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.853	Data appear Normal at 5% Significance Level	

Theta Star	0.0559		
nu star	13.65		
Approximate Chi Square Value (.05)	6.332	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0701
Adjusted Chi Square Value	5.127	95% Jackknife UCL	0.0735
		95% Standard Bootstrap UCL	0.0679
Anderson-Darling Test Statistic	0.442	95% Bootstrap-t UCL	0.0754
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.0672
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	0.069
Kolmogorov-Smirnov 5% Critical Value	0.3	95% BCA Bootstrap UCL	0.0698
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.107
		97.5% Chebyshev(Mean, Sd) UCL	0.133
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.183
95% Approximate Gamma UCL	0.103		
95% Adjusted Gamma UCL	0.127		
Potential UCL to Use		Use 95% Student's-t UCL	0.0735

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0075	Minimum of Log Data	-4.893
Maximum	0.135	Maximum of Log Data	-2.002
Mean	0.024	Mean of log Data	-4.466
Median	0.0079	SD of log Data	1
SD	0.0449		
Coefficient of Variation	1.871		
Skewness	2.826		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.433	Shapiro Wilk Test Statistic	0.495
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.054	95% H-UCL	0.0711
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0449
95% Adjusted-CLT UCL	0.067	97.5% Chebyshev (MVUE) UCL	0.0568
95% Modified-t UCL	0.0567	99% Chebyshev (MVUE) UCL	0.0802
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.587	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0408		
nu star	9.393		
Approximate Chi Square Value (.05)	3.566	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0501
Adjusted Chi Square Value	2.719	95% Jackknife UCL	0.054

		95% Standard Bootstrap UCL	0.0478
Anderson-Darling Test Statistic	2.272	95% Bootstrap-t UCL	2.081
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.889
Kolmogorov-Smirnov Test Statistic	0.49	95% Percentile Bootstrap UCL	0.0555
Kolmogorov-Smirnov 5% Critical Value	0.303	95% BCA Bootstrap UCL	0.0716
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0931
		97.5% Chebyshev(Mean, Sd) UCL	0.123
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.182
95% Approximate Gamma UCL	0.0632		
95% Adjusted Gamma UCL	0.0828		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.182
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0115	Minimum of Log Data	-4.465
Maximum	0.13	Maximum of Log Data	-2.04
Mean	0.0527	Mean of log Data	-3.539
Median	0.0138	SD of log Data	1.174
SD	0.0557		
Coefficient of Variation	1.058		
Skewness	0.678		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.695	Shapiro Wilk Test Statistic	0.702
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.09	95% H-UCL	0.335
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.146
95% Adjusted-CLT UCL	0.0901	97.5% Chebyshev (MVUE) UCL	0.187
95% Modified-t UCL	0.0908	99% Chebyshev (MVUE) UCL	0.267
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.691	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0762		
nu star	11.06		
Approximate Chi Square Value (.05)	4.613	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0851
Adjusted Chi Square Value	3.619	95% Jackknife UCL	0.09
		95% Standard Bootstrap UCL	0.0828
Anderson-Darling Test Statistic	1.28	95% Bootstrap-t UCL	0.0975
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	0.071
Kolmogorov-Smirnov Test Statistic	0.371	95% Percentile Bootstrap UCL	0.0821

Kolmogorov-Smirnov 5% Critical Value	0.302	95% BCA Bootstrap UCL	0.0834
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.139
		97.5% Chebyshev(Mean, Sd) UCL	0.176
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.249
95% Approximate Gamma UCL	0.126		
95% Adjusted Gamma UCL	0.161		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.249
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (beryllium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.58	Minimum of Log Data	-0.545
Maximum	1.13	Maximum of Log Data	0.122
Mean	0.834	Mean of log Data	-0.209
Median	0.865	SD of log Data	0.254
SD	0.206		
Coefficient of Variation	0.247		
Skewness	0.0408		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.972	95% H-UCL	1.016
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.161
95% Adjusted-CLT UCL	0.954	97.5% Chebyshev (MVUE) UCL	1.303
95% Modified-t UCL	0.972	99% Chebyshev (MVUE) UCL	1.581
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.5	Data appear Normal at 5% Significance Level	
Theta Star	0.0725		
nu star	183.9		
Approximate Chi Square Value (.05)	153.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.953
Adjusted Chi Square Value	146.5	95% Jackknife UCL	0.972
		95% Standard Bootstrap UCL	0.944
Anderson-Darling Test Statistic	0.371	95% Bootstrap-t UCL	0.963
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	0.934
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	0.945
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	0.939
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.151
		97.5% Chebyshev(Mean, Sd) UCL	1.288
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.557

95% Approximate Gamma UCL	0.999		
95% Adjusted Gamma UCL	1.047		
Potential UCL to Use		Use 95% Student's-t UCL	0.972

Result or 1/2 SDL (beta-bhc)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	2.4400E-4	Minimum of Log Data	-8.318
Maximum	0.015	Maximum of Log Data	-4.2
Mean	0.0079	Mean of log Data	-5.721
Median	0.0115	SD of log Data	1.87
SD	0.0063		
Coefficient of Variation	0.799		
Skewness	-0.521		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.771	Shapiro Wilk Test Statistic	0.725
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0122	95% H-UCL	1.231
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0475
95% Adjusted-CLT UCL	0.0112	97.5% Chebyshev (MVUE) UCL	0.0626
95% Modified-t UCL	0.0122	99% Chebyshev (MVUE) UCL	0.0924
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.51	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0156		
nu star	8.162		
Approximate Chi Square Value (.05)	2.829	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0117
Adjusted Chi Square Value	2.098	95% Jackknife UCL	0.0122
		95% Standard Bootstrap UCL	0.0114
Anderson-Darling Test Statistic	1.185	95% Bootstrap-t UCL	0.0116
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.0107
Kolmogorov-Smirnov Test Statistic	0.39	95% Percentile Bootstrap UCL	0.0113
Kolmogorov-Smirnov 5% Critical Value	0.305	95% BCA Bootstrap UCL	0.0112
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0178
		97.5% Chebyshev(Mean, Sd) UCL	0.022
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0303
95% Approximate Gamma UCL	0.023		
95% Adjusted Gamma UCL	0.031		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0303

Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (boron)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	4.26	Minimum of Log Data	1.449
Maximum	28.4	Maximum of Log Data	3.346
Mean	14.95	Mean of log Data	2.439
Median	12.4	SD of log Data	0.817
SD	10.5		
Coefficient of Variation	0.702		
Skewness	0.337		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21.98	95% H-UCL	40.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.74
95% Adjusted-CLT UCL	21.53	97.5% Chebyshev (MVUE) UCL	43.18
95% Modified-t UCL	22.06	99% Chebyshev (MVUE) UCL	59.77
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.355	Data appear Normal at 5% Significance Level	
Theta Star	11.03		
nu star	21.69		
Approximate Chi Square Value (.05)	12.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	21.06
Adjusted Chi Square Value	10.34	95% Jackknife UCL	21.98
		95% Standard Bootstrap UCL	20.6
Anderson-Darling Test Statistic	0.562	95% Bootstrap-t UCL	22.63
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	19.35
Kolmogorov-Smirnov Test Statistic	0.236	95% Percentile Bootstrap UCL	20.79
Kolmogorov-Smirnov 5% Critical Value	0.297	95% BCA Bootstrap UCL	20.78
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.13
		97.5% Chebyshev(Mean, Sd) UCL	38.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	51.87
95% Approximate Gamma UCL	26.79		
95% Adjusted Gamma UCL	31.36		
Potential UCL to Use		Use 95% Student's-t UCL	21.98

Result or 1/2 SDL (bromomethane)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.0013	Minimum of Log Data	-6.63
Maximum	0.031	Maximum of Log Data	-3.474
Mean	0.0089	Mean of log Data	-5.269
Median	0.0067	SD of log Data	1.168
SD	0.0099		
Coefficient of Variation	1.115		
Skewness	1.87		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.777	Shapiro Wilk Test Statistic	0.9
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0156	95% H-UCL	0.058
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0256
95% Adjusted-CLT UCL	0.0172	97.5% Chebyshev (MVUE) UCL	0.0328
95% Modified-t UCL	0.016	99% Chebyshev (MVUE) UCL	0.0469
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.737	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0121		
nu star	11.79		
Approximate Chi Square Value (.05)	5.091	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0147
Adjusted Chi Square Value	4.035	95% Jackknife UCL	0.0156
		95% Standard Bootstrap UCL	0.0142
Anderson-Darling Test Statistic	0.406	95% Bootstrap-t UCL	0.0234
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	0.0427
Kolmogorov-Smirnov Test Statistic	0.226	95% Percentile Bootstrap UCL	0.0148
Kolmogorov-Smirnov 5% Critical Value	0.301	95% BCA Bootstrap UCL	0.0166
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0242
		97.5% Chebyshev(Mean, Sd) UCL	0.0309
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0439
95% Approximate Gamma UCL	0.0206		
95% Adjusted Gamma UCL	0.0261		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0206

Result or 1/2 SDL (cadmium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	0.27	Maximum of Log Data	-1.309

Mean	0.147	Mean of log Data	-2.491
Median	0.19	SD of log Data	1.377
SD	0.112		
Coefficient of Variation	0.762		
Skewness	-0.424		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.802	Shapiro Wilk Test Statistic	0.716
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.222	95% H-UCL	2.239
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.561
95% Adjusted-CLT UCL	0.206	97.5% Chebyshev (MVUE) UCL	0.727
95% Modified-t UCL	0.221	99% Chebyshev (MVUE) UCL	1.052
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.711	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.207		
nu star	11.37		
Approximate Chi Square Value (.05)	4.814	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.212
Adjusted Chi Square Value	3.794	95% Jackknife UCL	0.222
		95% Standard Bootstrap UCL	0.207
Anderson-Darling Test Statistic	1.11	95% Bootstrap-t UCL	0.211
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	0.195
Kolmogorov-Smirnov Test Statistic	0.35	95% Percentile Bootstrap UCL	0.208
Kolmogorov-Smirnov 5% Critical Value	0.301	95% BCA Bootstrap UCL	0.206
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.32
		97.5% Chebyshev(Mean, Sd) UCL	0.395
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.541
95% Approximate Gamma UCL	0.348		
95% Adjusted Gamma UCL	0.441		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.541

Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (carbon disulfide)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	9.5500E-5	Minimum of Log Data	-9.256
Maximum	0.0077	Maximum of Log Data	-4.865
Mean	0.0013	Mean of log Data	-7.554
Median	4.8175E-4	SD of log Data	1.364
SD	0.0025		
Coefficient of Variation	1.875		

Skewness	2.757		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.522	Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0031	95% H-UCL	0.0134
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0034
95% Adjusted-CLT UCL	0.0038	97.5% Chebyshev (MVUE) UCL	0.0045
95% Modified-t UCL	0.0032	99% Chebyshev (MVUE) UCL	0.0065
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.48	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0028		
nu star	7.688		
Approximate Chi Square Value (.05)	2.555	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0028
Adjusted Chi Square Value	1.871	95% Jackknife UCL	0.0031
		95% Standard Bootstrap UCL	0.0027
Anderson-Darling Test Statistic	0.892	95% Bootstrap-t UCL	0.0142
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	0.0134
Kolmogorov-Smirnov Test Statistic	0.298	95% Percentile Bootstrap UCL	0.0031
Kolmogorov-Smirnov 5% Critical Value	0.306	95% BCA Bootstrap UCL	0.0033
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0053
		97.5% Chebyshev(Mean, Sd) UCL	0.0070
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0104
95% Approximate Gamma UCL	0.0041		
95% Adjusted Gamma UCL	0.0056		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0041
Result or 1/2 SDL (chromium)			
General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	8.29	Minimum of Log Data	2.115
Maximum	20.1	Maximum of Log Data	3.001
Mean	12.93	Mean of log Data	2.505
Median	11.55	SD of log Data	0.35
SD	4.611		
Coefficient of Variation	0.357		
Skewness	0.57		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Test Statistic	0.895

Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.02	95% H-UCL	17.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.93
95% Adjusted-CLT UCL	15.97	97.5% Chebyshev (MVUE) UCL	22.96
95% Modified-t UCL	16.08	99% Chebyshev (MVUE) UCL	28.91
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.937	Data appear Normal at 5% Significance Level	
Theta Star	2.178		
nu star	94.99		
Approximate Chi Square Value (.05)	73.51	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	15.61
Adjusted Chi Square Value	68.75	95% Jackknife UCL	16.02
		95% Standard Bootstrap UCL	15.41
Anderson-Darling Test Statistic	0.448	95% Bootstrap-t UCL	16.66
Anderson-Darling 5% Critical Value	0.715	95% Hall's Bootstrap UCL	15.32
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	15.5
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	15.63
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.04
		97.5% Chebyshev(Mean, Sd) UCL	23.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29.15
95% Approximate Gamma UCL	16.71		
95% Adjusted Gamma UCL	17.87		
Potential UCL to Use		Use 95% Student's-t UCL	16.02

Result or 1/2 SDL (chrysene)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	0.0257	Maximum of Log Data	-3.661
Mean	0.0094	Mean of log Data	-4.785
Median	0.007	SD of log Data	0.462
SD	0.0065		
Coefficient of Variation	0.697		
Skewness	2.777		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.577
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0139	95% H-UCL	0.0139

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0157
95% Adjusted-CLT UCL	0.0157	97.5% Chebyshev (MVUE) UCL	0.0186
95% Modified-t UCL	0.0143	99% Chebyshev (MVUE) UCL	0.0242
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.693	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0035		
nu star	43.09		
Approximate Chi Square Value (.05)	29.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0133
Adjusted Chi Square Value	26.16	95% Jackknife UCL	0.0139
		95% Standard Bootstrap UCL	0.013
Anderson-Darling Test Statistic	1.788	95% Bootstrap-t UCL	0.0588
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	0.037
Kolmogorov-Smirnov Test Statistic	0.395	95% Percentile Bootstrap UCL	0.014
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	0.0144
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0196
		97.5% Chebyshev(Mean, Sd) UCL	0.024
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0327
95% Approximate Gamma UCL	0.014		
95% Adjusted Gamma UCL	0.0156		
Potential UCL to Use		Use 95% Student's-t UCL	0.0139
		or 95% Modified-t UCL	0.0143

Result or 1/2 SDL (cobalt)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	5.19	Minimum of Log Data	1.647
Maximum	8.99	Maximum of Log Data	2.196
Mean	6.939	Mean of log Data	1.92
Median	6.945	SD of log Data	0.2
SD	1.378		
Coefficient of Variation	0.199		
Skewness	0.167		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.862	95% H-UCL	8.067
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.086
95% Adjusted-CLT UCL	7.771	97.5% Chebyshev (MVUE) UCL	10.02
95% Modified-t UCL	7.866	99% Chebyshev (MVUE) UCL	11.84

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.1	Data appear Normal at 5% Significance Level	
Theta Star	0.383		
nu star	289.5		
Approximate Chi Square Value (.05)	251.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	7.74
Adjusted Chi Square Value	242	95% Jackknife UCL	7.862
		95% Standard Bootstrap UCL	7.683
Anderson-Darling Test Statistic	0.268	95% Bootstrap-t UCL	7.852
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	7.642
Kolmogorov-Smirnov Test Statistic	0.197	95% Percentile Bootstrap UCL	7.689
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	7.689
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.062
		97.5% Chebyshev(Mean, Sd) UCL	9.981
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.79
95% Approximate Gamma UCL	8		
95% Adjusted Gamma UCL	8.3		
Potential UCL to Use		Use 95% Student's-t UCL	7.862

Result or 1/2 SDL (copper)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	8.33	Minimum of Log Data	2.12
Maximum	26.8	Maximum of Log Data	3.288
Mean	15.2	Mean of log Data	2.623
Median	12.55	SD of log Data	0.467
SD	7.421		
Coefficient of Variation	0.488		
Skewness	0.836		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20.17	95% H-UCL	23.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.14
95% Adjusted-CLT UCL	20.34	97.5% Chebyshev (MVUE) UCL	30.9
95% Modified-t UCL	20.3	99% Chebyshev (MVUE) UCL	40.26

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.353	Data appear Normal at 5% Significance Level	
Theta Star	4.533		
nu star	53.65		
Approximate Chi Square Value (.05)	37.82	Nonparametric Statistics	

Adjusted Level of Significance	0.0195	95% CLT UCL	19.51
Adjusted Chi Square Value	34.49	95% Jackknife UCL	20.17
		95% Standard Bootstrap UCL	19.15
Anderson-Darling Test Statistic	0.476	95% Bootstrap-t UCL	23.91
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	21.16
Kolmogorov-Smirnov Test Statistic	0.192	95% Percentile Bootstrap UCL	19.18
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	19.81
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.64
		97.5% Chebyshev(Mean, Sd) UCL	31.58
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.31
95% Approximate Gamma UCL	21.56		
95% Adjusted Gamma UCL	23.64		
Potential UCL to Use		Use 95% Student's-t UCL	20.17

Result or 1/2 SDL (iron)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	11300	Minimum of Log Data	9.333
Maximum	20100	Maximum of Log Data	9.908
Mean	15275	Mean of log Data	9.614
Median	15500	SD of log Data	0.214
SD	3227		
Coefficient of Variation	0.211		
Skewness	0.139		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17437	95% H-UCL	17970
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20327
95% Adjusted-CLT UCL	17212	97.5% Chebyshev (MVUE) UCL	22512
95% Modified-t UCL	17446	99% Chebyshev (MVUE) UCL	26805
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.92	Data appear Normal at 5% Significance Level	
Theta Star	959.6		
nu star	254.7		
Approximate Chi Square Value (.05)	218.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	17152
Adjusted Chi Square Value	210.3	95% Jackknife UCL	17437
		95% Standard Bootstrap UCL	16994
Anderson-Darling Test Statistic	0.298	95% Bootstrap-t UCL	17461
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	16993

Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	17025
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	17050
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20249
		97.5% Chebyshev(Mean, Sd) UCL	22401
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26629
95% Approximate Gamma UCL	17786		
95% Adjusted Gamma UCL	18500		
Potential UCL to Use		Use 95% Student's-t UCL	17437

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	10.6	Minimum of Log Data	2.361
Maximum	30.5	Maximum of Log Data	3.418
Mean	17.54	Mean of log Data	2.798
Median	15.5	SD of log Data	0.384
SD	7.076		
Coefficient of Variation	0.403		
Skewness	0.923		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.28	95% H-UCL	24.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.92
95% Adjusted-CLT UCL	22.52	97.5% Chebyshev (MVUE) UCL	32.44
95% Modified-t UCL	22.41	99% Chebyshev (MVUE) UCL	41.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.874	Data appear Normal at 5% Significance Level	
Theta Star	3.598		
nu star	77.99		
Approximate Chi Square Value (.05)	58.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	21.65
Adjusted Chi Square Value	54.42	95% Jackknife UCL	22.28
		95% Standard Bootstrap UCL	21.37
Anderson-Darling Test Statistic	0.324	95% Bootstrap-t UCL	23.69
Anderson-Darling 5% Critical Value	0.717	95% Hall's Bootstrap UCL	22.55
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	21.63
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	22.26
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.44
		97.5% Chebyshev(Mean, Sd) UCL	33.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.43

95% Approximate Gamma UCL	23.32		
95% Adjusted Gamma UCL	25.13		
Potential UCL to Use		Use 95% Student's-t UCL	22.28

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	13.5	Minimum of Log Data	2.603
Maximum	23.7	Maximum of Log Data	3.165
Mean	18.48	Mean of log Data	2.895
Median	18.85	SD of log Data	0.225
SD	4.071		
Coefficient of Variation	0.22		
Skewness	0.0036		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21.2	95% H-UCL	21.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.92
95% Adjusted-CLT UCL	20.84	97.5% Chebyshev (MVUE) UCL	27.7
95% Modified-t UCL	21.2	99% Chebyshev (MVUE) UCL	33.17
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.45	Data appear Normal at 5% Significance Level	
Theta Star	1.278		
nu star	231.2		
Approximate Chi Square Value (.05)	197	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	20.84
Adjusted Chi Square Value	189	95% Jackknife UCL	21.2
		95% Standard Bootstrap UCL	20.67
Anderson-Darling Test Statistic	0.416	95% Bootstrap-t UCL	21.17
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	20.56
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	20.65
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	20.68
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24.75
		97.5% Chebyshev(Mean, Sd) UCL	27.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.8
95% Approximate Gamma UCL	21.68		
95% Adjusted Gamma UCL	22.6		
Potential UCL to Use		Use 95% Student's-t UCL	21.2

Result or 1/2 SDL (m,p-cresol)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0105	Minimum of Log Data	-4.556
Maximum	0.0375	Maximum of Log Data	-3.283
Mean	0.0149	Mean of log Data	-4.31
Median	0.0117	SD of log Data	0.424
SD	0.0092		
Coefficient of Variation	0.619		
Skewness	2.758		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.523	Shapiro Wilk Test Statistic	0.61
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.021	95% H-UCL	0.0211
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0241
95% Adjusted-CLT UCL	0.0236	97.5% Chebyshev (MVUE) UCL	0.0282
95% Modified-t UCL	0.0216	99% Chebyshev (MVUE) UCL	0.0363
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.242	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0045		
nu star	51.87		
Approximate Chi Square Value (.05)	36.33	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0202
Adjusted Chi Square Value	33.07	95% Jackknife UCL	0.021
		95% Standard Bootstrap UCL	0.02
Anderson-Darling Test Statistic	1.626	95% Bootstrap-t UCL	0.0564
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	0.0455
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	0.0212
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	0.0244
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0291
		97.5% Chebyshev(Mean, Sd) UCL	0.0352
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0472
95% Approximate Gamma UCL	0.0212		
95% Adjusted Gamma UCL	0.0233		
Potential UCL to Use		Use 95% Student's-t UCL	0.021
		or 95% Modified-t UCL	0.0216

Result or 1/2 SDL (manganese)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	352	Minimum of Log Data	5.864
Maximum	711	Maximum of Log Data	6.567
Mean	487.6	Mean of log Data	6.162
Median	453	SD of log Data	0.247
SD	124.2		
Coefficient of Variation	0.255		
Skewness	0.739		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	570.8	95% H-UCL	590.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	673.6
95% Adjusted-CLT UCL	572.1	97.5% Chebyshev (MVUE) UCL	754.2
95% Modified-t UCL	572.7	99% Chebyshev (MVUE) UCL	912.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.66	Data appear Normal at 5% Significance Level	
Theta Star	41.81		
nu star	186.6		
Approximate Chi Square Value (.05)	156	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	559.8
Adjusted Chi Square Value	148.9	95% Jackknife UCL	570.8
		95% Standard Bootstrap UCL	556
Anderson-Darling Test Statistic	0.297	95% Bootstrap-t UCL	592.1
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	575
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	560.3
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	567
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	679
		97.5% Chebyshev(Mean, Sd) UCL	761.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	924.4
95% Approximate Gamma UCL	583.3		
95% Adjusted Gamma UCL	611		
Potential UCL to Use		Use 95% Student's-t UCL	570.8

Result or 1/2 SDL (methyl iodide)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	7.9500E-4	Minimum of Log Data	-7.137
Maximum	0.041	Maximum of Log Data	-3.194

Mean	0.0081	Mean of log Data	-5.689
Median	0.0039	SD of log Data	1.357
SD	0.0135		
Coefficient of Variation	1.669		
Skewness	2.624		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0172	95% H-UCL	0.0836
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0222
95% Adjusted-CLT UCL	0.0207	97.5% Chebyshev (MVUE) UCL	0.0288
95% Modified-t UCL	0.0179	99% Chebyshev (MVUE) UCL	0.0416
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.516	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0157		
nu star	8.249		
Approximate Chi Square Value (.05)	2.88	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.016
Adjusted Chi Square Value	2.141	95% Jackknife UCL	0.0172
		95% Standard Bootstrap UCL	0.0154
Anderson-Darling Test Statistic	0.64	95% Bootstrap-t UCL	0.0493
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	0.0518
Kolmogorov-Smirnov Test Statistic	0.232	95% Percentile Bootstrap UCL	0.0172
Kolmogorov-Smirnov 5% Critical Value	0.305	95% BCA Bootstrap UCL	0.0188
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.029
		97.5% Chebyshev(Mean, Sd) UCL	0.038
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0558
95% Approximate Gamma UCL	0.0232		
95% Adjusted Gamma UCL	0.0313		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0232

Result or 1/2 SDL (molybdenum)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.055	Minimum of Log Data	-2.9
Maximum	0.6	Maximum of Log Data	-0.511
Mean	0.146	Mean of log Data	-2.382
Median	0.06	SD of log Data	0.881
SD	0.191		
Coefficient of Variation	1.312		
Skewness	2.461		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.569	Shapiro Wilk Test Statistic	0.673
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.274	95% H-UCL	0.395
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.306
95% Adjusted-CLT UCL	0.32	97.5% Chebyshev (MVUE) UCL	0.382
95% Modified-t UCL	0.283	99% Chebyshev (MVUE) UCL	0.533
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.857	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.17		
nu star	13.71		
Approximate Chi Square Value (.05)	6.372	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.257
Adjusted Chi Square Value	5.162	95% Jackknife UCL	0.274
		95% Standard Bootstrap UCL	0.25
Anderson-Darling Test Statistic	1.46	95% Bootstrap-t UCL	3.299
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	2.48
Kolmogorov-Smirnov Test Statistic	0.409	95% Percentile Bootstrap UCL	0.263
Kolmogorov-Smirnov 5% Critical Value	0.3	95% BCA Bootstrap UCL	0.328
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.44
		97.5% Chebyshev(Mean, Sd) UCL	0.568
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.818
95% Approximate Gamma UCL	0.313		
95% Adjusted Gamma UCL	0.387		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.44

Result or 1/2 SDL (nickel)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	12.3	Minimum of Log Data	2.51
Maximum	20.6	Maximum of Log Data	3.025
Mean	16.33	Mean of log Data	2.777
Median	16.65	SD of log Data	0.193
SD	3.09		
Coefficient of Variation	0.189		
Skewness	-0.0427		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818

Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18.4	95% H-UCL	18.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.2
95% Adjusted-CLT UCL	18.1	97.5% Chebyshev (MVUE) UCL	23.31
95% Modified-t UCL	18.39	99% Chebyshev (MVUE) UCL	27.46
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	19.56	Data appear Normal at 5% Significance Level	
Theta Star	0.835		
nu star	312.9		
Approximate Chi Square Value (.05)	272.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0195	95% CLT UCL	18.12
Adjusted Chi Square Value	263.5	95% Jackknife UCL	18.4
		95% Standard Bootstrap UCL	18.04
Anderson-Darling Test Statistic	0.362	95% Bootstrap-t UCL	18.49
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	17.89
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	17.96
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	17.91
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.09
		97.5% Chebyshev(Mean, Sd) UCL	23.15
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27.2
95% Approximate Gamma UCL	18.72		
95% Adjusted Gamma UCL	19.39		
Potential UCL to Use		Use 95% Student's-t UCL	18.4

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.009	Minimum of Log Data	-4.711
Maximum	0.0265	Maximum of Log Data	-3.631
Mean	0.0147	Mean of log Data	-4.32
Median	0.0105	SD of log Data	0.469
SD	0.0073		
Coefficient of Variation	0.497		
Skewness	0.806		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.782	Shapiro Wilk Test Statistic	0.788
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0196	95% H-UCL	0.0225
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0253

95% Adjusted-CLT UCL	0.0197	97.5% Chebyshev (MVUE) UCL	0.0299
95% Modified-t UCL	0.0197	99% Chebyshev (MVUE) UCL	0.039
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.283	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0044		
nu star	52.53		
Approximate Chi Square Value (.05)	36.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.019
Adjusted Chi Square Value	33.6	95% Jackknife UCL	0.0196
		95% Standard Bootstrap UCL	0.0188
Anderson-Darling Test Statistic	0.881	95% Bootstrap-t UCL	0.0216
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	0.0178
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	0.019
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	0.0191
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.026
		97.5% Chebyshev(Mean, Sd) UCL	0.0308
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0404
95% Approximate Gamma UCL	0.021		
95% Adjusted Gamma UCL	0.023		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.021

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	63.3	Minimum of Log Data	4.148
Maximum	181	Maximum of Log Data	5.198
Mean	103.6	Mean of log Data	4.575
Median	89.45	SD of log Data	0.38
SD	41.82		
Coefficient of Variation	0.404		
Skewness	1		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	131.6	95% H-UCL	142.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	164.1
95% Adjusted-CLT UCL	133.5	97.5% Chebyshev (MVUE) UCL	190.5
95% Modified-t UCL	132.5	99% Chebyshev (MVUE) UCL	242.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.946	Data appear Normal at 5% Significance Level	

Theta Star	20.94		
nu star	79.14		
Approximate Chi Square Value (.05)	59.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	127.9
Adjusted Chi Square Value	55.38	95% Jackknife UCL	131.6
		95% Standard Bootstrap UCL	126.2
Anderson-Darling Test Statistic	0.349	95% Bootstrap-t UCL	145.3
Anderson-Darling 5% Critical Value	0.717	95% Hall's Bootstrap UCL	138.1
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	127.7
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	132.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	168.1
		97.5% Chebyshev(Mean, Sd) UCL	195.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	250.7
95% Approximate Gamma UCL	137.5		
95% Adjusted Gamma UCL	148		
Potential UCL to Use		Use 95% Student's-t UCL	131.6

Result or 1/2 SDL (titanium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	19.1	Minimum of Log Data	2.95
Maximum	40.5	Maximum of Log Data	3.701
Mean	30	Mean of log Data	3.367
Median	32.65	SD of log Data	0.286
SD	8.035		
Coefficient of Variation	0.268		
Skewness	-0.263		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.38	95% H-UCL	37.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43.33
95% Adjusted-CLT UCL	34.39	97.5% Chebyshev (MVUE) UCL	49.08
95% Modified-t UCL	35.34	99% Chebyshev (MVUE) UCL	60.37

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.311	Data appear Normal at 5% Significance Level	
Theta Star	3.222		
nu star	149		
Approximate Chi Square Value (.05)	121.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	34.67
Adjusted Chi Square Value	115.5	95% Jackknife UCL	35.38

		95% Standard Bootstrap UCL	34.35
Anderson-Darling Test Statistic	0.516	95% Bootstrap-t UCL	35.38
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	33.81
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	34.31
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	34.31
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	42.38
		97.5% Chebyshev(Mean, Sd) UCL	47.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	58.27
95% Approximate Gamma UCL	36.7		
95% Adjusted Gamma UCL	38.68		
Potential UCL to Use		Use 95% Student's-t UCL	35.38

Result or 1/2 SDL (vanadium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	16.8	Minimum of Log Data	2.821
Maximum	27.4	Maximum of Log Data	3.311
Mean	21.83	Mean of log Data	3.067
Median	21.8	SD of log Data	0.19
SD	4.107		
Coefficient of Variation	0.188		
Skewness	0.0796		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.58	95% H-UCL	25.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.24
95% Adjusted-CLT UCL	24.26	97.5% Chebyshev (MVUE) UCL	31.02
95% Modified-t UCL	24.58	99% Chebyshev (MVUE) UCL	36.47
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.05	Data appear Normal at 5% Significance Level	
Theta Star	1.089		
nu star	320.8		
Approximate Chi Square Value (.05)	280.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	24.21
Adjusted Chi Square Value	270.7	95% Jackknife UCL	24.58
		95% Standard Bootstrap UCL	24.07
Anderson-Darling Test Statistic	0.392	95% Bootstrap-t UCL	24.63
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	23.78
Kolmogorov-Smirnov Test Statistic	0.222	95% Percentile Bootstrap UCL	24.1
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	24.23

Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.15
		97.5% Chebyshev(Mean, Sd) UCL	30.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	36.27
95% Approximate Gamma UCL	24.98		
95% Adjusted Gamma UCL	25.87		
Potential UCL to Use		Use 95% Student's-t UCL	24.58

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics		Log-transformed Statistics	
Minimum	38.2	Minimum of Log Data	3.643
Maximum	999	Maximum of Log Data	6.907
Mean	332.3	Mean of log Data	4.894
Median	55.65	SD of log Data	1.489
SD	407.7		
Coefficient of Variation	1.227		
Skewness	0.879		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.737	Shapiro Wilk Test Statistic	0.746
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	605.4	95% H-UCL	6104
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1069
95% Adjusted-CLT UCL	617.3	97.5% Chebyshev (MVUE) UCL	1392
95% Modified-t UCL	612.9	99% Chebyshev (MVUE) UCL	2027
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	664.4		
nu star	8.002		
Approximate Chi Square Value (.05)	2.736	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	569.4
Adjusted Chi Square Value	2.021	95% Jackknife UCL	605.4
		95% Standard Bootstrap UCL	557.7
Anderson-Darling Test Statistic	1.087	95% Bootstrap-t UCL	766.5
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	474.6
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	570.5
Kolmogorov-Smirnov 5% Critical Value	0.306	95% BCA Bootstrap UCL	594.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	960.7
		97.5% Chebyshev(Mean, Sd) UCL	1233
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1767
95% Approximate Gamma UCL	971.8		
95% Adjusted Gamma UCL	1316		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1767
Recommended UCL exceeds the maximum observation			

APPENDIX B
BACKGROUND COMPARISONS

APPENDIX B-1
BACKGROUND COMPARISONS
SOUTH OF MARLIN SURFACE SOIL

ANTIMONY - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.118	1.228	83	0.953	0.878	10

Calculated Difference =	0.165	
Standard Error of the Difference =	0.407177285	
Degree of Freedom =	91	
t =	0.405228892	
p =	0.3445	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	background mean is not statistically less than site mean

ARSENIC - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	3.735	4.012	83	3.438	1.792	10

Calculated Difference =	0.297	
Standard Error of the Difference =	1.126036589	
Degree of Freedom =	91	
t =	0.263756971	
p =	0.3963	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

BARIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	345.2	349	83	333.1	288.1	10

Calculated Difference =	12.1	
Standard Error of the Difference =	124.3580544	
Degree of Freedom =	91	
t =	0.097299689	
p =	0.4614	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

CADMIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.464	1.141	83	0.0311	0.0398	10

Calculated Difference =	0.4329	
Standard Error of the Difference =	0.277019204	
Degree of Freedom =	91	
t =	1.562707545	
p =	0.0608	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

CHROMIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	16.08	15.7	83	15.2	3.02	10

Calculated Difference =	0.88	
Standard Error of the Difference =	3.925742193	
Degree of Freedom =	91	
t =	0.224161434	
p =	0.4116	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

COPPER - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	27.98	35.35	83	12.12	3.955	10

Calculated Difference =	15.86	
Standard Error of the Difference =	8.664375822	
Degree of Freedom =	91	
t =	1.830483849	
p =	0.0353	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically greater than background mean

LEAD - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	69.61	112.8	83	13.43	1.547	10

Calculated Difference =	56.18	
Standard Error of the Difference =	27.36239203	
Degree of Freedom =	91	
t =	2.053183068	
p =	0.0215	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically greater than background mean

LITHIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	7.856	5.715	83	21.14	5.166	10

Calculated Difference =	13.284	
Standard Error of the Difference =	2.142429492	
Degree of Freedom =	91	
t =	6.200437423	
p =	0.00	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

MANGANESE - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	257.4	129.3	83	377.4	93.75	10

Calculated Difference =	120	
Standard Error of the Difference =	43.15491673	
Degree of Freedom =	91	
t =	2.780679679	
p =	0.0033	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

MERCURY - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0227	0.0752	83	0.0213	0.00479	10

Calculated Difference =	0.0014	
Standard Error of the Difference =	0.01830147	
Degree of Freedom =	91	
t =	0.076496585	
p =	0.4698	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

MOLYBDENUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	1.306	1.588	83	0.522	0.0739	10

Calculated Difference =	0.784	
Standard Error of the Difference =	0.385854899	
Degree of Freedom =	91	
t =	2.031851873	
p =	0.0225	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically greater than background mean

ZINC - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	601.2	672.8	83	247	364.6	10

Calculated Difference =	354.2	
Standard Error of the Difference =	199.8008143	
Degree of Freedom =	91	
t =	1.772765547	
p =	0.0399	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically greater than background mean

APPENDIX B-2
BACKGROUND COMPARISONS
SOUTH OF MARLIN SOIL

ANTIMONY - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.023	1.14	166	0.953	0.878	10

Calculated Difference =	0.07	
Standard Error of the Difference =	0.39183601	
Degree of Freedom =	174	
t =	0.178646164	
p =	0.4292	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	background mean is not statistically less than site mean

ARSENIC - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	3.331	3.269	166	3.438	1.792	10

Calculated Difference =	0.107	
Standard Error of the Difference =	0.97454393	
Degree of Freedom =	174	
t =	0.109794948	
p =	0.4563	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

BARIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	237.4	274.8	166	333.1	288.1	10

Calculated Difference =	95.7	
Standard Error of the Difference =	112.8814519	
Degree of Freedom =	174	
t =	0.847792072	
p =	0.1989	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

CADMIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.335	0.859	166	0.0311	0.0398	10

Calculated Difference =	0.3039	
Standard Error of the Difference =	0.208717917	
Degree of Freedom =	174	
t =	1.456032165	
p =	0.0736	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

CHROMIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	13.53	12.49	166	15.2	3.02	10

Calculated Difference =	1.67	
Standard Error of the Difference =	3.176242508	
Degree of Freedom =	174	
t =	0.525778493	
p =	0.2998	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

COPPER - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	24.26	46.76	166	12.12	3.955	10

Calculated Difference =	12.14	
Standard Error of the Difference =	11.40971991	
Degree of Freedom =	174	
t =	1.064005085	
p =	0.1444	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

LEAD - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	53.52	104.2	166	13.43	1.547	10

Calculated Difference =	40.09	
Standard Error of the Difference =	25.27694655	
Degree of Freedom =	174	
t =	1.586030177	
p =	0.0573	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically greater than background mean

LITHIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	10.03	6.299	166	21.14	5.166	10

Calculated Difference =	11.11	
Standard Error of the Difference =	2.236676187	
Degree of Freedom =	174	
t =	4.967191972	
p =	0.00	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

MANGANESE - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	261.2	127.4	166	377.4	93.75	10

Calculated Difference =	116.2	
Standard Error of the Difference =	42.82121949	
Degree of Freedom =	174	
t =	2.713607912	
p =	0.0037	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

MERCURY - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0262	0.0941	166	0.0213	0.00479	10

Calculated Difference =	0.0049	
Standard Error of the Difference =	0.022872813	
Degree of Freedom =	174	
t =	0.214228129	
p =	0.4153	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

MOLYBDENUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.89	1.488	166	0.522	0.0739	10

Calculated Difference =	0.368	
Standard Error of the Difference =	0.361648843	
Degree of Freedom =	174	
t =	1.017561668	
p =	0.1550	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ZINC - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	433.8	786.8	166	247	364.6	10

Calculated Difference =	186.8	
Standard Error of the Difference =	222.9535182	
Degree of Freedom =	174	
t =	0.8378428	
p =	0.2016	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

APPENDIX B-3
BACKGROUND COMPARISONS
NORTH OF MARLIN SURFACE SOIL

ANTIMONY - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.744	2.146	18	0.953	0.878	10

Calculated Difference =	0.791	
Standard Error of the Difference =	0.589906214	
Degree of Freedom =	26	
t =	1.340891114	
p =	0.0958	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ARSENIC - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	2.522	1.164	18	3.438	1.792	10

Calculated Difference =	0.916	
Standard Error of the Difference =	0.633108336	
Degree of Freedom =	26	
t =	1.446829789	
p =	0.0799	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

BARIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	145.2	115.8	18	333.1	288.1	10

Calculated Difference =	187.9	
Standard Error of the Difference =	95.33605484	
Degree of Freedom =	26	
t =	1.970922756	
p =	0.0297	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

CADMIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.207	0.252	18	0.0311	0.0398	10

Calculated Difference =	0.1759	
Standard Error of the Difference =	0.06240139	
Degree of Freedom =	26	
t =	2.818847487	
p =	0.0045	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically greater than background mean

CHROMIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	20.26	27.58	18	15.2	3.02	10

Calculated Difference =	5.06	
Standard Error of the Difference =	6.7569619	
Degree of Freedom =	26	
t =	0.748857264	
p =	0.2303	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

COPPER - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	24.13	44.66	18	12.12	3.955	10

Calculated Difference =	12.01	
Standard Error of the Difference =	10.90360718	
Degree of Freedom =	26	
t =	1.101470348	
p =	0.1405	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

LEAD - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	57.7	111.1	18	13.43	1.547	10

Calculated Difference =	44.27	
Standard Error of the Difference =	26.95014837	
Degree of Freedom =	26	
t =	1.64266257	
p =	0.0562	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically greater than background mean

LITHIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	16.57	5.136	18	21.14	5.166	10

Calculated Difference =	4.57	
Standard Error of the Difference =	2.054368963	
Degree of Freedom =	26	
t =	2.224527377	
p =	0.0175	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	*site surface soil mean is statistically less than background mean*

MANGANESE - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	369.5	247.7	18	377.4	93.75	10

Calculated Difference =	7.9	
Standard Error of the Difference =	66.99284257	
Degree of Freedom =	26	
t =	0.117923045	
p =	0.4535	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically less than background mean

MERCURY - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0126	0.0163	18	0.0213	0.00479	10

Calculated Difference =	0.0087	
Standard Error of the Difference =	0.004233584	
Degree of Freedom =	26	
t =	2.054996426	
p =	0.0250	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

MOLYBDENUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.949	2.5	18	0.522	0.0739	10

Calculated Difference =	0.427	
Standard Error of the Difference =	0.606789238	
Degree of Freedom =	26	
t =	0.703703977	
p =	0.2439	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ZINC - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	418.4	1308	18	247	364.6	10

Calculated Difference =	171.4	
Standard Error of the Difference =	337.5387012	
Degree of Freedom =	26	
t =	0.507793623	
p =	0.3080	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

APPENDIX B-4
BACKGROUND COMPARISONS
NORTH OF MARLIN SOIL

ANTIMONY - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.416	1.779	36	0.953	0.878	10

Calculated Difference =	0.463	
Standard Error of the Difference =	0.513084318	
Degree of Freedom =	44	
t =	0.902385794	
p =	0.1859	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ARSENIC - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	2.573	1.369	36	3.438	1.792	10

Calculated Difference =	0.865	
Standard Error of the Difference =	0.656788524	
Degree of Freedom =	44	
t =	1.317014486	
p =	0.0973	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

BARIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	142.1	95.9	36	333.1	288.1	10

Calculated Difference =	191	
Standard Error of the Difference =	94.02738869	
Degree of Freedom =	44	
t =	2.031323029	
p =	0.0242	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

CADMIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.193	0.239	36	0.0311	0.0398	10

Calculated Difference =	0.1619	
Standard Error of the Difference =	0.059316632	
Degree of Freedom =	44	
t =	2.729419974	
p =	0.0045	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically greater than background mean

CHROMIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	17.17	19.6	36	15.2	3.02	10

Calculated Difference =	1.97	
Standard Error of the Difference =	4.848678898	
Degree of Freedom =	44	
t =	0.406296239	
p =	0.3432	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

COPPER - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	18.7	31.9	36	12.12	3.955	10

Calculated Difference =	6.58	
Standard Error of the Difference =	7.837321881	
Degree of Freedom =	44	
t =	0.83957251	
p =	0.2028	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

LEAD - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	37.8	80.99	36	13.43	1.547	10

Calculated Difference =	24.37	
Standard Error of the Difference =	19.6490511	
Degree of Freedom =	44	
t =	1.240263455	
p =	0.1108	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically greater than background mean

LITHIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	18.84	5.952	36	21.14	5.166	10

Calculated Difference =	2.3	
Standard Error of the Difference =	2.180058677	
Degree of Freedom =	44	
t =	1.055017475	
p =	0.1486	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

MANGANESE - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	347	204.1	36	377.4	93.75	10

Calculated Difference =	30.4	
Standard Error of the Difference =	57.70014591	
Degree of Freedom =	44	
t =	0.526861753	
p =	0.3005	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically less than background mean

MERCURY - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0094	0.0124	36	0.0213	0.00479	10

Calculated Difference =	0.0119	
Standard Error of the Difference =	0.00336736	
Degree of Freedom =	44	
t =	3.533925295	
p =	0.0005	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

MOLYBDENUM - NORTH OF MARLIN SOIL						
Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.586	1.788	36	0.522	0.0739	10

Calculated Difference =	0.064	
Standard Error of the Difference =	0.434282915	
Degree of Freedom =	44	
t =	0.147369371	
p =	0.4417	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ZINC - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	242.5	929.4	36	247	364.6	10

Calculated Difference =	4.5	
Standard Error of the Difference =	253.1879948	
Degree of Freedom =	44	
t =	0.017773355	
p =	0.4929	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

APPENDIX B-5
BACKGROUND COMPARISONS
INTRACOASTAL WATERWAY SEDIMENT

4,4'-DDT - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
4,4'-DDT	0.00041103	0.0007962	17	0.0001555	0.00015569	9

Calculated Difference =	0.00025553	
Standard Error of the Difference =	0.000199284	
Degree of Freedom =	24	
t =	1.28223903	
p =	0.106	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ALUMINUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Aluminum	6854	2346	16	12213	6892	9

Calculated Difference =	5359	
Standard Error of the Difference =	2252.49071	
Degree of Freedom =	23	
t =	2.379144107	
p =	0.013	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

ANTIMONY - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	2.245	1.751	16	4.023	2.215	9

Calculated Difference =	1.778	
Standard Error of the Difference =	0.819130942	
Degree of Freedom =	23	
t =	2.170593136	
p =	0.0203	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

ARSENIC - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	4.026	1.4	16	5.813	3.107	9

Calculated Difference =	1.787	
Standard Error of the Difference =	1.039537887	
Degree of Freedom =	23	
t =	1.719033066	
p =	0.0495	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

BARIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	215.3	59.65	16	209.7	47.73	9

Calculated Difference =	5.6	
Standard Error of the Difference =	20.90733397	
Degree of Freedom =	23	
t =	0.267848594	
p =	0.3956	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

BENZO(B)FLUORANTHENE - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Benzo(b)fluoranthene	0.1	0.157	16	0.0087	0.0106	9

Calculated Difference =	0.0913	
Standard Error of the Difference =	0.038225347	
Degree of Freedom =	23	
t =	2.388467508	
p =	0.5	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

BERYLLIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Beryllium	0.463	0.149	16	0.766	0.403	9

Calculated Difference =	0.303	
Standard Error of the Difference =	0.13246449	
Degree of Freedom =	23	
t =	2.287405473	
p =	0.0159	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

BORON - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Boron	12.04	9.92	16	27.64	12.82	9

Calculated Difference =	15.6	
Standard Error of the Difference =	4.714218044	
Degree of Freedom =	23	
t =	3.30913841	
p =	0.0015	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

COBALT - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cobalt	4.385	1.131	16	6.698	3.165	9

Calculated Difference =	2.313	
Standard Error of the Difference =	1.037770333	
Degree of Freedom =	23	
t =	2.228816845	
p =	0.0179	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

COPPER - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	7.112	2.997	16	8.138	5.165	9

Calculated Difference =	1.026	
Standard Error of the Difference =	1.787757246	
Degree of Freedom =	23	
t =	-0.573903421	
p =	0.2858	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

IRON - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Iron	13352	5546	16	16496	8097	9

Calculated Difference =	3144	
Standard Error of the Difference =	2892.307356	
Degree of Freedom =	23	
t =	1.087021403	
p =	0.1441	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

LEAD - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	11.56	7.161	16	9.587	3.602	9

Calculated Difference =	1.973	
Standard Error of the Difference =	2.076994545	
Degree of Freedom =	23	
t =	0.949930275	
p =	0.1760	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

LITHIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	10.53	3.559	16	21.4	14.41	9

Calculated Difference =	10.87	
Standard Error of the Difference =	4.637876359	
Degree of Freedom =	23	
t =	2.343745102	
p =	0.0141	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

MANGANESE - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	283.3	87.59	16	330.7	88.99	9

Calculated Difference =	47.4	
Standard Error of the Difference =	35.25927685	
Degree of Freedom =	23	
t =	1.34432706	
p =	0.0960	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

MERCURY - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0201	0.0073	16	0.0176	0.0132	9

Calculated Difference =	0.0025	
Standard Error of the Difference =	0.004534171	
Degree of Freedom =	23	
t =	0.551368717	
p =	0.5000	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

MOLYBDENUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.667	1.358	16	0.241	0.0675	9

Calculated Difference =	0.426	
Standard Error of the Difference =	0.330054329	
Degree of Freedom =	23	
t =	1.290696598	
p =	0.1048	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

NICKEL - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Nickel	9.589	2.741	16	14.91	8.111	9

Calculated Difference =	5.321	
Standard Error of the Difference =	2.649675082	
Degree of Freedom =	23	
t =	2.008170751	
p =	0.5000	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

STRONTIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Strontium	44.86	14.43	16	59.17	22.06	9

Calculated Difference =	14.31	
Standard Error of the Difference =	7.804670623	
Degree of Freedom =	23	
t =	1.833517478	
p =	0.0398	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

TITANIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Titanium	25.58	5.051	16	31.79	10.49	9

Calculated Difference =	6.21	
Standard Error of the Difference =	3.536205768	
Degree of Freedom =	23	
t =	1.756119527	
p =	0.0462	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

VANADIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Vanadium	13.86	3.523	16	20.21	9.135	9

Calculated Difference =	6.35	
Standard Error of the Difference =	3.012459534	
Degree of Freedom =	23	
t =	2.107912133	
p =	0.0231	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

ZINC - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	45.36	19.88	16	36.04	13.68	9

Calculated Difference =	9.32	
Standard Error of the Difference =	6.477819531	
Degree of Freedom =	23	
t =	1.438755735	
p =	0.0818	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

APPENDIX B-6
BACKGROUND COMPARISONS
WETLAND SEDIMENT

ANTIMONY - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.154	0.724	47	0.953	0.878	10

Calculated Difference =	0.201	
Standard Error of the Difference =	0.32851527	
Degree of Freedom =	55	
t =	0.611843706	
p =	0.2716	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ARSENIC - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	2.534	2.465	48	3.438	1.792	10

Calculated Difference =	0.904	
Standard Error of the Difference =	0.823742314	
Degree of Freedom =	56	
t =	1.097430573	
p =	0.1387	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

BARIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	151.7	136.5	48	333.1	288.1	10

Calculated Difference =	181.4	
Standard Error of the Difference =	96.93387285	
Degree of Freedom =	56	
t =	1.871378855	
p =	0.0333	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

CADMIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.103	0.146	48	0.0311	0.0398	10

Calculated Difference =	0.0719	
Standard Error of the Difference =	0.037580399	
Degree of Freedom =	56	
t =	1.913231441	
p =	0.0304	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically greater than background mean

CHROMIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	15.07	5.536	48	15.2	3.02	10

Calculated Difference =	0.13	
Standard Error of the Difference =	1.647671726	
Degree of Freedom =	56	
t =	0.078899211	
p =	0.4687	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

COPPER - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	14.49	8.49	48	12.12	3.955	10

Calculated Difference =	2.37	
Standard Error of the Difference =	2.409192475	
Degree of Freedom =	56	
t =	0.983732111	
p =	0.1647	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

LEAD - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	25.36	34.13	48	13.43	1.547	10

Calculated Difference =	11.93	
Standard Error of the Difference =	8.292183972	
Degree of Freedom =	56	
t =	1.438704211	
p =	0.0779	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically greater than background mean

LITHIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	18.65	3.754	48	21.14	5.166	10

Calculated Difference =	2.49	
Standard Error of the Difference =	1.870221145	
Degree of Freedom =	56	
t =	1.331393353	
p =	0.0943	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

MANGANESE - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	331.8	205.9	48	377.4	93.75	10

Calculated Difference =	45.6	
Standard Error of the Difference =	58.07511173	
Degree of Freedom =	56	
t =	0.785190052	
p =	0.2178	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically less than background mean

MERCURY - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0199	0.0194	48	0.0213	0.00479	10

Calculated Difference =	0.0014	
Standard Error of the Difference =	0.004942998	
Degree of Freedom =	56	
t =	0.283228898	
p =	0.3890	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically less than background mean

MOLYBDENUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.581	0.677	48	0.522	0.0739	10

Calculated Difference =	0.059	
Standard Error of the Difference =	0.16585129	
Degree of Freedom =	56	
t =	0.355740374	
p =	0.3617	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ZINC - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	139.1	160.9	53	247	364.6	10

Calculated Difference =	107.9	
Standard Error of the Difference =	121.7217613	
Degree of Freedom =	61	
t =	0.886447902	
p =	0.1896	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

APPENDIX B-7
BACKGROUND COMPARISONS
POND SEDIMENT

ANTIMONY - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	0.795	0.618	8	0.953	0.878	10

Calculated Difference =	0.158	
Standard Error of the Difference =	0.31552261	
Degree of Freedom =	16	
t =	0.500756506	
p =	0.3116	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

ARSENIC - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	1.735	2.233	8	3.438	1.792	10

Calculated Difference =	1.703	
Standard Error of the Difference =	0.783860649	
Degree of Freedom =	16	
t =	2.172580039	
p =	0.0226	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

BARIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	198.6	119.4	8	333.1	288.1	10

Calculated Difference =	134.5	
Standard Error of the Difference =	95.59691633	
Degree of Freedom =	16	
t =	1.406949148	
p =	0.0893	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site surface soil mean is not statistically less than background mean

CADMIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.147	0.112	8	0.0311	0.0398	10

Calculated Difference =	0.1159	
Standard Error of the Difference =	0.029938042	
Degree of Freedom =	16	
t =	3.871328672	
p =	0.0007	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically greater than background mean

CHROMIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	12.93	4.611	8	15.2	3.02	10

Calculated Difference =	2.27	
Standard Error of the Difference =	1.470614137	
Degree of Freedom =	16	
t =	1.543572812	
p =	0.0711	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

COPPER - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	15.2	7.421	8	12.12	3.955	10

Calculated Difference =	3.08	
Standard Error of the Difference =	2.191731568	
Degree of Freedom =	16	
t =	1.40528158	
p =	0.0896	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

LEAD - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	17.54	7.076	8	13.43	1.547	10

Calculated Difference =	4.11	
Standard Error of the Difference =	1.784545276	
Degree of Freedom =	16	
t =	2.303107719	
p =	0.0175	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically greater than background mean

LITHIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	18.48	4.071	8	21.14	5.166	10

Calculated Difference =	2.66	
Standard Error of the Difference =	1.908832199	
Degree of Freedom =	16	
t =	1.393522176	
p =	0.0912	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

MANGANESE - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	487.6	124.2	8	377.4	93.75	10

Calculated Difference =	110.2	
Standard Error of the Difference =	42.26460503	
Degree of Freedom =	16	
t =	2.607382701	
p =	0.0095	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically greater than background mean

MOLYBDENUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.146	0.191	8	0.522	0.0739	10

Calculated Difference =	0.376	
Standard Error of the Difference =	0.051885086	
Degree of Freedom =	16	
t =	7.24678375	
p =	0.0000	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site soil mean is statistically less than background mean

ZINC - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	332.3	407.7	8	247	364.6	10

Calculated Difference =	85.3	
Standard Error of the Difference =	151.8911495	
Degree of Freedom =	16	
t =	0.561586375	
p =	0.2910	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

APPENDIX C
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOUTH AREA SOIL

TABLE C-1
EXPOSURE POINT CONCENTATION (mg/kg)
SOIL SOUTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
2-Methylnaphthalene	0.0698		0.341	97.5% Chebyshev
4,4-DDD	0.00766		0.0498	97.5% Chebyshev
4,4'-DDE	0.0017		0.0054	97.5% Chebyshev
4,4'-DDT	0.0037		0.0125	99% Chebyshev
Acenaphthene	0.0419		0.115	97.5% Chebyshev
Acenaphthylene	0.042		0.114	97.5% Chebyshev
Anthracene	0.0874		0.21	97.5% Chebyshev
Aroclor-1254	0.205		0.74	97.5% Chebyshev
Benzo(a)anthracene	0.268		0.859	99% Chebyshev
Benzo(a)pyrene	0.347		1.008	99% Chebyshev
Benzo(b)fluoranthene	0.466		1.256	99% Chebyshev
Benzo(g,h,i)perylene	0.251		0.545	97.5% Chebyshev
Benzo(k)fluoranthene	0.157		0.378	97.5% Chebyshev
Boron	4.811		7.387	97.5% Chebyshev
Chrysene	0.327		0.938	99% Chebyshev
Cobalt	4.144		4.407	95% Student's-t
Copper	24.26		46.92	97.5% Chebyshev
Dibenz(a,h)anthracene	0.113		0.236	97.5% Chebyshev
Dieldrin	9.01E-04		0.0021	97.5% Chebyshev
Endrin Aldehyde	0.0019		0.0055	97.5% Chebyshev
Endrin Ketone	0.0013		0.0029	97.5% Chebyshev
Fluoranthene	0.594		1.886	99% Chebyshev
Fluorene	0.0442		0.107	97.5% Chebyshev
gamma-Chlordane	6.90E-04		0.0017	97.5% Chebyshev
Indeno(1,2,3-cd)pyrene	0.368		0.761	97.5% Chebyshev
Lead	53.52		104	97.5% Chebyshev
Molybdenum	0.89		1.61	97.5% Chebyshev
Naphthalene	0.323		2.775	99% Chebyshev
Nickel	11.74		12.37	95% Student's-t
Phenanthrene	0.401		1.349	99% Chebyshev
Pyrene	0.432		1.29	99% Chebyshev
Strontium	75.61		100.6	95% Chebyshev
Titanium	25.77		32.21	95% Student's-t
Vanadium	14.4		15.17	95% Approx. Gamma
Zinc	433.8		815.2	97.5% Chebyshev
LPAH	1.0093		5.011	
HPAH	3.323		9.157	
TOTAL PAHs	4.3323		14.168	

TABLE C-2
EXPOSURE POINT CONCENTATION (mg/kg)
SURFACE SOIL SOUTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
2-Methylnaphthalene	0.0293		0.0784	97.5% Chebyshev
4,4-DDD	7.89E-04		0.0029	97.5% Chebyshev
4,4'-DDE	0.0019		0.0074	97.5% Chebyshev
4,4'-DDT	0.0038		0.014	99% Chebyshev
Acenaphthene	0.0595		0.197	97.5% Chebyshev
Acenaphthylene	0.0382		0.113	97.5% Chebyshev
Anthracene	0.0961		0.297	97.5% Chebyshev
Aroclor-1254	0.137		0.726	97.5% Chebyshev
Benzo(a)anthracene	0.345		1.211	97.5% Chebyshev
Benzo(a)pyrene	0.457		1.457	97.5% Chebyshev
Benzo(b)fluoranthene	0.582		1.638	97.5% Chebyshev
Benzo(g,h,i)perylene	0.324		1.095	97.5% Chebyshev
Benzo(k)fluoranthene	0.24		0.651	97.5% Chebyshev
Boron	4.662		9.663	97.5% Chebyshev
Chrysene	0.409		1.322	99% Chebyshev
Cobalt	3.705		4.781	95% Chebyshev
Copper	27.98		32.45	95% H-UCL
Dibenz(a,h)anthracene	0.155		0.363	97.5% Chebyshev
Dieldrin	9.97E-04		0.003	97.5% Chebyshev
Endrin Aldehyde	0.0023		0.0084	97.5% Chebyshev
Endrin Ketone	0.0016		0.004	97.5% Chebyshev
Fluoranthene	0.799		2.656	97.5% H-UCL
Fluorene	0.0515		0.155	97.5% Chebyshev
gamma-Chlordane	8.27E-04		0.0025	97.5% Chebyshev
Indeno(1,2,3-cd)pyrene	0.47		1.115	97.5% Chebyshev
Lead	69.61		84.5	95% H-UCL
Molybdenum	1.306		1.645	95% Approx. Gamma
Naphthalene				NS
Nickel	11.64		12.54	95% Approx. Gamma
Phenanthrene	0.512		2.198	97.5% Chebyshev
Pyrene	0.533		1.366	95% H-UCL
Strontium	70.61		101.2	95% Chebyshev
Titanium	29.8		63	95% Chebyshev
Vanadium	13.76		14.84	95% Approx. Gamma
Zinc	601.2		727.7	95% Approx. Gamma
LPAH	0.7866		3.0384	
HPAH	4.314		12.874	
TOTAL PAHs	5.1006		15.9124	

Notes:
NS - Not sampled in surface soil.

