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FINAL TECHNICAL MEMORANDUM SUMMARY OF STEP 2 FIELD INVESTIGATIONS AND RECOMMENDATIONS ON ANALYTICAL SUITES FOR TISSUE ANALYSES, PENNIMAN LAKE STEP 2 SITE INSPECTION CHEATHAM ANNEX FISC WILLIAMSBURG VA

8/23/2013

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Summary of Step 2 Field Investigations and Recommendations on Analytical Suites for Tissue Analyses, Penniman Lake, Step 2 Site Inspection, Cheatham Annex

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1.0 Introduction

This Technical Memorandum (TM) has been prepared to provide: (1) a summary of the Step 2 field investigation activities for the Site Inspection (SI) at Penniman Lake, located at Naval Weapons Station Yorktown Cheatham Annex (CAX) in Williamsburg, Virginia (**Figure 1**); (2) a preliminary overview of the results of the soil and sediment samples collected during the Step 2 field investigation, and (3) recommendations for the analytical suite analyses for the Step 2 biological (fish and frog tissue) samples.

Once agreement is reached on the tissue analytes and the tissue data are analyzed and validated, the evaluation of these tissue results, as well as the results of all of the other samples collected during Step 2, will be completed, and a more-detailed presentation of the findings will be presented in an additional TM. The objectives of Step 2 of this SI are to further evaluate and identify potential upland polychlorinated biphenyl (PCB) sources, as inferred from the results of Step 1 of the SI, as well as to further characterize chemical concentrations in the lake. The overall objectives of the Penniman Lake SI are to identify potential source(s) of PCBs to Penniman Lake and to determine if additional investigation or action is required. The SI is being conducted using a stepped approach because the source of PCBs is not known.

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2.0 Site Background and History

CAX is located in Williamsburg, Virginia, on the York-James Peninsula (**Figure 1**). The peninsula trends northwest-southeast and is roughly bordered to the southwest by the James River, to the northeast by the York River, and to the southeast by the confluence of the James River and the Chesapeake Bay. CAX was established in June 1943 as a satellite unit of the Navy Supply Depot to provide bulk storage facilities. Before 1943, CAX had been the location of the Penniman Shell Loading Plant, a large powder and shell loading facility operated by the DuPont company during World War I. Today the mission of CAX is supplying Atlantic Fleet ships and providing recreational opportunities to military and civilian personnel.

Penniman Lake is a 48-acre freshwater lake located in the southeastern portion of CAX. The lake was created in 1943 when a portion of King Creek was dammed; it is not tidally influenced (**Figure 2**). Numerous drainage channels and stormwater outfalls discharge to the lake. An overflow structure adjacent to the dam (**Figure 2**) discharges directly to King's Creek; other major outflows are evaporation and recharge to groundwater. The historical use of the lake is unknown; however, the lake is currently used by the Department of Defense for recreational activities. The lake is

not open to the general public. Catch-and-release fishing restrictions were implemented for the lake in 2000 following identification of PCBs within lake sediment.[1]

In January 2001, CAX was placed on the National Priorities List, which required all subsequent activities for Navy Environmental Restoration sites to be conducted under the procedures set forth in the Comprehensive Environmental Response, Compensation, and Liability Act. Previously conducted evaluations and inspections that helped characterize potential contamination and contaminant sources at Penniman Lake include the Penniman Shell Loading Plant SI (Weston, 1999), Pond Study (Baker, 2001), Site 11 Remedial Investigation (Baker, 2007), Area of Concern 6 SI (CH2M HILL, 2012a), and various site visits. The previous investigations relevant to this SI are presented in detail in the final TM for Step 1 of the current SI, provided as Attachment **A** to this TM. Previous sampling locations and PCB results that exceeded a human health and/or ecological screening value are presented in Attachment **A, Figure 4**.

2.1 Summary of Step 1 of the SI

Because the source of PCBs in Penniman Lake is not known and Penniman Lake is a receiving body and not the source of potential contamination, a stepped approach SI has been implemented to identify the source(s). The Step 1 field investigation activities were conducted in July and August 2011. In accordance with the Step 1 Uniform Federal Policy Sampling and Analysis Plan (UFP-SAP) (CH2M HILL, 2011), a field survey was conducted to verify all outfalls and identify all natural drainages to the lake. Following identification of potential drainages, 26 surface soil (0 to 6-inch depth) samples were collected from the drainage ways and 44 surface sediment (0 to 4-inch depth) samples were collected from Penniman Lake and analyzed for PCB Aroclors. Details regarding Step 1 of the SI are presented in the Step 1 TM (**Attachment A**).

Surface soil and surface sediment data collected during the 2011 Step 1 field activities were evaluated to identify or eliminate potential PCB migration pathways into Penniman Lake.

- **Surface Soil**: The only PCB congener group that was detected in surface soil in the vicinity of Penniman Lake was Aroclor-1260. Aroclor-1260 concentrations ranged from below detection limits in surface soil samples SS16 and SS18 to a maximum of 63,000 micrograms per kilogram (µg/kg) in surface soil sample SS09. The highest Aroclor-1260 surface soil concentrations were detected in the drainageways leading to the northwest cove of Penniman Lake, including sample locations SS02 (23,000 µg/kg), SS04 (17,000 µg/kg), SS10 (17,000 µg/kg), and SS11 (30,000 µg/kg) (**Attachment A, Figure 5**).
- **Surface Sediment:** The only PCB congener group that was detected in surface sediment samples in Penniman Lake was Aroclor-1260. Aroclor-1260 concentrations ranged from below the detection limit in surface sediment sample SD25 to a maximum of 16,000 µg/kg in sample SD22. The highest surface sediment concentrations were detected in the sediment samples collected in the northwest cove of Penniman Lake (**Attachment A, Figure 6**). Outside of the northwest cove area, the highest Aroclor-1260 concentration was 810 µg/kg in surface sediment sample SD60, located in the northeast finger of Penniman Lake.

The Step 1 TM concluded that PCBs were distributed throughout Penniman Lake but were concentrated in several specific areas (**Attachment A**). The TM recommended further investigation of the areas that appeared to be along potential migration pathways from a potential PCB source, consisting of three sampling locations in the northwest finger of the lake (SS02, SS09, and SS12) and one sampling location in the northeast finger of the lake (SD60). In addition, it recommended a review of available historical records and information on building usage to gather additional information regarding the use of PCBs at the base, specifically within the four areas recommended for further investigation activities, and to review the historical non-PCB data collected to help identify any other constituents of potential concern that may need further evaluation.

[1] The restriction was implemented as a conservative measure based on the presence of bioaccumulative constituents; however, no biota sampling was conducted and no human health risk assessment was prepared.

3.0 Step 2 Field Investigation Activities

Step 2 field investigation activities were conducted in October and November 2012. Surface and subsurface soil, surface and subsurface sediment, and surface water samples were collected throughout the study area (**Figure 3**), at locations that were identified and based on the results of the samples collected during Step 1 and agreed upon by the CAX Partnering Team. All samples were collected in accordance with the Step 2 UFP-SAP (CH2M HILL, 2012b).

In addition, a reconnaissance-level biological survey of fish, frogs, and benthic invertebrates was conducted at Penniman Lake to study the composition of the aquatic communities present, and to select fish and amphibian species for collection. Biological (tissue) samples of fish and frogs (both adults and tadpoles) were collected to identify potential PCB (and potentially other bioaccumulative chemical) tissue concentrations in lake organisms to evaluate potential human health and ecological risks from this pathway. Both ecological (whole-body samples within the size range consumed by piscivorous wildlife likely to use the lake) and human health (fillet; edible size) samples were collected. The samples were frozen, sent to the laboratory, and pending analysis of the surface water and sediment samples, will be used to select the appropriate analytical parameters for the tissue samples. Biological samples will remain frozen at the laboratory until the team agrees on the list of parameters the samples will be analyzed for. This TM presents the recommendation for the biological sample analyses, based on the results for the surface water and sediment samples.

3.1 Step 2 Sample Summary and Rationale

A summary of the surface and subsurface soil, surface and subsurface sediment, surface water, and biological samples collected during the Step 2 field investigation, the rationale for sampling those locations, and any deviations from the UFP-SAP in regards to the sample collection are summarized in the following subsections. Soil, sediment, and surface water sample locations, as well as biological sample collection areas, are presented on **Figure 3**. In addition to the samples described below, quality assurance/quality control samples were also collected in accordance with the Step 2 UFP-SAP (CH2M HILL, 2012b).

3.1.1 Surface and Subsurface Soil

- Seven three-point composite surface soil (0 to 6-inch depth) samples (Station IDs CAPL-SO27 through CAPL-SO33) were collected around the base of utility pole-mounted transformers and analyzed for Aroclor-1260 only, in order to identify any potential Aroclor-1260 contamination in the vicinity of the utility pole-mounted transformers (possible PCB sources).
- Ten three-point composite surface and subsurface (6- to 24-inch depth) soil samples (*Station IDs CAPL-SO34 through CAPL-SO43;* collected within a 10-foot radius of the sample location) were collected in the vicinity of the former pad-mounted transformers and analyzed for Aroclor-1260, in order to identify any potential Aroclor-1260 contamination in the vicinity of former pad-mounted transformers (possible PCB sources). Initially, the UFP-SAP sampling design and rationale designated these samples as discrete surface and subsurface soil samples; however, the Partnering Team decided these samples should be collected as three-point composite samples in order to better characterize any potential contamination at or in the vicinity of the former pad-mounted transformers.
- Twelve co-located surface and subsurface soil samples (Station IDs CAPL- SO44 through CAPLSO50, and CAPL-SO55 through CAPL-SO59) were collected from drainage features leading into Penniman Lake, and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, Aroclor-1260, metals, cyanide, explosives, total organic carbon (TOC), pH, and grain size. These samples were collected in order to characterize PCB contamination and delineate the vertical extent of Aroclor-1260 contamination in drainages leading to the fingers of Penniman Lake. An additional four sample locations initially identified in the UFP_SAP (CAPL-SO51 through CAPL-SO54) as soil samples within the drainage areas were renamed, post-sampling, as sediment sample locations (CAPL-SD84 through CAPL-SD87), due to field observations and the water saturation of the samples at the time of collection.

- Ten co-located surface and subsurface soil samples (Station IDs CAPL- SO60 through CAPLSO69) were collected from areas upgradient of the drainage features leading into Penniman Lake, and analyzed for VOCs, SVOCs, pesticides, Aroclor-1260, metals, cyanide, explosives, TOC, pH, and grain size. These samples were collected in order to characterize PCB contamination in upgradient areas in the vicinity of Penniman Lake and to delineate the vertical extent of Aroclor-1260 contamination upgradient of the drainage feature locations, in areas where PCBs may have been used, stored, or released.
- Six co-located surface and subsurface soil samples (*S*tation IDs CAPL- SO70 through CAPLSO75) were collected from potentially sprayed areas (for example, for dust control), and analyzed for VOCs, SVOCs, pesticides, Aroclor-1260, metals, cyanide, explosives, TOC, pH, and grain size. These samples were collected in order to characterize PCB contamination and to delineate the vertical extent of Aroclor-1260 contamination in areas that were potentially sprayed with PCB-containing materials.

3.1.2 Surface/Subsurface Sediment and Surface Water

- Twenty-five co-located surface and subsurface sediment samples (Station IDs CAPL-SWSD62 through CAPL-SWSD69, CAPL-SD70 through CAPL-SD82, and CAPL-SD84 through CAPL-SD87*)* were collected and analyzed for VOCs, SVOCs, pesticides, Aroclor-1260, metals, cyanide, explosives, TOC, pH, acid volatile sulfide/simultaneous extracted metals, and grain size. Surface sediment (0 to 4-inch depth) samples were collected in order to investigate the nature and extent of contamination in surface sediment. In addition, surface sediment samples will support the ecological and human health risk evaluations as well as evaluation of the sediment characteristics within the lake. Subsurface sediment (4- to 8-inch depth) samples were collected to investigate the nature and extent of possible deeper contamination within the lake, and to help characterize the subsurface, given that limited subsurface data had been collected previously. In addition, subsurface sediment samples will be used to help evaluate sediment characteristics within the lake from historical deposition and subsequent burial of sediments. Initially, the UFP-SAP outlined the collection of 21 co-located surface and subsurface sediment samples; however, based on field observations and the saturation of the samples at the time of collection, samples originally designated as soil samples (CAPL-SO51 through CAPL-SO54) were renamed and analyzed as sediment samples (CAPL-SD84 through CAPL-SD87).
- One surface sediment sample (Station ID CAPL-SD83*)* was collected from the King Creek side of the dam, near the overflow pipe from Penniman Lake to King Creek, and analyzed for the aforementioned sediment parameters. This sample was collected to evaluate any potential transport of contaminants from Penniman Lake into the adjacent King Creek.
- Eight surface water samples (Station IDs CAPL-SWSD62 through CAPL-SWSD69) were collected and analyzed for VOCs, SVOCs, pesticides, Aroclor-1260, total and dissolved metals, cyanide, explosives, and hardness. These samples were collected to investigate the nature and extent of contamination of surface water.

Water quality parameters (dissolved oxygen, turbidity, temperature, specific conductivity, oxidation/ reduction potential and pH) were collected from the top, middle, and bottom of the water column above each sediment and surface water sample location.

3.1.3 Biological Samples

A variety of frogs and fish were collected from Penniman Lake for tissue analysis in order to further characterize the contamination within Penniman Lake and to evaluate the associated potential human health and ecological risks. All fish and adult frogs/tadpoles trapped or collected during the Step 2 sampling were identified in the field during a reconnaissance-level biological survey of Penniman Lake and its major drainages. Each fish/frog sample was weighed (to the nearest gram) and its total length measured (to the nearest centimeter). Areas where samples were collected are depicted on **Figure 3**. Frogs were collected from the drainage areas leading to the northwestern and southwestern fingers of Penniman Lake, and fish were collected from the northern, northwestern, and northeastern fingers of Penniman Lake.

After the biological survey was completed, the Partnering Team held a call to discuss the amount and types of biota found. The specific species collected were American bullfrog (*Lithobates catesbeinanus*; adult and tadpoles), golden shiner (*Notemigonus crysoleucas*), largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear

sunfish (*Lepomis microlophus*), and American eel (*Anguilla rostrata*), as detailed in **Table 1**. This table identifies the team agreement on how the tissue samples would be submitted to the laboratory for analysis. Almost all of the samples contained more than one specimen (individual organism), which were composited, but there was no compositing across species.

A total of seven composite whole-body adult bullfrog samples, one whole-body adult bullfrog sample, one composite whole-body bullfrog tadpole sample, five composite whole-body fish samples, and one composite whole-body eel sample, were collected, frozen, and sent to the lab for later analysis, the results of which will be used in the ecological risk evaluation.

An additional three composite edible-sized fish samples were collected, frozen, and sent to the lab for later analysis. These samples will be filleted at the lab. The fillets will be analyzed and used during the human health risk evaluation. Additionally, the offal (all parts of the fish except the fillet, including the skin) from each of these three samples will be also be analyzed. During the ecological risk evaluation, the fillet and offal pairs will be mathematically reconstituted to whole-body samples and used to evaluate potential risks to piscivorous species (for example, osprey) that consume larger fish.

4.0 Results of Step 2 Soil, Sediment, and Surface Water Sampling

The following subsections present a preliminary summary of the results of the soil, sediment, and surface water samples collected during Step 2 of the SI. The results are discussed with the sole objective of providing information relevant to enabling the team to decide the analytical suites for the Step 2 biological (fish and frog tissue) samples. Findings and conclusions with regard to identifying potential upland PCB sources, characterizing the extent of contamination in all relevant media, and determining if additional investigation or action is required will be presented in a subsequent TM.

Tables 2 through 7 present the detected concentrations and exceedances of screening criteria for constituents in each medium. Screening criteria are:

Surface and Subsurface Soil

- Base background surface and subsurface soil values (95% upper tolerance limits) for inorganic constituents) (CH2M HILL, 2011)
- EPA Regional screening levels (RSLs) for residential soil, adjusted as appropriate (for non-carcinogenic effects) (November 2012)
- Ecological screening values (ESVs) for soil (literature-based ecological screening values for plants and soil invertebrates)

Surface and Subsurface Sediment

- EPA RSLs for sediment, adjusted as appropriate (for non-carcinogenic effects) (November 2012)
- Freshwater ESVs for sediment (literature-based ecological screening values)

Surface Water

- EPA RSLs for tap water (surface water), adjusted as appropriate (for non-carcinogenic effects) (November 2012)
- Freshwater ESVs for surface water (literature-based ecological screening values)

4.1 Surface and Subsurface Soil

VOCs, SVOCs, pesticides/PCBs, explosives and inorganic constituents were detected in surface and subsurface soil samples at concentrations that exceeded one or more screening criteria in one or more samples. Detections of constituents in composite surface soil, composite subsurface soil, surface soil, and subsurface soil samples are presented in **Tables 2**, **3**, **4**, and **5**, respectively. Sample locations are presented on **Figure 3**. A summary of detections is provided as follows:

- **Surface Soil:** (CAPL-SS27 through CAPL SS43, CAPL-SS44 through CAPL-SS50, and CAPL-SS55 through SS75):
  - Aroclor 1260 was detected in one or more samples from each of the investigated source area groups (transformer locations, drainage locations, upgradient to drainages, and potentially sprayed areas). Surface

soil concentrations ranged from non-detect to 16,500 µg/kg, with the maximum concentration at location SS46 in the northwesternmost drainageway to Penniman Lake.

- Various SVOCs, pesticides, and inorganic constituents were also detected in all investigation areas, except for the transformer locations. A few explosives were detected in the drainage and upgradient drainage investigation areas in the surface samples**.**

- **Subsurface Soil:** (CAPL-SB34 through CAPL-SB43, CAPL-SB44 through CAPL-SB50, and CAPL-SB55 through SB75):
  - Aroclor-1260 was detected in one or more samples from each of the investigated source area groups, except for the transformer locations. Subsurface soil concentrations ranged from non-detect to 704 µg/kg, with the maximum concentration at location SB62 in the upgradient area to the northwesternmost drainageway to Penniman Lake.
  - Various VOCs, SVOCs, pesticides, and inorganic constituents were also detected in all investigation areas, except for the transformer locations. One explosive was detected in the upgradient area to the northwestern-most drainageway to Penniman Lake**.**

A complete evaluation of the surface and subsurface soil data will be provided in a subsequent TM following receipt of the tissue sample results, along with recommendations for the next step of investigation at Penniman Lake.

4.2 Surface Sediment, Subsurface Sediment, and Surface Water

Detections of constituents in surface sediment, subsurface sediment, and surface water are presented in **Tables 6, 7, and 8,** respectively. Surface sediment, subsurface sediment, and surface water samples that exceeded one or more screening criteria are presented on **Figures 4, 5, and 6**, respectively. A summary of detections is provided as follows:

- **Surface Sediment** (CAPL-SD62 through CAPL-SD87, except CAPL-SD83):
  - VOCs, SVOCs, pesticides/PCBs, explosives, and inorganic constituents were detected in surface sediment samples collected from Penniman Lake (**Table 6**). One VOC, 14 SVOCs, 15 pesticides/PCBs, 3 explosives, and 12 inorganic constituents exceeded one or more screening criteria. Aroclor-1260 was detected in multiple sediment sample locations, and exceeded the screening criteria at 15 locations (CAPL-SD62, SD63, SD64, SD65, SD67, SD70, SD73, SD77, SD78, SD79, SD80, SD84, SD85, SD86, and SD87) (**Figure 4**).
- **Surface Sediment** from along the King Creek side of the dam (CAPL-SD83):
  - VOCs, pesticides/PCBs, and inorganic constituents were detected in the surface sediment sample collected from the King Creek side of the dam. One VOC and four inorganic constituents exceeded one or more screening criteria (**Table 6, Figure 4).** Aroclor-1260 was detected in surface sediment at CAPL-SD83, but did not exceed screening criteria.
- **Subsurface Sediment** (CAPL-SSD62 through CAPL-SSD87):
  - VOCs, SVOCs, pesticide/PCBs, explosives, and inorganic constituents were detected in subsurface sediment samples collected from Penniman Lake (**Table 7**). One VOC, 15 SVOCs, 17 pesticides/PCBs, 1 explosive, and 10 inorganic constituents exceeded one or more screening criteria. Aroclor-1260 was detected in multiple sediment sample locations, and exceeded the screening criteria at 11 locations (CAPL-SSD62, SSD63, SSD67, SSD70, SSD77, SSD78, SSD79, SSD84, SSD85, SSD86, and SSD87) (**Figure 5**).
- **Surface Water** (CAPL-SW62 through CAPL-SW69):
  - VOCs, SVOCs, pesticide/PCBs, one explosive, total inorganic constituents, and dissolved inorganic constituents were detected in surface water samples collected from Penniman Lake (**Table 8**). Three SVOCs, two total inorganic constituents, and two dissolved inorganic constituents exceeded one or more screening criteria (**Table 8, Figure 6**). Aroclor-1260 was not detected in any of the surface water samples collected.

4.2.1 Discussion of Surface and Subsurface Sediment Results and Exceedances

The principal objectives of the Penniman Lake SI are to further evaluate and identify potential upland sources of PCBs and to further characterize the concentrations of PCBs, as well as other chemicals, within Penniman Lake. Surface soil and surface sediment samples collected during Step 1 of the SI were only analyzed for PCBs, and it was concluded that Aroclor-1260 was prevalent in samples collected in and around Penniman Lake.

The results of the Step 1 TM (**Attachment A**) indicated that PCBs, specifically the congener group Aroclor-1260, were distributed throughout Penniman Lake, although concentrated in several specific areas, as evidenced by the samples that exceeded the screening criteria. Four areas, located near surface soil samples CAPL-SS02, SS09, and SS12, and surface sediment sample SD60, were identified and investigated during Step 2 as potential migration pathways from a potential PCB source.

The maximum concentration of Aroclor-1260 detected in surface sediment during Step 2 is 16,200 J µg/kg at CAPL-SD84, a sample collected from a drainage leading to Penniman Lake. Other high concentrations (>1,000 µg/kg) were detected throughout the northwestern fingers of Penniman Lake, including sample locations CAPL-SD63 (1,270 J µg/kg), CAPL-SD70 (8,240 µg/kg), CAPL-SD85 (8,300 J µg/kg), CAPL-SD86 (4,090 J µg/kg), and CAPL-SD87 (3,780 J µg/kg).

The maximum concentration of Aroclor-1260 detected in subsurface sediment was 34,200 J µg/kg at CAPL-SSD84, a sample collected from a drainage leading to Penniman Lake. Other high concentrations (>1,000 µg/kg) were detected throughout the northwestern and northeastern fingers of Penniman Lake, including sample locations CAPL-SSD70 (2,030 J µg/kg), CAPL-SSD77 (1,170 µg/kg), CAPL-SSD78 (3,020 J µg/kg), CAPL-SSD85 (1,840 J µg/kg), and CAPL-SSD86 (3,700 J µg/kg).

The results of the Step 2 surface and subsurface sediment data, in addition to the surface sediment data from Step 1, indicate that Aroclor-1260 is distributed throughout Penniman Lake. The highest concentrations and highest frequencies of detections and exceedances of Aroclor-1260 occur in the northwestern fingers of the lake. Analytical data for all Step 2 samples are provided in **Attachment B**.

5.0 Risk Screening to Determine Tissue Analytes

5.1 Human Health Risk Screening

The human health risk screening (HHRS) was conducted to identify the constituents to be analyzed in fish tissue samples that were collected from Penniman Lake during Step 2. The sediment data collected were evaluated to identify constituents detected in sediment that may bioaccumulate in fish tissue at levels of potential concern to recreational fishermen and their families who might ingest fish caught in the lake.

The HHRS consisted of two steps: 1) a screening step to identify constituents of potential concern in sediment to recreational anglers and their families who may ingest fish from the lake (that is, chemicals that are considered bioaccumulative in fish), and 2) calculation of potential risks associated with ingestion of fish. The HHRS and associated tables are presented in **Attachment C** of this TM.

Based on the HHRS and calculations detailed in **Attachment C**, it is recommended that fish tissue analysis include the 10 bioaccumulative metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), PCBs, and pesticides presented in Section 6.0.

5.2 Ecological Risk Screening

The ecological risk screening was conducted to identify constituents for the Penniman Lake fish and frog tissue sample analyses. Site-specific food web modeling, using receptor species with a significant fish/frog dietary component, was conducted for constituents on the list of bioaccumulative chemicals in EPA (2000) guidance that were analyzed for in surface water and surface sediment samples. Maximum surface water and sediment concentrations were used in the modeling for conservatism. Two scenarios were run. The first scenario used maximum media concentrations and screening model parameter values. The second scenario used maximum media concentrations and baseline model parameter values.

Detailed information regarding the screening approach/methodology and results tables are provided in **Attachment D** of this TM. Based on the ecological risk screening results, it is recommended that the fish and frog tissue samples be analyzed for the 10 bioaccumulative metals, PCBs, and pesticides presented in Section 6.0.

6.0 Recommendations for Tissue Analysis

Based on the results of the human health and ecological risk screenings, the following are the recommended analyses for the tissue samples:

Penniman Lake SI – Recommended Fish and Frog Tissue Analyses			
Parameter	**Sample Type**		
	Fish Fillet (Human Health Risk Evaluation)	**Whole Body Fish, Frog and Eel (Ecological Risk Evaluation)**	**Fish Offal (Ecological Risk Evaluation)**
Bioaccumulative metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc)	√	√	√
Aroclor 1260	√		√
12 dioxin-like PCB congeners	√	√	√
PCB Homologues	√	√	√
TCL Pesticides	√	√	√
Percent Moisture	√	√	√
Percent Lipids	√	√	√

Note: The CAX Partnering Team, including technical support, discussed and agreed to the tissue PCB analyses during the February 1, 2012 conference call. This call is documented in meeting minutes, which are included in **Attachment E** of this document, and in the Penniman Lake Step 2 UFP-SAP, Worksheet 9b (scoping sessions) (CH2M HILL, 2012b). As noted in the call minutes, the sediment Aroclor data are sufficient for the ecological risk evaluation and eliminate the need for whole body tissue Aroclor 1260 analysis.

A total of 15 whole-body samples (9 frog and 6 fish/eel) were collected for ecological risk evaluation, and a total of 3 fillet samples were collected for human health risk evaluation. The offal from the three human health samples will also be analyzed and used, along with the fillet results, to reconstitute a whole-body concentration, in the ecological risk evaluation. **Table 1** identifies the various species comprising the tissue samples that were collected, along with the length and weight measurements for each specimen. Samples containing more than one specimen were submitted as composites; there was no compositing across species.

Following receipt of the tissue sample results, a new TM will be prepared presenting the results for all site media collected during Step 2, human health and ecological risk screenings, conclusions, and recommendations for the next step of investigation for Penniman Lake.

References

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Tables

Table 1
CAX Penniman Lake
Biological Sample Summary
October - November 2012

Sample ID	Date	Time	Species Name	Common Name	Specimen Number	Length (mm)	Weight (g)	Cohort	Sample Type*
CAPL-TS01-1012	10/24/2012	13:05	*Lithobates catesbeinanus*	American bullfrog	1	190	54	adult	whole body
					2	180	36	adult	whole body
					3	200	51	adult	whole body
						Total Weight:	**141**		
CAPL-TS02-1012	10/24/2012	13:10	*Lithobates catesbeinanus*	American bullfrog	1	170	26	adult	whole body
					2	265	122	adult	whole body
						Total Weight:	**148**		
CAPL-TS03-1012	10/24/2012	13:15	*Lithobates catesbeinanus*	American bullfrog	1	290	155	adult	whole body
						Total Weight:	**155**		
CAPL-TS04-1012	10/24/2012	13:20	*Lithobates catesbeinanus*	American bullfrog	1	200	66	adult	whole body
					2	200	45	adult	whole body
					3	150	20	adult	whole body
					4	110	8	adult	whole body
					5	140	14	adult	whole body
						Total Weight:	**153**		
CAPL-TS05-1012	10/24/2012	13:25	*Lithobates catesbeinanus*	American bullfrog	1	175	35	adult	whole body
					2	180	44	adult	whole body
					3	145	18	adult	whole body
					4	140	16	adult	whole body
					5	150	19	adult	whole body
					6	145	16	adult	whole body
						Total Weight:	**148**		
CAPL-TS06-1012	10/24/2012	15:30	*Lithobates catesbeinanus*	American bullfrog	1	255	110	adult	whole body
					2	180	37	adult	whole body
					3	105	6	adult	whole body
						Total Weight:	**153**		
CAPL-TS07-1012	10/24/2012	15:35	*Lithobates catesbeinanus*	American bullfrog	1	170	47	adult	whole body
					2	160	30	adult	whole body
					3	180	38	adult	whole body
					4	190	44	adult	whole body
						Total Weight:	**159**		

Table 1
CAX Penniman Lake
Biological Sample Summary
October - November 2012

Sample ID	Date	Time	Species Name	Common Name	Specimen Number	Length (mm)	Weight (g)	Cohort	Sample Type*
CAPL-TS08-1012	10/24/2012	15:40	*Lithobates catesbeinanus*	American bullfrog	1	165	26	adult	whole body
					2	180	35	adult	whole body
					3	185	43	adult	whole body
					4	160	25	adult	whole body
					5	160	24	adult	whole body
						Total Weight:	**153**		
CAPL-TS09-1012	10/24/2012	15:45	*Lithobates catesbeinanus*	American bullfrog	1	30-60	55	tadpole	whole body
						Total Weight:	**55**		
CAPL-TS10-WB-1012	10/10/2012	12:20	*Notemigonus crysoleucas*	golden shiner	1	90	7	medium	whole body
					2	95	7	medium	whole body
					3	100	8	medium	whole body
					4	90	6	medium	whole body
					5	85	7	medium	whole body
					6	105	10	medium	whole body
					7	80	4	medium	whole body
					8	95	8	medium	whole body
					9	105	9	medium	whole body
					10	85	6	medium	whole body
					11	90	6	medium	whole body
					12	95	7	medium	whole body
					13	120	15	medium	whole body
					14	95	7	medium	whole body
					15	85	4	medium	whole body
					16	95	8	medium	whole body
					17	105	10	medium	whole body
					18	90	5	medium	whole body
						Total Weight:	**134**		

Table 1
CAX Penniman Lake
Biological Sample Summary
October - November 2012

Sample ID	Date	Time	Species Name	Common Name	Specimen Number	Length (mm)	Weight (g)	Cohort	Sample Type*
CAPL-TS11-WB-1012	10/10/2012	12:25	*Micropterus salmoides*	largemouth bass	1	110	15	medium	whole body
					2	145	34	medium	whole body
					3	140	30	medium	whole body
					4	135	27	medium	whole body
					5	145	34	medium	whole body
					6	145	35	medium	whole body
					7	150	39	medium	whole body
					8	160	49	medium	whole body
					9	130	27	medium	whole body
						Total Weight:	**290**		
CAPL-TS12-WB-1012	10/10/2012	12:30	*Lepomis macrochirus*	bluegill	1	40-75	202	small	whole body
						Total Weight:	**202**		
CAPL-TS13-WB-1012	10/10/2012	12:15	*Lepomis macrochirus*	bluegill	1	160	88	medium	whole body
					2	170	99	medium	whole body
					3	185	137	medium	whole body
						Total Weight:	**324**		
CAPL-TS14-WB-1012	10/10/2012	12:35	*Lepomis microlophus*	redear sunfish	1	130	42	medium	whole body
					2	145	57	medium	whole body
					3	150	66	medium	whole body
					4	95	5	medium	whole body
					5	80	6	medium	whole body
						Total Weight:	**176**		
CAPL-TS15-WB-1012	10/10/2012	12:40	*Anguilla rostrata*	American eel	1	300	47	small	whole body
					2	285	38	small	whole body
					3	310	53	small	whole body
					4	245	20	small	whole body
						Total Weight:	**158**		
CAPL-TS16-F-1012 & CAPL-TS16-O-1012	10/10/2012	12:05	*Micropterus salmoides*	largemouth bass	1	270	195	large	fillet (HHRA)
					2	265	203	large	fillet (HHRA)
						Total Weight:	**398**		
CAPL-TS17-F-1012 & CAPL-TS17-O-1012	10/10/2012	11:45	*Micropterus salmoides*	largemouth bass	1	405	755	large	fillet (HHRA)
					2	345	570	large	fillet (HHRA)
						Total Weight:	**1325**		

Table 1
CAX Penniman Lake
Biological Sample Summary
October - November 2012

Sample ID	Date	Time	Species Name	Common Name	Specimen Number	Length (mm)	Weight (g)	Cohort	Sample Type*
CAPL-TS18-F-1012 & CAPL-TS18-O-1012	10/10/2012	11:50	*Micropterus salmoides*	largemouth bass	1	350	508	large	fillet (HHRA)
					2	340	515	large	fillet (HHRA)
						Total Weight:	**1023**		

Notes:

*Whole body samples were sent to the lab for analysis to be used in the ecological risk assessment, fillet samples were sent to the laboratory for analysis to be used in the human health risk assessment. Samples with more than one specimen were submitted as composites. There was no compositing across species.