TABLE C-3
TOXICITY VALUES

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
2-Methylnaphthalene																		
4,4-DDD	0.043	EPA, 2007a	Acute median LC50 in common cricket (dose 4.3 with uncertainty factor of 0.01)	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227		Avian TRV was used as a surrogate for the rat snake since no TRV was found specific for reptiles.	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
4,4'-DDE	0.043	EPA, 2007a	Acute median LC50 in common cricket (dose 4.3 with uncertainty factor of 0.01)	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227		Avian TRV was used as a surrogate for the rat snake since no TRV was found specific for reptiles.	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
4,4'-DDT	0.043	EPA, 2007a	Acute median LC50 in common cricket (dose 4.3 with uncertainty factor of 0.01)	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227		Avian TRV was used as a surrogate for the rat snake since no TRV was found specific for reptiles.	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Acenaphthene																		
Acenaphthylene																		
Anthracene																		
Aroclor-1254	2.51	EPA, 1999	Acute median LC50 in earthworms (dose 251 with uncertainty factor of 0.01)	0.155	Sample, 1996	Chronic LOAEL for reproduction in mouse with an uncertainty factor of 0.1	0.155	Sample, 1996	Chronic LOAEL for reproduction in mouse with an uncertainty factor of 0.1	0.18		Avian TRV	0.18	Sample, 1996		0.18	Sample, 1996	
Benzo(a)anthracene																		
Benzo(a)pyrene																		
Benzo(b)fluoranthene																		
Benzo(g,h,i)perylene																		
Benzo(k)fluoranthene																		
Boron																		
Chrysene																		
Cobalt																		
Copper	80	EPA, 2007c	Geometric mean of the MATC and EC10 values for six test species under different test species	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05		Avian TRV	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Dibenz(a,h)anthracene																		
Dieldrin				0.015	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.015	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.0709		Avian TRV	0.0709	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.0709	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival
Endrin Aldehyde				0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.01	Sample, 1996	Avian TRV	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1
Endrin Ketone				0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.01	Sample, 1996	Avian TRV	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1
Fluoranthene																		
Fluorene																		
gamma-Chlordane				4.6	Sample, 1996	Chronic NOAEL in mouse	4.6	Sample, 1996	Chronic NOAEL in mouse	2.14		Avian TRV	2.14	Sample, 1996	Chronic NOAEL in red-winged blackbird	2.14	Sample, 1996	Chronic NOAEL in red-winged blackbird
Indeno(1,2,3-cd)pyrene																		
Lead	1700	EPA, 2005e	Geometric mean of MATC values for one test species under different pH	4.7	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.7	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.63		Avian TRV	1.63	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.63	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Molybdenum																		
Naphthalene																		

TOXICITY VALUES

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
Nickel	280	EPA, 2007d	Geometric mean of MATC values for five species under different test conditions	1.7	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.7	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71		Avian TRV	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Phenanthrene																		
Pyrene																		
Strontium																		
Titanium																		
Vanadium	100	EPA, 2005d	LOAEC/NOAEC for growth in brocolli -- used as a surrogate for invertebrates	4.16	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.16	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.344		Avian TRV	0.344	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.344	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Zinc	120	EPA, 2007e	Geometric mean of the MATC and EC10 values for three test species under different test species	75.4	EPA, 2007e	Geometric mean of NOAEL values for reproduction and growth	75.4	EPA, 2007e	Geometric mean of NOAEL values for reproduction and growth	66.1		Avian TRV	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups
LPAH	29	EPA, 2007b		65.6	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	65.6	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	65.6		Mammalian TRV	65.6		Mammalian TRV	65.6		Mammalian TRV
HPAH	18	EPA, 2007b		0.615	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.615	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.615		Mammalian TRV	0.615		Mammalian TRV	0.615		Mammalian TRV
TOTAL PAHs																		

Notes:

EPA, 2007a -- DDT
EPA, 2007b -- PAHs
EPA, 2007c -- Copper
EPA, 2007d -- Nickel
EPA, 2007e -- Zinc
EPA, 2007f -- Selenium
EPA, 2005a -- Antimony
EPA, 2005b -- Cadmium
EPA, 2005c -- Chromium
EPA, 2005d -- Vanadium
EPA, 2005e -- Lead
EPA, 2005f -- Dieldrin
EPA, 2005g -- Barium

TABLE C-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
EARTHWORM

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV (earthworm)	Average EHQ	RME EHQ
2-Methylnaphthalene	6.98E-02	3.41E-01			
4,4-DDD	7.66E-03	4.98E-02	4.30E-02	1.78E-01	1.16E+00
4,4'-DDE	1.70E-03	5.40E-03	4.30E-02	3.95E-02	1.26E-01
4,4'-DDT	3.70E-03	1.25E-02	4.30E-02	8.60E-02	2.91E-01
Acenaphthene	4.19E-02	1.15E-01			
Acenaphthylene	4.20E-02	1.14E-01			
Anthracene	8.74E-02	2.10E-01			
Aroclor-1254	2.05E-01	7.40E-01	2.51E+00	8.17E-02	2.95E-01
Benzo(a)anthracene	2.68E-01	8.59E-01			
Benzo(a)pyrene	3.47E-01	1.01E+00			
Benzo(b)fluoranthene	4.66E-01	1.26E+00			
Benzo(g,h,i)perylene	2.51E-01	5.45E-01			
Benzo(k)fluoranthene	1.57E-01	3.78E-01			
Boron	4.81E+00	7.39E+00			
Chrysene	3.27E-01	9.38E-01			
Cobalt	4.14E+00	4.41E+00			
Copper	2.43E+01	4.69E+01	8.00E+01	3.03E-01	5.87E-01
Dibenz(a,h)anthracene	1.13E-01	2.36E-01			
Dieldrin	9.01E-04	2.10E-03			
Endrin Aldehyde	1.90E-03	5.50E-03			
Endrin Ketone	1.30E-03	2.90E-03			
Fluoranthene	5.94E-01	1.89E+00			
Fluorene	4.42E-02	1.07E-01			
gamma-Chlordane	6.90E-04	1.70E-03			
Indeno(1,2,3-cd)pyrene	3.68E-01	7.61E-01			
Lead	5.35E+01	1.04E+02	1.70E+03	3.15E-02	6.12E-02
Molybdenum	8.90E-01	1.61E+00			
Naphthalene	3.23E-01	2.78E+00			
Nickel	1.17E+01	1.24E+01	2.80E+02	4.19E-02	4.42E-02
Phenanthrene	4.01E-01	1.35E+00			
Pyrene	4.32E-01	1.29E+00			
Strontium	7.56E+01	1.01E+02			
Titanium	2.58E+01	3.22E+01			
Vanadium	1.44E+01	1.52E+01	1.00E+02	1.44E-01	1.52E-01
Zinc	4.34E+02	8.15E+02	1.20E+02	3.62E+00	6.79E+00
LPAH	1.01E+00	5.01E+00	2.90E+01	3.48E-02	1.73E-01
HPAH	3.32E+00	9.16E+00	1.80E+01	1.85E-01	5.09E-01
TOTAL PAHs	4.33E+00	1.42E+01			

TABLE C-5
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
DEER MOUSE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	2.13E-05	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	6.98E-02	3.41E-01	1.00E-04	4.91E-04
4,4-DDD	7.66E-03	4.98E-02	1.10E-05	7.17E-05
4,4'-DDE	1.70E-03	5.40E-03	2.45E-06	7.77E-06
4,4'-DDT	3.70E-03	1.25E-02	5.33E-06	1.80E-05
Acenaphthene	4.19E-02	1.15E-01	6.03E-05	1.66E-04
Acenaphthylene	4.20E-02	1.14E-01	6.04E-05	1.64E-04
Anthracene	8.74E-02	2.10E-01	1.26E-04	3.02E-04
Aroclor-1254	2.05E-01	7.40E-01	2.95E-04	1.07E-03
Benzo(a)anthracene	2.68E-01	8.59E-01	3.86E-04	1.24E-03
Benzo(a)pyrene	3.47E-01	1.01E+00	4.99E-04	1.45E-03
Benzo(b)fluoranthene	4.66E-01	1.26E+00	6.71E-04	1.81E-03
Benzo(g,h,i)perylene	2.51E-01	5.45E-01	3.61E-04	7.84E-04
Benzo(k)fluoranthene	1.57E-01	3.78E-01	2.26E-04	5.44E-04
Boron	4.81E+00	7.39E+00	6.92E-03	1.06E-02
Chrysene	3.27E-01	9.38E-01	4.71E-04	1.35E-03
Cobalt	4.14E+00	4.41E+00	5.96E-03	6.34E-03
Copper	2.43E+01	4.69E+01	3.49E-02	6.75E-02
Dibenz(a,h)anthracene	1.13E-01	2.36E-01	1.63E-04	3.40E-04
Dieldrin	9.01E-04	2.10E-03	1.30E-06	3.02E-06
Endrin Aldehyde	1.90E-03	5.50E-03	2.73E-06	7.92E-06
Endrin Ketone	1.30E-03	2.90E-03	1.87E-06	4.17E-06
Fluoranthene	5.94E-01	1.89E+00	8.55E-04	2.71E-03
Fluorene	4.42E-02	1.07E-01	6.36E-05	1.54E-04
gamma-Chlordane	6.90E-04	1.70E-03	9.94E-07	2.45E-06
Indeno(1,2,3-cd)pyrene	3.68E-01	7.61E-01	5.30E-04	1.10E-03
Lead	5.35E+01	1.04E+02	7.70E-02	1.50E-01
Molybdenum	8.90E-01	1.61E+00	1.28E-03	2.32E-03
Naphthalene	3.23E-01	2.78E+00	4.65E-04	3.99E-03
Nickel	1.17E+01	1.24E+01	1.69E-02	1.78E-02
Phenanthrene	4.01E-01	1.35E+00	5.77E-04	1.94E-03
Pyrene	4.32E-01	1.29E+00	6.22E-04	1.86E-03
Strontium	7.56E+01	1.01E+02	1.09E-01	1.45E-01
Titanium	2.58E+01	3.22E+01	3.71E-02	4.64E-02
Vanadium	1.44E+01	1.52E+01	2.07E-02	2.18E-02
Zinc	4.34E+02	8.15E+02	6.24E-01	1.17E+00
LPAH	1.01E+00	5.01E+00	1.45E-03	7.21E-03
HPAH	3.32E+00	9.16E+00	4.78E-03	1.32E-02
TOTAL PAHs	4.33E+00	1.42E+01	6.23E-03	2.04E-02

FOOD INGESTION

INTAKE = ((Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	8.87E-03	EPA, 1999 (normalized for bw)
Dfa	Dietary fraction of arthropods (unitless)	5.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	4.40E-01	EPA, 1993

TABLE C-5
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
DEER MOUSE

AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	9.65E-03	6.27E-02	7.18E-05	4.67E-04	3.26E-03	2.12E-02
4,4'-DDE	2.14E-03	6.80E-03	1.59E-05	5.06E-05	7.23E-04	2.30E-03
4,4'-DDT	4.66E-03	1.58E-02	3.47E-05	1.17E-04	1.57E-03	5.32E-03
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	2.32E-01	8.36E-01	2.05E-03	7.40E-03	7.83E-02	2.83E-01
Benzo(a)anthracene	8.04E-03	2.58E-02	5.41E-03	1.74E-02	4.13E-03	1.32E-02
Benzo(a)pyrene	2.43E-02	7.06E-02	3.50E-03	1.02E-02	9.08E-03	2.64E-02
Benzo(b)fluoranthene	3.26E-02	8.79E-02	4.71E-03	1.27E-02	1.22E-02	3.29E-02
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	1.26E-02	3.02E-02	1.59E-03	3.82E-03	4.63E-03	1.12E-02
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.31E-02	3.75E-02	6.11E-03	1.75E-02	6.00E-03	1.72E-02
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	9.70E-01	1.88E+00	9.70E+00	1.88E+01	2.88E+00	5.58E+00
Dibenz(a,h)anthracene	7.91E-03	1.65E-02	7.23E-04	1.51E-03	2.85E-03	5.94E-03
Dieldrin	1.32E-02	3.09E-02	3.14E-05	7.33E-05	4.45E-03	1.04E-02
Endrin Aldehyde	0.00E+00	0.00E+00	1.09E-04	3.17E-04	2.89E-05	8.35E-05
Endrin Ketone	0.00E+00	0.00E+00	7.49E-05	1.67E-04	1.97E-05	4.40E-05
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
gamma-Chlordane	0.00E+00	0.00E+00	9.87E-06	2.43E-05	2.60E-06	6.41E-06
Indeno(1,2,3-cd)pyrene	2.94E-02	6.09E-02	1.44E-03	2.97E-03	1.03E-02	2.12E-02
Lead	1.61E+00	3.12E+00	2.41E+00	4.68E+00	1.17E+00	2.28E+00
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.35E-01	2.47E-01	3.76E-01	3.96E-01	1.78E-01	1.87E-01
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Strontium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Titanium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylene (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	2.43E+02	4.57E+02	5.21E-10	9.78E-10	8.15E+01	1.53E+02
LPAH	7.07E-02	3.51E-01	2.04E-02	1.01E-01	2.91E-02	1.44E-01
HPAH	2.33E-01	6.41E-01	6.71E-02	1.85E-01	9.58E-02	2.64E-01
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	1.00E-04	4.91E-04
4,4-DDD	3.27E-03	2.13E-02
4,4'-DDE	7.26E-04	2.30E-03
4,4'-DDT	1.58E-03	5.33E-03
Acenaphthene	6.03E-05	1.66E-04
Acenaphthylene	6.04E-05	1.64E-04
Anthracene	1.26E-04	3.02E-04
Aroclor-1254	7.86E-02	2.84E-01
Benzo(a)anthracene	4.51E-03	1.45E-02
Benzo(a)pyrene	9.58E-03	2.78E-02
Benzo(b)fluoranthene	1.29E-02	3.47E-02

TABLE C-5
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
DEER MOUSE

Benzo(g,h,i)perylene	3.61E-04	7.84E-04
Benzo(k)fluoranthene	4.86E-03	1.17E-02
Boron	6.92E-03	1.06E-02
Chrysene	6.47E-03	1.86E-02
Cobalt	5.96E-03	6.34E-03
Copper	2.92E+00	5.65E+00
Dibenz(a,h)anthracene	3.01E-03	6.28E-03
Dieldrin	4.45E-03	1.04E-02
Endrin Aldehyde	3.16E-05	9.15E-05
Endrin Ketone	2.16E-05	4.82E-05
Fluoranthene	8.55E-04	2.71E-03
Fluorene	6.36E-05	1.54E-04
gamma-Chlordane	3.60E-06	8.86E-06
Indeno(1,2,3-cd)pyrene	1.08E-02	2.23E-02
Lead	1.25E+00	2.43E+00
Molybdenum	1.28E-03	2.32E-03
Naphthalene	4.65E-04	3.99E-03
Nickel	1.95E-01	2.05E-01
Phenanthrene	5.77E-04	1.94E-03
Pyrene	6.22E-04	1.86E-03
Strontium	1.09E-01	1.45E-01
Titanium	3.71E-02	4.64E-02
Vanadium	2.07E-02	2.18E-02
Zinc	8.22E+01	1.54E+02
LPAH	3.05E-02	1.52E-01
HPAH	1.01E-01	2.77E-01
TOTAL PAHs	1.31E-01	4.29E-01

TABLE C-6
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
COYOTE

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.55E+00	EPA, 1993 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.50E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.50E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.55E+01	EPA, 1993

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	2.09E-04	1.36E-03	1.26E-04	8.17E-04	1.88E-05	1.22E-04
4,4'-DDE	4.64E-05	1.47E-04	2.79E-05	8.86E-05	4.17E-06	1.33E-05
4,4'-DDT	1.01E-04	3.41E-04	6.07E-05	2.05E-04	9.08E-06	3.07E-05
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	4.99E-03	1.80E-02	3.00E-03	1.08E-02	4.50E-04	1.62E-03
Benzo(a)anthracene	1.93E-03	6.19E-03	1.16E-03	3.72E-03	1.74E-04	5.57E-04
Benzo(a)pyrene	7.06E-03	2.05E-02	4.26E-03	1.24E-02	6.36E-04	1.85E-03
Benzo(b)fluoranthene	1.12E-02	3.02E-02	6.73E-03	1.81E-02	1.01E-03	2.72E-03
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	3.76E-03	9.06E-03	2.25E-03	5.42E-03	3.38E-04	8.15E-04
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	2.71E-03	7.78E-03	1.63E-03	4.69E-03	2.44E-04	7.00E-04
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	6.01E-03	1.26E-02	3.63E-03	7.58E-03	5.42E-04	1.13E-03
Dieldrin	5.09E-06	1.19E-05	3.31E-06	7.73E-06	4.65E-07	1.08E-06
Endrin Aldehyde	4.50E-06	1.30E-05	2.95E-06	8.53E-06	4.11E-07	1.19E-06
Endrin Ketone	3.08E-06	6.87E-06	2.02E-06	4.50E-06	2.81E-07	6.28E-07
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
gamma-Chlordane	1.82E-05	4.47E-05	1.19E-05	2.92E-05	1.66E-06	4.08E-06
Indeno(1,2,3-cd)pyrene	4.57E-02	9.46E-02	2.75E-02	5.69E-02	4.12E-03	8.52E-03
Lead	9.66E-03	1.88E-02	0.00E+00	0.00E+00	7.24E-04	1.41E-03
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.24E-02	4.46E-02	0.00E+00	0.00E+00	3.18E-03	3.35E-03
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Strontium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Titanium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	2.34E-02	4.40E-02	1.74E+00	3.27E+00	4.53E-02	8.51E-02
LPAH	5.37E-02	2.67E-01	3.24E-02	1.61E-01	4.84E-03	2.40E-02
HPAH	1.77E-01	4.87E-01	1.07E-01	2.94E-01	1.59E-02	4.39E-02
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE C-7
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RAT SNAKE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.45E-04	EPA, 1993 *
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	6.98E-02	3.41E-01	7.26E-05	3.55E-04
4,4-DDD	7.66E-03	4.98E-02	7.97E-06	5.18E-05
4,4'-DDE	1.70E-03	5.40E-03	1.77E-06	5.62E-06
4,4'-DDT	3.70E-03	1.25E-02	3.85E-06	1.30E-05
Acenaphthene	4.19E-02	1.15E-01	4.36E-05	1.20E-04
Acenaphthylene	4.20E-02	1.14E-01	4.37E-05	1.19E-04
Anthracene	8.74E-02	2.10E-01	9.09E-05	2.18E-04
Aroclor-1254	2.05E-01	7.40E-01	2.13E-04	7.70E-04
Benzo(a)anthracene	2.68E-01	8.59E-01	2.79E-04	8.93E-04
Benzo(a)pyrene	3.47E-01	1.01E+00	3.61E-04	1.05E-03
Benzo(b)fluoranthene	4.66E-01	1.26E+00	4.85E-04	1.31E-03
Benzo(g,h,i)perylene	2.51E-01	5.45E-01	2.61E-04	5.67E-04
Benzo(k)fluoranthene	1.57E-01	3.78E-01	1.63E-04	3.93E-04
Boron	4.81E+00	7.39E+00	5.00E-03	7.68E-03
Chrysene	3.27E-01	9.38E-01	3.40E-04	9.76E-04
Cobalt	4.14E+00	4.41E+00	4.31E-03	4.58E-03
Copper	2.43E+01	4.69E+01	2.52E-02	4.88E-02
Dibenz(a,h)anthracene	1.13E-01	2.36E-01	1.18E-04	2.45E-04
Dieldrin	9.01E-04	2.10E-03	9.37E-07	2.18E-06
Endrin Aldehyde	1.90E-03	5.50E-03	1.98E-06	5.72E-06
Endrin Ketone	1.30E-03	2.90E-03	1.35E-06	3.02E-06
Fluoranthene	5.94E-01	1.89E+00	6.18E-04	1.96E-03
Fluorene	4.42E-02	1.07E-01	4.60E-05	1.11E-04
gamma-Chlordane	6.90E-04	1.70E-03	7.18E-07	1.77E-06
Indeno(1,2,3-cd)pyrene	3.68E-01	7.61E-01	3.83E-04	7.91E-04
Lead	5.35E+01	1.04E+02	5.57E-02	1.08E-01
Molybdenum	8.90E-01	1.61E+00	9.26E-04	1.67E-03
Naphthalene	3.23E-01	2.78E+00	3.36E-04	2.89E-03
Nickel	1.17E+01	1.24E+01	1.22E-02	1.29E-02
Phenanthrene	4.01E-01	1.35E+00	4.17E-04	1.40E-03
Pyrene	4.32E-01	1.29E+00	4.49E-04	1.34E-03
Strontium	7.56E+01	1.01E+02	7.86E-02	1.05E-01
Titanium	2.58E+01	3.22E+01	2.68E-02	3.35E-02
Vanadium	1.44E+01	1.52E+01	1.50E-02	1.58E-02
Zinc	4.34E+02	8.15E+02	4.51E-01	8.48E-01
LPAH	1.01E+00	5.01E+00	1.05E-03	5.21E-03
HPAH	3.32E+00	9.16E+00	3.46E-03	9.52E-03
TOTAL PAHs	4.33E+00	1.42E+01	4.51E-03	1.47E-02

FOOD INGESTION

INTAKE = ((Cb * IR * Dfb * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cm * IR * DFm *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cb	Bird concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.78E-03	EPA, 1993 (normalized for bw)
Dfb	Dietary fraction of birds (unitless)	1.80E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	2.00E-01	EPA, 1993
Dfm	Dietary fraction of small mammals (unitless)	6.20E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Bird	RME Bird	Average Arthropod	RME Arthropod	Average Mammal	RME Mammal	Average Intake	RME Intake

TABLE C-7
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RAT SNAKE

2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	1.26E-04	8.17E-04	9.65E-03	6.27E-02	2.09E-04	1.36E-03	4.16E-05	2.71E-04
4,4'-DDE	2.79E-05	8.86E-05	2.14E-03	6.80E-03	4.64E-05	1.47E-04	9.24E-06	2.94E-05
4,4'-DDT	6.07E-05	2.05E-04	4.66E-03	1.58E-02	1.01E-04	3.41E-04	2.01E-05	6.80E-05
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	3.00E-03	1.08E-02	2.32E-01	8.36E-01	4.99E-03	1.80E-02	9.99E-04	3.61E-03
Benzo(a)anthracene	1.16E-03	3.72E-03	8.04E-03	2.58E-02	1.93E-03	6.19E-03	6.03E-05	1.93E-04
Benzo(a)pyrene	4.26E-03	1.24E-02	2.43E-02	7.06E-02	7.06E-03	2.05E-02	2.00E-04	5.81E-04
Benzo(b)fluoranthene	6.73E-03	1.81E-02	3.26E-02	8.79E-02	1.12E-02	3.02E-02	2.94E-04	7.92E-04
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	2.25E-03	5.42E-03	1.26E-02	3.02E-02	3.76E-03	9.06E-03	1.05E-04	2.53E-04
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.63E-03	4.69E-03	1.31E-02	3.75E-02	2.71E-03	7.78E-03	9.18E-05	2.63E-04
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	9.70E-01	1.88E+00	0.00E+00	0.00E+00	3.88E-03	7.51E-03
Dibenz(a,h)anthracene	3.63E-03	7.58E-03	7.91E-03	1.65E-02	6.01E-03	1.26E-02	1.19E-04	2.49E-04
Dieldrin	3.31E-06	7.73E-06	1.32E-02	3.09E-02	5.09E-06	1.19E-05	5.30E-05	1.24E-04
Endrin Aldehyde	2.95E-06	8.53E-06	0.00E+00	0.00E+00	4.50E-06	1.30E-05	6.64E-08	1.92E-07
Endrin Ketone	2.02E-06	4.50E-06	0.00E+00	0.00E+00	3.08E-06	6.87E-06	4.55E-08	1.01E-07
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
gamma-Chlordane	1.19E-05	2.92E-05	0.00E+00	0.00E+00	1.82E-05	4.47E-05	2.68E-07	6.60E-07
Indeno(1,2,3-cd)pyrene	2.75E-02	5.69E-02	2.94E-02	6.09E-02	4.57E-02	9.46E-02	7.84E-04	1.62E-03
Lead	0.00E+00	0.00E+00	1.61E+00	3.12E+00	9.66E-03	1.88E-02	6.54E-03	1.27E-02
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	0.00E+00	0.00E+00	2.35E-01	2.47E-01	4.24E-02	4.46E-02	1.46E-03	1.54E-03
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Strontium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Titanium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	1.74E+00	3.27E+00	2.43E+02	4.57E+02	2.34E-02	4.40E-02	9.78E-01	1.84E+00
LPAH	3.24E-02	1.61E-01	7.07E-02	3.51E-01	5.37E-02	2.67E-01	1.07E-03	5.29E-03
HPAH	1.07E-01	2.94E-01	2.33E-01	6.41E-01	1.77E-01	4.87E-01	3.51E-03	9.67E-03
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	7.26E-05	3.55E-04
4,4-DDD	4.96E-05	3.23E-04
4,4'-DDE	1.10E-05	3.50E-05
4,4'-DDT	2.40E-05	8.10E-05
Acenaphthene	4.36E-05	1.20E-04
Acenaphthylene	4.37E-05	1.19E-04
Anthracene	9.09E-05	2.18E-04
Aroclor-1254	1.21E-03	4.38E-03
Benzo(a)anthracene	3.39E-04	1.09E-03
Benzo(a)pyrene	5.61E-04	1.63E-03
Benzo(b)fluoranthene	7.78E-04	2.10E-03
Benzo(g,h,i)perylene	2.61E-04	5.67E-04
Benzo(k)fluoranthene	2.68E-04	6.46E-04
Boron	5.00E-03	7.68E-03
Chrysene	4.32E-04	1.24E-03
Cobalt	4.31E-03	4.58E-03
Copper	2.91E-02	5.63E-02
Dibenz(a,h)anthracene	2.37E-04	4.95E-04
Dieldrin	5.40E-05	1.26E-04
Endrin Aldehyde	2.04E-06	5.91E-06
Endrin Ketone	1.40E-06	3.12E-06
Fluoranthene	6.18E-04	1.96E-03
Fluorene	4.60E-05	1.11E-04
gamma-Chlordane	9.86E-07	2.43E-06
Indeno(1,2,3-cd)pyrene	1.17E-03	2.41E-03
Lead	6.22E-02	1.21E-01

TABLE C-7
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RAT SNAKE

Molybdenum	9.26E-04	1.67E-03
Naphthalene	3.36E-04	2.89E-03
Nickel	1.37E-02	1.44E-02
Phenanthrene	4.17E-04	1.40E-03
Pyrene	4.49E-04	1.34E-03
Strontium	7.86E-02	1.05E-01
Titanium	2.68E-02	3.35E-02
Vanadium	1.50E-02	1.58E-02
Zinc	1.43E+00	2.69E+00
LPAH	2.12E-03	1.05E-02
HPAH	6.96E-03	1.92E-02
TOTAL PAHs	9.08E-03	2.97E-02

Notes:
* Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE C-8
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AMERICAN ROBIN

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.14E-03	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	2.93E-02	7.84E-02	4.18E-04	1.12E-03
4,4-DDD	7.89E-04	2.90E-03	1.12E-05	4.13E-05
4,4'-DDE	1.90E-03	7.40E-03	2.71E-05	1.05E-04
4,4'-DDT	3.80E-03	1.40E-02	5.42E-05	2.00E-04
Acenaphthene	5.95E-02	1.97E-01	8.48E-04	2.81E-03
Acenaphthylene	3.82E-02	1.13E-01	5.44E-04	1.61E-03
Anthracene	9.61E-02	2.97E-01	1.37E-03	4.23E-03
Aroclor-1254	1.37E-01	7.26E-01	1.95E-03	1.03E-02
Benzo(a)anthracene	3.45E-01	1.21E+00	4.92E-03	1.73E-02
Benzo(a)pyrene	4.57E-01	1.46E+00	6.51E-03	2.08E-02
Benzo(b)fluoranthene	5.82E-01	1.64E+00	8.29E-03	2.33E-02
Benzo(g,h,i)perylene	3.24E-01	1.10E+00	4.62E-03	1.56E-02
Benzo(k)fluoranthene	2.40E-01	6.51E-01	3.42E-03	9.28E-03
Boron	4.66E+00	9.66E+00	6.64E-02	1.38E-01
Chrysene	4.09E-01	1.32E+00	5.83E-03	1.88E-02
Cobalt	3.71E+00	4.78E+00	5.28E-02	6.81E-02
Copper	2.80E+01	3.25E+01	3.99E-01	4.62E-01
Dibenz(a,h)anthracene	1.55E-01	3.63E-01	2.21E-03	5.17E-03
Dieldrin	9.97E-04	3.00E-03	1.42E-05	4.28E-05
Endrin Aldehyde	2.30E-03	8.40E-03	3.28E-05	1.20E-04
Endrin Ketone	1.60E-03	4.00E-03	2.28E-05	5.70E-05
Fluoranthene	7.99E-01	2.66E+00	1.14E-02	3.78E-02
Fluorene	5.15E-02	1.55E-01	7.34E-04	2.21E-03
gamma-Chlordane	8.27E-04	2.50E-03	1.18E-05	3.56E-05
Indeno(1,2,3-cd)pyrene	4.70E-01	1.12E+00	6.70E-03	1.59E-02
Lead	6.96E+01	8.45E+01	9.92E-01	1.20E+00
Molybdenum	1.31E+00	1.65E+00	1.86E-02	2.34E-02
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.16E+01	1.25E+01	1.66E-01	1.79E-01
Phenanthrene	5.12E-01	2.20E+00	7.30E-03	3.13E-02
Pyrene	5.33E-01	1.37E+00	7.60E-03	1.95E-02
Strontium	7.06E+01	1.01E+02	1.01E+00	1.44E+00
Titanium	2.98E+01	6.30E+01	4.25E-01	8.98E-01
Vanadium	1.38E+01	1.48E+01	1.96E-01	2.11E-01
Zinc	6.01E+02	7.28E+02	8.57E+00	1.04E+01
LPAH	7.87E-01	3.04E+00	1.12E-02	4.33E-02
HPAH	4.31E+00	1.29E+01	6.15E-02	1.83E-01
TOTAL PAHs	5.10E+00	1.59E+01	7.27E-02	2.27E-01

FOOD INGESTION

INTAKE = ((Ce * IR * Dfe * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ce	Earthworm concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	3.52E-02	EPA, 1999 (normalized for bw)
Dfe	Dietary fraction of earthworms (unitless)	4.60E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	4.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	8.00E-02	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Earthworm	RME Earthworm	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake

TABLE C-8
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AMERICAN ROBIN

2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	9.65E-03	6.27E-02	9.65E-03	6.27E-02	7.18E-05	4.67E-04	3.91E-03	2.54E-02
4,4'-DDE	2.14E-03	6.80E-03	2.14E-03	6.80E-03	1.59E-05	5.06E-05	8.68E-04	2.76E-03
4,4'-DDT	4.66E-03	1.58E-02	4.66E-03	1.58E-02	3.47E-05	1.17E-04	1.89E-03	6.38E-03
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	2.32E-01	8.36E-01	2.32E-01	8.36E-01	2.05E-03	7.40E-03	9.38E-02	3.39E-01
Benzo(a)anthracene	8.04E-03	2.58E-02	8.04E-03	2.58E-02	5.41E-03	1.74E-02	3.45E-03	1.10E-02
Benzo(a)pyrene	2.43E-02	7.06E-02	2.43E-02	7.06E-02	3.50E-03	1.02E-02	9.96E-03	2.89E-02
Benzo(b)fluoranthene	3.26E-02	8.79E-02	3.26E-02	8.79E-02	4.71E-03	1.27E-02	1.34E-02	3.60E-02
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	1.26E-02	3.02E-02	1.26E-02	3.02E-02	1.59E-03	3.82E-03	5.14E-03	1.24E-02
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.31E-02	3.75E-02	1.31E-02	3.75E-02	6.11E-03	1.75E-02	5.51E-03	1.58E-02
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	9.70E-01	1.88E+00	9.70E-01	1.88E+00	9.70E+00	1.88E+01	7.34E-01	1.42E+00
Dibenz(a,h)anthracene	7.91E-03	1.65E-02	7.91E-03	1.65E-02	7.23E-04	1.51E-03	3.23E-03	6.74E-03
Dieldrin	1.32E-02	3.09E-02	1.32E-02	3.09E-02	3.14E-05	7.33E-05	5.36E-03	1.25E-02
Endrin Aldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-04	3.17E-04	3.85E-06	1.12E-05
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.49E-05	1.67E-04	2.64E-06	5.88E-06
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
gamma-Chlordane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.87E-06	2.43E-05	3.48E-07	8.56E-07
Indeno(1,2,3-cd)pyrene	2.94E-02	6.09E-02	2.94E-02	6.09E-02	1.44E-03	2.97E-03	1.20E-02	2.47E-02
Lead	1.61E+00	3.12E+00	1.61E+00	3.12E+00	2.41E+00	4.68E+00	7.35E-01	1.43E+00
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	2.35E-01	2.47E-01	2.35E-01	2.47E-01	3.76E-01	3.96E-01	1.08E-01	1.14E-01
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Strontium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Titanium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	2.43E+02	4.57E+02	2.43E+02	4.57E+02	5.21E-10	9.78E-10	9.83E+01	1.85E+02
LPAH	7.07E-02	3.51E-01	7.07E-02	3.51E-01	2.04E-02	1.01E-01	2.93E-02	1.46E-01
HPAH	2.33E-01	6.41E-01	2.33E-01	6.41E-01	6.71E-02	1.85E-01	9.65E-02	2.66E-01
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	4.18E-04	1.12E-03
4,4-DDD	3.92E-03	2.55E-02
4,4'-DDE	8.95E-04	2.86E-03
4,4'-DDT	1.94E-03	6.58E-03
Acenaphthene	8.48E-04	2.81E-03
Acenaphthylene	5.44E-04	1.61E-03
Anthracene	1.37E-03	4.23E-03
Aroclor-1254	9.58E-02	3.49E-01
Benzo(a)anthracene	8.36E-03	2.83E-02
Benzo(a)pyrene	1.65E-02	4.97E-02
Benzo(b)fluoranthene	2.17E-02	5.94E-02
Benzo(g,h,i)perylene	4.62E-03	1.56E-02
Benzo(k)fluoranthene	8.56E-03	2.17E-02
Boron	6.64E-02	1.38E-01
Chrysene	1.13E-02	3.46E-02
Cobalt	5.28E-02	6.81E-02
Copper	1.13E+00	1.88E+00
Dibenz(a,h)anthracene	5.44E-03	1.19E-02
Dieldrin	5.38E-03	1.25E-02
Endrin Aldehyde	3.66E-05	1.31E-04
Endrin Ketone	2.54E-05	6.29E-05
Ethylbenzene	0.00E+00	0.00E+00
Fluoranthene	1.14E-02	3.78E-02
Fluorene	7.34E-04	2.21E-03
gamma-Chlordane	1.21E-05	3.65E-05
Indeno(1,2,3-cd)pyrene	1.87E-02	4.06E-02

TABLE C-8
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AMERICAN ROBIN

Lead	1.73E+00	2.63E+00
Molybdenum	1.86E-02	2.34E-02
Naphthalene	0.00E+00	0.00E+00
Nickel	2.74E-01	2.93E-01
Phenanthrene	7.30E-03	3.13E-02
Pyrene	7.60E-03	1.95E-02
Strontium	1.01E+00	1.44E+00
Titanium	4.25E-01	8.98E-01
Vanadium	1.96E-01	2.11E-01
Zinc	1.07E+02	1.95E+02
LPAH	4.05E-02	1.89E-01
HPAH	1.58E-01	4.49E-01
TOTAL PAHs	1.99E-01	6.38E-01

TABLE C-9
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RED-TAILED HAWK

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.78E-01	EPA, 1999 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.85E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.15E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.60E-01	EPA, 1999

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4-DDD	2.09E-04	1.36E-03	1.26E-04	8.17E-04	3.53E-05	2.30E-04
4,4'-DDE	4.64E-05	1.47E-04	2.79E-05	8.86E-05	7.84E-06	2.49E-05
4,4'-DDT	1.01E-04	3.41E-04	6.07E-05	2.05E-04	1.71E-05	5.77E-05
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	4.99E-03	1.80E-02	3.00E-03	1.08E-02	8.45E-04	3.05E-03
Benzo(a)anthracene	1.93E-03	6.19E-03	1.16E-03	3.72E-03	3.27E-04	1.05E-03
Benzo(a)pyrene	7.06E-03	2.05E-02	4.26E-03	1.24E-02	1.19E-03	3.47E-03
Benzo(b)fluoranthene	1.12E-02	3.02E-02	6.73E-03	1.81E-02	1.90E-03	5.11E-03
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	3.76E-03	9.06E-03	2.25E-03	5.42E-03	6.36E-04	1.53E-03
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	2.71E-03	7.78E-03	1.63E-03	4.69E-03	4.59E-04	1.32E-03
Cobalt	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	6.01E-03	1.26E-02	3.63E-03	7.58E-03	1.02E-03	2.13E-03
Dieldrin	5.09E-06	1.19E-05	3.31E-06	7.73E-06	8.71E-07	2.03E-06
Endrin Aldehyde	4.50E-06	1.30E-05	2.95E-06	8.53E-06	7.71E-07	2.23E-06
Endrin Ketone	3.08E-06	6.87E-06	2.02E-06	4.50E-06	5.28E-07	1.18E-06
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
gamma-Chlordane	1.82E-05	4.47E-05	1.19E-05	2.92E-05	3.11E-06	7.66E-06
Indeno(1,2,3-cd)pyrene	4.57E-02	9.46E-02	2.75E-02	5.69E-02	7.74E-03	1.60E-02
Lead	9.66E-03	1.88E-02	0.00E+00	0.00E+00	1.40E-03	2.73E-03
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	4.24E-02	4.46E-02	0.00E+00	0.00E+00	6.15E-03	6.48E-03
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Strontium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Titanium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	2.34E-02	4.40E-02	1.74E+00	3.27E+00	7.27E-02	1.37E-01
LPAH	5.37E-02	2.67E-01	3.24E-02	1.61E-01	9.09E-03	4.51E-02
HPAH	1.77E-01	4.87E-01	1.07E-01	2.94E-01	2.99E-02	8.25E-02
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE C-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
DEER MOUSE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV (deer mouse)	Average EHQ	RME EHQ
2-Methylnaphthalene	1.00E-04	4.91E-04			
4,4-DDD	3.27E-03	2.13E-02	1.47E-01	2.22E-02	1.45E-01
4,4'-DDE	7.26E-04	2.30E-03	1.47E-01	4.94E-03	1.57E-02
4,4'-DDT	1.58E-03	5.33E-03	1.47E-01	1.07E-02	3.63E-02
Acenaphthene	6.03E-05	1.66E-04			
Acenaphthylene	6.04E-05	1.64E-04			
Anthracene	1.26E-04	3.02E-04			
Aroclor-1254	7.86E-02	2.84E-01	1.55E-01	5.07E-01	1.83E+00
Benzo(a)anthracene	4.51E-03	1.45E-02			
Benzo(a)pyrene	9.58E-03	2.78E-02			
Benzo(b)fluoranthene	1.29E-02	3.47E-02			
Benzo(g,h,i)perylene	3.61E-04	7.84E-04			
Benzo(k)fluoranthene	4.86E-03	1.17E-02			
Boron	6.92E-03	1.06E-02			
Chrysene	6.47E-03	1.86E-02			
Cobalt	5.96E-03	6.34E-03			
Copper	2.92E+00	5.65E+00	5.60E+00	5.21E-01	1.01E+00
Dibenz(a,h)anthracene	3.01E-03	6.28E-03			
Dieldrin	4.45E-03	1.04E-02	1.50E-02	2.97E-01	6.92E-01
Endrin Aldehyde	3.16E-05	9.15E-05	9.20E-02	3.43E-04	9.94E-04
Endrin Ketone	2.16E-05	4.82E-05	9.20E-02	2.35E-04	5.24E-04
Ethylbenzene	5.47E-06	1.83E-05			
Fluoranthene	8.55E-04	2.71E-03			
Fluorene	6.36E-05	1.54E-04			
gamma-Chlordane	3.60E-06	8.86E-06	4.60E+00	7.82E-07	1.93E-06
Indeno(1,2,3-cd)pyrene	1.08E-02	2.23E-02			
Lead	1.25E+00	2.43E+00	4.70E+00	2.66E-01	5.17E-01
Molybdenum	1.28E-03	2.32E-03			
Naphthalene	4.65E-04	3.99E-03			
Nickel	1.95E-01	2.05E-01	1.70E+00	1.15E-01	1.21E-01
Phenanthrene	5.77E-04	1.94E-03			
Pyrene	6.22E-04	1.86E-03			
Strontium	1.09E-01	1.45E-01			
Titanium	3.71E-02	4.64E-02			
Vanadium	2.07E-02	2.18E-02	4.16E+00	4.98E-03	5.25E-03
Zinc	8.22E+01	1.54E+02	7.54E+01	1.09E+00	2.05E+00
LPAH	3.05E-02	1.52E-01	6.56E+01	4.66E-04	2.31E-03
HPAH	1.01E-01	2.77E-01	6.15E-01	1.63E-01	4.51E-01
TOTAL PAHs	1.31E-01	4.29E-01			

TABLE C-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
COYOTE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Coyote	Average EHQ	RME EHQ
2-Methylnaphthalene	0.00E+00	0.00E+00			
4,4-DDD	1.88E-05	1.22E-04	1.47E-01	1.28E-04	8.32E-04
4,4'-DDE	4.17E-06	1.33E-05	1.47E-01	2.84E-05	9.02E-05
4,4'-DDT	9.08E-06	3.07E-05	1.47E-01	6.18E-05	2.09E-04
Acenaphthene	0.00E+00	0.00E+00			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	0.00E+00	0.00E+00			
Aroclor-1254	4.50E-04	1.62E-03	1.55E-01	2.90E-03	1.05E-02
Benzo(a)anthracene	1.74E-04	5.57E-04			
Benzo(a)pyrene	6.36E-04	1.85E-03			
Benzo(b)fluoranthene	1.01E-03	2.72E-03			
Benzo(g,h,i)perylene	0.00E+00	0.00E+00			
Benzo(k)fluoranthene	3.38E-04	8.15E-04			
Boron	0.00E+00	0.00E+00			
Chrysene	2.44E-04	7.00E-04			
Cobalt	0.00E+00	0.00E+00			
Copper	0.00E+00	0.00E+00	5.60E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	5.42E-04	1.13E-03			
Dieldrin	4.65E-07	1.08E-06	1.50E-02	3.10E-05	7.22E-05
Endrin Aldehyde	4.11E-07	1.19E-06	9.20E-02	4.47E-06	1.29E-05
Endrin Ketone	2.81E-07	6.28E-07	9.20E-02	3.06E-06	6.82E-06
Ethylbenzene	0.00E+00	0.00E+00			
Fluoranthene	0.00E+00	0.00E+00			
Fluorene	0.00E+00	0.00E+00			
gamma-Chlordane	1.66E-06	4.08E-06	4.60E+00	3.61E-07	8.88E-07
Indeno(1,2,3-cd)pyrene	4.12E-03	8.52E-03			
Lead	7.24E-04	1.41E-03	4.70E+00	1.54E-04	2.99E-04
Molybdenum	0.00E+00	0.00E+00			
Naphthalene	0.00E+00	0.00E+00			
Nickel	3.18E-03	3.35E-03	1.70E+00	1.87E-03	1.97E-03
Phenanthrene	0.00E+00	0.00E+00			
Pyrene	0.00E+00	0.00E+00			
Strontium	0.00E+00	0.00E+00			
Titanium	0.00E+00	0.00E+00			
Vanadium	0.00E+00	0.00E+00	4.16E+00	0.00E+00	0.00E+00
Zinc	4.53E-02	8.51E-02	7.54E+01	6.01E-04	1.13E-03
LPAH	4.84E-03	2.40E-02	6.56E+01	7.38E-05	3.66E-04
HPAH	1.59E-02	4.39E-02	6.15E-01	2.59E-02	7.14E-02
TOTAL PAHs	0.00E+00	0.00E+00			

TABLE C-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
RAT SNAKE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Rat Snake	Average EHQ	RME EHQ
2-Methylnaphthalene	7.26E-05	3.55E-04			
4,4-DDD	4.96E-05	3.23E-04	2.27E-01	2.19E-04	1.42E-03
4,4'-DDE	1.10E-05	3.50E-05	2.27E-01	4.85E-05	1.54E-04
4,4'-DDT	2.40E-05	8.10E-05	2.27E-01	1.06E-04	3.57E-04
Acenaphthene	4.36E-05	1.20E-04			
Acenaphthylene	4.37E-05	1.19E-04			
Anthracene	9.09E-05	2.18E-04			
Aroclor-1254	1.21E-03	4.38E-03	1.80E-01	6.74E-03	2.43E-02
Benzo(a)anthracene	3.39E-04	1.09E-03			
Benzo(a)pyrene	5.61E-04	1.63E-03			
Benzo(b)fluoranthene	7.78E-04	2.10E-03			
Benzo(g,h,i)perylene	2.61E-04	5.67E-04			
Benzo(k)fluoranthene	2.68E-04	6.46E-04			
Boron	5.00E-03	7.68E-03			
Chrysene	4.32E-04	1.24E-03			
Cobalt	4.31E-03	4.58E-03			
Copper	2.91E-02	5.63E-02	4.05E+00	7.19E-03	1.39E-02
Dibenz(a,h)anthracene	2.37E-04	4.95E-04			
Dieldrin	5.40E-05	1.26E-04	7.09E-02	7.61E-04	1.77E-03
Endrin Aldehyde	2.04E-06	5.91E-06	1.00E-02	2.04E-04	5.91E-04
Endrin Ketone	1.40E-06	3.12E-06	1.00E-02	1.40E-04	3.12E-04
Ethylbenzene	3.95E-06	1.32E-05			
Fluoranthene	6.18E-04	1.96E-03			
Fluorene	4.60E-05	1.11E-04			
gamma-Chlordane	9.86E-07	2.43E-06	2.14E+00	4.61E-07	1.13E-06
Indeno(1,2,3-cd)pyrene	1.17E-03	2.41E-03			
Lead	6.22E-02	1.21E-01	1.63E+00	3.82E-02	7.42E-02
Molybdenum	9.26E-04	1.67E-03			
Naphthalene	3.36E-04	2.89E-03			
Nickel	1.37E-02	1.44E-02	6.71E+00	2.04E-03	2.15E-03
Phenanthrene	4.17E-04	1.40E-03			
Pyrene	4.49E-04	1.34E-03			
Strontium	7.86E-02	1.05E-01			
Titanium	2.68E-02	3.35E-02			
Vanadium	1.50E-02	1.58E-02	3.44E-01	4.35E-02	4.59E-02
Zinc	1.43E+00	2.69E+00	6.61E+01	2.16E-02	4.06E-02
LPAH	2.12E-03	1.05E-02	6.56E+01	3.22E-05	1.60E-04
HPAH	6.96E-03	1.92E-02	6.15E-01	1.13E-02	3.12E-02
TOTAL PAHs	9.08E-03	2.97E-02			

TABLE C-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
AMERICAN ROBIN

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV American Robin	Average EHQ	RME EHQ
2-Methylnaphthalene	4.18E-04	1.12E-03			
4,4-DDD	3.92E-03	2.55E-02	2.27E-01	1.73E-02	1.12E-01
4,4'-DDE	8.95E-04	2.86E-03	2.27E-01	3.94E-03	1.26E-02
4,4'-DDT	1.94E-03	6.58E-03	2.27E-01	8.56E-03	2.90E-02
Acenaphthene	8.48E-04	2.81E-03			
Acenaphthylene	5.44E-04	1.61E-03			
Anthracene	1.37E-03	4.23E-03			
Aroclor-1254	9.58E-02	3.49E-01	1.80E-01	5.32E-01	1.94E+00
Benzo(a)anthracene	8.36E-03	2.83E-02			
Benzo(a)pyrene	1.65E-02	4.97E-02			
Benzo(b)fluoranthene	2.17E-02	5.94E-02			
Benzo(g,h,i)perylene	4.62E-03	1.56E-02			
Benzo(k)fluoranthene	8.56E-03	2.17E-02			
Boron	6.64E-02	1.38E-01			
Chrysene	1.13E-02	3.46E-02			
Cobalt	5.28E-02	6.81E-02			
Copper	1.13E+00	1.88E+00	4.05E+00	2.80E-01	4.65E-01
Dibenz(a,h)anthracene	5.44E-03	1.19E-02			
Dieldrin	5.38E-03	1.25E-02	7.09E-02	7.58E-02	1.77E-01
Endrin Aldehyde	3.66E-05	1.31E-04	1.00E-02	3.66E-03	1.31E-02
Endrin Ketone	2.54E-05	6.29E-05	1.00E-02	2.54E-03	6.29E-03
Fluoranthene	1.14E-02	3.78E-02			
Fluorene	7.34E-04	2.21E-03			
gamma-Chlordane	1.21E-05	3.65E-05	2.14E+00	5.67E-06	1.70E-05
Indeno(1,2,3-cd)pyrene	1.87E-02	4.06E-02			
Lead	1.73E+00	2.63E+00	1.63E+00	1.06E+00	1.61E+00
Molybdenum	1.86E-02	2.34E-02			
Naphthalene	0.00E+00	0.00E+00			
Nickel	2.74E-01	2.93E-01	6.71E+00	4.09E-02	4.36E-02
Phenanthrene	7.30E-03	3.13E-02			
Pyrene	7.60E-03	1.95E-02			
Strontium	1.01E+00	1.44E+00			
Titanium	4.25E-01	8.98E-01			
Vanadium	1.96E-01	2.11E-01	3.44E-01	5.70E-01	6.15E-01
Zinc	1.07E+02	1.95E+02	6.61E+01	1.62E+00	2.95E+00
LPAH	4.05E-02	1.89E-01	6.56E+01	6.18E-04	2.88E-03
HPAH	1.58E-01	4.49E-01	6.15E-01	2.57E-01	7.31E-01
TOTAL PAHs	1.99E-01	6.38E-01			