Table 2
CAX Penniman Lake
Composite Surface Soil Exceedances Analytical Results
October-November 2012

Station ID	CAX 95% UTL SS Background	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO27	CAPL-SO28	CAPL-SO29		CAPL-SO30	CAPL-SO31	CAPL-SO32	CAPL-SO33	CAPL-SO34	CAPL-SO35
Sample ID				CAPL-SS27-1012	CAPL-SS28-1112	CAPL-SS29-1012	CAPL-SS29P-1012	CAPL-SS30-1012	CAPL-SS31-1012	CAPL-SS32-1012	CAPL-SS33-1012	CAPL-SS34-1112	CAPL-SS35-1112
Sample Date				10/31/12	11/02/12	10/31/12	10/31/12	10/31/12	10/31/12	10/31/12	10/31/12	11/05/12	11/06/12
Chemical Name													
Pesticide/Polychlorinated Biphenyls (µg/kg)													
Aroclor-1260	--	220	8,000	**4,350 J**	117 J	94.2	150	26.6	**627**	34.9	10.6 U	44.6 J	10.4 UL

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Notes:

Underline indicates exceedance of CAX 95% UTL Surface Soil (SS) Background value

Bold text indicates exceedance of Adjusted Residential Soil RSLs (November 2012)

Shading indicates exceedance of CAX SS ECO SV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UL - Analyte not detected, quantitation limit is probably higher

µg/kg - Micrograms per kilogram

Table 2
CAX Penniman Lake
Composite Surface Soil Exceedances Analytical Results
October-November 2012

Station ID	CAX 95% UTL SS Background	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO36	CAPL-SO37	CAPL-SO38	CAPL-SO39		CAPL-SO40	CAPL-SO41	CAPL-SO42	CAPL-SO43
Sample ID				CAPL-SS36-1112	CAPL-SS37-1112	CAPL-SS38-1012	CAPL-SS39-1012	CAPL-SS39P-1012	CAPL-SS40-1112	CAPL-SS41-1012	CAPL-SS42-1012	CAPL-SS43-1112
Sample Date				11/06/12	11/06/12	10/31/12	10/31/12	10/31/12	11/01/12	10/31/12	10/31/12	11/01/12
Chemical Name												
Pesticide/Polychlorinated Biphenyls (µg/kg)												
Aroclor-1260	--	220	8,000	30.4 K	21.9 K	9.71 U	10.8 U	8.76 UL	9.22 U	16.2 J	10.3 UL	9.52 UL

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Notes:

Underline indicates exceedance of CAX 95% UTL Surface Soil (SS) Background value

Bold text indicates exceedance of Adjusted Residential Soil RSLs (November 2012)

Shading indicates exceedance of CAX SS ECO SV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

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K - Analyte present, value may be biased high, actual value may be lower

U - The material was analyzed for, but not detected

UL - Analyte not detected, quantitation limit is probably higher

µg/kg - Micrograms per kilogram

Table 3
CAX Penniman Lake
Composite Subsurface Soil Analytical Data
October-November 2012

Station ID	CAPL-SO34	CAPL-SO35	CAPL-SO36	CAPL-SO37	CAPL-SO38	CAPL-SO39	CAPL-SO40		CAPL-SO41	CAPL-SO42	CAPL-SO43
Sample ID	CAPL-SB34-1112	CAPL-SB35-1112	CAPL-SB36-1112	CAPL-SB37-1112	CAPL-SB38-1012	CAPL-SB39-1012	CAPL-SB40-1112	CAPL-SB40P-1112	CAPL-SB41-1012	CAPL-SB42-1012	CAPL-SB43-1112
Sample Date	11/05/12	11/06/12	11/06/12	11/06/12	10/31/12	10/31/12	11/01/12	11/01/12	10/31/12	10/31/12	11/01/12
Chemical Name											
Pesticide/Polychlorinated Biphenyls (µg/kg)											
Aroclor-1260	10.2 U	10.8 U	10.4 U	10.4 U	10.4 U	9.44 U	10.8 U	11.3 U	8.89 U	9.15 U	9.44 UL

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Notes:

Shading indicates detections

U - The material was analyzed for, but not detected
UL - Analyte not detected, quantitation limit is probably higher
µg/kg - Micrograms per kilogram

Table 4
CAX Penniman Lake
Surface Soil Exceedances Analytical Results
October-November 2012

Station ID	CAX 95% UTL BKG SS	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO44	CAPL-SO45		CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49		CAPL-SO50	CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58
Sample ID				CAPL-SS44-1012	CAPL-SS45-1012	CAPL-SS45P-1012	CAPL-SS46-1012	CAPL-SS47-1012	CAPL-SS48-1012	CAPL-SS49-1012	CAPL-SS49P-1012	CAPL-SS50-1012	CAPL-SS55-1012	CAPL-SS56-1012	CAPL-SS57-1012	CAPL-SS58-1012
Sample Date				10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name																
Volatile Organic Compounds (µg/kg)																
2-Butanone	--	2,800,000	--	6.35 UJ	6.8 UJ	6.82 UJ	7.34 UJ	5.35 UJ	14.7 J	6.52 U	6.39 U	8.07 U	3.06 J	7.16 U	8.91 U	15.4 U
Acetone	--	6,100,000	--	7.77 J	8.33 J	13.6 UJ	14.7 UJ	10.7 UJ	186 L	13 UJ	12.8 UJ	16.1 UJ	96.8 J	14.3 UJ	15.2 J	30.2 J
Methyl acetate	--	7,800,000	--	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U
Styrene	--	630,000	64,000	38.2	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U
Semivolatile Organic Compounds (µg/kg)																
2-Methylnaphthalene	--	23,000	--	9.42	3.96 U	4.1 U	69.7 J	71.6 J	59 K	46 K	91.3	45.9 K	3.61 U	4.53 U	5.33 U	5.34 U
Acenaphthene	--	340,000	--	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U
Acenaphthylene	--	340,000	--	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	15	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U
Anthracene	--	1,700,000	--	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U
Benzaldehyde	--	780,000	--	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U
Benzo(a)anthracene	--	150	--	5.75 J	3.96 U	4.1 U	86.6	72.4 J	56.1 J	23.5	47.3	92.3	4.19 J	6.82 J	5.33 U	5.34 U
Benzo(a)pyrene	--	15	--	6.85 J	3.96 U	4.1 U	**122**	**78.4 J**	**86.6 K**	**23.6 K**	**51.5**	**90.9 K**	3.61 U	4.53 U	5.33 U	6.2 J
Benzo(b)fluoranthene	--	150	--	11.5	4.78 J	4.97 J	**197**	**187**	137 K	50.5 K	75.9	135 K	4.31 J	9.95	5.33 U	8.22 J
Benzo(g,h,i)perylene	--	170,000	--	7.69	3.96 U	4.1 U	133	125	40.9 U	31.3 K	58.8	76.1 K	3.98 J	4.53 U	5.33 U	7.84 J
Benzo(k)fluoranthene	--	1,500	--	7.66 J	3.96 U	4.1 U	139	83.9 J	40.9 U	33	48.7	90.7	3.61 U	7.61 J	5.33 U	9.57 J
bis(2-Ethylhexyl)phthalate	--	35,000	30,000	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U
Carbazole	--	--	--	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U
Chrysene	--	15,000	--	13.4	4.79 J	4.1 U	200	189	109 K	50.1 K	102	211 K	3.61 U	9.62	5.33 U	13.9
Dibenz(a,h)anthracene	--	15	--	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	9.61 K	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U
Fluoranthene	--	230,000	--	10.3	3.96 U	4.1 U	246	211	145	63.8	107	298	5.6 J	4.77 J	6.21 J	11.3
Fluorene	--	230,000	--	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U
Indeno(1,2,3-cd)pyrene	--	150	--	6.99 J	3.96 U	4.1 U	114	97.7	70 J	29.1	39.3	71.5	4.87 J	8.28 J	5.33 U	7.83 J
Naphthalene	--	3,600	--	13.5	3.96 U	4.1 U	62.3 J	49.3 J	40.9 U	30.3 K	51.3	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U
Phenanthrene	--	1,700,000	--	5.93 J	3.96 U	4.1 U	108	143	92.8	55.7	106	69.5	3.61 U	4.53 U	5.33 U	5.95 J
Pyrene	--	170,000	--	10.9	3.96 U	4.1 U	213	183	134 K	58.5 K	97.2	263 K	5.68 J	4.95 J	5.33 U	10.3 J
Pesticide/Polychlorinated Biphenyls (µg/kg)																
4,4'-DDD	--	2,000	583	0.566 J	0.295 J	0.398 J	22.6 J	17 J	26.8 J	44 J	78.5 J	27.3 J	0.356 UL	1.5 J	1.26 J	0.813 J
4,4'-DDE	--	1,400	114	1.92 L	2.14 L	1.89 L	179	53.6 J	206	186 J	254 J	285 K	0.32 L	2.92 L	1.93	3.76 L
4,4'-DDT	--	1,700	100	2.15 J	1.76 L	1.48 J	194 J	70.4 J	214 J	30.8 J	40.8	132 K	0.363 L	0.264 J	0.331 J	7.79 J
Aldrin	--	29	3.63	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.424 UL	0.401 U	0.406 U	0.395 U	0.356 UL	0.452 UL	0.528 U	2.56 L
alpha-BHC	--	77	226	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.418 J	0.401 U	0.406 U	0.395 U	0.356 UL	0.496 J	0.211 J	0.722 J
alpha-Chlordane	--	1,600	11	0.394 UL	0.409 UL	0.407 UL	8.46 J	4.38 J	1.72 J	0.401 U	0.609 J	1.33 J	0.356 UL	0.452 UL	0.528 U	0.929 J
Aroclor-1260	--	220	8,000	177 J	134 L	103 L	**16,500 J**	**9,980 J**	**1,600 J**	**386**	**589 J**	**1,170 J**	8.72 UL	14.9 J	12.9 U	39.8 J
beta-BHC	--	270	342	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.211 J	0.401 U	0.406 U	0.395 U	0.356 UL	0.452 UL	0.528 U	0.536 UL
delta-BHC	--	270	226	0.394 UL	0.409 UL	0.407 UL	0.209 J	0.438 UL	0.424 UL	0.401 UL	0.258 J	0.395 UL	0.356 UL	0.452 UL	0.528 U	0.213 J
Dieldrin	--	30	10.5	2.25 L	1.19 L	1.48 J	**253 J**	**140 L**	16.8 J	1.49 J	13.7 J	18.8 J	0.356 UL	0.452 UL	0.528 U	0.565 J
Endosulfan I	--	37,000	6.32	0.394 UL	0.409 UL	0.407 UL	0.385 L	0.438 UL	1.06 L	0.401 U	0.406 U	0.395 UJ	0.356 UL	0.452 UL	0.528 U	0.536 UL
Endosulfan II	--	37,000	6.32	1.64 J	1.17 J	0.876 J	42.8 J	19.7 J	10.8 J	4.18 J	5.33 J	8.16 J	0.356 UL	0.452 UL	0.528 U	0.536 UL
Endosulfan sulfate	--	37,000	6.32	4.63 J	2.99 J	2.32 J	694 J	365 L	4.23 J	0.401 U	20.5	0.395 U	0.356 UL	0.399 L	0.528 U	0.648 J
Endrin	--	1,800	1.95	0.432 J	0.279 J	0.205 J	77.7 J	43 J	3.25 J	4.55 J	1.65 J	3.09 J	0.356 UL	0.452 UL	0.528 U	0.536 UL
Endrin aldehyde	--	1,800	1.95	0.394 UL	0.409 UL	0.407 UL	22.9 J	16.5 J	1.34 J	0.597 J	0.746 J	1.59 J	0.356 UL	0.452 UL	0.528 U	0.536 UL
Endrin ketone	--	1,800	1.95	0.756 J	0.558 J	0.452 J	45.9 J	83.3 J	5.46 J	1.18 J	1.81 J	2.62 J	0.356 UL	0.452 UL	0.528 U	0.273 J
gamma-BHC (Lindane)	--	520	7.75	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.149 J	0.297 J	0.137 J	0.406 U	0.395 U	0.356 UL	0.452 UL	0.528 U	1.47 J
gamma-Chlordane	--	1,600	11	2.59 J	1.33 J	3.55 L	9.77 J	15.5 J	4.79 J	3.82 B	0.874 B	4.04 J	1.29 J	2.1 J	2.61 J	3.76 L
Heptachlor	--	110	52.9	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.424 UL	0.401 U	0.406 U	0.395 UL	0.356 UL	0.452 UL	0.528 U	3.53 J
Heptachlor epoxide	--	53	52.9	0.394 UL	0.409 UL	0.407 UL	0.176 J	0.164 J	0.528 J	0.401 UL	0.517 J	0.258 J	0.356 UL	0.452 UL	0.528 U	0.536 UL
Methoxychlor	--	31,000	500	0.367 J	0.649 J	0.375 J	74.9 J	29.9 J	13.3 J	1.74 J	0.873 J	5.18 J	0.199 L	0.438 J	2.38 J	5.53 J
Explosives (µg/kg)																
1,3,5-Trinitrobenzene	--	220,000	--	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U
Nitroglycerin	--	610	--	435 U	455 U	476 U	500 U	459 U	455 U	455 U	455 U	476 U	495 U	467 U	391 U	**866 J**

Table 4
CAX Penniman Lake
Surface Soil Exceedances Analytical Results
October-November 2012

Station ID	CAX 95% UTL BKG SS	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO44	CAPL-SO45		CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49		CAPL-SO50	CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58
Sample ID				CAPL-SS44-1012	CAPL-SS45-1012	CAPL-SS45P-1012	CAPL-SS46-1012	CAPL-SS47-1012	CAPL-SS48-1012	CAPL-SS49-1012	CAPL-SS49P-1012	CAPL-SS50-1012	CAPL-SS55-1012	CAPL-SS56-1012	CAPL-SS57-1012	CAPL-SS58-1012
Sample Date				10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name																
Total Metals (mg/kg)																
Aluminum	12,200	7,700	pH < 5.5	**10,100**	**25,200**	**24,000**	**20,500**	**19,500**	**9,730**	**9,410**	**11,000**	**9,410**	4,920	2,100	2,480	2,910
Antimony	--	3.1	78	0.914 U	2.45 U	2.46 U	2.46 U	2.7 U	2.55 U	2.48 U	2.59 U	2.38 U	0.901 U	1.09 J	1.28 U	1.34 U
Arsenic	6.36	0.39	18	**2.54**	**7.03**	**6.21**	**6.07**	**6.69**	**6.35**	**5.54**	**5.69**	**5.48**	**1.64**	**1.55**	**1.17 J**	**1.12 J**
Barium	52.9	1,500	330	36.1	43.5	39	73.7	84.5	46.6	76.1	60.6	50.5	23.2	13.9	16.8	17
Beryllium	0.587	16	40	0.397 J	1.64	1.46 J	0.97 J	1.24 J	0.491 J	0.749 J	0.718 J	0.854 J	0.199 J	0.274 U	0.166 J	0.335 U
Cadmium	--	7	32	0.228 U	0.612 U	0.615 U	1.14 J	2.32	0.639 U	0.333 J	0.648 U	0.387 J	0.225 U	0.274 U	0.213 J	1.89
Calcium	2,290	--	--	1,370	2,220	2,040	3,610	4,590	4,810	9,650 J	5,640 J	7,710	368 J	567 J	2,260	1,840
Chromium	18.2	0.29	64	**14**	**45.9**	**46.3**	**41.4**	**35.3**	**17.2**	**16.1**	**17.7**	**19.9**	**5.46**	**3.54**	**4.76**	**4.26**
Cobalt	9.93	2.3	13	1.71	**4.96**	**4.78**	**3.76 J**	**4.71**	**2.38 J**	**3.09 J**	**3.02 J**	**2.94 J**	0.861 J	1.37 U	1.07 J	0.938 J
Copper	4.25	310	70	6.4	6.59	5.42	24.9	39.3	11.9	18.1 J	12.7 J	19.8	2.07	3.12	1.97	4.16
Cyanide	--	2.2	15.8	0.284 U	0.296 U	0.312 U	0.306 U	0.302 U	0.315 U	0.307 U	0.305 U	0.298 U	0.272 U	0.336 U	0.383 U	0.383 U
Iron	19,900	5,500	5 < pH > 8	**10,100**	**48,000**	**43,400**	**26,000**	**25,100**	**13,400**	**14,500 J**	**22,500 J**	**15,300**	**6,440**	2,780	2,310	3,990
Lead	17.4	400	120	17.6	16.5	14.4	141	211	65	61.6 J	40.7 J	81	12.5	9.1	29.3 J	13.1 J
Magnesium	1,070	--	--	856	2,650	2,740	2,450	3,130	1,240 J	1,360 J	1,300 J	2,060	400 J	232 J	327 J	732 J
Manganese	324	180	220	51.1	30.2	25.9	**213**	**308**	**212**	170	141	**297**	59	7.46	11.7	58.8
Mercury	0.111	2.3	0.1	0.0491 B	0.0603 B	0.0473 B	0.138	0.134	0.0712	0.061	0.0734	0.0472	0.0348 B	0.0421 B	0.0488 B	0.064 B
Nickel	9.52	150	38	3.72	13.2	11.3	9.03	11.1	5.96	6.9	6.44	7.18	2.47	1.35 J	2.31	2.43
Potassium	708	--	--	445 J	1,910	2,030	874 J	959 J	933 J	1,050 J	911 J	1,040 J	280 J	317 J	275 J	299 J
Vanadium	27.9	39	130	19.6	**67.3**	**64.5**	**45.8**	**43.9**	28.9	22.8	23.4	22	9.48	5.28	7.73	7.3
Zinc	26.5	2,300	120	36.7	41	33.7	315	428	139	71	55.4	85.2	10.9	31.7	16.1	74.4
Wet Chemistry																
pH (ph)	--	--	--	5.99 H3	5.25 H3	NA	5.79 H3	6.46 H3	6.25 H3	7.65 H3	NA	7.55 H3	5.48 H3	5.71 H3	5.99 H3	6.38 H3
Total organic carbon (TOC) (mg/kg)	--	--	--	5,900	24,700	NA	24,400	36,000	42,600	44,200	NA	52,300	9,100	16,200	43,700	41,500
Grain Size (PCT)																
Coarse Sand (%)	--	--	--	0.6	0.2	NA	0.9	0.8	1	5.1	NA	3.9	0.9	0.5	0.8	1
Fine Sand (%)	--	--	--	45.6	46.6	NA	37.9	29.2	43.3	37.7	NA	37	71.6	85.3	76.2	58.8
Fines (%)	--	--	--	42.6	46	NA	53.4	65.9	40.2	39.3	NA	36.4	16.9	6.6	16.9	28.1
Gravel (%)	--	--	--	0.7	2.8	NA	1.3	0	3.6	10.1	NA	13.3	0.2	0.3	0.4	2.5
Medium Sand (%)	--	--	--	10.5	4.4	NA	6.5	4.1	11.9	7.8	NA	9.4	10.4	7.4	5.7	9.6
Sand (%)	--	--	--	56.7	51.2	NA	45.3	34.1	56.2	50.6	NA	50.3	82.9	93.2	82.7	69.4
GRAINSIZE (PCT/P)																
GS03 Sieve 3" (75 mm)	--	--	--	100	100	NA	100	100	100	100	NA	100	100	100	100	100
GS05 Sieve 2" (50 mm)	--	--	--	100	100	NA	100	100	100	100	NA	100	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)	--	--	--	100	100	NA	100	100	100	100	NA	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	--	--	--	100	100	NA	100	100	100	100	NA	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	--	--	--	100	100	NA	100	100	100	100	NA	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	--	--	--	100	98	NA	100	100	97.4	97.3	NA	92.8	100	100	100	98.4
Sieve No. 004 (4.75 mm)	--	--	--	99.3	97.2	NA	98.7	100	96.4	89.9	NA	86.7	99.8	99.7	99.6	97.5
Sieve No. 010 (2.00 mm)	--	--	--	98.7	97	NA	97.8	99.2	95.4	84.8	NA	82.8	98.9	99.2	98.8	96.5
Sieve No. 020 (850 um)	--	--	--	96.3	96.3	NA	96.1	98.2	94.1	81.6	NA	78.9	97.3	98.6	98	94.5
Sieve No. 040 (425 um)	--	--	--	88.2	92.6	NA	91.3	95.1	83.5	77	NA	73.4	88.5	91.8	93.1	86.9
Sieve No. 060 (250 um)	--	--	--	66.6	70.8	NA	75.5	83.9	70.8	63.3	NA	59.9	55.5	53.2	63.8	63.6
Sieve No. 080 (180 um)	--	--	--	53.8	56.5	NA	64.8	76.2	61.2	52.8	NA	49.7	33.2	22.6	38.3	45.6
Sieve No. 100 (150 um)	--	--	--	49	52	NA	60.2	72.8	54.1	47.7	NA	44.6	25.3	12.1	27.8	37.2
Sieve No. 200 (75 um)	--	--	--	42.6	46	NA	53.4	65.9	40.2	39.3	NA	36.4	16.9	6.6	16.9	28.1

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Notes:

Underline indicates exceedance of CAX 95% UTL BKG SS

Bold text indicates exceedance of RSLs Residential Soil Adjusted 1112

Grey shading indicates exceedance of CAX SS ECO SV

RSLs were adjusted for noncarcinogens to account fo exposure to multiple constituent

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of th EPA recommended holding time

J - Analyte present, value may or may not be accurate c precise

K - Analyte present, value may be biased high, actual valu may be lowe

L - Analyte present, value may be biased low, actual valu may be higher

N - The MS/MSD accuracy and or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

pct - Percent

ph - pH units

µg/kg - Micrograms per kilogram

Table 4
CAX Penniman Lake
Surface Soil Exceedances Analytical Results
October-November 2012

Station ID	CAX 95% UTL BKG SS	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO59		CAPL-SO60	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69		CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75
Sample ID				CAPL-SS59-1012	CAPL-SS59P-1012	CAPL-SS60-1112	CAPL-SS61-1112	CAPL-SS62-1112	CAPL-SS63-1112	CAPL-SS64-1112	CAPL-SS65-1112	CAPL-SS66-1112	CAPL-SS67-1112	CAPL-SS68-1112	CAPL-SS69-1112	CAPL-SS69P-1112	CAPL-SS70-1112	CAPL-SS71-1112	CAPL-SS72-1112	CAPL-SS73-1112	CAPL-SS74-1112	CAPL-SS75-1112
Sample Date				10/26/12	10/26/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12
Chemical Name																					
Volatile Organic Compounds (µg/kg)																					
2-Butanone	--	2,800,000	--	8.44 J	8.47 U	5.22 U	6.56 U	4.14 U	5.2 U	23.5	5.38 J	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	7.37 J	4.4 J	7.92	4.61 U	5.79 U	7.06 U
Acetone	--	6,100,000	--	149 J	20.5 J	10.4 UJ	13.1 UJ	17.2 J	10.4 UJ	24.3 J	210 J	10.7 UJ	34.9 J	10.1 UJ	9.22 UJ	8.88 UJ	25.3 J	58.1 J	40.7 J	9.23 UJ	10.6 J	14.1 UJ
Methyl acetate	--	7,800,000	--	24	8.47 U	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UL	4.61 U	4.44 U	4.14 UJ	4.09 UJ	3.95 UJ	4.61 U	5.79 U	7.06 U
Styrene	--	630,000	64,000	3.82 U	4.23 U	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	15.2	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Semivolatile Organic Compounds (µg/kg)																					
2-Methylnaphthalene	--	23,000	--	4.25 U	4.85 U	4.43 U	190 U	3.9 U	23.2 J	12.4	117	45.9 J	69.5 J	4.49 U	37.9 U	37 U	37.7 J	39.2 U	34.5 U	39.8 U	35.5 U	41.8 U
Acenaphthene	--	340,000	--	4.25 U	4.85 U	4.43 U	190 U	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	75.6 J	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	166	41.8 U
Acenaphthylene	--	340,000	--	4.25 U	4.85 U	4.43 U	190 U	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	144	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	35.5 U	41.8 U
Anthracene	--	1,700,000	--	4.25 U	4.85 U	4.43 U	271 J	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	1,690	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	512	41.8 U
Benzaldehyde	--	780,000	--	213 U	243 U	222 U	1,910 U	195 U	195 U	210 U	517	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Benzo(a)anthracene	--	150	--	4.25 U	4.85 U	4.43 U	**3,570**	30.5	34.1 J	9.99	142	**182**	**14,400**	55.8	37.9 U	37 U	33.6 U	39.2 U	34.5 U	128	**797**	41.8 U
Benzo(a)pyrene	--	15	--	5.61 J	4.85 U	4.43 U	**4,780**	**54.6**	**23.9 J**	11.8	**195**	**192**	**8,120**	**54.3**	37.9 U	37 U	33.6 U	39.2 U	34.5 U	**119**	**722**	41.8 U
Benzo(b)fluoranthene	--	150	--	9.68	8.38 J	5.97 J	**8,910**	150	40.4	15.9	**242**	**335**	**11,300**	116	37.9 U	78.9	33.6 U	39.2 U	34.5 U	**157**	**418**	46.3 J
Benzo(g,h,i)perylene	--	170,000	--	5.93 J	4.85 U	4.43 U	4,730	73.4	47.8	11	153	172	3,320	45.5	37.9 U	37 U	33.6 U	39.2 U	34.5 U	114	399	41.8 U
Benzo(k)fluoranthene	--	1,500	--	6.64 J	8.49 J	4.52 J	**7,950**	85.2	40	7.92 J	289	330	**8,830**	70.6	40.3 J	37 U	33.6 U	39.2 U	34.5 U	128	506	41.8 U
bis(2-Ethylhexyl)phthalate	--	35,000	30,000	186 J	131 J	141 J	1,910 U	195 U	205 J	210 U	137 J	1,070 U	1,010 U	1,000 J	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Carbazole	--	--	--	213 U	243 U	222 U	968 J	195 U	195 U	210 U	237 U	1,070 U	1,450 J	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Chrysene	--	15,000	--	4.25 U	4.85 U	4.43 U	8,790	143	67	18.5	373	386	**19,200**	104	91.7	52.7 J	46.5 J	39.2 U	65.7 J	192	906	82.8 J
Dibenz(a,h)anthracene	--	15	--	4.25 U	4.85 U	4.43 U	**1,260**	**17.6**	19.5 U	4.18 U	**62.6**	42.7 U	**2,080**	**15.8**	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	**137**	41.8 U
Fluoranthene	--	230,000	--	16.2 B	17.4 B	5.38 J	12,200	118	62.9	17.1	115	384	72,300	112	64.4 J	43.7 J	36.7 J	40.5 J	34.5 U	260	1,510	69.7 J
Fluorene	--	230,000	--	4.25 U	4.85 U	4.43 U	190 U	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	40.4 U	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	169	41.8 U
Indeno(1,2,3-cd)pyrene	--	150	--	5.82 J	4.85 U	4.43 U	**4,200**	65.6	19.5 U	9.11	134	**175**	**3,800**	44.5	37.9 U	37 U	33.6 U	39.2 U	34.5 U	102	**321**	41.8 U
Naphthalene	--	3,600	--	4.25 U	4.85 U	4.43 U	190 U	3.9 U	19.5 U	7.72 J	423	42.7 U	104	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	35.5 U	41.8 U
Phenanthrene	--	1,700,000	--	6.9 B	5.98 B	10.2	3,190	17.4	33.9 J	19.7	213	121	6,370	17.1	42.1 J	37 U	44.2 J	39.2 U	73.8	172	1,910	53.3 J
Pyrene	--	170,000	--	13.8 B	16.6 B	6.11 J	13,300	119	67.7	17	135	374	54,600	118	60.8 J	38.9 J	51.6 J	46.1 J	47.8 J	231	2,080	54 J
Pesticide/Polychlorinated Biphenyls (µg/kg)																					
4,4'-DDD	--	2,000	583	0.747 J	0.36 J	0.442 U	10.9 J	0.386 UL	353	0.519 J	0.381 J	6.28 J	1.89 J	0.68 J	2 J	1.08 J	0.351 UJ	0.394 UJ	0.718 J	19.3 J	0.565 J	1.84 J
4,4'-DDE	--	1,400	114	2.44 J	4.52 J	0.442 UJ	127 K	1.28 L	**2,640**	1.68 L	4.44 J	91.1 K	4.92 J	0.459 UJ	4.22 J	3.34 J	0.351 UJ	0.394 UJ	4.42 J	146 L	2.46 J	16.4 J
4,4'-DDT	--	1,900	100	0.324 J	0.491 U	0.442 U	122 K	0.386 U	806	0.433 UJ	0.605 J	31.9 J	7.1 J	0.595 J	17.6 J	3.97 J	0.337 J	0.525 J	4.85 J	334 L	0.373 UJ	5.95 J
Aldrin	--	29	3.63	0.432 UL	0.397 J	0.442 U	0.397 U	0.386 U	0.415 U	0.433 U	0.467 U	0.441 U	0.399 UL	0.459 U	0.392 U	0.37 U	0.351 U	0.394 UJ	0.358 L	0.398 UL	0.373 U	0.415 UL
alpha-BHC	--	77	226	0.514 J	1.05 J	0.442 U	0.397 U	0.386 U	0.415 U	0.433 U	0.467 U	0.441 U	0.399 U	0.459 U	0.392 U	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UL	0.373 U	0.415 UL
alpha-Chlordane	--	1,600	11	0.432 UL	0.491 UL	0.442 U	0.518 J	0.386 UL	8.88 L	0.433 UL	0.467 UL	0.441 UL	0.259 J	0.459 U	1.78 J	1.52 J	0.351 U	0.394 U	0.362 UJ	13.3 J	1.42 J	0.415 UJ
Aroclor-1260	--	220	8,000	13.5 L	12 U	10.8 U	**627 J**	42.3	**397**	10.6 U	11.4 U	**2,770 J**	9.77 U	36.9 J	**266 J**	**283 J**	8.59 U	12.1 J	34.9 L	**4,630 J**	9.13 U	**357 J**
beta-BHC	--	270	342	0.432 UL	0.491 U	0.442 U	0.397 U	0.386 U	0.415 U	0.433 U	0.467 U	0.441 U	0.305 J	0.459 U	0.392 U	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UL	0.373 U	0.415 UL
delta-BHC	--	270	226	0.432 UL	0.907 J	0.442 U	1.07 J	0.386 U	0.156 L	0.424 J	0.455 J	0.377 J	0.681 J	0.459 U	0.392 UL	0.37 UL	0.351 UJ	0.394 UJ	0.362 UL	0.398 UJ	0.373 U	0.415 UL
Dieldrin	--	30	10.5	0.432 UL	0.491 U	0.442 U	13.3 J	0.462 J	7.09 L	0.433 UJ	0.344 J	26.5 K	0.399 U	0.264 J	5.69 L	5.53	0.351 U	0.394 U	0.453 J	19.1 J	0.306 J	0.704 J
Endosulfan I	--	37,000	6.32	0.432 UL	0.275 J	0.442 U	0.397 U	0.386 U	0.263 J	0.433 U	0.467 U	0.441 U	1.14 J	0.459 U	0.392 UL	0.37 U	0.351 U	0.394 U	0.362 UJ	0.398 UL	0.373 U	0.415 UL
Endosulfan II	--	37,000	6.32	0.432 UL	0.491 UL	0.442 U	4.69 J	0.386 UL	9.2 L	0.231 J	0.467 U	6.04 J	2.5 J	0.387 J	2.99 J	3.26 J	0.351 U	0.394 U	0.273 L	39.2 L	0.373 U	0.415 UJ
Endosulfan sulfate	--	37,000	6.32	0.432 UL	1.48 J	0.442 U	4.08 J	0.303 J	12.4 J	1.68 J	0.467 UL	64.2 L	0.347 J	0.459 U	9.13 L	10.1 L	0.351 U	0.394 U	9.86 J	0.559 J	0.373 U	2.3 L
Endrin	--	1,800	1.95	0.432 UL	0.491 UL	0.442 U	1.75 J	0.492 J	13.3 J	0.433 U	0.467 UL	13.6 J	0.399 U	0.459 U	2.62 J	2.5 J	0.351 UJ	0.394 UJ	0.362 UL	0.398 UJ	0.373 U	0.415 UJ
Endrin aldehyde	--	1,800	1.95	0.432 UL	0.953 J	0.442 U	0.397 U	0.386 U	0.9 J	5.31 J	3.16 J	2.19 J	1.73 J	0.459 U	0.518 J	0.397 J	0.351 U	0.394 UJ	0.362 UL	7.81 J	0.373 U	0.759 J
Endrin ketone	--	1,800	1.95	0.432 UL	0.491 U	0.442 UJ	4.97 J	0.359 L	4.05 L	0.433 UL	1.65 K	26.5 J	0.399 UL	0.459 U	3.04 J	0.834 J	0.351 U	0.394 U	0.362 UL	40.2 J	0.373 U	1.36 J
gamma-BHC (Lindane)	--	520	7.75	0.523 J	1.84 J	0.442 U	4.76 J	0.386 U	0.415 U	0.433 U	0.467 U	0.159 J	0.399 UL	0.205 J	0.392 U	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UL	0.373 UJ	0.415 UL
gamma-Chlordane	--	1,600	11	2.51 L	0.491 U	0.484 J	1.62 K	0.428 J	14.5	0.251 J	0.253 J	1.81 J	0.399 UL	0.402 J	1.55 J	1.24 J	0.642 J	0.916 L	0.53 J	12.7 L	3.31 J	0.765 L
Heptachlor	--	110	52.9	1.16 J	0.372 J	0.442 U	0.397 U	0.386 UL	0.417 L	0.433 UL	0.467 UL	0.148 J	0.399 UL	0.459 U	0.392 UL	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UJ	0.373 UJ	0.415 UL
Heptachlor epoxide	--	53	52.9	0.363 L	0.491 UL	0.442 U	0.397 UL	0.386 U	9.28 J	0.433 UL	0.467 U	0.272 J	0.399 UL	0.459 U	0.392 UL	0.37 UL	0.351 UJ	0.394 UJ	0.362 UL	0.483 J	0.373 UJ	0.415 UJ
Methoxychlor	--	31,000	500	0.392 J	6.65 J	0.442 UJ	3.55 J	0.316 J	2.8 J	0.433 UL	2.72 K	10 J	1.91 J	0.459 UJ	0.712 J	0.206 J	0.351 UJ	0.394 UJ	0.215 J	21.2 J	0.373 UJ	1.52 J
Explosives (µg/kg)																					
1,3,5-Trinitrobenzene	--	220,000	--	192 U	181 U	162 U	110 J	160 U	193 U	183 U	194 U	176 U	161 J	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
Nitroglycerin	--	610	--	481 U	452 U	405 U	446 U	400 U	483 U	457 U	485 U	441 U	478 U	433 U	400 U	439 U	465 U	478 U	478 U	426 U	435 U	433 U

Table 4
CAX Penniman Lake
Surface Soil Exceedances Analytical Results
October-November 2012