TABLE C-14
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
RED-TAILED HAWK

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Red-Tailed Hawk	Average EHQ	RME EHQ
2-Methylnaphthalene	0.00E+00	0.00E+00			
4,4-DDD	3.53E-05	2.30E-04	2.27E-01	1.56E-04	1.01E-03
4,4'-DDE	7.84E-06	2.49E-05	2.27E-01	3.45E-05	1.10E-04
4,4'-DDT	1.71E-05	5.77E-05	2.27E-01	7.52E-05	2.54E-04
Acenaphthene	0.00E+00	0.00E+00			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	0.00E+00	0.00E+00			
Aroclor-1254	8.45E-04	3.05E-03	1.80E-01	4.69E-03	1.69E-02
Benzo(a)anthracene	3.27E-04	1.05E-03			
Benzo(a)pyrene	1.19E-03	3.47E-03			
Benzo(b)fluoranthene	1.90E-03	5.11E-03			
Benzo(g,h,i)perylene	0.00E+00	0.00E+00			
Benzo(k)fluoranthene	6.36E-04	1.53E-03			
Boron	0.00E+00	0.00E+00			
Chrysene	4.59E-04	1.32E-03			
Cobalt	0.00E+00	0.00E+00			
Copper	0.00E+00	0.00E+00	4.05E+00	0.00E+00	0.00E+00
Dibenz(a,h)anthracene	1.02E-03	2.13E-03			
Dieldrin	8.71E-07	2.03E-06	7.09E-02	1.23E-05	2.86E-05
Endrin Aldehyde	7.71E-07	2.23E-06	1.00E-02	7.71E-05	2.23E-04
Endrin Ketone	5.28E-07	1.18E-06	1.00E-02	5.28E-05	1.18E-04
Fluoranthene	0.00E+00	0.00E+00			
Fluorene	0.00E+00	0.00E+00			
gamma-Chlordane	3.11E-06	7.66E-06	2.14E+00	1.45E-06	3.58E-06
Indeno(1,2,3-cd)pyrene	7.74E-03	1.60E-02			
Lead	1.40E-03	2.73E-03	1.63E+00	8.60E-04	1.67E-03
Molybdenum	0.00E+00	0.00E+00			
Naphthalene	0.00E+00	0.00E+00			
Nickel	6.15E-03	6.48E-03	6.71E+00	9.17E-04	9.66E-04
Phenanthrene	0.00E+00	0.00E+00			
Pyrene	0.00E+00	0.00E+00			
Strontium	0.00E+00	0.00E+00			
Titanium	0.00E+00	0.00E+00			
Vanadium	0.00E+00	0.00E+00	3.44E-01	0.00E+00	0.00E+00
Zinc	7.27E-02	1.37E-01	6.61E+01	1.10E-03	2.07E-03
LPAH	9.09E-03	4.51E-02	6.56E+01	1.39E-04	6.88E-04
HPAH	2.99E-02	8.25E-02	6.15E-01	4.87E-02	1.34E-01
TOTAL PAHs	0.00E+00	0.00E+00			

TABLE C-15
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csoil x BCF (or BAF)

where:

Cfood = Chemical Concentration in food (mg/kg dry)
Csoil = Chemical Concentration in soil (mg/kg dry)
BCF = Bioconcentration Factor (unitless)
BAF = Bioaccumulation Factor (unitless)

Compound	Average Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
2-Methylnaphthalene	6.98E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
4,4-DDD	7.66E-03	1.26E+00	9.65E-03	EPA, 1999	1.26E+00	9.65E-03	EPA, 1999	9.37E-03	7.18E-05	EPA, 1999	2.72E-02	2.08E-04	EPA, 1999	6.52E-05	4.99E-07	EPA, 1999	2.09E-04	1.59E-02	1.22E-04	EPA, 1999	5.10E-04	3.91E-06	EPA, 1999	1.26E-04
4,4'-DDE	1.70E-03	1.26E+00	2.14E-03	EPA, 1999	1.26E+00	2.14E-03	EPA, 1999	9.37E-03	1.59E-05	EPA, 1999	2.72E-02	4.62E-05	EPA, 1999	6.52E-05	1.11E-07	EPA, 1999	4.64E-05	1.59E-02	2.70E-05	EPA, 1999	5.10E-04	8.67E-07	EPA, 1999	2.79E-05
4,4'-DDT	3.70E-03	1.26E+00	4.66E-03	EPA, 1999	1.26E+00	4.66E-03	EPA, 1999	9.37E-03	3.47E-05	EPA, 1999	2.72E-02	1.01E-04	EPA, 1999	6.52E-05	2.41E-07	EPA, 1999	1.01E-04	1.59E-02	5.88E-05	EPA, 1999	5.10E-04	1.89E-06	EPA, 1999	6.07E-05
Acenaphthene	4.19E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Acenaphthylene	4.20E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Anthracene	8.74E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Aroclor-1254	2.05E-01	1.13E+00	2.32E-01	EPA, 1999	1.13E+00	2.32E-01	EPA, 1999	1.00E-02	2.05E-03	EPA, 1999	2.43E-02	4.98E-03	EPA, 1999	5.83E-05	1.20E-05	EPA, 1999	4.99E-03	1.42E-02	2.91E-03	EPA, 1999	4.55E-04	9.33E-05	EPA, 1999	3.00E-03
Benzo(a)anthracene	2.68E-01	3.00E-02	8.04E-03	EPA, 1999	3.00E-02	8.04E-03	EPA, 1999	2.02E-02	5.41E-03	EPA, 1999	7.19E-03	1.93E-03	EPA, 1999	1.73E-05	4.64E-06	EPA, 1999	1.93E-03	4.20E-03	1.13E-03	EPA, 1999	1.35E-04	3.62E-05	EPA, 1999	1.16E-03
Benzo(a)pyrene	3.47E-01	7.00E-02	2.43E-02	EPA, 1999	7.00E-02	2.43E-02	EPA, 1999	1.01E-02	3.50E-03	EPA, 1999	2.03E-02	7.04E-03	EPA, 1999	4.86E-05	1.69E-05	EPA, 1999	7.06E-03	1.19E-02	4.13E-03	EPA, 1999	3.81E-04	1.32E-04	EPA, 1999	4.26E-03
Benzo(b)fluoranthene	4.66E-01	7.00E-02	3.26E-02	EPA, 1999	7.00E-02	3.26E-02	EPA, 1999	1.01E-02	4.71E-03	EPA, 1999	2.40E-02	1.12E-02	EPA, 1999	5.75E-05	2.68E-05	EPA, 1999	1.12E-02	1.40E-02	6.52E-03	EPA, 1999	4.50E-04	2.10E-04	EPA, 1999	6.73E-03
Benzo(g,h,i)perylene	2.51E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Benzo(k)fluoranthene	1.57E-01	8.00E-02	1.26E-02	EPA, 1999	8.00E-02	1.26E-02	EPA, 1999	1.01E-02	1.59E-03	EPA, 1999	2.39E-02	3.75E-03	EPA, 1999	5.73E-05	9.00E-06	EPA, 1999	3.76E-03	1.39E-02	2.18E-03	EPA, 1999	4.48E-04	7.03E-05	EPA, 1999	2.25E-03
Boron	4.81E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Chrysene	3.27E-01	4.00E-02	1.31E-02	EPA, 1999	4.00E-02	1.31E-02	EPA, 1999	1.87E-02	6.11E-03	EPA, 1999	8.27E-03	2.70E-03	EPA, 1999	1.99E-05	6.51E-06	EPA, 1999	2.71E-03	4.84E-03	1.58E-03	EPA, 1999	1.55E-04	5.07E-05	EPA, 1999	1.63E-03
Cobalt	4.14E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Copper	2.43E+01	4.00E-02	9.70E-01	EPA, 1999	4.00E-02	9.70E-01	EPA, 1999	4.00E-01	9.70E+00	EPA, 1999		0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Dibenz(a,h)anthracene	1.13E-01	7.00E-02	7.91E-03	EPA, 1999	7.00E-02	7.91E-03	EPA, 1999	6.40E-03	7.23E-04	EPA, 1999	5.31E-02	6.00E-03	EPA, 1999	1.27E-04	1.44E-05	EPA, 1999	6.01E-03	3.11E-02	3.51E-03	EPA, 1999	9.98E-04	1.13E-04	EPA, 1999	3.63E-03
Dieldrin	9.01E-04	1.47E+01	1.32E-02	EPA, 2005f	1.47E+01	1.32E-02	EPA, 2005f	3.49E-02	3.14E-05	EPA, 1998	5.65E-03	5.09E-06	EPA, 1998		0.00E+00		5.09E-06	3.68E-03	3.31E-06	EPA, 1998		0.00E+00		3.31E-06
Endrin Aldehyde	1.90E-03		0.00E+00			0.00E+00		5.76E-02	1.09E-04	EPA, 1998	2.37E-03	4.50E-06	EPA, 1998		0.00E+00		4.50E-06	1.55E-03	2.95E-06	EPA, 1998		0.00E+00		2.95E-06
Edrin Ketone	1.30E-03		0.00E+00			0.00E+00		5.76E-02	7.49E-05	EPA, 1998	2.37E-03	3.08E-06	EPA, 1998		0.00E+00		3.08E-06	1.55E-03	2.02E-06	EPA, 1998		0.00E+00		2.02E-06
Ethylbenzene	3.80E-03		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluoranthene	5.94E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluorene	4.42E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
gamma-Chlordane	6.90E-04		0.00E+00			0.00E+00		1.43E-02	9.87E-06	EPA, 1998	2.63E-02	1.82E-05	EPA, 1998		0.00E+00		1.82E-05	1.72E-02	1.19E-05	EPA, 1998		0.00E+00		1.19E-05
Indeno(1,2,3-cd)pyrene	3.68E-01	8.00E-02	2.94E-02	EPA, 1999	8.00E-02	2.94E-02	EPA, 1999	3.90E-03	1.44E-03	EPA, 1999	1.24E-01	4.56E-02	EPA, 1999	2.98E-04	1.10E-04	EPA, 1999	4.57E-02	7.24E-02	2.66E-02	EPA, 1999	2.32E-03	8.54E-04	EPA, 1999	2.75E-02
Lead	5.35E+01	3.00E-02	1.61E+00	EPA, 1999	3.00E-02	1.61E+00	EPA, 1999	4.50E-02	2.41E+00	EPA, 1999	1.80E-04	9.63E-03	EPA, 1999	4.32E-07	2.31E-05	EPA, 1999	9.66E-03		0.00E+00			0.00E+00		0.00E+00
Molybdenum	8.90E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Naphthalene	3.23E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Nickel	1.17E+01	2.00E-02	2.35E-01	EPA, 1999	2.00E-02	2.35E-01	EPA, 1999	3.20E-02	3.76E-01	EPA, 1999	3.60E-03	4.23E-02	EPA, 1999	8.63E-06	1.01E-04	EPA, 1999	4.24E-02		0.00E+00			0.00E+00		0.00E+00
Phenanthrene	4.01E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Pyrene	4.32E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Strontium	7.56E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Titanium	2.58E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Vanadium	1.44E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Zinc	4.34E+02	5.60E-01	2.43E+02	EPA, 1999	5.60E-01	2.43E+02	EPA, 1999	1.20E-12	5.21E-10	EPA, 1999	5.39E-05	2.34E-02	EPA, 1999	1.29E-07	5.60E-05	EPA, 1999	2.34E-02	3.89E-03	1.69E+00	EPA, 1999	1.25E-04	5.42E-02	EPA, 1999	1.74E+00
LPAH	1.01E+00	7.00E-02	7.07E-02	EPA, 1999*	7.00E-02	7.07E-02	EPA, 1999*	2.02E-02	2.04E-02	EPA, 1999*	5.31E-02	5.36E-02	EPA, 1999*	1.27E-04	1.28E-04	EPA, 1999*	5.37E-02	3.11E-02	3.14E-02	EPA, 1999*	9.98E-04	1.01E-03	EPA, 1999*	3.24E-02
HPAH	3.32E+00	7.00E-02	2.33E-01	EPA, 1999*	7.00E-02	2.33E-01	EPA, 1999*	2.02E-02	6.71E-02	EPA, 1999*	5.31E-02	1.76E-01	EPA, 1999*	1.27E-04	4.22E-04	EPA, 1999*	1.77E-01	3.11E-02	1.03E-01	EPA, 1999*	9.98E-04	3.32E-03	EPA, 1999*	1.07E-01
TOTAL PAHs	4.33E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007a -- DDT
EPA, 2007b -- PAHs
EPA, 2007c -- Copper
EPA, 2007d -- Nickel
EPA, 2007e -- Zinc
EPA, 2005a -- Antimony
EPA, 2005b -- Cadmium
EPA, 2005c -- Chromium
EPA, 2005d -- Vanadium
EPA, 2005e -- Lead

TABLE C-16
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csoil x BCF (or BAF)

where:

Cfood = Chemical Concentration in food (mg/kg dry)
Csoil = Chemical Concentration in soil (mg/kg dry)
BCF = Bioconcentration Factor (unitless)
BAF = Bioaccumulation Factor (unitless)

Compound	RME Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
2-Methylnaphthalene	3.41E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
4,4-DDD	4.98E-02	1.26E+00	6.27E-02	EPA, 1999	1.26E+00	6.27E-02	EPA, 1999	9.37E-03	4.67E-04	EPA, 1999	2.72E-02	1.35E-03	EPA, 1999	6.52E-05	3.25E-06	EPA, 1999	1.36E-03	1.59E-02	7.92E-04	EPA, 1999	5.10E-04	2.54E-05	EPA, 1999	8.17E-04
4,4'-DDE	5.40E-03	1.26E+00	6.80E-03	EPA, 1999	1.26E+00	6.80E-03	EPA, 1999	9.37E-03	5.06E-05	EPA, 1999	2.72E-02	1.47E-04	EPA, 1999	6.52E-05	3.52E-07	EPA, 1999	1.47E-04	1.59E-02	8.59E-05	EPA, 1999	5.10E-04	2.75E-06	EPA, 1999	8.86E-05
4,4'-DDT	1.25E-02	1.26E+00	1.58E-02	EPA, 1999	1.26E+00	1.58E-02	EPA, 1999	9.37E-03	1.17E-04	EPA, 1999	2.72E-02	3.40E-04	EPA, 1999	6.52E-05	8.15E-07	EPA, 1999	3.41E-04	1.59E-02	1.99E-04	EPA, 1999	5.10E-04	6.38E-06	EPA, 1999	2.05E-04
Acenaphthene	1.15E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Acenaphthylene	1.14E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Anthracene	2.10E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Aroclor-1254	7.40E-01	1.13E+00	8.36E-01	EPA, 1999	1.13E+00	8.36E-01	EPA, 1999	1.00E-02	7.40E-03	EPA, 1999	2.43E-02	1.80E-02	EPA, 1999	5.83E-05	4.31E-05	EPA, 1999	1.80E-02	1.42E-02	1.05E-02	EPA, 1999	4.55E-04	3.37E-04	EPA, 1999	1.08E-02
Benzo(a)anthracene	8.59E-01	3.00E-02	2.58E-02	EPA, 1999	3.00E-02	2.58E-02	EPA, 1999	2.02E-02	1.74E-02	EPA, 1999	7.19E-03	6.18E-03	EPA, 1999	1.73E-05	1.49E-05	EPA, 1999	6.19E-03	4.20E-03	3.61E-03	EPA, 1999	1.35E-04	1.16E-04	EPA, 1999	3.72E-03
Benzo(a)pyrene	1.01E+00	7.00E-02	7.06E-02	EPA, 1999	7.00E-02	7.06E-02	EPA, 1999	1.01E-02	1.02E-02	EPA, 1999	2.03E-02	2.05E-02	EPA, 1999	4.86E-05	4.90E-05	EPA, 1999	2.05E-02	1.19E-02	1.20E-02	EPA, 1999	3.81E-04	3.84E-04	EPA, 1999	1.24E-02
Benzo(b)fluoranthene	1.26E+00	7.00E-02	8.79E-02	EPA, 1999	7.00E-02	8.79E-02	EPA, 1999	1.01E-02	1.27E-02	EPA, 1999	2.40E-02	3.01E-02	EPA, 1999	5.75E-05	7.22E-05	EPA, 1999	3.02E-02	1.40E-02	1.76E-02	EPA, 1999	4.50E-04	5.65E-04	EPA, 1999	1.81E-02
Benzo(g,h,i)perylene	5.45E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Benzo(k)fluoranthene	3.78E-01	8.00E-02	3.02E-02	EPA, 1999	8.00E-02	3.02E-02	EPA, 1999	1.01E-02	3.82E-03	EPA, 1999	2.39E-02	9.03E-03	EPA, 1999	5.73E-05	2.17E-05	EPA, 1999	9.06E-03	1.39E-02	5.25E-03	EPA, 1999	4.48E-04	1.69E-04	EPA, 1999	5.42E-03
Boron	7.39E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Chrysene	9.38E-01	4.00E-02	3.75E-02	EPA, 1999	4.00E-02	3.75E-02	EPA, 1999	1.87E-02	1.75E-02	EPA, 1999	8.27E-03	7.76E-03	EPA, 1999	1.99E-05	1.87E-05	EPA, 1999	7.78E-03	4.84E-03	4.54E-03	EPA, 1999	1.55E-04	1.45E-04	EPA, 1999	4.69E-03
Cobalt	4.41E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Copper	4.69E+01	4.00E-02	1.88E+00	EPA, 1999	4.00E-02	1.88E+00	EPA, 1999	4.00E-01	1.88E+01	EPA, 1999		0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Dibenz(a,h)anthracene	2.36E-01	7.00E-02	1.65E-02	EPA, 1999	7.00E-02	1.65E-02	EPA, 1999	6.40E-03	1.51E-03	EPA, 1999	5.31E-02	1.25E-02	EPA, 1999	1.27E-04	3.00E-05	EPA, 1999	1.26E-02	3.11E-02	7.34E-03	EPA, 1999	9.98E-04	2.36E-04	EPA, 1999	7.58E-03
Dieldrin	2.10E-03	1.47E+01	3.09E-02	EPA, 2005f	1.47E+01	3.09E-02	EPA, 2005f	3.49E-02	7.33E-05	EPA, 1998	5.65E-03	1.19E-05	EPA, 1998		0.00E+00		1.19E-05	3.68E-03	7.73E-06	EPA, 1998		0.00E+00		7.73E-06
Endrin Aldehyde	5.50E-03		0.00E+00			0.00E+00		5.76E-02	3.17E-04	EPA, 1998	2.37E-03	1.30E-05	EPA, 1998		0.00E+00		1.30E-05	1.55E-03	8.53E-06	EPA, 1998		0.00E+00		8.53E-06
Edrin Ketone	2.90E-03		0.00E+00			0.00E+00		5.76E-02	1.67E-04	EPA, 1998	2.37E-03	6.87E-06	EPA, 1998		0.00E+00		6.87E-06	1.55E-03	4.50E-06	EPA, 1998		0.00E+00		4.50E-06
Fluoranthene	1.89E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluorene	1.07E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
gamma-Chlordane	1.70E-03		0.00E+00			0.00E+00		1.43E-02	2.43E-05	EPA, 1998	2.63E-02	4.47E-05	EPA, 1998		0.00E+00		4.47E-05	1.72E-02	2.92E-05	EPA, 1998		0.00E+00		2.92E-05
Indeno(1,2,3-cd)pyrene	7.61E-01	8.00E-02	6.09E-02	EPA, 1999	8.00E-02	6.09E-02	EPA, 1999	3.90E-03	2.97E-03	EPA, 1999	1.24E-01	9.44E-02	EPA, 1999	2.98E-04	2.27E-04	EPA, 1999	9.46E-02	7.24E-02	5.51E-02	EPA, 1999	2.32E-03	1.77E-03	EPA, 1999	5.69E-02
Lead	1.04E+02	3.00E-02	3.12E+00	EPA, 1999	3.00E-02	3.12E+00	EPA, 1999	4.50E-02	4.68E+00	EPA, 1999	1.80E-04	1.87E-02	EPA, 1999	4.32E-07	4.49E-05	EPA, 1999	1.88E-02		0.00E+00			0.00E+00		0.00E+00
Molybdenum	1.61E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Naphthalene	2.78E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Nickel	1.24E+01	2.00E-02	2.47E-01	EPA, 1999	2.00E-02	2.47E-01	EPA, 1999	3.20E-02	3.96E-01	EPA, 1999	3.60E-03	4.45E-02	EPA, 1999	8.63E-06	1.07E-04	EPA, 1999	4.46E-02		0.00E+00			0.00E+00		0.00E+00
Phenanthrene	1.35E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Pyrene	1.29E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Strontium	1.01E+02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Titanium	3.22E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Vanadium	1.52E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Zinc	8.15E+02	5.60E-01	4.57E+02	EPA, 1999	5.60E-01	4.57E+02	EPA, 1999	1.20E-12	9.78E-10	EPA, 1999	5.39E-05	4.39E-02	EPA, 1999	1.29E-07	1.05E-04	EPA, 1999	4.40E-02	3.89E-03	3.17E+00	EPA, 1999	1.25E-04	1.02E-01	EPA, 1999	3.27E+00
LPAH	5.01E+00	7.00E-02	3.51E-01	EPA, 1999*	7.00E-02	3.51E-01	EPA, 1999*	2.02E-02	1.01E-01	EPA, 1999*	5.31E-02	2.66E-01	EPA, 1999*	1.27E-04	6.36E-04	EPA, 1999*	2.67E-01	3.11E-02	1.56E-01	EPA, 1999*	9.98E-04	5.00E-03	EPA, 1999*	1.61E-01
HPAH	9.16E+00	7.00E-02	6.41E-01	EPA, 1999*	7.00E-02	6.41E-01	EPA, 1999*	2.02E-02	1.85E-01	EPA, 1999*	5.31E-02	4.86E-01	EPA, 1999*	1.27E-04	1.16E-03	EPA, 1999*	4.87E-01	3.11E-02	2.85E-01	EPA, 1999*	9.98E-04	9.14E-03	EPA, 1999*	2.94E-01
TOTAL PAHs	1.42E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007a -- DDT
EPA, 2007b -- PAHs
EPA, 2007c -- Copper
EPA, 2007d -- Nickel
EPA, 2007e -- Zinc
EPA, 2005a -- Antimony
EPA, 2005b -- Cadmium
EPA, 2005c -- Chromium
EPA, 2005d -- Vanadium
EPA, 2005e -- Lead

APPENDIX D
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR NORTH AREA SOIL

TABLE D-1
EXPOSURE POINT CONCENTATION (mg/kg)
SOIL NORTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
2-Methylnaphthalene	0.0103		0.0198	95% Chebyshev
4,4'-DDE	7.00E-04		0.0024	95% Chebyshev
4,4'-DDT	7.04E-04		0.0038	99% Chebyshev
Acenaphthene	0.0142		0.036	95% Chebyshev
Acenaphthylene				NC
Anthracene	0.0215		0.107	99% Chebyshev
Aroclor-1254	0.0056		0.0168	95% Chebyshev
Benzo(a)anthracene	0.068		0.464	99% Chebyshev
Benzo(a)pyrene	0.0922		0.554	99% Chebyshev
Benzo(b)fluoranthene	0.12		0.649	99% Chebyshev
Benzo(g,h,i)perylene	0.0961		0.494	99% Chebyshev
Benzo(k)fluoranthene	0.0601		0.341	99% Chebyshev
Boron	7.576		20.55	99% Chebyshev
Cadmium	0.193		0.59	99% Chebyshev
Chrysene	0.0885		0.529	99% Chebyshev
Dibenz(a,h)anthracene	0.0384		0.177	99% Chebyshev
Dieldrin				NC
Endrin				NC
Endrin Ketone				NC
Fluoranthene	0.146		0.923	99% Chebyshev
Fluorene	0.0112		0.0282	95% Chebyshev
Iron	17531		21765	95% Student's-t
Naphthalene	0.0236		0.102	99% Chebyshev
Nickel	17.17		18.79	95% Student's-t
Phenanthrene	0.0998		0.595	99% Chebyshev
Pyrene	0.143		0.879	99% Chebyshev
Vanadium	20.54		22.9	95% Student's-t
LPAH	0.1806		0.888	
HPAH	0.9853		5.587	
TOTAL PAHs	1.1659		6.475	

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.
NC - Not a COPC in soil.

TABLE D-2
EXPOSURE POINT CONCENTATION (mg/kg)
SURFACE SOIL NORTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
2-Methylnaphthalene	0.0123		0.0275	95% Chebyshev
4,4'-DDE	0.0011		0.0093	99% Chebyshev
4,4'-DDT	0.0012		0.0073	99% Chebyshev
Acenaphthene	0.0161		0.0528	95% Chebyshev
Acenaphthylene	0.0099		0.0234	95% Chebyshev
Anthracene	0.0257		0.168	99% Chebyshev
Aroclor-1254	0.0037		0.0077	95% Chebyshev
Benzo(a)anthracene	0.0715		0.72	99% Chebyshev
Benzo(a)pyrene	0.114		0.888	99% Chebyshev
Benzo(b)fluoranthene	0.146		0.352	95% Adjusted Gamma
Benzo(g,h,i)perylene	0.132		0.842	99% Chebyshev
Benzo(k)fluoranthene	0.0689		0.505	99% Chebyshev
Boron	8.028		13.49	95% Approx. Gamma
Cadmium	0.207		0.799	99% Chebyshev
Chrysene	0.102		0.812	99% Chebyshev
Dibenz(a,h)anthracene	0.0471		0.284	99% Chebyshev
Dieldrin	4.87E-04		0.0034	99% Chebyshev
Endrin	3.04E-04		7.59E-04	95% Chebyshev
Endrin Ketone	8.74E-04		0.0031	95% Chebyshev
Fluoranthene	0.159		1.358	99% Chebyshev
Fluorene	0.0163		0.0496	95% Chebyshev
Indeno(1,2,3-cd)pyrene	0.151		0.969	99% Chebyshev
Naphthalene				NS
Nickel	17.04		20.76	95% Student's-t
Phenanthrene	0.109		0.845	99% Chebyshev
Pyrene	0.147		1.169	99% Chebyshev
Vanadium	19.66		23.4	95% Student's-t
LPAH	0.1893		1.1663	
HPAH	1.1385		7.899	
TOTAL PAHs	1.3278		9.0653	

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.
NS - Not sampled in surface soil.

TABLE D-3
TOXICITY REFERENCE VALUES

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
2-Methylnaphthalene																		
4,4'-DDE	0.043	EPA, 2007a	Acute median LC50 in common cricket (dose 4.3 with uncertainty factor of 0.01)	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Avian TRV was used as a surrogate for the rat snake since no TRV was found specific for reptiles.	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
4,4'-DDT	0.043	EPA, 2007a	Acute median LC50 in common cricket (dose 4.3 with uncertainty factor of 0.01)	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Avian TRV was used as a surrogate for the rat snake since no TRV was found specific for reptiles.	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Acenaphthene																		
Acenaphthylene																		
Anthracene																		
#REF!	30	EPA, 2005a	EC20 for earthworms	0.125	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.125	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.125		Mammalian TRV	0.125		Mammalian TRV	0.125		Mammalian TRV
Aroclor-1254	2.51	EPA, 1999	Acute median LC50 in earthworms (dose 251 with uncertainty factor of 0.01)	0.155	Sample, 1996	Chronic LOAEL for reproduction in mouse with an uncertainty factor of 0.1	0.155	Sample, 1996	Chronic LOAEL for reproduction in mouse with an uncertainty factor of 0.1	0.18	Sample, 1996	Avian TRV	0.18	Sample, 1996		0.18	Sample, 1996	
#REF!	330	EPA, 2005g	Geometric mean of the EC20 values for *three test species* under three separate test conditions of pH	51.8	EPA, 2005g	*Geometric mean of* NOAEL values for reproduction and growth	51.8	EPA, 2005g	Geometric mean of NOAEL values for reproduction and growth	51.8		Mammalian TRV	51.8		Mammalian TRV	51.8		Mammalian TRV
Benzo(a)anthracene																		
Benzo(a)pyrene																		
Benzo(b)fluoranthene																		
Benzo(g,h,i)perylene																		
Benzo(k)fluoranthene																		
Boron																		
Cadmium	10	EPA, 1999	Chronic (4-month) NOAEL for cocoon production in earthworm (dose 10)	0.77	EPA, 2005b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.77	EPA, 2005b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.45	EPA, 1999	Avian TRV	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth
#REF!	57	EPA, 2005c	Maximum acceptable toxicant concentration (MATC) for reproductive effects in earthworm	2.4	EPA, 2005c	Geometric mean of NOAEL values for reproduction and growth	2.4	EPA, 2005c	Geometric mean of NOAEL values for reproduction and growth	2.66	EPA, 2005c	Avian TRV	2.66	EPA, 2005c	Geometric mean of the NOAEL values for reproduction and growth	2.66	EPA, 2005c	Geometric mean of the NOAEL values for reproduction and growth
Chrysene																		
#REF!	80	EPA, 2007c	Geometric mean of the MATC and EC10 values for six test species under different test species	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05	EPA, 2007c	Avian TRV	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Dibenz(a,h)anthracene																		
Dieldrin				0.015	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.015	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.0709		Avian TRV	0.0709	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.0709	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth, and survival
Endrin				0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.01	Sample, 1996	Avian TRV	0.01	Sample, 1996	screech owl with an uncertainty factor of 0.1	0.01	Sample, 1996	screech owl with an uncertainty factor of 0.1
Endrin Ketone				0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.092	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.01	Sample, 1996	Avian TRV	0.01	Sample, 1996	screech owl with an uncertainty factor of 0.1	0.01	Sample, 1996	screech owl with an uncertainty factor of 0.1
Fluoranthene																		

TOXICITY REFERENCE VALUES

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
Fluorene																		
Indeno(1,2,3-cd)pyrene																		
#REF!	1700	EPA, 2005e	Geometric mean of MATC values for one test species under different pH	4.7	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.7	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.63	EPA, 2005e	Avian TRV	1.63	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.63	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
#REF!																		
#REF!																		
#REF!	2.5	EPA, 1999	Toxicity value not available – TRV for methyl mercury was used as a surrogate	1.01	EPA, 1999	Chronic (6-months) NOAEL for reproduction in mink (dose 1.01 with uncertainty factor of 1)	1.01	EPA, 1999	Chronic (6-months) NOAEL for reproduction in mink (dose 1.01 with uncertainty factor of 1)	3.25	EPA, 1999	Avian TRV	3.25	EPA, 1999	Acute (5 days) LOAEL for mortality in coturnix quail (dose 325 with uncertainty factor of 0.01)	3.25	EPA, 1999	Acute (5 days) LOAEL for mortality in coturnix quail (dose 325 with uncertainty factor of 0.01)
#REF!																		
Naphthalene																		
Nickel	280	EPA, 2007d	Geometric mean of MATC values for five species under different test conditions	1.7	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.7	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71	EPA, 2007d	Avian TRV	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Phenanthrene																		
Pyrene																		
Vanadium	100	EPA, 2005d	LOAEC/NOAEC for growth in brocolli – used as a surrogate for invertebrates	4.16	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.16	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.344	EPA, 2005d	Avian TRV	0.344	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.344	EPA, 2005d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
#REF!	120	EPA, 2007e	Geometric mean of the MATC and EC10 values for three test species under different test species	75.4	EPA, 2007e	Geometric mean of NOAEL values for reproduction and growth	75.4	EPA, 2007e	Geometric mean of NOAEL values for reproduction and growth	66.1	EPA, 2007e	Avian TRV	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups
LPAH	29	EPA, 2007b		65.6	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	65.6	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	65.6		Mammalian TRV	65.6		Mammalian TRV	65.6		Mammalian TRV
HPAH	18	EPA, 2007b		0.615	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.615	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.615		Mammalian TRV	0.615		Mammalian TRV	0.615		Mammalian TRV
TOTAL PAHs																		

Notes:

EPA, 2007a – DDT
EPA, 2007b – PAHs
EPA, 2007c – Copper
EPA, 2007d – Nickel
EPA, 2007e – Zinc
EPA, 2005a – Antimony
EPA, 2005b – Cadmium
EPA, 2005c – Chromium
EPA, 2005d – Vanadium
EPA, 2005e – Lead

TABLE D-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
EARTHWORM

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV (earthworm)	Average EHQ	RME EHQ
2-Methylnaphthalene	1.03E-02	1.98E-02			
4,4'-DDE	7.00E-04	2.40E-03	4.30E-02	1.63E-02	5.58E-02
4,4'-DDT	7.04E-04	3.80E-03	4.30E-02	1.64E-02	8.84E-02
Acenaphthene	1.42E-02	3.60E-02			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	2.15E-02	1.07E-01			
Aroclor-1254	5.60E-03	1.68E-02	2.51E+00	2.23E-03	6.69E-03
Benzo(a)anthracene	6.80E-02	4.64E-01			
Benzo(a)pyrene	9.22E-02	5.54E-01			
Benzo(b)fluoranthene	1.20E-01	6.49E-01			
Benzo(g,h,i)perylene	9.61E-02	4.94E-01			
Benzo(k)fluoranthene	6.01E-02	3.41E-01			
Boron	7.58E+00	2.06E+01			
Cadmium	1.93E-01	5.90E-01	1.00E+01	1.93E-02	5.90E-02
Chrysene	8.85E-02	5.29E-01			
Dibenz(a,h)anthracene	3.84E-02	1.77E-01			
Dieldrin	0.00E+00	0.00E+00			
Endrin	0.00E+00	0.00E+00			
Endrin Ketone	0.00E+00	0.00E+00			
Fluoranthene	1.46E-01	9.23E-01			
Fluorene	1.12E-02	2.82E-02			
Indeno(1,2,3-cd)pyrene	1.33E-01	5.77E-01			
Naphthalene	2.36E-02	1.02E-01			
Nickel	1.72E+01	1.88E+01	2.80E+02	6.13E-02	6.71E-02
Phenanthrene	9.98E-02	5.95E-01			
Pyrene	1.43E-01	8.79E-01			
Vanadium	2.05E+01	2.29E+01	1.00E+02	2.05E-01	2.29E-01
LPAH	1.81E-01	8.88E-01	2.90E+01	6.23E-03	3.06E-02
HPAH	9.85E-01	5.59E+00	1.80E+01	5.47E-02	3.10E-01
TOTAL PAHs	1.17E+00	6.48E+00			

TABLE D-5
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
DEER MOUSE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	2.13E-05	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	1.03E-02	1.98E-02	1.48E-05	2.85E-05
4,4'-DDE	7.00E-04	2.40E-03	1.01E-06	3.45E-06
4,4'-DDT	7.04E-04	3.80E-03	1.01E-06	5.47E-06
Acenaphthene	1.42E-02	3.60E-02	2.04E-05	5.18E-05
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	2.15E-02	1.07E-01	3.09E-05	1.54E-04
Aroclor-1254	5.60E-03	1.68E-02	8.06E-06	2.42E-05
Benzo(a)anthracene	6.80E-02	4.64E-01	9.79E-05	6.68E-04
Benzo(a)pyrene	9.22E-02	5.54E-01	1.33E-04	7.97E-04
Benzo(b)fluoranthene	1.20E-01	6.49E-01	1.73E-04	9.34E-04
Benzo(g,h,i)perylene	9.61E-02	4.94E-01	1.38E-04	7.11E-04
Benzo(k)fluoranthene	6.01E-02	3.41E-01	8.65E-05	4.91E-04
Boron	7.58E+00	2.06E+01	1.09E-02	2.96E-02
Cadmium	1.93E-01	5.90E-01	2.78E-04	8.49E-04
Chrysene	8.85E-02	5.29E-01	1.27E-04	7.61E-04
Dibenz(a,h)anthracene	3.84E-02	1.77E-01	5.53E-05	2.55E-04
Dieldrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	1.46E-01	9.23E-01	2.10E-04	1.33E-03
Fluorene	1.12E-02	2.82E-02	1.61E-05	4.06E-05
Indeno(1,2,3-cd)pyrene	1.33E-01	5.77E-01	1.91E-04	8.30E-04
Naphthalene	2.36E-02	1.02E-01	3.40E-05	1.47E-04
Nickel	1.72E+01	1.88E+01	2.47E-02	2.70E-02
Phenanthrene	9.98E-02	5.95E-01	1.44E-04	8.56E-04
Pyrene	1.43E-01	8.79E-01	2.06E-04	1.27E-03
Vanadium	2.05E+01	2.29E+01	2.96E-02	3.30E-02
LPAH	1.81E-01	8.88E-01	2.60E-04	1.28E-03
HPAH	9.85E-01	5.59E+00	1.42E-03	8.04E-03
TOTAL PAHs	1.17E+00	6.48E+00	1.68E-03	9.32E-03

FOOD INGESTION

INTAKE = ((Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	8.87E-03	EPA, 1999 (normalized for bw)
Dfa	Dietary fraction of arthropods (unitless)	5.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	4.40E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE D-5
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
DEER MOUSE

4,4'-DDE	8.82E-04	3.02E-03	6.56E-06	2.25E-05	2.98E-04	1.02E-03
4,4'-DDT	8.87E-04	4.79E-03	6.60E-06	3.56E-05	2.99E-04	1.62E-03
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	6.33E-03	1.90E-02	5.60E-05	1.68E-04	2.14E-03	6.42E-03
Benzo(a)anthracene	2.04E-03	1.39E-02	1.37E-03	9.37E-03	1.05E-03	7.14E-03
Benzo(a)pyrene	6.45E-03	3.88E-02	9.31E-04	5.60E-03	2.41E-03	1.45E-02
Benzo(b)fluoranthene	8.40E-03	4.54E-02	1.21E-03	6.55E-03	3.14E-03	1.70E-02
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	4.81E-03	2.73E-02	6.07E-04	3.44E-03	1.77E-03	1.01E-02
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	1.85E-01	5.66E-01	7.03E-02	2.15E-01	8.07E-02	2.47E-01
Chrysene	3.54E-03	2.12E-02	1.65E-03	9.89E-03	1.62E-03	9.71E-03
Dibenz(a,h)anthracene	2.69E-03	1.24E-02	2.46E-04	1.13E-03	9.67E-04	4.46E-03
Dieldrin	7.15E-03	5.00E-02	1.70E-05	1.19E-04	2.41E-03	1.68E-02
Endrin	0.00E+00	0.00E+00	1.75E-05	4.37E-05	4.62E-06	1.15E-05
Endrin Ketone	0.00E+00	0.00E+00	5.03E-05	1.79E-04	1.33E-05	4.71E-05
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.06E-02	4.62E-02	5.19E-04	2.25E-03	3.71E-03	1.61E-02
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3.43E-01	3.76E-01	5.49E-01	6.01E-01	2.60E-01	2.85E-01
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LPAH	1.26E-02	6.22E-02	3.65E-03	1.79E-02	5.20E-03	2.56E-02
HPAH	6.90E-02	3.91E-01	1.99E-02	1.13E-01	2.84E-02	1.61E-01
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	1.48E-05	2.85E-05
4,4'-DDE	2.99E-04	1.02E-03
4,4'-DDT	3.00E-04	1.62E-03
Acenaphthene	2.04E-05	5.18E-05
Acenaphthylene	0.00E+00	0.00E+00
Anthracene	3.09E-05	1.54E-04
Aroclor-1254	2.15E-03	6.44E-03
Benzo(a)anthracene	1.14E-03	7.81E-03
Benzo(a)pyrene	2.54E-03	1.53E-02
Benzo(b)fluoranthene	3.31E-03	1.79E-02
Benzo(g,h,i)perylene	1.38E-04	7.11E-04
Benzo(k)fluoranthene	1.86E-03	1.06E-02
Boron	1.09E-02	2.96E-02
Cadmium	8.10E-02	2.48E-01
Chrysene	1.75E-03	1.05E-02
Dibenz(a,h)anthracene	1.02E-03	4.71E-03
Dieldrin	2.41E-03	1.68E-02
Endrin	4.62E-06	1.15E-05
Endrin Ketone	1.33E-05	4.71E-05
Fluoranthene	2.10E-04	1.33E-03
Fluorene	1.61E-05	4.06E-05
Indeno(1,2,3-cd)pyrene	3.90E-03	1.69E-02
Naphthalene	3.40E-05	1.47E-04
Nickel	2.85E-01	3.12E-01
Phenanthrene	1.44E-04	8.56E-04
Pyrene	2.06E-04	1.27E-03
Vanadium	2.96E-02	3.30E-02
LPAH	5.46E-03	2.69E-02

TABLE D-5
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
DEER MOUSE

HPAH	2.98E-02	1.69E-01
TOTAL PAHs	1.68E-03	9.32E-03

TABLE D-6
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
COYOTE

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.55E+00	EPA, 1993 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.50E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.50E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.55E+01	EPA, 1993

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDE	1.91E-05	6.54E-05	1.15E-05	3.94E-05	1.72E-06	5.89E-06
4,4'-DDT	1.92E-05	1.04E-04	1.16E-05	6.24E-05	1.73E-06	9.33E-06
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	1.36E-04	4.09E-04	8.21E-05	2.46E-04	1.23E-05	3.68E-05
Benzo(a)anthracene	4.90E-04	3.34E-03	2.95E-04	2.01E-03	4.41E-05	3.01E-04
Benzo(a)pyrene	1.88E-03	1.13E-02	1.13E-03	6.80E-03	1.69E-04	1.02E-03
Benzo(b)fluoranthene	2.89E-03	1.56E-02	1.73E-03	9.38E-03	2.60E-04	1.41E-03
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	1.44E-03	8.17E-03	8.62E-04	4.89E-03	1.30E-04	7.35E-04
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	1.39E-05	4.25E-05	9.38E-03	2.87E-02	2.36E-04	7.20E-04
Chrysene	7.34E-04	4.39E-03	4.42E-04	2.64E-03	6.61E-05	3.95E-04
Dibenz(a,h)anthracene	2.04E-03	9.42E-03	1.23E-03	5.68E-03	1.84E-04	8.49E-04
Dieldrin	2.75E-06	1.92E-05	1.79E-06	1.25E-05	2.51E-07	1.75E-06
Endrin	7.20E-07	1.80E-06	4.71E-07	1.18E-06	6.58E-08	1.64E-07
Endrin Ketone	2.07E-06	7.35E-06	1.35E-06	4.81E-06	1.89E-07	6.71E-07
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.65E-02	7.17E-02	9.94E-03	4.31E-02	1.49E-03	6.46E-03
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	6.20E-02	6.78E-02	0.00E+00	0.00E+00	4.65E-03	5.09E-03
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LPAH	9.61E-03	4.73E-02	5.80E-03	2.85E-02	8.66E-04	4.26E-03
HPAH	5.24E-02	2.97E-01	3.16E-02	1.79E-01	4.72E-03	2.68E-02
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE D-7
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RAT SNAKE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.45E-04	EPA, 1993 *
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	1.03E-02	1.98E-02	1.07E-05	2.06E-05
4,4'-DDE	7.00E-04	2.40E-03	7.28E-07	2.50E-06
4,4'-DDT	7.04E-04	3.80E-03	7.32E-07	3.95E-06
Acenaphthene	1.42E-02	3.60E-02	1.48E-05	3.74E-05
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	2.15E-02	1.07E-01	2.24E-05	1.11E-04
Aroclor-1254	5.60E-03	1.68E-02	5.82E-06	1.75E-05
Benzo(a)anthracene	6.80E-02	4.64E-01	7.07E-05	4.83E-04
Benzo(a)pyrene	9.22E-02	5.54E-01	9.59E-05	5.76E-04
Benzo(b)fluoranthene	1.20E-01	6.49E-01	1.25E-04	6.75E-04
Benzo(g,h,i)perylene	9.61E-02	4.94E-01	9.99E-05	5.14E-04
Benzo(k)fluoranthene	6.01E-02	3.41E-01	6.25E-05	3.55E-04
Boron	7.58E+00	2.06E+01	7.88E-03	2.14E-02
Cadmium	1.93E-01	5.90E-01	2.01E-04	6.14E-04
Chrysene	8.85E-02	5.29E-01	9.20E-05	5.50E-04
Dibenz(a,h)anthracene	3.84E-02	1.77E-01	3.99E-05	1.84E-04
Dieldrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	1.46E-01	9.23E-01	1.52E-04	9.60E-04
Fluorene	1.12E-02	2.82E-02	1.16E-05	2.93E-05
Indeno(1,2,3-cd)pyrene	1.33E-01	5.77E-01	1.38E-04	6.00E-04
Naphthalene	2.36E-02	1.02E-01	2.45E-05	1.06E-04
Nickel	1.72E+01	1.88E+01	1.79E-02	1.95E-02
Phenanthrene	9.98E-02	5.95E-01	1.04E-04	6.19E-04
Pyrene	1.43E-01	8.79E-01	1.49E-04	9.14E-04
Vanadium	2.05E+01	2.29E+01	2.14E-02	2.38E-02
LPAH	1.81E-01	8.88E-01	1.88E-04	9.24E-04
HPAH	9.85E-01	5.59E+00	1.02E-03	5.81E-03
TOTAL PAHs	1.17E+00	6.48E+00	1.21E-03	6.73E-03

FOOD INGESTION

INTAKE = ((Cb * IR * Dfb * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cm * IR * DFm *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cb	Bird concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.78E-03	EPA, 1993 (normalized for bw)
Dfb	Dietary fraction of birds (unitless)	1.80E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	2.00E-01	EPA, 1993
Dfm	Dietary fraction of small mammals (unitless)	6.20E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Bird	RME Bird	Average Arthropod	RME Arthropod	Average Mammal	RME Mammal	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDE	1.15E-05	3.94E-05	8.82E-04	3.02E-03	1.91E-05	6.54E-05	3.81E-06	1.30E-05
4,4'-DDT	1.16E-05	6.24E-05	8.87E-04	4.79E-03	1.92E-05	1.04E-04	3.83E-06	2.07E-05
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	8.21E-05	2.46E-04	6.33E-03	1.90E-02	1.36E-04	4.09E-04	2.73E-05	8.19E-05

TABLE D-7
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RAT SNAKE

Benzo(a)anthracene	2.95E-04	2.01E-03	2.04E-03	1.39E-02	4.90E-04	3.34E-03	1.53E-05	1.04E-04
Benzo(a)pyrene	1.13E-03	6.80E-03	6.45E-03	3.88E-02	1.88E-03	1.13E-02	5.32E-05	3.19E-04
Benzo(b)fluoranthene	1.73E-03	9.38E-03	8.40E-03	4.54E-02	2.89E-03	1.56E-02	7.56E-05	4.09E-04
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	8.62E-04	4.89E-03	4.81E-03	2.73E-02	1.44E-03	8.17E-03	4.02E-05	2.28E-04
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	9.38E-03	2.87E-02	1.85E-01	5.66E-01	1.39E-05	4.25E-05	7.75E-04	2.37E-03
Chrysene	4.42E-04	2.64E-03	3.54E-03	2.12E-02	7.34E-04	4.39E-03	2.48E-05	1.49E-04
Dibenz(a,h)anthracene	1.23E-03	5.68E-03	2.69E-03	1.24E-02	2.04E-03	9.42E-03	4.05E-05	1.87E-04
Dieldrin	1.79E-06	1.25E-05	7.15E-03	5.00E-02	2.75E-06	1.92E-05	2.87E-05	2.00E-04
Endrin	4.71E-07	1.18E-06	0.00E+00	0.00E+00	7.20E-07	1.80E-06	1.06E-08	2.65E-08
Endrin Ketone	1.35E-06	4.81E-06	0.00E+00	0.00E+00	2.07E-06	7.35E-06	3.06E-08	1.08E-07
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	9.94E-03	4.31E-02	1.06E-02	4.62E-02	1.65E-02	7.17E-02	2.83E-04	1.23E-03
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	0.00E+00	0.00E+00	3.43E-01	3.76E-01	6.20E-02	6.78E-02	2.14E-03	2.34E-03
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LPAH	5.80E-03	2.85E-02	1.26E-02	6.22E-02	9.61E-03	4.73E-02	1.91E-04	9.37E-04
HPAH	3.16E-02	1.79E-01	6.90E-02	3.91E-01	5.24E-02	2.97E-01	1.04E-03	5.90E-03
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	1.07E-05	2.06E-05
4,4'-DDE	4.53E-06	1.55E-05
4,4'-DDT	4.56E-06	2.46E-05
Acenaphthene	1.48E-05	3.74E-05
Acenaphthylene	0.00E+00	0.00E+00
Anthracene	2.24E-05	1.11E-04
Aroclor-1254	3.31E-05	9.94E-05
Benzo(a)anthracene	8.60E-05	5.87E-04
Benzo(a)pyrene	1.49E-04	8.96E-04
Benzo(b)fluoranthene	2.00E-04	1.08E-03
Benzo(g,h,i)perylene	9.99E-05	5.14E-04
Benzo(k)fluoranthene	1.03E-04	5.83E-04
Boron	7.88E-03	2.14E-02
Cadmium	9.76E-04	2.98E-03
Chrysene	1.17E-04	6.99E-04
Dibenz(a,h)anthracene	8.05E-05	3.71E-04
Dieldrin	2.87E-05	2.00E-04
Endrin	1.06E-08	2.65E-08
Endrin Ketone	3.06E-08	1.08E-07
Fluoranthene	1.52E-04	9.60E-04
Fluorene	1.16E-05	2.93E-05
Indeno(1,2,3-cd)pyrene	4.22E-04	1.83E-03
Naphthalene	2.45E-05	1.06E-04
Nickel	2.00E-02	2.19E-02
Phenanthrene	1.04E-04	6.19E-04
Pyrene	1.49E-04	9.14E-04
Vanadium	2.14E-02	2.38E-02
LPAH	3.78E-04	1.86E-03
HPAH	2.06E-03	1.17E-02
TOTAL PAHs	1.21E-03	6.73E-03

Notes:
* Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE D-8
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
AMERICAN ROBIN

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.14E-03	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	1.23E-02	2.75E-02	1.75E-04	3.92E-04
4,4'-DDE	1.10E-03	9.30E-03	1.57E-05	1.33E-04
4,4'-DDT	1.20E-03	7.30E-03	1.71E-05	1.04E-04
Acenaphthene	1.61E-02	5.28E-02	2.29E-04	7.52E-04
Acenaphthylene	9.90E-03	2.34E-02	1.41E-04	3.33E-04
Anthracene	2.57E-02	1.68E-01	3.66E-04	2.39E-03
Aroclor-1254	3.70E-03	7.70E-03	5.27E-05	1.10E-04
Benzo(a)anthracene	7.15E-02	7.20E-01	1.02E-03	1.03E-02
Benzo(a)pyrene	1.14E-01	8.88E-01	1.62E-03	1.27E-02
Benzo(b)fluoranthene	1.46E-01	3.52E-01	2.08E-03	5.02E-03
Benzo(g,h,i)perylene	1.32E-01	8.42E-01	1.88E-03	1.20E-02
Benzo(k)fluoranthene	6.89E-02	5.05E-01	9.82E-04	7.20E-03
Boron	8.03E+00	1.35E+01	1.14E-01	1.92E-01
Cadmium	2.07E-01	7.99E-01	2.95E-03	1.14E-02
Chrysene	1.02E-01	8.12E-01	1.45E-03	1.16E-02
Dibenz(a,h)anthracene	4.71E-02	2.84E-01	6.71E-04	4.05E-03
Dieldrin	4.87E-04	3.40E-03	6.93E-06	4.85E-05
Endrin	3.04E-04	7.59E-04	4.33E-06	1.08E-05
Endrin Ketone	8.74E-04	3.10E-03	1.25E-05	4.42E-05
Fluoranthene	1.59E-01	1.36E+00	2.27E-03	1.94E-02
Fluorene	1.63E-02	4.96E-02	2.32E-04	7.07E-04
Indeno(1,2,3-cd)pyrene	1.51E-01	9.69E-01	2.15E-03	1.38E-02
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	1.70E+01	2.08E+01	2.43E-01	2.96E-01
Phenanthrene	1.09E-01	8.45E-01	1.55E-03	1.20E-02
Pyrene	1.47E-01	1.17E+00	2.09E-03	1.67E-02
Vanadium	1.97E+01	2.34E+01	2.80E-01	3.33E-01
LPAH	1.89E-01	1.17E+00	2.70E-03	1.66E-02
HPAH	1.14E+00	7.90E+00	1.62E-02	1.13E-01
TOTAL PAHs	1.33E+00	9.07E+00	1.89E-02	1.29E-01

FOOD INGESTION

INTAKE = ((Ce * IR * Dfe * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ce	Earthworm concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	3.52E-02	EPA, 1999 (normalized for bw)
Dfe	Dietary fraction of earthworms (unitless)	4.60E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	4.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	8.00E-02	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Earthworm	RME Earthworm	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDE	8.82E-04	3.02E-03	8.82E-04	3.02E-03	6.56E-06	2.25E-05	3.57E-04	1.22E-03
4,4'-DDT	8.87E-04	4.79E-03	8.87E-04	4.79E-03	6.60E-06	3.56E-05	3.59E-04	1.94E-03
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	6.33E-03	1.90E-02	6.33E-03	1.90E-02	5.60E-05	1.68E-04	2.56E-03	7.69E-03

TABLE D-8
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
AMERICAN ROBIN

Benzo(a)anthracene	2.04E-03	1.39E-02	2.04E-03	1.39E-02	1.37E-03	9.37E-03	8.74E-04	5.96E-03
Benzo(a)pyrene	6.45E-03	3.88E-02	6.45E-03	3.88E-02	9.31E-04	5.60E-03	2.65E-03	1.59E-02
Benzo(b)fluoranthene	8.40E-03	4.54E-02	8.40E-03	4.54E-02	1.21E-03	6.55E-03	3.44E-03	1.86E-02
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	4.81E-03	2.73E-02	4.81E-03	2.73E-02	6.07E-04	3.44E-03	1.97E-03	1.12E-02
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	1.85E-01	5.66E-01	1.85E-01	5.66E-01	7.03E-02	2.15E-01	7.75E-02	2.37E-01
Chrysene	3.54E-03	2.12E-02	3.54E-03	2.12E-02	1.65E-03	9.89E-03	1.49E-03	8.91E-03
Dibenz(a,h)anthracene	2.69E-03	1.24E-02	2.69E-03	1.24E-02	2.46E-04	1.13E-03	1.10E-03	5.06E-03
Dieldrin	7.15E-03	5.00E-02	7.15E-03	5.00E-02	1.70E-05	1.19E-04	2.90E-03	2.02E-02
Endrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-05	4.37E-05	6.16E-07	1.54E-06
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.03E-05	1.79E-04	1.77E-06	6.29E-06
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.06E-02	4.62E-02	1.06E-02	4.62E-02	5.19E-04	2.25E-03	4.33E-03	1.88E-02
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	3.43E-01	3.76E-01	3.43E-01	3.76E-01	5.49E-01	6.01E-01	1.58E-01	1.73E-01
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LPAH	1.26E-02	6.22E-02	1.26E-02	6.22E-02	3.65E-03	1.79E-02	5.25E-03	2.58E-02
HPAH	6.90E-02	3.91E-01	6.90E-02	3.91E-01	1.99E-02	1.13E-01	2.86E-02	1.62E-01
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	1.75E-04	3.92E-04
4,4'-DDE	3.73E-04	1.36E-03
4,4'-DDT	3.76E-04	2.04E-03
Acenaphthene	2.29E-04	7.52E-04
Acenaphthylene	1.41E-04	3.33E-04
Anthracene	3.66E-04	2.39E-03
Aroclor-1254	2.62E-03	7.80E-03
Benzo(a)anthracene	1.89E-03	1.62E-02
Benzo(a)pyrene	4.27E-03	2.85E-02
Benzo(b)fluoranthene	5.52E-03	2.36E-02
Benzo(g,h,i)perylene	1.88E-03	1.20E-02
Benzo(k)fluoranthene	2.95E-03	1.84E-02
Boron	1.14E-01	1.92E-01
Cadmium	8.04E-02	2.48E-01
Chrysene	2.94E-03	2.05E-02
Dibenz(a,h)anthracene	1.77E-03	9.10E-03
Dieldrin	2.90E-03	2.03E-02
Endrin	4.95E-06	1.24E-05
Endrin Ketone	1.42E-05	5.05E-05
Fluoranthene	2.27E-03	1.94E-02
Fluorene	2.32E-04	7.07E-04
Indeno(1,2,3-cd)pyrene	6.48E-03	3.26E-02
Naphthalene	0.00E+00	0.00E+00
Nickel	4.01E-01	4.69E-01
Phenanthrene	1.55E-03	1.20E-02
Pyrene	2.09E-03	1.67E-02
Vanadium	2.80E-01	3.33E-01
LPAH	7.94E-03	4.24E-02
HPAH	4.48E-02	2.75E-01
TOTAL PAHs	1.89E-02	1.29E-01

TABLE D-9
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RED-TAILED HAWK

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.78E-01	EPA, 1999 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.85E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.15E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.60E-01	EPA, 1999

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4,4'-DDE	1.91E-05	6.54E-05	1.15E-05	3.94E-05	3.23E-06	1.11E-05
4,4'-DDT	1.92E-05	1.04E-04	1.16E-05	6.24E-05	3.25E-06	1.75E-05
Acenaphthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Aroclor-1254	1.36E-04	4.09E-04	8.21E-05	2.46E-04	2.31E-05	6.92E-05
Benzo(a)anthracene	4.90E-04	3.34E-03	2.95E-04	2.01E-03	8.29E-05	5.66E-04
Benzo(a)pyrene	1.88E-03	1.13E-02	1.13E-03	6.80E-03	3.18E-04	1.91E-03
Benzo(b)fluoranthene	2.89E-03	1.56E-02	1.73E-03	9.38E-03	4.88E-04	2.64E-03
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	1.44E-03	8.17E-03	8.62E-04	4.89E-03	2.43E-04	1.38E-03
Boron	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	1.39E-05	4.25E-05	9.38E-03	2.87E-02	3.75E-04	1.15E-03
Chrysene	7.34E-04	4.39E-03	4.42E-04	2.64E-03	1.24E-04	7.42E-04
Dibenz(a,h)anthracene	2.04E-03	9.42E-03	1.23E-03	5.68E-03	3.46E-04	1.59E-03
Dieldrin	2.75E-06	1.92E-05	1.79E-06	1.25E-05	4.70E-07	3.29E-06
Endrin	7.20E-07	1.80E-06	4.71E-07	1.18E-06	1.23E-07	3.08E-07
Endrin Ketone	2.07E-06	7.35E-06	1.35E-06	4.81E-06	3.55E-07	1.26E-06
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluorene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	1.65E-02	7.17E-02	9.94E-03	4.31E-02	2.80E-03	1.21E-02
Naphthalene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	6.20E-02	6.78E-02	0.00E+00	0.00E+00	9.00E-03	9.85E-03
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vanadium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LPAH	9.61E-03	4.73E-02	5.80E-03	2.85E-02	1.63E-03	8.00E-03
HPAH	5.24E-02	2.97E-01	3.16E-02	1.79E-01	8.87E-03	5.03E-02
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE D-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
DEER MOUSE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV (deer mouse)	Average EHQ	RME EHQ
2-Methylnaphthalene	1.48E-05	2.85E-05			
4,4'-DDE	2.99E-04	1.02E-03	1.47E-01	2.03E-03	6.97E-03
4,4'-DDT	3.00E-04	1.62E-03	1.47E-01	2.04E-03	1.10E-02
Acenaphthene	2.04E-05	5.18E-05			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	3.09E-05	1.54E-04			
Aroclor-1254	2.15E-03	6.44E-03	1.55E-01	1.38E-02	4.15E-02
Benzo(a)anthracene	1.14E-03	7.81E-03			
Benzo(a)pyrene	2.54E-03	1.53E-02			
Benzo(b)fluoranthene	3.31E-03	1.79E-02			
Benzo(g,h,i)perylene	1.38E-04	7.11E-04			
Benzo(k)fluoranthene	1.86E-03	1.06E-02			
Boron	1.09E-02	2.96E-02			
Cadmium	8.10E-02	2.48E-01	7.70E-01	1.05E-01	3.22E-01
Chrysene	1.75E-03	1.05E-02			
Dibenz(a,h)anthracene	1.02E-03	4.71E-03			
Dieldrin	2.41E-03	1.68E-02	1.50E-02	1.60E-01	1.12E+00
Endrin	4.62E-06	1.15E-05	9.20E-02	5.02E-05	1.25E-04
Endrin Ketone	1.33E-05	4.71E-05	9.20E-02	1.44E-04	5.12E-04
Fluoranthene	2.10E-04	1.33E-03			
Fluorene	1.61E-05	4.06E-05			
Indeno(1,2,3-cd)pyrene	3.90E-03	1.69E-02			
Naphthalene	3.40E-05	1.47E-04			
Nickel	2.85E-01	3.12E-01	1.70E+00	1.68E-01	1.83E-01
Phenanthrene	1.44E-04	8.56E-04			
Pyrene	2.06E-04	1.27E-03			
Vanadium	2.96E-02	3.30E-02	4.16E+00	7.11E-03	7.92E-03
LPAH	5.46E-03	2.69E-02	6.56E+01	8.33E-05	4.10E-04
HPAH	2.98E-02	1.69E-01	6.15E-01	4.85E-02	2.75E-01
TOTAL PAHs	1.68E-03	9.32E-03			

TABLE D-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
COYOTE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Coyote	Average EHQ	RME EHQ
2-Methylnaphthalene	0.00E+00	0.00E+00			
4,4'-DDE	1.72E-06	5.89E-06	1.47E-01	1.17E-05	4.01E-05
4,4'-DDT	1.73E-06	9.33E-06	1.47E-01	1.18E-05	6.35E-05
Acenaphthene	0.00E+00	0.00E+00			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	0.00E+00	0.00E+00			
Aroclor-1254	1.23E-05	3.68E-05	1.55E-01	7.92E-05	2.38E-04
Benzo(a)anthracene	4.41E-05	3.01E-04			
Benzo(a)pyrene	1.69E-04	1.02E-03			
Benzo(b)fluoranthene	2.60E-04	1.41E-03			
Benzo(g,h,i)perylene	0.00E+00	0.00E+00			
Benzo(k)fluoranthene	1.30E-04	7.35E-04			
Boron	0.00E+00	0.00E+00			
Cadmium	2.36E-04	7.20E-04	7.70E-01	3.06E-04	9.35E-04
Chrysene	6.61E-05	3.95E-04			
Dibenz(a,h)anthracene	1.84E-04	8.49E-04			
Dieldrin	2.51E-07	1.75E-06	1.50E-02	1.67E-05	1.17E-04
Endrin	6.58E-08	1.64E-07	9.20E-02	7.15E-07	1.79E-06
Endrin Ketone	1.89E-07	6.71E-07	9.20E-02	2.06E-06	7.30E-06
Fluoranthene	0.00E+00	0.00E+00			
Fluorene	0.00E+00	0.00E+00			
Indeno(1,2,3-cd)pyrene	1.49E-03	6.46E-03			
Naphthalene	0.00E+00	0.00E+00			
Nickel	4.65E-03	5.09E-03	1.70E+00	2.73E-03	2.99E-03
Phenanthrene	0.00E+00	0.00E+00			
Pyrene	0.00E+00	0.00E+00			
Vanadium	0.00E+00	0.00E+00	4.16E+00	0.00E+00	0.00E+00
LPAH	8.66E-04	4.26E-03	6.56E+01	1.32E-05	6.49E-05
HPAH	4.72E-03	2.68E-02	6.15E-01	7.68E-03	4.36E-02
TOTAL PAHs	0.00E+00	0.00E+00			

TABLE D-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
RAT SNAKE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Rat Snake	Average EHQ	RME EHQ
2-Methylnaphthalene	1.07E-05	2.06E-05			
4,4'-DDE	4.53E-06	1.55E-05	2.27E-01	2.00E-05	6.85E-05
4,4'-DDT	4.56E-06	2.46E-05	2.27E-01	2.01E-05	1.08E-04
Acenaphthene	1.48E-05	3.74E-05			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	2.24E-05	1.11E-04			
Aroclor-1254	3.31E-05	9.94E-05	1.80E-01	1.84E-04	5.52E-04
Benzo(a)anthracene	8.60E-05	5.87E-04			
Benzo(a)pyrene	1.49E-04	8.96E-04			
Benzo(b)fluoranthene	2.00E-04	1.08E-03			
Benzo(g,h,i)perylene	9.99E-05	5.14E-04			
Benzo(k)fluoranthene	1.03E-04	5.83E-04			
Boron	7.88E-03	2.14E-02			
Cadmium	9.76E-04	2.98E-03	1.45E+00	6.73E-04	2.06E-03
Chrysene	1.17E-04	6.99E-04			
Dibenz(a,h)anthracene	8.05E-05	3.71E-04			
Dieldrin	2.87E-05	2.00E-04	7.09E-02	4.04E-04	2.82E-03
Endrin	1.06E-08	2.65E-08	1.00E-02	1.06E-06	2.65E-06
Endrin Ketone	3.06E-08	1.08E-07	1.00E-02	3.06E-06	1.08E-05
Fluoranthene	1.52E-04	9.60E-04			
Fluorene	1.16E-05	2.93E-05			
Indeno(1,2,3-cd)pyrene	4.22E-04	1.83E-03			
Naphthalene	2.45E-05	1.06E-04			
Nickel	2.00E-02	2.19E-02	6.71E+00	2.98E-03	3.26E-03
Phenanthrene	1.04E-04	6.19E-04			
Pyrene	1.49E-04	9.14E-04			
Vanadium	2.14E-02	2.38E-02	3.44E-01	6.21E-02	6.92E-02
LPAH	3.78E-04	1.86E-03	6.56E+01	5.77E-06	2.84E-05
HPAH	2.06E-03	1.17E-02	6.15E-01	3.36E-03	1.90E-02
TOTAL PAHs	1.21E-03	6.73E-03			

TABLE D-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
AMERICAN ROBIN

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV American Robin	Average EHQ	RME EHQ
2-Methylnaphthalene	1.75E-04	3.92E-04			
4,4'-DDE	3.73E-04	1.36E-03	2.27E-01	1.64E-03	5.98E-03
4,4'-DDT	3.76E-04	2.04E-03	2.27E-01	1.66E-03	9.00E-03
Acenaphthene	2.29E-04	7.52E-04			
Acenaphthylene	1.41E-04	3.33E-04			
Anthracene	3.66E-04	2.39E-03			
Aroclor-1254	2.62E-03	7.80E-03	1.80E-01	1.45E-02	4.33E-02
Benzo(a)anthracene	1.89E-03	1.62E-02			
Benzo(a)pyrene	4.27E-03	2.85E-02			
Benzo(b)fluoranthene	5.52E-03	2.36E-02			
Benzo(g,h,i)perylene	1.88E-03	1.20E-02			
Benzo(k)fluoranthene	2.95E-03	1.84E-02			
Boron	1.14E-01	1.92E-01			
Cadmium	8.04E-02	2.48E-01	1.47E+00	5.47E-02	1.69E-01
Chrysene	2.94E-03	2.05E-02			
Dibenz(a,h)anthracene	1.77E-03	9.10E-03			
Dieldrin	2.90E-03	2.03E-02	7.09E-02	4.09E-02	2.86E-01
Endrin	4.95E-06	1.24E-05	1.00E-02	4.95E-04	1.24E-03
Endrin Ketone	1.42E-05	5.05E-05	1.00E-02	1.42E-03	5.05E-03
Fluoranthene	2.27E-03	1.94E-02			
Fluorene	2.32E-04	7.07E-04			
Indeno(1,2,3-cd)pyrene	6.48E-03	3.26E-02			
Naphthalene	0.00E+00	0.00E+00			
Nickel	4.01E-01	4.69E-01	6.71E+00	5.98E-02	6.99E-02
Phenanthrene	1.55E-03	1.20E-02			
Pyrene	2.09E-03	1.67E-02			
Vanadium	2.80E-01	3.33E-01	3.44E-01	8.14E-01	9.69E-01
LPAH	7.94E-03	4.24E-02	6.56E+01	1.21E-04	6.47E-04
HPAH	4.48E-02	2.75E-01	6.15E-01	7.29E-02	4.47E-01
TOTAL PAHs	1.89E-02	1.29E-01			

TABLE D-14
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
RED-TAILED HAWK

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Red-Tailed Hawk	Average EHQ	RME EHQ
2-Methylnaphthalene	0.00E+00	0.00E+00			
4,4'-DDE	3.23E-06	1.11E-05	2.27E-01	1.42E-05	4.88E-05
4,4'-DDT	3.25E-06	1.75E-05	2.27E-01	1.43E-05	7.72E-05
Acenaphthene	0.00E+00	0.00E+00			
Acenaphthylene	0.00E+00	0.00E+00			
Anthracene	0.00E+00	0.00E+00			
Aroclor-1254	2.31E-05	6.92E-05	1.80E-01	1.28E-04	3.85E-04
Benzo(a)anthracene	8.29E-05	5.66E-04			
Benzo(a)pyrene	3.18E-04	1.91E-03			
Benzo(b)fluoranthene	4.88E-04	2.64E-03			
Benzo(g,h,i)perylene	0.00E+00	0.00E+00			
Benzo(k)fluoranthene	2.43E-04	1.38E-03			
Boron	0.00E+00	0.00E+00			
Cadmium	3.75E-04	1.15E-03	1.47E+00	2.55E-04	7.80E-04
Chrysene	1.24E-04	7.42E-04			
Dibenz(a,h)anthracene	3.46E-04	1.59E-03			
Dieldrin	4.70E-07	3.29E-06	7.09E-02	6.64E-06	4.64E-05
Endrin	1.23E-07	3.08E-07	1.00E-02	1.23E-05	3.08E-05
Endrin Ketone	3.55E-07	1.26E-06	1.00E-02	3.55E-05	1.26E-04
Fluoranthene	0.00E+00	0.00E+00			
Fluorene	0.00E+00	0.00E+00			
Indeno(1,2,3-cd)pyrene	2.80E-03	1.21E-02			
Naphthalene	0.00E+00	0.00E+00			
Nickel	9.00E-03	9.85E-03	6.71E+00	1.34E-03	1.47E-03
Phenanthrene	0.00E+00	0.00E+00			
Pyrene	0.00E+00	0.00E+00			
Vanadium	0.00E+00	0.00E+00	3.44E-01	0.00E+00	0.00E+00
LPAH	1.63E-03	8.00E-03	6.56E+01	2.48E-05	1.22E-04
HPAH	8.87E-03	5.03E-02	6.15E-01	1.44E-02	8.18E-02
TOTAL PAHs	0.00E+00	0.00E+00			

TABLE D-15
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csoil x BCF (or BAF)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csoil =	Chemical Concentration in soil (mg/kg dry)
BCF	Bioconcentration Factor (unitless)
BAF =	Bioaccumulation Factor (unitless)

Compound	Average Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
2-Methylnaphthalene	1.03E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
4,4'-DDE	7.00E-04	1.26E+00	8.82E-04	EPA, 1999	1.26E+00	8.82E-04	EPA, 1999	9.37E-03	6.56E-06	EPA, 1999	2.72E-02	1.90E-05	EPA, 1999	6.52E-05	4.56E-08	EPA, 1999	1.91E-05	1.59E-02	1.11E-05	EPA, 1999	5.10E-04	3.57E-07	EPA, 1999	1.15E-05
4,4'-DDT	7.04E-04	1.26E+00	8.87E-04	EPA, 1999	1.26E+00	8.87E-04	EPA, 1999	9.37E-03	6.60E-06	EPA, 1999	2.72E-02	1.91E-05	EPA, 1999	6.52E-05	4.59E-08	EPA, 1999	1.92E-05	1.59E-02	1.12E-05	EPA, 1999	5.10E-04	3.59E-07	EPA, 1999	1.16E-05
Acenaphthene	1.42E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Acenaphthylene	0.00E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Anthracene	2.15E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Aroclor-1254	5.60E-03	1.13E+00	6.33E-03	EPA, 1999	1.13E+00	6.33E-03	EPA, 1999	1.00E-02	5.60E-05	EPA, 1999	2.43E-02	1.36E-04	EPA, 1999	5.83E-05	3.26E-07	EPA, 1999	1.36E-04	1.42E-02	7.95E-05	EPA, 1999	4.55E-04	2.55E-06	EPA, 1999	8.21E-05
Benzo(a)anthracene	6.80E-02	3.00E-02	2.04E-03	EPA, 1999	3.00E-02	2.04E-03	EPA, 1999	2.02E-02	1.37E-03	EPA, 1999	7.19E-03	4.89E-04	EPA, 1999	1.73E-05	1.18E-06	EPA, 1999	4.90E-04	4.20E-03	2.86E-04	EPA, 1999	1.35E-04	9.18E-06	EPA, 1999	2.95E-04
Benzo(a)pyrene	9.22E-02	7.00E-02	6.45E-03	EPA, 1999	7.00E-02	6.45E-03	EPA, 1999	1.01E-02	9.31E-04	EPA, 1999	2.03E-02	1.87E-03	EPA, 1999	4.86E-05	4.48E-06	EPA, 1999	1.88E-03	1.19E-02	1.10E-03	EPA, 1999	3.81E-04	3.51E-05	EPA, 1999	1.13E-03
Benzo(b)fluoranthene	1.20E-01	7.00E-02	8.40E-03	EPA, 1999	7.00E-02	8.40E-03	EPA, 1999	1.01E-02	1.21E-03	EPA, 1999	2.40E-02	2.88E-03	EPA, 1999	5.75E-05	6.90E-06	EPA, 1999	2.89E-03	1.40E-02	1.68E-03	EPA, 1999	4.50E-04	5.40E-05	EPA, 1999	1.73E-03
Benzo(g,h,i)perylene	9.61E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Benzo(k)fluoranthene	6.01E-02	8.00E-02	4.81E-03	EPA, 1999	8.00E-02	4.81E-03	EPA, 1999	1.01E-02	6.07E-04	EPA, 1999	2.39E-02	1.44E-03	EPA, 1999	5.73E-05	3.44E-06	EPA, 1999	1.44E-03	1.39E-02	8.35E-04	EPA, 1999	4.48E-04	2.69E-05	EPA, 1999	8.62E-04
Boron	7.58E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Cadmium	1.93E-01	9.60E-01	1.85E-01	EPA, 1999	9.60E-01	1.85E-01	EPA, 1999	3.64E-01	7.03E-02	EPA, 1999	7.19E-05	1.39E-05	EPA, 1999	1.73E-07	3.34E-08	EPA, 1999	1.39E-05	4.71E-02	9.09E-03	EPA, 1999	1.51E-03	2.91E-04	EPA, 1999	9.38E-03
Chrysene	8.85E-02	4.00E-02	3.54E-03	EPA, 1999	4.00E-02	3.54E-03	EPA, 1999	1.87E-02	1.65E-03	EPA, 1999	8.27E-03	7.32E-04	EPA, 1999	1.99E-05	1.76E-06	EPA, 1999	7.34E-04	4.84E-03	4.28E-04	EPA, 1999	1.55E-04	1.37E-05	EPA, 1999	4.42E-04
Dibenz(a,h)anthracene	3.84E-02	7.00E-02	2.69E-03	EPA, 1999	7.00E-02	2.69E-03	EPA, 1999	6.40E-03	2.46E-04	EPA, 1999	5.31E-02	2.04E-03	EPA, 1999	1.27E-04	4.88E-06	EPA, 1999	2.04E-03	3.11E-02	1.19E-03	EPA, 1999	9.98E-04	3.83E-05	EPA, 1999	1.23E-03
Dieldrin	4.87E-04	1.47E+01	7.15E-03	EPA, 2005f	1.47E+01	7.15E-03	EPA, 2005f	3.49E-02	1.70E-05	EPA, 1998	5.65E-03	2.75E-06	EPA, 1998		0.00E+00		2.75E-06	3.68E-03	1.79E-06	EPA, 1998		0.00E+00		1.79E-06
Endrin	3.04E-04		0.00E+00			0.00E+00		5.76E-02	1.75E-05	EPA, 1998	2.37E-03	7.20E-07	EPA, 1998		0.00E+00		7.20E-07	1.55E-03	4.71E-07	EPA, 1998		0.00E+00		4.71E-07
Endrin Ketone	8.74E-04		0.00E+00			0.00E+00		5.76E-02	5.03E-05	EPA, 1998	2.37E-03	2.07E-06	EPA, 1998		0.00E+00		2.07E-06	1.55E-03	1.35E-06	EPA, 1998		0.00E+00		1.35E-06
Fluoranthene	1.46E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluorene	1.12E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Indeno(1,2,3-cd)pyrene	1.33E-01	8.00E-02	1.06E-02	EPA, 1999	8.00E-02	1.06E-02	EPA, 1999	3.90E-03	5.19E-04	EPA, 1999	1.24E-01	1.65E-02	EPA, 1999	2.98E-04	3.96E-05	EPA, 1999	1.65E-02	7.24E-02	9.63E-03	EPA, 1999	2.32E-03	3.09E-04	EPA, 1999	9.94E-03
Naphthalene	2.36E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Nickel	1.72E+01	2.00E-02	3.43E-01	EPA, 1999	2.00E-02	3.43E-01	EPA, 1999	3.20E-02	5.49E-01	EPA, 1999	3.60E-03	6.18E-02	EPA, 1999	8.63E-06	1.48E-04	EPA, 1999	6.20E-02		0.00E+00			0.00E+00		0.00E+00
Phenanthrene	9.98E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Pyrene	1.43E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Vanadium	2.05E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
LPAH	1.81E-01	7.00E-02	1.26E-02	EPA, 1999*	7.00E-02	1.26E-02	EPA, 1999*	2.02E-02	3.65E-03	EPA, 1999*	5.31E-02	9.59E-03	EPA, 1999*	1.27E-04	2.29E-05	EPA, 1999*	9.61E-03	3.11E-02	5.62E-03	EPA, 1999*	9.98E-04	1.80E-04	EPA, 1999*	5.80E-03
HPAH	9.85E-01	7.00E-02	6.90E-02	EPA, 1999*	7.00E-02	6.90E-02	EPA, 1999*	2.02E-02	1.99E-02	EPA, 1999*	5.31E-02	5.23E-02	EPA, 1999*	1.27E-04	1.25E-04	EPA, 1999*	5.24E-02	3.11E-02	3.06E-02	EPA, 1999*	9.98E-04	9.83E-04	EPA, 1999*	3.16E-02
TOTAL PAHs	1.17E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE D-16
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csoil x BCF (or BAF)

where:

Cfood = Chemical Concentration in food (mg/kg dry)
Csoil = Chemical Concentration in soil (mg/kg dry)
BCF = Bioconcentration Factor (unitless)
BAF = Bioaccumulation Factor (unitless)

Compound	RME Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
2-Methylnaphthalene	1.98E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
4,4'-DDE	2.40E-03	1.26E+00	3.02E-03	EPA, 1999	1.26E+00	3.02E-03	EPA, 1999	9.37E-03	2.25E-05	EPA, 1999	2.72E-02	6.53E-05	EPA, 1999	6.52E-05	1.56E-07	EPA, 1999	6.54E-05	1.59E-02	3.82E-05	EPA, 1999	5.10E-04	1.22E-06	EPA, 1999	3.94E-05
4,4'-DDT	3.80E-03	1.26E+00	4.79E-03	EPA, 1999	1.26E+00	4.79E-03	EPA, 1999	9.37E-03	3.56E-05	EPA, 1999	2.72E-02	1.03E-04	EPA, 1999	6.52E-05	2.48E-07	EPA, 1999	1.04E-04	1.59E-02	6.04E-05	EPA, 1999	5.10E-04	1.94E-06	EPA, 1999	6.24E-05
Acenaphthene	3.60E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Acenaphthylene	0.00E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Anthracene	1.07E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Aroclor-1254	1.68E-02	1.13E+00	1.90E-02	EPA, 1999	1.13E+00	1.90E-02	EPA, 1999	1.00E-02	1.68E-04	EPA, 1999	2.43E-02	4.08E-04	EPA, 1999	5.83E-05	9.79E-07	EPA, 1999	4.09E-04	1.42E-02	2.39E-04	EPA, 1999	4.55E-04	7.64E-06	EPA, 1999	2.46E-04
Benzo(a)anthracene	4.64E-01	3.00E-02	1.39E-02	EPA, 1999	3.00E-02	1.39E-02	EPA, 1999	2.02E-02	9.37E-03	EPA, 1999	7.19E-03	3.34E-03	EPA, 1999	1.73E-05	8.03E-06	EPA, 1999	3.34E-03	4.20E-03	1.95E-03	EPA, 1999	1.35E-04	6.26E-05	EPA, 1999	2.01E-03
Benzo(a)pyrene	5.54E-01	7.00E-02	3.88E-02	EPA, 1999	7.00E-02	3.88E-02	EPA, 1999	1.01E-02	5.60E-03	EPA, 1999	2.03E-02	1.12E-02	EPA, 1999	4.86E-05	2.69E-05	EPA, 1999	1.13E-02	1.19E-02	6.59E-03	EPA, 1999	3.81E-04	2.11E-04	EPA, 1999	6.80E-03
Benzo(b)fluoranthene	6.49E-01	7.00E-02	4.54E-02	EPA, 1999	7.00E-02	4.54E-02	EPA, 1999	1.01E-02	6.55E-03	EPA, 1999	2.40E-02	1.56E-02	EPA, 1999	5.75E-05	3.73E-05	EPA, 1999	1.56E-02	1.40E-02	9.09E-03	EPA, 1999	4.50E-04	2.92E-04	EPA, 1999	9.38E-03
Benzo(g,h,i)perylene	4.94E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Benzo(k)fluoranthene	3.41E-01	8.00E-02	2.73E-02	EPA, 1999	8.00E-02	2.73E-02	EPA, 1999	1.01E-02	3.44E-03	EPA, 1999	2.39E-02	8.15E-03	EPA, 1999	5.73E-05	1.95E-05	EPA, 1999	8.17E-03	1.39E-02	4.74E-03	EPA, 1999	4.48E-04	1.53E-04	EPA, 1999	4.89E-03
Boron	2.06E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Cadmium	5.90E-01	9.60E-01	5.66E-01	EPA, 1999	9.60E-01	5.66E-01	EPA, 1999	3.64E-01	2.15E-01	EPA, 1999	7.19E-05	4.24E-05	EPA, 1999	1.73E-07	1.02E-07	EPA, 1999	4.25E-05	4.71E-02	2.78E-02	EPA, 1999	1.51E-03	8.91E-04	EPA, 1999	2.87E-02
Chrysene	5.29E-01	4.00E-02	2.12E-02	EPA, 1999	4.00E-02	2.12E-02	EPA, 1999	1.87E-02	9.89E-03	EPA, 1999	8.27E-03	4.37E-03	EPA, 1999	1.99E-05	1.05E-05	EPA, 1999	4.39E-03	4.84E-03	2.56E-03	EPA, 1999	1.55E-04	8.20E-05	EPA, 1999	2.64E-03
Dibenz(a,h)anthracene	1.77E-01	7.00E-02	1.24E-02	EPA, 1999	7.00E-02	1.24E-02	EPA, 1999	6.40E-03	1.13E-03	EPA, 1999	5.31E-02	9.40E-03	EPA, 1999	1.27E-04	2.25E-05	EPA, 1999	9.42E-03	3.11E-02	5.50E-03	EPA, 1999	9.98E-04	1.77E-04	EPA, 1999	5.68E-03
Dieldrin	3.40E-03	1.47E+01	5.00E-02	EPA, 2005f	1.47E+01	5.00E-02	EPA, 2005f	3.49E-02	1.19E-04	EPA, 1998	5.65E-03	1.92E-05	EPA, 1998		0.00E+00		1.92E-05	3.68E-03	1.25E-05	EPA, 1998		0.00E+00		1.25E-05
Endrin	7.59E-04		0.00E+00			0.00E+00		5.76E-02	4.37E-05	EPA, 1998	2.37E-03	1.80E-06	EPA, 1998		0.00E+00		1.80E-06	1.55E-03	1.18E-06	EPA, 1998		0.00E+00		1.18E-06
Endrin Ketone	3.10E-03		0.00E+00			0.00E+00		5.76E-02	1.79E-04	EPA, 1998	2.37E-03	7.35E-06	EPA, 1998		0.00E+00		7.35E-06	1.55E-03	4.81E-06	EPA, 1998		0.00E+00		4.81E-06
Fluoranthene	9.23E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluorene	2.82E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Indeno(1,2,3-cd)pyrene	5.77E-01	8.00E-02	4.62E-02	EPA, 1999	8.00E-02	4.62E-02	EPA, 1999	3.90E-03	2.25E-03	EPA, 1999	1.24E-01	7.15E-02	EPA, 1999	2.98E-04	1.72E-04	EPA, 1999	7.17E-02	7.24E-02	4.18E-02	EPA, 1999	2.32E-03	1.34E-03	EPA, 1999	4.31E-02
Naphthalene	1.02E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Nickel	1.88E+01	2.00E-02	3.76E-01	EPA, 1999	2.00E-02	3.76E-01	EPA, 1999	3.20E-02	6.01E-01	EPA, 1999	3.60E-03	6.76E-02	EPA, 1999	8.63E-06	1.62E-04	EPA, 1999	6.78E-02		0.00E+00			0.00E+00		0.00E+00
Phenanthrene	5.95E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Pyrene	8.79E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Vanadium	2.29E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
LPAH	8.88E-01	7.00E-02	6.22E-02	EPA, 1999*	7.00E-02	6.22E-02	EPA, 1999*	2.02E-02	1.79E-02	EPA, 1999*	5.31E-02	4.72E-02	EPA, 1999*	1.27E-04	1.13E-04	EPA, 1999*	4.73E-02	3.11E-02	2.76E-02	EPA, 1999*	9.98E-04	8.86E-04	EPA, 1999*	2.85E-02
HPAH	5.59E+00	7.00E-02	3.91E-01	EPA, 1999*	7.00E-02	3.91E-01	EPA, 1999*	2.02E-02	1.13E-01	EPA, 1999*	5.31E-02	2.97E-01	EPA, 1999*	1.27E-04	7.10E-04	EPA, 1999*	2.97E-01	3.11E-02	1.74E-01	EPA, 1999*	9.98E-04	5.58E-03	EPA, 1999*	1.79E-01
TOTAL PAHs	6.48E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX E
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL

TABLE E-1
EXPOSURE POINT CONCENTATION (mg/kg)
BACKGROUND SOIL

Parameter	Average		95% UCL	Statistic Used
Antimony	0.953		2.19	Maximum*
Arsenic	3.438		4.477	95% Student's-t
Barium	333.1		502.3	95% Approx. Gamma
Benzo(a)anthracene	0.0116		0.0457	95% Chebyshev
Benzo(a)pyrene	0.0122		0.0431	95% Chebyshev
Benzo(b)fluoranthene	0.00941		0.0325	95% Chebyshev
Benzo(g,h,i)perylene	0.0241		0.0527	95% Chebyshev
Benzo(k)fluoranthene	0.0158		0.0595	95% Chebyshev
Cadmium	0.0311		0.11	Maximum*
Chromium	15.2		16.95	95% Student's-t
Chrysene	0.0145		0.0477	95% Chebyshev
Copper	12.12		14.41	95% Student's-t
Fluoranthene	0.0208		0.156	Maximum*
Indeno(1,2,3-cd)pyrene	0.0551		0.417	Maximum*
Lead	13.43		14.33	95% Student's-t
Lithium	21.14		24.13	95% Student's-t
Manganese	377.4		431.8	95% Student's-t
Mercury	0.0213		0.0241	95% Student's-t
Molybdenum	0.522		0.565	95% Student's-t
Phenanthrene	0.0167		0.137	Maximum*
Pyrene	0.0218		0.0728	95% Chebyshev
Zinc	247		969	Maximum*
LPAH	0.0167		0.137	
HPAH	0.18531		0.927	
TOTAL PAHs	0.20201		1.064	

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.

TABLE E-2
TOXICITY REFERENCE VALUES

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
Antimony	30	EPA, 2005a	EC20 for earthworms	0.125	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.125	Sample, 1996	Chronic LOAEL in mouse with an uncertainty factor of 0.1	0.125		Mammalian TRV	0.125		Mammalian TRV	0.125		Mammalian TRV
Arsenic																		
Barium	330	EPA, 2005g	Geometric mean of the EC20 values for three test species under three separate test conditions of pH	51.8	EPA, 2005g	Geometric mean of NOAEL values for reproduction and growth	51.8	EPA, 2005g	Geometric mean of NOAEL values for reproduction and growth	51.8		Mammalian TRV	51.8		Mammalian TRV	51.8		Mammalian TRV
Benzo(a)anthracene																		
Benzo(a)pyrene																		
Benzo(b)fluoranthene																		
Benzo(g,h,i)perylene																		
Benzo(k)fluoranthene																		
Cadmium	10	EPA, 1999	Chronic (4-month) NOAEL for cocoon production in earthworm (dose 10)	0.77	EPA, 2005b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.77	EPA, 2005b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.45		Avian TRV	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth
Chromium	57	EPA, 2005c	Maximum acceptable toxicant concentration (MATC) for reproductive effects in earthworm	2.4	EPA, 2005c	Geometric mean of NOAEL values for reproduction and growth	2.4	EPA, 2005c	Geometric mean of NOAEL values for reproduction and growth	2.66		Avian TRV	2.66	EPA, 2005c	Geometric mean of the NOAEL values for reproduction and growth	2.66	EPA, 2005c	Geometric mean of the NOAEL values for reproduction and growth
Chrysene																		
Copper	80	EPA, 2007c	Geometric mean of the MATC and EC10 values for six test species under different test species	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05		Avian TRV	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Fluoranthene																		
Indeno(1,2,3-cd)pyrene																		
Lead	1700	EPA, 2005e	Geometric mean of MATC values for one test species under different pH	4.7	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.7	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.63		Avian TRV	1.63	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	1.63	EPA, 2005e	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Lithium																		
Manganese																		
Mercury	2.5	EPA, 1999	Toxicity value not available – TRV for methyl mercury was used as a surrogate	1.01	EPA, 1999	Chronic (6-months) NOAEL for reproduction in mink (dose 1.01 with uncertainty factor of 1)	1.01	EPA, 1999	Chronic (6-months) NOAEL for reproduction in mink (dose 1.01 with uncertainty factor of 1)	3.25		Avian TRV	3.25	EPA, 1999	Acute (5 days) LOAEL for mortality in coturnix quail (dose 325 with uncertainty factor of 0.01)	3.25	EPA, 1999	Acute (5 days) LOAEL for mortality in coturnix quail (dose 325 with uncertainty factor of 0.01)
Molybdenum																		
Phenanthrene																		
Pyrene																		
Zinc	120	EPA, 2007e	Geometric mean of the MATC and EC10 values for three test species under different test species	75.4	EPA, 2007e	Geometric mean of NOAEL values for reproduction and growth	75.4	EPA, 2007e	Geometric mean of NOAEL values for reproduction and growth	66.1		Avian TRV	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups
LPAH	29	EPA, 2007b		65.6	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	65.6	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	65.6		Mammalian TRV	65.6		Mammalian TRV	65.6		Mammalian TRV

TOXICITY REFERENCE VALUES

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
HPAH	18	EPA, 2007b		0.615	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.615	EPA, 2007b	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.615		Mammalian TRV	0.615		Mammalian TRV	0.615		Mammalian TRV
TOTAL PAHs																		

Notes:

EPA, 2007a – DDT
EPA, 2007b – PAHs
EPA, 2007c – Copper
EPA, 2007d – Nickel
EPA, 2007e – Zinc
EPA, 2007f – Selenium
EPA, 2005a – Antimony
EPA, 2005b – Cadmium
EPA, 2005c – Chromium
EPA, 2005d – Vanadium
EPA, 2005e – Lead
EPA, 2005f – Dieldrin
EPA, 2005g – Barium

TABLE E-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
EARTHWORM

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV (earthworm)	Average EHQ	RME EHQ
Antimony	9.53E-01	2.19E+00	3.00E+01	3.18E-02	7.30E-02
Arsenic	3.44E+00	4.48E+00			
Barium	3.33E+02	5.02E+02	3.30E+02	1.01E+00	1.52E+00
Benzo(a)anthracene	1.16E-02	4.57E-02			
Benzo(a)pyrene	1.22E-02	4.31E-02			
Benzo(b)fluoranthene	9.41E-03	3.25E-02			
Benzo(g,h,i)perylene	2.41E-02	5.27E-02			
Benzo(k)fluoranthene	1.58E-02	5.95E-02			
Cadmium	3.11E-02	1.10E-01	1.00E+01	3.11E-03	1.10E-02
Chromium	1.52E+01	1.70E+01	5.70E+01	2.67E-01	2.97E-01
Chrysene	1.45E-02	4.77E-02			
Copper	1.21E+01	1.44E+01	8.00E+01	1.52E-01	1.80E-01
Fluoranthene	2.08E-02	1.56E-01			
Indeno(1,2,3-cd)pyrene	5.51E-02	4.17E-01			
Lead	1.34E+01	1.43E+01	1.70E+03	7.90E-03	8.43E-03
Lithium	2.11E+01	2.41E+01			
Manganese	3.77E+02	4.32E+02			
Mercury	2.13E-02	2.41E-02	2.50E+00	8.52E-03	9.64E-03
Molybdenum	5.22E-01	5.65E-01			
Phenanthrene	1.67E-02	1.37E-01			
Pyrene	2.18E-02	7.28E-02			
Zinc	2.47E+02	9.69E+02	1.20E+02	2.06E+00	8.08E+00
LPAH	1.67E-02	1.37E-01	2.90E+01	5.76E-04	4.72E-03
HPAH	1.85E-01	9.27E-01	1.80E+01	1.03E-02	5.15E-02
TOTAL PAHs	2.02E-01	1.06E+00			

TABLE E-4
INTAKE CALCULATIONS FOR BACKGROUND SOIL
DEER MOUSE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	2.13E-05	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Antimony	9.53E-01	2.19E+00	1.37E-03	3.15E-03
Arsenic	3.44E+00	4.48E+00	4.95E-03	6.44E-03
Barium	3.33E+02	5.02E+02	4.79E-01	7.23E-01
Benzo(a)anthracene	1.16E-02	4.57E-02	1.67E-05	6.58E-05
Benzo(a)pyrene	1.22E-02	4.31E-02	1.76E-05	6.20E-05
Benzo(b)fluoranthene	9.41E-03	3.25E-02	1.35E-05	4.68E-05
Benzo(g,h,i)perylene	2.41E-02	5.27E-02	3.47E-05	7.58E-05
Benzo(k)fluoranthene	1.58E-02	5.95E-02	2.27E-05	8.56E-05
Cadmium	3.11E-02	1.10E-01	4.48E-05	1.58E-04
Chromium	1.52E+01	1.70E+01	2.19E-02	2.44E-02
Chrysene	1.45E-02	4.77E-02	2.09E-05	6.86E-05
Copper	1.21E+01	1.44E+01	1.74E-02	2.07E-02
Fluoranthene	2.08E-02	1.56E-01	2.99E-05	2.25E-04
Indeno(1,2,3-cd)pyrene	5.51E-02	4.17E-01	7.93E-05	6.00E-04
Lead	1.34E+01	1.43E+01	1.93E-02	2.06E-02
Lithium	2.11E+01	2.41E+01	3.04E-02	3.47E-02
Manganese	3.77E+02	4.32E+02	5.43E-01	6.21E-01
Mercury	2.13E-02	2.41E-02	3.07E-05	3.47E-05
Molybdenum	5.22E-01	5.65E-01	7.51E-04	8.13E-04
Phenanthrene	1.67E-02	1.37E-01	2.40E-05	1.97E-04
Pyrene	2.18E-02	7.28E-02	3.14E-05	1.05E-04
Zinc	2.47E+02	9.69E+02	3.55E-01	1.39E+00
LPAH	1.67E-02	1.37E-01	2.40E-05	1.97E-04
HPAH	1.85E-01	9.27E-01	2.67E-04	1.33E-03
TOTAL PAHs	2.02E-01	1.06E+00	2.91E-04	1.53E-03

FOOD INGESTION

INTAKE = ((Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	8.87E-03	EPA, 1999 (normalized for bw)
Dfa	Dietary fraction of arthropods (unitless)	5.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	4.40E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
Antimony	2.10E-01	4.82E-01	1.91E-01	4.38E-01	1.21E-01	2.77E-01
Arsenic	3.78E-01	4.92E-01	1.24E-01	1.61E-01	1.60E-01	2.08E-01
Barium	7.33E+01	1.11E+02	5.00E+01	7.53E+01	3.78E+01	5.70E+01
Benzo(a)anthracene	3.48E-04	1.37E-03	2.34E-04	9.23E-04	1.79E-04	7.04E-04
Benzo(a)pyrene	8.54E-04	3.02E-03	1.23E-04	4.35E-04	3.19E-04	1.13E-03
Benzo(b)fluoranthene	6.59E-04	2.28E-03	9.50E-05	3.28E-04	2.46E-04	8.50E-04

TABLE E-4
INTAKE CALCULATIONS FOR BACKGROUND SOIL
DEER MOUSE

Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	1.26E-03	4.76E-03	1.60E-04	6.01E-04	4.66E-04	1.76E-03
Cadmium	2.99E-02	1.06E-01	1.13E-02	4.00E-02	1.30E-02	4.60E-02
Chromium	1.52E-01	1.70E-01	1.14E-01	1.27E-01	8.11E-02	9.04E-02
Chrysene	5.80E-04	1.91E-03	2.71E-04	8.92E-04	2.66E-04	8.76E-04
Copper	4.85E-01	5.76E-01	4.85E+00	5.76E+00	1.44E+00	1.71E+00
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	4.41E-03	3.34E-02	2.15E-04	1.63E-03	1.54E-03	1.16E-02
Lead	4.03E-01	4.30E-01	6.04E-01	6.45E-01	2.95E-01	3.14E-01
Lithium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	8.52E-04	9.64E-04	7.99E-04	9.04E-04	4.97E-04	5.62E-04
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	1.38E+02	5.43E+02	2.96E-10	1.16E-09	4.64E+01	1.82E+02
LPAH	1.17E-03	9.59E-03	3.37E-04	2.77E-03	4.81E-04	3.95E-03
HPAH	1.30E-02	6.49E-02	3.74E-03	1.87E-02	5.34E-03	2.67E-02
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Antimony	1.22E-01	2.80E-01
Arsenic	1.65E-01	2.14E-01
Barium	3.83E+01	5.77E+01
Benzo(a)anthracene	1.95E-04	7.69E-04
Benzo(a)pyrene	3.37E-04	1.19E-03
Benzo(b)fluoranthene	2.60E-04	8.97E-04
Benzo(g,h,i)perylene	3.47E-05	7.58E-05
Benzo(k)fluoranthene	4.89E-04	1.84E-03
Cadmium	1.31E-02	4.62E-02
Chromium	1.03E-01	1.15E-01
Chrysene	2.87E-04	9.44E-04
Copper	1.46E+00	1.73E+00
Fluoranthene	2.99E-05	2.25E-04
Indeno(1,2,3-cd)pyrene	1.62E-03	1.22E-02
Lead	3.14E-01	3.35E-01
Lithium	3.04E-02	3.47E-02
Manganese	5.43E-01	6.21E-01
Mercury	5.27E-04	5.97E-04
Molybdenum	7.51E-04	8.13E-04
Phenanthrene	2.40E-05	1.97E-04
Pyrene	3.14E-05	1.05E-04
Zinc	4.68E+01	1.84E+02
LPAH	5.05E-04	4.15E-03
HPAH	5.61E-03	2.81E-02
TOTAL PAHs	6.11E-03	3.22E-02

TABLE E-5
INTAKE CALCULATIONS FOR BACKGROUND SOIL
COYOTE

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.55E+00	EPA, 1993 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.50E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.50E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.55E+01	EPA, 1993

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
Antimony	5.72E-04	1.31E-03	0.00E+00	0.00E+00	4.29E-05	9.86E-05
Arsenic	4.14E-03	5.39E-03	0.00E+00	0.00E+00	3.10E-04	4.04E-04
Barium	3.00E-02	4.53E-02	0.00E+00	0.00E+00	2.25E-03	3.39E-03
Benzo(a)anthracene	8.36E-05	3.29E-04	5.03E-05	1.98E-04	7.53E-06	2.97E-05
Benzo(a)pyrene	2.48E-04	8.77E-04	1.50E-04	5.29E-04	2.24E-05	7.90E-05
Benzo(b)fluoranthene	2.26E-04	7.82E-04	1.36E-04	4.70E-04	2.04E-05	7.04E-05
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	3.79E-04	1.43E-03	2.27E-04	8.54E-04	3.41E-05	1.28E-04
Cadmium	2.24E-06	7.93E-06	1.51E-03	5.35E-03	3.80E-05	1.34E-04
Chromium	5.03E-02	5.61E-02	0.00E+00	0.00E+00	3.77E-03	4.21E-03
Chrysene	1.20E-04	3.95E-04	7.24E-05	2.38E-04	1.08E-05	3.56E-05
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	6.85E-03	5.18E-02	4.12E-03	3.12E-02	6.17E-04	4.67E-03
Lead	2.42E-03	2.59E-03	0.00E+00	0.00E+00	1.82E-04	1.94E-04
Lithium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	6.68E-05	7.56E-05	2.33E-04	2.64E-04	1.08E-05	1.23E-05
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	1.33E-02	5.24E-02	9.92E-01	3.89E+00	2.58E-02	1.01E-01
LPAH	8.89E-04	7.29E-03	5.36E-04	4.40E-03	8.01E-05	6.57E-04
HPAH	9.86E-03	4.93E-02	5.95E-03	2.98E-02	8.88E-04	4.44E-03
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE E-6
INTAKE CALCULATIONS FOR BACKGROUND SOIL
RAT SNAKE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.45E-04	EPA, 1993 *
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Antimony	9.53E-01	2.19E+00	9.91E-04	2.28E-03
Arsenic	3.44E+00	4.48E+00	3.58E-03	4.66E-03
Barium	3.33E+02	5.02E+02	3.46E-01	5.22E-01
Benzo(a)anthracene	1.16E-02	4.57E-02	1.21E-05	4.75E-05
Benzo(a)pyrene	1.22E-02	4.31E-02	1.27E-05	4.48E-05
Benzo(b)fluoranthene	9.41E-03	3.25E-02	9.79E-06	3.38E-05
Benzo(g,h,i)perylene	2.41E-02	5.27E-02	2.51E-05	5.48E-05
Benzo(k)fluoranthene	1.58E-02	5.95E-02	1.64E-05	6.19E-05
Cadmium	3.11E-02	1.10E-01	3.23E-05	1.14E-04
Chromium	1.52E+01	1.70E+01	1.58E-02	1.76E-02
Chrysene	1.45E-02	4.77E-02	1.51E-05	4.96E-05
Copper	1.21E+01	1.44E+01	1.26E-02	1.50E-02
Fluoranthene	2.08E-02	1.56E-01	2.16E-05	1.62E-04
Indeno(1,2,3-cd)pyrene	5.51E-02	4.17E-01	5.73E-05	4.34E-04
Lead	1.34E+01	1.43E+01	1.40E-02	1.49E-02
Lithium	2.11E+01	2.41E+01	2.20E-02	2.51E-02
Manganese	3.77E+02	4.32E+02	3.92E-01	4.49E-01
Mercury	2.13E-02	2.41E-02	2.22E-05	2.51E-05
Molybdenum	5.22E-01	5.65E-01	5.43E-04	5.88E-04
Phenanthrene	1.67E-02	1.37E-01	1.74E-05	1.42E-04
Pyrene	2.18E-02	7.28E-02	2.27E-05	7.57E-05
Zinc	2.47E+02	9.69E+02	2.57E-01	1.01E+00
LPAH	1.67E-02	1.37E-01	1.74E-05	1.42E-04
HPAH	1.85E-01	9.27E-01	1.93E-04	9.64E-04
TOTAL PAHs	2.02E-01	1.06E+00	2.10E-04	1.11E-03

FOOD INGESTION

INTAKE = ((Cb * IR * Dfb * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cm * IR * DFm *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cb	Bird concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.78E-03	EPA, 1993 (normalized for bw)
Dfb	Dietary fraction of birds (unitless)	1.80E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	2.00E-01	EPA, 1993
Dfm	Dietary fraction of small mammals (unitless)	6.20E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Bird	RME Bird	Average Arthropod	RME Arthropod	Average Mammal	RME Mammal	Average Intake	RME Intake
Antimony	0.00E+00	0.00E+00	2.10E-01	4.82E-01	5.72E-04	1.31E-03	8.46E-04	1.94E-03
Arsenic	0.00E+00	0.00E+00	3.78E-01	4.92E-01	4.14E-03	5.39E-03	1.56E-03	2.04E-03
Barium	0.00E+00	0.00E+00	7.33E+01	1.11E+02	3.00E-02	4.53E-02	2.94E-01	4.43E-01
Benzo(a)anthracene	5.03E-05	1.98E-04	3.48E-04	1.37E-03	8.36E-05	3.29E-04	2.61E-06	1.03E-05
Benzo(a)pyrene	1.50E-04	5.29E-04	8.54E-04	3.02E-03	2.48E-04	8.77E-04	7.03E-06	2.48E-05
Benzo(b)fluoranthene	1.36E-04	4.70E-04	6.59E-04	2.28E-03	2.26E-04	7.82E-04	5.93E-06	2.05E-05
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	2.27E-04	8.54E-04	1.26E-03	4.76E-03	3.79E-04	1.43E-03	1.06E-05	3.98E-05
Cadmium	1.51E-03	5.35E-03	2.99E-02	1.06E-01	2.24E-06	7.93E-06	1.25E-04	4.42E-04
Chromium	0.00E+00	0.00E+00	1.52E-01	1.70E-01	5.03E-02	5.61E-02	1.23E-03	1.37E-03
Chrysene	7.24E-05	2.38E-04	5.80E-04	1.91E-03	1.20E-04	3.95E-04	4.07E-06	1.34E-05
Copper	0.00E+00	0.00E+00	4.85E-01	5.76E-01	0.00E+00	0.00E+00	1.94E-03	2.31E-03

TABLE E-6
INTAKE CALCULATIONS FOR BACKGROUND SOIL
RAT SNAKE

Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	4.12E-03	3.12E-02	4.41E-03	3.34E-02	6.85E-03	5.18E-02	1.17E-04	8.88E-04
Lead	0.00E+00	0.00E+00	4.03E-01	4.30E-01	2.42E-03	2.59E-03	1.64E-03	1.75E-03
Lithium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	2.33E-04	2.64E-04	8.52E-04	9.64E-04	6.68E-05	7.56E-05	5.08E-06	5.74E-06
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	9.92E-01	3.89E+00	1.38E+02	5.43E+02	1.33E-02	5.24E-02	5.57E-01	2.19E+00
LPAH	5.36E-04	4.40E-03	1.17E-03	9.59E-03	8.89E-04	7.29E-03	1.76E-05	1.45E-04
HPAH	5.95E-03	2.98E-02	1.30E-02	6.49E-02	9.86E-03	4.93E-02	1.96E-04	9.79E-04
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Antimony	1.84E-03	4.22E-03
Arsenic	5.14E-03	6.69E-03
Barium	6.40E-01	9.65E-01
Benzo(a)anthracene	1.47E-05	5.78E-05
Benzo(a)pyrene	1.97E-05	6.97E-05
Benzo(b)fluoranthene	1.57E-05	5.43E-05
Benzo(g,h,i)perylene	2.51E-05	5.48E-05
Benzo(k)fluoranthene	2.70E-05	1.02E-04
Cadmium	1.57E-04	5.56E-04
Chromium	1.70E-02	1.90E-02
Chrysene	1.92E-05	6.30E-05
Copper	1.45E-02	1.73E-02
Fluoranthene	2.16E-05	1.62E-04
Indeno(1,2,3-cd)pyrene	1.75E-04	1.32E-03
Lead	1.56E-02	1.67E-02
Lithium	2.20E-02	2.51E-02
Manganese	3.92E-01	4.49E-01
Mercury	2.72E-05	3.08E-05
Molybdenum	5.43E-04	5.88E-04
Phenanthrene	1.74E-05	1.42E-04
Pyrene	2.27E-05	7.57E-05
Zinc	8.14E-01	3.19E+00
LPAH	3.50E-05	2.87E-04
HPAH	3.88E-04	1.94E-03
TOTAL PAHs	4.23E-04	2.23E-03

Notes:
* Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE E-7
INTAKE CALCULATIONS FOR BACKGROUND SOIL
AMERICAN ROBIN

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.14E-03	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Antimony	9.53E-01	2.19E+00	1.36E-02	3.12E-02
Arsenic	3.44E+00	4.48E+00	4.90E-02	6.38E-02
Barium	3.33E+02	5.02E+02	4.75E+00	7.16E+00
Benzo(a)anthracene	1.16E-02	4.57E-02	1.65E-04	6.51E-04
Benzo(a)pyrene	1.22E-02	4.31E-02	1.74E-04	6.14E-04
Benzo(b)fluoranthene	9.41E-03	3.25E-02	1.34E-04	4.63E-04
Benzo(g,h,i)perylene	2.41E-02	5.27E-02	3.43E-04	7.51E-04
Benzo(k)fluoranthene	1.58E-02	5.95E-02	2.25E-04	8.48E-04
Cadmium	3.11E-02	1.10E-01	4.43E-04	1.57E-03
Chromium	1.52E+01	1.70E+01	2.17E-01	2.42E-01
Chrysene	1.45E-02	4.77E-02	2.07E-04	6.80E-04
Copper	1.21E+01	1.44E+01	1.73E-01	2.05E-01
Fluoranthene	2.08E-02	1.56E-01	2.96E-04	2.22E-03
Indeno(1,2,3-cd)pyrene	5.51E-02	4.17E-01	7.85E-04	5.94E-03
Lead	1.34E+01	1.43E+01	1.91E-01	2.04E-01
Lithium	2.11E+01	2.41E+01	3.01E-01	3.44E-01
Manganese	3.77E+02	4.32E+02	5.38E+00	6.15E+00
Mercury	2.13E-02	2.41E-02	3.04E-04	3.43E-04
Molybdenum	5.22E-01	5.65E-01	7.44E-03	8.05E-03
Phenanthrene	1.67E-02	1.37E-01	2.38E-04	1.95E-03
Pyrene	2.18E-02	7.28E-02	3.11E-04	1.04E-03
Zinc	2.47E+02	9.69E+02	3.52E+00	1.38E+01
LPAH	1.67E-02	1.37E-01	2.38E-04	1.95E-03
HPAH	1.85E-01	9.27E-01	2.64E-03	1.32E-02
TOTAL PAHs	2.02E-01	1.06E+00	2.88E-03	1.52E-02

FOOD INGESTION

INTAKE = ((Ce * IR * Dfe * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ce	Earthworm concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	3.52E-02	EPA, 1999 (normalized for bw)
Dfe	Dietary fraction of earthworms (unitless)	4.60E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	4.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	8.00E-02	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Earthworm	RME Earthworm	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
Antimony	2.10E-01	4.82E-01	2.10E-01	4.82E-01	1.91E-01	4.38E-01	9.16E-02	2.10E-01
Arsenic	3.78E-01	4.92E-01	3.78E-01	4.92E-01	1.24E-01	1.61E-01	1.57E-01	2.05E-01
Barium	7.33E+01	1.11E+02	7.33E+01	1.11E+02	5.00E+01	7.53E+01	3.14E+01	4.74E+01
Benzo(a)anthracene	3.48E-04	1.37E-03	3.48E-04	1.37E-03	2.34E-04	9.23E-04	1.49E-04	5.87E-04
Benzo(a)pyrene	8.54E-04	3.02E-03	8.54E-04	3.02E-03	1.23E-04	4.35E-04	3.50E-04	1.24E-03
Benzo(b)fluoranthene	6.59E-04	2.28E-03	6.59E-04	2.28E-03	9.50E-05	3.28E-04	2.70E-04	9.32E-04
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	1.26E-03	4.76E-03	1.26E-03	4.76E-03	1.60E-04	6.01E-04	5.17E-04	1.95E-03
Cadmium	2.99E-02	1.06E-01	2.99E-02	1.06E-01	1.13E-02	4.00E-02	1.25E-02	4.42E-02
Chromium	1.52E-01	1.70E-01	1.52E-01	1.70E-01	1.14E-01	1.27E-01	6.55E-02	7.31E-02
Chrysene	5.80E-04	1.91E-03	5.80E-04	1.91E-03	2.71E-04	8.92E-04	2.44E-04	8.04E-04
Copper	4.85E-01	5.76E-01	4.85E-01	5.76E-01	4.85E+00	5.76E+00	3.67E-01	4.36E-01