Station ID	CAX 95% UTL BKG SS	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO59		CAPL-SO60	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69		CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75
Sample ID				CAPL-SS59-1012	CAPL-SS59P-1012	CAPL-SS60-1112	CAPL-SS61-1112	CAPL-SS62-1112	CAPL-SS63-1112	CAPL-SS64-1112	CAPL-SS65-1112	CAPL-SS66-1112	CAPL-SS67-1112	CAPL-SS68-1112	CAPL-SS69-1112	CAPL-SS69P-1112	CAPL-SS70-1112	CAPL-SS71-1112	CAPL-SS72-1112	CAPL-SS73-1112	CAPL-SS74-1112	CAPL-SS75-1112
Sample Date				10/26/12	10/26/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12
Chemical Name																						
Total Metals (mg/kg)																						
Aluminum	12,200	7,700	pH < 5.5	4,720	4,380	**14,800**	**11,100**	5,400	6,090	**13,700**	6,660	**8,330**	4,340	**25,800**	**10,300**	**10,000**	6,070	**9,460**	3,260	5,380	7,640	**9,110**
Antimony	--	3.1	78	1.03 U	1.16 U	2.73 U	2.33 U	0.942 U	2.51 U	2.69 U	**11.6**	2.53 U	2.42 U	2.67 UL	2.46 U	2.28 U	0.787 U	2.3 U	2.14 U	2.33 U	2.27 U	2.65 U
Arsenic	6.36	0.39	18	**1.45**	**1.73**	**19.3**	**8.12**	**3.47**	**8.93**	**10**	**2.44 J**	**6.5**	**2.69 J**	**14.4**	**5.74 J**	**7.9 J**	**1.19**	**2.1 J**	**0.941 J**	**2.6 J**	**5.29**	**7.22**
Barium	52.9	1,500	330	16.4	14.9	80.8	50.2	44.8	27.4	48.2	175	66.3	39.9	81.8	52.6 J	37.1 J	10.9	14	46	34.1	66.4	61.1
Beryllium	0.587	16	40	0.257 J	0.238 J	1.4 J	0.838 J	0.571 J	1.3 J	0.866 J	0.887 J	0.677 J	0.441 J	1.44	0.537 J	0.418 J	1.63	1.35 J	0.535 U	0.363 J	0.521 J	0.759 J
Cadmium	--	7	32	0.724	0.538 J	0.412 J	1.94	0.413 J	1.21 J	0.674 U	0.989 J	0.613 J	0.606 U	0.668 U	0.615 U	0.57 U	0.197 U	0.575 U	0.535 U	0.984 J	0.568 U	0.339 J
Calcium	2,290	--	--	1,600	1,600	15,000	11,200	539 J	19,000	5,740	3,910	4,370	1,170 J	6,660	5,630 J	3,740 J	15,900	11,000	40,800	2,070	58,200	2,170
Chromium	18.2	0.29	64	**6.91**	**6.69**	**40.3**	**69.7**	**10.9**	**66.7**	**29.9**	**8.21**	**18.5**	**8.3**	**56.1**	**19.4**	**21.1**	**5.78**	**10.5**	**7.84**	**16.7**	**23.3**	**19.3**
Cobalt	9.93	2.3	13	1.23 J	1.24 J	**6.04**	**4.6**	**2.53**	**2.73 J**	**3.28 J**	**2.91 J**	**3.75 J**	3.03 U	**5.81**	2.12 J	1.61 J	2.09	2.05 J	2.01 J	2.02 J	**3.8**	**3.66 J**
Copper	4.25	310	70	7.11	5.67	5.81	26.1	6.24	12	8.2	10.7	20.1	5.05	9.67	12.4 J	7.95 J	3.29	4.57	6.47	44.8	28.3	51.5
Cyanide	--	2.2	15.8	0.314 U	0.358 U	0.322 U	0.279 U	0.286 U	0.291 U	0.317 U	0.354 U	0.323 U	0.289 U	0.334 U	0.281 U	0.261 U	0.246 U	0.29 U	0.265 U	0.297 U	0.272 U	0.155 J
Iron	19,900	5,500	5 < pH > 8	**7,050**	**7,610**	**53,300**	**22,300**	**8,330**	**32,800**	**33,300**	**8,680**	**17,500**	**9,300**	**49,100**	**18,400**	**16,800**	**10,400**	**15,100**	**6,370**	**11,100**	**10,900**	**18,500**
Lead	17.4	400	120	12 J	11.7 J	14.5	107	25.3	46.8	21.3	42.5	77.7	28.8	14.7	29.9	22.7	12.9	10.3	15.1	127	14.7	159
Magnesium	1,070	--	--	1,290	1,320	3,950	2,050	654	1,960	2,110	1,590 J	2,080	580 J	4,380	1,290 J	1,230 J	2,530	2,620	22,800	1,480	2,520	1,680
Manganese	324	180	220	78.4	90.4	**259**	151	**256**	140	77.7	**264**	**216**	86.5	133 L	123 J	90.1 J	**405**	**331**	117	140	161	**351**
Mercury	0.111	2.3	0.1	0.0204 B	0.0291 B	0.0327 J	0.0835	0.11	0.145	0.0672	0.0499	0.247	0.034 J	0.0784	0.0476	0.0465	0.031 U	0.0355 U	0.0242 J	0.0861	0.0188 J	0.0835
Nickel	9.52	150	38	2.87	3	15.8	11.4	4.59	8.33	8.8	5.9	7.21	2.99 J	18.5	4.96 J	3.4 J	2.28	2.64 J	3.24	6.27	11.8	6.5
Potassium	708	--	--	517 J	540 J	4,240	1,600	401 J	1,840	1,800	451 J	807 J	437 J	3,420	795 J	821 J	667	987 J	421 J	414 J	1,280 J	975 J
Vanadium	27.9	39	130	11.4	11.1	**40.3**	29.1	10.6	26.7	33.3	10.9	24.1	11.1	**55.6**	24.7	26.5	13.7	19.7	12.8	19.4	28.3	25.6
Zinc	26.5	2,300	120	60.2	56.4	63.4	235	45.5	83.9	59.6	190	142	35.2	73.9 K	58.6 J	40.2 J	44.6	33.3	21.7	175	47.5	196
Wet Chemistry																						
pH (ph)	--	--	--	6.5 H3	NA	7.66 H3	7.74 H3	6.06 H3	8.25 H3	7.96 H3	6.25 H3	7.5 H3	6.7 H3	7.77 H3	8.19 H3	NA	9.11 H3	9.12 H3	8.15 H3	7 H3	11.9 H3	5.85 H3
Total organic carbon (TOC) (mg/kg)	--	--	--	15,000	NA	18,400	33,500 N	12,300 N	16,000 N	29,800	128,000	60,800	39,400	21,100 N	20,900 N	NA	7,450	9,410	13,500	29,600	13,200	40,100
Grain Size (PCT)																						
Coarse Sand (%)	--	--	--	4.9	NA	0.3	3.8	1.2	5.3	1	7.2	6	2.7	0.7	5.5	NA	18.2	11.5	10.9	4.4	20.3	2.8
Fine Sand (%)	--	--	--	40.6	NA	46.7	51.4	67.1	52.7	38.8	41.6	33.1	55.6	27.7	36.4	NA	17.8	20.6	20.1	44.6	15.9	44.6
Fines (%)	--	--	--	0.5	NA	49.1	31.3	24.8	22.3	43.9	21.8	32.4	31.3	67.2	28.7	NA	16	14.7	18.1	25.9	6.2	38.5
Gravel (%)	--	--	--	45.1	NA	0.4	3.5	0.3	12.9	11	14.7	15.7	3.7	2.1	18.2	NA	25.6	36.3	32.3	1.3	38.6	2.1
Medium Sand (%)	--	--	--	8.9	NA	3.5	10	6.6	6.8	5.3	14.7	12.8	6.7	2.3	11.2	NA	22.4	16.9	18.6	23.8	19	12
Sand (%)	--	--	--	54.4	NA	50.5	65.2	74.9	64.8	45.1	63.5	51.9	65	30.7	53.1	NA	58.4	49	49.6	72.8	55.2	59.4
GRAINSIZE (PCT/P)																						
GS03 Sieve 3" (75 mm)	--	--	--	100	NA	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS05 Sieve 2" (50 mm)	--	--	--	100	NA	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)	--	--	--	100	NA	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	--	--	--	100	NA	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	--	--	--	80.3	NA	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	--	--	--	58	NA	100	100	100	95.4	91.4	94.2	89.2	98.4	100	89.5	NA	92.5	76.7	79.3	100	82.8	99.1
Sieve No. 004 (4.75 mm)	--	--	--	54.9	NA	99.6	96.5	99.7	87.1	89	85.3	84.3	96.3	97.9	81.8	NA	74.4	63.7	67.7	98.7	61.4	97.9
Sieve No. 010 (2.00 mm)	--	--	--	50	NA	99.3	92.7	98.5	81.8	88	78.1	78.3	93.6	97.2	76.3	NA	56.2	52.2	56.8	94.3	41.1	95.1
Sieve No. 020 (850 um)	--	--	--	46.7	NA	98.5	88.4	97.5	78.7	86.5	72.3	73.2	91.7	96.4	71.8	NA	43.3	42.6	48.6	83.4	31.5	89.7
Sieve No. 040 (425 um)	--	--	--	41.1	NA	95.8	82.7	91.9	75	82.7	63.4	65.5	86.9	94.9	65.1	NA	33.8	35.3	38.2	70.5	22.1	83.1
Sieve No. 060 (250 um)	--	--	--	27.3	NA	73.8	64.4	63.2	59	65.8	44.5	49.5	62.8	85	50.6	NA	27.1	27	28.7	51.6	14.9	63
Sieve No. 080 (180 um)	--	--	--	15.7	NA	57.3	49.9	44.3	39.8	53.4	32.3	40.6	43.5	76.1	40.7	NA	23.2	21.7	23.5	39.6	11.2	49.5
Sieve No. 100 (150 um)	--	--	--	8.7	NA	53.5	42.4	35.3	30.2	49.3	27.8	37	37.7	73.5	36.2	NA	20.8	19.1	21.5	34	9.4	44.6
Sieve No. 200 (75 um)	--	--	--	0.5	NA	49.1	31.3	24.8	22.3	43.9	21.8	32.4	31.3	67.2	28.7	NA	16	14.7	18.1	25.9	6.2	38.5

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Notes:

Underline indicates exceedance of CAX 95% UTL BKG SS

Bold text indicates exceedance of RSLs Residential Soil Adjusted 1112

Grey shading indicates exceedance of CAX SS ECO SV

RSLs were adjusted for noncarcinogens to account fo exposure to multiple constituent

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of th EPA recommended holding time

J - Analyte present, value may or may not be accurate c precise

K - Analyte present, value may be biased high, actual valu may be lowe

L - Analyte present, value may be biased low, actual valu may be higher

N - The MS/MSD accuracy and or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

pct - Percent

ph - pH units

µg/kg - Micrograms per kilogram

Table 5
CAX Penniman Lake
Subsurface Soil Exceedances Analytical Data
October-November 2012

Station ID	CAX 95% UTL BKG SB	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO44	CAPL-SO45	CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49	CAPL-SO50		CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59
Sample ID				CAPL-SB44-1012	CAPL-SB45-1012	CAPL-SB46-1012	CAPL-SB47-1012	CAPL-SB48-1012	CAPL-SB49-1012	CAPL-SB50-1012	CAPL-SB50P-1012	CAPL-SB55-1012	CAPL-SB56-1012	CAPL-SB57-1012	CAPL-SB58-1012	CAPL-SB59-1012
Sample Date				10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name																
Volatile Organic Compounds (µg/kg)																
2-Butanone	--	2,800,000	--	5.16 UJ	6.99 UJ	7.61 UJ	5.95 UJ	6.28 U	5.28 U	7.55 U	6.9 U	5.05 UJ	93.1	6.83 U	6.44 UJ	3.88 J
Acetone	--	6,100,000	--	10.3 UJ	14 UJ	15.2 UJ	6.84 J	61 J	10.6 UJ	15.1 UJ	13.8 UJ	7.89 J	261 J	13.7 UJ	9.05 J	14.8 J
Carbon disulfide	--	82,000	--	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	2.89 J	3.42 U	3.22 U	1.93 J
Semivolatile Organic Compounds (µg/kg)																
2-Methylnaphthalene	--	23,000	--	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.56 J	4.5 U	4.23 U	4.1 U
Anthracene	--	1,700,000	--	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Benzo(a)anthracene	--	150	--	3.66 U	4.36 U	3.94 U	3.93 U	23.8 J	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Benzo(a)pyrene	--	15	--	3.66 U	4.36 U	5.81 J	3.93 U	**23.2 K**	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Benzo(b)fluoranthene	--	150	--	3.66 U	4.36 U	22.4	3.93 U	57 K	4 U	4.26 U	5.56 K	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Benzo(g,h,i)perylene	--	170,000	--	3.66 U	4.36 U	11.9	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Benzo(k)fluoranthene	--	1,500	--	3.66 U	4.36 U	9.43	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	6.87 J	4.5 U	4.23 U	4.1 U
bis(2-Ethylhexyl)phthalate	--	35,000	30,000	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U
Chrysene	--	15,000	--	3.66 U	4.36 U	17.3	3.93 U	31.6 K	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Dibenz(a,h)anthracene	--	15	--	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Fluoranthene	--	230,000	--	3.66 U	4.36 U	17.5	3.93 U	49	4 U	4.26 U	5.42 J	4.57 J	10.7	4.5 U	4.23 U	4.1 U
Fluorene	--	230,000	--	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Indeno(1,2,3-cd)pyrene	--	150	--	3.66 U	4.36 U	9.69	3.93 U	23.3 J	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Naphthalene	--	3,600	--	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U
Phenanthrene	--	1,700,000	--	3.66 U	4.36 U	6.01 J	3.93 U	30.2 J	4 U	4.26 U	7.26 J	4.03 U	8.77 J	4.5 U	4.23 U	4.1 U
Pyrene	--	170,000	--	3.66 U	4.36 U	16.5	3.93 U	43.5 K	4 U	4.26 U	6.22 K	4.22 J	10.7	4.5 U	4.23 U	4.1 U
Pesticide/Polychlorinated Biphenyls (µg/kg)																
4,4'-DDD	--	2,000	583	0.23 J	0.47 UL	0.851 J	3.08 J	13 J	1.69 J	2.68 J	0.675 J	0.396 UL	11.3 J	19.7 J	0.243 J	2.7 J
4,4'-DDE	--	1,400	114	0.456 L	0.47 UL	7.49 J	3.01 J	143 J	9.02	7.1	4.78	0.346 J	9.67	11.5 L	3.53 L	14.3 L
4,4'-DDT	--	1,700	100	0.353 J	0.47 UL	2.96 J	2.11 J	60 J	0.467 J	3.71 J	2.88 J	0.396 U	0.663 J	2.53 J	1.28 J	1.54 L
Aldrin	--	29	3.63	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.333 J	0.429 UL
alpha-BHC	--	77	226	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.307 J	0.444 UL	0.594 J
alpha-Chlordane	--	1,600	11	0.367 UL	0.47 UL	0.768 J	0.394 UL	0.656 J	0.412 U	0.441 U	0.398 U	0.396 U	0.449 UL	0.451 UL	0.444 UL	0.429 UL
Aroclor-1260	--	220	8,000	35.6 J	23.2 L	**414 L**	**284 J**	**428 L**	13.9 J	39.7	31.7	9.7 U	54.3 J	19.9 L	35.2 L	9.07 L
beta-BHC	--	270	342	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.252 J	0.444 UL	0.429 UL
Dieldrin	--	30	10.5	0.602 L	0.47 UL	6.49 L	3.65 L	8.16 J	0.412 U	0.613 J	0.449 J	0.396 U	1.66 J	0.451 UL	0.444 UL	0.429 UL
Endosulfan II	--	37,000	6.32	0.367 UL	0.47 UL	4.18 J	0.81 J	4.07 J	0.412 U	0.441 U	0.398 UL	0.396 U	0.449 UL	0.451 UL	0.444 UL	0.429 UL
Endosulfan sulfate	--	37,000	6.32	0.937 J	0.484 J	29.3 J	9.05 L	0.367 UL	0.412 U	0.441 U	1.45 J	0.396 U	0.449 U	0.681 J	0.444 UL	0.227 J
Endrin	--	1,800	1.95	0.367 UL	0.47 UL	1.1 J	1.54 J	1.25 J	0.412 U	0.441 U	0.398 U	0.396 U	0.905 J	0.403 L	0.519 J	0.429 UL
Endrin aldehyde	--	1,800	1.95	0.367 UL	0.47 UL	0.452 J	0.441 J	0.646 J	0.412 U	0.441 U	0.398 U	0.396 U	1.15 J	0.429 J	0.444 UL	0.429 UL
Endrin ketone	--	1,800	1.95	0.367 UL	0.47 UL	1.84 J	0.81 J	1.73 J	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.444 UL	0.429 UL
gamma-BHC (Lindane)	--	520	7.75	0.367 UL	0.47 UL	0.411 U	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.444 UL	0.429 UL
gamma-Chlordane	--	1,600	11	2.17 J	1.76 J	2.1 J	1.88 L	3.66 B	0.412 UJ	0.366 B	0.411 B	1.45 J	0.296 J	0.303 J	3.23 L	2.5 L
Heptachlor	--	110	52.9	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.185 J	0.246 J	1.97 J
Heptachlor epoxide	--	53	52.9	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.201 L	0.437 J
Methoxychlor	--	31,000	500	0.367 UL	0.47 UL	3.49 J	0.85 J	4.95 J	0.412 UJ	0.441 U	0.398 U	0.396 U	1.63 J	3.61 J	0.52 J	1.28 J
Explosives (µg/kg)																
Nitroglycerin	--	610	--	455 U	493 U	498 U	478 U	455 U	500 U	500 U	455 U	478 U	465 U	469 U	493 U	452 U
Total Metals (mg/kg)																
Aluminum	13,000	7,700	pH < 5.5	**11,600**	**27,600**	**22,400**	**24,000**	**11,500**	**10,900**	**23,400**	**24,500**	6,480	3,590	2,580	4,220	1,600
Arsenic	5.54	0.39	18	**2.12**	**16.3**	**4.87**	**4.01**	**4.51**	**2.91**	**11.5 J**	**7.98 J**	**1.9**	**2.76**	**1.44 J**	**1.5**	**1.11 J**
Barium	84.5	1,500	330	33.4	52.8	39.6	46.8	26.2	47.3	55.7 J	87.3 J	29.4	18.4	12.2	24.3	7.04
Beryllium	--	16	40	0.421 J	1.89	0.786 J	0.552 J	0.323 J	0.52 J	1.1 J	1.07 J	0.263 J	0.21 J	0.228 J	0.25 J	0.254 U
Cadmium	--	7	32	0.218 U	0.697 U	0.61 U	0.627 U	0.57 U	0.246 U	0.626 U	0.622 U	0.252 U	0.268 U	0.204 J	1.64 K	0.254 U
Calcium	2,380	--	--	1,160	2,690	3,920	3,190	1,800	1,570	3,360	3,320	283 J	681	1,660	760 L	695
Chromium	33.7	0.29	64	**15.1**	**58.5**	**44.9**	**42.6**	**19.1 K**	**15.2**	**41.8**	**37.7**	**6.74**	**5.6**	**5.41**	**5.56**	**3.67**
Cobalt	5.18	2.3	13	**2.54**	**6.45**	**2.62 J**	1.97 J	1.51 J	**2.69**	**4.1**	**4.62**	1.27 J	1.07 J	2.16	0.947	1.27 U
Copper	3.17	310	70	3.59	8.05	4.26	8.85	5.1	3.71	5.35	4.65	3.02	3.17	2.37	3.54	1.26 J
Iron	32,000	5,500	5 < pH > 8	**10,300**	**63,500**	**33,600**	**27,100**	**14,200**	**13,400**	**52,600**	**38,700**	5,460	**5,560**	2,570	4,220	2,470
Lead	8.79	400	120	7.96	16	11.9	9.33	23.6	9.17	15	12.4	13.3	8.58	22 J	16.8 K	4.59 J
Magnesium	1,120	--	--	844	4,280	2,740	1,750	957 J	969	2,440	2,080	489 J	341 J	312 J	601 K	268 J
Manganese	176	180	220	35.2	65.1	28.3	16.2	59.4	50.6	78.7 J	45 J	22.8	11.3	7.37	34.4 K	7.12
Mercury	--	2.3	0.1	0.0354 J	0.0947	0.0344 J	0.0446 J	0.0462	0.0298 J	0.0671	0.0642	0.0354 J	0.0226 J	0.0437	0.0454 L	0.036 U
Nickel	17.6	150	38	3.96	16.1	7.25	5.86	4.06	4.37	9.19	8.36	3.06 B	2.19 B	3.17 B	2.63 B	1.15 B
Potassium	901	--	--	483 J	4,420	1,920	863 J	744 J	593 J	1,510 J	887 J	362 J	412 J	351 J	315 K	364 J
Selenium	--	39	0.52	0.546 U	1.74 U	1.52 U	1.57 U	1.42 U	0.616 U	1.56 U	1.55 U	0.631 U	0.669 U	0.54 J	0.349 U	0.636 U
Vanadium	48.3	39	130	20.2	**66.7**	**51.4**	**54.3**	27.9 K	17.7	**47.7**	**43.8**	11.3	8.95	6.94	8.78 K	4.81
Zinc	28	2,300	120	14.1	48.8	43	20.2	42.3	16.8	29.5	25.7	11.7	48.2	13.2	72.7 K	52.7
Wet Chemistry																
pH (ph)	--	--	--	5.82 H3	5.06 H3	6.6 H3	5.52 H3	5.88 H3	7.86 H3	8.08 H3	NA	5.7 H3	6.02 H3	6.96 H3	5.82 H3	5.87 H3
Total organic carbon (TOC) (mg/kg)	--	--	--	4,100	1,770	3,180	5,670	20,300	3,740	5,900	NA	5,480	13,300	26,000	11,900	8,970

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Notes:

Underline indicates exceedance of CAX 95% UTL BKG SB

Bold text indicates exceedance of RSLs Residential Soil Adjusted 1112

Grey Shading indicates exceedance CAX SS ECO SV

RSLs were adjusted for noncarcinogens to account fo exposure to multiple constituent

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of th EPA recommended holding tim

J - Analyte present, value may or may not be accurate c precise

K - Analyte present, value may be biased high, actual valu may be lowe

L - Analyte present, value may be biased low, actual valu may be highe

N - The MS/MSD accuracy and or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

*- Exceeding quality control criteria are associated with th reported results

Table 5
CAX Penniman Lake
Subsurface Soil Exceedances Analytical Data
October-November 2012

Station ID	CAX 95% UTL BKG SB	RSLs Residential Soil Adjusted 1112	CAX SS ECO SV	CAPL-SO60		CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69	CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75	
Sample ID				CAPL-SB60-1112	CAPL-SB60P-1112	CAPL-SB61-1112	CAPL-SB62-1112	CAPL-SB63-1112	CAPL-SB64-1112	CAPL-SB65-1112	CAPL-SB66-1112	CAPL-SB67-1112	CAPL-SB68-1112	CAPL-SB69-1112	CAPL-SB70-1112	CAPL-SB71-1112	CAPL-SB72-1112	CAPL-SB73-1112	CAPL-SB74-1112	CAPL-SB75-1112	CAPL-SB75P-1112
Sample Date				11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12	11/05/12
Chemical Name																					
Volatile Organic Compounds (µg/kg)																					
2-Butanone	--	2,800,000	--	5.79 U	6.35 U	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	4.75 J	4.16 U	4.24 J	4.76 U	4.9 U
Acetone	--	6,100,000	--	11.6 UJ	12.7 UJ	8.57 UJ	5.13 J	9.44 UJ	9.53 UJ	9.24 UJ	11.7 UJ	5.86 J	12.3 UJ	9.1 UJ	11.1 UJ	6.84 J	25.8 J	8.32 UJ	28.8 J	9.51 UJ	9.8 UJ
Carbon disulfide	--	82,000	--	2.89 U	3.18 U	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
Semivolatile Organic Compounds (µg/kg)																					
2-Methylnaphthalene	--	23,000	--	4.2 U	4.4 U	3.85 U	39.2 U	35.5	9.96	3.89 U	16.4	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	4.41 J	3.52 U	8.87	7.32 J
Anthracene	--	1,700,000	--	4.2 U	4.4 U	3.85 U	83.6	65.4	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Benzo(a)anthracene	--	150	--	4.2 U	4.4 U	3.85 U	**610**	3.99 U	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	122	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Benzo(a)pyrene	--	15	--	4.2 U	4.4 U	3.85 U	**859**	3.99 U	4.99 J	3.89 U	3.93 U	3.7 U	4.21 U	**213**	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	5.02 J	4.58 U
Benzo(b)fluoranthene	--	150	--	4.2 U	4.4 U	3.85 U	**2,100**	7.82 J	9.11	3.89 U	8	3.7 U	4.21 U	**292**	3.86 U	4.28 U	17.6 U	8.24	3.52 U	10.8	5.39 J
Benzo(g,h,i)perylene	--	170,000	--	4.2 U	4.4 U	3.85 U	1,140	3.99 U	6.09 J	3.89 U	5.27 J	3.7 U	4.21 U	186	3.86 U	4.28 U	17.6 U	3.96 J	3.52 U	5.46 J	4.58 U
Benzo(k)fluoranthene	--	1,500	--	4.2 U	4.4 U	3.85 U	**2,210**	3.99 U	5.51 J	3.89 U	3.93 U	3.7 U	4.21 U	274	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
bis(2-Ethylhexyl)phthalate	35,000	30,000		211 U	221 U	167 J	512 J	200 U	196 U	130 J	197 U	186 U	553	1,000 U	109 J	167 J	302 J	185 U	177 U	202 U	164 J
Chrysene	--	15,000	--	4.2 U	4.4 U	3.85 U	3,070	14.8	22.8	3.89 U	16.4	3.7 U	4.21 U	346	3.86 U	4.28 U	24.1 J	10.5	3.52 U	20.4	11.8
Dibenz(a,h)anthracene	--	15	--	4.2 U	4.4 U	3.85 U	**250**	3.99 U	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	**56.2 J**	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Fluoranthene	--	230,000	--	4.2 U	4.4 U	3.85 U	3,360	6.05 J	6.26 J	3.89 U	5.35 J	3.7 U	4.21 U	343	3.86 U	4.28 U	17.6 U	6.38 J	3.52 U	7.37 J	4.58 U
Fluorene	--	230,000	--	4.2 U	4.4 U	3.85 U	39.2 U	8.88	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Indeno(1,2,3-cd)pyrene	--	150	--	4.2 U	4.4 U	3.85 U	**1,000**	3.99 U	4.3 J	3.89 U	3.93 U	3.7 U	4.21 U	**161**	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.28 J	4.58 U
Naphthalene	--	3,600	--	4.2 U	4.4 U	3.85 U	39.2 U	53	7.17 J	3.89 U	16.7	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	4.46 J	3.52 U	6.63 J	6.05 J
Phenanthrene	--	1,700,000	--	4.2 U	4.4 U	3.85 U	405	46.7	17.7	3.89 U	17.5	3.7 U	4.21 U	88	3.86 U	4.28 U	26.1 J	8.88	3.52 U	19.4	12.6
Pyrene	--	170,000	--	4.2 U	4.4 U	3.85 U	2,980	10.2	7.48 J	3.89 U	7.02 J	3.7 U	4.21 U	361	3.86 U	4.28 U	17.6 U	6.56 J	3.52 U	8.55	4.67 J
Pesticide/Polychlorinated Biphenyls (µg/kg)																					
4,4'-DDD	--	2,000	583	0.43 U	0.442 U	0.399 U	3.36 L	0.837	0.957 J	0.387 U	0.811 J	0.392 U	0.425 UL	5.6 J	0.407 U	0.421 U	0.356 UL	0.616 J	0.37 U	0.406 UJ	0.447 U
4,4'-DDE	--	1,400	114	0.43 UJ	0.442 UJ	0.399 UJ	23.1 K	8.29 J	3.66	0.387 UJ	0.347 J	0.392 UJ	0.217 J	5.45 J	0.407 U	0.421 U	0.356 UL	4.16 L	3.78 J	0.561 J	0.795 J
4,4'-DDT	--	1,700	100	0.43 U	0.442 U	0.399 U	32.1 L	1.13 J	0.801 J	0.387 UJ	0.401 U	0.392 UJ	1.41 J	19.6 L	0.407 UJ	0.421 UJ	0.356 UJ	3.63 J	0.37 UJ	0.406 U	0.447 U
Aldrin	--	29	3.63	0.43 U	0.442 U	0.399 U	0.929 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.594 J	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
alpha-BHC	--	77	226	0.43 U	0.442 U	0.399 U	0.352 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.251 J	0.409 U	0.407 UJ	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
alpha-Chlordane	--	1,600	11	0.43 U	0.442 U	0.399 U	0.512 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	1.9 J	0.407 U	0.421 U	0.356 UL	0.375 UJ	0.37 U	0.406 U	0.447 U
Aroclor-1260	--	220	8,000	10.5 U	7.83 J	9.77 U	**704 J**	9.88 U	75.9 J	9.49 U	13.5 J	9.61 U	141	211 J	9.97 U	10.3 U	8.72 UL	56.9	9.06 U	9.95 UL	11 UL
beta-BHC	--	270	342	0.43 U	0.442 U	0.399 U	0.403 U	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Dieldrin	--	30	10.5	0.43 U	0.442 U	0.399 U	2.91 L	0.403 U	1.02 J	0.387 U	0.401 U	0.392 U	4.4 L	4.36	0.407 U	0.421 U	0.356 UL	1 J	0.37 U	0.406 U	0.447 U
Endosulfan II	37,000	6.32	0.43 U	0.442 U	0.399 U	2.32 L	0.403 U	0.757 J	0.387 U	0.401 U	0.392 U	2.31 J	2.29 J	0.407 U	0.421 U	0.356 UL	0.375 UJ	0.37 U	0.406 U	0.447 U	
Endosulfan sulfate	37,000	6.32	0.43 U	0.442 U	0.399 U	19.7 K	0.403 U	0.401 U	0.387 U	0.54 J	0.392 U	4.43 L	7.5 L	0.407 U	0.421 U	0.356 UJ	0.375 U	0.37 U	0.406 U	0.447 UL	
Endrin	--	1,800	1.95	0.43 U	0.442 U	0.399 U	6.12 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	4.14 J	0.529 J	0.407 UJ	0.421 U	0.356 UL	0.375 UJ	0.37 U	0.406 U	0.447 U
Endrin aldehyde	--	1,800	1.95	0.43 U	0.442 U	0.399 U	1.27 K	0.403 U	0.523 J	0.387 U	0.401 U	0.392 U	0.276 J	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Endrin ketone	--	1,800	1.95	0.43 U	0.442 U	0.399 UL	7.34 L	0.403 U	0.401 U	0.387 U	0.401 UJ	0.392 U	1.36 L	2.52 J	0.407 U	0.421 U	0.356 UL	0.375 UL	0.37 U	0.406 U	0.447 UL
gamma-BHC (Lindane)	--	520	7.75	0.43 U	0.442 U	0.399 U	1.17 K	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
gamma-Chlordane	--	1,600	11	0.301 J	0.538 J	0.399 U	3.76 L	0.403 U	0.394 J	0.252 J	0.283 J	0.392 U	1.86	1.79	0.332 J	0.219 J	0.356 UJ	0.565 J	0.316 J	0.312 J	0.364 J
Heptachlor	--	110	52.9	0.43 U	0.442 U	0.399 U	0.27 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Heptachlor epoxide	--	53	52.9	0.43 U	0.442 U	0.399 U	1.44 K	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.187 J	0.409 UL	0.407 UJ	0.421 U	0.356 UL	0.375 UL	0.37 UJ	0.406 U	0.447 U
Methoxychlor	--	31,000	500	0.43 U	0.442 U	0.399 UJ	4.71 K	0.403 UJ	0.545 J	0.387 UJ	0.401 UJ	0.392 UJ	0.327 J	0.257 J	0.407 UJ	0.421 UJ	0.356 UJ	0.456 J	0.37 UJ	0.406 UJ	0.447 UL
Explosives (µg/kg)																					
Nitroglycerin	--	610	--	446 U	500 U	435 U	566 J	441 U	448 U	467 U	485 U	457 U	488 U	493 U	444 U	403 U	410 U	488 U	433 U	413 U	441 U
Total Metals (mg/kg)																					
Aluminum	13,000	7,700	pH < 5.5	**12,100**	**15,800**	**16,400**	**8,930**	**11,600**	**13,600**	**16,800**	**8,500**	**18,100**	**15,300**	**10,300**	**8,670**	**13,700**	5,140	**8,690**	**13,400**	**12,900**	**11,400**
Arsenic	5.54	0.39	18	**14.2 J**	**22.4 J**	**1.9 J**	**2.64 J**	**3.41**	**10.7**	**6.91**	**6.85**	**11.9**	**17.1**	**7.05**	**1.82**	**7.08**	**1.51 J**	**2.69**	**11.6**	**6.7**	**7.79**
Barium	84.5	1,500	330	49.2 J	77.2 J	38.2	48.8	40.5	49	71	89.3	64.7	61.8	37.7	26.9	70.6	44	62.8	31.7	212 J	99.8 J
Beryllium	--	16	40	0.95 J	1.32 J	0.45 J	0.495 J	0.431 J	0.821 J	0.908 J	0.737 J	1.21 J	1.14 J	0.555 J	0.251 J	0.965 J	0.573 U	0.454	0.88 J	1.24 J	0.858 J
Cadmium	--	7	32	0.668 U	0.365 J	0.609 U	1.02 J	0.613 U	0.628 U	0.566 U	0.574 U	0.592 U	0.647 U	0.61 U	0.242 U	0.642 U	0.573 U	0.196 J	0.535 U	0.616 U	0.703 U
Calcium	2,380	--	--	116,000 J	16,800 J	3,160	1,780	6,460	16,900	2,890	3,150	3,020	79,700	5,690	988	3,990	1,020 J	2,550	3,590	8,710 J	6,360 J
Chromium	33.7	0.29	64	**30.9**	**41.8**	**34.6**	**20**	**19.7**	**31.7**	**33**	**19.2**	**39.6**	**39.4**	**22.2**	**13.9**	**37.3**	**8.4**	**16.5 K**	**33.3**	**22.6**	**25.8**
Cobalt	5.18	2.3	13	**4.52 J**	**9.11 J**	3.05 U	1.88 J	1.89 J	**3.4 J**	**3.27 J**	2.13 J	**3.67 J**	**5.26**	2.12 J	1.28 J	**3 J**	2.87 U	1.52	**2.71 J**	**2.63 J**	**2.9 J**
Copper	3.17	310	70	4.48	5.19	4.89	10.1	5.31	6.64	2.95	5.04	4.57	**4.12**	12.6	3.48	2.57 U	2.77 J	10.9 L	3.96	11.5	11.7
Iron	32,000	5,500	5 < pH > 8	**42,300**	**51,100**	**26,600**	**12,700**	**19,300**	**38,600**	**37,200**	**22,500**	**51,400**	**34,400**	**23,800**	**10,200**	**37,600**	**8,050**	**14,700**	**64,700**	**25,900**	**34,200**
Lead	8.79	400	120	9.66 J	14 J	14.4	66.5	11.2	190	8.99	14.8	10.7	10.8	23.2	6.49	8.19	6.53	34.4 L	10.6	18.4	21.7
Magnesium	1,120	--	--	3,300	3,790	1,490 J	983 J	1,100 J	8,710	1,770	1,670	2,180	3,870	2,280	632	3,290	545 J	886 K	1,670	2,960 J	2,050 J
Manganese	176	180	220	**208 J**	**520 J**	17.8	90.6	36.4	75.4	40.4	92.3	67.5	155	111	15.8	32.5	33.2	82 L	100	**373 J**	126 J
Mercury	--	2.3	0.1	0.0227 J	0.0316 J	0.0511	0.0674	0.0795	0.0789	0.0311 J	0.049	0.0358 J	0.0299 J	0.0432	0.053	0.0261 J	0.0251 J	0.0578	0.0324 U	0.0661 J	0.0387 UJ
Nickel	17.6	150	38	14	18.2	3.49	4.5	3.95	9.1	6.12	4.95	7.82	15.9	4.85	2.46	6	1.69 J	3.11	7.28	6.42	7.29
Potassium	901	--	--	2,730	3,170	665 J	547 J	532 J	2,000	769 J	1,470	1,690	3,620	1,270 J	276 J	3,450	860 U	421 K	1,570	1,510 J	1,540 J
Selenium	--	39	0.52	1.67 U	1.74 U	1.52 U	1.5 U	1.53 U	1.57 U	1.42 U	1.43 U	1.48 U	1.62 U	1.53 U	0.606 U	1.61 U	1.43 U	0.301 U	1.34 U	1.54 U	1.76 U
Vanadium	48.3	39	130	30.3	**40**	34	20.4	22.7	33.5	34.5	20.4	**45.1**	34.4	24.5	18.9	34	10.7	20.4	**42.3**	26.4	31.1
Zinc	28	2,300	120	44.8	51.5	24.3	98.6	16.2	32.2	17.1	27.4	22.9	49.9	53.8	6.44	24.6	29.9	36.5 L	21.2	37.4	38.8
Wet Chemistry																					
pH (ph)	--	--	--	8.14 H3	NA	7.93 H3	6.73 H3	8.12 H3	8.12 H3	7.42 H3	7.73 H3	7.2 H3	8.16 H3	8.32 H3	7.35 H3	5.95 H3	8.03 H3	8.05 H3	7.8 H3	8.24 H3	NA
Total organic carbon (TOC) (mg/kg)	--	--	--	6,880	NA	2,690 N	27,500 N	10,900 N*	32,800	3,960	9,110	3,180	1,640 J	15,600 N	1,480	1,940	6,290	14,300	2,880	13,800	NA