TABLE E-7
INTAKE CALCULATIONS FOR BACKGROUND SOIL
AMERICAN ROBIN

Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	4.41E-03	3.34E-02	4.41E-03	3.34E-02	2.15E-04	1.63E-03	1.79E-03	1.36E-02
Lead	4.03E-01	4.30E-01	4.03E-01	4.30E-01	6.04E-01	6.45E-01	1.84E-01	1.97E-01
Lithium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	8.52E-04	9.64E-04	8.52E-04	9.64E-04	7.99E-04	9.04E-04	3.73E-04	4.22E-04
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	1.38E+02	5.43E+02	1.38E+02	5.43E+02	2.96E-10	1.16E-09	5.60E+01	2.20E+02
LPAH	1.17E-03	9.59E-03	1.17E-03	9.59E-03	3.37E-04	2.77E-03	4.85E-04	3.98E-03
HPAH	1.30E-02	6.49E-02	1.30E-02	6.49E-02	3.74E-03	1.87E-02	5.38E-03	2.69E-02
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Antimony	1.05E-01	2.42E-01
Arsenic	2.06E-01	2.69E-01
Barium	3.62E+01	5.45E+01
Benzo(a)anthracene	3.14E-04	1.24E-03
Benzo(a)pyrene	5.24E-04	1.85E-03
Benzo(b)fluoranthene	4.04E-04	1.40E-03
Benzo(g,h,i)perylene	3.43E-04	7.51E-04
Benzo(k)fluoranthene	7.42E-04	2.80E-03
Cadmium	1.29E-02	4.57E-02
Chromium	2.82E-01	3.15E-01
Chrysene	4.51E-04	1.48E-03
Copper	5.40E-01	6.42E-01
Fluoranthene	2.96E-04	2.22E-03
Indeno(1,2,3-cd)pyrene	2.58E-03	1.95E-02
Lead	3.76E-01	4.01E-01
Lithium	3.01E-01	3.44E-01
Manganese	5.38E+00	6.15E+00
Mercury	6.77E-04	7.65E-04
Molybdenum	7.44E-03	8.05E-03
Phenanthrene	2.38E-04	1.95E-03
Pyrene	3.11E-04	1.04E-03
Zinc	5.95E+01	2.33E+02
LPAH	7.23E-04	5.93E-03
HPAH	8.02E-03	4.01E-02
TOTAL PAHs	8.75E-03	4.61E-02

TABLE E-8
INTAKE CALCULATIONS FOR BACKGROUND SOIL
RED-TAILED HAWK

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.78E-01	EPA, 1999 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.85E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.15E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.60E-01	EPA, 1999

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
Antimony	5.72E-04	1.31E-03	0.00E+00	0.00E+00	8.31E-05	1.91E-04
Arsenic	4.14E-03	5.39E-03	0.00E+00	0.00E+00	6.01E-04	7.82E-04
Barium	3.00E-02	4.53E-02	0.00E+00	0.00E+00	4.36E-03	6.57E-03
Benzo(a)anthracene	8.36E-05	3.29E-04	5.03E-05	1.98E-04	1.41E-05	5.57E-05
Benzo(a)pyrene	2.48E-04	8.77E-04	1.50E-04	5.29E-04	4.20E-05	1.48E-04
Benzo(b)fluoranthene	2.26E-04	7.82E-04	1.36E-04	4.70E-04	3.83E-05	1.32E-04
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	3.79E-04	1.43E-03	2.27E-04	8.54E-04	6.40E-05	2.41E-04
Cadmium	2.24E-06	7.93E-06	1.51E-03	5.35E-03	6.05E-05	2.14E-04
Chromium	5.03E-02	5.61E-02	0.00E+00	0.00E+00	7.30E-03	8.14E-03
Chrysene	1.20E-04	3.95E-04	7.24E-05	2.38E-04	2.03E-05	6.69E-05
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	6.85E-03	5.18E-02	4.12E-03	3.12E-02	1.16E-03	8.77E-03
Lead	2.42E-03	2.59E-03	0.00E+00	0.00E+00	3.52E-04	3.75E-04
Lithium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	6.68E-05	7.56E-05	2.33E-04	2.64E-04	1.90E-05	2.15E-05
Molybdenum	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	1.33E-02	5.24E-02	9.92E-01	3.89E+00	4.14E-02	1.62E-01
LPAH	8.89E-04	7.29E-03	5.36E-04	4.40E-03	1.50E-04	1.23E-03
HPAH	9.86E-03	4.93E-02	5.95E-03	2.98E-02	1.67E-03	8.35E-03
TOTAL PAHs	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE E-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
DEER MOUSE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV (deer mouse)	Average EHQ	RME EHQ
Antimony	1.22E-01	2.80E-01	1.25E-01	9.76E-01	2.24E+00
Arsenic	1.65E-01	2.14E-01			
Barium	3.83E+01	5.77E+01	5.18E+01	7.38E-01	1.11E+00
Benzo(a)anthracene	1.95E-04	7.69E-04			
Benzo(a)pyrene	3.37E-04	1.19E-03			
Benzo(b)fluoranthene	2.60E-04	8.97E-04			
Benzo(g,h,i)perylene	3.47E-05	7.58E-05			
Benzo(k)fluoranthene	4.89E-04	1.84E-03			
Cadmium	1.31E-02	4.62E-02	7.70E-01	1.69E-02	5.99E-02
Chromium	1.03E-01	1.15E-01	2.40E+00	4.29E-02	4.78E-02
Chrysene	2.87E-04	9.44E-04			
Copper	1.46E+00	1.73E+00	5.60E+00	2.60E-01	3.10E-01
Fluoranthene	2.99E-05	2.25E-04			
Indeno(1,2,3-cd)pyrene	1.62E-03	1.22E-02			
Lead	3.14E-01	3.35E-01	4.70E+00	6.68E-02	7.13E-02
Lithium	3.04E-02	3.47E-02			
Manganese	5.43E-01	6.21E-01			
Mercury	5.27E-04	5.97E-04	1.01E+00	5.22E-04	5.91E-04
Molybdenum	7.51E-04	8.13E-04			
Phenanthrene	2.40E-05	1.97E-04			
Pyrene	3.14E-05	1.05E-04			
Zinc	4.68E+01	1.84E+02	7.54E+01	6.20E-01	2.43E+00
LPAH	5.05E-04	4.15E-03	6.56E+01	7.70E-06	6.32E-05
HPAH	5.61E-03	2.81E-02	6.15E-01	9.12E-03	4.56E-02
TOTAL PAHs	6.11E-03	3.22E-02			

TABLE E-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
COYOTE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Coyote	Average EHQ	RME EHQ
Antimony	4.29E-05	9.86E-05	1.25E-01	3.43E-04	7.89E-04
Arsenic	3.10E-04	4.04E-04			
Barium	2.25E-03	3.39E-03	5.18E+01	4.35E-05	6.55E-05
Benzo(a)anthracene	7.53E-06	2.97E-05			
Benzo(a)pyrene	2.24E-05	7.90E-05			
Benzo(b)fluoranthene	2.04E-05	7.04E-05			
Benzo(g,h,i)perylene	0.00E+00	0.00E+00			
Benzo(k)fluoranthene	3.41E-05	1.28E-04			
Cadmium	3.80E-05	1.34E-04	7.70E-01	4.93E-05	1.74E-04
Chromium	3.77E-03	4.21E-03	2.40E+00	1.57E-03	1.75E-03
Chrysene	1.08E-05	3.56E-05			
Copper	0.00E+00	0.00E+00	5.60E+00	0.00E+00	0.00E+00
Fluoranthene	0.00E+00	0.00E+00			
Indeno(1,2,3-cd)pyrene	6.17E-04	4.67E-03			
Lead	1.82E-04	1.94E-04	4.70E+00	3.87E-05	4.13E-05
Lithium	0.00E+00	0.00E+00			
Manganese	0.00E+00	0.00E+00			
Mercury	1.08E-05	1.23E-05	1.01E+00	1.07E-05	1.21E-05
Molybdenum	0.00E+00	0.00E+00			
Phenanthrene	0.00E+00	0.00E+00			
Pyrene	0.00E+00	0.00E+00			
Zinc	2.58E-02	1.01E-01	7.54E+01	3.42E-04	1.34E-03
LPAH	8.01E-05	6.57E-04	6.56E+01	1.22E-06	1.00E-05
HPAH	8.88E-04	4.44E-03	6.15E-01	1.44E-03	7.23E-03
TOTAL PAHs	0.00E+00	0.00E+00			

TABLE E-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL SOUTH OF MARLIN
RAT SNAKE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Rat Snake	Average EHQ	RME EHQ
Antimony	1.84E-03	4.22E-03	1.25E-01	1.47E-02	3.38E-02
Arsenic	5.14E-03	6.69E-03			
Barium	6.40E-01	9.65E-01	5.18E+01	1.24E-02	1.86E-02
Benzo(a)anthracene	1.47E-05	5.78E-05			
Benzo(a)pyrene	1.97E-05	6.97E-05			
Benzo(b)fluoranthene	1.57E-05	5.43E-05			
Benzo(g,h,i)perylene	2.51E-05	5.48E-05			
Benzo(k)fluoranthene	2.70E-05	1.02E-04			
Cadmium	1.57E-04	5.56E-04	1.45E+00	1.08E-04	3.84E-04
Chromium	1.70E-02	1.90E-02	2.66E+00	6.41E-03	7.14E-03
Chrysene	1.92E-05	6.30E-05			
Copper	1.45E-02	1.73E-02	4.05E+00	3.59E-03	4.27E-03
Fluoranthene	2.16E-05	1.62E-04			
Indeno(1,2,3-cd)pyrene	1.75E-04	1.32E-03			
Lead	1.56E-02	1.67E-02	1.63E+00	9.58E-03	1.02E-02
Lithium	2.20E-02	2.51E-02			
Manganese	3.92E-01	4.49E-01			
Mercury	2.72E-05	3.08E-05	3.25E+00	8.38E-06	9.48E-06
Molybdenum	5.43E-04	5.88E-04			
Phenanthrene	1.74E-05	1.42E-04			
Pyrene	2.27E-05	7.57E-05			
Zinc	8.14E-01	3.19E+00	6.61E+01	1.23E-02	4.83E-02
LPAH	3.50E-05	2.87E-04	6.56E+01	5.33E-07	4.38E-06
HPAH	3.88E-04	1.94E-03	6.15E-01	6.31E-04	3.16E-03
TOTAL PAHs	4.23E-04	2.23E-03			

TABLE E-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
AMERICAN ROBIN

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV American Robin	Average EHQ	RME EHQ
Antimony	1.05E-01	2.42E-01	1.25E-01	8.41E-01	1.93E+00
Arsenic	2.06E-01	2.69E-01			
Barium	3.62E+01	5.45E+01	5.18E+01	6.98E-01	1.05E+00
Benzo(a)anthracene	3.14E-04	1.24E-03			
Benzo(a)pyrene	5.24E-04	1.85E-03			
Benzo(b)fluoranthene	4.04E-04	1.40E-03			
Benzo(g,h,i)perylene	3.43E-04	7.51E-04			
Benzo(k)fluoranthene	7.42E-04	2.80E-03			
Cadmium	1.29E-02	4.57E-02	1.47E+00	8.79E-03	3.11E-02
Chromium	2.82E-01	3.15E-01	2.66E+00	1.06E-01	1.18E-01
Chrysene	4.51E-04	1.48E-03			
Copper	5.40E-01	6.42E-01	4.05E+00	1.33E-01	1.58E-01
Fluoranthene	2.96E-04	2.22E-03			
Indeno(1,2,3-cd)pyrene	2.58E-03	1.95E-02			
Lead	3.76E-01	4.01E-01	1.63E+00	2.31E-01	2.46E-01
Lithium	3.01E-01	3.44E-01			
Manganese	5.38E+00	6.15E+00			
Mercury	6.77E-04	7.65E-04	3.25E+00	2.08E-04	2.36E-04
Molybdenum	7.44E-03	8.05E-03			
Phenanthrene	2.38E-04	1.95E-03			
Pyrene	3.11E-04	1.04E-03			
Zinc	5.95E+01	2.33E+02	6.61E+01	9.00E-01	3.53E+00
LPAH	7.23E-04	5.93E-03	6.56E+01	1.10E-05	9.04E-05
HPAH	8.02E-03	4.01E-02	6.15E-01	1.30E-02	6.53E-02
TOTAL PAHs	8.75E-03	4.61E-02			

TABLE E-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
RED-TAILED HAWK

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Red-Tailed Hawk	Average EHQ	RME EHQ
Antimony	8.31E-05	1.91E-04	1.25E-01	6.65E-04	1.53E-03
Arsenic	6.01E-04	7.82E-04			
Barium	4.36E-03	6.57E-03	5.18E+01	8.42E-05	1.27E-04
Benzo(a)anthracene	1.41E-05	5.57E-05			
Benzo(a)pyrene	4.20E-05	1.48E-04			
Benzo(b)fluoranthene	3.83E-05	1.32E-04			
Benzo(g,h,i)perylene	0.00E+00	0.00E+00			
Benzo(k)fluoranthene	6.40E-05	2.41E-04			
Cadmium	6.05E-05	2.14E-04	1.47E+00	4.11E-05	1.45E-04
Chromium	7.30E-03	8.14E-03	2.66E+00	2.75E-03	3.06E-03
Chrysene	2.03E-05	6.69E-05			
Copper	0.00E+00	0.00E+00	4.05E+00	0.00E+00	0.00E+00
Fluoranthene	0.00E+00	0.00E+00			
Indeno(1,2,3-cd)pyrene	1.16E-03	8.77E-03			
Lead	3.52E-04	3.75E-04	1.63E+00	2.16E-04	2.30E-04
Lithium	0.00E+00	0.00E+00			
Manganese	0.00E+00	0.00E+00			
Mercury	1.90E-05	2.15E-05	3.25E+00	5.84E-06	6.61E-06
Molybdenum	0.00E+00	0.00E+00			
Phenanthrene	0.00E+00	0.00E+00			
Pyrene	0.00E+00	0.00E+00			
Zinc	4.14E-02	1.62E-01	6.61E+01	6.26E-04	2.46E-03
LPAH	1.50E-04	1.23E-03	6.56E+01	2.29E-06	1.88E-05
HPAH	1.67E-03	8.35E-03	6.15E-01	2.71E-03	1.36E-02
TOTAL PAHs	0.00E+00	0.00E+00			

TABLE E-14
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csoil x BCF (or BAF)

where:

Cfood = Chemical Concentration in food (mg/kg dry)
Csoil = Chemical Concentration in soil (mg/kg dry)
BCF Bioconcentration Factor (unitless)
BAF = Bioaccumulation Factor (unitless)

Compound	Average Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
Antimony	9.53E-01	2.20E-01	2.10E-01	EPA, 1999	2.20E-01	2.10E-01	EPA, 1999	2.00E-01	1.91E-01	EPA, 1999	5.99E-04	5.71E-04	EPA, 1999	1.44E-06	1.37E-06	EPA, 1999	5.72E-04		0.00E+00			0.00E+00		0.00E+00
Arsenic	3.44E+00	1.10E-01	3.78E-01	EPA, 1999	1.10E-01	3.78E-01	EPA, 1999	3.60E-02	1.24E-01	EPA, 1999	1.20E-03	4.13E-03	EPA, 1999	2.88E-06	9.90E-06	EPA, 1999	4.14E-03		0.00E+00			0.00E+00		0.00E+00
Barium	3.33E+02	2.20E-01	7.33E+01	EPA, 1999	2.20E-01	7.33E+01	EPA, 1999	1.50E-01	5.00E+01	EPA, 1999	8.99E-05	2.99E-02	EPA, 1999	2.16E-07	7.19E-05	EPA, 1999	3.00E-02		0.00E+00			0.00E+00		0.00E+00
Benzo(a)anthracene	1.16E-02	3.00E-02	3.48E-04	EPA, 1999	3.00E-02	3.48E-04	EPA, 1999	2.02E-02	2.34E-04	EPA, 1999	7.19E-03	8.34E-05	EPA, 1999	1.73E-05	2.01E-07	EPA, 1999	8.36E-05	4.20E-03	4.87E-05	EPA, 1999	1.35E-04	1.57E-06	EPA, 1999	5.03E-05
Benzo(a)pyrene	1.22E-02	7.00E-02	8.54E-04	EPA, 1999	7.00E-02	8.54E-04	EPA, 1999	1.01E-02	1.23E-04	EPA, 1999	2.03E-02	2.48E-04	EPA, 1999	4.86E-05	5.93E-07	EPA, 1999	2.48E-04	1.19E-02	1.45E-04	EPA, 1999	3.81E-04	4.65E-06	EPA, 1999	1.50E-04
Benzo(b)fluoranthene	9.41E-03	7.00E-02	6.59E-04	EPA, 1999	7.00E-02	6.59E-04	EPA, 1999	1.01E-02	9.50E-05	EPA, 1999	2.40E-02	2.26E-04	EPA, 1999	5.75E-05	5.41E-07	EPA, 1999	2.26E-04	1.40E-02	1.32E-04	EPA, 1999	4.50E-04	4.23E-06	EPA, 1999	1.36E-04
Benzo(g,h,i)perylene	2.41E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Benzo(k)fluoranthene	1.58E-02	8.00E-02	1.26E-03	EPA, 1999	8.00E-02	1.26E-03	EPA, 1999	1.01E-02	1.60E-04	EPA, 1999	2.39E-02	3.78E-04	EPA, 1999	5.73E-05	9.05E-07	EPA, 1999	3.79E-04	1.39E-02	2.20E-04	EPA, 1999	4.48E-04	7.08E-06	EPA, 1999	2.27E-04
Cadmium	3.11E-02	9.60E-01	2.99E-02	EPA, 1999	9.60E-01	2.99E-02	EPA, 1999	3.64E-01	1.13E-02	EPA, 1999	7.19E-05	2.24E-06	EPA, 1999	1.73E-07	5.38E-09	EPA, 1999	2.24E-06	4.71E-02	1.46E-03	EPA, 1999	1.51E-03	4.70E-05	EPA, 1999	1.51E-03
Chromium	1.52E+01	1.00E-02	1.52E-01	EPA, 1999	1.00E-02	1.52E-01	EPA, 1999	7.50E-03	1.14E-01	EPA, 1999	3.30E-03	5.02E-02	VI - EPA, 1999	7.91E-06	1.20E-04	VI - EPA, 1999	5.03E-02		0.00E+00			0.00E+00		0.00E+00
Chrysene	1.45E-02	4.00E-02	5.80E-04	EPA, 1999	4.00E-02	5.80E-04	EPA, 1999	1.87E-02	2.71E-04	EPA, 1999	8.27E-03	1.20E-04	EPA, 1999	1.99E-05	2.89E-07	EPA, 1999	1.20E-04	4.84E-03	7.02E-05	EPA, 1999	1.55E-04	2.25E-06	EPA, 1999	7.24E-05
Copper	1.21E+01	4.00E-02	4.85E-01	EPA, 1999	4.00E-02	4.85E-01	EPA, 1999	4.00E-01	4.85E+00	EPA, 1999		0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluoranthene	2.08E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Indeno(1,2,3-cd)pyrene	5.51E-02	8.00E-02	4.41E-03	EPA, 1999	8.00E-02	4.41E-03	EPA, 1999	3.90E-03	2.15E-04	EPA, 1999	1.24E-01	6.83E-03	EPA, 1999	2.98E-04	1.64E-05	EPA, 1999	6.85E-03	7.24E-02	3.99E-03	EPA, 1999	2.32E-03	1.28E-04	EPA, 1999	4.12E-03
Lead	1.34E+01	3.00E-02	4.03E-01	EPA, 1999	3.00E-02	4.03E-01	EPA, 1999	4.50E-02	6.04E-01	EPA, 1999	1.80E-04	2.42E-03	EPA, 1999	4.32E-07	5.80E-06	EPA, 1999	2.42E-03		0.00E+00			0.00E+00		0.00E+00
Lithium	2.11E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Manganese	3.77E+02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Mercury	2.13E-02	4.00E-02	8.52E-04	EPA, 1999	4.00E-02	8.52E-04	EPA, 1999	3.75E-02	7.99E-04	EPA, 1999	3.13E-03	6.67E-05	EPA, 1999	7.52E-06	1.60E-07	EPA, 1999	6.68E-05	1.06E-02	2.26E-04	EPA, 1999	3.42E-04	7.28E-06	EPA, 1999	2.33E-04
Molybdenum	5.22E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Phenanthrene	1.67E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Pyrene	2.18E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Zinc	2.47E+02	5.60E-01	1.38E+02	EPA, 1999	5.60E-01	1.38E+02	EPA, 1999	1.20E-12	2.96E-10	EPA, 1999	5.39E-05	1.33E-02	EPA, 1999	1.29E-07	3.19E-05	EPA, 1999	1.33E-02	3.89E-03	9.61E-01	EPA, 1999	1.25E-04	3.09E-02	EPA, 1999	9.92E-01
LPAH	1.67E-02	7.00E-02	1.17E-03	EPA, 1999*	7.00E-02	1.17E-03	EPA, 1999*	2.02E-02	3.37E-04	EPA, 1999*	5.31E-02	8.87E-04	EPA, 1999*	1.27E-04	2.12E-06	EPA, 1999*	8.89E-04	3.11E-02	5.19E-04	EPA, 1999*	9.98E-04	1.67E-05	EPA, 1999*	5.36E-04
HPAH	1.85E-01	7.00E-02	1.30E-02	EPA, 1999*	7.00E-02	1.30E-02	EPA, 1999*	2.02E-02	3.74E-03	EPA, 1999*	5.31E-02	9.84E-03	EPA, 1999*	1.27E-04	2.35E-05	EPA, 1999*	9.86E-03	3.11E-02	5.76E-03	EPA, 1999*	9.98E-04	1.85E-04	EPA, 1999*	5.95E-03
TOTAL PAHs	2.02E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007a -- DDT
EPA, 2007b -- PAHs
EPA, 2007c -- Copper
EPA, 2007d -- Nickel
EPA, 2007e -- Zinc
EPA, 2005a -- Antimony
EPA, 2005b -- Cadmium
EPA, 2005c -- Chromium
EPA, 2005d -- Vanadium
EPA, 2005e -- Lead

TABLE E-15
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csoil x BCF (or BAF)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csoil =	Chemical Concentration in soil (mg/kg dry)
BCF	Bioconcentration Factor (unitless)
BAF =	Bioaccumulation Factor (unitless)

Compound	RME Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
Antimony	2.19E+00	2.20E-01	4.82E-01	EPA, 1999	2.20E-01	4.82E-01	EPA, 1999	2.00E-01	4.38E-01	EPA, 1999	5.99E-04	1.31E-03	EPA, 1999	1.44E-06	3.15E-06	EPA, 1999	1.31E-03		0.00E+00			0.00E+00		0.00E+00
Arsenic	4.48E+00	1.10E-01	4.92E-01	EPA, 1999	1.10E-01	4.92E-01	EPA, 1999	3.60E-02	1.61E-01	EPA, 1999	1.20E-03	5.37E-03	EPA, 1999	2.68E-06	1.29E-05	EPA, 1999	5.39E-03		0.00E+00			0.00E+00		0.00E+00
Barium	5.02E+02	2.20E-01	1.11E+02	EPA, 1999	2.20E-01	1.11E+02	EPA, 1999	1.50E-01	7.53E+01	EPA, 1999	8.99E-05	4.52E-02	EPA, 1999	2.16E-07	1.08E-04	EPA, 1999	4.53E-02		0.00E+00			0.00E+00		0.00E+00
Benzo(a)anthracene	4.57E-02	3.00E-02	1.37E-03	EPA, 1999	3.00E-02	1.37E-03	EPA, 1999	2.02E-02	9.23E-04	EPA, 1999	7.19E-03	3.29E-04	EPA, 1999	1.73E-05	7.91E-07	EPA, 1999	3.29E-04	4.20E-03	1.92E-04	EPA, 1999	1.35E-04	6.17E-06	EPA, 1999	1.98E-04
Benzo(a)pyrene	4.31E-02	7.00E-02	3.02E-03	EPA, 1999	7.00E-02	3.02E-03	EPA, 1999	1.01E-02	4.35E-04	EPA, 1999	2.03E-02	8.75E-04	EPA, 1999	4.86E-05	2.09E-06	EPA, 1999	8.77E-04	1.19E-02	5.13E-04	EPA, 1999	3.81E-04	1.64E-05	EPA, 1999	5.29E-04
Benzo(b)fluoranthene	3.25E-02	7.00E-02	2.28E-03	EPA, 1999	7.00E-02	2.28E-03	EPA, 1999	1.01E-02	3.28E-04	EPA, 1999	2.40E-02	7.80E-04	EPA, 1999	5.75E-05	1.87E-06	EPA, 1999	7.82E-04	1.40E-02	4.55E-04	EPA, 1999	4.50E-04	1.46E-05	EPA, 1999	4.70E-04
Benzo(g,h,i)perylene	5.27E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Benzo(k)fluoranthene	5.95E-02	8.00E-02	4.76E-03	EPA, 1999	8.00E-02	4.76E-03	EPA, 1999	1.01E-02	6.01E-04	EPA, 1999	2.39E-02	1.42E-03	EPA, 1999	5.73E-05	3.41E-06	EPA, 1999	1.43E-03	1.39E-02	8.27E-04	EPA, 1999	4.48E-04	2.67E-05	EPA, 1999	8.54E-04
Cadmium	1.10E-01	9.60E-01	1.06E-01	EPA, 1999	9.60E-01	1.06E-01	EPA, 1999	3.64E-01	4.00E-02	EPA, 1999	7.19E-05	7.91E-06	EPA, 1999	1.73E-07	1.90E-08	EPA, 1999	7.93E-06	4.71E-02	5.18E-03	EPA, 1999	1.51E-03	1.66E-04	EPA, 1999	5.35E-03
Chromium	1.70E+01	1.00E-02	1.70E-01	EPA, 1999	1.00E-02	1.70E-01	EPA, 1999	7.50E-03	1.27E-01	EPA, 1999	3.30E-03	5.59E-02	VI - EPA, 1999	7.91E-06	1.34E-04	VI - EPA, 1999	5.61E-02		0.00E+00			0.00E+00		0.00E+00
Chrysene	4.77E-02	4.00E-02	1.91E-03	EPA, 1999	4.00E-02	1.91E-03	EPA, 1999	1.87E-02	8.92E-04	EPA, 1999	8.27E-03	3.94E-04	EPA, 1999	1.99E-05	9.49E-07	EPA, 1999	3.95E-04	4.84E-03	2.31E-04	EPA, 1999	1.55E-04	7.39E-06	EPA, 1999	2.38E-04
Copper	1.44E+01	4.00E-02	5.76E-01	EPA, 1999	4.00E-02	5.76E-01	EPA, 1999	4.00E-01	5.76E+00	EPA, 1999		0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Fluoranthene	1.56E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Indeno(1,2,3-cd)pyrene	4.17E-01	8.00E-02	3.34E-02	EPA, 1999	8.00E-02	3.34E-02	EPA, 1999	3.90E-03	1.63E-03	EPA, 1999	1.24E-01	5.17E-02	EPA, 1999	2.98E-04	1.24E-04	EPA, 1999	5.18E-02	7.24E-02	3.02E-02	EPA, 1999	2.32E-03	9.67E-04	EPA, 1999	3.12E-02
Lead	1.43E+01	3.00E-02	4.30E-01	EPA, 1999	3.00E-02	4.30E-01	EPA, 1999	4.50E-02	6.45E-01	EPA, 1999	1.80E-04	2.58E-03	EPA, 1999	4.32E-07	6.19E-06	EPA, 1999	2.59E-03		0.00E+00			0.00E+00		0.00E+00
Lithium	2.41E+01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Manganese	4.32E+02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Mercury	2.41E-02	4.00E-02	9.64E-04	EPA, 1999	4.00E-02	9.64E-04	EPA, 1999	3.75E-02	9.04E-04	EPA, 1999	3.13E-03	7.54E-05	EPA, 1999	7.52E-06	1.81E-07	EPA, 1999	7.56E-05	1.06E-02	2.55E-04	EPA, 1999	3.42E-04	8.24E-06	EPA, 1999	2.64E-04
Molybdenum	5.65E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Phenanthrene	1.37E-01		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Pyrene	7.28E-02		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Zinc	9.69E+02	5.60E-01	5.43E+02	EPA, 1999	5.60E-01	5.43E+02	EPA, 1999	1.20E-12	1.16E-09	EPA, 1999	5.39E-05	5.22E-02	EPA, 1999	1.29E-07	1.25E-04	EPA, 1999	5.24E-02	3.89E-03	3.77E+00	EPA, 1999	1.25E-04	1.21E-01	EPA, 1999	3.89E+00
LPAH	1.37E-01	7.00E-02	9.59E-03	EPA, 1999*	7.00E-02	9.59E-03	EPA, 1999*	2.02E-02	2.77E-03	EPA, 1999*	5.31E-02	7.27E-03	EPA, 1999*	1.27E-04	1.74E-05	EPA, 1999*	7.29E-03	3.11E-02	4.26E-03	EPA, 1999*	9.98E-04	1.37E-04	EPA, 1999*	4.40E-03
HPAH	9.27E-01	7.00E-02	6.49E-02	EPA, 1999*	7.00E-02	6.49E-02	EPA, 1999*	2.02E-02	1.87E-02	EPA, 1999*	5.31E-02	4.92E-02	EPA, 1999*	1.27E-04	1.18E-04	EPA, 1999*	4.93E-02	3.11E-02	2.88E-02	EPA, 1999*	9.98E-04	9.25E-04	EPA, 1999*	2.98E-02
TOTAL PAHs	1.06E+00		0.00E+00			0.00E+00			0.00E+00			0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007a – DDT
EPA, 2007b – PAHs
EPA, 2007c – Copper
EPA, 2007d – Nickel
EPA, 2007e – Zinc
EPA, 2005a – Antimony
EPA, 2005b – Cadmium
EPA, 2005c – Chromium
EPA, 2005d – Vanadium
EPA, 2005e – Lead

APPENDIX F
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT

TABLE F-1
EXPOSURE POINT CONCENTATION (mg/kg)
INTRACOASTAL WATERWAY SEDIMENT

Parameter	Average		95% UCL	Statistic Used
2-Methylnaphthalene	0.0083		0.0096	95% Student's-t
4,4'-DDT	4.11E-04		0.0023	99% Chebyshev
Acenaphthylene	0.0116		0.0273	95% Chebyshev
Anthracene	0.0201		0.0424	95% Chebyshev
Benzo(a)anthracene	0.0454		0.301	99% Chebyshev
Benzo(a)pyrene	0.0661		0.352	99% Chebyshev
Benzo(b)fluoranthene	0.1		0.491	99% Chebyshev
Benzo(g,h,i)perylene	0.0661		0.357	99% Chebyshev
Benzo(k)fluoranthene	0.0589		0.271	99% Chebyshev
Chrysene	0.0774		0.153	95% Approx. Gamma
Dibenz(a,h)anthracene	0.0435		0.205	99% Chebyshev
Fluoranthene	0.113		0.614	99% Chebyshev
Fluorene	0.0122		0.0243	95% Chebyshev
gamma-Chlordane	3.13E-04		5.70E-04	95% Chebyshev
Hexachlorobenzene	0.01		0.0126	95% Student's-t
Indeno(1,2,3-cd)pyrene	0.0722		0.347	99% Chebyshev
Phenanthrene	0.0746		0.388	99% Chebyshev
Pyrene	0.13		0.678	99% Chebyshev
LPAH	0.1268		0.4916	
HPAH	0.7726		3.769	
TOTAL PAHs	0.8994		4.2606	

TABLE F-2
TOXICITY REFERENCE VALUES

Parameter	Capitella capitata (mg/kg)	Ref.	Comments	Capitella capitata (mg/kg)	Ref.	Comments	Fiddler Crab (mg/kgBW-day)	Ref.	Comments	Black Drum (mg/kgBW-day)	Ref.	Comments	Spotted seatrout (mg/kgBW-day)	Ref.	Comments	Sandpiper (mg/kgBW-day)	Ref.	Comments	Green heron (mg/kgBW-day)	Ref.	Comments
2-Methylnaphthalene	0.07	SQUIRT	ERL	0.67	SQUIRT	ERM															
4,4'-DDT	0.001	SQUIRT	ERL	0.007	SQUIRT	ERM	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Acenaphthylene	0.044	SQUIRT	ERL	0.64	SQUIRT	ERM															
Anthracene	0.0853	SQUIRT	ERL	1.1	SQUIRT	ERM															
Benzo(a)anthracene	0.261	SQUIRT	ERL	1.6	SQUIRT	ERM															
Benzo(a)pyrene	0.43	SQUIRT	ERL	1.6	SQUIRT	ERM															
Benzo(b)fluoranthene	1.8	SQUIRT	AET	1.8	SQUIRT	AET															
Benzo(g,h,i)perylene	0.67	SQUIRT	AET	0.67	SQUIRT	AET															
Benzo(k)fluoranthene	1.8	SQUIRT	AET	1.8	SQUIRT	AET															
Chrysene	0.384	SQUIRT	ERL	2.8	SQUIRT	ERM															
Dibenz(a,h)anthracene	0.0634	SQUIRT	ERL	0.26	SQUIRT	ERM															
Fluoranthene	0.6	SQUIRT	ERL	5.1	SQUIRT	ERM															
Fluorene	0.019	SQUIRT	ERL	0.54	SQUIRT	ERM															
gamma-Chlordane	5.00E-04	SQUIRT	ERL	0.006	SQUIRT	ERM	4.6	Sample, 1996	mammalian TRV for soil	4.6	Sample, 1996	mammalian TRV for soil	4.6	Sample, 1996	mammalian TRV for soil	2.14	Sample, 1996	Chronic NOAEL in red-winged blackbird	2.14	Sample, 1996	Chronic NOAEL in red-winged blackbird
Hexachlorobenzene	0.006	SQUIRT	AET	0.006	SQUIRT	AET	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil
Indeno(1,2,3-cd)pyrene	0.6	SQUIRT	AET	0.6	SQUIRT	AET															
Phenanthrene	0.24	SQUIRT	ERL	1.5	SQUIRT	ERM															
Pyrene	0.665	SQUIRT	ERL	2.6	SQUIRT	ERM															
LPAH	0.552	SQUIRT	ERL	3.162	SQUIRT	ERM	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil
HPAH	1.7	SQUIRT	ERL	9.6	SQUIRT	ERM	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV
TOTAL PAHs	4.022	SQUIRT	ERL	44.792	SQUIRT	ERM															

Notes:
ERL -- Effects Range-Low
AET -- Apparent Effects Threshold
TEL -- Threshold Effects Level

EPA, 2007a -- DDT
EPA, 2007b -- PAHs

TABLE F-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
CAPITELLA CAPITATA

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
2-Methylnaphthalene	8.30E-03	9.60E-03	7.00E-02	1.19E-01	1.37E-01
4,4'-DDT	4.11E-04	2.30E-03	1.00E-03	4.11E-01	2.30E+00
Acenaphthylene	1.16E-02	2.73E-02	4.40E-02	2.64E-01	6.20E-01
Anthracene	2.01E-02	4.24E-02	8.53E-02	2.36E-01	4.97E-01
Benzo(a)anthracene	4.54E-02	3.01E-01	2.61E-01	1.74E-01	1.15E+00
Benzo(a)pyrene	6.61E-02	3.52E-01	4.30E-01	1.54E-01	8.19E-01
Benzo(b)fluoranthene	1.00E-01	4.91E-01	1.80E+00	5.56E-02	2.73E-01
Benzo(g,h,i)perylene	6.61E-02	3.57E-01	6.70E-01	9.87E-02	5.33E-01
Benzo(k)fluoranthene	5.89E-02	2.71E-01	1.80E+00	3.27E-02	1.51E-01
Chrysene	7.74E-02	1.53E-01	3.84E-01	2.02E-01	3.98E-01
Dibenz(a,h)anthracene	4.35E-02	2.05E-01	6.34E-02	6.86E-01	3.23E+00
Fluoranthene	1.13E-01	6.14E-01	6.00E-01	1.88E-01	1.02E+00
Fluorene	1.22E-02	2.43E-02	1.90E-02	6.42E-01	1.28E+00
gamma-Chlordane	3.13E-04	5.70E-04	5.00E-04	6.26E-01	1.14E+00
Hexachlorobenzene	1.00E-02	1.26E-02	6.00E-03	1.67E+00	2.10E+00
Indeno(1,2,3-cd)pyrene	7.22E-02	3.47E-01	6.00E-01	1.20E-01	5.78E-01
Phenanthrene	7.46E-02	3.88E-01	2.40E-01	3.11E-01	1.62E+00
Pyrene	1.30E-01	6.78E-01	6.65E-01	1.95E-01	1.02E+00
LPAH	1.27E-01	4.92E-01	5.52E-01	2.30E-01	8.91E-01
HPAH	7.73E-01	3.77E+00	1.70E+00	4.54E-01	2.22E+00
TOTAL PAHs	8.99E-01	4.26E+00	4.02E+00	2.24E-01	1.06E+00

TABLE F-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
CAPITELLA CAPITATA -- COMPARED WITH MIDPOINT BETWEEN ERLs and ERMs

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
2-Methylnaphthalene	8.30E-03	9.60E-03	3.70E-01	2.24E-02	2.59E-02
4,4'-DDT	4.11E-04	2.30E-03	4.00E-03	1.03E-01	5.75E-01
Acenaphthylene	1.16E-02	2.73E-02	3.42E-01	3.39E-02	7.98E-02
Anthracene	2.01E-02	4.24E-02	5.93E-01	3.39E-02	7.15E-02
Benzo(a)anthracene	4.54E-02	3.01E-01	9.31E-01	4.88E-02	3.23E-01
Benzo(a)pyrene	6.61E-02	3.52E-01	1.02E+00	6.51E-02	3.47E-01
Benzo(b)fluoranthene	1.00E-01	4.91E-01	1.80E+00	5.56E-02	2.73E-01
Benzo(g,h,i)perylene	6.61E-02	3.57E-01	6.70E-01	9.87E-02	5.33E-01
Benzo(k)fluoranthene	5.89E-02	2.71E-01	1.80E+00	3.27E-02	1.51E-01
Chrysene	7.74E-02	1.53E-01	1.59E+00	4.86E-02	9.61E-02
Dibenz(a,h)anthracene	4.35E-02	2.05E-01	1.62E-01	2.69E-01	1.27E+00
Fluoranthene	1.13E-01	6.14E-01	2.85E+00	3.96E-02	2.15E-01
Fluorene	1.22E-02	2.43E-02	2.80E-01	4.36E-02	8.69E-02
gamma-Chlordane	3.13E-04	5.70E-04	3.25E-03	9.64E-02	1.75E-01
Hexachlorobenzene	1.00E-02	1.26E-02	6.00E-03	1.67E+00	2.10E+00
Indeno(1,2,3-cd)pyrene	7.22E-02	3.47E-01	6.00E-01	1.20E-01	5.78E-01
Phenanthrene	7.46E-02	3.88E-01	8.70E-01	8.57E-02	4.46E-01
Pyrene	1.30E-01	6.78E-01	1.63E+00	7.96E-02	4.15E-01
LPAH	1.27E-01	4.92E-01	1.86E+00	6.83E-02	2.65E-01
HPAH	7.73E-01	3.77E+00	5.65E+00	1.37E-01	6.67E-01
TOTAL PAHs	8.99E-01	4.26E+00	2.44E+01	3.69E-02	1.75E-01

TABLE F-5
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
FIDDLER CRAB

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	1.16E-08	Cammen, 1979
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	8.30E-03	9.60E-03	1.07E-08	1.23E-08
4,4'-DDT	4.11E-04	2.30E-03	5.28E-10	2.95E-09
Acenaphthylene	1.16E-02	2.73E-02	1.49E-08	3.51E-08
Anthracene	2.01E-02	4.24E-02	2.58E-08	5.45E-08
Benzo(a)anthracene	4.54E-02	3.01E-01	5.83E-08	3.87E-07
Benzo(a)pyrene	6.61E-02	3.52E-01	8.49E-08	4.52E-07
Benzo(b)fluoranthene	1.00E-01	4.91E-01	1.28E-07	6.31E-07
Benzo(g,h,i)perylene	6.61E-02	3.57E-01	8.49E-08	4.59E-07
Benzo(k)fluoranthene	5.89E-02	2.71E-01	7.57E-08	3.48E-07
Chrysene	7.74E-02	1.53E-01	9.94E-08	1.97E-07
Dibenz(a,h)anthracene	4.35E-02	2.05E-01	5.59E-08	2.63E-07
Fluoranthene	1.13E-01	6.14E-01	1.45E-07	7.89E-07
Fluorene	1.22E-02	2.43E-02	1.57E-08	3.12E-08
gamma-Chlordane	3.13E-04	5.70E-04	4.02E-10	7.33E-10
Hexachlorobenzene	1.00E-02	1.26E-02	1.28E-08	1.62E-08
Indeno(1,2,3-cd)pyrene	7.22E-02	3.47E-01	9.27E-08	4.46E-07
Phenanthrene	7.46E-02	3.88E-01	9.58E-08	4.98E-07
Pyrene	1.30E-01	6.78E-01	1.67E-07	8.71E-07
LPAH	1.27E-01	4.92E-01	1.63E-07	6.31E-07
HPAH	7.73E-01	3.77E+00	9.92E-07	4.84E-06
TOTAL PAHs	8.99E-01	4.26E+00	1.16E-06	5.47E-06

FOOD INGESTION

INTAKE = (Ci * IR * DFi * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ci	Invertebrate concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.16E-08	Cammen, 1979
Dfi	Dietary fraction of invertebrates (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	ased on width/length eq.

Chemical	Average Invertebrate	RME Invertebrate	Average Intake	RME Intake
2-Methylnaphthalene	1.34E-02	1.55E-02	1.72E-08	1.99E-08
4,4'-DDT	3.29E-04	1.84E-03	4.22E-10	2.36E-09
Acenaphthylene	1.87E-02	4.40E-02	2.40E-08	5.65E-08
Anthracene	3.24E-02	6.83E-02	4.16E-08	8.77E-08
Benzo(a)anthracene	6.58E-02	4.36E-01	8.46E-08	5.61E-07
Benzo(a)pyrene	1.05E-01	5.60E-01	1.35E-07	7.19E-07
Benzo(b)fluoranthene	1.61E-01	7.91E-01	2.07E-07	1.02E-06
Benzo(g,h,i)perylene	1.06E-01	5.75E-01	1.37E-07	7.38E-07
Benzo(k)fluoranthene	9.48E-02	4.36E-01	1.22E-07	5.60E-07
Chrysene	1.07E-01	2.11E-01	1.37E-07	2.71E-07
Dibenz(a,h)anthracene	7.00E-02	3.30E-01	9.00E-08	4.24E-07
Fluoranthene	1.82E-01	9.89E-01	2.34E-07	1.27E-06

TABLE F-5
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
FIDDLER CRAB

Fluorene	1.96E-02	3.91E-02	2.52E-08	5.03E-08
gamma-Chlordane	1.84E-03	3.35E-03	2.37E-09	4.31E-09
Hexachlorobenzene	5.12E-03	6.45E-03	6.58E-09	8.29E-09
Indeno(1,2,3-cd)pyrene	1.16E-01	5.59E-01	1.49E-07	7.18E-07
Phenanthrene	1.20E-01	6.25E-01	1.54E-07	8.02E-07
Pyrene	2.09E-01	1.09E+00	2.69E-07	1.40E-06
LPAH	2.04E-01	7.91E-01	2.62E-07	1.02E-06
HPAH	1.24E+00	6.07E+00	1.60E-06	7.79E-06
TOTAL PAHs	1.45E+00	6.86E+00	1.86E-06	8.81E-06

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	2.78E-08	3.22E-08
4,4'-DDT	9.50E-10	5.32E-09
Acenaphthylene	3.89E-08	9.15E-08
Anthracene	6.74E-08	1.42E-07
Benzo(a)anthracene	1.43E-07	9.47E-07
Benzo(a)pyrene	2.20E-07	1.17E-06
Benzo(b)fluoranthene	3.35E-07	1.65E-06
Benzo(g,h,i)perylene	2.22E-07	1.20E-06
Benzo(k)fluoranthene	1.97E-07	9.09E-07
Chrysene	2.37E-07	4.68E-07
Dibenz(a,h)anthracene	1.46E-07	6.87E-07
Fluoranthene	3.79E-07	2.06E-06
Fluorene	4.09E-08	8.15E-08
gamma-Chlordane	2.77E-09	5.04E-09
Hexachlorobenzene	1.94E-08	2.45E-08
Indeno(1,2,3-cd)pyrene	2.42E-07	1.16E-06
Phenanthrene	2.50E-07	1.30E-06
Pyrene	4.36E-07	2.27E-06
LPAH	4.25E-07	1.65E-06
HPAH	2.59E-06	1.26E-05
TOTAL PAHs	3.02E-06	1.43E-05

TABLE F-6
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
SPOTTED SEATROUT

FOOD INGESTION

INTAKE = (Cf * IR * Dff * AUF)/BW

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.60E-02	same as black drum
Dff	Dietary fraction of fish (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.00E+00	TPWD website

Chemical	Average Fish	RME Fish	Average Intake	RME Intake
2-Methylnaphthalene	3.86E-02	4.46E-02	1.00E-03	1.16E-03
4,4'-DDT	2.38E-04	1.33E-03	6.20E-06	3.47E-05
Acenaphthylene	5.74E-03	1.35E-02	1.49E-04	3.51E-04
Anthracene	1.69E-03	3.56E-03	4.39E-05	9.26E-05
Benzo(a)anthracene	3.00E-02	1.99E-01	7.79E-04	5.17E-03
Benzo(a)pyrene	4.36E-02	2.32E-01	1.13E-03	6.04E-03
Benzo(b)fluoranthene	6.60E-02	3.24E-01	1.72E-03	8.43E-03
Benzo(g,h,i)perylene	4.36E-02	2.36E-01	1.13E-03	6.13E-03
Benzo(k)fluoranthene	3.89E-02	1.79E-01	1.01E-03	4.65E-03
Chrysene	5.11E-02	1.01E-01	1.33E-03	2.63E-03
Dibenz(a,h)anthracene	2.87E-02	1.35E-01	7.46E-04	3.52E-03
Fluoranthene	7.46E-02	4.05E-01	1.94E-03	1.05E-02
Fluorene	6.04E-03	1.20E-02	1.57E-04	3.13E-04
gamma-Chlordane	4.70E-04	8.56E-04	1.22E-05	2.22E-05
Hexachlorobenzene	1.42E-02	1.79E-02	3.69E-04	4.65E-04
Indeno(1,2,3-cd)pyrene	4.77E-02	2.29E-01	1.24E-03	5.95E-03
Phenanthrene	3.69E-02	1.92E-01	9.60E-04	4.99E-03
Pyrene	8.58E-02	4.47E-01	2.23E-03	1.16E-02
LPAH	6.29E-02	2.44E-01	1.64E-03	6.34E-03
HPAH	5.10E-01	2.49E+00	1.33E-02	6.47E-02
TOTAL PAHs	5.94E-01	2.81E+00	1.54E-02	7.31E-02

TABLE F-7
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
BLACK DRUM

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.60E-03	Neill, 1998*
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.24E+00	PCO BERA

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	8.30E-03	9.60E-03	1.74E-05	2.02E-05
4,4'-DDT	4.11E-04	2.30E-03	8.63E-07	4.83E-06
Acenaphthylene	1.16E-02	2.73E-02	2.44E-05	5.73E-05
Anthracene	2.01E-02	4.24E-02	4.22E-05	8.90E-05
Benzo(a)anthracene	4.54E-02	3.01E-01	9.53E-05	6.32E-04
Benzo(a)pyrene	6.61E-02	3.52E-01	1.39E-04	7.39E-04
Benzo(b)fluoranthene	1.00E-01	4.91E-01	2.10E-04	1.03E-03
Benzo(g,h,i)perylene	6.61E-02	3.57E-01	1.39E-04	7.50E-04
Benzo(k)fluoranthene	5.89E-02	2.71E-01	1.24E-04	5.69E-04
Chrysene	7.74E-02	1.53E-01	1.63E-04	3.21E-04
Dibenz(a,h)anthracene	4.35E-02	2.05E-01	9.14E-05	4.31E-04
Fluoranthene	1.13E-01	6.14E-01	2.37E-04	1.29E-03
Fluorene	1.22E-02	2.43E-02	2.56E-05	5.10E-05
gamma-Chlordane	3.13E-04	5.70E-04	6.58E-07	1.20E-06
Hexachlorobenzene	1.00E-02	1.26E-02	2.10E-05	2.65E-05
Indeno(1,2,3-cd)pyrene	7.22E-02	3.47E-01	1.52E-04	7.29E-04
Phenanthrene	7.46E-02	3.88E-01	1.57E-04	8.15E-04
Pyrene	1.30E-01	6.78E-01	2.73E-04	1.42E-03
LPAH	1.27E-01	4.92E-01	2.66E-04	1.03E-03
HPAH	7.73E-01	3.77E+00	1.62E-03	7.92E-03
TOTAL PAHs	8.99E-01	4.26E+00	1.89E-03	8.95E-03

FOOD INGESTION

INTAKE = ((Cw * IR * Dfw * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW) + ((Cf * IR * DFf *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cw	Worm concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cf	Fish concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.60E-02	Neill, 1998
Dfw	Dietary fraction of worms (unitless)	3.33E-01	prof. judgement
Dfc	Dietary fraction of crabs (unitless)	3.33E-01	prof. judgement
Dff	Dietary fraction of fish (unitless)	3.33E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.24E+00	PCO BERA

Chemical	Average Worm	RME Worm	Average Crab	RME Crab	Average Fish	RME Fish	Average Intake	RME Intake
2-Methylnaphthalene	1.34E-02	1.55E-02	0.00E+00	0.00E+00	3.86E-02	4.46E-02	3.63E-04	4.20E-04
4,4'-DDT	3.29E-04	1.84E-03	1.65E-03	9.25E-03	2.38E-04	1.33E-03	1.55E-05	8.69E-05
Acenaphthylene	1.87E-02	4.40E-02	0.00E+00	0.00E+00	5.74E-03	1.35E-02	1.71E-04	4.02E-04
Anthracene	3.24E-02	6.83E-02	6.57E-02	1.39E-01	1.69E-03	3.56E-03	6.98E-04	1.47E-03
Benzo(a)anthracene	6.58E-02	4.36E-01	1.15E-01	7.62E-01	3.00E-02	1.99E-01	1.47E-03	9.77E-03
Benzo(a)pyrene	1.05E-01	5.60E-01	9.92E-03	5.28E-02	4.36E-02	2.32E-01	1.11E-03	5.91E-03
Benzo(b)fluoranthene	1.61E-01	7.91E-01	1.57E-01	7.71E-01	6.60E-02	3.24E-01	2.69E-03	1.32E-02
Benzo(g,h,i)perylene	1.06E-01	5.75E-01	0.00E+00	0.00E+00	4.36E-02	2.36E-01	1.05E-03	5.67E-03
Benzo(k)fluoranthene	9.48E-02	4.36E-01	0.00E+00	0.00E+00	3.89E-02	1.79E-01	9.35E-04	4.30E-03
Chrysene	1.07E-01	2.11E-01	9.98E-02	1.97E-01	5.11E-02	1.01E-01	1.80E-03	3.56E-03
Dibenz(a,h)anthracene	7.00E-02	3.30E-01	0.00E+00	0.00E+00	2.87E-02	1.35E-01	6.91E-04	3.25E-03
Fluoranthene	1.82E-01	9.89E-01	1.51E+00	8.19E+00	7.46E-02	4.05E-01	1.23E-02	6.70E-02
Fluorene	1.96E-02	3.91E-02	0.00E+00	0.00E+00	6.04E-03	1.20E-02	1.80E-04	3.58E-04
gamma-Chlordane	1.84E-03	3.35E-03	7.20E-04	1.31E-03	4.70E-04	8.56E-04	2.12E-05	3.86E-05
Hexachlorobenzene	5.12E-03	6.45E-03	5.00E-02	6.30E-02	1.42E-02	1.79E-02	4.85E-04	6.11E-04
Indeno(1,2,3-cd)pyrene	1.16E-01	5.59E-01	0.00E+00	0.00E+00	4.77E-02	2.29E-01	1.15E-03	5.51E-03
Phenanthrene	1.20E-01	6.25E-01	0.00E+00	0.00E+00	3.69E-02	1.92E-01	1.10E-03	5.71E-03
Pyrene	2.09E-01	1.09E+00	0.00E+00	0.00E+00	8.58E-02	4.47E-01	2.06E-03	1.08E-02
LPAH	2.04E-01	7.91E-01	4.15E-01	1.61E+00	6.29E-02	2.44E-01	4.77E-03	1.85E-02
HPAH	1.24E+00	6.07E+00	2.53E+00	1.23E+01	5.10E-01	2.49E+00	2.99E-02	1.46E-01
TOTAL PAHs	1.45E+00	6.86E+00	2.94E+00	1.39E+01	5.94E-01	2.81E+00	3.48E-02	1.65E-01

TABLE F-7
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
BLACK DRUM

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	3.81E-04	4.40E-04
4,4'-DDT	1.64E-05	9.17E-05
Acenaphthylene	1.95E-04	4.59E-04
Anthracene	7.40E-04	1.56E-03
Benzo(a)anthracene	1.57E-03	1.04E-02
Benzo(a)pyrene	1.25E-03	6.65E-03
Benzo(b)fluoranthene	2.90E-03	1.42E-02
Benzo(g,h,i)perylene	1.19E-03	6.42E-03
Benzo(k)fluoranthene	1.06E-03	4.87E-03
Chrysene	1.97E-03	3.88E-03
Dibenz(a,h)anthracene	7.82E-04	3.68E-03
Fluoranthene	1.26E-02	6.83E-02
Fluorene	2.05E-04	4.09E-04
gamma-Chlordane	2.19E-05	3.98E-05
Hexachlorobenzene	5.06E-04	6.37E-04
Indeno(1,2,3-cd)pyrene	1.30E-03	6.24E-03
Phenanthrene	1.25E-03	6.53E-03
Pyrene	2.34E-03	1.22E-02
LPAH	5.03E-03	1.95E-02
HPAH	3.16E-02	1.54E-01
TOTAL PAHs	3.67E-02	1.74E-01

Notes:
* Sediment ingestion was assumed to be 10% of dietary intake

TABLE F-8
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
SANDPIPER

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sediment concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.10E-02	EPA, 1993
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	8.30E-03	9.60E-03	8.11E-04	9.38E-04
4,4'-DDT	4.11E-04	2.30E-03	4.01E-05	2.25E-04
Acenaphthylene	1.16E-02	2.73E-02	1.13E-03	2.67E-03
Anthracene	2.01E-02	4.24E-02	1.96E-03	4.14E-03
Benzo(a)anthracene	4.54E-02	3.01E-01	4.43E-03	2.94E-02
Benzo(a)pyrene	6.61E-02	3.52E-01	6.46E-03	3.44E-02
Benzo(b)fluoranthene	1.00E-01	4.91E-01	9.77E-03	4.80E-02
Benzo(g,h,i)perylene	6.61E-02	3.57E-01	6.46E-03	3.49E-02
Benzo(k)fluoranthene	5.89E-02	2.71E-01	5.75E-03	2.65E-02
Chrysene	7.74E-02	1.53E-01	7.56E-03	1.49E-02
Dibenz(a,h)anthracene	4.35E-02	2.05E-01	4.25E-03	2.00E-02
Fluoranthene	1.13E-01	6.14E-01	1.10E-02	6.00E-02
Fluorene	1.22E-02	2.43E-02	1.19E-03	2.37E-03
gamma-Chlordane	3.13E-04	5.70E-04	3.06E-05	5.57E-05
Hexachlorobenzene	1.00E-02	1.26E-02	9.77E-04	1.23E-03
Indeno(1,2,3-cd)pyrene	7.22E-02	3.47E-01	7.05E-03	3.39E-02
Phenanthrene	7.46E-02	3.88E-01	7.29E-03	3.79E-02
Pyrene	1.30E-01	6.78E-01	1.27E-02	6.62E-02
LPAH	1.27E-01	4.92E-01	1.24E-02	4.80E-02
HPAH	7.73E-01	3.77E+00	7.55E-02	3.68E-01
TOTAL PAHs	8.99E-01	4.26E+00	8.78E-02	4.16E-01

FOOD INGESTION

INTAKE = ((Cc * IR * Dfc * AUF)/(BW) + (Cw * IR * DFwa * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cw	Worm concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.08E-01	EPA, 1993
Dfc	Dietary fraction of crabs (unitless)	4.00E-01	prof. judgement
Dfw	Dietary fraction of worms (unitless)	6.00E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Crab	RME Crab	Average Worm	RME Worm	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	1.34E-02	1.55E-02	4.03E-03	4.66E-03
4,4'-DDT	1.65E-03	9.25E-03	3.29E-04	1.84E-03	4.31E-04	2.41E-03
Acenaphthylene	0.00E+00	0.00E+00	1.87E-02	4.40E-02	5.63E-03	1.32E-02
Anthracene	6.57E-02	1.39E-01	3.24E-02	6.83E-02	2.30E-02	4.84E-02
Benzo(a)anthracene	1.15E-01	7.62E-01	6.58E-02	4.36E-01	4.29E-02	2.85E-01
Benzo(a)pyrene	9.92E-03	5.28E-02	1.05E-01	5.60E-01	3.37E-02	1.79E-01
Benzo(b)fluoranthene	1.57E-01	7.71E-01	1.61E-01	7.91E-01	8.01E-02	3.93E-01
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	1.06E-01	5.75E-01	3.21E-02	1.73E-01
Benzo(k)fluoranthene	0.00E+00	0.00E+00	9.48E-02	4.36E-01	2.86E-02	1.32E-01
Chrysene	9.98E-02	1.97E-01	1.07E-01	2.11E-01	5.23E-02	1.03E-01
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	7.00E-02	3.30E-01	2.11E-02	9.95E-02
Fluoranthene	1.51E+00	8.19E+00	1.82E-01	9.89E-01	3.58E-01	1.94E+00
Fluorene	0.00E+00	0.00E+00	1.96E-02	3.91E-02	5.92E-03	1.18E-02
gamma-Chlordane	7.20E-04	1.31E-03	1.84E-03	3.35E-03	7.00E-04	1.27E-03
Hexachlorobenzene	5.00E-02	6.30E-02	5.12E-03	6.45E-03	1.16E-02	1.46E-02
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	1.16E-01	5.59E-01	3.50E-02	1.68E-01
Phenanthrene	0.00E+00	0.00E+00	1.20E-01	6.25E-01	3.62E-02	1.88E-01
Pyrene	0.00E+00	0.00E+00	2.09E-01	1.09E+00	6.31E-02	3.29E-01

TABLE F-8
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
SANDPIPER

LPAH	4.15E-01	1.61E+00	2.04E-01	7.91E-01	1.45E-01	5.62E-01
HPAH	2.53E+00	1.23E+01	1.24E+00	6.07E+00	8.83E-01	4.31E+00
TOTAL PAHs	2.94E+00	1.39E+01	1.45E+00	6.86E+00	1.03E+00	4.87E+00

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	4.84E-03	5.60E-03
4,4'-DDT	4.71E-04	2.64E-03
Acenaphthylene	6.76E-03	1.59E-02
Anthracene	2.49E-02	5.26E-02
Benzo(a)anthracene	4.74E-02	3.14E-01
Benzo(a)pyrene	4.01E-02	2.14E-01
Benzo(b)fluoranthene	8.98E-02	4.41E-01
Benzo(g,h,i)perylene	3.85E-02	2.08E-01
Benzo(k)fluoranthene	3.43E-02	1.58E-01
Chrysene	5.98E-02	1.18E-01
Dibenz(a,h)anthracene	2.54E-02	1.19E-01
Fluoranthene	3.69E-01	2.00E+00
Fluorene	7.11E-03	1.42E-02
gamma-Chlordane	7.30E-04	1.33E-03
Hexachlorobenzene	1.26E-02	1.58E-02
Indeno(1,2,3-cd)pyrene	4.21E-02	2.02E-01
Phenanthrene	4.35E-02	2.26E-01
Pyrene	7.58E-02	3.95E-01
LPAH	1.57E-01	6.10E-01
HPAH	9.58E-01	4.67E+00
TOTAL PAHs	1.12E+00	5.28E+00

TABLE F-9
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
GREEN HERON

FOOD INGESTION

INTAKE = ((Cf * IR * Dff * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.13E-01	EPA, 1993
DFf	Dietary fraction of fish (unitless)	7.50E-01	Kent, 1986
DFc	Dietary fraction of crab (unitless)	2.50E-01	Kent, 1986
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	3.75E-01	Dunning, 1993

Chemical	Average Fish	RME Fish	Average Crab	RME Crab	Average Intake	RME Intake
2-Methylnaphthalene	3.86E-02	4.46E-02	0.00E+00	0.00E+00	8.68E-03	1.00E-02
4,4'-DDT	2.38E-04	1.33E-03	1.65E-03	9.25E-03	1.78E-04	9.94E-04
Acenaphthylene	5.74E-03	1.35E-02	0.00E+00	0.00E+00	1.29E-03	3.04E-03
Anthracene	1.69E-03	3.56E-03	6.57E-02	1.39E-01	5.31E-03	1.12E-02
Benzo(a)anthracene	3.00E-02	1.99E-01	1.15E-01	7.62E-01	1.54E-02	1.02E-01
Benzo(a)pyrene	4.36E-02	2.32E-01	9.92E-03	5.28E-02	1.06E-02	5.62E-02
Benzo(b)fluoranthene	6.60E-02	3.24E-01	1.57E-01	7.71E-01	2.66E-02	1.31E-01
Benzo(g,h,i)perylene	4.36E-02	2.36E-01	0.00E+00	0.00E+00	9.82E-03	5.30E-02
Benzo(k)fluoranthene	3.89E-02	1.79E-01	0.00E+00	0.00E+00	8.75E-03	4.02E-02
Chrysene	5.11E-02	1.01E-01	9.98E-02	1.97E-01	1.90E-02	3.75E-02
Dibenz(a,h)anthracene	2.87E-02	1.35E-01	0.00E+00	0.00E+00	6.46E-03	3.04E-02
Fluoranthene	7.46E-02	4.05E-01	1.51E+00	8.19E+00	1.30E-01	7.05E-01
Fluorene	6.04E-03	1.20E-02	0.00E+00	0.00E+00	1.36E-03	2.71E-03
gamma-Chlordane	4.70E-04	8.56E-04	7.20E-04	1.31E-03	1.60E-04	2.91E-04
Hexachlorobenzene	1.42E-02	1.79E-02	5.00E-02	6.30E-02	6.95E-03	8.75E-03
Indeno(1,2,3-cd)pyrene	4.77E-02	2.29E-01	0.00E+00	0.00E+00	1.07E-02	5.15E-02
Phenanthrene	3.69E-02	1.92E-01	0.00E+00	0.00E+00	8.31E-03	4.32E-02
Pyrene	8.58E-02	4.47E-01	0.00E+00	0.00E+00	1.93E-02	1.01E-01
LPAH	6.29E-02	2.44E-01	4.15E-01	1.61E+00	4.52E-02	1.75E-01
HPAH	5.10E-01	2.49E+00	2.53E+00	1.23E+01	3.04E-01	1.48E+00
TOTAL PAHs	5.94E-01	2.81E+00	2.94E+00	1.39E+01	3.54E-01	1.68E+00

TABLE F-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
FIDDLER CRAB

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Fiddler Crab	Average EHQ	RME EHQ
2-Methylnaphthalene	2.78E-08	3.22E-08			
4,4'-DDT	9.50E-10	5.32E-09	1.47E-01	6.46E-09	3.62E-08
Acenaphthylene	3.89E-08	9.15E-08			
Anthracene	6.74E-08	1.42E-07			
Benzo(a)anthracene	1.43E-07	9.47E-07			
Benzo(a)pyrene	2.20E-07	1.17E-06			
Benzo(b)fluoranthene	3.35E-07	1.65E-06			
Benzo(g,h,i)perylene	2.22E-07	1.20E-06			
Benzo(k)fluoranthene	1.97E-07	9.09E-07			
Chrysene	2.37E-07	4.68E-07			
Dibenz(a,h)anthracene	1.46E-07	6.87E-07			
Fluoranthene	3.79E-07	2.06E-06			
Fluorene	4.09E-08	8.15E-08			
gamma-Chlordane	2.77E-09	5.04E-09	4.60E+00	6.02E-10	1.10E-09
Hexachlorobenzene	1.94E-08	2.45E-08	2.25E-01	8.63E-08	1.09E-07
Indeno(1,2,3-cd)pyrene	2.42E-07	1.16E-06			
Phenanthrene	2.50E-07	1.30E-06			
Pyrene	4.36E-07	2.27E-06			
LPAH	4.25E-07	1.65E-06	6.56E+01	6.48E-09	2.51E-08
HPAH	2.59E-06	1.26E-05	9.31E+00	2.78E-07	1.36E-06
TOTAL PAHs	3.02E-06	1.43E-05			

TABLE F-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
BLACK DRUM

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Black Drum	Average EHQ	RME EHQ
2-Methylnaphthalene	3.81E-04	4.40E-04			
4,4'-DDT	1.64E-05	9.17E-05	1.47E-01	1.11E-04	6.24E-04
Acenaphthylene	1.95E-04	4.59E-04			
Anthracene	7.40E-04	1.56E-03			
Benzo(a)anthracene	1.57E-03	1.04E-02			
Benzo(a)pyrene	1.25E-03	6.65E-03			
Benzo(b)fluoranthene	2.90E-03	1.42E-02			
Benzo(g,h,i)perylene	1.19E-03	6.42E-03			
Benzo(k)fluoranthene	1.06E-03	4.87E-03			
Chrysene	1.97E-03	3.88E-03			
Dibenz(a,h)anthracene	7.82E-04	3.68E-03			
Fluoranthene	1.26E-02	6.83E-02			
Fluorene	2.05E-04	4.09E-04			
gamma-Chlordane	2.19E-05	3.98E-05	4.60E+00	4.75E-06	8.65E-06
Hexachlorobenzene	5.06E-04	6.37E-04	2.25E-01	2.25E-03	2.83E-03
Indeno(1,2,3-cd)pyrene	1.30E-03	6.24E-03			
Phenanthrene	1.25E-03	6.53E-03			
Pyrene	2.34E-03	1.22E-02			
LPAH	5.03E-03	1.95E-02	6.56E+01	7.67E-05	2.97E-04
HPAH	3.16E-02	1.54E-01	9.31E+00	3.39E-03	1.65E-02
TOTAL PAHs	3.67E-02	1.74E-01			

TABLE F-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
SPOTTED SEATROUT

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Spotted Seatrout	Average EHQ	RME EHQ
2-Methylnaphthalene	1.00E-03	1.16E-03			
4,4'-DDT	6.20E-06	3.47E-05	1.47E-01	4.22E-05	2.36E-04
Acenaphthylene	1.49E-04	3.51E-04			
Anthracene	4.39E-05	9.26E-05			
Benzo(a)anthracene	7.79E-04	5.17E-03			
Benzo(a)pyrene	1.13E-03	6.04E-03			
Benzo(b)fluoranthene	1.72E-03	8.43E-03			
Benzo(g,h,i)perylene	1.13E-03	6.13E-03			
Benzo(k)fluoranthene	1.01E-03	4.65E-03			
Chrysene	1.33E-03	2.63E-03			
Dibenz(a,h)anthracene	7.46E-04	3.52E-03			
Fluoranthene	1.94E-03	1.05E-02			
Fluorene	1.57E-04	3.13E-04			
gamma-Chlordane	1.22E-05	2.22E-05	4.60E+00	2.66E-06	4.84E-06
Hexachlorobenzene	3.69E-04	4.65E-04	2.25E-01	1.64E-03	2.07E-03
Indeno(1,2,3-cd)pyrene	1.24E-03	5.95E-03			
Phenanthrene	9.60E-04	4.99E-03			
Pyrene	2.23E-03	1.16E-02			
LPAH	1.64E-03	6.34E-03	6.56E+01	2.49E-05	9.66E-05
HPAH	1.33E-02	6.47E-02	9.31E+00	1.42E-03	6.95E-03
TOTAL PAHs	1.54E-02	7.31E-02			

TABLE F-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
SANDPIPER

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Sandpiper	Average EHQ	RME EHQ
2-Methylnaphthalene	4.84E-03	5.60E-03			
4,4'-DDT	4.71E-04	2.64E-03	2.27E-01	2.08E-03	1.16E-02
Acenaphthylene	6.76E-03	1.59E-02			
Anthracene	2.49E-02	5.26E-02			
Benzo(a)anthracene	4.74E-02	3.14E-01			
Benzo(a)pyrene	4.01E-02	2.14E-01			
Benzo(b)fluoranthene	8.98E-02	4.41E-01			
Benzo(g,h,i)perylene	3.85E-02	2.08E-01			
Benzo(k)fluoranthene	3.43E-02	1.58E-01			
Chrysene	5.98E-02	1.18E-01			
Dibenz(a,h)anthracene	2.54E-02	1.19E-01			
Fluoranthene	3.69E-01	2.00E+00			
Fluorene	7.11E-03	1.42E-02			
gamma-Chlordane	7.30E-04	1.33E-03	2.14E+00	3.41E-04	6.22E-04
Hexachlorobenzene	1.26E-02	1.58E-02	2.25E-01	5.59E-02	7.04E-02
Indeno(1,2,3-cd)pyrene	4.21E-02	2.02E-01			
Phenanthrene	4.35E-02	2.26E-01			
Pyrene	7.58E-02	3.95E-01			
LPAH	1.57E-01	6.10E-01	6.56E+01	2.40E-03	9.29E-03
HPAH	9.58E-01	4.67E+00	9.31E+00	1.03E-01	5.02E-01
TOTAL PAHs	1.12E+00	5.28E+00			

TABLE F-14
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT
GREEN HERON

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Green Heron	Average EHQ	RME EHQ
2-Methylnaphthalene	8.68E-03	1.00E-02			
4,4'-DDT	1.78E-04	9.94E-04	2.27E-01	7.82E-04	4.38E-03
Acenaphthylene	1.29E-03	3.04E-03			
Anthracene	5.31E-03	1.12E-02			
Benzo(a)anthracene	1.54E-02	1.02E-01			
Benzo(a)pyrene	1.06E-02	5.62E-02			
Benzo(b)fluoranthene	2.66E-02	1.31E-01			
Benzo(g,h,i)perylene	9.82E-03	5.30E-02			
Benzo(k)fluoranthene	8.75E-03	4.02E-02			
Chrysene	1.90E-02	3.75E-02			
Dibenz(a,h)anthracene	6.46E-03	3.04E-02			
Fluoranthene	1.30E-01	7.05E-01			
Fluorene	1.36E-03	2.71E-03			
gamma-Chlordane	1.60E-04	2.91E-04	2.14E+00	7.46E-05	1.36E-04
Hexachlorobenzene	6.95E-03	8.75E-03	2.25E-01	3.09E-02	3.89E-02
Indeno(1,2,3-cd)pyrene	1.07E-02	5.15E-02			
Phenanthrene	8.31E-03	4.32E-02			
Pyrene	1.93E-02	1.01E-01			
LPAH	4.52E-02	1.75E-01	6.56E+01	6.90E-04	2.67E-03
HPAH	3.04E-01	1.48E+00	9.31E+00	3.27E-02	1.59E-01
TOTAL PAHs	3.54E-01	1.68E+00			

TABLE F-15
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csed x BSAF (or BSAF or BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	Average Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
2-Methylnaphthalene	8.30E-03	1.61E+00	1.34E-02	EPA, 1999		0.00E+00		4.65E+00	3.86E-02	Brunson et al. (1998)
4,4'-DDT	4.11E-04	8.00E-01	3.29E-04	BSAF DB	4.02E+00	1.65E-03	BSAF DB	5.80E-01	2.38E-04	WSDOH, 1995
Acenaphthylene	1.16E-02	1.61E+00	1.87E-02	EPA, 1999		0.00E+00		0.495	5.74E-03	WSDOH, 1995
Anthracene	2.01E-02	1.61E+00	3.24E-02	EPA, 1999	3.27E+00	6.57E-02	BSAF DB	8.40E-02	1.69E-03	WSDOH, 1995
Benzo(a)anthracene	4.54E-02	1.45E+00	6.58E-02	EPA, 1999	2.53E+00	1.15E-01	BSAF DB	6.60E-01	3.00E-02	WSDOH. 1995
Benzo(a)pyrene	6.61E-02	1.59E+00	1.05E-01	EPA, 1999	1.50E-01	9.92E-03	BSAF DB	6.60E-01	4.36E-02	WSDOH, 1995
Benzo(b)fluoranthene	1.00E-01	1.61E+00	1.61E-01	EPA, 1999	1.57E+00	1.57E-01	BSAF DB	6.60E-01	6.60E-02	WSDOH, 1995
Benzo(g,h,i)perylene	6.61E-02	1.61E+00	1.06E-01	EPA, 1999		0.00E+00		6.60E-01	4.36E-02	WSDOH, 1995
Benzo(k)fluoranthene	5.89E-02	1.61E+00	9.48E-02	EPA, 1999		0.00E+00		6.60E-01	3.89E-02	WSDOH, 1995
Chrysene	7.74E-02	1.38E+00	1.07E-01	EPA, 1999	1.29E+00	9.98E-02	BSAF DB	6.60E-01	5.11E-02	WSDOH, 1995
Dibenz(a,h)anthracene	4.35E-02	1.61E+00	7.00E-02	EPA, 1999		0.00E+00		6.60E-01	2.87E-02	WSDOH, 1995
Fluoranthene	1.13E-01	1.61E+00	1.82E-01	EPA, 1999	1.33E+01	1.51E+00	BSAF DB	6.60E-01	7.46E-02	WSDOH, 1995
Fluorene	1.22E-02	1.61E+00	1.96E-02	EPA, 1999		0.00E+00		4.95E-01	6.04E-03	WSDOH, 1995
gamma-Chlordane	3.13E-04	5.88E+00	1.84E-03	BSAF DB	2.30E+00	7.20E-04	BSAF DB	1.50E+00	4.70E-04	BSAF DB
Hexachlorobenzene	1.00E-02	5.12E-01	5.12E-03	BSAF DB	5.00E+00	5.00E-02	BSAF DB	1.42E+00	1.42E-02	Max value from Calcasieu RI
Indeno(1,2,3-cd)pyrene	7.22E-02	1.61E+00	1.16E-01	EPA, 1999		0.00E+00		6.60E-01	4.77E-02	WSDOH, 1995
Phenanthrene	7.46E-02	1.61E+00	1.20E-01	EPA, 1999		0.00E+00		4.95E-01	3.69E-02	WSDOH, 1995
Pyrene	1.30E-01	1.61E+00	2.09E-01	EPA, 1999		0.00E+00		6.60E-01	8.58E-02	WSDOH, 1995
LPAH	1.27E-01	1.61E+00	2.04E-01	EPA, 1999	3.27E+00	4.15E-01	max PAH	4.96E-01	6.29E-02	WSDOH, 1995
HPAH	7.73E-01	1.61E+00	1.24E+00	EPA, 1999	3.27E+00	2.53E+00	max PAH	6.60E-01	5.10E-01	WSDOH, 1995
TOTAL PAHs	8.99E-01	1.61E+00	1.45E+00	EPA, 1999	3.27E+00	2.94E+00	max PAH	6.60E-01	5.94E-01	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE F-16
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csed x BSAF (or BSAF or BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	RME Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
2-Methylnaphthalene	9.60E-03	1.61E+00	1.55E-02	EPA, 1999		0.00E+00		4.65E+00	4.46E-02	Brunson et al. (1998)
4,4'-DDT	2.30E-03	8.00E-01	1.84E-03	BSAF DB	4.02E+00	9.25E-03	BSAF DB	5.80E-01	1.33E-03	WSDOH, 1995
Acenaphthylene	2.73E-02	1.61E+00	4.40E-02	EPA, 1999		0.00E+00		0.495	1.35E-02	WSDOH, 1995
Anthracene	4.24E-02	1.61E+00	6.83E-02	EPA, 1999	3.27E+00	1.39E-01	BSAF DB	8.40E-02	3.56E-03	WSDOH, 1995
Benzo(a)anthracene	3.01E-01	1.45E+00	4.36E-01	EPA, 1999	2.53E+00	7.62E-01	BSAF DB	6.60E-01	1.99E-01	WSDOH, 1995
Benzo(a)pyrene	3.52E-01	1.59E+00	5.60E-01	EPA, 1999	1.50E-01	5.28E-02	BSAF DB	6.60E-01	2.32E-01	WSDOH, 1995
Benzo(b)fluoranthene	4.91E-01	1.61E+00	7.91E-01	EPA, 1999	1.57E+00	7.71E-01	BSAF DB	6.60E-01	3.24E-01	WSDOH, 1995
Benzo(g,h,i)perylene	3.57E-01	1.61E+00	5.75E-01	EPA, 1999		0.00E+00		6.60E-01	2.36E-01	WSDOH, 1995
Benzo(k)fluoranthene	2.71E-01	1.61E+00	4.36E-01	EPA, 1999		0.00E+00		6.60E-01	1.79E-01	WSDOH, 1995
Chrysene	1.53E-01	1.38E+00	2.11E-01	EPA, 1999	1.29E+00	1.97E-01	BSAF DB	6.60E-01	1.01E-01	WSDOH, 1995
Dibenz(a,h)anthracene	2.05E-01	1.61E+00	3.30E-01	EPA, 1999		0.00E+00		6.60E-01	1.35E-01	WSDOH, 1995
Fluoranthene	6.14E-01	1.61E+00	9.89E-01	EPA, 1999	1.33E+01	8.19E+00	BSAF DB	6.60E-01	4.05E-01	WSDOH, 1995
Fluorene	2.43E-02	1.61E+00	3.91E-02	EPA, 1999		0.00E+00		4.95E-01	1.20E-02	WSDOH, 1995
gamma-Chlordane	5.70E-04	5.88E+00	3.35E-03	BSAF DB	2.30E+00	1.31E-03	BSAF DB	1.50E+00	8.56E-04	BSAF DB
Hexachlorobenzene	1.26E-02	5.12E-01	6.45E-03	BSAF DB	5.00E+00	6.30E-02	BSAF DB	1.42E+00	1.79E-02	Max value from Calcasieu RI
Indeno(1,2,3-cd)pyrene	3.47E-01	1.61E+00	5.59E-01	EPA, 1999		0.00E+00		6.60E-01	2.29E-01	WSDOH, 1995
Phenanthrene	3.88E-01	1.61E+00	6.25E-01	EPA, 1999		0.00E+00		4.95E-01	1.92E-01	WSDOH, 1995
Pyrene	6.78E-01	1.61E+00	1.09E+00	EPA, 1999		0.00E+00		6.60E-01	4.47E-01	WSDOH, 1995
LPAH	4.92E-01	1.61E+00	7.91E-01	EPA, 1999	3.27E+00	1.61E+00	max PAH	4.96E-01	2.44E-01	WSDOH, 1995
HPAH	3.77E+00	1.61E+00	6.07E+00	EPA, 1999	3.27E+00	1.23E+01	max PAH	6.60E-01	2.49E+00	WSDOH, 1995
TOTAL PAHs	4.26E+00	1.61E+00	6.86E+00	EPA, 1999	3.27E+00	1.39E+01	max PAH	6.60E-01	2.81E+00	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX G
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY BACKGROUND SEDIMENT

TABLE G-1
EXPOSURE POINT CONCENTATION (mg/kg)
INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND DATA

Parameter	Average		95% UCL	Statistic Used
4,4'-DDT	1.56E-04		3.82E-04	95% Chebyshev
Arsenic	5.81E+00		7.74E+00	95% Student's-t
Benzo(b)fluoranthene	8.70E-03		2.41E-02	95% Chebyshev
Copper	8.14E+00		1.13E+01	95% Student's-t
Hexachlorobenzene	0.0178		0.0187	95% Student's-t
Mercury	1.76E-02		2.73E-02	95% Approx. Gamma
Nickel	1.49E+01		1.99E+01	95% Student's-t
Zinc	3.60E+01		4.45E+01	95% Student's-t
LPAH				
HPAH	8.70E-03		2.41E-02	
TOTAL PAHs	0.0087		0.0241	

TABLE G-2
TOXICITY REFERENCE VALUES

Parameter	Capitella capitata (mg/kg)	Ref.	Comments	Fiddler Crab (mg/kgBW-day)	Ref.	Comments	Black Drum (mg/kgBW-day)	Ref.	Comments	Spotted seatrout (mg/kgBW-day)	Ref.	Comments	Sandpiper (mg/kgBW-day)	Ref.	Comments	Green heron (mg/kgBW-day)	Ref.	Comments
4,4'-DDT	0.001	SQUIRT	ERL	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Arsenic	8.2	SQUIRT	ERL															
Benzo(b)fluoranthene	1.8	SQUIRT	AET															
Copper	34	SQUIRT	ERL	5.6	EPA, 2007c	mammalian TRV for soil	5.6	EPA, 2007c	mammalian TRV for soil	5.6	EPA, 2007c	mammalian TRV for soil	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Hexachlorobenzene	0.006	SQUIRT	AET	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil	0.225	EPA, 1999	avian TRV for soil
Mercury	0.15	SQUIRT	ERL	1.01	EPA, 1999	mammalian TRV for soil	1.01	EPA, 1999	mammalian TRV for soil	1.01	EPA, 1999	mammalian TRV for soil	3.25	EPA, 1999	Acute (5 days) LOAEL for mortality in coturnix quail (dose 325 with uncertainty factor of 0.01)	3.25	EPA, 1999	Acute (5 days) LOAEL for mortality in coturnix quail (dose 325 with uncertainty factor of 0.01)
Nickel	20.9	SQUIRT	ERL	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Zinc	150	SQUIRT	ERL	75.4	EPA, 2007e	mammalian TRV for soil	75.4	EPA, 2007e	mammalian TRV for soil	75.4	EPA, 2007e	mammalian TRV for soil	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups	66.1	EPA, 2007e	Geometric mean of NOAEL values within the reproductive and growth effect groups
LPAH	0.552	SQUIRT	ERL	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil
HPAH	1.7	SQUIRT	ERL	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV
TOTAL PAHs	4.022	SQUIRT	ERL															

Notes:
ERL -- Effects Range-Low
AET -- Apparent Effects Threshold
TEL -- Threshold Effects Level

EPA, 2007a -- DDT
EPA, 2007b -- PAHs
EPA, 2007c -- Copper
EPA, 2007d -- Nickel
EPA, 2007e -- Zinc
EPA, 2007f -- Selenium
EPA, 2005a -- Antimony
EPA, 2005b -- Cadmium
EPA, 2005c -- Chromium
EPA, 2005d -- Vanadium
EPA, 2005e -- Lead
EPA, 2005f -- Dieldrin
EPA, 2005g -- Barium

TABLE G-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
CAPITELLA CAPITATA

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDT	1.56E-04	3.82E-04	1.00E-03	1.56E-01	3.82E-01
Arsenic	5.81E+00	7.74E+00	8.20E+00	7.09E-01	9.44E-01
Benzo(b)fluoranthene	8.70E-03	2.41E-02	1.80E+00	4.83E-03	1.34E-02
Copper	8.14E+00	1.13E+01	3.40E+01	2.39E-01	3.34E-01
Hexachlorobenzene	1.78E-02	1.87E-02	6.00E-03	2.97E+00	3.12E+00
Mercury	1.76E-02	2.73E-02	1.50E-01	1.17E-01	1.82E-01
Nickel	1.49E+01	1.99E+01	2.09E+01	7.13E-01	9.54E-01
Zinc	3.60E+01	4.45E+01	1.50E+02	2.40E-01	2.97E-01
LPAH	0.00E+00	0.00E+00	5.52E-01	0.00E+00	0.00E+00
HPAH	8.70E-03	2.41E-02	1.70E+00	5.12E-03	1.42E-02
TOTAL PAHs	8.70E-03	2.41E-02	4.02E+00	2.16E-03	5.99E-03

TABLE G-4
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
FIDDLER CRAB

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	1.16E-08	Cammen, 1979
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDT	1.56E-04	3.82E-04	2.00E-10	4.90E-10
Arsenic	5.81E+00	7.74E+00	7.47E-06	9.94E-06
Benzo(b)fluoranthene	8.70E-03	2.41E-02	1.12E-08	3.10E-08
Copper	8.14E+00	1.13E+01	1.05E-05	1.46E-05
Hexachlorobenzene	1.78E-02	1.87E-02	2.29E-08	2.40E-08
Mercury	1.76E-02	2.73E-02	2.26E-08	3.51E-08
Nickel	1.49E+01	1.99E+01	1.92E-05	2.56E-05
Zinc	3.60E+01	4.45E+01	4.63E-05	5.72E-05
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	8.70E-03	2.41E-02	1.12E-08	3.10E-08
TOTAL PAHs	8.70E-03	2.41E-02	1.12E-08	3.10E-08

FOOD INGESTION

INTAKE = (Ci * IR * DFi * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ci	Invertebrate concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.16E-08	Cammen, 1979
Dfi	Dietary fraction of invertebrates (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	ased on width/length eq.

Chemical	Average Invertebrate	RME Invertebrate	Average Intake	RME Intake
4,4'-DDT	1.24E-04	3.05E-04	1.60E-10	3.92E-10
Arsenic	5.23E+00	6.97E+00	6.72E-06	8.95E-06
Benzo(b)fluoranthene	1.40E-02	3.88E-02	1.80E-08	4.98E-08
Copper	2.44E+00	3.40E+00	3.14E-06	4.37E-06
Hexachlorobenzene	9.11E-03	9.57E-03	1.17E-08	1.23E-08
Mercury	7.04E-03	1.09E-02	9.04E-09	1.40E-08
Nickel	1.34E+01	1.79E+01	1.72E-05	2.31E-05
Zinc	2.05E+01	2.54E+01	2.64E-05	3.26E-05
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	1.40E-02	3.88E-02	1.80E-08	4.98E-08
TOTAL PAHs	1.40E-02	3.88E-02	1.80E-08	4.98E-08

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDT	3.60E-10	8.82E-10

TABLE G-4
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
FIDDLER CRAB

Arsenic	1.42E-05	1.89E-05
Benzo(b)fluoranthene	2.92E-08	8.08E-08
Copper	1.36E-05	1.89E-05
Hexachlorobenzene	3.46E-08	3.63E-08
Mercury	3.16E-08	4.91E-08
Nickel	3.64E-05	4.87E-05
Zinc	7.27E-05	8.98E-05
LPAH	0.00E+00	0.00E+00
HPAH	2.92E-08	8.08E-08
TOTAL PAHs	2.92E-08	8.08E-08

TABLE G-5
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
SPOTTED SEATROUT

FOOD INGESTION

INTAKE = (Cf * IR * Dff * AUF)/BW

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.60E-02	same as black drum
Dff	Dietary fraction of fish (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.00E+00	TPWD website

Chemical	Average Fish	RME Fish	Average Intake	RME Intake
4,4'-DDT	9.02E-05	2.21E-04	2.35E-06	5.76E-06
Arsenic	9.42E-01	1.25E+00	2.45E-02	3.26E-02
Benzo(b)fluoranthene	5.74E-03	1.59E-02	1.49E-04	4.14E-04
Copper	8.14E+00	1.13E+01	2.12E-01	2.95E-01
Hexachlorobenzene	2.53E-02	2.66E-02	6.57E-04	6.90E-04
Mercury	5.68E-02	8.82E-02	1.48E-03	2.29E-03
Nickel	8.05E-01	1.08E+00	2.09E-02	2.80E-02
Zinc	4.11E+01	5.08E+01	1.07E+00	1.32E+00
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	5.74E-03	1.59E-02	1.49E-04	4.14E-04
TOTAL PAHs	5.74E-03	1.59E-02	1.49E-04	4.14E-04

TABLE G-6
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT – BACKGROUND
BLACK DRUM

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.60E-03	Neill, 1998*
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.24E+00	PCO BERA

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDT	1.56E-04	3.82E-04	3.27E-07	8.02E-07
Arsenic	5.81E+00	7.74E+00	1.22E-02	1.63E-02
Benzo(b)fluoranthene	8.70E-03	2.41E-02	1.83E-05	5.06E-05
Copper	8.14E+00	1.13E+01	1.71E-02	2.38E-02
Hexachlorobenzene	1.78E-02	1.87E-02	3.74E-05	3.93E-05
Mercury	1.76E-02	2.73E-02	3.70E-05	5.73E-05
Nickel	1.49E+01	1.99E+01	3.13E-02	4.19E-02
Zinc	3.60E+01	4.45E+01	7.57E-02	9.35E-02
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	8.70E-03	2.41E-02	1.83E-05	5.06E-05
TOTAL PAHs	8.70E-03	2.41E-02	1.83E-05	5.06E-05

FOOD INGESTION

INTAKE = ((Cw * IR * Dfw * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW) + ((Cf * IR * DFf *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cw	Worm concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cf	Fish concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.60E-02	Neill, 1998
Dfw	Dietary fraction of worms (unitless)	3.33E-01	prof. judgement
Dfc	Dietary fraction of crabs (unitless)	3.33E-01	prof. judgement
Dff	Dietary fraction of fish (unitless)	3.33E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.24E+00	PCO BERA

Chemical	Average Worm	RME Worm	Average Crab	RME Crab	Average Fish	RME Fish	Average Intake	RME Intake
4,4'-DDT	1.24E-04	3.05E-04	6.25E-04	1.53E-03	9.02E-05	2.21E-04	5.87E-06	1.44E-05
Arsenic	5.23E+00	6.97E+00	0.00E+00	0.00E+00	9.42E-01	1.25E+00	4.32E-02	5.75E-02
Benzo(b)fluoranthene	1.40E-02	3.88E-02	1.37E-02	3.78E-02	5.74E-03	1.59E-02	2.34E-04	6.47E-04
Copper	2.44E+00	3.40E+00	0.00E+00	0.00E+00	8.14E+00	1.13E+01	7.40E-02	1.03E-01
Hexachlorobenzene	9.11E-03	9.57E-03	8.90E-02	9.35E-02	2.53E-02	2.66E-02	8.63E-04	9.07E-04
Mercury	7.04E-03	1.09E-02	0.00E+00	0.00E+00	5.68E-02	8.82E-02	4.47E-04	6.93E-04
Nickel	1.34E+01	1.79E+01	0.00E+00	0.00E+00	8.05E-01	1.08E+00	9.95E-02	1.33E-01
Zinc	2.05E+01	2.54E+01	0.00E+00	0.00E+00	4.11E+01	5.08E+01	4.31E-01	5.32E-01
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	1.40E-02	3.88E-02	2.84E-02	7.88E-02	5.74E-03	1.59E-02	3.37E-04	9.34E-04
TOTAL PAHs	1.40E-02	3.88E-02	2.84E-02	7.88E-02	5.74E-03	1.59E-02	3.37E-04	9.34E-04

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDT	6.20E-06	1.52E-05
Arsenic	5.54E-02	7.37E-02
Benzo(b)fluoranthene	2.52E-04	6.98E-04
Copper	9.11E-02	1.27E-01
Hexachlorobenzene	9.00E-04	9.46E-04
Mercury	4.84E-04	7.50E-04
Nickel	1.31E-01	1.75E-01
Zinc	5.07E-01	6.26E-01
LPAH	0.00E+00	0.00E+00
HPAH	3.55E-04	9.84E-04
TOTAL PAHs	3.55E-04	9.84E-04

Notes:
* Sediment ingestion was assumed to be 10% of dietary intake

TABLE G-7
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
SANDPIPER

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sediment concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.10E-02	EPA, 1993
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDT	1.56E-04	3.82E-04	1.52E-05	3.73E-05
Arsenic	5.81E+00	7.74E+00	5.68E-01	7.56E-01
Benzo(b)fluoranthene	8.70E-03	2.41E-02	8.50E-04	2.35E-03
Copper	8.14E+00	1.13E+01	7.95E-01	1.11E+00
Hexachlorobenzene	1.78E-02	1.87E-02	1.74E-03	1.83E-03
Mercury	1.76E-02	2.73E-02	1.72E-03	2.67E-03
Nickel	1.49E+01	1.99E+01	1.46E+00	1.95E+00
Zinc	3.60E+01	4.45E+01	3.52E+00	4.35E+00
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	8.70E-03	2.41E-02	8.50E-04	2.35E-03
TOTAL PAHs	8.70E-03	2.41E-02	8.50E-04	2.35E-03

FOOD INGESTION

INTAKE = ((Cc * IR * Dfc * AUF)/(BW) + (Cw * IR * DFwa * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cw	Worm concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.08E-01	EPA, 1993
Dfc	Dietary fraction of crabs (unitless)	4.00E-01	prof. judgement
Dfw	Dietary fraction of worms (unitless)	6.00E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Crab	RME Crab	Average Worm	RME Worm	Average Intake	RME Intake
4,4'-DDT	6.25E-04	1.53E-03	1.24E-04	3.05E-04	1.63E-04	4.00E-04
Arsenic	0.00E+00	0.00E+00	5.23E+00	6.97E+00	1.58E+00	2.10E+00
Benzo(b)fluoranthene	1.37E-02	3.78E-02	1.40E-02	3.88E-02	6.97E-03	1.93E-02
Copper	0.00E+00	0.00E+00	2.44E+00	3.40E+00	7.36E-01	1.03E+00
Hexachlorobenzene	8.90E-02	9.35E-02	9.11E-03	9.57E-03	2.06E-02	2.17E-02
Mercury	0.00E+00	0.00E+00	7.04E-03	1.09E-02	2.12E-03	3.29E-03
Nickel	0.00E+00	0.00E+00	1.34E+01	1.79E+01	4.04E+00	5.41E+00
Zinc	0.00E+00	0.00E+00	2.05E+01	2.54E+01	6.19E+00	7.65E+00
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	2.84E-02	7.88E-02	1.40E-02	3.88E-02	9.94E-03	2.75E-02
TOTAL PAHs	2.84E-02	7.88E-02	1.40E-02	3.88E-02	9.94E-03	2.75E-02

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDT	1.78E-04	4.38E-04
Arsenic	2.14E+00	2.86E+00
Benzo(b)fluoranthene	7.82E-03	2.17E-02
Copper	1.53E+00	2.13E+00
Hexachlorobenzene	2.24E-02	2.35E-02
Mercury	3.84E-03	5.96E-03
Nickel	5.50E+00	7.36E+00
Zinc	9.71E+00	1.20E+01
LPAH	0.00E+00	0.00E+00
HPAH	1.08E-02	2.99E-02
TOTAL PAHs	1.08E-02	2.99E-02

TABLE G-8
INTAKE CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
GREEN HERON

FOOD INGESTION

INTAKE = ((Cf * IR * Dff * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.13E-01	EPA, 1993
DFf	Dietary fraction of fish (unitless)	7.50E-01	Kent, 1986
DFc	Dietary fraction of crab (unitless)	2.50E-01	Kent, 1986
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	3.75E-01	Dunning, 1993

Chemical	Average Fish	RME Fish	Average Crab	RME Crab	Average Intake	RME Intake
4,4'-DDT	9.02E-05	2.21E-04	6.25E-04	1.53E-03	6.72E-05	1.65E-04
Arsenic	9.42E-01	1.25E+00	0.00E+00	0.00E+00	2.12E-01	2.82E-01
Benzo(b)fluoranthene	5.74E-03	1.59E-02	1.37E-02	3.78E-02	2.32E-03	6.42E-03
Copper	8.14E+00	1.13E+01	0.00E+00	0.00E+00	1.83E+00	2.55E+00
Hexachlorobenzene	2.53E-02	2.66E-02	8.90E-02	9.35E-02	1.24E-02	1.30E-02
Mercury	5.68E-02	8.82E-02	0.00E+00	0.00E+00	1.28E-02	1.98E-02
Nickel	8.05E-01	1.08E+00	0.00E+00	0.00E+00	1.81E-01	2.42E-01
Zinc	4.11E+01	5.08E+01	0.00E+00	0.00E+00	9.24E+00	1.14E+01
LPAH	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HPAH	5.74E-03	1.59E-02	2.84E-02	7.88E-02	3.43E-03	9.49E-03
TOTAL PAHs	5.74E-03	1.59E-02	2.84E-02	7.88E-02	3.43E-03	9.49E-03

TABLE G-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
FIDDLER CRAB

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Fiddler Crab	Average EHQ	RME EHQ
4,4'-DDT	3.60E-10	8.82E-10	1.47E-01	2.45E-09	6.00E-09
Arsenic	1.42E-05	1.89E-05			
Benzo(b)fluoranthene	2.92E-08	8.08E-08			
Copper	1.36E-05	1.89E-05	5.60E+00	2.43E-06	3.38E-06
Hexachlorobenzene	3.46E-08	3.63E-08	2.25E-01	1.54E-07	1.61E-07
Mercury	3.16E-08	4.91E-08	1.01E+00	3.13E-08	4.86E-08
Nickel	3.64E-05	4.87E-05	1.70E+00	2.14E-05	2.86E-05
Zinc	7.27E-05	8.98E-05	7.54E+01	9.64E-07	1.19E-06
LPAH			6.56E+01		
HPAH	2.92E-08	8.08E-08	9.31E+00	3.13E-09	8.68E-09
TOTAL PAHs	2.92E-08	8.08E-08			

TABLE G-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
BLACK DRUM

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Black Drum	Average EHQ	RME EHQ
4,4'-DDT	6.20E-06	1.52E-05	1.47E-01	4.22E-05	1.04E-04
Arsenic	5.54E-02	7.37E-02			
Benzo(b)fluoranthene	2.52E-04	6.98E-04			
Copper	9.11E-02	1.27E-01	5.60E+00	1.63E-02	2.27E-02
Hexachlorobenzene	9.00E-04	9.46E-04	2.25E-01	4.00E-03	4.20E-03
Mercury	4.84E-04	7.50E-04	1.01E+00	4.79E-04	7.43E-04
Nickel	1.31E-01	1.75E-01	1.70E+00	7.69E-02	1.03E-01
Zinc	5.07E-01	6.26E-01	7.54E+01	6.72E-03	8.30E-03
LPAH			6.56E+01		
HPAH	3.55E-04	9.84E-04	9.31E+00	3.82E-05	1.06E-04
TOTAL PAHs	3.55E-04	9.84E-04			

TABLE G-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
SPOTTED SEATROUT

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Spotted Seatrout	Average EHQ	RME EHQ
4,4'-DDT	2.35E-06	5.76E-06	1.47E-01	1.60E-05	3.92E-05
Arsenic	2.45E-02	3.26E-02			
Benzo(b)fluoranthene	1.49E-04	4.14E-04			
Copper	2.12E-01	2.95E-01	5.60E+00	3.78E-02	5.27E-02
Hexachlorobenzene	6.57E-04	6.90E-04	2.25E-01	2.92E-03	3.07E-03
Mercury	1.48E-03	2.29E-03	1.01E+00	1.46E-03	2.27E-03
Nickel	2.09E-02	2.80E-02	1.70E+00	1.23E-02	1.65E-02
Zinc	1.07E+00	1.32E+00	7.54E+01	1.42E-02	1.75E-02
LPAH			6.56E+01		
HPAH	1.49E-04	4.14E-04	9.31E+00	1.60E-05	4.44E-05
TOTAL PAHs	1.49E-04	4.14E-04			

TABLE G-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
SANDPIPER

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Sandpiper	Average EHQ	RME EHQ
4,4'-DDT	1.78E-04	4.38E-04	2.27E-01	7.86E-04	1.93E-03
Arsenic	2.14E+00	2.86E+00	0.00E+00		
Benzo(b)fluoranthene	7.82E-03	2.17E-02	0.00E+00		
Copper	1.53E+00	2.13E+00	4.05E+00	3.78E-01	5.27E-01
Hexachlorobenzene	2.24E-02	2.35E-02	2.25E-01	9.94E-02	1.04E-01
Mercury	3.84E-03	5.96E-03	3.25E+00	1.18E-03	1.83E-03
Nickel	5.50E+00	7.36E+00	6.71E+00	8.20E-01	1.10E+00
Zinc	9.71E+00	1.20E+01	6.61E+01	1.47E-01	1.81E-01
LPAH			6.56E+01		
HPAH	1.08E-02	2.99E-02	9.31E+00	1.16E-03	3.21E-03
TOTAL PAHs	1.08E-02	2.99E-02	0.00E+00		

TABLE G-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR INTRACOASTAL WATERWAY SEDIMENT -- BACKGROUND
GREEN HERON

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Green Heron	Average EHQ	RME EHQ
4,4'-DDT	6.72E-05	1.65E-04	2.27E-01	2.96E-04	7.26E-04
Arsenic	2.12E-01	2.82E-01			
Benzo(b)fluoranthene	2.32E-03	6.42E-03			
Copper	1.83E+00	2.55E+00	4.05E+00	4.52E-01	6.30E-01
Hexachlorobenzene	1.24E-02	1.30E-02	2.25E-01	5.49E-02	5.77E-02
Mercury	1.28E-02	1.98E-02	3.25E+00	3.94E-03	6.10E-03
Nickel	1.81E-01	2.42E-01	6.71E+00	2.70E-02	3.61E-02
Zinc	9.24E+00	1.14E+01	6.61E+01	1.40E-01	1.73E-01
LPAH			6.56E+01		
HPAH	3.43E-03	9.49E-03	9.31E+00	3.68E-04	1.02E-03
TOTAL PAHs	3.43E-03	9.49E-03	0.00E+00		

TABLE G-14
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg) -- BACKGROUND SEDIMENT

Cfood = Csed x BSAF (or BSAFor BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	Average Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
4,4'-DDT	1.56E-04	8.00E-01	1.24E-04	BSAF DB	4.02E+00	6.25E-04	BSAF DB	5.80E-01	9.02E-05	WSDOH, 1995
Arsenic	5.81E+00	9.00E-01	5.23E+00	EPA, 1999		0.00E+00		1.62E-01	9.42E-01	EPA, 2000
Benzo(b)fluoranthene	8.70E-03	1.61E+00	1.40E-02	EPA, 1999	1.57E+00	1.37E-02	BSAF DB	6.60E-01	5.74E-03	WSDOH, 1995
Copper	8.14E+00	3.00E-01	2.44E+00	EPA, 1999		0.00E+00		1.00E+00	8.14E+00	Max value from Calcasieu RI
Hexachlorobenzene	1.78E-02	5.12E-01	9.11E-03	BSAF DB	5.00E+00	8.90E-02	BSAF DB	1.42E+00	2.53E-02	Max value from Calcasieu RI
Mercury	1.76E-02	4.00E-01	7.04E-03	EPA, 1999		0.00E+00		3.23E+00	5.68E-02	Max value from Calcasieu RI
Nickel	1.49E+01	9.00E-01	1.34E+01	EPA, 1999		0.00E+00		5.40E-02	8.05E-01	Max value from Calcasieu RI
Zinc	3.60E+01	5.70E-01	2.05E+01	EPA, 1999		0.00E+00		1.14E+00	4.11E+01	Max value from Calcasieu RI
LPAH	0.00E+00	1.61E+00	0.00E+00	EPA, 1999	3.27E+00	0.00E+00	max PAH	4.96E-01	0.00E+00	WSDOH, 1995
HPAH	8.70E-03	1.61E+00	1.40E-02	EPA, 1999	3.27E+00	2.84E-02	max PAH	6.60E-01	5.74E-03	WSDOH, 1995
TOTAL PAHs	8.70E-03	1.61E+00	1.40E-02	EPA, 1999	3.27E+00	2.84E-02	max PAH	6.60E-01	5.74E-03	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE G-15
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg) -- BACKGROUND SEDIMENT

Cfood = Csed x BSAF (or BSAFor BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	RME Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
4,4'-DDT	3.82E-04	8.00E-01	3.05E-04	BSAF DB	4.02E+00	1.53E-03	BSAF DB	5.80E-01	2.21E-04	WSDOH, 1995
Arsenic	7.74E+00	9.00E-01	6.97E+00	EPA, 1999		0.00E+00		1.62E-01	1.25E+00	EPA, 2000
Benzo(b)fluoranthene	2.41E-02	1.61E+00	3.88E-02	EPA, 1999	1.57E+00	3.78E-02	BSAF DB	6.60E-01	1.59E-02	WSDOH, 1995
Copper	1.13E+01	3.00E-01	3.40E+00	EPA, 1999		0.00E+00		1.00E+00	1.13E+01	Max value from Calcasieu RI
Hexachlorobenzene	1.87E-02	5.12E-01	9.57E-03	BSAF DB	5.00E+00	9.35E-02	BSAF DB	1.42E+00	2.66E-02	Max value from Calcasieu RI
Mercury	2.73E-02	4.00E-01	1.09E-02	EPA, 1999		0.00E+00		3.23E+00	8.82E-02	Max value from Calcasieu RI
Nickel	1.99E+01	9.00E-01	1.79E+01	EPA, 1999		0.00E+00		5.40E-02	1.08E+00	Max value from Calcasieu RI
Zinc	4.45E+01	5.70E-01	2.54E+01	EPA, 1999		0.00E+00		1.14E+00	5.08E+01	Max value from Calcasieu RI
LPAH	0.00E+00	1.61E+00	0.00E+00	EPA, 1999	3.27E+00	0.00E+00	max PAH	4.96E-01	0.00E+00	WSDOH, 1995
HPAH	2.41E-02	1.61E+00	3.88E-02	EPA, 1999	3.27E+00	7.88E-02	max PAH	6.60E-01	1.59E-02	WSDOH, 1995
TOTAL PAHs	2.41E-02	1.61E+00	3.88E-02	EPA, 1999	3.27E+00	7.88E-02	max PAH	6.60E-01	1.59E-02	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX H
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR WETLAND SEDIMENT

TABLE H-1
EXPOSURE POINT CONCENTATION (mg/kg)
SEDIMENT NORTH OF MARLIN

Parameter	Average		95% UCL	Statistic Used
2-Methylnaphthalene	0.0246		0.116	99% Chebyshev
4,4'-DDT	9.52E-04		0.0022	97.5% Chebyshev
Acenaphthene	0.0195		0.064	99% Chebyshev
Acenaphthylene	0.0314		0.165	99% Chebyshev
Anthracene	0.0288		0.126	99% Chebyshev
Benzo(a)anthracene	0.0543		0.306	99% Chebyshev
Benzo(a)pyrene	0.104		0.476	99% Chebyshev
Benzo(b)fluoranthene	0.0902		0.431	99% Chebyshev
Benzo(g,h,i)perylene	0.198		0.755	99% Chebyshev
Benzo(k)fluoranthene	0.0659		0.237	99% Chebyshev
Cadmium	0.103		0.313	99% Chebyshev
Chrysene	0.217		1.24	99% Chebyshev
Dibenz(a,h)anthracene	0.203		1.1	99% Chebyshev
Endosulfan Sulfate	0.0018		0.00144	97.5% Chebyshev
Endrin Aldehyde	0.001		0.0043	97.5% Chebyshev
Endrin Ketone	7.85E-04		0.002	95% Chebyshev
Fluoranthene	0.108		0.637	99% Chebyshev
Fluorene	0.0186		0.0637	99% Chebyshev
gamma-Chlordane	4.05E-04		8.27E-04	95% Chebyshev
Indeno(1,2,3-cd)pyrene	0.201		0.785	99% Chebyshev
Nickel	17.3		18.1	95% Student's-t
Phenanthrene	0.0761		0.432	99% Chebyshev
Pyrene	0.154		0.663	99% Chebyshev
LPAH	0.199		0.9667	
HPAH	1.3954		6.63	
TOTAL PAHs	1.5944		7.5967	

TABLE H-2
TOXICITY REFERENCE VALUES

Parameter	Capitella capitata (mg/kg)	Ref.	Comments	Capitella capitata (mg/kg)	Ref.	Comments	Fiddler Crab (mg/kgBW-day)	Ref.	Comments	Black Drum (mg/kgBW-day)	Ref.	Comments	Spotted seatrout (mg/kgBW-day)	Ref.	Comments	Sandpiper (mg/kgBW-day)	Ref.	Comments	Green heron (mg/kgBW-day)	Ref.	Comments
2-Methylnaphthalene	0.07	SQUIRT	ERL	0.67	SQUIRT	ERM															
4,4'-DDT	0.001	SQUIRT	ERL	0.007	SQUIRT	ERM	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Acenaphthene	0.016	SQUIRT	ERL	0.5	SQUIRT	ERM															
Acenaphthylene	0.044	SQUIRT	ERL	0.64	SQUIRT	ERM															
Anthracene	0.0853	SQUIRT	ERL	1.1	SQUIRT	ERM															
Benzo(a)anthracene	0.261	SQUIRT	ERL	1.6	SQUIRT	ERM															
Benzo(a)pyrene	0.43	SQUIRT	ERL	1.6	SQUIRT	ERM															
Benzo(b)fluoranthene	1.8	SQUIRT	AET	1.8	SQUIRT	AET															
Benzo(g,h,i)perylene	0.67	SQUIRT	AET	0.67	SQUIRT	AET															
Benzo(k)fluoranthene	1.8	SQUIRT	AET	1.8	SQUIRT	AET															
Cadmium	1.2	SQUIRT	ERL	9.6	SQUIRT	ERM	0.77	EPA, 2005b	mammalian TRV for soil	0.77	EPA, 2005b	mammalian TRV for soil	0.77	EPA, 2005b	mammalian TRV for soil	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth
Chrysene	0.384	SQUIRT	ERL	2.8	SQUIRT	ERM															
Dibenz(a,h)anthracene	0.0634	SQUIRT	ERL	0.26	SQUIRT	ERM															
Endosulfan Sulfate																					
Endrin Aldehyde	0.00267	SQUIRT	TEL for freshwater sediment	0.0624	SQUIRT	PEL for freshwater sediment	0.092	Sample, 1996	mammalian TRV for soil	0.092	Sample, 1996	mammalian TRV for soil	0.092	Sample, 1996	mammalian TRV for soil	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1
Endrin Ketone	0.00267	SQUIRT	TEL for freshwater sediment	0.0624	SQUIRT	PEL for freshwater sediment	0.092	Sample, 1996	mammalian TRV for soil	0.092	Sample, 1996	mammalian TRV for soil	0.092	Sample, 1996	mammalian TRV for soil	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1	0.01	Sample, 1996	Chronic LOAEL in screech owl with an uncertainty factor of 0.1
Fluoranthene	0.6	SQUIRT	ERL	5.1	SQUIRT	ERM															
Fluorene	0.019	SQUIRT	ERL	0.54	SQUIRT	ERM															
gamma-Chlordane	5.00E-04	SQUIRT	ERL	0.006	SQUIRT	ERM	4.6	Sample, 1996	mammalian TRV for soil	4.6	Sample, 1996	mammalian TRV for soil	4.6	Sample, 1996	mammalian TRV for soil	2.14	Sample, 1996	Chronic NOAEL in red-winged blackbird	2.14	Sample, 1996	Chronic NOAEL in red-winged blackbird
Indeno(1,2,3-cd)pyrene	0.6	SQUIRT	AET	0.6	SQUIRT	AET															
Nickel	20.9	SQUIRT	ERL	51.6	SQUIRT	ERM	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Phenanthrene	0.24	SQUIRT	ERL	1.5	SQUIRT	ERM															
Pyrene	0.665	SQUIRT	ERL	2.6	SQUIRT	ERM															
LPAH	0.552	SQUIRT	ERL	3.162	SQUIRT	ERM	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil
HPAH	1.7	SQUIRT	ERL	9.6	SQUIRT	ERM	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV
TOTAL PAHs	4.022	SQUIRT	ERL	44.792	SQUIRT	ERM															

Notes:
ERL – Effects Range-Low
AET – Apparent Effects Threshold
TEL – Threshold Effects Level