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Notes:

Underline indicates exceedance of CAX 95% UTL BKG SB

Bold text indicates exceedance of RSLs Residential Soil Adjusted 1112

Grey Shading indicates exceedance CAX SS ECO SV

RSLs were adjusted for noncarcinogens to account fo exposure to multiple constituent

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of th EPA recommended holding tim

J - Analyte present, value may or may not be accurate c precise

K - Analyte present, value may be biased high, actual valu may be lowe

L - Analyte present, value may be biased low, actual valu may be highe

N - The MS/MSD accuracy and or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

*- Exceeding quality control criteria are associated with th reported results

Table 6
CAX Penniman Lake
Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD70		CAPL-SD71		CAPL-SD72		CAPL-SD73				CAPL-SD74	CAPL-SD75	CAPL-SD76	CAPL-SD77	
Sample ID			CAPL-SD70-1012	CAPL-SD70-1012-V	CAPL-SD71-1012	CAPL-SD71-1012-V	CAPL-SD72-1012	CAPL-SD72-1012-V	CAPL-SD73-1012	CAPL-SD73P-1012	CAPL-SD73-1012-V	CAPL-SD73P-1012-V	CAPL-SD74-1012	CAPL-SD75-1012	CAPL-SD76-1012	CAPL-SD77-1012	CAPL-SD77-1012-V
Sample Date			10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/16/12	10/25/12
Chemical Name																	
Volatile Organic Compounds (µg/kg)																	
2-Butanone	28,000,000	--	NA	125	NA	131	NA	50.6 J	NA	NA	59.5 J	79.9	108	71.2	17.3 J	NA	42.7
Acetone	61,000,000	--	NA	330 J	NA	477 J	NA	181 J	NA	NA	215 J	309 J	418 J	273 J	60.6	NA	137 J
Carbon disulfide	740,000	0.85	NA	4.41 J	NA	13.6 J	NA	26.7 J	NA	NA	29.9 J	19 J	19.2 U	13.4 U	5.3 UJ	NA	6.19 U
Methyl acetate	29,000,000	--	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 U	NA	12.4 U
Methylcyclohexane	--	--	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	26.4
Toluene	820,000	670	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Semivolatile Organic Compounds (µg/kg)																	
Acenaphthene	3,400,000	290	140	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Anthracene	17,000,000	57.2	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Benzaldehyde	1,200,000	--	323 J	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	184 J	421 U	NA
Benzo(a)anthracene	1,500	108	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Benzo(a)pyrene	150	150	79.3 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	36.9	42 U	NA
Benzo(b)fluoranthene	1,500	240	143	NA	20.5 J	NA	27.2 U	NA	19.1 J	17 U	NA	NA	23.3 J	16.6 U	34.9	42 U	NA
Benzo(g,h,i)perylene	1,700,000	170	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	29.9	42 U	NA
Benzo(k)fluoranthene	15,000	240	94.6 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	28.3	42 U	NA
Chrysene	150,000	166	173	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Dibenz(a,h)anthracene	150	33	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Dibenzofuran	78,000	5,100	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Fluoranthene	2,300,000	423	227	NA	32.5	NA	27.2 U	NA	22.4 J	17 U	NA	NA	34.9 J	16.6 U	48.2	42 U	NA
Fluorene	2,300,000	77.4	70.7 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Indeno(1,2,3-cd)pyrene	1,500	200	66 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	23.2	42 U	NA
Phenanthrene	17,000,000	204	138	NA	16.3 J	NA	27.2 U	NA	16.2 U	17 U	NA	NA	22.5 J	16.6 U	30.5	53.1 J	NA
Pyrene	1,700,000	195	216	NA	29.6 J	NA	27.2 U	NA	23.7 J	17 U	NA	NA	32.4 J	16.6 U	53.3	42 U	NA
Pesticide/Polychlorinated Biphenyls (µg/kg)																	
4,4'-DDD	20,000	4.88	43.9 J	NA	1.52 J	NA	2.79 U	NA	1.66 J	1.23 J	NA	NA	2.13 U	1.67 U	23.3 J	2.64 L	NA
4,4'-DDE	14,000	3.16	121 J	NA	7.95 J	NA	6.03 J	NA	14 J	10.1 J	NA	NA	5.19 J	4.58 J	45.9 J	46.5 J	NA
4,4'-DDT	17,000	4.16	21 J	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.966 J	3.61 J	NA
Aldrin	290	2	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	0.83 U	NA
alpha-BHC	770	6	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	1.54 J	NA
alpha-Chlordane	16,000	3.24	29.6 L	NA	1.51 UL	NA	2.79 U	NA	1.97 J	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	9.57 L	NA
Aroclor-1260	2,200	59.8	**8,240**	NA	57.4 J	NA	68.2 U	NA	78.5 J	48.4 J	NA	NA	52.3 U	25.9 J	37.3 J	720 J	NA
beta-BHC	2,700	5	0.98 J	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	0.287 L	NA
delta-BHC	2,700	3	0.954 UL	NA	1.51 U	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	1.14 J	NA
Dieldrin	300	1.9	106 J	NA	1.68 J	NA	2.86 J	NA	2.64 J	1.48 J	NA	NA	2.13 U	1.67 U	0.377 L	15.1 J	NA
Endosulfan I	370,000	2.9	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	0.83 U	NA
Endosulfan II	370,000	14	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	23.8 J	0.69 UL	1.41 L	NA
Endosulfan sulfate	370,000	5.4	0.954 UL	NA	2.36 J	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	12.8 J	NA
Endrin	18,000	2.22	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.576 L	13.7	NA
Endrin aldehyde	18,000	2.22	16.4 J	NA	2.38 J	NA	3.95 J	NA	3.53 J	2.58 J	NA	NA	2.14 J	2.49 J	0.368 L	0.637 J	NA
Endrin ketone	18,000	2.22	34.7 J	NA	4.31 J	NA	4.6 J	NA	5.62 J	3.4 J	NA	NA	2.88 J	1.67 U	0.69 U	0.83 UL	NA
gamma-BHC (Lindane)	5,200	2.37	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.485 J	0.364 J	NA
gamma-Chlordane	16,000	3.24	94.2 J	NA	5.18 J	NA	17 J	NA	1.8 J	2.98 J	NA	NA	12.7 J	3.09 J	4.03 L	35.9 J	NA
Heptachlor	1,100	68	0.954 UL	NA	1.51 U	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	1.97 J	NA
Heptachlor epoxide	530	2.47	2.42 J	NA	1.51 U	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	0.708 L	NA
Methoxychlor	310,000	19	82.2 J	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	0.83 UL	NA
Explosives (µg/kg)																	
1,3-Dinitrobenzene	6,100	6.7	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	469 J	303 J	NA
2,4,6-Trinitrotoluene	36,000	92	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
3-Nitrotoluene	6,100	1,920	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	882	198 U	NA
4-Nitrotoluene	240,000	4,060	189 U	NA	195 U	NA	196 U	NA	198 U	104 J	NA	NA	192 U	330 J	194 U	198 U	NA
HMX	3,800,000	4.7	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
Nitroglycerin	6,100	--	472 U	NA	1,210 J	NA	490 U	NA	1,250 J	1,250	NA	NA	486 J	1,230 J	485 U	495 U	NA
Tetryl	240,000	--	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	245 J	198 U	NA
Total Metals (mg/kg)																	
Aluminum	77,000	25,500	8,670	NA	18,300	NA	28,200	NA	25,200	22,700	NA	NA	17,200	20,500	6,530	2,430	NA
Antimony	31	3	6.01 U	NA	9.2 U	NA	17.2 U	NA	9.92 U	10.3 U	NA	NA	5.35 U	4.27 U	1.65 U	1.03 U	NA
Arsenic	3.9	9.79	**12.7**	NA	**33.9**	NA	**51.5**	NA	**51.7**	**50.9**	NA	NA	**42.4**	**47.3**	**5.56**	**9.1**	NA
Barium	15,000	20	43	NA	72.6	NA	107	NA	93.9	85.5	NA	NA	75.4	88.3	28.1	12.9	NA
Beryllium	160	--	1.5 U	NA	2.3 U	NA	4.3 U	NA	2.48 U	2.57 U	NA	NA	0.949 J	1 J	0.283 J	0.171 J	NA
Cadmium	70	0.99	1.5 U	NA	2.3 U	NA	4.3 U	NA	2.48 U	2.57 U	NA	NA	1.34 U	1.07 U	0.414 U	0.144 J	NA
Calcium	--	--	32,700	NA	102,000	NA	122,000	NA	88,800	89,300	NA	NA	80,400	104,000	2,870	2,560	NA
Chromium	2.9	43.4	**19.4**	NA	**36.6**	NA	**50.4**	NA	**46.3**	**43.1**	NA	NA	**36.1**	**38.7**	**9**	**5.73**	NA
Cobalt	23	50	7.51 U	NA	11.5 U	NA	21.5 U	NA	12.4 U	12.8 U	NA	NA	4.99 J	5.77 J	1.46 J	1.71	NA

Table 6
CAX Penniman Lake
Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD70		CAPL-SD71		CAPL-SD72		CAPL-SD73				CAPL-SD74	CAPL-SD75	CAPL-SD76	CAPL-SD77	
Sample ID			CAPL-SD70-1012	CAPL-SD70-1012-V	CAPL-SD71-1012	CAPL-SD71-1012-V	CAPL-SD72-1012	CAPL-SD72-1012-V	CAPL-SD73-1012	CAPL-SD73P-1012	CAPL-SD73-1012-V	CAPL-SD73P-1012-V	CAPL-SD74-1012	CAPL-SD75-1012	CAPL-SD76-1012	CAPL-SD77-1012	CAPL-SD77-1012-V
Sample Date			10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/16/12	10/25/12
Chemical Name																	
Copper	3,100	31.6	33	NA	43.1	NA	40.2	NA	50.1	43.7	NA	NA	46	56.9	4.7	4.63	NA
Cyanide	22	--	0.682 U	NA	1.05 U	NA	2.26 U	NA	1.27 U	1.24 U	NA	NA	1.66 U	1.18 U	0.522 U	0.641 U	NA
Iron	55,000	20,000	21,900	NA	30,100	NA	41,300	NA	39,300	36,000	NA	NA	34,900	34,000	5,960	4,360	NA
Lead	4,000	35.8	66.8	NA	72.8	NA	69.2	NA	81.6	74.7	NA	NA	56.2	69.3	16.3	15.2	NA
Magnesium	--	--	2,100 J	NA	2,900 J	NA	4,320 J	NA	3,820 J	3,440 J	NA	NA	2,800 J	3,270	531 J	337 J	NA
Manganese	1,800	460	102	NA	119	NA	206	NA	163	147	NA	NA	163	143	25.4	14.6	NA
Mercury	23	0.18	0.11	NA	0.134 J	NA	0.198 J	NA	0.147 J	0.164 J	NA	NA	0.126 J	0.136 J	0.0408 J	0.0656 J	NA
Nickel	1,500	22.7	11.7	NA	11.9	NA	18.1 J	NA	15.4	14.4	NA	NA	13	14.8	3.63	2.17	NA
Potassium	--	--	1,480 J	NA	2,400 J	NA	3,570 J	NA	3,070 J	2,770 J	NA	NA	2,390 J	2,570 J	397 J	384 J	NA
Selenium	390	2	3.75 U	NA	5.75 U	NA	10.7 U	NA	6.2 U	6.42 U	NA	NA	3.34 U	2.67 U	1.03 U	0.644 U	NA
Silver	390	1	1.5 U	NA	2.3 U	NA	4.3 U	NA	2.48 U	2.57 U	NA	NA	1.34 U	1.07 U	0.414 U	0.258 U	NA
Sodium	--	--	2,250 U	NA	3,450 U	NA	6,450 U	NA	3,720 U	3,850 U	NA	NA	2,010 U	755 J	621 U	386 U	NA
Vanadium	390	--	25.4	NA	46.3	NA	69.9	NA	58.3	57.1	NA	NA	52.1	55.5	15	7.66	NA
Zinc	23,000	121	190	NA	173	NA	186	NA	173	160	NA	NA	133	148	18.7	48.6	NA
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)																	
Zinc, SEM	--	--	2.64	NA	1.66 D	NA	1.22	NA	1.54 D	NA	NA	NA	1.08	0.377 D	0.0847	0.597	NA
Acid volatile sulfide, SEM	--	--	10.3	NA	13.7	NA	14.4	NA	12.8	NA	NA	NA	19.8	4.16	0.411	4.96	NA
Cadmium, SEM	--	--	0.00566	NA	0.00245 J	NA	0.00191 J	NA	0.00176 J	NA	NA	NA	0.00246 J	4.06E-04 J	8.24E-04 U	0.00119 J	NA
Copper, SEM	--	--	0.112	NA	0.0751	NA	0.159	NA	0.303	NA	NA	NA	0.246	0.103	0.0079 J	0.0193 J	NA
Lead, SEM	--	--	0.324	NA	0.246 D	NA	0.162	NA	0.279 D	NA	NA	NA	0.18	0.0722 D	0.0256	0.0832	NA
Nickel, SEM	--	--	0.103	NA	0.0307 J	NA	0.0266 J	NA	0.0361 J	NA	NA	NA	0.0364 J	0.00837 J	0.00343 J	0.0116 J	NA
Wet Chemistry																	
pH (ph)	--	--	7.47 H3	NA	6.85 H3	NA	6.93 H3	NA	7.01 H3	NA	NA	NA	7.3 H3	7.34 H3	6.83 H3	6.71 H3	NA
Total organic carbon (TOC) (mg/kg)	--	--	98,300	NA	51,800	NA	107,000	NA	37,100	NA	NA	NA	79,300	84,300	51,400	91,100	NA
Grain Size (pct)																	
Coarse Sand (%)	--	--	2.3	NA	0	NA	1.8	NA	0	NA	NA	NA	0	0	4	2.9	NA
Fine Sand (%)	--	--	42.5	NA	7.4	NA	14.2	NA	3.1	NA	NA	NA	5	4	75	56.3	NA
Fines (%)	--	--	46.7	NA	92.2	NA	79.7	NA	96.6	NA	NA	NA	94.6	95.8	12.4	26	NA
Gravel (%)	--	--	1.9	NA	0	NA	1.1	NA	0	NA	NA	NA	0	0	0.9	1.7	NA
Medium Sand (%)	--	--	6.6	NA	0.4	NA	3.2	NA	0.3	NA	NA	NA	0.4	0.2	7.7	13.1	NA
Sand (%)	--	--	51.4	NA	7.8	NA	19.2	NA	3.4	NA	NA	NA	5.4	4.2	86.7	72.3	NA
GRAINSIZE (PCT/P)																	
GS03 Sieve 3" (75 mm)	--	--	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS05 Sieve 2" (50 mm)	--	--	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS06 Sieve 1.5" (37.5 mm)	--	--	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS07 Sieve 1" (25.0 mm)	--	--	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS08 Sieve 0.75" (19.0 mm)	--	--	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS10 Sieve 0.375" (9.5 mm)	--	--	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
Sieve No. 004 (4.75 mm)	--	--	98.1	NA	100	NA	98.9	NA	100	NA	NA	NA	100	100	99.1	98.3	NA
Sieve No. 010 (2.00 mm)	--	--	95.8	NA	100	NA	97.1	NA	100	NA	NA	NA	100	100	95.1	95.4	NA
Sieve No. 020 (850 um)	--	--	94.3	NA	99.9	NA	96.1	NA	99.9	NA	NA	NA	100	100	93.6	92.2	NA
Sieve No. 040 (425 um)	--	--	89.2	NA	99.6	NA	93.9	NA	99.7	NA	NA	NA	99.6	99.8	87.4	82.3	NA
Sieve No. 060 (250 um)	--	--	66.2	NA	98.5	NA	90.6	NA	99.3	NA	NA	NA	98.8	99.4	57.1	53.6	NA
Sieve No. 080 (180 um)	--	--	54.9	NA	97	NA	88.1	NA	98.9	NA	NA	NA	98.1	99	31.9	36.7	NA
Sieve No. 100 (150 um)	--	--	52.2	NA	95.9	NA	86.2	NA	98.4	NA	NA	NA	97.5	98.6	22.5	30.6	NA
Sieve No. 200 (75 um)	--	--	46.7	NA	92.2	NA	79.7	NA	96.6	NA	NA	NA	94.6	95.8	12.4	26	NA

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Notes:

Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment

Shading indicates exceedance of CAX Freshwater Sediment ESV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed
* - Exceeding quality control criteria are associated with the reported result
B - Analyte not detected above the level reported in blanks
D - Compound identified in an analysis at a secondary dilution factor
H3- The sample for this analyte was received outside of the EPA recommended holding time
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher
M - Indicates that the sample matrix interfered with the quantitation of the analyte
N- The MS/MSD accuracy and/ or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
UL - Analyte not detected, quantitation limit is probably higher
Y- The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side
mg/kg - Milligrams per kilogram
pct - Percent
pct/p - Percent passed
ph - pH units
µg/kg - Micrograms per kilogram
µmol/g - Micromoles per gram

Table 6
CAX Penniman Lake
Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD78	CAPL-SD79		CAPL-SD80	CAPL-SD81	CAPL-SD82	CAPL-SD83		CAPL-SD84		CAPL-SD85		CAPL-SD86		CAPL-SD87	
Sample ID			CAPL-SD78-1012	CAPL-SD79-1012	CAPL-SD79P-1012	CAPL-SD80-1012	CAPL-SD81-1012	CAPL-SD82-1012	CAPL-SD83-1012	CAPL-SD83-1012-V	CAPL-SD84-1012	CAPL-SD84-1012-A	CAPL-SD85-1012	CAPL-SD85-1012-A	CAPL-SD86-1012	CAPL-SD86-1012-A	CAPL-SD87-1012	CAPL-SD87-1012-A
Sample Date			10/16/12	10/16/12	10/16/12	10/16/12	10/18/12	10/18/12	10/16/12	10/25/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12
Chemical Name																		
Volatile Organic Compounds (µg/kg)																		
2-Butanone	28,000,000	--	23.1 J	23.8	39.7	42.7	42.2	90.7	NA	5.92 J	6.15 U	NA	3.93 J	NA	4.8 U	NA	28.8	NA
Acetone	61,000,000	--	77.5 J	85.3	121	150	229 J	399 J	NA	22.6 J	12.3 UJ	NA	21.3 J	NA	9.6 UJ	NA	111 J	NA
Carbon disulfide	740,000	0.85	5.21 UL	4.9 UJ	6.48 UJ	3.5 J	9.22 J	11.7 J	NA	2.26 J	3.07 U	NA	3.04 U	NA	2.4 U	NA	3.7 U	NA
Methyl acetate	29,000,000	--	10.4 UJ	5.12 J	8.47 J	10.1 U	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA	7.39 U	NA
Methylcyclohexane	--	--	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA	3.7 U	NA
Toluene	820,000	670	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	6.87 J	3.07 U	NA	3.04 U	NA	2.4 U	NA	3.7 U	NA
Semivolatile Organic Compounds (µg/kg)																		
Acenaphthene	3,400,000	290	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	336 K	NA
Anthracene	17,000,000	57.2	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	265	NA
Benzaldehyde	1,200,000	--	398 U	326 U	459 U	212 J	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA	203 U	NA
Benzo(a)anthracene	1,500	108	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	125	NA
Benzo(a)pyrene	150	150	39.7 U	9.18 J	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	20.3 U	NA
Benzo(b)fluoranthene	1,500	240	39.7 U	10.5 J	45.8 U	36.4 U	17.9 J	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	81.9 K	NA
Benzo(g,h,i)perylene	1,700,000	170	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	20.3 U	NA
Benzo(k)fluoranthene	15,000	240	39.7 U	8.89 J	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	20.3 U	NA
Chrysene	150,000	166	57.2 J	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	130 K	NA
Dibenz(a,h)anthracene	150	33	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	20.3 U	NA
Dibenzofuran	78,000	5,100	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA	125 J	NA
Fluoranthene	2,300,000	423	39.7 U	22.4	45.8 U	36.4 U	18.5 J	96.9 U	6.97 U	NA	19.6 U	NA	22.2 J	NA	20.3 U	NA	440	NA
Fluorene	2,300,000	77.4	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	285 K	NA
Indeno(1,2,3-cd)pyrene	1,500	200	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	24.2 J	NA
Phenanthrene	17,000,000	204	39.7 U	6.51 U	45.8 U	37 J	13.9 J	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	949	NA
Pyrene	1,700,000	195	41.4 J	22.2	45.8 U	44.3 J	14.6 J	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA	497 K	NA
Pesticide/Polychlorinated Biphenyls (µg/kg)																		
4,4'-DDD	20,000	4.88	10.3 J	1.69 L	3.47 J	1.39 L	1.31 U	1.91 U	2.88 L	NA	10.2 J	NA	12.8 K	NA	6.53 J	NA	6.56 J	NA
4,4'-DDE	14,000	3.16	12.6	13.6 J	23.6 J	21.5	1.22 J	3.49 J	2.15 L	NA	50.8 J	NA	64.9 J	NA	18.5 L	NA	13.1	NA
4,4'-DDT	17,000	4.16	0.932 J	1.14 J	1.12 J	0.696 J	1.31 U	1.91 U	0.694 UJ	NA	137 K	NA	71 J	NA	27.6 J	NA	18.3 J	NA
Aldrin	290	2	0.8 UL	0.66 U	0.328 J	0.505 L	1.31 U	1.91 U	0.468 L	NA	3.54 J	NA	1.2 J	NA	0.407 J	NA	0.681 J	NA
alpha-BHC	770	6	0.536 J	0.66 U	0.912 U	0.585 L	1.31 U	1.91 U	0.49 L	NA	0.408 U	NA	0.443 U	NA	0.414 UL	NA	0.419 U	NA
alpha-Chlordane	16,000	3.24	0.8 UL	0.914 J	0.302 J	0.715 U	1.31 U	1.91 U	0.694 UL	NA	6.82 J	NA	13.1 K	NA	8.56 J	NA	9.44	NA
Aroclor-1260	2,200	59.8	66.1 L	212 J	354 J	156	32 U	46.9 U	29.3 L	NA	**16,200 J**	NA	**8,300 J**	NA	**4,090 J**	NA	**3,780 J**	NA
beta-BHC	2,700	5	0.8 UL	0.66 U	0.912 U	0.744 L	1.31 U	1.91 U	0.694 UL	NA	0.408 UL	NA	2.09 K	NA	0.414 UL	NA	0.419 U	NA
delta-BHC	2,700	3	0.8 U	1.5 J	0.912 U	0.503 J	1.31 U	1.91 U	0.694 UL	NA	0.208 J	NA	1.3 K	NA	0.505 J	NA	1.04 J	NA
Dieldrin	300	1.9	0.8 U	4.13 J	6.63 J	2.42 L	1.31 U	1.91 U	0.694 UL	NA	**364 K**	NA	167 K	NA	66.6 J	NA	79.2	NA
Endosulfan I	370,000	2.9	0.8 U	0.66 U	0.912 U	0.715 UL	1.31 U	1.91 U	0.694 UL	NA	0.408 U	NA	0.615 J	NA	0.325 J	NA	0.81 J	NA
Endosulfan II	370,000	14	0.8 U	2.25 J	3.37 J	1.36 J	1.31 U	1.91 U	0.694 UL	NA	56.1 J	NA	26.1 K	NA	43.9 J	NA	15.4 J	NA
Endosulfan sulfate	370,000	5.4	22.8 K	4.47 J	6.65 J	0.715 U	1.31 U	1.91 U	0.694 UL	NA	681 K	NA	319 K	NA	0.414 UL	NA	0.419 U	NA
Endrin	18,000	2.22	1.14 L	3.07 L	5.37 J	0.715 UL	1.31 U	1.91 U	0.694 UL	NA	143 K	NA	51.7	NA	29.5 J	NA	35.7 J	NA
Endrin aldehyde	18,000	2.22	0.8 UL	0.79 J	0.683 J	3.05 L	1.31 U	1.91 U	0.733 L	NA	17.4 J	NA	8.26 J	NA	4.39 J	NA	5.11 J	NA
Endrin ketone	18,000	2.22	0.8 U	0.66 U	0.912 U	0.715 U	1.31 U	1.91 U	0.694 UL	NA	49.4 J	NA	22.2 J	NA	15.1 J	NA	12.6 J	NA
gamma-BHC (Lindane)	5,200	2.37	1 J	0.573 J	0.744 J	0.715 U	1.31 U	1.91 U	0.694 UL	NA	0.135 J	NA	0.614 J	NA	0.414 UL	NA	0.419 U	NA
gamma-Chlordane	16,000	3.24	2.58	3.78 J	6.3 J	2.71	0.735 J	2.58 J	0.694 UL	NA	22.7 J	NA	40.1	NA	17.2 J	NA	28.4	NA
Heptachlor	1,100	68	0.9 L	0.66 U	0.744 J	0.715 UL	1.31 U	1.91 U	1.27 L	NA	0.361 B	NA	0.974	NA	0.414 UL	NA	0.177 B	NA
Heptachlor epoxide	530	2.47	0.8 UL	0.66 UL	0.912 U	0.715 UL	1.31 U	1.91 U	0.343 L	NA	3.58 J	NA	5.37 K	NA	0.981 J	NA	1.22 J	NA
Methoxychlor	310,000	19	4.11 J	0.66 UL	0.912 U	4.73 J	1.31 U	1.91 U	0.302 J	NA	49.2 J	NA	25.7 J	NA	12.8 J	NA	11.4 J	NA
Explosives (µg/kg)																		
1,3-Dinitrobenzene	6,100	6.7	151 J	179 U	384 J	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA	182 U	NA
2,4,6-Trinitrotoluene	36,000	92	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA	182 U	NA
3-Nitrotoluene	6,100	1,920	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA	182 U	NA
4-Nitrotoluene	240,000	4,060	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA	182 U	NA
HMX	3,800,000	4.7	195 U	179 U	464 J	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA	182 U	NA
Nitroglycerin	6,100	--	488 U	448 U	493 U	500 U	476 U	641 J	490 U	NA	455 U	NA	435 U	NA	455 U	NA	455 U	NA
Tetryl	240,000	--	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA	182 U	NA
Total Metals (mg/kg)																		
Aluminum	77,000	25,500	4,040	2,630	3,200	5,770	26,000	17,400	13,300	NA	2,310	NA	6,860	NA	2,270	NA	2,890	NA
Antimony	31	3	0.952 UL	0.778 U	1.14 U	1.78 U	7.78 U	4.8 U	4.42 U	NA	0.502 U	NA	3.89	NA	0.995 U	NA	1.07 U	NA
Arsenic	3.9	9.79	**5.53**	**7.87**	**7.53**	**16.8**	**27.9**	**46.3**	**30.2**	NA	3.22	NA	**5.62**	NA	2.24	NA	2.42	NA
Barium	15,000	20	22.3	15.6	18.6	26.8	63.5	72.9	21.7 J	NA	12.9	NA	90.2	NA	22.8	NA	16.5	NA
Beryllium	160	--	0.253 J	0.181 J	0.214 J	0.306 J	1.15 J	0.803 J	0.862 J	NA	0.22 J	NA	5.98	NA	1.19	NA	0.393 J	NA
Cadmium	70	0.99	0.242 J	0.136 J	0.157 J	0.456 J	1.95 U	1.2 U	1.1 U	NA	0.112 J	NA	0.712 U	NA	0.249 U	NA	0.267 U	NA
Calcium	--	--	4,310	3,380	3,720	23,100	18,700	87,900	2,070 J	NA	29,600	NA	50,700	NA	40,200	NA	26,000	NA
Chromium	2.9	43.4	**8.21**	**5.31**	**5.91**	**9.76**	**45.6 J**	**29.7**	**56.3**	NA	**7.75**	NA	**45**	NA	**11.3**	NA	**8.94**	NA
Cobalt	23	50	1.83	1.15 J	1.43 J	1.6 J	8.67 J	5.34 J	5.52 U	NA	1.03	NA	**34.5**	NA	5.24	NA	1.54 J	NA

Table 6
CAX Penniman Lake
Sediment Exceedances Analytical Results
October - November 2012