EPA, 2007a – DDT
EPA, 2007b – PAHs
EPA, 2007d – Nickel
EPA, 2005b – Cadmium

TABLE H-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
CAPITELLA CAPITATA

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
2-Methylnaphthalene	2.46E-02	1.16E-01	7.00E-02	3.51E-01	1.66E+00
4,4'-DDT	9.52E-04	2.20E-03	1.00E-03	9.52E-01	2.20E+00
Acenaphthene	1.95E-02	6.40E-02	1.60E-02	1.22E+00	4.00E+00
Acenaphthylene	3.14E-02	1.65E-01	4.40E-02	7.14E-01	3.75E+00
Anthracene	2.88E-02	1.26E-01	8.53E-02	3.38E-01	1.48E+00
Benzo(a)anthracene	5.43E-02	3.06E-01	2.61E-01	2.08E-01	1.17E+00
Benzo(a)pyrene	1.04E-01	4.76E-01	4.30E-01	2.42E-01	1.11E+00
Benzo(b)fluoranthene	9.02E-02	4.31E-01	1.80E+00	5.01E-02	2.39E-01
Benzo(g,h,i)perylene	1.98E-01	7.55E-01	6.70E-01	2.96E-01	1.13E+00
Benzo(k)fluoranthene	6.59E-02	2.37E-01	1.80E+00	3.66E-02	1.32E-01
Cadmium	1.03E-01	3.13E-01	1.20E+00	8.58E-02	2.61E-01
Chrysene	2.17E-01	1.24E+00	3.84E-01	5.65E-01	3.23E+00
Dibenz(a,h)anthracene	2.03E-01	1.10E+00	6.34E-02	3.20E+00	1.74E+01
Endosulfan Sulfate	1.80E-03	1.44E-03			
Endrin Aldehyde	1.00E-03	4.30E-03	2.67E-03	3.75E-01	1.61E+00
Endrin Ketone	7.85E-04	2.00E-03	2.67E-03	2.94E-01	7.49E-01
Fluoranthene	1.08E-01	6.37E-01	6.00E-01	1.80E-01	1.06E+00
Fluorene	1.86E-02	6.37E-02	1.90E-02	9.79E-01	3.35E+00
gamma-Chlordane	4.05E-04	8.27E-04	5.00E-04	8.10E-01	1.65E+00
Indeno(1,2,3-cd)pyrene	2.01E-01	7.85E-01	6.00E-01	3.35E-01	1.31E+00
Nickel	1.73E+01	1.81E+01	2.09E+01	8.28E-01	8.66E-01
Phenanthrene	7.61E-02	4.32E-01	2.40E-01	3.17E-01	1.80E+00
Pyrene	1.54E-01	6.63E-01	6.65E-01	2.32E-01	9.97E-01
LPAH	1.99E-01	9.67E-01	5.52E-01	3.61E-01	1.75E+00
HPAH	1.40E+00	6.63E+00	1.70E+00	8.21E-01	3.90E+00
TOTAL PAHs	1.59E+00	7.60E+00	4.02E+00	3.96E-01	1.89E+00

TABLE H-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
CAPITELLA CAPITATA -- MIDPOINT BETWEEN ERL AND ERM COMPARISON

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
2-Methylnaphthalene	2.46E-02	1.16E-01	3.70E-01	6.65E-02	3.14E-01
4,4'-DDT	9.52E-04	2.20E-03	4.00E-03	2.38E-01	5.50E-01
Acenaphthene	1.95E-02	6.40E-02	2.58E-01	7.56E-02	2.48E-01
Acenaphthylene	3.14E-02	1.65E-01	3.42E-01	9.18E-02	4.82E-01
Anthracene	2.88E-02	1.26E-01	5.93E-01	4.86E-02	2.13E-01
Benzo(a)anthracene	5.43E-02	3.06E-01	9.31E-01	5.84E-02	3.29E-01
Benzo(a)pyrene	1.04E-01	4.76E-01	1.02E+00	1.02E-01	4.69E-01
Benzo(b)fluoranthene	9.02E-02	4.31E-01	1.80E+00	5.01E-02	2.39E-01
Benzo(g,h,i)perylene	1.98E-01	7.55E-01	6.70E-01	2.96E-01	1.13E+00
Benzo(k)fluoranthene	6.59E-02	2.37E-01	1.80E+00	3.66E-02	1.32E-01
Cadmium	1.03E-01	3.13E-01	5.40E+00	1.91E-02	5.80E-02
Chrysene	2.17E-01	1.24E+00	1.59E+00	1.36E-01	7.79E-01
Dibenz(a,h)anthracene	2.03E-01	1.10E+00	1.62E-01	1.26E+00	6.80E+00
Endosulfan Sulfate	1.80E-03	1.44E-03			
Endrin Aldehyde	1.00E-03	4.30E-03	3.25E-02	3.07E-02	1.32E-01
Endrin Ketone	7.85E-04	2.00E-03	3.25E-02	2.41E-02	6.15E-02
Fluoranthene	1.08E-01	6.37E-01	2.85E+00	3.79E-02	2.24E-01
Fluorene	1.86E-02	6.37E-02	2.80E-01	6.65E-02	2.28E-01
gamma-Chlordane	4.05E-04	8.27E-04	3.25E-03	1.25E-01	2.54E-01
Indeno(1,2,3-cd)pyrene	2.01E-01	7.85E-01	6.00E-01	3.35E-01	1.31E+00
Nickel	1.73E+01	1.81E+01	3.63E+01	4.77E-01	4.99E-01
Phenanthrene	7.61E-02	4.32E-01	8.70E-01	8.75E-02	4.97E-01
Pyrene	1.54E-01	6.63E-01	1.63E+00	9.43E-02	4.06E-01
LPAH	1.99E-01	9.67E-01	1.86E+00	1.07E-01	5.21E-01
HPAH	1.40E+00	6.63E+00	5.65E+00	2.47E-01	1.17E+00
TOTAL PAHs	1.59E+00	7.60E+00	2.44E+01	6.53E-02	3.11E-01

TABLE H-5
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
CAPITELLA CAPITATA -- ERM COMPARISON

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
2-Methylnaphthalene	2.46E-02	1.16E-01	6.70E-01	3.67E-02	1.73E-01
4,4'-DDT	9.52E-04	2.20E-03	7.00E-03	1.36E-01	3.14E-01
Acenaphthene	1.95E-02	6.40E-02	5.00E-01	3.90E-02	1.28E-01
Acenaphthylene	3.14E-02	1.65E-01	6.40E-01	4.91E-02	2.58E-01
Anthracene	2.88E-02	1.26E-01	1.10E+00	2.62E-02	1.15E-01
Benzo(a)anthracene	5.43E-02	3.06E-01	1.60E+00	3.39E-02	1.91E-01
Benzo(a)pyrene	1.04E-01	4.76E-01	1.60E+00	6.50E-02	2.98E-01
Benzo(b)fluoranthene	9.02E-02	4.31E-01	1.80E+00	5.01E-02	2.39E-01
Benzo(g,h,i)perylene	1.98E-01	7.55E-01	6.70E-01	2.96E-01	1.13E+00
Benzo(k)fluoranthene	6.59E-02	2.37E-01	1.80E+00	3.66E-02	1.32E-01
Cadmium	1.03E-01	3.13E-01	9.60E+00	1.07E-02	3.26E-02
Chrysene	2.17E-01	1.24E+00	2.80E+00	7.75E-02	4.43E-01
Dibenz(a,h)anthracene	2.03E-01	1.10E+00	2.60E-01	7.81E-01	4.23E+00
Endosulfan Sulfate	1.80E-03	1.44E-03	0.00E+00		
Endrin Aldehyde	1.00E-03	4.30E-03	6.24E-02	1.60E-02	6.89E-02
Endrin Ketone	7.85E-04	2.00E-03	6.24E-02	1.26E-02	3.21E-02
Fluoranthene	1.08E-01	6.37E-01	5.10E+00	2.12E-02	1.25E-01
Fluorene	1.86E-02	6.37E-02	5.40E-01	3.44E-02	1.18E-01
gamma-Chlordane	4.05E-04	8.27E-04	6.00E-03	6.75E-02	1.38E-01
Indeno(1,2,3-cd)pyrene	2.01E-01	7.85E-01	6.00E-01	3.35E-01	1.31E+00
Nickel	1.73E+01	1.81E+01	5.16E+01	3.35E-01	3.51E-01
Phenanthrene	7.61E-02	4.32E-01	1.50E+00	5.07E-02	2.88E-01
Pyrene	1.54E-01	6.63E-01	2.60E+00	5.92E-02	2.55E-01
LPAH	1.99E-01	9.67E-01	3.16E+00	6.29E-02	3.06E-01
HPAH	1.40E+00	6.63E+00	9.60E+00	1.45E-01	6.91E-01
TOTAL PAHs	1.59E+00	7.60E+00	4.48E+01	3.56E-02	1.70E-01

TABLE H-6
INTAKE CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
FIDDLER CRAB

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	1.16E-05	Cammen, 1979
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	2.46E-02	1.16E-01	3.16E-05	1.49E-04
4,4'-DDT	9.52E-04	2.20E-03	1.22E-06	2.83E-06
Acenaphthene	1.95E-02	6.40E-02	2.50E-05	8.22E-05
Acenaphthylene	3.14E-02	1.65E-01	4.03E-05	2.12E-04
Aluminum	1.32E+04	1.40E+04	1.70E+01	1.79E+01
Anthracene	2.88E-02	1.26E-01	3.70E-05	1.62E-04
Benzo(a)anthracene	5.43E-02	3.06E-01	6.97E-05	3.93E-04
Benzo(a)pyrene	1.04E-01	4.76E-01	1.34E-04	6.11E-04
Benzo(b)fluoranthene	9.02E-02	4.31E-01	1.16E-04	5.54E-04
Benzo(g,h,i)perylene	1.98E-01	7.55E-01	2.54E-04	9.70E-04
Benzo(k)fluoranthene	6.59E-02	2.37E-01	8.46E-05	3.04E-04
Cadmium	1.03E-01	3.13E-01	1.32E-04	4.02E-04
Chrysene	2.17E-01	1.24E+00	2.79E-04	1.59E-03
Dibenz(a,h)anthracene	2.03E-01	1.10E+00	2.61E-04	1.41E-03
Endosulfan Sulfate	1.80E-03	1.44E-03	2.31E-06	1.85E-06
Endrin Aldehyde	1.00E-03	4.30E-03	1.28E-06	5.52E-06
Endrin Ketone	7.85E-04	2.00E-03	1.01E-06	2.57E-06
Fluoranthene	1.08E-01	6.37E-01	1.39E-04	8.18E-04
Fluorene	1.86E-02	6.37E-02	2.39E-05	8.18E-05
gamma-Chlordane	4.05E-04	8.27E-04	5.20E-07	1.06E-06
Indeno(1,2,3-cd)pyrene	2.01E-01	7.85E-01	2.58E-04	1.01E-03
Nickel	1.73E+01	1.81E+01	2.22E-02	2.32E-02
Phenanthrene	7.61E-02	4.32E-01	9.77E-05	5.55E-04
Pyrene	1.54E-01	6.63E-01	1.98E-04	8.52E-04
LPAH	1.99E-01	9.67E-01	2.56E-04	1.24E-03
HPAH	1.40E+00	6.63E+00	1.79E-03	8.52E-03
TOTAL PAHs	1.59E+00	7.60E+00	2.05E-03	9.76E-03

FOOD INGESTION

INTAKE = (Ci * IR * DFi * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ci	Invertebrate concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.16E-05	Cammen, 1979
Dfi	Dietary fraction of invertebrates (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Invertebrate	RME Invertebrate	Average Intake	RME Intake
2-Methylnaphthalene	3.96E-02	1.87E-01	5.09E-05	2.40E-04
4,4'-DDT	7.62E-04	1.76E-03	9.78E-07	2.26E-06
Acenaphthene	3.14E-02	1.03E-01	4.03E-05	1.32E-04
Acenaphthylene	5.06E-02	2.66E-01	6.49E-05	3.41E-04
Anthracene	4.64E-02	2.03E-01	5.96E-05	2.61E-04
Benzo(a)anthracene	7.87E-02	4.44E-01	1.01E-04	5.70E-04

TABLE H-6
INTAKE CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
FIDDLER CRAB

Benzo(a)pyrene	1.65E-01	7.57E-01	2.12E-04	9.72E-04
Benzo(b)fluoranthene	1.45E-01	6.94E-01	1.87E-04	8.91E-04
Benzo(g,h,i)perylene	3.19E-01	1.22E+00	4.09E-04	1.56E-03
Benzo(k)fluoranthene	1.06E-01	3.82E-01	1.36E-04	4.90E-04
Cadmium	3.50E-01	1.06E+00	4.50E-04	1.37E-03
Chrysene	2.99E-01	1.71E+00	3.85E-04	2.20E-03
Dibenz(a,h)anthracene	3.27E-01	1.77E+00	4.20E-04	2.27E-03
Endosulfan Sulfate	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin Aldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	1.74E-01	1.03E+00	2.23E-04	1.32E-03
Fluorene	2.99E-02	1.03E-01	3.85E-05	1.32E-04
gamma-Chlordane	2.38E-03	4.86E-03	3.06E-06	6.25E-06
Indeno(1,2,3-cd)pyrene	3.24E-01	1.26E+00	4.16E-04	1.62E-03
Nickel	1.56E+01	1.63E+01	2.00E-02	2.09E-02
Phenanthrene	1.23E-01	6.96E-01	1.57E-04	8.93E-04
Pyrene	2.48E-01	1.07E+00	3.18E-04	1.37E-03
LPAH	3.20E-01	1.56E+00	4.12E-04	2.00E-03
HPAH	2.25E+00	1.07E+01	2.89E-03	1.37E-02
TOTAL PAHs	2.57E+00	1.22E+01	3.30E-03	1.57E-02

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	8.25E-05	3.89E-04
4,4'-DDT	2.20E-06	5.09E-06
Acenaphthene	6.54E-05	2.15E-04
Acenaphthylene	1.05E-04	5.53E-04
Anthracene	9.65E-05	4.22E-04
Benzo(a)anthracene	1.71E-04	9.63E-04
Benzo(a)pyrene	3.46E-04	1.58E-03
Benzo(b)fluoranthene	3.02E-04	1.44E-03
Benzo(g,h,i)perylene	6.64E-04	2.53E-03
Benzo(k)fluoranthene	2.21E-04	7.95E-04
Cadmium	5.82E-04	1.77E-03
Chrysene	6.63E-04	3.79E-03
Dibenz(a,h)anthracene	6.81E-04	3.69E-03
Endosulfan Sulfate	2.31E-06	1.85E-06
Endrin Aldehyde	1.28E-06	5.52E-06
Endrin Ketone	1.01E-06	2.57E-06
Fluoranthene	3.62E-04	2.14E-03
Fluorene	6.24E-05	2.14E-04
gamma-Chlordane	3.58E-06	7.31E-06
Indeno(1,2,3-cd)pyrene	6.74E-04	2.63E-03
Nickel	4.22E-02	4.42E-02
Phenanthrene	2.55E-04	1.45E-03
Pyrene	5.16E-04	2.22E-03
LPAH	6.67E-04	3.24E-03
HPAH	4.68E-03	2.22E-02
TOTAL PAHs	5.35E-03	2.55E-02

TABLE H-7
INTAKE CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
SANDPIPER

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sediment concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.10E-02	EPA, 1993
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
2-Methylnaphthalene	2.46E-02	1.16E-01	2.40E-03	1.13E-02
4,4'-DDT	9.52E-04	2.20E-03	9.30E-05	2.15E-04
Acenaphthene	1.95E-02	6.40E-02	1.90E-03	6.25E-03
Acenaphthylene	3.14E-02	1.65E-01	3.07E-03	1.61E-02
Anthracene	2.88E-02	1.26E-01	2.81E-03	1.23E-02
Benzo(a)anthracene	5.43E-02	3.06E-01	5.30E-03	2.99E-02
Benzo(a)pyrene	1.04E-01	4.76E-01	1.02E-02	4.65E-02
Benzo(b)fluoranthene	9.02E-02	4.31E-01	8.81E-03	4.21E-02
Benzo(g,h,i)perylene	1.98E-01	7.55E-01	1.93E-02	7.37E-02
Benzo(k)fluoranthene	6.59E-02	2.37E-01	6.44E-03	2.31E-02
Cadmium	1.03E-01	3.13E-01	1.01E-02	3.06E-02
Chrysene	2.17E-01	1.24E+00	2.12E-02	1.21E-01
Dibenz(a,h)anthracene	2.03E-01	1.10E+00	1.98E-02	1.07E-01
Endosulfan Sulfate	1.80E-03	1.44E-03	1.76E-04	1.41E-04
Endrin Aldehyde	1.00E-03	4.30E-03	9.77E-05	4.20E-04
Endrin Ketone	7.85E-04	2.00E-03	7.67E-05	1.95E-04
Fluoranthene	1.08E-01	6.37E-01	1.05E-02	6.22E-02
Fluorene	1.86E-02	6.37E-02	1.82E-03	6.22E-03
gamma-Chlordane	4.05E-04	8.27E-04	3.96E-05	8.08E-05
Indeno(1,2,3-cd)pyrene	2.01E-01	7.85E-01	1.96E-02	7.67E-02
Nickel	1.73E+01	1.81E+01	1.69E+00	1.77E+00
Phenanthrene	7.61E-02	4.32E-01	7.43E-03	4.22E-02
Pyrene	1.54E-01	6.63E-01	1.50E-02	6.48E-02
LPAH	1.99E-01	9.67E-01	1.94E-02	9.44E-02
HPAH	1.40E+00	6.63E+00	1.36E-01	6.48E-01
TOTAL PAHs	1.59E+00	7.60E+00	1.56E-01	7.42E-01

FOOD INGESTION

INTAKE = ((Cc * IR * Dfc * AUF)/(BW) + (Cw * IR * DFwa * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cw	Worm concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.08E-01	EPA, 1993
Dfc	Dietary fraction of crabs (unitless)	4.00E-01	prof. judgement
Dfw	Dietary fraction of worms (unitless)	6.00E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Crab	RME Crab	Average Worm	RME Worm	Average Intake	RME Intake
2-Methylnaphthalene	0.00E+00	0.00E+00	3.96E-02	1.87E-01	1.19E-02	5.63E-02
4,4'-DDT	3.83E-03	8.84E-03	7.62E-04	1.76E-03	9.99E-04	2.31E-03
Acenaphthene	0.00E+00	0.00E+00	5.06E-02	2.66E-01	1.52E-02	8.01E-02
Acenaphthylene	0.00E+00	0.00E+00	5.06E-02	2.66E-01	1.52E-02	8.01E-02
Anthracene	9.42E-02	4.12E-01	4.64E-02	2.03E-01	3.29E-02	1.44E-01
Benzo(a)anthracene	1.37E-01	7.74E-01	7.87E-02	4.44E-01	5.13E-02	2.89E-01
Benzo(a)pyrene	1.56E-02	7.14E-02	1.65E-01	7.57E-01	5.30E-02	2.42E-01
Benzo(b)fluoranthene	1.42E-01	6.77E-01	1.45E-01	6.94E-01	7.22E-02	3.45E-01
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	3.19E-01	1.22E+00	9.61E-02	3.66E-01
Benzo(k)fluoranthene	0.00E+00	0.00E+00	1.06E-01	3.82E-01	3.20E-02	1.15E-01
Cadmium	0.00E+00	0.00E+00	3.50E-01	1.06E+00	1.06E-01	3.21E-01
Chrysene	2.80E-01	1.60E+00	2.99E-01	1.71E+00	1.47E-01	8.37E-01
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	3.27E-01	1.77E+00	9.85E-02	5.34E-01

TABLE H-7
INTAKE CALCULATIONS FOR SEDIMENT NORTH OF MARLIN SANDPIPER

Endosulfan Sulfate	9.00E-03	7.20E-03	0.00E+00	0.00E+00	1.81E-03	1.45E-03
Endrin Aldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	1.44E+00	8.50E+00	1.74E-01	1.03E+00	3.42E-01	2.02E+00
Fluorene	0.00E+00	0.00E+00	2.99E-02	1.03E-01	9.03E-03	3.09E-02
gamma-Chlordane	9.32E-04	1.90E-03	2.38E-03	4.86E-03	9.05E-04	1.85E-03
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	3.24E-01	1.26E+00	9.75E-02	3.81E-01
Nickel	0.00E+00	0.00E+00	1.56E+01	1.63E+01	4.69E+00	4.91E+00
Phenanthrene	0.00E+00	0.00E+00	1.23E-01	6.96E-01	3.69E-02	2.10E-01
Pyrene	0.00E+00	0.00E+00	2.48E-01	1.07E+00	7.47E-02	3.22E-01
LPAH	6.51E-01	3.16E+00	3.20E-01	1.56E+00	2.27E-01	1.10E+00
HPAH	4.56E+00	2.17E+01	2.25E+00	1.07E+01	1.59E+00	7.57E+00
TOTAL PAHs	5.21E+00	2.48E+01	2.57E+00	1.22E+01	1.82E+00	8.68E+00

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
2-Methylnaphthalene	1.43E-02	6.76E-02
4,4'-DDT	1.09E-03	2.52E-03
Acenaphthene	1.71E-02	8.63E-02
Acenaphthylene	1.83E-02	9.62E-02
Anthracene	3.57E-02	1.56E-01
Benzo(a)anthracene	5.66E-02	3.19E-01
Benzo(a)pyrene	6.31E-02	2.89E-01
Benzo(b)fluoranthene	8.10E-02	3.87E-01
Benzo(g,h,i)perylene	1.15E-01	4.40E-01
Benzo(k)fluoranthene	3.84E-02	1.38E-01
Cadmium	1.16E-01	3.51E-01
Chrysene	1.68E-01	9.58E-01
Dibenz(a,h)anthracene	1.18E-01	6.41E-01
Endosulfan Sulfate	1.98E-03	1.59E-03
Endrin Aldehyde	9.77E-05	4.20E-04
Endrin Ketone	7.67E-05	1.95E-04
Fluoranthene	3.52E-01	2.08E+00
Fluorene	1.08E-02	3.71E-02
gamma-Chlordane	9.44E-04	1.93E-03
Indeno(1,2,3-cd)pyrene	1.17E-01	4.58E-01
Nickel	6.38E+00	6.68E+00
Phenanthrene	4.44E-02	2.52E-01
Pyrene	8.98E-02	3.86E-01
LPAH	2.47E-01	1.20E+00
HPAH	1.73E+00	8.22E+00
TOTAL PAHs	1.98E+00	9.42E+00

TABLE H-8
INTAKE CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
GREEN HERON

FOOD INGESTION

INTAKE = ((Cf * IR * Dff * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.13E-01	EPA, 1993
DFf	Dietary fraction of fish (unitless)	7.50E-01	Kent, 1986
DFc	Dietary fraction of crab (unitless)	2.50E-01	Kent, 1986
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	3.75E-01	Dunning, 1993

Chemical	Average Fish	RME Fish	Average Crab	RME Crab	Average Intake	RME Intake
2-Methylnaphthalene	1.14E-01	5.39E-01	0.00E+00	0.00E+00	2.57E-02	1.21E-01
4,4'-DDT	5.52E-04	1.28E-03	3.83E-03	8.84E-03	4.11E-04	9.50E-04
Acenaphthene	1.55E-02	8.17E-02	0.00E+00	0.00E+00	3.50E-03	1.84E-02
Acenaphthylene	1.55E-02	8.17E-02	0.00E+00	0.00E+00	3.50E-03	1.84E-02
Anthracene	2.42E-03	1.06E-02	9.42E-02	4.12E-01	7.61E-03	3.33E-02
Benzo(a)anthracene	3.58E-02	2.02E-01	1.37E-01	7.74E-01	1.84E-02	1.04E-01
Benzo(a)pyrene	6.86E-02	3.14E-01	1.56E-02	7.14E-02	1.66E-02	7.60E-02
Benzo(b)fluoranthene	5.95E-02	2.84E-01	1.42E-01	6.77E-01	2.40E-02	1.15E-01
Benzo(g,h,i)perylene	1.31E-01	4.98E-01	0.00E+00	0.00E+00	2.94E-02	1.12E-01
Benzo(k)fluoranthene	4.35E-02	1.56E-01	0.00E+00	0.00E+00	9.79E-03	3.52E-02
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.43E-01	8.18E-01	2.80E-01	1.60E+00	5.32E-02	3.04E-01
Dibenz(a,h)anthracene	1.34E-01	7.26E-01	0.00E+00	0.00E+00	3.01E-02	1.63E-01
Endosulfan Sulfate	0.00E+00	0.00E+00	9.00E-03	7.20E-03	6.75E-04	5.40E-04
Endrin Aldehyde	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Endrin Ketone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fluoranthene	7.13E-02	4.20E-01	1.44E+00	8.50E+00	1.24E-01	7.32E-01
Fluorene	9.21E-03	3.15E-02	0.00E+00	0.00E+00	2.07E-03	7.09E-03
gamma-Chlordane	6.08E-04	1.24E-03	9.32E-04	1.90E-03	2.07E-04	4.22E-04
Indeno(1,2,3-cd)pyrene	1.33E-01	5.18E-01	0.00E+00	0.00E+00	2.98E-02	1.17E-01
Nickel	9.34E-01	9.77E-01	0.00E+00	0.00E+00	2.10E-01	2.20E-01
Phenanthrene	3.77E-02	2.14E-01	0.00E+00	0.00E+00	8.48E-03	4.81E-02
Pyrene	1.02E-01	4.38E-01	0.00E+00	0.00E+00	2.29E-02	9.85E-02
LPAH	9.87E-02	4.79E-01	6.51E-01	3.16E+00	7.10E-02	3.45E-01
HPAH	9.21E-01	4.38E+00	4.56E+00	2.17E+01	5.49E-01	2.61E+00
TOTAL PAHs	1.05E+00	5.01E+00	5.21E+00	2.48E+01	6.28E-01	2.99E+00

TABLE H-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
FIDDLER CRAB

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Fiddler Crab	Average EHQ	RME EHQ
2-Methylnaphthalene	8.25E-05	3.89E-04			
4,4'-DDT	2.20E-06	5.09E-06	1.47E-01	1.50E-05	3.46E-05
Acenaphthene	6.54E-05	2.15E-04			
Acenaphthylene	1.05E-04	5.53E-04			
Anthracene	9.65E-05	4.22E-04			
Benzo(a)anthracene	1.71E-04	9.63E-04			
Benzo(a)pyrene	3.46E-04	1.58E-03			
Benzo(b)fluoranthene	3.02E-04	1.44E-03			
Benzo(g,h,i)perylene	6.64E-04	2.53E-03			
Benzo(k)fluoranthene	2.21E-04	7.95E-04			
Cadmium	5.82E-04	1.77E-03	7.70E-01	7.56E-04	2.30E-03
Chrysene	6.63E-04	3.79E-03			
Dibenz(a,h)anthracene	6.81E-04	3.69E-03			
Endosulfan Sulfate	2.31E-06	1.85E-06			
Endrin Aldehyde	1.28E-06	5.52E-06	9.20E-02	1.40E-05	6.00E-05
Endrin Ketone	1.01E-06	2.57E-06	9.20E-02	1.10E-05	2.79E-05
Fluoranthene	3.62E-04	2.14E-03			
Fluorene	6.24E-05	2.14E-04			
gamma-Chlordane	3.58E-06	7.31E-06	4.60E+00	7.78E-07	1.59E-06
Indeno(1,2,3-cd)pyrene	6.74E-04	2.63E-03			
Nickel	4.22E-02	4.42E-02	1.70E+00	2.48E-02	2.60E-02
Phenanthrene	2.55E-04	1.45E-03			
Pyrene	5.16E-04	2.22E-03			
LPAH	6.67E-04	3.24E-03	6.56E+01	1.02E-05	4.94E-05
HPAH	4.68E-03	2.22E-02	9.31E+00	5.02E-04	2.39E-03
TOTAL PAHs	5.35E-03	2.55E-02			

TABLE H-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
SANDPIPER

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Sandpiper	Average EHQ	RME EHQ
2-Methylnaphthalene	1.43E-02	6.76E-02			
4,4'-DDT	1.09E-03	2.52E-03	2.27E-01	4.81E-03	1.11E-02
Acenaphthene	1.71E-02	8.63E-02			
Acenaphthylene	1.83E-02	9.62E-02			
Anthracene	3.57E-02	1.56E-01			
Benzo(a)anthracene	5.66E-02	3.19E-01			
Benzo(a)pyrene	6.31E-02	2.89E-01			
Benzo(b)fluoranthene	8.10E-02	3.87E-01			
Benzo(g,h,i)perylene	1.15E-01	4.40E-01			
Benzo(k)fluoranthene	3.84E-02	1.38E-01			
Cadmium	1.16E-01	3.51E-01	1.47E+00	7.86E-02	2.39E-01
Chrysene	1.68E-01	9.58E-01			
Dibenz(a,h)anthracene	1.18E-01	6.41E-01			
Endosulfan Sulfate	1.98E-03	1.59E-03			
Endrin Aldehyde	9.77E-05	4.20E-04	1.00E-02	9.77E-03	4.20E-02
Endrin Ketone	7.67E-05	1.95E-04	1.00E-02	7.67E-03	1.95E-02
Fluoranthene	3.52E-01	2.08E+00			
Fluorene	1.08E-02	3.71E-02			
gamma-Chlordane	9.44E-04	1.93E-03	2.14E+00	4.41E-04	9.01E-04
Indeno(1,2,3-cd)pyrene	1.17E-01	4.58E-01			
Nickel	6.38E+00	6.68E+00	6.71E+00	9.51E-01	9.95E-01
Phenanthrene	4.44E-02	2.52E-01			
Pyrene	8.98E-02	3.86E-01			
LPAH	2.47E-01	1.20E+00	6.56E+01	3.76E-03	1.83E-02
HPAH	1.73E+00	8.22E+00	9.31E+00	1.86E-01	8.83E-01
TOTAL PAHs	1.98E+00	9.42E+00			

TABLE H-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SEDIMENT NORTH OF MARLIN
GREEN HERON

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Green Heron	Average EHQ	RME EHQ
2-Methylnaphthalene	2.57E-02	1.21E-01			
4,4'-DDT	4.11E-04	9.50E-04	2.27E-01	1.81E-03	4.19E-03
Acenaphthene	3.50E-03	1.84E-02			
Acenaphthylene	3.50E-03	1.84E-02			
Anthracene	7.61E-03	3.33E-02			
Benzo(a)anthracene	1.84E-02	1.04E-01			
Benzo(a)pyrene	1.66E-02	7.60E-02			
Benzo(b)fluoranthene	2.40E-02	1.15E-01			
Benzo(g,h,i)perylene	2.94E-02	1.12E-01			
Benzo(k)fluoranthene	9.79E-03	3.52E-02			
Cadmium	0.00E+00	0.00E+00	1.47E+00		
Chrysene	5.32E-02	3.04E-01			
Dibenz(a,h)anthracene	3.01E-02	1.63E-01			
Endosulfan Sulfate	6.75E-04	5.40E-04			
Endrin Aldehyde	0.00E+00	0.00E+00	1.00E-02	0.00E+00	0.00E+00
Endrin Ketone	0.00E+00	0.00E+00	1.00E-02	0.00E+00	0.00E+00
Fluoranthene	1.24E-01	7.32E-01			
Fluorene	2.07E-03	7.09E-03			
gamma-Chlordane	2.07E-04	4.22E-04	2.14E+00	9.65E-05	1.97E-04
Indeno(1,2,3-cd)pyrene	2.98E-02	1.17E-01			
Nickel	2.10E-01	2.20E-01	6.71E+00	3.13E-02	3.28E-02
Phenanthrene	8.48E-03	4.81E-02			
Pyrene	2.29E-02	9.85E-02			
LPAH	7.10E-02	3.45E-01	6.56E+01	1.08E-03	5.26E-03
HPAH	5.49E-01	2.61E+00	9.31E+00	5.90E-02	2.80E-01
TOTAL PAHs	6.28E-01	2.99E+00			

TABLE H-12
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csed x BSAF (or BSAFor BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	Average Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
2-Methylnaphthalene	2.46E-02	1.61E+00	3.96E-02	EPA, 1999		0.00E+00		4.65E+00	1.14E-01	Brunson et al. (1998)
4,4'-DDT	9.52E-04	8.00E-01	7.62E-04	BSAF DB	4.02E+00	3.83E-03	BSAF DB	5.80E-01	5.52E-04	WSDOH, 1995
Acenaphthene	1.95E-02	1.61E+00	3.14E-02	EPA, 1999		0.00E+00		0.495	9.65E-03	WSDOH, 1995
Acenaphthylene	3.14E-02	1.61E+00	5.06E-02	EPA, 1999		0.00E+00		0.495	1.55E-02	WSDOH, 1995
Anthracene	2.88E-02	1.61E+00	4.64E-02	EPA, 1999	3.27E+00	9.42E-02	BSAF DB	8.40E-02	2.42E-03	WSDOH, 1995
Benzo(a)anthracene	5.43E-02	1.45E+00	7.87E-02	EPA, 1999	2.53E+00	1.37E-01	BSAF DB	6.60E-01	3.58E-02	WSDOH, 1995
Benzo(a)pyrene	1.04E-01	1.59E+00	1.65E-01	EPA, 1999	1.50E-01	1.56E-02	BSAF DB	6.60E-01	6.86E-02	WSDOH, 1995
Benzo(b)fluoranthene	9.02E-02	1.61E+00	1.45E-01	EPA, 1999	1.57E+00	1.42E-01	BSAF DB	6.60E-01	5.95E-02	WSDOH, 1995
Benzo(g,h,i)perylene	1.98E-01	1.61E+00	3.19E-01	EPA, 1999		0.00E+00		6.60E-01	1.31E-01	WSDOH, 1995
Benzo(k)fluoranthene	6.59E-02	1.61E+00	1.06E-01	EPA, 1999		0.00E+00		6.60E-01	4.35E-02	WSDOH, 1995
Cadmium	1.03E-01	3.40E+00	3.50E-01	EPA, 1999		0.00E+00			0.00E+00	
Chrysene	2.17E-01	1.38E+00	2.99E-01	EPA, 1999	1.29E+00	2.80E-01	BSAF DB	6.60E-01	1.43E-01	WSDOH, 1995
Dibenz(a,h)anthracene	2.03E-01	1.61E+00	3.27E-01	EPA, 1999		0.00E+00		6.60E-01	1.34E-01	WSDOH, 1995
Endosulfan Sulfate	1.80E-03		0.00E+00		5.00E+00	9.00E-03	BSAF DB		0.00E+00	
Endrin Aldehyde	1.00E-03		0.00E+00			0.00E+00			0.00E+00	
Endrin Ketone	7.85E-04		0.00E+00			0.00E+00			0.00E+00	
Fluoranthene	1.08E-01	1.61E+00	1.74E-01	EPA, 1999	1.33E+01	1.44E+00	BSAF DB	6.60E-01	7.13E-02	WSDOH, 1995
Fluorene	1.86E-02	1.61E+00	2.99E-02	EPA, 1999		0.00E+00		4.95E-01	9.21E-03	WSDOH, 1995
gamma-Chlordane	4.05E-04	5.88E+00	2.38E-03	BSAF DB	2.30E+00	9.32E-04	BSAF DB	1.50E+00	6.08E-04	BSAF DB
Indeno(1,2,3-cd)pyrene	2.01E-01	1.61E+00	3.24E-01	EPA, 1999		0.00E+00		6.60E-01	1.33E-01	WSDOH, 1995
Nickel	1.73E+01	9.00E-01	1.56E+01	EPA, 1999		0.00E+00		5.40E-02	9.34E-01	Max value from Calcasieu RI
Phenanthrene	7.61E-02	1.61E+00	1.23E-01	EPA, 1999		0.00E+00		4.95E-01	3.77E-02	WSDOH, 1995
Pyrene	1.54E-01	1.61E+00	2.48E-01	EPA, 1999		0.00E+00		6.60E-01	1.02E-01	WSDOH, 1995
LPAH	1.99E-01	1.61E+00	3.20E-01	EPA, 1999	3.27E+00	6.51E-01	max PAH	4.96E-01	9.87E-02	WSDOH, 1995
HPAH	1.40E+00	1.61E+00	2.25E+00	EPA, 1999	3.27E+00	4.56E+00	max PAH	6.60E-01	9.21E-01	WSDOH, 1995
TOTAL PAHs	1.59E+00	1.61E+00	2.57E+00	EPA, 1999	3.27E+00	5.21E+00	max PAH	6.60E-01	1.05E+00	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE H-13
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csed x BSAF (or BSAFor BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	RME Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
2-Methylnaphthalene	1.16E-01	1.61E+00	1.87E-01	EPA, 1999		0.00E+00		4.65E+00	5.39E-01	Brunson et al. (1998)
4,4'-DDT	2.20E-03	8.00E-01	1.76E-03	BSAF DB	4.02E+00	8.84E-03	BSAF DB	5.80E-01	1.28E-03	WSDOH, 1995
Acenaphthene	6.40E-02	1.61E+00	1.03E-01	EPA, 1999		0.00E+00		0.495	3.17E-02	WSDOH, 1995
Acenaphthylene	1.65E-01	1.61E+00	2.66E-01	EPA, 1999		0.00E+00		0.495	8.17E-02	WSDOH, 1995
Anthracene	1.26E-01	1.61E+00	2.03E-01	EPA, 1999	3.27E+00	4.12E-01	BSAF DB	8.40E-02	1.06E-02	WSDOH, 1995
Benzo(a)anthracene	3.06E-01	1.45E+00	4.44E-01	EPA, 1999	2.53E+00	7.74E-01	BSAF DB	6.60E-01	2.02E-01	WSDOH, 1995
Benzo(a)pyrene	4.76E-01	1.59E+00	7.57E-01	EPA, 1999	1.50E-01	7.14E-02	BSAF DB	6.60E-01	3.14E-01	WSDOH, 1995
Benzo(b)fluoranthene	4.31E-01	1.61E+00	6.94E-01	EPA, 1999	1.57E+00	6.77E-01	BSAF DB	6.60E-01	2.84E-01	WSDOH, 1995
Benzo(g,h,i)perylene	7.55E-01	1.61E+00	1.22E+00	EPA, 1999		0.00E+00		6.60E-01	4.98E-01	WSDOH, 1995
Benzo(k)fluoranthene	2.37E-01	1.61E+00	3.82E-01	EPA, 1999		0.00E+00		6.60E-01	1.56E-01	WSDOH, 1995
Cadmium	3.13E-01	3.40E+00	1.06E+00	EPA, 1999		0.00E+00			0.00E+00	
Chrysene	1.24E+00	1.38E+00	1.71E+00	EPA, 1999	1.29E+00	1.60E+00	BSAF DB	6.60E-01	8.18E-01	WSDOH, 1995
Dibenz(a,h)anthracene	1.10E+00	1.61E+00	1.77E+00	EPA, 1999		0.00E+00		6.60E-01	7.26E-01	WSDOH, 1995
Endosulfan Sulfate	1.44E-03		0.00E+00		5.00E+00	7.20E-03	BSAF DB		0.00E+00	
Endrin Aldehyde	4.30E-03		0.00E+00			0.00E+00			0.00E+00	
Endrin Ketone	2.00E-03		0.00E+00			0.00E+00			0.00E+00	
Fluoranthene	6.37E-01	1.61E+00	1.03E+00	EPA, 1999	1.33E+01	8.50E+00	BSAF DB	6.60E-01	4.20E-01	WSDOH, 1995
Fluorene	6.37E-02	1.61E+00	1.03E-01	EPA, 1999		0.00E+00		4.95E-01	3.15E-02	WSDOH, 1995
gamma-Chlordane	8.27E-04	5.88E+00	4.86E-03	BSAF DB	2.30E+00	1.90E-03	BSAF DB	1.50E+00	1.24E-03	BSAF DB
Indeno(1,2,3-cd)pyrene	7.85E-01	1.61E+00	1.26E+00	EPA, 1999		0.00E+00		6.60E-01	5.18E-01	WSDOH, 1995
Nickel	1.81E+01	9.00E-01	1.63E+01	EPA, 1999		0.00E+00		5.40E-02	9.77E-01	Max value from Calcasieu RI
Phenanthrene	4.32E-01	1.61E+00	6.96E-01	EPA, 1999		0.00E+00		4.95E-01	2.14E-01	WSDOH, 1995
Pyrene	6.63E-01	1.61E+00	1.07E+00	EPA, 1999		0.00E+00		6.60E-01	4.38E-01	WSDOH, 1995
LPAH	9.67E-01	1.61E+00	1.56E+00	EPA, 1999	3.27E+00	3.16E+00	max PAH	4.96E-01	4.79E-01	WSDOH, 1995
HPAH	6.63E+00	1.61E+00	1.07E+01	EPA, 1999	3.27E+00	2.17E+01	max PAH	6.60E-01	4.38E+00	WSDOH, 1995
TOTAL PAHs	7.60E+00	1.61E+00	1.22E+01	EPA, 1999	3.27E+00	2.48E+01	max PAH	6.60E-01	5.01E+00	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX I
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT

TABLE I-1
EXPOSURE POINT CONCENTATION (mg/kg)
POND SEDIMENT

Parameter	Average		95% UCL	Statistic Used
4,4'-DDD	6.96E-03		6.76E-04	RME EPC is max detect*
4,4'-DDT	4.16E-03		1.57E-03	RME EPC is max detect*
Benzo(b)fluoranthene	4.77E-02		1.06E-01	RME EPC is max detect
Benzo(g,h,i)perylene	2.40E-02		1.35E-01	RME EPC is max detect
Benzo(k)fluoranthene	5.27E-02		1.30E-01	RME EPC is max detect
Cadmium	1.47E-01		2.70E-01	RME EPC is max detect
Chrysene	9.50E-03		2.57E-02	RME EPC is max detect
Nickel	1.63E+01		2.06E+01	RME EPC is max detect
Pyrene	1.47E-02		2.65E-02	RME EPC is max detect
LPAHs				
HPAH	1.49E-01		4.23E-01	
TOTAL PAHs	1.49E-01		4.23E-01	

Notes:
*The maximum detected value is sometimes lower than the average since the reporting limit was used as a proxy value when it was not detected and because J flag data were used in the risk assessment.

TABLE I-2
TOXICITY REFERENCE VALUES

Parameter	Capitella capitata (mg/kg)	Ref.	Comments	Capitella capitata (mg/kg)	Ref.	Comments	Fiddler Crab (mg/kgBW-day)	Ref.	Comments	Black Drum (mg/kgBW-day)	Ref.	Comments	Spotted seatrout (mg/kgBW-day)	Ref.	Comments	Sandpiper (mg/kgBW-day)	Ref.	Comments	Green heron (mg/kgBW-day)	Ref.	Comments
4,4'-DDD	0.001	SQUIRT	ERL	0.007	SQUIRT	ERM	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
4,4'-DDT	0.001	SQUIRT	ERL	0.007	SQUIRT	ERM	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Benzo(b)fluoranthene	1.8	SQUIRT	AET	1.8	SQUIRT	AET															
Benzo(g,h,i)perylene	0.67	SQUIRT	AET	0.67	SQUIRT	AET															
Benzo(k)fluoranthene	1.8	SQUIRT	AET	1.8	SQUIRT	AET															
Cadmium	1.2	SQUIRT	ERL	9.6	SQUIRT	ERM	0.77	EPA, 2005b	mammalian TRV for soil	0.77	EPA, 2005b	mammalian TRV for soil	0.77	EPA, 2005b	mammalian TRV for soil	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth	1.47	EPA, 1999	Geometric mean of NOAEL values for reproduction and growth
Chrysene	0.384	SQUIRT	ERL	2.8	SQUIRT	ERM															
Nickel	20.9	SQUIRT	ERL	51.6	SQUIRT	ERM	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	6.71	EPA, 2007d	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Pyrene	0.665	SQUIRT	ERL	2.6	SQUIRT	ERM															
LPAH	0.552	SQUIRT	ERL	3.162	SQUIRT	ERM	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil	65.6	EPA, 2007b	mammalian TRV for soil
HPAH	1.7	SQUIRT	ERL	9.6	SQUIRT	ERM	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV	9.31	EPA, 2007b	midpoint between NOAEL and LOAEL for soil mammalian TRV
TOTAL PAHs	4.022	SQUIRT	ERL	44.792	SQUIRT	ERM															

Notes:
ERL – Effects Range-Low
AET – Apparent Effects Threshold
TEL – Threshold Effects Level

EPA, 2007a – DDT
EPA, 2007b – PAHs
EPA, 2007c – Copper
EPA, 2007d – Nickel
EPA, 2007e – Zinc
EPA, 2007f – Selenium
EPA, 2005a – Antimony
EPA, 2005b – Cadmium
EPA, 2005c – Chromium
EPA, 2005d – Vanadium
EPA, 2005e – Lead
EPA, 2005f – Dieldrin
EPA, 2005g – Barium

TABLE I-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
CAPITELLA CAPITATA

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDD	6.96E-03	6.76E-04	1.00E-03	6.96E+00	6.76E-01
4,4'-DDT	4.16E-03	1.57E-03	1.00E-03	4.16E+00	1.57E+00
Benzo(b)fluoranthene	4.77E-02	1.06E-01	1.80E+00	2.65E-02	5.89E-02
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	6.70E-01	3.58E-02	2.01E-01
Benzo(k)fluoranthene	5.27E-02	1.30E-01	1.80E+00	2.93E-02	7.22E-02
Cadmium	1.47E-01	2.70E-01	1.20E+00	1.23E-01	2.25E-01
Chrysene	9.50E-03	2.57E-02	3.84E-01	2.47E-02	6.69E-02
Nickel	1.63E+01	2.06E+01	2.09E+01	7.81E-01	9.86E-01
Pyrene	1.47E-02	2.65E-02	6.65E-01	2.21E-02	3.98E-02
LPAH			5.52E-01		
HPAH	1.49E-01	4.23E-01	1.70E+00	8.74E-02	2.49E-01
TOTAL PAHs	1.49E-01	4.23E-01	4.02E+00	3.69E-02	1.05E-01

TABLE I-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
CAPITELLA CAPITATA -- MIDPOINT BETWEEN ERL AND ERM COMPARISON

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDD	6.96E-03	6.76E-04	4.00E-03	1.74E+00	1.69E-01
4,4'-DDT	4.16E-03	1.57E-03	4.00E-03	1.04E+00	3.93E-01
Benzo(b)fluoranthene	4.77E-02	1.06E-01	1.80E+00	2.65E-02	5.89E-02
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	6.70E-01	3.58E-02	2.01E-01
Benzo(k)fluoranthene	5.27E-02	1.30E-01	1.80E+00	2.93E-02	7.22E-02
Cadmium	1.47E-01	2.70E-01	5.40E+00	2.73E-02	5.00E-02
Chrysene	9.50E-03	2.57E-02	1.59E+00	5.97E-03	1.61E-02
Nickel	1.63E+01	2.06E+01	3.63E+01	4.50E-01	5.68E-01
Pyrene	1.47E-02	2.65E-02	1.63E+00	9.00E-03	1.62E-02
LPAH			1.86E+00		
HPAH	1.49E-01	4.23E-01	5.65E+00	2.63E-02	7.49E-02
TOTAL PAHs	1.49E-01	4.23E-01	2.44E+01	6.09E-03	1.73E-02

TABLE I-5
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
CAPITELLA CAPITATA – ERM COMPARISON

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDD	6.96E-03	6.76E-04	7.00E-03	9.94E-01	9.66E-02
4,4'-DDT	4.16E-03	1.57E-03	7.00E-03	5.94E-01	2.24E-01
Benzo(b)fluoranthene	4.77E-02	1.06E-01	1.80E+00	2.65E-02	5.89E-02
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	6.70E-01	3.58E-02	2.01E-01
Benzo(k)fluoranthene	5.27E-02	1.30E-01	1.80E+00	2.93E-02	7.22E-02
Cadmium	1.47E-01	2.70E-01	9.60E+00	1.53E-02	2.81E-02
Chrysene	9.50E-03	2.57E-02	2.80E+00	3.39E-03	9.18E-03
Nickel	1.63E+01	2.06E+01	5.16E+01	3.16E-01	3.99E-01
Pyrene	1.47E-02	2.65E-02	2.60E+00	5.65E-03	1.02E-02
LPAH			3.16E+00		
HPAH	1.49E-01	4.23E-01	9.60E+00	1.55E-02	4.41E-02
TOTAL PAHs	1.49E-01	4.23E-01	4.48E+01	3.32E-03	9.45E-03

TABLE I-6
INTAKE CALCULATIONS FOR POND SEDIMENT
FIDDLER CRAB

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	1.16E-05	Cammen, 1979
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDD	6.96E-03	6.76E-04	8.93E-06	8.68E-07
4,4'-DDT	4.16E-03	1.57E-03	5.34E-06	2.02E-06
Benzo(b)fluoranthene	4.77E-02	1.06E-01	6.12E-05	1.36E-04
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	3.08E-05	1.73E-04
Benzo(k)fluoranthene	5.27E-02	1.30E-01	6.77E-05	1.67E-04
Cadmium	1.47E-01	2.70E-01	1.89E-04	3.47E-04
Chrysene	9.50E-03	2.57E-02	1.22E-05	3.30E-05
Nickel	1.63E+01	2.06E+01	2.10E-02	2.65E-02
Pyrene	1.47E-02	2.65E-02	1.89E-05	3.40E-05
LPAH				
HPAH	1.49E-01	4.23E-01	1.91E-04	5.44E-04
TOTAL PAHs	1.49E-01	4.23E-01	1.91E-04	5.44E-04

FOOD INGESTION

INTAKE = (Ci * IR * DFi * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ci	Invertebrate concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.16E-05	Cammen, 1979
Dfi	Dietary fraction of invertebrates (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Invertebrate	RME Invertebrate	Average Intake	RME Intake
4,4'-DDD	5.56E-03	5.41E-04	7.15E-06	6.95E-07
4,4'-DDT	3.33E-03	1.26E-03	4.27E-06	1.61E-06
Benzo(b)fluoranthene	7.67E-02	1.71E-01	9.86E-05	2.19E-04
Benzo(g,h,i)perylene	3.86E-02	2.17E-01	4.96E-05	2.79E-04
Benzo(k)fluoranthene	8.48E-02	2.09E-01	1.09E-04	2.69E-04
Cadmium	5.00E-01	9.18E-01	6.43E-04	1.18E-03
Chrysene	3.26E-02	8.82E-02	4.19E-05	1.13E-04
Nickel	1.47E+01	1.85E+01	1.89E-02	2.38E-02
Pyrene	2.37E-02	4.27E-02	3.04E-05	5.48E-05
LPAH				
HPAH	2.39E-01	6.81E-01	3.07E-04	8.75E-04
TOTAL PAHs	2.39E-01	6.81E-01	3.07E-04	8.75E-04

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDD	1.61E-05	1.56E-06
4,4'-DDT	9.62E-06	3.63E-06
Benzo(b)fluoranthene	1.60E-04	3.55E-04
Benzo(g,h,i)perylene	8.04E-05	4.53E-04
Benzo(k)fluoranthene	1.77E-04	4.36E-04
Cadmium	8.32E-04	1.53E-03
Chrysene	5.41E-05	1.46E-04
Nickel	3.98E-02	5.03E-02
Pyrene	4.93E-05	8.88E-05
LPAH		
HPAH	4.98E-04	1.42E-03
TOTAL PAHs	4.98E-04	1.42E-03

TABLE I-7
INTAKE CALCULATIONS FOR POND SEDIMENT
SANDPIPER

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sediment concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.10E-02	EPA, 1993
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDD	6.96E-03	6.76E-04	6.79E-04	6.60E-05
4,4'-DDT	4.16E-03	1.57E-03	4.06E-04	1.53E-04
Benzo(b)fluoranthene	4.77E-02	1.06E-01	4.66E-03	1.04E-02
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	2.34E-03	1.32E-02
Benzo(k)fluoranthene	5.27E-02	1.30E-01	5.15E-03	1.27E-02
Cadmium	1.47E-01	2.70E-01	1.44E-02	2.64E-02
Chrysene	9.50E-03	2.57E-02	9.28E-04	2.51E-03
Nickel	1.63E+01	2.06E+01	1.59E+00	2.01E+00
Pyrene	1.47E-02	2.65E-02	1.44E-03	2.59E-03
LPAH				
HPAH	1.49E-01	4.23E-01	1.45E-02	4.13E-02
TOTAL PAHs	1.49E-01	4.23E-01	1.45E-02	4.13E-02

FOOD INGESTION

INTAKE = ((Cc * IR * Dfc * AUF)/(BW) + (Cw * IR * DFwa * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cw	Worm concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.08E-01	EPA, 1993
Dfc	Dietary fraction of crabs (unitless)	4.00E-01	prof. judgement
Dfw	Dietary fraction of worms (unitless)	6.00E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Crab	RME Crab	Average Worm	RME Worm	Average Intake	RME Intake
4,4'-DDD	2.80E-02	2.72E-03	5.56E-03	5.41E-04	7.30E-03	7.09E-04
4,4'-DDT	1.67E-02	6.31E-03	3.33E-03	1.26E-03	4.36E-03	1.65E-03
Benzo(b)fluoranthene	7.48E-02	1.66E-01	7.67E-02	1.71E-01	3.82E-02	8.49E-02
Benzo(g,h,i)perylene	3.76E-02	2.12E-01	3.86E-02	2.17E-01	1.92E-02	1.08E-01
Benzo(k)fluoranthene	8.27E-02	2.04E-01	8.48E-02	2.09E-01	4.22E-02	1.04E-01
Cadmium	0.00E+00	0.00E+00	5.00E-01	9.18E-01	1.51E-01	2.77E-01
Chrysene	1.23E-02	3.32E-02	3.26E-02	8.82E-02	1.23E-02	3.32E-02
Nickel	0.00E+00	0.00E+00	1.47E+01	1.85E+01	4.43E+00	5.59E+00
Pyrene	0.00E+00	0.00E+00	2.37E-02	4.27E-02	7.13E-03	1.29E-02
LPAH						
HPAH	4.86E-01	1.38E+00	2.39E-01	6.81E-01	1.70E-01	4.83E-01
TOTAL PAHs	4.86E-01	1.38E+00	2.39E-01	6.81E-01	1.70E-01	4.83E-01

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDD	7.98E-03	7.75E-04
4,4'-DDT	4.77E-03	1.80E-03
Benzo(b)fluoranthene	4.28E-02	9.52E-02
Benzo(g,h,i)perylene	2.15E-02	1.21E-01
Benzo(k)fluoranthene	4.73E-02	1.17E-01
Cadmium	1.65E-01	3.03E-01
Chrysene	1.32E-02	3.57E-02
Nickel	6.02E+00	7.60E+00
Pyrene	8.57E-03	1.54E-02
LPAH		
HPAH	1.84E-01	5.25E-01
TOTAL PAHs	1.84E-01	5.25E-01

TABLE I-8
INTAKE CALCULATIONS FOR POND SEDIMENT
GREEN HERON

FOOD INGESTION

INTAKE = ((Cf * IR * Dff * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.13E-01	EPA, 1993
DFf	Dietary fraction of fish (unitless)	7.50E-01	Kent, 1986
DFc	Dietary fraction of crab (unitless)	2.50E-01	Kent, 1986
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	3.75E-01	Dunning, 1993

Chemical	Average Fish	RME Fish	Average Crab	RME Crab	Average Intake	RME Intake
4,4'-DDD	4.03E-03	3.92E-04	2.80E-02	2.72E-03	3.00E-03	2.92E-04
4,4'-DDT	2.41E-03	9.11E-04	1.67E-02	6.31E-03	1.80E-03	6.78E-04
Benzo(b)fluoranthene	3.15E-02	7.00E-02	7.48E-02	1.66E-01	1.27E-02	2.82E-02
Benzo(g,h,i)perylene	1.58E-02	8.91E-02	3.76E-02	2.12E-01	6.38E-03	3.59E-02
Benzo(k)fluoranthene	3.48E-02	8.58E-02	8.27E-02	2.04E-01	1.40E-02	3.46E-02
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	6.27E-03	1.70E-02	1.23E-02	3.32E-02	2.33E-03	6.30E-03
Nickel	8.82E-01	1.11E+00	0.00E+00	0.00E+00	1.98E-01	2.50E-01
Pyrene	9.70E-03	1.75E-02	0.00E+00	0.00E+00	2.18E-03	3.94E-03
LPAH						
HPAH	9.80E-02	2.79E-01	4.86E-01	1.38E+00	5.85E-02	1.67E-01
TOTAL PAHs	9.80E-02	2.79E-01	4.86E-01	1.38E+00	5.85E-02	1.67E-01