Station ID	**Adjusted Residential RSL x 10 for SD 1112**	**CAX Freshwater Sediment ESV**	CAPL-SD78	CAPL-SD79		CAPL-SD80	CAPL-SD81	CAPL-SD82	CAPL-SD83		CAPL-SD84		CAPL-SD85		CAPL-SD86		CAPL-SD87	
Sample ID			CAPL-SD78-1012	CAPL-SD79-1012	CAPL-SD79P-1012	CAPL-SD80-1012	CAPL-SD81-1012	CAPL-SD82-1012	CAPL-SD83-1012	CAPL-SD83-1012-V	CAPL-SD84-1012	CAPL-SD84-1012-A	CAPL-SD85-1012	CAPL-SD85-1012-A	CAPL-SD86-1012	CAPL-SD86-1012-A	CAPL-SD87-1012	CAPL-SD87-1012-A
Sample Date			10/16/12	10/16/12	10/16/12	10/16/12	10/18/12	10/18/12	10/16/12	10/25/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12
Chemical Name																		
Copper	3,100	31.6	6.98	3.81	4.54	14.1	25.8	48.4	13.8	NA	3.99	NA	1,000	NA	98.3	NA	16.1	NA
Cyanide	22	--	0.56 U	4.86	0.672 U	0.516 U	0.922 U	1.38 U	0.496 U	NA	0.155 J	NA	0.19 J	NA	0.306 U	NA	0.354 J	NA
Iron	55,000	20,000	7,870	4,300	4,900	7,790	36,600	26,100	**68,200**	NA	8,880	NA	31,600	NA	9,880	NA	6,810	NA
Lead	4,000	35.8	19.8	11.6	13.2	23	30.4	49.7	23.6	NA	90.3	NA	853	NA	126	NA	72.9	NA
Magnesium	--	--	556 J	328 J	377 J	803 J	4,270 J	2,530 J	3,080	NA	772 J	NA	1,940 J	NA	742 J	NA	638 J	NA
Manganese	1,800	460	14.9	13.4	15.5	40.2	199	144	98.5	NA	32.4	NA	275	NA	63.6	NA	20.6	NA
Mercury	23	0.18	0.0413 J	0.0476 J	0.0733 J	0.0641 J	0.103 J	0.14 J	0.0342 J	NA	0.0174 J	NA	0.0196 J	NA	0.0397 U	NA	0.0201 J	NA
Nickel	1,500	22.7	3.06	1.99	2.31	3.72	18.4	13	6.27	NA	2.88	NA	564	NA	65.4	NA	11.1	NA
Potassium	--	--	724 L	343 J	409 J	663 J	3,220 J	1,900 J	2,010 J	NA	780	NA	1,740 J	NA	730	NA	785	NA
Selenium	390	2	0.53 J	0.486 U	0.71 U	1.11 U	4.86 U	3 U	2.76 U	NA	0.314 U	NA	1.78 U	NA	0.622 UL	NA	0.668 U	NA
Silver	390	1	0.238 U	0.194 U	0.284 U	0.446 U	1.95 U	1.2 U	1.1 U	NA	0.125 UJ	NA	0.519 J	NA	0.249 UJ	NA	0.267 UJ	NA
Sodium	--	--	357 U	292 U	426 U	668 U	2,920 U	1,800 U	5,040	NA	168 J	NA	519 J	NA	340 J	NA	158 J	NA
Vanadium	390	--	12.2	7.34	7.96	13.7	58.5	45	171	NA	9.12	NA	20.6	NA	7.99	NA	8.37	NA
Zinc	23,000	121	83.1 L	33.5	37	70	89.5	110	111	NA	77.7	NA	2,950	NA	525	NA	119	NA
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)																		
Zinc, SEM	--	--	0.859	0.385	NA	0.764	0.53	0.752	0.439	NA	NA	0.282 D	NA	4.43 D	NA	0.974	NA	0.676
Acid volatile sulfide, SEM	--	--	0.484 J	3.42	NA	5.52	5.47	14.9	7.68	NA	NA	0.114 J	NA	1.03	NA	2.08	NA	2.57
Cadmium, SEM	--	--	0.00218 J	0.0013 J	NA	0.00383	0.00184 U	0.00272 U	0.00122 U	NA	NA	5.73E-04 U	NA	5.52E-04 U	NA	3.84E-04 J	NA	9.26E-04 J
Copper, SEM	--	--	0.0618	0.0117 J	NA	0.0865	0.0261 J	0.248	0.0202 J	NA	NA	0.0178	NA	0.675	NA	0.124	NA	0.0646
Lead, SEM	--	--	0.0796	0.0405	NA	0.0882	0.0617	0.164	0.0382	NA	NA	0.0463 D	NA	0.393 D	NA	0.101	NA	0.0696
Nickel, SEM	--	--	0.015 J	0.0071 J	NA	0.00828 J	0.0142 J	0.0206 J	0.0107 J	NA	NA	0.00368 JY	NA	0.468 Y	NA	0.112 Y	NA	0.0503 Y
Wet Chemistry																		
pH (ph)	--	--	6.9 H3	6.98 H3	NA	7.29 H3	7.19 H3	7.16 H3	7.24 H3	NA	8.28 H3	NA	8.11 H3	NA	7.88 H3	NA	8.04 H3	NA
Total organic carbon (TOC) (mg/kg)	--	--	71,500	68,400	NA	69,200	108,000	134,000	36,100	NA	2,300	NA	3,440	NA	3,210	NA	7,080	NA
Grain Size (pct)																		
Coarse Sand (%)	--	--	5.1	2.2	NA	1	0	0.9	6.4	NA	6.5	NA	6.9	NA	3.6	NA	3.8	NA
Fine Sand (%)	--	--	73.8	77.8	NA	51.2	3.7	5.7	30.4	NA	55.8	NA	56.1	NA	73.3	NA	71.9	NA
Fines (%)	--	--	10.6	11.1	NA	40.6	95.9	92.8	13.7	NA	13.5	NA	2.1	NA	4.4	NA	4.2	NA
Gravel (%)	--	--	2.3	0.3	NA	0.3	0	0.4	34.1	NA	11.6	NA	5.8	NA	4.1	NA	10.8	NA
Medium Sand (%)	--	--	8.2	8.6	NA	6.9	0.4	0.2	15.4	NA	12.6	NA	29.2	NA	14.6	NA	9.3	NA
Sand (%)	--	--	87.1	88.6	NA	59.1	4.1	6.8	52.2	NA	74.9	NA	92.2	NA	91.5	NA	85	NA
GRAINSIZE (PCT/P)																		
GS03 Sieve 3" (75 mm)	--	--	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA	100	NA
GS05 Sieve 2" (50 mm)	--	--	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA	100	NA
GS06 Sieve 1.5" (37.5 mm)	--	--	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA	100	NA
GS07 Sieve 1" (25.0 mm)	--	--	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA	100	NA
GS08 Sieve 0.75" (19.0 mm)	--	--	100	100	NA	100	100	100	76.3	NA	92.5	NA	100	NA	100	NA	100	NA
GS10 Sieve 0.375" (9.5 mm)	--	--	98.7	100	NA	100	100	100	72.9	NA	91.9	NA	97.4	NA	97.6	NA	94.6	NA
Sieve No. 004 (4.75 mm)	--	--	97.7	99.7	NA	99.7	100	99.6	65.9	NA	88.4	NA	94.2	NA	95.9	NA	89.2	NA
Sieve No. 010 (2.00 mm)	--	--	92.6	97.5	NA	98.7	100	98.7	59.5	NA	81.9	NA	87.3	NA	92.3	NA	85.4	NA
Sieve No. 020 (850 um)	--	--	91.2	96.4	NA	97.2	100	98.7	54.1	NA	75.9	NA	72.4	NA	87	NA	82.2	NA
Sieve No. 040 (425 um)	--	--	84.4	88.9	NA	91.8	99.6	98.5	44.1	NA	69.3	NA	58.1	NA	77.7	NA	76.1	NA
Sieve No. 060 (250 um)	--	--	57.8	57.1	NA	75	98.7	97.7	32.8	NA	42.8	NA	26.6	NA	42.6	NA	44.4	NA
Sieve No. 080 (180 um)	--	--	35	31.4	NA	61.3	98	97.1	26.1	NA	22.5	NA	8.9	NA	16.3	NA	18.1	NA
Sieve No. 100 (150 um)	--	--	21	20.6	NA	53.3	97.6	96.5	21.8	NA	17.2	NA	4.9	NA	9.1	NA	10.1	NA
Sieve No. 200 (75 um)	--	--	10.6	11.1	NA	40.6	95.9	92.8	13.7	NA	13.5	NA	2.1	NA	4.4	NA	4.2	NA

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Notes:

Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment

Shading indicates exceedance of CAX Freshwater Sediment ESV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed
* - Exceeding quality control criteria are associated with the reported result
B - Analyte not detected above the level reported in blanks
D - Compound identified in an analysis at a secondary dilution factor
H3- The sample for this analyte was received outside of the EPA recommended holding time
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher
M - Indicates that the sample matrix interfered with the quantitation of the analyte
N- The MS/MSD accuracy and/ or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
UL - Analyte not detected, quantitation limit is probably higher
Y- The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side
mg/kg - Milligrams per kilogram
pct - Percent
pct/p - Percent passed
ph - pH units
µg/kg - Micrograms per kilogram
µmol/g - Micromoles per gram

Table 6
CAX Penniman Lake
Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SWSD62		CAPL-SWSD63		CAPL-SWSD64				CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID			CAPL-SD62-1012	CAPL-SD62-1012-V	CAPL-SD63-1012	CAPL-SD63-1012-V	CAPL-SD64-1012	CAPL-SD64P-1012	CAPL-SD64-1012-V	CAPL-SD64P-1012-V	CAPL-SD65-1012	CAPL-SD66-1012	CAPL-SD67-1012	CAPL-SD68-1012	CAPL-SD69-1012
Sample Date			10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/18/12	10/17/12
Chemical Name															
Volatile Organic Compounds (µg/kg)															
2-Butanone	28,000,000	--	NA	101	NA	146	NA	NA	156	135	17.6 J	25.1	15.9 J	50.3 J	43.7
Acetone	61,000,000	--	NA	323 J	NA	472 J	NA	NA	543 J	460 J	70.1 J	87 J	47.2	204 J	140 J
Carbon disulfide	740,000	0.85	NA	9.93 J	NA	13.3 J	NA	NA	17.5 J	13.2 J	4.87 U	4.66 U	4.35 UJ	13.9 L	7.4 U
Methyl acetate	29,000,000	--	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 U	30.2 U	14.8 U
Methylcyclohexane	--	--	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Toluene	820,000	670	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Semivolatile Organic Compounds (µg/kg)															
Acenaphthene	3,400,000	290	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
Anthracene	17,000,000	57.2	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	41.3 J	85.8 U	8.37 U
Benzaldehyde	1,200,000	--	888 U	NA	384 J	NA	718 U	744 U	NA	NA	377 U	170 J	316 U	861 U	420 U
Benzo(a)anthracene	1,500	108	17.7 U	NA	78.2 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	223	85.8 U	8.37 U
Benzo(a)pyrene	150	150	17.7 U	NA	93.3 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	**303**	85.8 U	8.37 U
Benzo(b)fluoranthene	1,500	240	17.7 U	NA	96.3 J	NA	14.3 U	14.8 U	NA	NA	13.2 J	6.29 U	400	85.8 U	8.37 U
Benzo(g,h,i)perylene	1,700,000	170	17.7 U	NA	94.2 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	7.31 J	208	85.8 U	8.37 U
Benzo(k)fluoranthene	15,000	240	17.7 U	NA	102 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	335	85.8 U	8.37 U
Chrysene	150,000	166	17.7 U	NA	185	NA	14.3 U	14.8 U	NA	NA	10.3 J	9.23 J	285	85.8 U	8.37 U
Dibenz(a,h)anthracene	150	33	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	74.1	85.8 U	8.37 U
Dibenzofuran	78,000	5,100	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Fluoranthene	2,300,000	423	17.7 U	NA	174	NA	16.5 J	20.8 J	NA	NA	16	12.2 J	123	85.8 U	8.37 U
Fluorene	2,300,000	77.4	17.7 U	NA	99.7 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
Indeno(1,2,3-cd)pyrene	1,500	200	17.7 U	NA	90.1 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	238	85.8 U	8.37 U
Phenanthrene	17,000,000	204	17.7 U	NA	181	NA	14.3 U	14.8 U	NA	NA	12.9 J	10.5 J	69.7	85.8 U	8.37 U
Pyrene	1,700,000	195	17.7 U	NA	194	NA	18.5 J	16.8 J	NA	NA	13.6 J	13.3	108	85.8 U	8.37 U
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	20,000	4.88	1.81 UL	NA	7.08 J	NA	10.6 J	4.44 J	NA	NA	0.778 U	0.63 U	4.7 L	1.7 U	0.844 UL
4,4'-DDE	14,000	3.16	9.69 J	NA	39.2 J	NA	16.5 J	8.72 J	NA	NA	6.29 J	4.74	23.7 L	1.7 U	0.844 UL
4,4'-DDT	17,000	4.16	1.81 UL	NA	4.18 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	7.55 J	1.7 U	0.844 UL
Aldrin	290	2	1.81 UL	NA	1.81 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.95 L	1.7 U	0.844 UL
alpha-BHC	770	6	0.777 J	NA	1.32 U	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.427 L	1.7 U	0.844 UL
alpha-Chlordane	16,000	3.24	1.5 J	NA	3.63 J	NA	2.22 J	1.48 U	NA	NA	1.02 J	0.63 U	4.25 L	1.7 U	0.844 UL
Aroclor-1260	2,200	59.8	140 J	NA	1,270 J	NA	84.7 J	34.5 J	NA	NA	63.6	35.9	914 L	41.6 U	20.7 UL
beta-BHC	2,700	5	1.81 UL	NA	1.32 U	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
delta-BHC	2,700	3	1.81 UL	NA	2.71 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
Dieldrin	300	1.9	3.58 J	NA	20.7 J	NA	2.41 J	1.34 J	NA	NA	1.5 J	0.63 U	4.55 L	1.7 U	0.844 UL
Endosulfan I	370,000	2.9	1.81 UL	NA	0.68 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.523 L	1.7 U	0.844 UL
Endosulfan II	370,000	14	1.32 J	NA	13.2 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	11.3 L	1.7 U	0.844 UL
Endosulfan sulfate	370,000	5.4	1.81 UL	NA	41.1 J	NA	2.13 J	1.42 J	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
Endrin	18,000	2.22	1.81 UL	NA	15.6 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
Endrin aldehyde	18,000	2.22	3.54 J	NA	4.96 J	NA	1.5 UL	2.02 J	NA	NA	2.75	1.99	3.11 L	1.7 U	0.844 UL
Endrin ketone	18,000	2.22	14.7 J	NA	1.66 J	NA	6.86 J	3.13 J	NA	NA	0.778 U	0.63 U	2.03 L	1.7 U	0.844 UL
gamma-BHC (Lindane)	5,200	2.37	1.81 UL	NA	0.692 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.245 L	1.7 U	0.844 UL
gamma-Chlordane	16,000	3.24	0.963 J	NA	41 J	NA	1.52 J	1 J	NA	NA	15.1 B	1.37	8.24 L	1.84 J	5.31 J
Heptachlor	1,100	68	1.63 J	NA	1.32 UL	NA	1.5 UL	1.48 U	NA	NA	0.958 J	0.63 U	0.619 UL	1.7 U	0.844 UL
Heptachlor epoxide	530	2.47	1.81 UL	NA	1.32 UL	NA	1.5 UL	1.48 U	NA	NA	0.929 J	0.63 U	1.24 L	1.7 U	0.844 UL
Methoxychlor	310,000	19	1.81 UL	NA	10.7 J	NA	5.43 J	1.48 U	NA	NA	0.584 J	0.63 U	10.1 J	1.7 U	0.844 UL
Explosives (µg/kg)															
1,3-Dinitrobenzene	6,100	6.7	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
2,4,6-Trinitrotoluene	36,000	92	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	125 J
3-Nitrotoluene	6,100	1,920	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
4-Nitrotoluene	240,000	4,060	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
HMX	3,800,000	4.7	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
Nitroglycerin	6,100	--	328 J	NA	969 J	NA	1,410 J	311 J	NA	NA	490 U	478 U	478 U	500 U	469 U
Tetryl	240,000	--	194 U	NA	211 J	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 R	188 U
Total Metals (mg/kg)															
Aluminum	77,000	25,500	21,600	NA	19,800	NA	20,900	17,400	NA	NA	6,830	4,010	3,550	26,700	6,560
Antimony	31	3	10.9 U	NA	7.82 U	NA	8.58 U	9.07 U	NA	NA	0.946 U	0.762 U	1.6 U	2.11 UL	5.25 U
Arsenic	3.9	9.79	**38.1**	NA	**36.5**	NA	**47.5**	**39.1**	NA	NA	**9.58**	**8.68**	**6.18**	**56.7**	**6.48 J**
Barium	15,000	20	77.3	NA	89	NA	80.5	66.3	NA	NA	26.7	19.7	30.2	80.2	21.2 J
Beryllium	160	--	2.73 U	NA	1.14 J	NA	1.15 J	2.27 U	NA	NA	0.253 J	0.222 J	0.242 J	1.02 J	1.31 U
Cadmium	70	0.99	2.73 U	NA	1.95 U	NA	2.14 U	2.27 U	NA	NA	0.237 U	0.204 J	0.239 J	0.528 U	1.31 U
Calcium	--	--	75,900	NA	122,000	NA	93,700	77,900	NA	NA	26,600	12,500	10,100	33,500	3,630
Chromium	2.9	43.4	**49.4**	NA	**38.5**	NA	**44.9**	**36.9**	NA	NA	**11.8**	**7.22**	**6.45**	**45.6 K**	**16.1**
Cobalt	23	50	13.6 U	NA	5.25 J	NA	5.97 J	11.3 U	NA	NA	1.67	1.14 J	2.08 J	6.91	6.56 U

Table 6
CAX Penniman Lake
Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SWSD62		CAPL-SWSD63		CAPL-SWSD64				CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID			CAPL-SD62-1012	CAPL-SD62-1012-V	CAPL-SD63-1012	CAPL-SD63-1012-V	CAPL-SD64-1012	CAPL-SD64P-1012	CAPL-SD64-1012-V	CAPL-SD64P-1012-V	CAPL-SD65-1012	CAPL-SD66-1012	CAPL-SD67-1012	CAPL-SD68-1012	CAPL-SD69-1012
Sample Date			10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/18/12	10/17/12
Chemical Name															
Copper	3,100	31.6	43.9	NA	40.7	NA	51.4	44.5	NA	NA	10.1	8.22	4.58	26.3	4.31 J
Cyanide	22	--	1.29 U	NA	0.937 U	NA	1.02 U	1.08 U	NA	NA	2.95	0.439 U	0.438 U	1.3 UL	0.649 U
Iron	55,000	20,000	39,600	NA	34,000	NA	35,200	28,400	NA	NA	8,450	5,340	8,770	30,900	14,600
Lead	4,000	35.8	80.7	NA	85.8	NA	78.2	63.8	NA	NA	14.8	11.7	12.4	33.3	6.8
Magnesium	--	--	3,040 J	NA	3,090 J	NA	3,000 J	2,480 J	NA	NA	978	517	2,380	4,190 K	1,090 J
Manganese	1,800	460	142	NA	143	NA	124	102	NA	NA	47.6	33.4	165	161	57.5
Mercury	23	0.18	0.154 J	NA	0.197	NA	1.48	1.23	NA	NA	0.0444 J	0.0325 J	0.0664 J	0.0995 J	0.0391 J
Nickel	1,500	22.7	13.5 J	NA	12.2	NA	13.9	11.8	NA	NA	4.18	2.61	3.62	18.2	3.4 J
Potassium	--	--	2,660 J	NA	2,330 J	NA	2,790 J	2,360 J	NA	NA	850	489	428 J	3,370 K	1,470 J
Selenium	390	2	6.81 U	NA	4.89 U	NA	5.36 U	5.67 U	NA	NA	0.591 U	0.476 U	1 U	1.32 U	3.28 U
Silver	390	1	2.73 U	NA	1.95 U	NA	2.14 U	2.27 U	NA	NA	0.237 U	0.191 U	0.4 U	0.528 U	1.31 U
Sodium	--	--	4,090 U	NA	2,930 U	NA	3,220 U	3,400 U	NA	NA	175 J	286 U	600 U	1,290 J	1,970 U
Vanadium	390	--	55	NA	45.9	NA	54.6	43.6	NA	NA	17.2	9.92	10.9	67.8	19.3
Zinc	23,000	121	253	NA	201	NA	187	151	NA	NA	41.9	29.9	41.9	90.4	24.2
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)															
Zinc, SEM	--	--	2.29 D	NA	2.6 D	NA	1.53 D	NA	NA	NA	0.344	0.2	0.198	0.539	0.193
Acid volatile sulfide, SEM	--	--	11.2	NA	13.2	NA	11.8	NA	NA	NA	4.49	3.95	2.85	9.51	6.38
Cadmium, SEM	--	--	0.00407 J	NA	0.00457 J	NA	0.00218 J	NA	NA	NA	0.00103 U	0.00104 J	5.00E-04 J	0.00224 U	0.00119 U
Copper, SEM	--	--	0.0655	NA	0.068	NA	0.0695	NA	NA	NA	0.0572	0.024	0.0162	0.124	0.0167 J
Lead, SEM	--	--	0.266 D	NA	0.345 D	NA	0.232 D	NA	NA	NA	0.0505	0.0281	0.0228	0.0974	0.021
Nickel, SEM	--	--	0.0338 J	NA	0.0436 J	NA	0.0388 J	NA	NA	NA	0.00866 J	0.00419 J	0.00377 J	0.0262 J	0.0114 J
Wet Chemistry															
pH (ph)	--	--	6.81 H3	NA	6.81 H3	NA	6.83 H3	NA	NA	NA	7.24 H3	7.1 H3	7.1 H3	7.1 H3	6.83 H3
Total organic carbon (TOC) (mg/kg)	--	--	74,400	NA	71,400	NA	75,900	NA	NA	NA	37,900 *	35,000 *	106,000	116,000	72,200 *
Grain Size (pct)															
Coarse Sand (%)	--	--	0	NA	0	NA	0	NA	NA	NA	0	0.5	6.4	0.4	2.8
Fine Sand (%)	--	--	10.8	NA	8.5	NA	18.3	NA	NA	NA	56.3	69.4	44.6	7.6	39.2
Fines (%)	--	--	88.1	NA	89.6	NA	80.3	NA	NA	NA	34.1	22.9	19	89.9	52.1
Gravel (%)	--	--	0	NA	0	NA	0	NA	NA	NA	0	0.1	14.7	0	3.3
Medium Sand (%)	--	--	1.1	NA	1.9	NA	1.4	NA	NA	NA	9.6	7.1	15.3	2.1	2.6
Sand (%)	--	--	11.9	NA	10.4	NA	19.7	NA	NA	NA	65.9	77	66.3	10.1	44.6
GRAINSIZE (PCT/P)															
GS03 Sieve 3" (75 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS05 Sieve 2" (50 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	100	92.4	100	100
Sieve No. 004 (4.75 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	99.9	85.3	100	96.7
Sieve No. 010 (2.00 mm)	--	--	100	NA	100	NA	100	NA	NA	NA	100	99.4	78.9	99.6	93.9
Sieve No. 020 (850 um)	--	--	99.7	NA	99.2	NA	99.6	NA	NA	NA	98.6	98.6	74.5	99.4	93
Sieve No. 040 (425 um)	--	--	98.9	NA	98.1	NA	98.6	NA	NA	NA	90.4	92.3	63.6	97.5	91.3
Sieve No. 060 (250 um)	--	--	97.6	NA	96.6	NA	95.3	NA	NA	NA	66	61.1	43.1	95.1	84.4
Sieve No. 080 (180 um)	--	--	95.6	NA	95.2	NA	90	NA	NA	NA	50	37.3	30.4	93.5	73.8
Sieve No. 100 (150 um)	--	--	93.7	NA	94.1	NA	86.9	NA	NA	NA	42.7	29.2	24.9	92.7	66.2
Sieve No. 200 (75 um)	--	--	88.1	NA	89.6	NA	80.3	NA	NA	NA	34.1	22.9	19	89.9	52.1

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Notes:

Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment

Shading indicates exceedance of CAX Freshwater Sediment ESV

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* - Exceeding quality control criteria are associated with the reported result
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H3- The sample for this analyte was received outside of the EPA recommended holding time
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher
M - Indicates that the sample matrix interfered with the quantitation of the analyte
N- The MS/MSD accuracy and/ or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
UL - Analyte not detected, quantitation limit is probably higher
Y- The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side
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pct - Percent
pct/p - Percent passed
ph - pH units
µg/kg - Micrograms per kilogram
µmol/g - Micromoles per gram

Table 7
CAX Penniman Lake
Subsurface Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD70	CAPL-SD71	CAPL-SD72	CAPL-SD73	CAPL-SD74		CAPL-SD75	CAPL-SD76	CAPL-SD77	CAPL-SD78
Sample ID			CAPL-SSD70-1012	CAPL-SSD71-1012	CAPL-SSD72-1012	CAPL-SSD73-1012	CAPL-SSD74-1012	CAPL-SSD74P-1012	CAPL-SSD75-1012	CAPL-SSD76-1012	CAPL-SSD77-1012	CAPL-SSD78-1012
Sample Date			10/17/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/16/12	10/16/12
Chemical Name												
Volatile Organic Compounds (µg/kg)												
2-Butanone	28,000,000	--	43.3	71.6	39.6 J	92.6	49.2 J	59.5	71.2 J	3.66 J	8.71 J	27.9
Acetone	61,000,000	--	141 J	271 J	151 J	347 J	224 J	234 J	323 J	17.3 J	36.3	107
Carbon disulfide	740,000	0.85	4.48 U	9.37 U	11.5 J	11.8 U	13.4 J	9.4 J	9.7 J	2.46 UJ	2.42 UJ	6.56 UJ
Semivolatile Organic Compounds (µg/kg)												
2-Methylnaphthalene	230,000	--	1,420	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	10.7	40.3 U
Acenaphthene	3,400,000	290	79,800	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U
Anthracene	17,000,000	57.2	85,600	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U
Benzaldehyde	1,200,000	--	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U
Benzo(a)anthracene	1,500	108	**36,600**	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	19.7	99.9
Benzo(a)pyrene	150	150	**20,500**	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	9.1	18.9	87.4
Benzo(b)fluoranthene	1,500	240	**16,100**	11 U	19.5 U	15.1 U	20.8 J	15.6 U	77.8 U	7.75 J	15.5	87.4
Benzo(g,h,i)perylene	1,700,000	170	5,990	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	7.15 J	11	92
Benzo(k)fluoranthene	15,000	240	**17,700**	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	5.29 J	18	68.1 J
Chrysene	150,000	166	46,300	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	21.8	194
Dibenz(a,h)anthracene	150	33	**2,710**	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U
Dibenzofuran	78,000	5,100	32,900 J	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U
Fluoranthene	2,300,000	423	125,000	11 U	19.5 U	15.1 U	27.1 J	15.6 U	77.8 U	6.27 J	24.2	186
Fluorene	2,300,000	77.4	81,700	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U
Indeno(1,2,3-cd)pyrene	1,500	200	**5,960**	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	5.21 J	10.6	63.3 J
Naphthalene	36,000	176	548 U	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	131
Phenanthrene	17,000,000	204	287,000	11 U	19.5 U	15.1 U	22.3 J	15.6 U	77.8 U	4.38 U	4.35 U	131
Pyrene	1,700,000	195	135,000	11 U	19.5 U	15.1 U	25.9 J	15.6 U	77.8 U	7.97 J	23.4	283
Pesticide/Polychlorinated Biphenyls (µg/kg)												
4,4'-DDD	20,000	4.88	70.7 J	3.85 J	1.98 U	6.99 J	2.96 J	1.86 J	1.58 U	3.16 J	0.438 UL	33.6 L
4,4'-DDE	14,000	3.16	50.1 J	8.61 J	1.98 U	21.6 J	6.22 J	5.12 J	3.67 J	6.3	20 J	251 J
4,4'-DDT	17,000	4.16	4.21 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.67 J	5.25 J	9.17 J
Aldrin	290	2	0.453 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.414 J	0.792 U
alpha-BHC	770	6	3.69 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 UL	0.438 UL	0.792 U
alpha-Chlordane	16,000	3.24	7.13 J	0.492 J	1.98 U	2.1 J	1.55 J	1.64 UL	1.58 U	0.447 U	3.88 L	34.7
Aroclor-1260	2,200	59.8	2,030 J	37.3 J	48.5 U	52.7 J	40.7 U	40.2 UL	38.6 U	10.9 U	1,170	**3,020 J**
beta-BHC	2,700	5	26.2 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.438 UL	0.792 U
delta-BHC	2,700	3	6.34 J	1.11 U	1.98 U	1.07 J	1.66 U	1.64 UL	1.58 U	0.447 UL	0.438 U	0.582 J
Dieldrin	300	1.9	8.03 J	2.1 J	1.98 U	3.01 J	1.66 U	0.919 J	1.58 U	0.447 U	5.14 J	50.1 L
Endosulfan I	370,000	2.9	0.571 UL	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.376 L	0.438 UL	1.21 J
Endosulfan II	370,000	14	0.806 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.438 UL	1.3 L
Endosulfan sulfate	370,000	5.4	45.9 J	0.946 J	1.98 U	1.48 J	0.921 J	1.64 UL	1.58 U	2.01 K	0.438 U	102 J
Endrin	18,000	2.22	23.9 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.355 J	0.438 UL	49 L
Endrin aldehyde	18,000	2.22	5.18 J	2.29 J	1.98 U	0.813 J	2.27 J	1.64 J	1.58 U	0.447 UL	3.54 J	16.2 L
Endrin ketone	18,000	2.22	3.62 J	2.73	1.98 U	3.04 J	1.66 U	1.64 L	1.58 U	0.447 U	3.41 J	8.6 J
gamma-BHC (Lindane)	5,200	2.37	0.201 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.438 U	0.683 J
gamma-Chlordane	16,000	3.24	26.9 J	1.11 J	16.4 J	2.69 J	14.7 J	8.95 J	1.8 J	0.667 L	26.1	212
Heptachlor	1,100	68	1.56 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	0.964 J	0.447 U	0.438 UL	0.792 U
Heptachlor epoxide	530	2.47	0.571 UL	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 UL	0.856 L	3.43 L
Methoxychlor	310,000	19	10.3 J	0.478 J	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	1.12 J	3.14 J	276 J
Explosives (µg/kg)												
1,3-Dinitrobenzene	6,100	6.7	551	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	456
4-Nitrotoluene	240,000	4,060	178 U	197 U	190 U	109 J	194 U	197 U	192 U	187 U	200 U	199 U
Nitroglycerin	6,100	--	444 U	928 J	476 U	1,160	485 U	493 U	842 J	467 U	500 U	498 U

Table 7
CAX Penniman Lake
Subsurface Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD70	CAPL-SD71	CAPL-SD72	CAPL-SD73	CAPL-SD74		CAPL-SD75	CAPL-SD76	CAPL-SD77	CAPL-SD78
Sample ID			CAPL-SSD70-1012	CAPL-SSD71-1012	CAPL-SSD72-1012	CAPL-SSD73-1012	CAPL-SSD74-1012	CAPL-SSD74P-1012	CAPL-SSD75-1012	CAPL-SSD76-1012	CAPL-SSD77-1012	CAPL-SSD78-1012
Sample Date			10/17/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/16/12	10/16/12
Chemical Name												
Total Metals (mg/kg)												
Aluminum	77,000	25,500	4,690	15,900	21,100	29,100	18,800	19,700	22,300	1,740	3,690	10,500
Antimony	31	3	3.53 U	6.84 U	11.9 U	9.26 U	4.01 U	3.93 U	3.83 U	0.577 UL	0.561 U	1.99 U
Arsenic	3.9	9.79	**16.5**	**26.5**	**31.2**	**52**	**47**	**43.5**	**40.6**	0.801	2.18	**8.75**
Barium	15,000	20	36.5	59.9	53.7 J	104	62.8	65.6	75.4	7.13	18.7	49.5
Beryllium	160	--	0.443 J	0.876 J	2.97 U	1.44 J	1.04 J	1.07 J	1.04 J	0.144 U	0.163 J	0.558 J
Cadmium	70	0.99	0.883 U	1.71 U	2.97 U	2.31 U	1 U	0.983 U	0.958 U	0.144 U	0.14 U	0.417 J
Calcium	--	--	27,300	96,100	20,800	92,000	54,700	59,900	68,300	481 K	667	4,650
Chromium	2.9	43.4	**11.5**	**31.7**	**35.2**	**54.2**	**35.5**	**37.9**	**40.1**	2.65	**5.52**	**15.2**
Cobalt	23	50	2.23 J	4.41 J	14.8 U	7.32 J	5.97 J	6.28	6.54	0.389 J	0.995	2.95 J
Copper	3,100	31.6	10.4	29.2	14.7 J	60	31.7	39.1	44	0.883	2.2	19.8
Cyanide	22	--	0.399 U	0.778 U	1.57 U	1.18 U	1.13 U	1.16 U	1.1 U	0.298 U	0.332 U	0.577 U
Iron	55,000	20,000	14,900	24,500	21,200	41,800	31,100	30,500	30,000	1,520	3,530	11,300
Lead	4,000	35.8	37.6	47.9	22.3	92.3	41.8	44	48.5	3.98	10.4	43
Magnesium	--	--	1,050 J	2,760 J	3,410 J	4,650 J	3,170	3,340	4,090	146 K	283 J	989 J
Manganese	1,800	460	48.4	106	120	180	151	150	142	5.77	8.18	32.3
Mercury	23	0.18	0.0538 J	0.12	0.167 U	0.13 J	0.106 J	0.106 J	0.113 J	0.0234 J	0.0244 J	0.0894 J
Nickel	1,500	22.7	4.07 J	9.94	12 J	18	13.4	14	15.8	0.945	1.94	6.36
Potassium	--	--	1,110 J	2,180 J	2,830 J	3,510 J	2,390 J	2,520	2,920	130 K	271 J	804 J
Sodium	--	--	1,320 U	2,570 U	4,450 U	1,640 J	1,500 U	1,470 U	1,090 J	216 U	210 U	745 U
Vanadium	390	--	14.7	41.1	48.9	67	48.8	50.2	52.9	3.89	7.92	23.5
Zinc	23,000	121	67.8	102	56.6	186	97.4	103	118	3.99	18.2	84.3
Wet Chemistry												
pH (ph)	--	--	7.02 H3	6.86 H3	7.36 H3	7.06 H3	7.71 H3	NA	7.13 H3	6.93 H3	7 H3	6.79 H3
Total organic carbon (TOC) (mg/kg)	--	--	33,600	44,500	165,000	57,300	124,000	NA	74,400	7,570	15,800	63,700

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Notes:

Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment

Shading indicates exceedance of CAX Freshwater Sediment ESV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

Table 7
CAX Penniman Lake
Subsurface Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD79		CAPL-SD80		CAPL-SD81	CAPL-SD82	CAPL-SD84	CAPL-SD85	CAPL-SD86	CAPL-SD87	CAPL-SWSD62	CAPL-SWSD63
Sample ID			CAPL-SSD79-1012	CAPL-SSD79-1012-V	CAPL-SSD80-1012	CAPL-SSD80-1012-V	CAPL-SSD81-1012	CAPL-SSD82-1012	CAPL-SSD84-1012	CAPL-SSD85-1012	CAPL-SSD86-1012	CAPL-SSD87-1012	CAPL-SSD62-1012	CAPL-SSD63-1012
Sample Date			10/16/12	10/25/12	10/16/12	10/25/12	10/18/12	10/18/12	10/24/12	10/24/12	10/24/12	10/24/12	10/17/12	10/17/12
Chemical Name														
Volatile Organic Compounds (µg/kg)														
2-Butanone	28,000,000	--	NA	3.88 J	NA	57.3	22.7 J	116	7.37 J	3.55 J	6.23 J	23.9	89.3	138
Acetone	61,000,000	--	NA	17.2 J	NA	195 J	120 J	438 J	25 J	16.7 J	26.3 J	90.6 J	331 J	459 J
Carbon disulfide	740,000	0.85	NA	3.29 U	NA	7.31 J	29.7	22.7 U	2.11 J	2.92 U	4.19 J	3.9 U	12.1 U	12.1 U
Semivolatile Organic Compounds (µg/kg)														
2-Methylnaphthalene	230,000	--	9.45 J	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	47.2 U	12.6 U	63.9 U
Acenaphthene	3,400,000	290	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	1,270 K	12.6 U	63.9 U
Anthracene	17,000,000	57.2	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	2,650	12.6 U	63.9 U
Benzaldehyde	1,200,000	--	242 U	NA	310 U	NA	170 U	5,660 U	205 U	206 U	211 U	236 U	631 U	931 J
Benzo(a)anthracene	1,500	108	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.43 J	**2,300**	12.6 U	63.9 U
Benzo(a)pyrene	150	150	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	**1,230 K**	12.6 U	63.9 U
Benzo(b)fluoranthene	1,500	240	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	6.61 K	1,400 K	12.6 U	80.1 J
Benzo(g,h,i)perylene	1,700,000	170	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	466 K	12.6 U	63.9 U
Benzo(k)fluoranthene	15,000	240	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	726	12.6 U	63.9 U
Chrysene	150,000	166	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	6.28 K	2,350 K	12.6 U	63.9 U
Dibenz(a,h)anthracene	150	33	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	134 K	12.6 U	63.9 U
Dibenzofuran	78,000	5,100	242 U	NA	310 U	NA	170 U	5,660 U	205 U	206 U	211 U	380 J	631 U	641 U
Fluoranthene	2,300,000	423	16.2	NA	12.4 J	NA	11.5 U	113 U	9.91	4.1 U	11	6,230	12.6 U	127 J
Fluorene	2,300,000	77.4	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	1,340 K	12.6 U	63.9 U
Indeno(1,2,3-cd)pyrene	1,500	200	4.83 U	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.33 J	386	12.6 U	63.9 U
Naphthalene	36,000	176	145	NA	6.18 U	NA	11.5 U	113 U	4.09 U	4.1 U	4.2 U	47.2 U	12.6 U	63.9 U
Phenanthrene	17,000,000	204	4.83 U	NA	6.18 U	NA	11.5 U	113 U	6.8 J	4.1 U	4.95 J	7,590	12.6 U	112 J
Pyrene	1,700,000	195	17.3	NA	11.1 J	NA	11.5 U	113 U	9.78 K	4.1 U	8.84 K	6,970 K	12.6 U	111 J
Pesticide/Polychlorinated Biphenyls (µg/kg)														
4,4'-DDD	20,000	4.88	0.804 L	NA	0.607 U	NA	1.12 U	2.32 U	0.422 U	3.02 J	7.08 L	13.6 J	17.7 J	3.06 J
4,4'-DDE	14,000	3.16	32.7 J	NA	3.57 J	NA	1.12 U	4.8	17.1 J	9.61	23.5 L	2.09 J	26.4 J	10.1 J
4,4'-DDT	17,000	4.16	3.14 J	NA	0.607 U	NA	1.12 U	2.32 U	218 J	11.2 J	13.9 J	0.441 J	0.848 J	0.959 J
Aldrin	290	2	0.934 J	NA	0.607 U	NA	1.12 U	2.32 U	5.33 J	0.196 J	0.715 J	0.493 UL	1.27 UL	1.35 UL
alpha-BHC	770	6	0.478 U	NA	0.606 J	NA	1.12 U	2.32 U	0.422 U	0.423 U	0.441 U	0.493 UL	0.563 J	1.35 UL
alpha-Chlordane	16,000	3.24	9.94 L	NA	0.607 U	NA	1.12 U	2.32 U	13.4 J	3.34	17 J	1.48 J	1.64 L	1.04 L
Aroclor-1260	2,200	59.8	630 J	NA	14.9 U	NA	27.4 U	36.6 J	**34,200 J**	1,840 J	**3,700 J**	138 L	169 J	217 J
beta-BHC	2,700	5	1.12 L	NA	0.607 U	NA	1.12 U	2.32 U	0.422 U	0.423 U	0.441 UL	1.26	1.27 UL	1.35 UL
delta-BHC	2,700	3	0.478 U	NA	0.607 U	NA	1.12 U	2.32 U	0.505 J	0.423 U	0.642 L	0.387 L	1.27 UL	0.509 J
Dieldrin	300	1.9	6.88 J	NA	0.323 J	NA	1.12 U	2.32 U	**709**	4.07 J	62.4 J	3.49 J	4.65 J	4.36 J
Endosulfan I	370,000	2.9	0.22 J	NA	0.607 U	NA	1.12 U	2.32 U	0.422 U	0.354 J	0.663 J	0.493 UL	1.27 UL	1.35 UL
Endosulfan II	370,000	14	12.5 L	NA	0.607 U	NA	1.12 U	2.32 U	483 J	18.1 J	39.7 J	0.595 J	2.1 J	2.44 J
Endosulfan sulfate	370,000	5.4	20.3 L	NA	0.607 U	NA	1.12 U	2.32 U	129 J	0.423 U	0.441 U	0.493 UL	6.42 J	9.51 J
Endrin	18,000	2.22	1.15 J	NA	0.607 U	NA	1.12 U	2.32 U	59.1 J	12.2 J	31.1 J	3.12 J	0.859 J	1.09 J
Endrin aldehyde	18,000	2.22	2.1 J	NA	0.607 U	NA	1.12 U	2.32 U	30 J	1.56 J	2.55 J	0.284 J	5.11 L	4.52 J
Endrin ketone	18,000	2.22	1.72 J	NA	0.607 U	NA	1.12 U	2.32 U	28 J	5.59 J	13.1 J	0.592 J	16.5 J	1.35 UL
gamma-BHC (Lindane)	5,200	2.37	0.478 U	NA	0.415 J	NA	1.12 U	2.32 U	0.427 J	0.423 U	0.441 UL	0.493 UL	1.27 UL	1.35 UL
gamma-Chlordane	16,000	3.24	40.6	NA	1.3	NA	1.85 J	3.72 J	40.8 B	11.6	38.1 B	7.05 L	2.12 J	12.2 L
Heptachlor	1,100	68	0.478 U	NA	0.607 U	NA	1.12 U	2.32 U	0.422 U	0.423 U	0.441 U	0.493 UL	1.27 UL	1.35 UL
Heptachlor epoxide	530	2.47	0.72 L	NA	0.607 U	NA	1.12 U	2.32 U	6.42 J	0.965 J	1.75 L	0.422 J	1.27 UL	1.35 UL
Methoxychlor	310,000	19	9.38 J	NA	0.607 U	NA	1.12 U	2.32 U	137 J	5.58 J	10.1 J	0.947 J	16.2 J	1.35 UL
Explosives (µg/kg)														
1,3-Dinitrobenzene	6,100	6.7	117 J	NA	199 U	NA	193 U	193 U	200 U	182 U	182 U	190 U	197 U	196 U
4-Nitrotoluene	240,000	4,060	193 U	NA	199 U	NA	193 U	193 U	200 U	182 U	182 U	190 U	197 U	196 U
Nitroglycerin	6,100	--	483 U	NA	498 U	NA	483 U	968 J	500 U	455 U	455 U	476 U	326 J	490 U

Table 7
CAX Penniman Lake
Subsurface Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SD79		CAPL-SD80		CAPL-SD81	CAPL-SD82	CAPL-SD84	CAPL-SD85	CAPL-SD86	CAPL-SD87	CAPL-SWSD62	CAPL-SWSD63
Sample ID			CAPL-SSD79-1012	CAPL-SSD79-1012-V	CAPL-SSD80-1012	CAPL-SSD80-1012-V	CAPL-SSD81-1012	CAPL-SSD82-1012	CAPL-SSD84-1012	CAPL-SSD85-1012	CAPL-SSD86-1012	CAPL-SSD87-1012	CAPL-SSD62-1012	CAPL-SSD63-1012
Sample Date			10/16/12	10/25/12	10/16/12	10/25/12	10/18/12	10/18/12	10/24/12	10/24/12	10/24/12	10/24/12	10/17/12	10/17/12
Chemical Name														
Total Metals (mg/kg)														
Aluminum	77,000	25,500	4,070	NA	3,660	NA	34,700	15,600	5,360	6,220	2,840	7,680	18,800	17,800
Antimony	31	3	0.599 U	NA	1.47 U	NA	6.94 U	5.62 U	1.04 U	2.58 J	2.59 U	2.86 U	7.6 U	8 U
Arsenic	3.9	9.79	3.11	NA	**4.29**	NA	**24.4**	**45.8**	**5.1**	**5.72**	3.16 J	**5.28**	**44.3**	**27.4**
Barium	15,000	20	21.3	NA	17.1	NA	64.7	66.9	25.6	49.9	28.2	32.1	70.2	86.7
Beryllium	160	--	0.209 J	NA	0.26 J	NA	1.63 J	0.731 J	0.474 J	3.09	1.6 J	0.572 J	1.9 U	2 U
Cadmium	70	0.99	0.15 U	NA	0.188 J	NA	1.73 U	1.4 U	0.259 U	0.656 U	0.648 U	0.715 U	1.9 U	2 U
Calcium	--	--	1,650	NA	7,440	NA	8,270	85,200	74,500	61,500	36,500	34,300	82,000	104,000
Chromium	2.9	43.4	**6.11**	NA	**7.39**	NA	**61.7**	**26.9**	**14.1**	**27.6**	**15.1**	**18.6**	**45**	**35.2**
Cobalt	23	50	1.23	NA	0.949 J	NA	13.1	5.24 J	1.74	11.4	9.62	2.78 J	9.5 U	10 U
Copper	3,100	31.6	2.62	NA	3.4	NA	18.4	42.5	2.69	379	160	10.9	34.4	32.3
Cyanide	22	--	0.351 U	NA	0.434 U	NA	0.826 U	1.7 U	0.205 J	0.246 J	0.321 U	0.349 U	0.892 U	0.962 U
Iron	55,000	20,000	4,400	NA	4,880	NA	51,400	26,000	14,000	28,400	9,490	15,300	30,400	33,700
Lead	4,000	35.8	10.6	NA	9.16	NA	25	42.1	13.5	236	236	26.4	107	68.4
Magnesium	--	--	347 J	NA	579 J	NA	6,550	2,430 J	1,430 J	2,210 J	846 J	1,370 J	2,500 J	2,720 J
Manganese	1,800	460	12.3	NA	24.5	NA	317	144	35.4	153	79.2	31.4	108	139
Mercury	23	0.18	0.0331 J	NA	0.0297 J	NA	0.0813 J	0.0957 J	0.0229 B	0.0155 B	0.0185 B	0.0922 B	0.115 J	0.252
Nickel	1,500	22.7	2.15	NA	2.27	NA	26.1	12.5	3.58	242	118	7.09	11	10.9
Potassium	--	--	338 J	NA	486 J	NA	4,410	1,780 J	1,640	3,040	630 J	1,630 J	2,220 J	2,190 J
Sodium	--	--	224 U	NA	552 U	NA	2,600 U	2,110 U	331 J	539 J	972 U	1,070 U	2,850 U	3,000 U
Vanadium	390	--	9.04	NA	9.33	NA	76.9	39.8	13.8	21.2	8.15	20.4	45	40
Zinc	23,000	121	21.1	NA	20.3	NA	97.2	101	28.3	1,040	927	73.6	215	165
Wet Chemistry														
pH (ph)	--	--	7 H3	NA	7.53 H3	NA	7.25 H3	7.26 H3	8.02 H3	8.28 H3	7.91 H3	7.92 H3	7.31 H3	6.92 H3
Total organic carbon (TOC) (mg/kg)	--	--	25,500	NA	37,000	NA	75,400	136,000	4,950	2,510	11,400	32,400	45,400	103,000

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Notes:

Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment

Shading indicates exceedance of CAX Freshwater Sediment ESV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

Table 7
CAX Penniman Lake
Subsurface Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66		CAPL-SWSD67		CAPL-SWSD68	CAPL-SWSD69	
Sample ID			CAPL-SSD64-1012	CAPL-SSD65-1012	CAPL-SSD66-1012	CAPL-SSD66P-1012	CAPL-SSD67-1012	CAPL-SSD67-1012-V	CAPL-SSD68-1012	CAPL-SSD69-1012	CAPL-SSD69-1012-V
Sample Date			10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/25/12	10/18/12	10/17/12	10/25/12
Chemical Name											
Volatile Organic Compounds (µg/kg)											
2-Butanone	28,000,000	--	117	19.4 J	6.49 J	8.17 J	NA	13.2	21.8 J	NA	44.8
Acetone	61,000,000	--	415 J	77.6 J	35.4 J	35.8 J	NA	46.9 J	86.5 J	NA	133 J
Carbon disulfide	740,000	0.85	11.8 U	6.02 J	1.48 J	1.88 J	NA	3.23 U	14.8 J	NA	4.08 J
Semivolatile Organic Compounds (µg/kg)											
2-Methylnaphthalene	230,000	--	13.1 U	9.9 U	4.6 U	4.6 U	8.35 J	NA	14.6 U	5.68 U	NA
Acenaphthene	3,400,000	290	13.1 U	9.9 U	4.6 U	4.6 U	8.55 J	NA	14.6 U	5.68 U	NA
Anthracene	17,000,000	57.2	13.1 U	9.9 U	4.6 U	4.6 U	25.1	NA	14.6 U	5.68 U	NA
Benzaldehyde	1,200,000	--	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Benzo(a)anthracene	1,500	108	13.1 U	9.9 U	4.6 U	4.6 U	230	NA	14.6 U	5.68 U	NA
Benzo(a)pyrene	150	150	13.1 U	9.9 U	4.6 U	4.6 U	**369**	NA	14.6 U	5.68 U	NA
Benzo(b)fluoranthene	1,500	240	13.1 U	9.9 U	4.6 U	4.6 U	392	NA	14.6 U	5.68 U	NA
Benzo(g,h,i)perylene	1,700,000	170	13.1 U	9.9 U	4.6 U	4.6 U	246	NA	14.6 U	5.68 U	NA
Benzo(k)fluoranthene	15,000	240	13.1 U	9.9 U	4.6 U	4.6 U	467	NA	14.6 U	5.68 U	NA
Chrysene	150,000	166	13.1 U	9.9 U	4.6 U	4.6 U	359	NA	14.6 U	5.68 U	NA
Dibenz(a,h)anthracene	150	33	13.1 U	9.9 U	4.6 U	4.6 U	77.5	NA	14.6 U	5.68 U	NA
Dibenzofuran	78,000	5,100	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Fluoranthene	2,300,000	423	13.1 U	9.9 U	4.6 U	4.6 U	199	NA	14.6 U	5.68 U	NA
Fluorene	2,300,000	77.4	13.1 U	9.9 U	4.6 U	4.6 U	10.7 J	NA	14.6 U	5.68 U	NA
Indeno(1,2,3-cd)pyrene	1,500	200	13.1 U	9.9 U	4.6 U	4.6 U	221	NA	14.6 U	5.68 U	NA
Naphthalene	36,000	176	13.1 U	9.9 U	4.6 U	4.6 U	8.6 J	NA	14.6 U	5.68 U	NA
Phenanthrene	17,000,000	204	13.1 U	9.9 U	4.6 U	4.6 U	64.4	NA	14.6 U	5.68 U	NA
Pyrene	1,700,000	195	13.1 U	9.9 U	4.6 U	4.6 U	226	NA	14.6 U	5.68 U	NA
Pesticide/Polychlorinated Biphenyls (µg/kg)											
4,4'-DDD	20,000	4.88	5.53 J	0.986 U	0.471 U	0.465 U	2.18 L	NA	1.48 U	0.434 J	NA
4,4'-DDE	14,000	3.16	9.13 J	3.35 J	0.617 J	0.567 J	14 L	NA	1.48 U	1.51 J	NA
4,4'-DDT	17,000	4.16	1.36 UL	0.986 U	0.471 U	0.465 U	1.51 J	NA	1.48 U	0.569 UL	NA
Aldrin	290	2	1.36 UL	0.986 U	0.471 U	0.465 U	0.531 L	NA	1.48 U	0.569 UL	NA
alpha-BHC	770	6	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
alpha-Chlordane	16,000	3.24	1.44 L	0.457 J	0.471 U	0.465 U	0.908 L	NA	1.48 U	0.569 UL	NA
Aroclor-1260	2,200	59.8	33.4 UL	24.2 U	7.74 J	6.18 J	230 L	NA	36.1 U	13.9 UL	NA
beta-BHC	2,700	5	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
delta-BHC	2,700	3	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
Dieldrin	300	1.9	1.36 UL	0.986 U	0.471 U	0.465 U	1.11 L	NA	1.48 U	1.07 J	NA
Endosulfan I	370,000	2.9	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
Endosulfan II	370,000	14	1.36 UL	0.986 U	0.471 U	0.465 U	0.604 L	NA	1.48 U	0.569 UL	NA
Endosulfan sulfate	370,000	5.4	1.36 UL	1.66 J	0.471 U	0.465 U	0.355 L	NA	1.48 U	0.37 J	NA
Endrin	18,000	2.22	1.36 UL	0.986 U	0.471 U	0.465 U	3.15 L	NA	1.48 U	0.863 J	NA
Endrin aldehyde	18,000	2.22	1.36 UL	1.45 J	0.471 U	0.465 U	3.73 L	NA	1.48 U	0.867 J	NA
Endrin ketone	18,000	2.22	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
gamma-BHC (Lindane)	5,200	2.37	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
gamma-Chlordane	16,000	3.24	1.26 J	9.23 B	1.01 J	1.23 J	5.22 L	NA	1.56 J	4.77 K	NA
Heptachlor	1,100	68	1.36 UL	0.927 J	0.471 U	0.465 U	0.54 L	NA	1.48 U	0.569 U	NA
Heptachlor epoxide	530	2.47	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
Methoxychlor	310,000	19	1.36 UL	0.986 U	0.471 U	0.465 U	2.42 J	NA	1.48 U	0.569 U	NA
Explosives (µg/kg)											
1,3-Dinitrobenzene	6,100	6.7	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
4-Nitrotoluene	240,000	4,060	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
Nitroglycerin	6,100	--	996 J	459 U	444 U	455 U	495 U	NA	493 U	467 U	NA

Table 7
CAX Penniman Lake
Subsurface Sediment Exceedances Analytical Results
October - November 2012

Station ID	Adjusted Residential RSL x 10 for SD 1112	CAX Freshwater Sediment ESV	CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66		CAPL-SWSD67		CAPL-SWSD68	CAPL-SWSD69	
Sample ID			CAPL-SSD64-1012	CAPL-SSD65-1012	CAPL-SSD66-1012	CAPL-SSD66P-1012	CAPL-SSD67-1012	CAPL-SSD67-1012-V	CAPL-SSD68-1012	CAPL-SSD69-1012	CAPL-SSD69-1012-V
Sample Date			10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/25/12	10/18/12	10/17/12	10/25/12
Chemical Name											
Total Metals (mg/kg)											
Aluminum	77,000	25,500	19,300	20,300	1,770	1,920	2,100	NA	30,700	3,460	NA
Antimony	31	3	8.22 U	5.96 U	0.564 U	0.56 U	1.32 U	NA	8.7 U	0.679 UL	NA
Arsenic	3.9	9.79	**22.8**	**19**	2.33	2.74	**9.01**	NA	**22.5**	**5.86**	NA
Barium	15,000	20	71.5	40.3	13.1 J	8.81 J	9.73	NA	60	10.2	NA
Beryllium	160	--	1.15 J	1.49 U	0.156 J	0.153 J	0.329 U	NA	1.14 J	0.224 J	NA
Cadmium	70	0.99	2.06 U	1.49 U	0.141 U	0.14 U	0.329 U	NA	2.17 U	0.17 U	NA
Calcium	--	--	74,300	8,410	1,290	1,350	2,130	NA	13,400	2,080	NA
Chromium	2.9	43.4	**39.3**	**30.7 J**	**3.99 J**	**4.3**	**4.65**	NA	**51.4 J**	**10.3**	NA
Cobalt	23	50	6.01 J	5.51 J	0.507 J	0.578 J	1.64 U	NA	6.73 J	0.761 J	NA
Copper	3,100	31.6	37.6	11.4	1.43	1.59	4.45	NA	16.3	3.46	NA
Cyanide	22	--	1.01 U	0.745 U	0.327 U	0.352 U	0.396 U	NA	1.04 U	0.399 UL	NA
Iron	55,000	20,000	29,600	25,600	2,530	2,870	4,330	NA	28,400	9,000	NA
Lead	4,000	35.8	57.6	15.6	3.41	4.1	18.2	NA	19.6	4.92	NA
Magnesium	--	--	2,620 J	3,260 J	247 J	262 J	405 J	NA	5,360 J	767 K	NA
Manganese	1,800	460	97.2	105	9.66	11.7	30.7	NA	160	24.6	NA
Mercury	23	0.18	1.45	0.0484 J	0.035 U	0.0384 U	0.0493 J	NA	0.0582 J	0.0233 J	NA
Nickel	1,500	22.7	12.7	12.6	1.08	1.21	1.55 J	NA	18.6	2.18 B	NA
Potassium	--	--	2,430 J	2,470 J	304 J	329 J	367 J	NA	4,110 J	1,190 K	NA
Sodium	--	--	5,440	2,240 U	212 U	73.4 J	493 U	NA	1,850 J	255 U	NA
Vanadium	390	--	46.6	39.6	6.04	6.62	6.4	NA	73.6	12.1	NA
Zinc	23,000	121	155	69	6.03	6.81	50.7	NA	74.6	14.7	NA
Wet Chemistry											
pH (ph)	--	--	6.89 H3	7.16 H3	7.35 H3	NA	7.34 H3	NA	7.53 H3	6.77 H3	NA
Total organic carbon (TOC) (mg/kg)	--	--	124,000	63,000	10,700	NA	30,900	NA	88,200	28,400	NA

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Notes:

Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment

Shading indicates exceedance of CAX Freshwater Sediment ESV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

Table 8
CAX Penniman Lake
Surface Water Exceedances Analytical Results
October 2012

Station ID	**Tapwater RSLs X 10 for SW, Adjusted 1112**	**Surface Water ESV**	CAPL-SWSD62	CAPL-SWSD63		CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID			CAPL-SW62-1012	CAPL-SW63-1012	CAPL-SW63P-1012	CAPL-SW64-1012	CAPL-SW65-1012	CAPL-SW66-1012	CAPL-SW67-1012	CAPL-SW68-1012	CAPL-SW69-1012
Sample Date			10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12
Chemical Name											
Volatile Organic Compounds (µg/l)											
Acetone	12,000	1,500	63.7 J	22	5 U	5 U	2.51 J	5 U	5 U	5 U	5 U
Chloromethane	190	5,500	1.86	3.08	6.88	0.5 U	4.84	6.48	6.01	6.69	6.25
Semivolatile Organic Compounds (µg/l)											
Acenaphthene	400	23	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.134 J	0.0943 U	0.098 U	0.0943 U
Anthracene	1,300	0.73	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.126 J	0.0943 U	0.098 U	0.0943 U
Benzo(a)anthracene	0.29	0.027	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0707 J	0.0943 U	0.098 U	0.0563 J
Benzo(b)fluoranthene	0.29	9.07	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0549 J
Benzo(g,h,i)perylene	87	7.64	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0684 J
Benzo(k)fluoranthene	2.9	9.07	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0615 J
Chrysene	29	--	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0693 J	0.0943 U	0.098 U	0.0783 J
Dibenz(a,h)anthracene	0.029	--	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	**0.0782 J**
Fluoranthene	630	8.1	0.0604 J	0.0962 U	0.0668 J	0.0488 J	0.0926 U	0.173 J	0.0943 U	0.098 U	0.0943 U
Fluorene	220	3.9	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.131 J	0.0943 U	0.098 U	0.0943 U
Indeno(1,2,3-cd)pyrene	0.29	4.31	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.076 J
Phenanthrene	1,300	6.3	0.189 U	0.192 U	0.192 U	0.189 U	0.185 U	0.455	0.189 U	0.196 U	0.189 U
Pyrene	87	0.025	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.19	0.0943 U	0.098 U	0.0943 U
Pesticide/Polychlorinated Biphenyls (µg/l)											
Heptachlor	0.018	0.0069	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00538 J
Explosives (µg/l)											
4-Amino-2,6-dinitrotoluene	30	19	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.108 L	0.157 UL	0.16 UL
Total Metals (µg/l)											
Arsenic	0.45	150	**1.5 J**	**1.54 J**	**1.64 J**	**1.44 J**	**2.01 J**	**1.37 J**	**1.85 J**	**1.62 J**	**1.7 J**
Barium	2,900	4	20.1	19.4	19.5	19.1	21.6	20.4	21	21	20.4
Calcium	--	--	37,300	36,300	38,000	36,700	37,300	33,800	36,700	35,600	36,200
Iron	11,000	1,000	361	328	321	390	337	302	359	301	344
Magnesium	--	--	1,550	1,560	1,570	1,530	1,590	1,380	1,590	1,400	1,490
Manganese	320	120	41.3	39.9	40.3	53.5	49.4	47.2	49	49.8	47.5
Potassium	--	--	2,770	2,750	2,800	2,730	2,820	2,640	2,840	2,660	2,780
Sodium	--	--	9,100	9,200	9,210	9,020	9,370	8,330	9,410	8,370	8,970
Dissolved Metals (µg/l)											
Arsenic, Dissolved	0.45	150	**1.31 J**	**1.2 J**	**1.32 J**	**1.17 J**	**1.19 J**	**1.26 J**	**1.24 J**	**1.15 J**	**1.42 J**
Barium, Dissolved	2,900	4	18.5	19.5	18.1	18.4	19.5	19.1	19.2	20.1	19
Calcium, Dissolved	--	--	38,400	41,600	37,100	37,400	34,700	33,800	35,400	35,500	35,600
Iron, Dissolved	11,000	1,000	62.4	83.1	73.4	71.7	73.5	73.2	83.8	76.7	97.6
Magnesium, Dissolved	--	--	1,570	1,680	1,540	1,560	1,380	1,360	1,440	1,460	1,500
Manganese, Dissolved	320	120	14.9	16.1	14.4	13.6	9.88	9.86	12.6	10.4	10.4
Nickel, Dissolved	300	52.0	1.5 U	1.5 U	1.5 U	1.5 U	1.96 J	1.5 U	1.5 U	1.5 U	1.5 U
Potassium, Dissolved	--	--	2,780	2,930	2,720	2,770	2,630	2,600	2,690	2,700	2,710
Sodium, Dissolved	--	--	9,220	9,650	9,130	9,220	8,370	8,250	8,630	8,690	9,000
Zinc, Dissolved	4,700	118.1	2.5 U	1.33 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Wet Chemistry											
Hardness (mg/l)	--	--	91.3	90.7	NA	89.9	86.3	86.5	86.9	87.1	88.1

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Notes:

Bold text indicates exceedance of Tapwater RSLs X 10 for SW, Adjusted 1112

Shading indicates exceedance of Surface Water ESV

RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

J - Analyte present, value may or may not be accurate or precise

L - Analyte present, value may be biased low, actual value may be higher

R - Unreliable Result

U - The material was analyzed for, but not detected

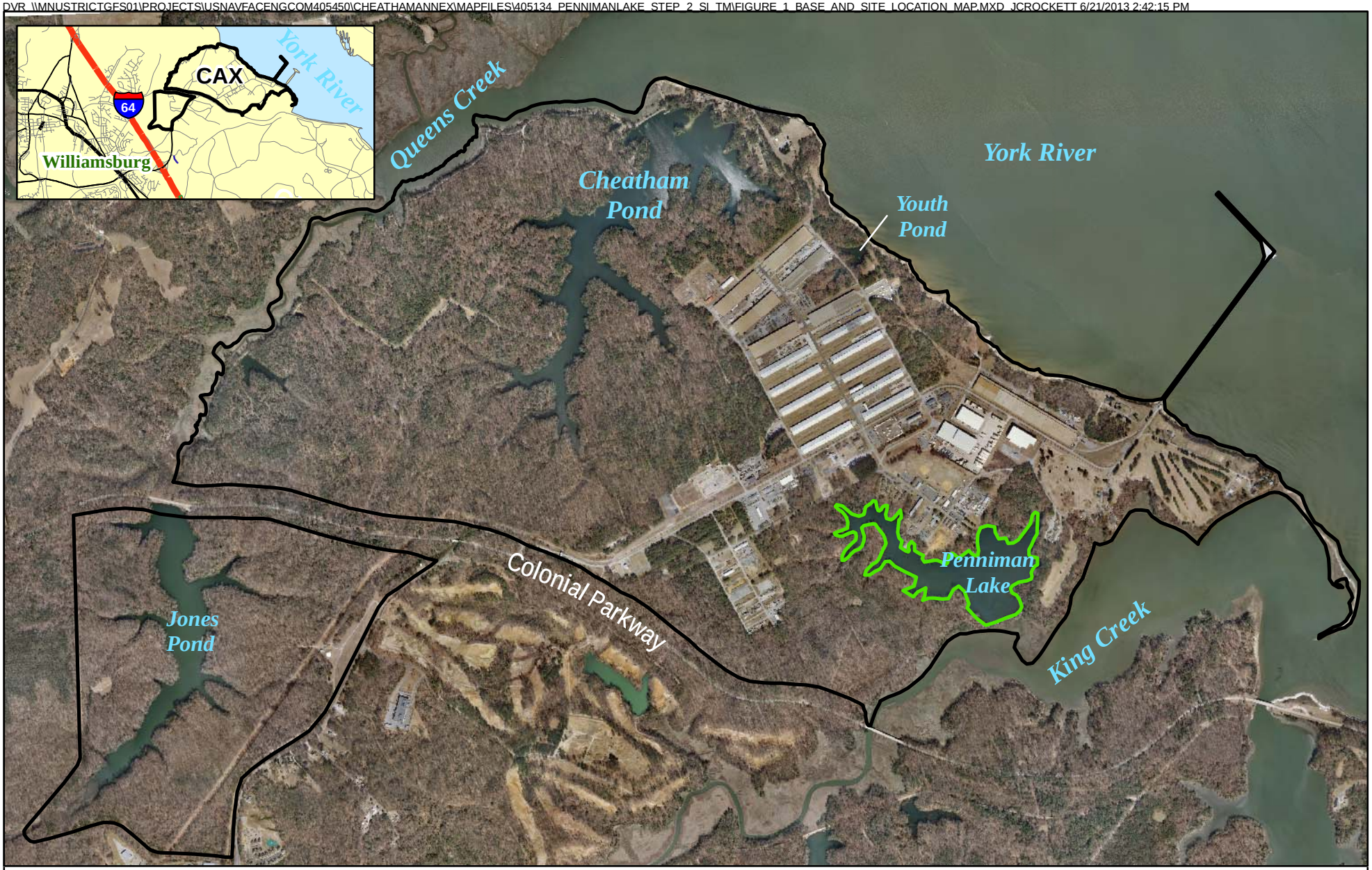
UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/l - Milligrams per liter

µg/l - Micrograms per liter

Figures



Legend

- Cheatham Annex Boundary
- Approximate Study Area Boundary

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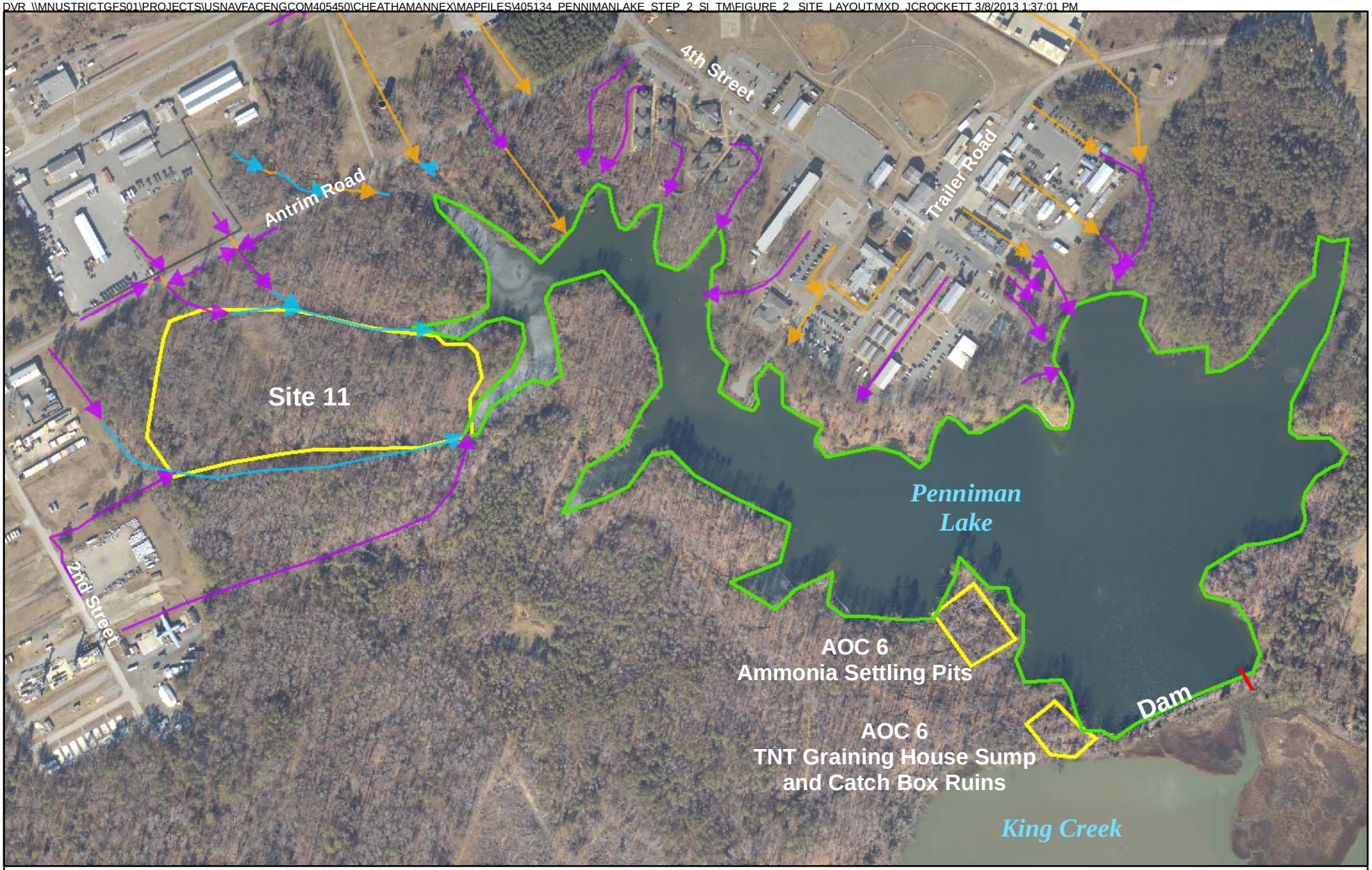
Figure 1
Base and Site Location Map
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, Virginia

CH2MHILL



Legend

- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- Adjacent Environmental Restoration Program Sites
- Approximate Study Area Boundary

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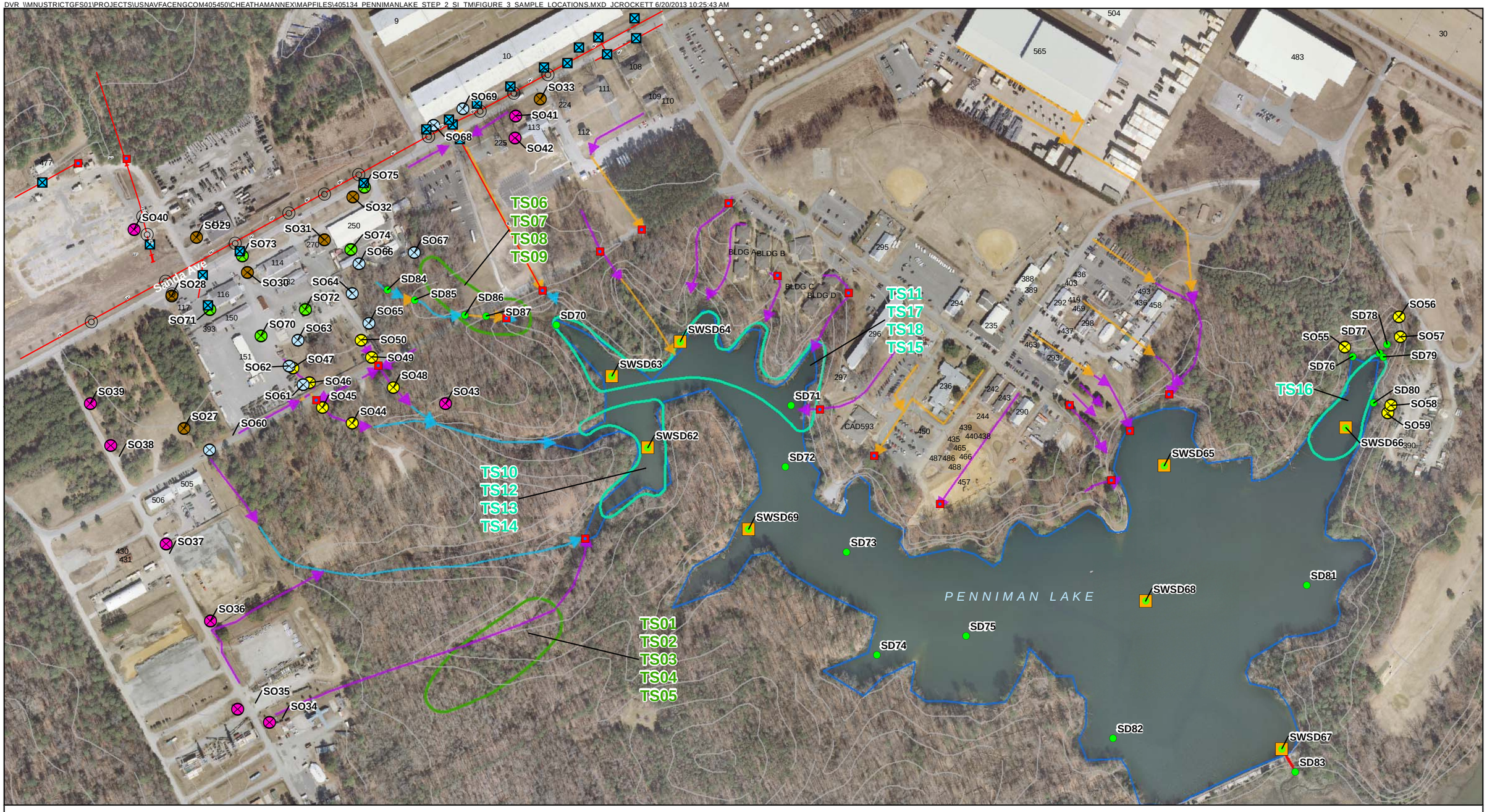
Figure 2
Site Layout
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

DVR \\MNUSTRICTGFS01\PROJECTS\USNAVFACENGCOM405450\CHEATHAMANNEX\MAPFILES\405134_PENNIMANLAKE_STEP_2_SI_TM\FIGURE_3_SAMPLE_LOCATIONS.MXD JCROCKETT 6/20/2013 10:25:43 AM



Legend

- Surface and Subsurface Sediment Sample Locations
- Surface and Subsurface Sediment and Surface Water Sample Locations
- Surface Soil Locations - Pole Mounted Transformer
- Surface and Subsurface Soil Locations - Drainages
- Surface and Subsurface Soil Locations - Former Pad Mounted Transformer (PCB 1260)
- Surface and Subsurface Soil Locations - Potential Sprayed Areas
- Surface and Subsurface Soil Locations - Upgradient to Drainage Ditches
- Inlet
- Outfall Point
- Water Utility Infrastructure
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- Elevation Contours (ft amsl)
- Shoreline
- Fish Sample Collection Area
- Frog Sample Collection Area

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Figure 3
Sample Locations
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

D:\8_IMNU\STRICT\GIS\01\PROJECTS\USN\VAFACENGCOM\405450\CHEATHAMANNEX\MAPFILES\405134_PENNIMAN LAKE_STEP_2_SI_TM\FIGURE_3_SAMPLE_LOCATIONS.MXD JCOCKCETT 6/26/2013 12:14:51 PM

SO69
SO33
SO68
SO41
SO42
SO75
SO32
SO40
SO29
SO31
SO74
SO67
SO73
SO66
TS06
TS07
TS08
TS09
SO28
SO30
SO64
SD84
SD85
SD86
SO72
SD87
SO71
SO65
SD70
SO70
SO63
SO50
SWSD64
TS11
TS17
TS18
TS15
SO62
SO47
SO49
SWSD63
SO46
SO48
SO39
SO61
SO45
SO43
SD71
SO27
SO44
SO38
SWSD62
SO60
SD72
SWSD65
TS10
TS12
TS13
TS14
SWSD69
SO37
SD73
SD81
PENNIMAN LAKE
SWSD68
SO36
TS01
TS02
TS03
TS04
TS05
SD75
SD74
SO35
SO34
SD82
SWSD67
SD83
SO56
SD78
SD77
SO55
SO57
SD79
SD76
TS16
SD80
SO58
SO59
SWSD66
Sanda Ave

Legend

- Surface and Subsurface Sediment Sample Locations
- Surface and Subsurface Sediment and Surface Water Sample Locations
- Surface Soil Locations - Pole Mounted Transformer
- Surface and Subsurface Soil Locations - Drainages
- Surface and Subsurface Soil Locations - Former Pad Mounted Transformer (PCB 1260)
- Surface and Subsurface Soil Locations - Potential Sprayed Areas
- Surface and Subsurface Soil Locations - Upgradient to Drainage Ditches
- Inlet
- Basin
- Outfall Point
- Water Utility Infrastructure
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- Elevation Contours (ft amsl)
- Shoreline
- Fish Sample Collection Area
- Frog Sample Collection Area

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Figure 3
Sample Locations
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, Virginia

CH2MHILL.