TABLE I-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
FIDDLER CRAB

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Fiddler Crab	Average EHQ	RME EHQ
4,4'-DDD	1.61E-05	1.56E-06	1.47E-01	1.09E-04	1.06E-05
4,4'-DDT	9.62E-06	3.63E-06	1.47E-01	6.54E-05	2.47E-05
Benzo(b)fluoranthene	1.60E-04	3.55E-04			
Benzo(g,h,i)perylene	8.04E-05	4.53E-04			
Benzo(k)fluoranthene	1.77E-04	4.36E-04			
Cadmium	8.32E-04	1.53E-03	7.70E-01	1.08E-03	1.98E-03
Chrysene	5.41E-05	1.46E-04			
Nickel	3.98E-02	5.03E-02	1.70E+00	2.34E-02	2.96E-02
Pyrene	4.93E-05	8.88E-05			
LPAH					
HPAH	4.98E-04	1.42E-03	9.31E+00	5.35E-05	1.52E-04
TOTAL PAHs	4.98E-04	1.42E-03			

TABLE I-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
SANDPIPER

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Sandpiper	Average EHQ	RME EHQ
4,4'-DDD	7.98E-03	7.75E-04	2.27E-01	3.51E-02	3.41E-03
4,4'-DDT	4.77E-03	1.80E-03	2.27E-01	2.10E-02	7.93E-03
Benzo(b)fluoranthene	4.28E-02	9.52E-02			
Benzo(g,h,i)perylene	2.15E-02	1.21E-01			
Benzo(k)fluoranthene	4.73E-02	1.17E-01			
Cadmium	1.65E-01	3.03E-01	1.47E+00	1.12E-01	2.06E-01
Chrysene	1.32E-02	3.57E-02			
Nickel	6.02E+00	7.60E+00	6.71E+00	8.98E-01	1.13E+00
Pyrene	8.57E-03	1.54E-02			
LPAH					
HPAH	1.84E-01	5.25E-01	9.31E+00	1.98E-02	5.64E-02
TOTAL PAHs	1.84E-01	5.25E-01			

TABLE I-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
GREEN HERON

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Green Heron	Average EHQ	RME EHQ
4,4'-DDD	3.00E-03	2.92E-04	2.27E-01	1.32E-02	1.29E-03
4,4'-DDT	1.80E-03	6.78E-04	2.27E-01	7.92E-03	2.99E-03
Benzo(b)fluoranthene	1.27E-02	2.82E-02			
Benzo(g,h,i)perylene	6.38E-03	3.59E-02			
Benzo(k)fluoranthene	1.40E-02	3.46E-02			
Cadmium	0.00E+00	0.00E+00	1.47E+00	0.00E+00	0.00E+00
Chrysene	2.33E-03	6.30E-03			
Nickel	1.98E-01	2.50E-01	6.71E+00	2.96E-02	3.73E-02
Pyrene	2.18E-03	3.94E-03			
LPAH					
HPAH	5.85E-02	1.67E-01	9.31E+00	6.28E-03	1.79E-02
TOTAL PAHs	5.85E-02	1.67E-01			

TABLE 1-12
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csed x BSAF (or BSAF or BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	Average Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
4,4'-DDD	6.96E-03	8.00E-01	5.56E-03	BSAF DB	4.02E+00	2.80E-02	BSAF DB	5.80E-01	4.03E-03	WSDOH, 1995
4,4'-DDT	4.16E-03	8.00E-01	3.33E-03	BSAF DB	4.02E+00	1.67E-02	BSAF DB	5.80E-01	2.41E-03	WSDOH, 1995
Benzo(b)fluoranthene	4.77E-02	1.61E+00	7.67E-02	EPA, 1999	1.57E+00	7.48E-02	BSAF DB	6.60E-01	3.15E-02	WSDOH, 1995
Benzo(g,h,i)perylene	2.40E-02	1.61E+00	3.86E-02	EPA, 1999	1.57E+00	3.76E-02	BSAF DB	6.60E-01	1.58E-02	WSDOH, 1995
Benzo(k)fluoranthene	5.27E-02	1.61E+00	8.48E-02	EPA, 1999	1.57E+00	8.27E-02	BSAF DB	6.60E-01	3.48E-02	WSDOH, 1995
Cadmium	1.47E-01	3.40E+00	5.00E-01	EPA, 1999		0.00E+00			0.00E+00	
Chrysene	9.50E-03	3.43E+00	3.26E-02	BSAF DB	1.29E+00	1.23E-02	BSAF DB	6.60E-01	6.27E-03	WSDOH, 1995
Nickel	1.63E+01	9.00E-01	1.47E+01	EPA, 1999		0.00E+00		5.40E-02	8.82E-01	Max value from Calcasieu RI
Pyrene	1.47E-02	1.61E+00	2.37E-02	EPA, 1999		0.00E+00		6.60E-01	9.70E-03	WSDOH, 1995
LPAH		1.61E+00	0.00E+00	EPA, 1999						
HPAH	1.49E-01	1.61E+00	2.39E-01	EPA, 1999	3.27E+00	4.86E-01	max PAH	6.60E-01	9.80E-02	WSDOH, 1995
TOTAL PAHs	1.49E-01	1.61E+00	2.39E-01	EPA, 1999	3.27E+00	4.86E-01	max PAH	6.60E-01	9.80E-02	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE I-13
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)

Cfood = Csed x BSAF (or BSAF or BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	RME Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
4,4'-DDD	6.76E-04	8.00E-01	5.41E-04	BSAF DB	4.02E+00	2.72E-03	BSAF DB	5.80E-01	3.92E-04	WSDOH, 1995
4,4'-DDT	1.57E-03	8.00E-01	1.26E-03	BSAF DB	4.02E+00	6.31E-03	BSAF DB	5.80E-01	9.11E-04	WSDOH, 1995
Benzo(b)fluoranthene	1.06E-01	1.61E+00	1.71E-01	EPA, 1999	1.57E+00	1.66E-01	BSAF DB	6.60E-01	7.00E-02	WSDOH, 1995
Benzo(g,h,i)perylene	1.35E-01	1.61E+00	2.17E-01	EPA, 1999	1.57E+00	2.12E-01	BSAF DB	6.60E-01	8.91E-02	WSDOH, 1995
Benzo(k)fluoranthene	1.30E-01	1.61E+00	2.09E-01	EPA, 1999	1.57E+00	2.04E-01	BSAF DB	6.60E-01	8.58E-02	WSDOH, 1995
Cadmium	2.70E-01	3.40E+00	9.18E-01	EPA, 1999		0.00E+00			0.00E+00	
Chrysene	2.57E-02	3.43E+00	8.82E-02	BSAF DB	1.29E+00	3.32E-02	BSAF DB	6.60E-01	1.70E-02	WSDOH, 1995
Nickel	2.06E+01	9.00E-01	1.85E+01	EPA, 1999		0.00E+00		5.40E-02	1.11E+00	Max value from Calcasieu RI
Pyrene	2.65E-02	1.61E+00	4.27E-02	EPA, 1999		0.00E+00		6.60E-01	1.75E-02	WSDOH, 1995
LPAH		1.61E+00	0.00E+00	EPA, 1999						
HPAH	4.23E-01	1.61E+00	6.81E-01	EPA, 1999	3.27E+00	1.38E+00	max PAH	6.60E-01	2.79E-01	WSDOH, 1995
TOTAL PAHs	4.23E-01	1.61E+00	6.81E-01	EPA, 1999	3.27E+00	1.38E+00	max PAH	6.60E-01	2.79E-01	WSDOH, 1995

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX J
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS USING LOAELS

APPENDIX J-1
SOIL SOUTH OF MARLIN

TABLE J-1-1
EXPOSURE POINT CONCENTATION (mg/kg)
SOIL SOUTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
4,4-DDD	0.00766		0.0498	97.5% Chebyshev
Aroclor-1254	0.205		0.74	97.5% Chebyshev
Copper	24.26		46.92	97.5% Chebyshev
Lead	53.52		104	97.5% Chebyshev
Zinc	433.8		815.2	97.5% Chebyshev

TABLE J-1-2
EXPOSURE POINT CONCENTATION (mg/kg)
SURFACE SOIL SOUTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
4,4-DDD	7.89E-04		0.0029	97.5% Chebyshev
Aroclor-1254	0.137		0.726	97.5% Chebyshev
Copper	27.98		32.45	95% H-UCL
Lead	69.61		84.5	95% H-UCL
Zinc	601.2		727.7	95% Approx. Gamma

Notes:
NS - Not sampled in surface soil.

TABLE J-1-3
TOXICITY REFERENCE VALUES -- SEVERAL WITH LOAELS
SURFACE SOIL SOUTH OF MARLIN AVE.

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
4,4-DDD	0.43	EPA, 2007a	Acute median LC50 in common cricket (dose 4.3 with *uncertainty factor of* 0.1)	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded *LOAEL for reproduction*, growth, and survival	0.147	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded *LOAEL for reproduction*, growth, and survival	0.227		Avian TRV was used as a surrogate for the rat snake *since no TRV was found* specific for reptiles.	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded *LOAEL for reproduction*, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for *reproduction*, growth, and survival
Aroclor-1254	2.51	EPA, 1999	Acute median LC50 in earthworms (dose *251 with uncertainty* factor of 0.01)	0.68	Sample, 1996	*Chronic* LOAEL for reproduction in mouse	0.68	Sample, 1996	*Chronic* LOAEL for reproduction in mouse	0.68	Sample, 1996		0.68	Sample, 1996		0.68	Sample, 1996	
Copper	80	EPA, 2007c	Geometric mean of the MATC and EC10 values for six test species under different test species	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	5.6	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05		Avian TRV	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	4.05	EPA, 2007c	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Lead	1700	EPA, 2005e	Geometric mean of MATC values for one test species under different pH	80	Sample, 1996	LOAEL	80	Sample, 1996	LOAEL	80	Sample, 1996	LOAEL	80	Sample, 1996	LOAEL	80	Sample, 1996	LOAEL
Zinc	537.998	EPA, 2007e	Geometric mean of the MATC for reproduction for two different test species	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL

Notes:

EPA, 2007c -- Copper
EPA, 2007e -- Zinc
EPA, 2005e -- Lead

TABLE J-1-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
EARTHWORM

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV (earthworm)	Average EHQ	RME EHQ
4,4-DDD	7.66E-03	4.98E-02	4.30E-01	1.78E-02	1.16E-01
Aroclor-1254	2.05E-01	7.40E-01	2.51E+00	8.17E-02	2.95E-01
Copper	2.43E+01	4.69E+01	8.00E+01	3.03E-01	5.87E-01
Lead	5.35E+01	1.04E+02	1.70E+03	3.15E-02	6.12E-02
Zinc	4.34E+02	8.15E+02	5.38E+02	8.06E-01	1.52E+00

TABLE J-1-5
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
DEER MOUSE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	2.13E-05	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	*Area Use Factor*	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4-DDD	7.66E-03	4.98E-02	1.10E-05	7.17E-05
Aroclor-1254	2.05E-01	7.40E-01	2.95E-04	1.07E-03
Copper	2.43E+01	4.69E+01	3.49E-02	6.75E-02
Lead	5.35E+01	1.04E+02	7.70E-02	1.50E-01
Zinc	4.34E+02	8.15E+02	6.24E-01	1.17E+00

FOOD INGESTION

INTAKE = ((Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	8.87E-03	EPA, 1999 (normalized for bw)
Dfa	Dietary fraction of arthropods (unitless)	5.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	4.40E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
4,4-DDD	9.65E-03	6.27E-02	7.18E-05	4.67E-04	3.26E-03	2.12E-02
Aroclor-1254	2.32E-01	8.36E-01	2.05E-03	7.40E-03	7.83E-02	2.83E-01
Copper	9.70E-01	1.88E+00	9.70E+00	1.88E+01	2.88E+00	5.58E+00
Lead	1.61E+00	3.12E+00	2.41E+00	4.68E+00	1.17E+00	2.28E+00
Zinc	2.43E+02	4.57E+02	5.21E-10	9.78E-10	8.15E+01	1.53E+02

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4-DDD	3.27E-03	2.13E-02
Aroclor-1254	7.86E-02	2.84E-01
Copper	2.92E+00	5.65E+00
Lead	1.25E+00	2.43E+00
Zinc	8.22E+01	1.54E+02

TABLE J-1-6
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
COYOTE

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.55E+00	EPA, 1993 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.50E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.50E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.55E+01	EPA, 1993

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
4,4-DDD	2.09E-04	1.36E-03	1.26E-04	8.17E-04	1.88E-05	1.22E-04
Aroclor-1254	4.99E-03	1.80E-02	3.00E-03	1.08E-02	4.50E-04	1.62E-03
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	9.66E-03	1.88E-02	0.00E+00	0.00E+00	7.24E-04	1.41E-03
Zinc	2.34E-02	4.40E-02	1.74E+00	3.27E+00	4.53E-02	8.51E-02

TABLE J-1-7
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RAT SNAKE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.45E-04	EPA, 1993 *
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4-DDD	7.66E-03	4.98E-02	7.97E-06	5.18E-05
Aroclor-1254	2.05E-01	7.40E-01	2.13E-04	7.70E-04
Copper	2.43E+01	4.69E+01	2.52E-02	4.88E-02
Lead	5.35E+01	1.04E+02	5.57E-02	1.08E-01
Zinc	4.34E+02	8.15E+02	4.51E-01	8.48E-01

FOOD INGESTION

INTAKE = ((Cb * IR * Dfb * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cm * IR * DFm *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cb	Bird concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.78E-03	EPA, 1993 (normalized for bw)
Dfb	Dietary fraction of birds (unitless)	1.80E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	2.00E-01	EPA, 1993
Dfm	Dietary fraction of small mammals (unitless)	6.20E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Bird	RME Bird	Average Arthropod	RME Arthropod	Average Mammal	RME Mammal	Average Intake	RME Intake
4,4-DDD	1.26E-04	8.17E-04	9.65E-03	6.27E-02	2.09E-04	1.36E-03	4.16E-05	2.71E-04
Aroclor-1254	3.00E-03	1.08E-02	2.32E-01	8.36E-01	4.99E-03	1.80E-02	9.99E-04	3.61E-03
Copper	0.00E+00	0.00E+00	9.70E-01	1.88E+00	0.00E+00	0.00E+00	3.88E-03	7.51E-03
Lead	0.00E+00	0.00E+00	1.61E+00	3.12E+00	9.66E-03	1.88E-02	6.54E-03	1.27E-02
Zinc	1.74E+00	3.27E+00	2.43E+02	4.57E+02	2.34E-02	4.40E-02	9.78E-01	1.84E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4-DDD	4.96E-05	3.23E-04
Aroclor-1254	1.21E-03	4.38E-03
Copper	2.91E-02	5.63E-02
Lead	6.22E-02	1.21E-01
Zinc	1.43E+00	2.69E+00

Notes:
* Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE J-1-8
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AMERICAN ROBIN

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.14E-03	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4-DDD	7.89E-04	2.90E-03	1.12E-05	4.13E-05
Aroclor-1254	1.37E-01	7.26E-01	1.95E-03	1.03E-02
Copper	2.80E+01	3.25E+01	3.99E-01	4.62E-01
Lead	6.96E+01	8.45E+01	9.92E-01	1.20E+00
Zinc	6.01E+02	7.28E+02	8.57E+00	1.04E+01

FOOD INGESTION

INTAKE = ((Ce * IR * Dfe * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ce	Earthworm concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	3.52E-02	EPA, 1999 (normalized for bw)
Dfe	Dietary fraction of earthworms (unitless)	4.60E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	4.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	8.00E-02	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Earthworm	RME Earthworm	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
4,4-DDD	9.65E-03	6.27E-02	9.65E-03	6.27E-02	7.18E-05	4.67E-04	3.91E-03	2.54E-02
Aroclor-1254	2.32E-01	8.36E-01	2.32E-01	8.36E-01	2.05E-03	7.40E-03	9.38E-02	3.39E-01
Copper	9.70E-01	1.88E+00	9.70E-01	1.88E+00	9.70E+00	1.88E+01	7.34E-01	1.42E+00
Lead	1.61E+00	3.12E+00	1.61E+00	3.12E+00	2.41E+00	4.68E+00	7.35E-01	1.43E+00
Zinc	2.43E+02	4.57E+02	2.43E+02	4.57E+02	5.21E-10	9.78E-10	9.83E+01	1.85E+02

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4-DDD	3.92E-03	2.55E-02
Aroclor-1254	9.58E-02	3.49E-01
Copper	1.13E+00	1.88E+00
Lead	1.73E+00	2.63E+00
Zinc	1.07E+02	1.95E+02

TABLE J-1-9
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RED-TAILED HAWK

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.78E-01	EPA, 1999 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.85E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.15E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.60E-01	EPA, 1999

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
4,4-DDD	2.09E-04	1.36E-03	1.26E-04	8.17E-04	3.53E-05	2.30E-04
Aroclor-1254	4.99E-03	1.80E-02	3.00E-03	1.08E-02	8.45E-04	3.05E-03
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	9.66E-03	1.88E-02	0.00E+00	0.00E+00	1.40E-03	2.73E-03
Zinc	2.34E-02	4.40E-02	1.74E+00	3.27E+00	7.27E-02	1.37E-01

TABLE J-1-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
DEER MOUSE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV (deer mouse)	Average EHQ	RME EHQ
4,4-DDD	3.27E-03	2.13E-02	1.47E-01	2.22E-02	1.45E-01
Aroclor-1254	7.86E-02	2.84E-01	6.80E-01	1.16E-01	4.17E-01
Copper	2.92E+00	5.65E+00	5.60E+00	5.21E-01	1.01E+00
Lead	1.25E+00	2.43E+00	8.00E+01	1.56E-02	3.04E-02
Zinc	8.22E+01	1.54E+02	3.20E+02	2.57E-01	4.82E-01

TABLE J-1-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
COYOTE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Coyote	Average EHQ	RME EHQ
4,4-DDD	1.88E-05	1.22E-04	1.47E-01	1.28E-04	8.32E-04
Aroclor-1254	4.50E-04	1.62E-03	6.80E-01	6.61E-04	2.39E-03
Copper	0.00E+00	0.00E+00	5.60E+00	0.00E+00	0.00E+00
Lead	7.24E-04	1.41E-03	8.00E+01	9.05E-06	1.76E-05
Zinc	4.53E-02	8.51E-02	3.20E+02	1.42E-04	2.66E-04

TABLE J-1-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
RAT SNAKE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Rat Snake	Average EHQ	RME EHQ
4,4-DDD	4.96E-05	3.23E-04	2.27E-01	2.19E-04	1.42E-03
Aroclor-1254	#REF!	#REF!	6.80E-01	#REF!	#REF!
Copper	2.91E-02	5.63E-02	4.05E+00	7.19E-03	1.39E-02
Lead	6.22E-02	1.21E-01	8.00E+01	7.78E-04	1.51E-03
Zinc	1.43E+00	2.69E+00	3.20E+02	4.47E-03	8.39E-03

TABLE J-1-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
AMERICAN ROBIN

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV American Robin	Average EHQ	RME EHQ
4,4-DDD	3.92E-03	2.55E-02	2.27E-01	1.73E-02	1.12E-01
Aroclor-1254	9.58E-02	3.49E-01	6.80E-01	1.41E-01	5.13E-01
Copper	1.13E+00	1.88E+00	4.05E+00	2.80E-01	4.65E-01
Lead	1.73E+00	2.63E+00	8.00E+01	2.16E-02	3.29E-02
Zinc	1.07E+02	1.95E+02	3.20E+02	3.34E-01	6.10E-01

TABLE J-1-14
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL SOUTH OF MARLIN
RED-TAILED HAWK

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Red-Tailed Hawk	Average EHQ	RME EHQ
4,4-DDD	3.53E-05	2.30E-04	2.27E-01	1.56E-04	1.01E-03
Aroclor-1254	8.45E-04	3.05E-03	6.80E-01	1.24E-03	4.48E-03
Copper	0.00E+00	0.00E+00	4.05E+00	0.00E+00	0.00E+00
Lead	1.40E-03	2.73E-03	8.00E+01	1.75E-05	3.41E-05
Zinc	7.27E-02	1.37E-01	3.20E+02	2.27E-04	4.27E-04

TABLE J-1-15
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
SURFACE SOIL SOUTH OF MARLIN AVE.

Cfood = Csoil x BCF (or BAF)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csoil =	Chemical Concentration in soil (mg/kg dry)
BCF	Bioconcentration Factor (unitless)
BAF =	Bioaccumulation Factor (unitless)

Compound	Average Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
4,4-DDD	7.66E-03	1.26E+00	9.65E-03	EPA, 1999	1.26E+00	9.65E-03	EPA, 1999	9.37E-03	7.18E-05	EPA, 1999	2.72E-02	2.08E-04	EPA, 1999	6.52E-05	4.99E-07	EPA, 1999	2.09E-04	1.59E-02	1.22E-04	EPA, 1999	5.10E-04	3.91E-06	EPA, 1999	1.26E-04
Aroclor-1254	2.05E-01	1.13E+00	2.32E-01	EPA, 1999	1.13E+00	2.32E-01	EPA, 1999	1.00E-02	2.05E-03	EPA, 1999	2.43E-02	4.98E-03	EPA, 1999	5.83E-05	1.20E-05	EPA, 1999	4.99E-03	1.42E-02	2.91E-03	EPA, 1999	4.55E-04	9.33E-05	EPA, 1999	3.00E-03
Copper	2.43E+01	4.00E-02	9.70E-01	EPA, 1999	4.00E-02	9.70E-01	EPA, 1999	4.00E-01	9.70E+00	EPA, 1999		0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Lead	5.35E+01	3.00E-02	1.61E+00	EPA, 1999	3.00E-02	1.61E+00	EPA, 1999	4.50E-02	2.41E+00	EPA, 1999	1.80E-04	9.63E-03	EPA, 1999	4.32E-07	2.31E-05	EPA, 1999	9.66E-03		0.00E+00			0.00E+00		0.00E+00
Zinc	4.34E+02	5.60E-01	2.43E+02	EPA, 1999	5.60E-01	2.43E+02	EPA, 1999	1.20E-12	5.21E-10	EPA, 1999	5.39E-05	2.34E-02	EPA, 1999	1.29E-07	5.60E-05	EPA, 1999	2.34E-02	3.89E-03	1.69E+00	EPA, 1999	1.25E-04	5.42E-02	EPA, 1999	1.74E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007c -- Copper
EPA, 2007e -- Zinc
EPA, 2005e -- Lead

TABLE J-1-16
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
SURFACE SOIL SOUTH OF MARLIN AVE.

Cfood = Csoil x BCF (or BAF)

where:

Cfood = Chemical Concentration in food (mg/kg dry)
Csoil = Chemical Concentration in soil (mg/kg dry)
BCF = Bioconcentration Factor (unitless)
BAF = Bioaccumulation Factor (unitless)

Compound	RME Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
4,4-DDD	4.98E-02	1.26E+00	6.27E-02	EPA, 1999	1.26E+00	6.27E-02	EPA, 1999	9.37E-03	4.67E-04	EPA, 1999	2.72E-02	1.35E-03	EPA, 1999	6.52E-05	3.25E-06	EPA, 1999	1.36E-03	1.59E-02	7.92E-04	EPA, 1999	5.10E-04	2.54E-05	EPA, 1999	8.17E-04
Aroclor-1254	7.40E-01	1.13E+00	8.36E-01	EPA, 1999	1.13E+00	8.36E-01	EPA, 1999	1.00E-02	7.40E-03	EPA, 1999	2.43E-02	1.80E-02	EPA, 1999	5.83E-05	4.31E-05	EPA, 1999	1.80E-02	1.42E-02	1.05E-02	EPA, 1999	4.55E-04	3.37E-04	EPA, 1999	1.08E-02
Copper	4.69E+01	4.00E-02	1.88E+00	EPA, 1999	4.00E-02	1.88E+00	EPA, 1999	4.00E-01	1.88E+01	EPA, 1999		0.00E+00			0.00E+00		0.00E+00		0.00E+00			0.00E+00		0.00E+00
Lead	1.04E+02	3.00E-02	3.12E+00	EPA, 1999	3.00E-02	3.12E+00	EPA, 1999	4.50E-02	4.68E+00	EPA, 1999	1.80E-04	1.87E-02	EPA, 1999	4.32E-07	4.49E-05	EPA, 1999	1.88E-02		0.00E+00			0.00E+00		0.00E+00
Zinc	8.15E+02	5.60E-01	4.57E+02	EPA, 1999	5.60E-01	4.57E+02	EPA, 1999	1.20E-12	9.78E-10	EPA, 1999	5.39E-05	4.39E-02	EPA, 1999	1.29E-07	1.05E-04	EPA, 1999	4.40E-02	3.89E-03	3.17E+00	EPA, 1999	1.25E-04	1.02E-01	EPA, 1999	3.27E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007c – Copper
EPA, 2007e – Zinc
EPA, 2005e – Lead

APPENDIX J-2
SOIL NORTH OF MARLIN

TABLE J-2-1
EXPOSURE POINT CONCENTATION (mg/kg)
SOIL NORTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
Dieldrin				NC

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.
NC - Not a COPC in soil.

TABLE J-2-2
EXPOSURE POINT CONCENTATION (mg/kg)
SURFACE SOIL NORTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
Dieldrin	4.87E-04		0.0034	99% Chebyshev

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.
NS - Not sampled in surface soil.

TABLE J-2-3
TOXICITY REFERENCE VALUES – SEVERAL BASED ON LOAELS
SURFACE SOIL NORTH OF MARLIN AVE.

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
Dieldrin				1.8	EPA, 2005f	Geometric mean of LOAEL values for survival, reproduction and growth	1.8	EPA, 2005f	Geometric mean of LOAEL values for survival, reproduction and growth	0.0709		Avian TRV	0.0709	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth,	0.0709	EPA, 2005f	Highest bounded NOAEL for growth lower than the lowest bounded LOAEL for reproduction, growth,

Notes:

EPA, 2007a – DDT.
EPA, 2007b – PAHs
EPA, 2007c – Copper
EPA, 2007d – Nickel
EPA, 2007e – Zinc
EPA, 2007f – Dieldrin
EPA, 2005a – Antimony
EPA, 2005b – Cadmium
EPA, 2005c – Chromium
EPA, 2005d – Vanadium
EPA, 2005e – Lead

TABLE J-2-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
EARTHWORM

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV (earthworm)	Average EHQ	RME EHQ
Dieldrin	0.00E+00	0.00E+00			

TABLE J-2-5
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
DEER MOUSE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	2.13E-05	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Dieldrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOOD INGESTION

INTAKE = ((Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	8.87E-03	EPA, 1999 (normalized for bw)
Dfa	Dietary fraction of arthropods (unitless)	5.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	4.40E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
Dieldrin	7.15E-03	5.00E-02	1.70E-05	1.19E-04	2.41E-03	1.68E-02

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Dieldrin	2.41E-03	1.68E-02

TABLE J-2-6
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
COYOTE

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.55E+00	EPA, 1993 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.50E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.50E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.55E+01	EPA, 1993

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
Dieldrin	2.75E-06	1.92E-05	1.79E-06	1.25E-05	2.51E-07	1.75E-06

TABLE J-2-7
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RAT SNAKE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.45E-04	EPA, 1993 *
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Dieldrin	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOOD INGESTION

INTAKE = ((Cb * IR * Dfb * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cm * IR * DFm *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cb	Bird concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.78E-03	EPA, 1993 (normalized for bw)
Dfb	Dietary fraction of birds (unitless)	1.80E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	2.00E-01	EPA, 1993
Dfm	Dietary fraction of small mammals (unitless)	6.20E-01	EPA, 1993
AUF	*Area Use Factor*	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Bird	RME Bird	Average Arthropod	RME Arthropod	Average Mammal	RME Mammal	Average Intake	RME Intake
Dieldrin	1.79E-06	1.25E-05	7.15E-03	5.00E-02	2.75E-06	1.92E-05	2.87E-05	2.00E-04

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Dieldrin	2.87E-05	2.00E-04

Notes:
* Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE J-2-8
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
AMERICAN ROBIN

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.14E-03	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Dieldrin	4.87E-04	3.40E-03	6.93E-06	4.85E-05

FOOD INGESTION

INTAKE = ((Ce * IR * Dfe * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ce	Earthworm concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	3.52E-02	EPA, 1999 (normalized for bw)
Dfe	Dietary fraction of earthworms (unitless)	4.60E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	4.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	8.00E-02	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Earthworm	RME Earthworm	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
Dieldrin	7.15E-03	5.00E-02	7.15E-03	5.00E-02	1.70E-05	1.19E-04	2.90E-03	2.02E-02

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Dieldrin	2.90E-03	2.03E-02

TABLE J-2-9
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RED-TAILED HAWK

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.78E-01	EPA, 1999 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.85E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.15E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.60E-01	EPA, 1999

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
Dieldrin	2.75E-06	1.92E-05	1.79E-06	1.25E-05	4.70E-07	3.29E-06

TABLE J-2-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
DEER MOUSE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV (deer mouse)	Average EHQ	RME EHQ
Dieldrin	2.41E-03	1.68E-02	1.80E+00	1.34E-03	9.34E-03

TABLE J-2-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
COYOTE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Coyote	Average EHQ	RME EHQ
Dieldrin	2.51E-07	1.75E-06	1.80E+00	1.39E-07	9.74E-07

TABLE J-2-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
RAT SNAKE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Rat Snake	Average EHQ	RME EHQ
Dieldrin	2.87E-05	2.00E-04	7.09E-02	4.04E-04	2.82E-03

TABLE J-2-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
AMERICAN ROBIN

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV American Robin	Average EHQ	RME EHQ
Dieldrin	2.90E-03	2.03E-02	7.09E-02	4.09E-02	2.86E-01

TABLE J-2-14
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR SOIL NORTH OF MARLIN
RED-TAILED HAWK

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Red-Tailed Hawk	Average EHQ	RME EHQ
Dieldrin	4.70E-07	3.29E-06	7.09E-02	6.64E-06	4.64E-05

TABLE J-2-15
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
SURFACE SOIL NORTH OF MARLIN AVE.

Cfood = Csoil x BCF (or BAF)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csoil =	Chemical Concentration in soil (mg/kg dry)
BCF	Bioconcentration Factor (unitless)
BAF =	Bioaccumulation Factor (unitless)

Compound	Average Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
Dieldrin	4.87E-04	1.47E+01	7.15E-03	EPA, 2005f	1.47E+01	7.15E-03	EPA, 2005f	3.49E-02	1.70E-05	EPA, 1998	5.65E-03	2.75E-06	EPA, 1998		0.00E+00		2.75E-06	3.68E-03	1.79E-06	EPA, 1998		0.00E+00		1.79E-06

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE J-1-16
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
SURFACE SOIL NORTH OF MARLIN AVE.

Cfood = Csoil x BCF (or BAF)

where:

Cfood = Chemical Concentration in food (mg/kg dry)
Csoil = Chemical Concentration in soil (mg/kg dry)
BCF = Bioconcentration Factor (unitless)
BAF = Bioaccumulation Factor (unitless)

Compound	RME Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
Dieldrin	3.40E-03	1.47E+01	5.00E-02	EPA, 2005f	1.47E+01	5.00E-02	EPA, 2005f	3.49E-02	1.19E-04	EPA, 1998	5.65E-03	1.92E-05	EPA, 1998		0.00E+00		1.92E-05	3.68E-03	1.25E-05	EPA, 1998		0.00E+00		1.25E-05

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX J-3
BACKGROUND SOIL

TABLE J-3-1
EXPOSURE POINT CONCENTATION (mg/kg)
BACKGROUND SOIL

Parameter	Average		95% UCL	Statistic Used
Antimony	0.953		2.19	Maximum*
Barium	333.1		502.3	95% Approx. Gamma
Zinc	247		969	Maximum*

Notes:
* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.

TABLE J-3-2
TOXICITY REFERENCE VALUES -- SEVERAL BASED ON LOAELS
BACKGROUND SOIL

Parameter	Earthworm (mg/kg)	Ref.	Comments	Deer Mouse (mg/kgBW-day)	Ref.	Comments	Coyote (mg/kgBW-day)	Ref.	Comments	Rat Snake (mg/kgBW-day)	Ref.	Comments	American Robin (mg/kgBW-day)	Ref.	Comments	Red-tailed Hawk (mg/kgBW-day)	Ref.	Comments
Antimony	30	EPA, 2005a	EC20 for earthworms	1.25	Sample, 1996	Chronic LOAEL in mouse	1.25	Sample, 1996	Chronic LOAEL in mouse	1.25		Mammalian TRV	1.25		Mammalian TRV	1.25		Mammalian TRV
Barium	330	EPA, 2005g	Geometric mean of the EC20 values for three test species *under three separate* test conditions of pH	118.95	EPA, 2005g	Geometric mean of LOAEL values for *survival, reproduction and* growth	118.95	EPA, 2005g	Geometric mean of LOAEL values for *survival, reproduction* and growth	118.95		Mammalian TRV	118.95		Mammalian TRV	118.95		Mammalian TRV
Zinc	537.998	EPA, 2007e	Geometric mean of the MATC for reproduction for two different test species	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL	320	Sample, 1996	LOAEL

Notes:

EPA, 2007e -- Zinc
EPA, 2005a -- Antimony
EPA, 2005g -- Barium

TABLE J-3-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
EARTHWORM

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV (earthworm)	Average EHQ	RME EHQ
Antimony	9.53E-01	2.19E+00	3.00E+01	3.18E-02	7.30E-02
Barium	3.33E+02	5.02E+02	3.30E+02	1.01E+00	1.52E+00
Zinc	2.47E+02	9.69E+02	5.38E+02	4.59E-01	1.80E+00

TABLE J-3-4
INTAKE CALCULATIONS FOR BACKGROUND SOIL
DEER MOUSE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	2.13E-05	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Antimony	9.53E-01	2.19E+00	1.37E-03	3.15E-03
Barium	3.33E+02	5.02E+02	4.79E-01	7.23E-01
Zinc	2.47E+02	9.69E+02	3.55E-01	1.39E+00

FOOD INGESTION

INTAKE = ((Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	8.87E-03	EPA, 1999 (normalized for bw)
Dfa	Dietary fraction of arthropods (unitless)	5.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	4.40E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.48E-02	EPA, 1999

Chemical	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
Antimony	2.10E-01	4.82E-01	1.91E-01	4.38E-01	1.21E-01	2.77E-01
Barium	7.33E+01	1.11E+02	5.00E+01	7.53E+01	3.78E+01	5.70E+01
Zinc	1.38E+02	5.43E+02	2.96E-10	1.16E-09	4.64E+01	1.82E+02

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Antimony	1.22E-01	2.80E-01
Barium	3.83E+01	5.77E+01
Zinc	4.68E+01	1.84E+02

TABLE J-3-5
INTAKE CALCULATIONS FOR BACKGROUND SOIL
COYOTE

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.55E+00	EPA, 1993 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.50E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.50E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.55E+01	EPA, 1993

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
Antimony	5.72E-04	1.31E-03	0.00E+00	0.00E+00	4.29E-05	9.86E-05
Barium	3.00E-02	4.53E-02	0.00E+00	0.00E+00	2.25E-03	3.39E-03
Zinc	1.33E-02	5.24E-02	9.92E-01	3.89E+00	2.58E-02	1.01E-01

TABLE J-3-6
INTAKE CALCULATIONS FOR BACKGROUND SOIL
RAT SNAKE

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.45E-04	EPA, 1993 *
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Antimony	9.53E-01	2.19E+00	9.91E-04	2.28E-03
Barium	3.33E+02	5.02E+02	3.46E-01	5.22E-01
Zinc	2.47E+02	9.69E+02	2.57E-01	1.01E+00

FOOD INGESTION

INTAKE = ((Cb * IR * Dfb * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cm * IR * DFm *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cb	Bird concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	2.78E-03	EPA, 1993 (normalized for bw)
Dfb	Dietary fraction of birds (unitless)	1.80E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	2.00E-01	EPA, 1993
Dfm	Dietary fraction of small mammals (unitless)	6.20E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	1.39E-01	EPA, 1993

Chemical	Average Bird	RME Bird	Average Arthropod	RME Arthropod	Average Mammal	RME Mammal	Average Intake	RME Intake
Antimony	0.00E+00	0.00E+00	2.10E-01	4.82E-01	5.72E-04	1.31E-03	8.46E-04	1.94E-03
Barium	0.00E+00	0.00E+00	7.33E+01	1.11E+02	3.00E-02	4.53E-02	2.94E-01	4.43E-01
Zinc	9.92E-01	3.89E+00	1.38E+02	5.43E+02	1.33E-02	5.24E-02	5.57E-01	2.19E+00

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Antimony	1.84E-03	4.22E-03
Barium	6.40E-01	9.65E-01
Zinc	8.14E-01	3.19E+00

Notes:
* Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE J-3-7
INTAKE CALCULATIONS FOR BACKGROUND SOIL
AMERICAN ROBIN

SOIL INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
IR	Ingestion rate of soil (kg/day)	1.14E-03	EPA, 1999 (normalized for bw)
AF	Chemical Bioavailability in soil (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
Antimony	9.53E-01	2.19E+00	1.36E-02	3.12E-02
Barium	3.33E+02	5.02E+02	4.75E+00	7.16E+00
Zinc	2.47E+02	9.69E+02	3.52E+00	1.38E+01

FOOD INGESTION

INTAKE = ((Ce * IR * Dfe * AUF)/(BW) + (Ca * IR * DFa * AUF) / (BW) + ((Cp * IR * DFs *AUF)/(BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ce	Earthworm concentration (mg/kg)	see FoodConc page	
Ca	Arthropod concentration (mg/kg)	see FoodConc page	
Cp	Plant concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	3.52E-02	EPA, 1999 (normalized for bw)
Dfe	Dietary fraction of earthworms (unitless)	4.60E-01	EPA, 1993
Dfa	Dietary fraction of arthropods (unitless)	4.60E-01	EPA, 1993
Dfs	Dietary fraction of plants, seeds and other vegetation (unitless)	8.00E-02	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	8.00E-02	EPA, 1999

Chemical	Average Earthworm	RME Earthworm	Average Arthropod	RME Arthropod	Average Plant	RME Plant	Average Intake	RME Intake
Antimony	2.10E-01	4.82E-01	2.10E-01	4.82E-01	1.91E-01	4.38E-01	9.16E-02	2.10E-01
Barium	7.33E+01	1.11E+02	7.33E+01	1.11E+02	5.00E+01	7.53E+01	3.14E+01	4.74E+01
Zinc	1.38E+02	5.43E+02	1.38E+02	5.43E+02	2.96E-10	1.16E-09	5.60E+01	2.20E+02

TOTAL INTAKE

INTAKE = Soil Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
Antimony	1.05E-01	2.42E-01
Barium	3.62E+01	5.45E+01
Zinc	5.95E+01	2.33E+02

TABLE J-3-8
INTAKE CALCULATIONS FOR BACKGROUND SOIL
RED-TAILED HAWK

FOOD INGESTION

INTAKE = ((Cm * IR * Dfm * AUF)/(BW) + (Cb * IR * DFb * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cm	Mammal concentration (mg/kg)	see FoodConc page	
Cb	Bird concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.78E-01	EPA, 1999 (normalized for bw)
Dfm	Dietary fraction of small mammals (unitless)	7.85E-01	EPA, 1993
Dfb	Dietary fraction of birds (unitless)	2.15E-01	EPA, 1993
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.60E-01	EPA, 1999

Chemical	Average Mammal	RME Mammal	Average Bird	RME Bird	Average Intake	RME Intake
Antimony	5.72E-04	1.31E-03	0.00E+00	0.00E+00	8.31E-05	1.91E-04
Barium	3.00E-02	4.53E-02	0.00E+00	0.00E+00	4.36E-03	6.57E-03
Zinc	1.33E-02	5.24E-02	9.92E-01	3.89E+00	4.14E-02	1.62E-01

TABLE J-3-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
DEER MOUSE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV (deer mouse)	Average EHQ	RME EHQ
Antimony	1.22E-01	2.80E-01	1.25E+00	9.76E-02	2.24E-01
Barium	3.83E+01	5.77E+01	1.19E+02	3.22E-01	4.85E-01
Zinc	4.68E+01	1.84E+02	3.20E+02	1.46E-01	5.73E-01

TABLE J-3-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
COYOTE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Coyote	Average EHQ	RME EHQ
Antimony	4.29E-05	9.86E-05	1.25E+00	3.43E-05	7.89E-05
Barium	2.25E-03	3.39E-03	1.19E+02	1.89E-05	2.85E-05
Zinc	2.58E-02	1.01E-01	3.20E+02	8.06E-05	3.16E-04

TABLE J-3-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL SOUTH OF MARLIN
RAT SNAKE

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Rat Snake	Average EHQ	RME EHQ
Antimony	1.84E-03	4.22E-03	1.25E+00	1.47E-03	3.38E-03
Barium	6.40E-01	9.65E-01	1.19E+02	5.38E-03	8.11E-03
Zinc	8.14E-01	3.19E+00	3.20E+02	2.54E-03	9.98E-03

TABLE J-3-12
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
AMERICAN ROBIN

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV American Robin	Average EHQ	RME EHQ
Antimony	1.05E-01	2.42E-01	1.25E+00	8.41E-02	1.93E-01
Barium	3.62E+01	5.45E+01	1.19E+02	3.04E-01	4.59E-01
Zinc	5.95E+01	2.33E+02	3.20E+02	1.86E-01	7.30E-01

TABLE J-3-13
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR BACKGROUND SOIL
RED-TAILED HAWK

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Red-Tailed Hawk	Average EHQ	RME EHQ
Antimony	8.31E-05	1.91E-04	1.25E+00	6.65E-05	1.53E-04
Barium	4.36E-03	6.57E-03	1.19E+02	3.66E-05	5.53E-05
Zinc	4.14E-02	1.62E-01	3.20E+02	1.29E-04	5.07E-04

TABLE J-3-14
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
BACKGROUND SOIL

Cfood = Csoil x BCF (or BAF)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csoil =	Chemical Concentration in soil (mg/kg dry)
BCF =	Bioconcentration Factor (unitless)
BAF =	Bioaccumulation Factor (unitless)

Compound	Average Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
Antimony	9.53E-01	2.20E-01	2.10E-01	EPA, 1999	2.20E-01	2.10E-01	EPA, 1999	2.00E-01	1.91E-01	EPA, 1999	5.99E-04	5.71E-04	EPA, 1999	1.44E-06	1.37E-06	EPA, 1999	5.72E-04		0.00E+00			0.00E+00		0.00E+00
Barium	3.33E+02	2.20E-01	7.33E+01	EPA, 1999	2.20E-01	7.33E+01	EPA, 1999	1.50E-01	5.00E+01	EPA, 1999	8.99E-05	2.99E-02	EPA, 1999	2.16E-07	7.19E-05	EPA, 1999	3.00E-02		0.00E+00			0.00E+00		0.00E+00
Zinc	2.47E+02	5.60E-01	1.38E+02	EPA, 1999	5.60E-01	1.38E+02	EPA, 1999	1.20E-12	2.96E-10	EPA, 1999	5.39E-05	1.33E-02	EPA, 1999	1.29E-07	3.19E-05	EPA, 1999	1.33E-02	3.89E-03	9.61E-01	EPA, 1999	1.25E-04	3.09E-02	EPA, 1999	9.92E-01

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007e -- Zinc
EPA, 2005a -- Antimony

TABLE J-3-15
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
BACKGROUND SOIL

Cfood = Csoil x BCF (or BAF)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csoil =	Chemical Concentration in soil (mg/kg dry)
BCF	Bioconcentration Factor (unitless)
BAF =	Bioaccumulation Factor (unitless)

Compound	RME Csoil (mg/kg)	Soil to Earthworm BCF	Earthworm Concentration	Reference	Soil to Arthropod BCF	Arthropod Concentration	Reference	Soil to Plant BAF	Plant/Fruit/Seed Concentration	Reference	Plant to Wildlife BCF	Plant to Deer Mouse Concentration	Reference	Soil to Wildlife BCF	Soil to Deer Mouse Concentration	Reference	TOTAL DEER MOUSE CONCENTRATION	Plant to Bird BCF	Plant to Bird Concentration	Reference	Soil to Bird BCF	Soil to Bird Concentration	Reference	TOTAL BIRD CONCENTRATION
Antimony	2.19E+00	2.20E-01	4.82E-01	EPA, 1999	2.20E-01	4.82E-01	EPA, 1999	2.00E-01	4.38E-01	EPA, 1999	5.99E-04	1.31E-03	EPA, 1999	1.44E-06	3.15E-06	EPA, 1999	1.31E-03		0.00E+00			0.00E+00		0.00E+00
Barium	5.02E+02	2.20E-01	1.11E+02	EPA, 1999	2.20E-01	1.11E+02	EPA, 1999	1.50E-01	7.53E+01	EPA, 1999	8.99E-05	4.52E-02	EPA, 1999	2.16E-07	1.08E-04	EPA, 1999	4.53E-02		0.00E+00			0.00E+00		0.00E+00
Zinc	9.69E+02	5.60E-01	5.43E+02	EPA, 1999	5.60E-01	5.43E+02	EPA, 1999	1.20E-12	1.16E-09	EPA, 1999	5.39E-05	5.22E-02	EPA, 1999	1.29E-07	1.25E-04	EPA, 1999	5.24E-02	3.89E-03	3.77E+00	EPA, 1999	1.25E-04	1.21E-01	EPA, 1999	3.89E+00

Notes:
Does not exceed screening criteria but is considered bioaccumulative.
Exceeds screening criteria but is not considered bioaccumulative.
Exceeds screening criteria and is considered bioaccumulative.
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.
EPA, 2007a -- DDT
EPA, 2007b -- PAHs
EPA, 2007c -- Copper
EPA, 2007d -- Nickel
EPA, 2007e -- Zinc
EPA, 2005a -- Antimony
EPA, 2005b -- Cadmium
EPA, 2005c -- Chromium
EPA, 2005d -- Vanadium
EPA, 2005e -- Lead

APPENDIX J-4
POND SEDIMENT

TABLE J-4-1
EXPOSURE POINT CONCENTATION (mg/kg)
POND SEDIMENT

Parameter	Average		95% UCL	Statistic Used
4,4'-DDT	4.16E-03		1.57E-03	RME EPC is max detect*
Nickel	1.63E+01		2.06E+01	RME EPC is max detect

Notes:
*The maximum detected value is sometimes lower than the average since the reporting limit was used as a proxy value when it was not detected and because J flag data were used in the risk assessment.

TABLE J-4-2
TOXICITY REFERENCE VALUES - WITH SEVERAL LOAELS
POND SEDIMENT

Parameter	Capitella capitata (mg/kg)	Ref.	Comments	Capitella capitata (mg/kg)	Ref.	Comments	Fiddler Crab (mg/kgBW-day)	Ref.	Comments	Black Drum (mg/kgBW-day)	Ref.	Comments	Spotted seatrout (mg/kgBW-day)	Ref.	Comments	Sandpiper (mg/kgBW-day)	Ref.	Comments	Green heron (mg/kgBW-day)	Ref.	Comments
4,4'-DDT	0.001	SQUIRT	ERL	0.007	SQUIRT	ERM	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.147	EPA, 2007a	mammalian TRV for soil	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival	0.227	EPA, 2007a	Highest bounded NOAEL for growth and reproduction lower than the lowest bounded LOAEL for reproduction, growth, and survival
Nickel	20.9	SQUIRT	ERL	51.6	SQUIRT	ERM	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	1.7	EPA, 2007d	mammalian TRV for soil	21.66	EPA, 2007d	Geometric mean of LOAEL for reproduction, growth, and survival	21.66	EPA, 2007d	Geometric mean of LOAEL for reproduction, growth, and survival

Notes:
ERL – Effects Range-Low
AET – Apparent Effects Threshold
TEL – Threshold Effects Level

EPA, 2007a – DDT
EPA, 2007d – Nickel

TABLE J-4-3
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
CAPITELLA CAPITATA

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDT	4.16E-03	1.57E-03	1.00E-03	4.16E+00	1.57E+00
Nickel	1.63E+01	2.06E+01	2.09E+01	7.81E-01	9.86E-01

TABLE J-4-4
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
CAPITELLA CAPITATA -- MIDPOINT BETWEEN ERL AND ERM COMPARISON

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDT	4.16E-03	1.57E-03	4.00E-03	1.04E+00	3.93E-01
Nickel	1.63E+01	2.06E+01	3.63E+01	4.50E-01	5.68E-01

TABLE J-4-5
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
CAPITELLA CAPITATA – ERM COMPARISON

Ecological Hazard Quotient = Sc/TRV

Parameter	Definition	Default
Sc	Soil Concentration (mg/kg)	see below
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Sc	RME Sc	TRV capitella capitata	Average EHQ	RME EHQ
4,4'-DDT	4.16E-03	1.57E-03	7.00E-03	5.94E-01	2.24E-01
Nickel	1.63E+01	2.06E+01	5.16E+01	3.16E-01	3.99E-01

TABLE J-4-6
INTAKE CALCULATIONS FOR POND SEDIMENT
FIDDLER CRAB

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sed concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	1.16E-05	Cammen, 1979
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDT	4.16E-03	1.57E-03	5.34E-06	2.02E-06
Nickel	1.63E+01	2.06E+01	2.10E-02	2.65E-02

FOOD INGESTION

INTAKE = (Ci * IR * DFi * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Ci	Invertebrate concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.16E-05	Cammen, 1979
Dfi	Dietary fraction of invertebrates (unitless)	1.00E+00	TPWD website
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	9.00E-03	based on width/length eq.

Chemical	Average Invertebrate	RME Invertebrate	Average Intake	RME Intake
4,4'-DDT	3.33E-03	1.26E-03	4.27E-06	1.61E-06
Nickel	1.47E+01	1.85E+01	1.89E-02	2.38E-02

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDT	9.62E-06	3.63E-06
Nickel	3.98E-02	5.03E-02

TABLE J-4-7
INTAKE CALCULATIONS FOR POND SEDIMENT
SANDPIPER

SEDIMENT INGESTION

INTAKE = (Sc * IR * AF * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Sediment concentration (mg/kg)	see data page	
IR	Ingestion rate of sed (kg/day)	2.10E-02	EPA, 1993
AF	Chemical Bioavailability in sediment (unitless)	1	EPA, 1997
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Sc	RME Sc	Average Intake	RME Intake
4,4'-DDT	4.16E-03	1.57E-03	4.06E-04	1.53E-04
Nickel	1.63E+01	2.06E+01	1.59E+00	2.01E+00

FOOD INGESTION

INTAKE = ((Cc * IR * Dfc * AUF)/(BW) + (Cw * IR * DFwa * AUF) / (BW)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cc	Crab concentration (mg/kg)	see FoodConc page	
Cw	Worm concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.08E-01	EPA, 1993
Dfc	Dietary fraction of crabs (unitless)	4.00E-01	prof. judgement
Dfw	Dietary fraction of worms (unitless)	6.00E-01	prof. judgement
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	2.15E-01	Dunning, 1993

Chemical	Average Crab	RME Crab	Average Worm	RME Worm	Average Intake	RME Intake
4,4'-DDT	1.67E-02	6.31E-03	3.33E-03	1.26E-03	4.36E-03	1.65E-03
Nickel	0.00E+00	0.00E+00	1.47E+01	1.85E+01	4.43E+00	5.59E+00

TOTAL INTAKE

INTAKE = Sediment Intake + Food Intake

Chemical	TOTAL Average Intake	TOTAL RME Intake
4,4'-DDT	4.77E-03	1.80E-03
Nickel	6.02E+00	7.60E+00

TABLE J-4-8
INTAKE CALCULATIONS FOR POND SEDIMENT
GREEN HERON

FOOD INGESTION

INTAKE = ((Cf * IR * Dff * AUF)/(BW) + (Cc * IR * DFc * AUF) / (BW))

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Cf	Fish concentration (mg/kg)	see FoodConc page	
Cc	Crab concentration (mg/kg)	see FoodConc page	
IR	Ingestion rate of of food (kg/day)	1.13E-01	EPA, 1993
DFf	Dietary fraction of fish (unitless)	7.50E-01	Kent, 1986
DFc	Dietary fraction of crab (unitless)	2.50E-01	Kent, 1986
AUF	Area Use Factor	1	EPA, 1997
BW	Body weight (kg)	3.75E-01	Dunning, 1993

Chemical	Average Fish	RME Fish	Average Crab	RME Crab	Average Intake	RME Intake
4,4'-DDT	2.41E-03	9.11E-04	1.67E-02	6.31E-03	1.80E-03	6.78E-04
Nickel	8.82E-01	1.11E+00	0.00E+00	0.00E+00	1.98E-01	2.50E-01

TABLE J-4-9
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
FIDDLER CRAB

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Fiddler Crab	Average EHQ	RME EHQ
4,4'-DDT	9.62E-06	3.63E-06	1.47E-01	6.54E-05	2.47E-05
Nickel	3.98E-02	5.03E-02	1.70E+00	2.34E-02	2.96E-02

TABLE J-4-10
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
SANDPIPER

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Sandpiper	Average EHQ	RME EHQ
4,4'-DDT	4.77E-03	1.80E-03	2.27E-01	2.10E-02	7.93E-03
Nickel	6.02E+00	7.60E+00	2.17E+01	2.78E-01	3.51E-01

TABLE J-4-11
ECOLOGICAL HAZARD QUOTIENT CALCULATIONS FOR POND SEDIMENT
GREEN HERON

Ecological Hazard Quotient = Intake/TRV

Parameter	Definition	Default
Intake	Intake of COPC (mg/kg-day)	see Intake
TRV	Toxicity Reference Value (mg/kg)	see TRV summary page

Chemical	Average Intake	RME Intake	TRV Green Heron	Average EHQ	RME EHQ
4,4'-DDT	1.80E-03	6.78E-04	2.27E-01	7.92E-03	2.99E-03
Nickel	1.98E-01	2.50E-01	2.17E+01	9.16E-03	1.16E-02

TABLE J-4-12
AVERAGE CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
POND SEDIMENT

Cfood = Csed x BSAF (or BSAF or BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	Average Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
4,4'-DDT	4.16E-03	8.00E-01	3.33E-03	BSAF DB	4.02E+00	1.67E-02	BSAF DB	5.80E-01	2.41E-03	WSDOH, 1995
Nickel	1.63E+01	9.00E-01	1.47E+01	EPA, 1999		0.00E+00		5.40E-02	8.82E-01	Max value from Calcasieu RI

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

TABLE J-4-13
RME CONCENTRATION OF CHEMICAL IN FOOD ITEM (mg/kg)
POND SEDIMENT

Cfood = Csed x BSAF (or BSAF or BCF with food chain multiplier)

where:

Cfood =	Chemical Concentration in food (mg/kg dry)
Csed =	Chemical Concentration in soil (mg/kg dry)
BSAF	Biota to Sediment Accumulation Factor (unitless)
BCF =	Bioconcentration Factor (unitless)

Compound	RME Csed (mg/kg)	Sediment to Worm BSAF	Worm Concentration	Reference	Sediment to Crab BSAF	Crab Concentration	Reference	Sediment to Fish BSAF	Fish Concentration	Reference
4,4'-DDT	1.57E-03	8.00E-01	1.26E-03	BSAF DB	4.02E+00	6.31E-03	BSAF DB	5.80E-01	9.11E-04	WSDOH, 1995
Nickel	2.06E+01	9.00E-01	1.85E+01	EPA, 1999		0.00E+00		5.40E-02	1.11E+00	Max value from Calcasieu RI

Notes:
* For BAFs and BCFs for LPAHs and HPAHs, the most conservative value for the individual PAHs was used to estimated food concentrations.

APPENDIX K
REFERENCES FOR THE APPENDICES

APPENDIX K – TABLE REFERENCES

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