DVR \\MNUSTRICTGFS01\PROJECTS\USNAVFACENGCOM405450\CHEATHAMANNEX\MAPFILES\405134_PENNIMANLAKE_STEP_2_SI_TM\FIGURE_4_SURFACE_SEDIMENT_SAMPLE_LOCS_AND_EXCEEDANCES.MXD JCROCKETT 6/21/2013 2:44:17 PM

Sample ID	CAPL-SD85-1012
Sample Date	10/24/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	12.8 K
4,4'-DDE	64.9 J
4,4'-DDT	71 J
alpha-Chlordane	13.1 K
Aroclor-1260	**8,300 J**
Dieldrin	167 K
Endosulfan II	26.1 K
Endosulfan sulfate	319 K
Endrin	51.7
Endrin aldehyde	8.26 J
Endrin ketone	22.2 J
gamma-Chlordane	40.1
Heptachlor epoxide	5.37 K
Methoxychlor	25.7 J
Total Metals (mg/kg)	
Antimony	3.89
Arsenic	**5.62**
Barium	90.2
Chromium	**45**
Cobalt	**34.5**
Copper	1,000
Iron	31,600
Lead	853
Nickel	564
Zinc	2,950

Sample ID	CAPL-SD86-1012
Sample Date	10/24/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	6.53 J
4,4'-DDE	18.5 L
4,4'-DDT	27.6 J
alpha-Chlordane	8.56 J
Aroclor-1260	**4,090 J**
Dieldrin	66.6 J
Endosulfan II	43.9 J
Endrin	29.5 J
Endrin aldehyde	4.39 J
Endrin ketone	15.1 J
gamma-Chlordane	17.2 J
Total Metals (mg/kg)	
Barium	22.8
Chromium	**11.3**
Copper	98.3
Lead	126
Nickel	65.4
Zinc	525

Sample ID	CAPL-SD87-1012
Sample Date	10/24/12
SVOCs (µg/kg)	
Acenaphthene	336 K
Anthracene	265
Benzo(a)anthracene	125
Fluoranthene	440
Fluorene	285 K
Phenanthrene	949
Pyrene	497 K
PCBs (µg/kg)	
4,4'-DDD	6.56 J
4,4'-DDE	13.1
4,4'-DDT	18.3 J
alpha-Chlordane	9.44
Aroclor-1260	**3,780 J**
Dieldrin	79.2
Endosulfan II	15.4 J
Endrin	35.7 J
Endrin aldehyde	5.11 J
Endrin ketone	12.6 J
gamma-Chlordane	28.4
Total Metals (mg/kg)	
Chromium	**8.94**
Lead	72.9

Sample ID	CAPL-SD70-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	4.41 J
SVOCs (µg/kg)	
Chrysene	173
Pyrene	216
Pesticide/PCBs (µg/kg)	
4,4'-DDD	43.9 J
4,4'-DDE	121 J
4,4'-DDT	21 J
alpha-Chlordane	29.6 L
Aroclor-1260	**8,240**
Dieldrin	106 J
Endrin aldehyde	16.4 J
Endrin ketone	34.7 J
gamma-Chlordane	94.2 J
Methoxychlor	82.2 J
Total Metals (mg/kg)	
Arsenic	**12.7**
Barium	43
Chromium	**19.4**
Copper	33
Iron	21,900
Lead	66.8
Zinc	190

Sample ID	CAPL-SD63-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	13.3 J
SVOCs (µg/kg)	
Chrysene	185
Fluorene	99.7 J
Pesticide/PCBs (µg/kg)	
4,4'-DDD	7.08 J
4,4'-DDE	39.2 J
4,4'-DDT	4.18 J
alpha-Chlordane	3.63 J
Aroclor-1260	1,270 J
Dieldrin	20.7 J
Endosulfan sulfate	41.1 J
Endrin	15.6 J
Endrin aldehyde	4.96 J
gamma-Chlordane	41 J
Total Metals (mg/kg)	
Arsenic	**36.5**
Barium	89
Chromium	**38.5**
Copper	40.7
Iron	34,000
Lead	85.8
Mercury	0.197
Zinc	201

Sample ID	CAPL-SD64-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	17.5 J
PCBs (µg/kg)	
4,4'-DDD	10.6 J
4,4'-DDE	16.5 J
Aroclor-1260	84.7 J
Dieldrin	2.41 J
Endrin ketone	6.86 J
Total Metals (mg/kg)	
Arsenic	**47.5**
Barium	80.5
Chromium	**44.9**
Copper	51.4
Iron	35,200
Lead	78.2
Mercury	1.48
Zinc	187

Sample ID	CAPL-SD71-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	13.6 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	7.95 J
Endrin aldehyde	2.38 J
Endrin ketone	4.31 J
gamma-Chlordane	5.18 J
Total Metals (mg/kg)	
Arsenic	**33.9**
Barium	72.6
Chromium	**36.6**
Copper	43.1
Iron	30,100
Lead	72.8
Zinc	173

Sample ID	CAPL-SD65-1012
Sample Date	10/18/12
PCBs (µg/kg)	
4,4'-DDE	6.29 J
Aroclor-1260	63.6
Endrin aldehyde	2.75
Total Metals (mg/kg)	
Arsenic	**9.58**
Barium	26.7
Chromium	**11.8**

Sample ID	CAPL-SD76-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	23.3 J
4,4'-DDE	45.9 J
gamma-Chlordane	4.03 L
Explosives (µg/kg)	
1,3-Dinitrobenzene	469 J
Total Metals (mg/kg)	
Arsenic	**5.56**
Barium	28.1
Chromium	**9**

Sample ID	CAPL-SD78-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	10.3 J
4,4'-DDE	12.6
Aroclor-1260	66.1 L
Endosulfan sulfate	22.8 K
Explosives (µg/kg)	
1,3-Dinitrobenzene	151 J
Total Metals (mg/kg)	
Arsenic	**5.53**
Barium	22.3
Chromium	**8.21**

Sample ID	CAPL-SD77-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	46.5 J
alpha-Chlordane	9.57 L
Aroclor-1260	720 J
Dieldrin	15.1 J
Endosulfan sulfate	12.8 J
Endrin	13.7
gamma-Chlordane	35.9 J
Explosives (µg/kg)	
1,3-Dinitrobenzene	303 J
Total Metals (mg/kg)	
Arsenic	**9.1**
Chromium	**5.73**

Sample ID	CAPL-SD79-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	23.6 J
Aroclor-1260	354 J
Dieldrin	6.63 J
Endosulfan sulfate	6.65 J
Endrin	5.37 J
gamma-Chlordane	6.3 J
Explosives (µg/kg)	
1,3-Dinitrobenzene	384 J
HMX	464 J
Total Metals (mg/kg)	
Arsenic	**7.87**
Chromium	**5.91**

Sample ID	CAPL-SD80-1012
Sample Date	10/16/12
VOCs (µg/kg)	
Carbon disulfide	3.5 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	21.5
Aroclor-1260	156
Dieldrin	2.42 L
Endrin aldehyde	3.05 L
Total Metals (mg/kg)	
Arsenic	**16.8**
Barium	26.8
Chromium	**9.76**

Sample ID	CAPL-SD66-1012
Sample Date	10/18/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	4.74
Total Metals (mg/kg)	
Arsenic	**8.68**
Chromium	**7.22**

Sample ID	CAPL-SD84-1012
Sample Date	10/24/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	10.2 J
4,4'-DDE	50.8 J
4,4'-DDT	137 K
Aldrin	3.54 J
alpha-Chlordane	6.82 J
Aroclor-1260	**16,200 J**
Dieldrin	**364 K**
Endosulfan II	56.1 J
Endosulfan sulfate	681 K
Endrin	143 K
Endrin aldehyde	17.4 J
Endrin ketone	49.4 J
gamma-Chlordane	22.7 J
Heptachlor epoxide	3.58 J
Methoxychlor	49.2 J
Total Metals (mg/kg)	
Chromium	**7.75**
Lead	90.3

Sample ID	CAPL-SD62-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	9.93 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	9.69 J
Aroclor-1260	140 J
Dieldrin	3.58 J
Endrin aldehyde	3.54 J
Endrin ketone	14.7 J
Total Metals (mg/kg)	
Arsenic	**38.1**
Barium	77.3
Chromium	**49.4**
Copper	43.9
Iron	39,600
Lead	80.7
Zinc	253

Sample ID	CAPL-SD72-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	26.7 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	6.03 J
Dieldrin	2.86 J
Endrin aldehyde	3.95 J
Endrin ketone	4.6 J
gamma-Chlordane	17 J
Total Metals (mg/kg)	
Aluminum	28,200
Arsenic	**51.5**
Barium	107
Chromium	**50.4**
Copper	40.2
Iron	41,300
Lead	69.2
Mercury	0.198 J
Zinc	186

Sample ID	CAPL-SD69-1012
Sample Date	10/17/12
Pesticide/PCBs (µg/kg)	
gamma-Chlordane	5.31 J
Explosives (µg/kg)	
2,4,6-Trinitrotoluene	125 J
Total Metals (mg/kg)	
Arsenic	**6.48 J**
Barium	21.2 J
Chromium	**16.1**

Sample ID	CAPL-SD73-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	29.9 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	14 J
Aroclor-1260	78.5 J
Dieldrin	2.64 J
Endrin aldehyde	3.53 J
Endrin ketone	5.62 J
Total Metals (mg/kg)	
Arsenic	**51.7**
Barium	93.9
Chromium	**46.3**
Copper	50.1
Iron	39,300
Lead	81.6
Zinc	173

Sample ID	CAPL-SD74-1012
Sample Date	10/18/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	5.19 J
Endrin ketone	2.88 J
gamma-Chlordane	12.7 J
Total Metals (mg/kg)	
Arsenic	**42.4**
Barium	75.4
Chromium	**36.1**
Copper	46
Iron	34,900
Lead	56.2
Zinc	133

Sample ID	CAPL-SD75-1012
Sample Date	10/18/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	4.58 J
Endosulfan II	23.8 J
Endrin aldehyde	2.49 J
Total Metals (mg/kg)	
Arsenic	**47.3**
Barium	88.3
Chromium	**38.7**
Copper	56.9
Iron	34,000
Lead	69.3
Zinc	148

Sample ID	CAPL-SD82-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	11.7 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	3.49 J
Total Metals (mg/kg)	
Arsenic	**46.3**
Barium	72.9
Chromium	**29.7**
Copper	48.4
Iron	26,100
Lead	49.7

Sample ID	CAPL-SD68-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	13.9 L
Total Metals (mg/kg)	
Aluminum	26,700
Arsenic	**56.7**
Barium	80.2
Chromium	**45.6 K**
Iron	30,900

Sample ID	CAPL-SD67-1012
Sample Date	10/16/12
SVOCs (µg/kg)	
Benzo(a)anthracene	223
Benzo(a)pyrene	**303**
Benzo(b)fluoranthene	400
Benzo(g,h,i)perylene	208
Benzo(k)fluoranthene	335
Chrysene	285
Dibenz(a,h)anthracene	74.1
Indeno(1,2,3-cd)pyrene	238
Pesticide/PCBs (µg/kg)	
4,4'-DDE	23.7 L
4,4'-DDT	7.55 J
alpha-Chlordane	4.25 L
Aroclor-1260	914 L
Dieldrin	4.55 L
Endrin aldehyde	3.11 L
gamma-Chlordane	8.24 L
Total Metals (mg/kg)	
Arsenic	**6.18**
Barium	30.2
Chromium	**6.45**

Sample ID	CAPL-SD81-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	9.22 J
Total Metals (mg/kg)	
Aluminum	26,000
Arsenic	**27.9**
Barium	63.5
Chromium	**45.6 J**
Iron	36,600

Sample ID	CAPL-SD83-1012*
Sample Date	10/16/12
VOCs (µg/kg)	
Carbon disulfide	2.26 J
Total Metals (mg/kg)	
Arsenic	**30.2**
Barium	21.7 J
Chromium	**56.3**
Iron	**68,200**

	Adjusted Residential RSL x 10 for SD 11/12	CAX Freshwater Sediment ESV
VOCs (µg/kg)		
Carbon disulfide	740,000	0.85
SVOCs (µg/kg)		
Acenaphthene	3,400,000	290
Anthracene	17,000,000	57.2
Benzo(a)anthracene	1,500	108
Benzo(a)pyrene	150	150
Benzo(b)fluoranthene	1,500	240
Benzo(g,h,i)perylene	1,700,000	170
Benzo(k)fluoranthene	15,000	240
Chrysene	150,000	166
Dibenz(a,h)anthracene	150	33
Fluoranthene	2,300,000	423
Fluorene	2,300,000	77.4
Indeno(1,2,3-cd)pyrene	1,500	200
Phenanthrene	17,000,000	204
Pyrene	1,700,000	195
Pesticide/PCBs (µg/kg)		
4,4'-DDD	20,000	4.88
4,4'-DDE	14,000	3.16
4,4'-DDT	17,000	4.16
Aldrin	290	2
alpha-Chlordane	16,000	3.24
Aroclor-1260	2,200	59.8
Dieldrin	300	1.9
Endosulfan II	370,000	14
Endosulfan sulfate	370,000	5.4
Endrin	18,000	2.22
Endrin aldehyde	18,000	2.22
Endrin ketone	18,000	2.22
gamma-Chlordane	16,000	3.24
Heptachlor epoxide	530	2.47
Methoxychlor	310,000	19
Explosives (µg/kg)		
1,3-Dinitrobenzene	6,100	6.7
2,4,6-Trinitrotoluene	36,000	92
HMX	3,800,000	4.7
Total Metals (mg/kg)		
Aluminum	77,000	25,500
Antimony	31	3
Arsenic	3.9	9.79
Barium	15,000	20
Chromium	2.9	43.4
Cobalt	23	50
Copper	3,100	31.6
Iron	55,000	20,000
Lead	4,000	35.8
Mercury	23	0.18
Nickel	1,500	22.7
Zinc	23,000	121

Legend
- Surface and Subsurface Sediment Sample Locations
- Surface Water, Surface Sediment, and Subsurface Sediment Sample Locations
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- Elevation Contours (ft amsl)
- Shoreline

Note:
Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment
Shading indicates exceedance of CAX Freshwater Sediment ESV
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher
mg/kg - Milligrams per kilogram

ph - pH units
µg/kg - Micrograms per kilogram
* VOCs were recollected on 10/25/12

N W E S

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Figure 4
Surface Sediment Sample Locations and Exceedances
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, Virginia

CH2MHILL.

Sample ID	CAPL-SSD85-1012
Sample Date	10/24/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	9.61
4,4'-DDT	11.2 J
alpha-Chlordane	3.34
Aroclor-1260	1,840 J
Dieldrin	4.07 J
Endosulfan II	18.1 J
Endrin	12.2 J
Endrin ketone	5.59 J
gamma-Chlordane	11.6
Total Metals (mg/kg)	
Arsenic	**5.72**
Barium	49.8
Chromium	**27.6**
Copper	379
Iron	28,400
Lead	236
Nickel	242
Zinc	1,040

Sample ID	CAPL-SSD86-1012
Sample Date	10/24/12
VOCs (µg/kg)	
Carbon disulfide	4.19 J
Pesticide/PCBs (µg/kg)	
4,4'-DDD	7.08 L
4,4'-DDE	23.5 L
4,4'-DDT	13.9 J
alpha-Chlordane	466 K
Aroclor-1260	**3,700 J**
Dieldrin	62.4 J
Endosulfan II	39.7 J
Endrin	31.1 J
Endrin aldehyde	2.55 J
Endrin ketone	13.1 J
Total Metals (mg/kg)	
Barium	28.2
Chromium	**15.1**
Copper	160
Lead	236
Nickel	118
Zinc	927

Sample ID	CAPL-SSD87-1012
Sample Date	10/24/12
SVOCs (µg/kg)	
Acenaphthene	1,270 K
Anthracene	2,650
Benzo(a)anthracene	**2,300**
Benzo(a)pyrene	**1,230 K**
Benzo(b)fluoranthene	1,400 K
Benzo(g,h,i)perylene	466 K
Benzo(k)fluoranthene	726
Chrysene	2,350 K
Dibenz(a,h)anthracene	134 K
Fluoranthene	6,230
Fluorene	1,340 K
Indeno(1,2,3-cd)pyrene	386
Phenanthrene	7,590
Pyrene	6,970 K
Pesticide/PCBs (µg/kg)	
4,4'-DDD	13.6 J
Aroclor-1260	138 L
Dieldrin	3.49 J
Endrin	3.12 J
gamma-Chlordane	7.05 L
Total Metals (mg/kg)	
Arsenic	**5.28**
Barium	32.1
Chromium	**18.6**

Sample ID	CAPL-SSD70-1012
Sample Date	10/17/12
SVOCs (µg/kg)	
Acenaphthene	79,800
Anthracene	85,600
Benzo(a)anthracene	**36,600**
Benzo(a)pyrene	**20,500**
Benzo(b)fluoranthene	**16,100**
Benzo(g,h,i)perylene	5,960
Benzo(k)fluoranthene	**17,700**
Chrysene	46,300
Dibenz(a,h)anthracene	**2,710**
Dibenzofuran	32,900 J
Fluoranthene	125,000
Fluorene	81,700
Indeno(1,2,3-cd)pyrene	**5,960**
Phenanthrene	287,000
Pyrene	135,000
Pesticide/PCBs (µg/kg)	
4,4'-DDD	70.7 J
4,4'-DDE	50.1 J
4,4'-DDT	4.21 J
alpha-Chlordane	7.13 J
Aroclor-1260	2,030 J
beta-BHC	26.2 J
delta-BHC	6.34 J
Dieldrin	8.03 J
Endosulfan sulfate	45.9 J
Endrin	23.9 J
Endrin aldehyde	5.18 J
Endrin ketone	3.62 J
gamma-Chlordane	26.9 J
Explosives (µg/kg)	
1,3-Dinitrobenzene	551
Total Metals (mg/kg)	
Arsenic	**16.5**
Barium	36.5
Chromium	**11.5**
Lead	37.6

Sample ID	CAPL-SSD63-1012
Sample Date	10/17/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	10.1 J
Aroclor-1260	217 J
Dieldrin	4.36 J
Endosulfan sulfate	9.51 J
Endrin aldehyde	4.52 J
gamma-Chlordane	12.2 L
Total Metals (mg/kg)	
Arsenic	**27.4**
Barium	86.7
Chromium	**35.2**
Copper	32.3
Iron	33,700
Lead	68.4
Mercury	0.252
Zinc	165

Sample ID	CAPL-SSD64-1012
Sample Date	10/17/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	5.53 J
4,4'-DDE	9.13 J
Total Metals (mg/kg)	
Arsenic	**22.8**
Barium	71.5
Chromium	**39.3**
Copper	37.6
Iron	29,600
Lead	57.6
Mercury	1.45
Zinc	155

Sample ID	CAPL-SSD71-1012
Sample Date	10/17/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	8.61 J
Dieldrin	2.1 J
Endrin aldehyde	2.29 J
Endrin ketone	2.73
Total Metals (mg/kg)	
Arsenic	**26.5**
Barium	59.9
Chromium	**31.7**
Iron	24,500
Lead	47.9

Sample ID	CAPL-SSD65-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	6.02 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	3.35 J
Total Metals (mg/kg)	
Arsenic	**19**
Barium	40.3
Chromium	**30.7 J**
Iron	25,600

Sample ID	CAPL-SSD76-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	6.3

Sample ID	CAPL-SSD78-1012
Sample Date	10/16/12
SVOCs (µg/kg)	
Chrysene	194
Pyrene	283
Pesticide/PCBs (µg/kg)	
4,4'-DDD	33.6 L
4,4'-DDE	251 J
4,4'-DDT	9.17 J
alpha-Chlordane	34.7
Aroclor-1260	**3,020 J**
Dieldrin	50.1 L
Endosulfan sulfate	102 J
Endrin	49 L
Endrin aldehyde	16.2 L
Endrin ketone	8.6 J
gamma-Chlordane	212
Heptachlor epoxide	3.43 L
Methoxychlor	276 J
Explosives (µg/kg)	
1,3-Dinitrobenzene	456
Total Metals (mg/kg)	
Arsenic	**8.75**
Barium	49.5
Chromium	**15.2**
Lead	43

Sample ID	CAPL-SSD77-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	20 J
4,4'-DDT	5.25 J
alpha-Chlordane	3.88 L
Aroclor-1260	1,170
Dieldrin	5.14 J
Endrin aldehyde	3.54 J
Endrin ketone	3.41 J
gamma-Chlordane	26.1
Total Metals (mg/kg)	
Chromium	**5.52**

Sample ID	CAPL-SSD79-1012
Sample Date	10/16/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	32.7 J
alpha-Chlordane	9.94 L
Aroclor-1260	630 J
Dieldrin	6.88 J
Endosulfan sulfate	20.3 L
gamma-Chlordane	40.6
Explosives (µg/kg)	
1,3-Dinitrobenzene	117 J
Total Metals (mg/kg)	
Barium	21.3
Chromium	**6.11**

Sample ID	CAPL-SSD80-1012*
Sample Date	10/16/12
VOCs (µg/kg)	
Carbon disulfide	7.31 **J**
Pesticide/PCBs (µg/kg)	
4,4'-DDE	3.57 J
Total Metals (mg/kg)	
Arsenic	**4.29**
Chromium	**7.39**

Sample ID	CAPL-SSD84-1012
Sample Date	10/24/12
VOCs (µg/kg)	
Carbon disulfide	2.11 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	17.1 J
4,4'-DDT	218 J
Aldrin	5.33 J
alpha-Chlordane	13.4 J
Aroclor-1260	**34,200 J**
Dieldrin	**709**
Endosulfan II	483 J
Endosulfan sulfate	129 J
Endrin	59.1 J
Endrin aldehyde	30 J
Endrin ketone	28 J
Heptachlor epoxide	6.42 J
Methoxychlor	137 J
Total Metals (mg/kg)	
Arsenic	**5.1**
Barium	25.6
Chromium	**14.1**

Sample ID	CAPL-SSD66-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	1.88 J
Total Metals (mg/kg)	
Chromium	**4.3**

Sample ID	CAPL-SSD62-1012
Sample Date	10/17/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	17.7 J
4,4'-DDE	26.4 J
Aroclor-1260	169 J
Dieldrin	4.65 J
Endosulfan sulfate	6.42 J
Endrin aldehyde	5.11 L
Endrin ketone	16.5 J
Total Metals (mg/kg)	
Arsenic	**44.3**
Barium	70.2
Chromium	**45**
Copper	34.4
Iron	30,400
Lead	107
Zinc	215

Sample ID	CAPL-SSD67-1012
Sample Date	10/16/12
SVOCs (µg/kg)	
Benzo(a)anthracene	230
Benzo(a)pyrene	**369**
Benzo(b)fluoranthene	392
Benzo(g,h,i)perylene	246
Benzo(k)fluoranthene	467
Chrysene	359
Dibenz(a,h)anthracene	77.5
Indeno(1,2,3-cd)pyrene	221
Pyrene	226
Pesticide/PCBs (µg/kg)	
4,4'-DDE	14 L
Aroclor-1260	230 L
Endrin	3.15 L
Endrin aldehyde	3.73 L
gamma-Chlordane	5.22 L
Total Metals (mg/kg)	
Arsenic	**9.01**
Chromium	**4.65**

Sample ID	CAPL-SSD68-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	14.8 J
Total Metals (mg/kg)	
Aluminum	30,700
Arsenic	**22.5**
Barium	60
Chromium	**51.4 J**
Iron	28,400

Sample ID	CAPL-SSD72-1012
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	11.5 J
Pesticide/PCBs (µg/kg)	
gamma-Chlordane	16.4 J
Total Metals (mg/kg)	
Arsenic	**31.2**
Barium	53.7 J
Chromium	**35.2**
Iron	21,200

Sample ID	CAPL-SSD69-1012*
Sample Date	10/17/12
VOCs (µg/kg)	
Carbon disulfide	4.08 J
Pesticide/PCBs (µg/kg)	
gamma-Chlordane	4.77 K
Total Metals (mg/kg)	
Arsenic	**5.86**
Chromium	**10.3**

Sample ID	CAPL-SSD73-1012
Sample Date	10/17/12
Pesticide/PCBs (µg/kg)	
4,4'-DDD	6.99 J
4,4'-DDE	21.6 J
Dieldrin	3.01 J
Endrin ketone	3.04 J
Total Metals (mg/kg)	
Aluminum	29,100
Arsenic	**52**
Barium	104
Chromium	**54.2**
Copper	60
Iron	41,800
Lead	92.3
Zinc	186

Sample ID	CAPL-SSD74-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	13.4 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	6.22 J
Endrin aldehyde	2.27 J
gamma-Chlordane	14.7 J
Total Metals (mg/kg)	
Arsenic	**47**
Barium	65.6
Chromium	**37.9**
Copper	39.1
Iron	31,100
Lead	44

Sample ID	CAPL-SSD75-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	9.7 J
Pesticide/PCBs (µg/kg)	
4,4'-DDE	3.67 J
Total Metals (mg/kg)	
Arsenic	**40.6**
Barium	75.4
Chromium	**40.1**
Copper	44
Iron	30,000
Lead	48.5

Sample ID	CAPL-SSD82-1012
Sample Date	10/18/12
Pesticide/PCBs (µg/kg)	
4,4'-DDE	4.8
gamma-Chlordane	3.72 J
Total Metals (mg/kg)	
Arsenic	**45.8**
Barium	66.9
Chromium	**26.9**
Copper	42.5
Iron	26,000
Lead	42.1

Sample ID	CAPL-SSD81-1012
Sample Date	10/18/12
VOCs (µg/kg)	
Carbon disulfide	29.7
Total Metals (mg/kg)	
Aluminum	34,700
Arsenic	**24.4**
Barium	64.7
Chromium	**61.7**
Iron	51,400
Nickel	26.1

	Adjusted Residential RSL x 10 for SD 11/12	CAX Freshwater Sediment ESV
VOCs (µg/kg)		
Carbon disulfide	740,000	0.85
SVOCs (µg/kg)		
Acenaphthene	3,400,000	290
Anthracene	17,000,000	57.2
Benzo(a)anthracene	1,500	108
Benzo(a)pyrene	150	150
Benzo(b)fluoranthene	1,500	240
Benzo(g,h,i)perylene	1,700,000	170
Benzo(k)fluoranthene	15,000	240
Chrysene	150,000	166
Dibenz(a,h)anthracene	150	33
Dibenzofuran	78,000	5,100
Fluoranthene	2,300,000	423
Fluorene	2,300,000	77.4
Indeno(1,2,3-cd)pyrene	1,500	200
Phenanthrene	17,000,000	204
Pyrene	1,700,000	195
Pesticide/PCBs (µg/kg)		
4,4'-DDD	20,000	4.88
4,4'-DDE	14,000	3.16
4,4'-DDT	17,000	4.16
Aldrin	290	2
alpha-Chlordane	16,000	3.24
Aroclor-1260	2,200	59.8
beta-BHC	2,700	5
delta-BHC	2,700	3
Dieldrin	300	1.9
Endosulfan II	370,000	14
Endosulfan sulfate	370,000	5.4
Endrin	18,000	2.22
Endrin aldehyde	18,000	2.22
Endrin ketone	18,000	2.22
gamma-Chlordane	16,000	3.24
Heptachlor epoxide	530	2.47
Methoxychlor	310,000	19
Explosives (µg/kg)		
1,3-Dinitrobenzene	6,100	6.7
Total Metals (mg/kg)		
Aluminum	77,000	25,500
Arsenic	3.9	9.79
Barium	15,000	20
Chromium	2.9	43.4
Copper	3,100	31.6
Iron	55,000	20,000
Lead	4,000	35.8
Mercury	23	0.18
Nickel	1,500	22.7
Zinc	23,000	121

Legend
- Surface and Subsurface Sediment Sample Locations
- Surface Water, Surface Sediment, and Subsurface Sediment Sample Locations
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- Elevation Contours (ft amsl)
- Shoreline

Note:
Bold text indicates exceedance of Adjusted Residential Soil RSL x 10 for Sediment
Shading indicates exceedance of CAX Freshwater Sediment ESV
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents
NA - Not analyzed
VOCs - Volatile Organic Compounds
SVOCs - Semivolatile Organic Compounds
PCBs - Polychlorinated Biphenyls
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher

mg/kg - Milligrams per kilogram
µg/kg - Micrograms per kilogram
* VOCs were recollected on 10/25/12

N W E S

0 175 350 Feet

Figure 5
Subsurface Sediment Sample Locations and Exceedances
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, Virginia

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DVR \\MNUSTRICTGFS01\PROJECTS\USNAVFACENGCOM405450\CHEATHAMANNEX\MAPFILES\405134_PENNIMANLAKE_STEP_2_SI_TM\FIGURE_6_SW_SAMPLE_LOCS_AND_EXCEEDANCES.MXD JCROCKETT 6/21/2013 2:52:30 PM

Sample ID	CAPL-SW64-1012
Sample Date	10/15/12
Total Metals (µg/l)	
Arsenic	**1.44 J**
Barium	19.1
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.17 J**
Barium, Dissolved	18.4

Sample ID	CAPL-SW65-1012
Sample Date	10/15/12
Total Metals (µg/l)	
Arsenic	**2.01 J**
Barium	21.6
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.19 J**
Barium, Dissolved	19.5

Sample ID	CAPL-SW66-1012
Sample Date	10/15/12
SVOCs (µg/l)	
Benzo(a)anthracene	0.0707 J
Pyrene	0.19
Total Metals (µg/l)	
Arsenic	**1.37 J**
Barium	20.4
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.26 J**
Barium, Dissolved	19.1

Sample ID	CAPL-SW63-1012
Sample Date	10/15/12
Total Metals (µg/l)	
Arsenic	**1.64 J**
Barium	19.5
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.32 J**
Barium, Dissolved	19.5

Sample ID	CAPL-SW62-1012
Sample Date	10/15/12
Total Metals (µg/l)	
Arsenic	**1.5 J**
Barium	20.1
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.31 J**
Barium, Dissolved	18.5

Sample ID	CAPL-SW69-1012
Sample Date	10/15/12
SVOCs (µg/l)	
Benzo(a)anthracene	0.0563 J
Dibenz(a,h)anthracene	**0.0782 J**
Total Metals (µg/l)	
Arsenic	**1.7 J**
Barium	20.4
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.42 J**
Barium, Dissolved	19

Sample ID	CAPL-SW68-1012
Sample Date	10/15/12
Total Metals (µg/l)	
Arsenic	**1.62 J**
Barium	21
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.15 J**
Barium, Dissolved	20.1

Sample ID	CAPL-SW67-1012
Sample Date	10/15/12
Total Metals (µg/l)	
Arsenic	**1.85 J**
Barium	21
Dissolved Metals (µg/l)	
Arsenic, Dissolved	**1.24 J**
Barium, Dissolved	19.2

	RSLs Tap X 10 for SW Adjusted 11/12	Surface Water Eco SV
SVOCs (µg/l)		
Benzo(a)anthracene	0.29	0.027
Dibenz(a,h)anthracene	0.029	--
Pyrene	87	0.025
Total Metals (µg/l)		
Arsenic	0.45	150
Barium	2,900	4
Dissolved Metals (µg/l)		
Arsenic, Dissolved	0.45	150
Barium, Dissolved	2,900	4

PENNIMAN LAKE

BLDG A BLDG B BLDG C BLDG D

CAD593

Legend

- Surface Water, Surface Sediment, and Subsurface Sediment Sample Locations
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- Elevation Contours (ft amsl)
- Shoreline

Note:
Bold text indicates exceedance of RSLs Tap X 10 for SW Adjusted 11/12
Shading indicates exceedance of Surface Water ESV
RSLs were adjusted for noncarcinogens to account for exposure to multiple constituents
SVOCs - Semivolatile Organic Compounds
J - Analyte present, value may or may not be accurate or precise
µg/l - Micrograms per liter

Figure 6
Surface Water Sample Locations and Exceedances
Penniman Lake Step 2 Site Inspection
Cheatham Annex
Williamsburg, VA

N W E S
0 175 350
Feet

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Attachment A
Step 1 Site Inspection Technical Memorandum

Results of the Step 1 Polychlorinated Biphenyls Site Inspection at Penniman Lake, Cheatham Annex, Williamsburg, Virginia

PREPARED FOR: Cheatham Annex Partnering Team

PREPARED BY: CH2M HILL

DATE: February 29, 2012

Introduction

This Technical Memorandum (TM) has been prepared to present the results of the Step I field sampling activities for the polychlorinated biphenyls (PCB) Site Inspection (SI) at Penniman Lake, located at Naval Weapons Station Yorktown Cheatham Annex (CAX) in Williamsburg, Virginia (**Figure 1**). The objective of the Penniman Lake SI is to identify potential source(s) of PCBs to Penniman Lake and to determine if additional investigation or action is required. The SI is being conducted using a stepped approach since the source of PCBs is not known.

This TM was prepared under the United States Navy Comprehensive Long-term Environmental Action (CLEAN) Contract N62470-08-D-1000, for submittal to the Naval Facilities Engineering Command (NAVFAC), Mid-Atlantic Division, the United States Environmental Protection Agency (USEPA), and the Virginia Department of Environmental Quality (VDEQ). The Navy, USEPA, and VDEQ work jointly as the CAX Tier I Partnering Team.

Site Background and History

CAX is located in Williamsburg, Virginia, on the York-James Peninsula (**Figure 1**). The peninsula trends northwest-southeast and is roughly bordered to the southwest by the James River, to the northeast by the York River, and to the southeast by the confluence of the James River and the Chesapeake Bay. CAX was established in June 1943 as a satellite unit of the Navy Supply Depot to provide bulk storage facilities. Prior to 1943, CAX had been the location of the Penniman Shell Loading Plant, a large powder and shell loading facility operated by DuPont during World War I. Today the mission of CAX is supplying Atlantic Fleet ships and providing recreational opportunities to military and civilian personnel.

Penniman Lake is a 48-acre fresh water surface water body located in the southeastern portion of CAX, created in 1943 when a portion of King Creek was dammed; it is not tidally influenced (**Figure 3**). Numerous drainage channels and stormwater outfalls discharge to the lake. There is an overflow structure adjacent to the dam (Figure 4) that discharges directly to King's Creek; other major outlets are evaporation and recharge to groundwater. The historical use of the lake is unknown; however, the lake is currently used by the Department of Defense (DoD) for recreational activities. The lake is not open to the general public. Catch-and-release fishing restrictions were implemented for the lake in 2000 following identification of PCBs within lake sediment.

In January 2001, CAX was placed on the National Priorities List (NPL), which required all subsequent activities for Navy Environmental Restoration (ER) sites be conducted under CERCLA procedures. Previously conducted evaluations and investigations that helped characterize potential contamination and contaminant sources at Penniman Lake included: Penniman Shell Loading Plant Site Inspection (Weston, 1999), Pond Study (Baker, 2001), Site 11 Remedial Investigation (RI) (Baker, 2007), AOC 6 Site Inspection (CH2M HILL, 2011), and various site visits. Previous sampling locations and PCB results that exceeded a human health and/or ecological screening level are shown in **Figure 4** (designated with either a yellow, lavender, or green triangle, as noted in the Legend) .

In 1999, an SI of the former Penniman Shell Loading Plant (PSLP) was conducted to determine if contamination existed that could be attributed to the former PSLP activities. The SI included the collection of twenty-nine samples, including waste source, sediment, surface water, and drinking water near various remnants of the former PSLP. As part of this investigation, one sediment sample (PEN-SED-01) and one surface water (PEN1-SW-02) and sediment sample [PEN1-SED-02 (and –SED02A, a duplicate)] were collected from Penniman Lake, adjacent to the Ammonia Settling Pits and TNT Graining House Sump and Catch Box Ruins, respectively as part of

this investigation, at locations shown on **Figure 4**. The sediment samples were analyzed for Target Compound List (TCL) organic compounds, Target Analyte List (TAL) inorganic constituents, and explosive compounds, while the surface water sample was analyzed for TCL organic compounds, and TAL inorganic constituents. The SI concluded that the activities at the former PSLP had not affected Penniman Lake.

In 2000, a Pond Study was conducted that included the collection of eight co-located surface water and surface sediment samples from Penniman Lake that were analyzed for TCL organic compounds, TAL inorganic constituents, and explosive compounds. There were PCB concentrations (Aroclor-1260) detected above both ecological and human health screening values at a maximum concentration of 4,700 micrograms per kilogram (µg/kg). The highest concentrations of PCBs were detected within one cove in the northwestern portion of the lake (**Figure 4**). The report recommended the establishment of catch-and-release fishing restrictions and further investigations to determine the source of PCBs and potential risks to human health and the environment.

In 2002, a Remedial Investigation (RI) at Site 11, located adjacent to the northwestern portion of Penniman Lake, was conducted that consisted of the collection of 24 surface and subsurface soil, 15 surface and subsurface sediment, 13 surface water, and 8 groundwater samples from within Site 11 and adjacent areas. Samples were analyzed for TCL organic compounds, TAL inorganic constituents, and explosive compounds. PCBs were detected in the Penniman Lake sediment, with a maximum concentration of 15,000 µg/kg in the northwest cove of the lake. In addition, PCBs were detected in a sediment sample collected from a drainage channel upgradient of Site 11 at a concentration of 7,500 µg/kg (**Figure 4**). The RI concluded that Site 11 was not the source of PCB contamination in Penniman Lake (Baker, 2007). The RI recommended additional sampling from within the drainage channel upgradient of Outfall NR-029 (**Figure 3**) and in the northwest cove of Penniman Lake to determine the extent of PCB contamination and potentially identify the source(s).

Based on the RI recommendations, the northwest cove of Penniman Lake and associated drainages were the initial focus of a study to determine the source of the PCB contamination. On June 10, 2008, CH2M HILL personnel conducted a site visit to identify upgradient areas that drain to the northwest cove of Penniman Lake and to Outfalls NR-026 through NR-029 (**Figure 4**) in order to help evaluate potential source areas. The following provides a summary of the drainage patterns identified during the site visit:

- Surface water runoff enters the northwest cove of Penniman Lake from the heavily wooded slopes along this portion of the lake, as well as through Outfalls NR-026 and -027.
- Stormwater runoff originating from areas south of Building 10 is collected in drop inlets on the north and south sides of Sanda Avenue, and is channeled to Outfall NR-026.
- Outfall NR-026 discharges to the northwest cove of Penniman Lake via a drainage ditch.
- A ravine upgradient of Outfall NR-027, north of Antrim Road, channels stormwater runoff from areas south of Building 250.
- Outfall NR-027 discharges to the northwest cove of Penniman Lake via a drainage ditch.

In addition, Outfall NR-028 conveys stormwater runoff to Penniman Lake from an intermittent drainage channel that originates south of Building 132 and north of Antrim Road. Outfall NR-029 conveys stormwater runoff from two intermittent drainage channels that originate north of Antrim Road; one flows east, parallel to Antrim road, and the other flows southeast, perpendicular to Antrim Road. A sampling plan was developed and presented to the CAX Partnering Team. In subsequent discussions, the Team decided all drainages to the lake should be evaluated, not just those discharging to the northwest cove, and the focus of the study changed to include all outfalls and natural drainages around the lake.

In October 2008, samples of Penniman Lake surface water and sediment were collected from two locations adjacent to AOC 6 (CAA06-SD/SW01 and CAA06-SD/SW02 – **Figure 4**) to determine if AOC 6 has had an impact on the lake (CH2M HILL, 2011). Based on historic sample results and known site activities, the AOC 6 SI analytical parameters did not include PCBs. Thus, these samples do not contribute to the evaluation of Penniman Lake PCB contamination, but are mentioned here to complete the list of samples collected from the lake prior to the current Step 1 SI activities.

Physical Setting

The area surrounding Penniman Lake is generally forested and slopes towards the lake. The topography ranges from approximately 35 feet above mean sea level (amsl) to less than 10 feet amsl. The direction of surface water flow in the lake is unknown but likely flows to the south towards the dam. There is an overflow structure adjacent to the dam (**Figure 4**) that discharges directly to King's Creek; other major outlets are evaporation and recharge to groundwater. Surface water flow may also be influenced by the wind. The Yorktown- Eastover aquifer extends across all of CAX and ranges from 60 to 100 feet thick. The transmissivity of the aquifer ranges from 0.5 to 40 square feet per day (ft^2/day), with the general direction of groundwater flow from west-to-east. The depth to groundwater in the Yorktown-Eastover aquifer is likely shallow; this aquifer likely discharges to some extent to the lake.

Distribution of Aroclor-1260 Contamination

Based on analytical results from previous investigations, Aroclor-1260 concentrations were detected in surface soil within stormwater drainage ways that discharge to Penniman Lake and in surface sediment throughout Penniman Lake. However, the highest concentrations were detected in sediment in the northwest cove (**Figure 3**). Further investigations to identify the source of this contamination, and the distribution of contamination at this source, are being conducted as part of the SI.

Release History

The source of the PCBs within Penniman Lake is unknown. Several drainages and outfalls discharge to the lake and appear to be the pathway through which Aroclor-1260 was transported to Penniman Lake; these features and potential source areas are being investigated during this SI.

Potential Contaminant Sources and Transport Pathways

No records of PCB releases or discharges that could have contaminated Penniman Lake sediment have been identified to date. Based on what can be inferred from the historical analytical data, there are several potential mechanisms for PCB transport to Penniman Lake: oil or fluids containing PCBs may have been (1) directly released to drainage ditches that discharged through outfalls into the lake, (2) released via disposal to surface soil in areas where stormwater runoff would transport PCBs and discharge into the lake via the drainages, or (3) applied for dust control to former gravel parking areas or roads where stormwater runoff would transport PCBs and discharge into the lake via the drainages. Other potential migration pathways from the terrestrial areas into the lake, such as by wind dispersion, are not expected to be significant because the area is heavily vegetated. Since PCBs tend to bind to soil, they are not expected to migrate downward to groundwater.

At this time, the historical and current use of the buildings located between Sanda Avenue and Antrim Road, near the northwest cove of Penniman Lake, is unknown. Further research is being conducted as part of the SI to determine if historical activities at or within the vicinity of these buildings may be a potential source of the PCBs in Penniman Lake.

Potential Exposure and Receptor Pathways

Potential human receptors exposed to surface water and sediment at Penniman Lake are:

- Adult recreational user
- Child recreational user
- Current on-base workers
- Future construction workers

Recreational users and workers may be exposed to PCBs through ingestion of and dermal contact with surface water and sediment as well as ingestion of fish. It is noted that catch and release fishing restrictions are in place for Penniman Lake. However, there is no way to guarantee that all of the fish caught are released and the most conservative approach is to assume that there is a potential for some fish ingestion. Recreational users and workers may also be exposed to PCBs through dermal contact with surface water and sediment in ditches that drain to Penniman Lake.

Potential ecological receptors exposed to surface water and sediment at Penniman Lake are:

- Aquatic/Wetland Plants
- Birds
- Mammals
- Reptiles
- Amphibians
- Benthic/Aquatic Invertebrates
- Fish

Aquatic and wetland plants may be exposed to PCBs through direct contact with surface water and sediment or through root uptake from the sediment. Fish, amphibians, reptiles and benthic/aquatic invertebrates may be exposed through direct contact with surface water and sediment. Food web exposures via birds, mammals, reptiles, and amphibians include ingestion of aquatic/wetland plants, fish, and benthic/aquatic invertebrates.

Conceptual Site Model

The conceptual site model (CSM) for Penniman Lake is based on data collected as part of previous investigations. The CSM interprets the site background and history, physical setting, distribution of contamination, release history, potential contaminant sources and transport pathways, and the potential exposure and receptor pathways. Since the specific source or sources of contaminants to Penniman Lake have not been identified to date, the CSM remains incomplete. The current CSM for Penniman Lake is shown in **Figure 2**.

Step 1 Field Investigation Activities

Since the source of PCBs in Penniman Lake is not known and Penniman Lake is a receiving body and not the source, a stepped-approach SI has been implemented to identify the source. In accordance with the UFP-SAP, a field survey was conducted to verify all outfalls and identify all natural drainages to the lake. Following identification of potential drainages, 26 surface soil samples were collected from the drainage ways and 44 surface sediment samples were collected from Penniman Lake. Prior to sample collection, a site visit was conducted with a representative from the USEPA's Biological Technical Assistance Group (BTAG) to flag specific sample locations in the northwest cove and associated drainages and to get a general idea of the type of depositional area to sample. Field activities also included site reconnaissance in the wooded area upstream of and surrounding the northwest cove to look for drums and/or an obvious sign of dumping. A bucket-like container, similar in size to a 5 gallon bucket with lid, was found just downstream of sample location SS05 near Isaacson Road. A surface soil sample, SS17, was collected from immediately beneath the container. In addition, surface debris consisting of one metal container and a few sections of pipe was identified on the west bank of the drainage between locations SS10 andSS11.

Surface soil samples were collected with a hand auger, and surface sediment samples were collected with a ponar dredge. All samples were analyzed for PCBs and sediment samples were also analyzed for additional total organic carbon (TOC) and grain size analytical suites. Water quality parameters (i.e., dissolved oxygen, turbidity, temperature, specific conductivity, oxidation/reduction potential and pH) were collected from the top, middle, and bottom of the water column above each sediment sample location.

Discussion of Results

Surface soil and surface sediment data collected during the 2011 Step I field activities have been evaluated to identify or eliminate potential PCB migration pathways into Penniman Lake. **Tables 1** and **2** include the detected PCB concentrations in surface soil and surface sediment, respectively. All analytical data for all samples are provided in **Appendix A**.

Soil

In total, 25 surface soil samples plus 3 duplicate samples were collected from the drainages and outfalls leading into Penniman Lake. These locations were chosen to determine if the PCBs detected in Penniman Lake sediments originated from contaminant transport through the stormwater drainage channel network (either from a

historical or ongoing release). Surface soil samples were analyzed for TCL PCBs in accordance with EPA Method 8082.

The only PCB congener group that was detected in surface soil in the vicinity of Penniman Lake was Aroclor-1260. Aroclor-1260 concentrations ranged from below detection limits in surface soil samples SS16 and SS18 to a maximum of 63,000 µg/kg in surface soil sample SS09. The highest Aroclor-1260 surface soil concentrations were detected in the drainage ways leading to the northwest cove of Penniman Lake (**Figure 5**), including sample locations SS02 (23,000 µg/kg), SS04 (17,000 µg/kg), SS10 (17,000 µg/kg), and SS11 (30,000 µg/kg). The surface soil sample collected fromimmediately beneath the bucket-like container that was identified during the site reconnaissance of the wooded area (SS17) contained Aroclor-1260 at 140 µg/kg. Given this relatively low Aroclor-1260 concentration and the significantly higher concentrations in upstream samples, this container does not appear to represent a PCB source.

Sediment

A total of 44 surface sediment samples and 6 duplicate samples were collected from Penniman Lake. Like the surface soil samples, these locations were selected to determine if a release of PCBs to Penniman Lake originated via transport through the stormwater drainage channel network (either from a historical or ongoing release). Surface sediment samples were analyzed for TCL PCBs in accordance with EPA Method 8082.

The only PCB congener group that was detected in surface sediment samples in Penniman Lake was Aroclor-1260. Aroclor-1260 concentrations ranged from below the detection limit in surface sediment sample SD25 to a maximum of 16,000 µg/kg in sample SD22. The highest surface sediment concentrations were detected in the sediment samples collected in the northwest cove of Penniman Lake (**Figure 6**). Outside of the northwest cove area, the highest Aroclor-1260 concentration was 810 µg/kg in surface sediment sample SD60, located in the northeast finger of Penniman Lake.

Conclusions and Recommendations

Results of the Step 1 PCB sampling indicate that PCBs are distributed throughout Penniman Lake, but the highest concentrations are found in the northwest cove area, nearest the outfalls of the stormwater drainage channels in which the highest concentrations of Aroclor-1260 were detected in upstream surface soil samples. In order to continue the investigation to locate potential sources for the PCBs detected in surface soil and sediment, four areas upstream of Penniman Lake are recommended for Step 2 investigation activities. These areas are shown in **Figure 7**, and include Step 1 sampling locations SS02, SS09, SS12, and SD60, which appear to be along potential migration pathways from a potential PCB source.

In addition, a review of available historical records and information on building usage will be conducted to gather additional information regarding the use of PCBs at the base, and specifically within the four areas recommended for further investigation activities. Lastly, the historic non-PCB data from the Pond Study (Baker 2001), Site 11 RI (Baker, 2007) and AOC 6 SI (CH2M HILL, 2011), will be reviewed to help identify constituents of potential concern that may need further evaluation. The sampling strategy and approach for Step 2 will be determined by the CAX Partnering Team and documented, under separate cover, in an addendum to the UFP-SAP *Site Inspection Sampling and Analysis Plan, Penniman Lake, June 2011*.

References

Baker Environmental, Inc. (Baker) 2001. *Final Pond Study Report, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia.* August.

Baker. 2007. *Remedial Investigation, Site 11 – Bone Yard, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia.* April.

CH2M HILL. 2011. *Draft Site Inspection Report, Areas of Concern 1, 2, 6, 7, and 8, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia*. June.

Roy F. Weston, Inc. (Weston) 1999. *Final Site Inspection Narrative Report Penniman Shell Loading Plant, Williamsburg, Virginia.* August.

Tables

TABLE 1
Surface Soil Analytical Detections
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SS01-0811	CAPL-SS01P-0811	CAPL-SS02-0811	CAPL-SS03-0811	CAPL-SS04-0811	CAPL-SS05-0811	CAPL-SS06-0811	CAPL-SS07-0811	CAPL-SS08-0811	CAPL-SS09-0811	CAPL-SS10-0811	CAPL-SS10P-0811	CAPL-SS11-0811	CAPL-SS12-0811
Sample Date	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1260	5,600	4,300	23,000	590	17,000	4,400	2,000	73	94	63,000	13,000	17,000	38,000	1,000

Notes:

Shading indicates detection

U - The material was analyzed for, but not detected

UG/KG - Micrograms per kilogram

TABLE 1
Surface Soil Analytical Detections
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SS13-0811	CAPL-SS14-0811	CAPL-SS15-0811	CAPL-SS16-0811	CAPL-SS17-0811	CAPL-SS18-0811	CAPL-SS18P-0811	CAPL-SS19-0811	CAPL-SS21-0811	CAPL-SS22-0811	CAPL-SS23-0811	CAPL-SS24-0811	CAPL-SS25-0811	CAPL-SS26-0811
Sample Date	8/1/11	8/1/11	8/1/11	8/2/11	8/1/11	8/1/11	8/1/11	8/1/11	8/2/11	8/2/11	8/2/11	8/2/11	8/1/11	8/1/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1260	560	340	290	18 U	140	17 U	17 U	450	49	150	30	22	390	30

Notes:

Shading indicates detection

U - The material was analyzed for, but not detected

UG/KG - Micrograms per kilogram

TABLE 2
Surface Sediment Analytical Detections
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SD18-0811	CAPL-SD19-0811	CAPL-SD20-0811	CAPL-SD20P-0811	CAPL-SD21-0811	CAPL-SD22-0711	CAPL-SD23-0711	CAPL-SD24-0711	CAPL-SD25-0711	CAPL-SD26-0811	CAPL-SD27-0711	CAPL-SD28-0711	CAPL-SD28P-0711	CAPL-SD29-0711
Sample Date	8/2/11	8/2/11	8/2/11	8/2/11	8/2/11	7/28/11	7/28/11	7/28/11	7/28/11	8/2/11	7/28/11	7/28/11	7/28/11	7/28/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1260	4,100	2,600	25 U	15 J	45	16,000	6,200	930	18 U	35	150	590	410	950
Wet Chemistry (MG/KG)														
Total organic carbon (TOC)	34,000	3,800	110,000	NS	1,300	180,000	79,000	110,000	12,000	15,000	98,000	87,000	NS	78,000
Grain Size (PCT/P)														
GS03 Sieve 3" (75 mm)	100	100	100	NS	100	100	100	100	100	100	100	100	NS	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	NS	100	100	100	100	100	100	100	100	NS	100
GS08 Sieve 0.75" (19.0 mm)	96	100	96	NS	100	100	100	100	100	99	100	100	NS	100
GS10 Sieve 0.375" (9.5 mm)	95	98	92	NS	100	98	100	100	99	95	98	100	NS	100
Sieve No. 004 (4.75 mm)	91	95	86	NS	100	91	100	98	98	92	92	100	NS	100
Sieve No. 008 (2.36-MM)	88	91	80	NS	100	73	98	74	94	89	72	90	NS	94
Sieve No. 016 (1.18-MM)	84	82	70	NS	100	49	92	46	89	86	47	58	NS	75
Sieve No. 030 (600-UM)	79	65	55	NS	99	31	75	31	82	76	30	36	NS	52
Sieve No. 040 (425 um)	72	53	47	NS	96	24	64	26	76	65	24	30	NS	44
Sieve No. 050 (300-UM)	48	30	34	NS	75	20	56	22	52	41	20	25	NS	36
Sieve No. 100 (150 um)	8.2	3.3	10	NS	4.6	13	44	15	5.6	10	12	18	NS	28
Sieve No. 200 (75 um)	3.5	1.6	4	NS	0.8	8	25	9.2	1.5	3.5	6.8	11	NS	18

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Notes:

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NS - Not sampled
U - The material was analyzed for, but not detected
MG/KG - Milligrams per kilogram
PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

TABLE 2
Surface Sediment Analytical Detections
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SD30-0711	CAPL-SD31-0711	CAPL-SD32-0711	CAPL-SD33-0711	CAPL-SD33P-0711	CAPL-SD34-0711	CAPL-SD35-0711	CAPL-SD36-0711	CAPL-SD37-0711	CAPL-SD38-0711	CAPL-SD38P-0711	CAPL-SD39-0711	CAPL-SD40-0711	CAPL-SD41-
Sample Date	7/28/11	7/28/11	7/28/11	7/28/11	7/28/11	7/27/11	7/28/11	7/28/11	7/27/11	7/27/11	7/27/11	7/27/11	7/27/11	7/28/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1260	1,100	180	210	580	1,000	760	390	110	380	41 J	91 J	220	95	430
Wet Chemistry (MG/KG)														
Total organic carbon (TOC)	75,000	68,000	110,000	80,000	NS	78,000	110,000	64,000	72,000	85,000	NS	68,000	47,000	81,000
Grain Size (PCT/P)														
GS03 Sieve 3" (75 mm)	100	100	100	100	NS	100	100	100	100	100	NS	100	100	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	100	NS	100	100	100	100	100	NS	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	NS	100	100	100	100	99	NS	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	100	99	100	NS	100	99	100	100	79	NS	100	100	100
Sieve No. 004 (4.75 mm)	100	100	96	100	NS	100	99	100	100	69	NS	99	100	100
Sieve No. 008 (2.36-MM)	89	92	87	92	NS	94	98	82	97	57	NS	96	96	87
Sieve No. 016 (1.18-MM)	59	72	72	60	NS	66	88	50	75	47	NS	90	83	56
Sieve No. 030 (600-UM)	38	54	57	35	NS	45	66	31	50	39	NS	84	70	35
Sieve No. 040 (425 um)	32	48	50	28	NS	38	57	26	42	36	NS	79	65	29
Sieve No. 050 (300-UM)	27	43	41	22	NS	33	47	21	34	33	NS	70	60	24
Sieve No. 100 (150 um)	20	25	20	14	NS	24	29	14	26	23	NS	62	44	17
Sieve No. 200 (75 um)	12	14	7	8.5	NS	15	17	8.4	14	12	NS	46	23	11

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Notes:

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MG/KG - Milligrams per kilogram
PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

TABLE 2
Surface Sediment Analytical Detections
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	0711	CAPL-SD42-0711	CAPL-SD43-0711	CAPL-SD44-0711	CAPL-SD45-0711	CAPL-SD46-0711	CAPL-SD47-0711	CAPL-SD48-0711	CAPL-SD49-0711	CAPL-SD50-0711	CAPL-SD50P-0711	CAPL-SD51-0711	CAPL-SD52-0711	CAPL-SD53-0711	CAPL-SD54-
Sample Date		7/27/11	7/28/11	7/28/11	7/28/11	7/27/11	7/27/11	7/29/11	7/29/11	7/29/11	7/29/11	7/29/11	7/29/11	7/29/11	7/27/11
Chemical Name															
Pesticide/Polychlorinated Biphenyls (UG/KG)															
Aroclor-1260		230	110	410	130	390	200	23 J	270	540	440	250	400	180	230
Wet Chemistry (MG/KG)															
Total organic carbon (TOC)		80,000	150,000	130,000	5,500	80,000	100,000	8,200	130,000	66,000	NS	70,000	58,000	63,000	83,000
Grain Size (PCT/P)															
GS03 Sieve 3" (75 mm)		100	100	100	100	100	100	100	100	100	NS	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)		100	100	100	100	100	100	100	100	100	NS	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)		100	100	100	99	100	100	100	100	100	NS	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)		100	97	100	99	100	100	100	100	100	NS	100	100	100	100
Sieve No. 004 (4.75 mm)		100	89	88	98	100	100	98	100	100	NS	100	100	100	99
Sieve No. 008 (2.36-MM)		84	72	40	97	86	96	95	97	97	NS	98	96	98	95
Sieve No. 016 (1.18-MM)		53	51	21	92	54	72	92	83	85	NS	82	75	85	81
Sieve No. 030 (600-UM)		34	34	11	75	35	49	72	64	68	NS	55	54	67	59
Sieve No. 040 (425 um)		28	29	8.4	58	29	42	50	55	60	NS	46	47	59	51
Sieve No. 050 (300-UM)		24	23	6.2	39	24	36	29	47	52	NS	38	40	52	43
Sieve No. 100 (150 um)		18	13	3.3	19	18	28	12	34	41	NS	28	31	40	32
Sieve No. 200 (75 um)		9.4	5.8	1.4	6.4	11	18	4.5	18	26	NS	18	20	22	20

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PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

TABLE 2
Surface Sediment Analytical Detections
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	0711	CAPL-SD55-0711	CAPL-SD56-0711	CAPL-SD57-0711	CAPL-SD58-0711	CAPL-SD58P-0711	CAPL-SD59-0711	CAPL-SD60-0711	CAPL-SD61-0811
Sample Date		7/27/11	7/27/11	7/27/11	7/29/11	7/29/11	7/27/11	7/29/11	8/2/11
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor-1260		39	280	48 J	170	240	410	810	40
Wet Chemistry (MG/KG)									
Total organic carbon (TOC)		19,000	84,000	35,000	74,000	NS	98,000	78,000	15,000
Grain Size (PCT/P)									
GS03 Sieve 3" (75 mm)		100	100	100	100	NS	100	100	100
GS06 Sieve 1.5" (37.5 mm)		100	100	100	100	NS	100	100	100
GS08 Sieve 0.75" (19.0 mm)		100	100	100	100	NS	100	100	100
GS10 Sieve 0.375" (9.5 mm)		100	100	100	100	NS	100	100	100
Sieve No. 004 (4.75 mm)		100	100	99	100	NS	100	99	99
Sieve No. 008 (2.36-MM)		99	96	97	93	NS	94	85	98
Sieve No. 016 (1.18-MM)		96	82	93	67	NS	69	60	96
Sieve No. 030 (600-UM)		88	62	82	49	NS	46	45	90
Sieve No. 040 (425 um)		79	53	68	43	NS	39	39	83
Sieve No. 050 (300-UM)		59	46	46	38	NS	33	34	50
Sieve No. 100 (150 um)		18	36	14	29	NS	25	26	17
Sieve No. 200 (75 um)		5.5	22	4.6	18	NS	16	17	5.8

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Notes:

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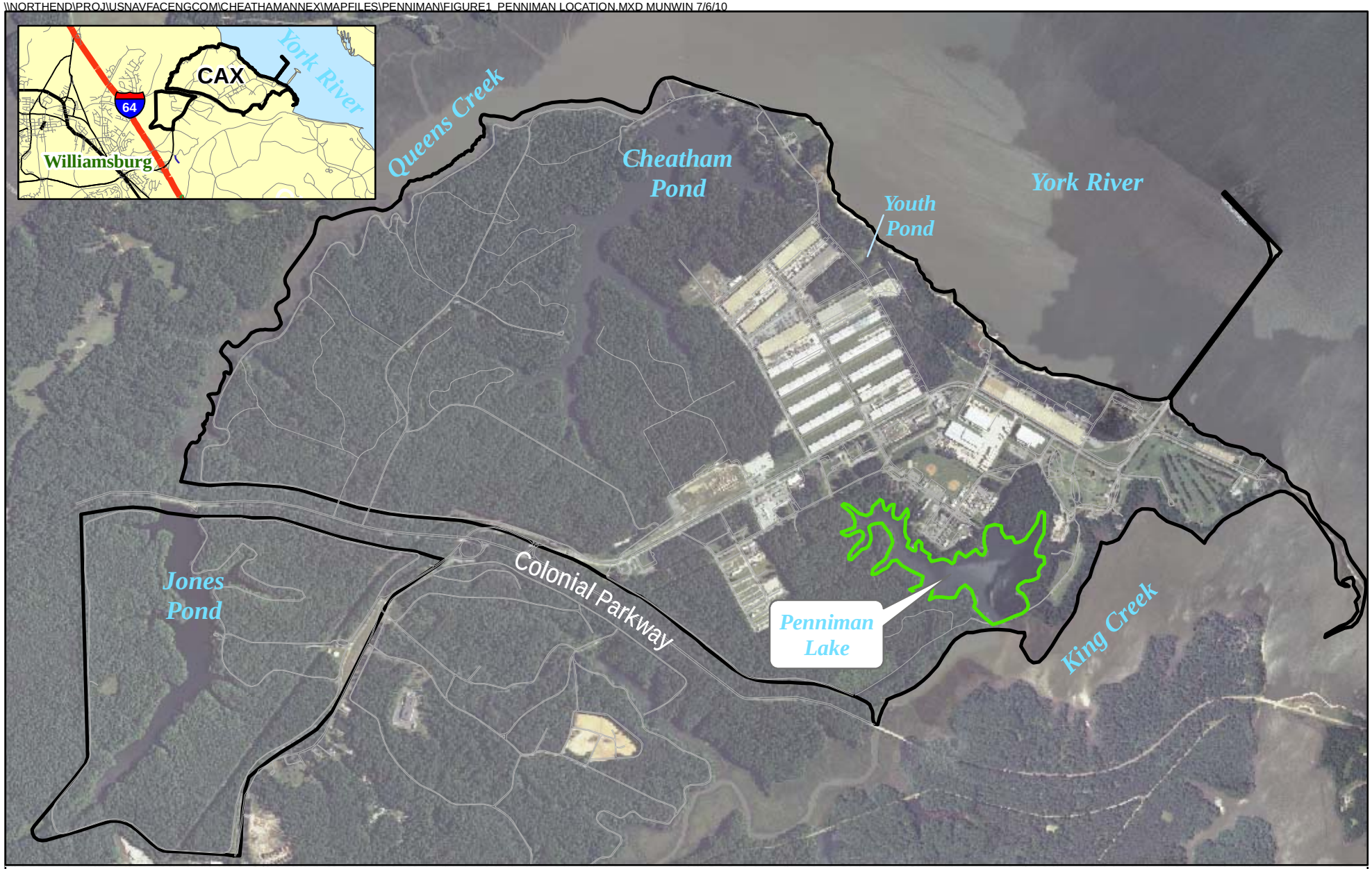
Figures

\\NORTHEND\PROJ\USNAVFACENGCOM\CHEATHAMANNEX\MAPFILES\PENNIMAN\FIGURE1_PENNIMAN LOCATION.MXD MUNWIN 7/6/10



Legend

- Cheatham Annex Boundary
- Approximate Study Area Boundary

N
W E
S

0 1,000 2,000
Feet

Figure 1
Location Map
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

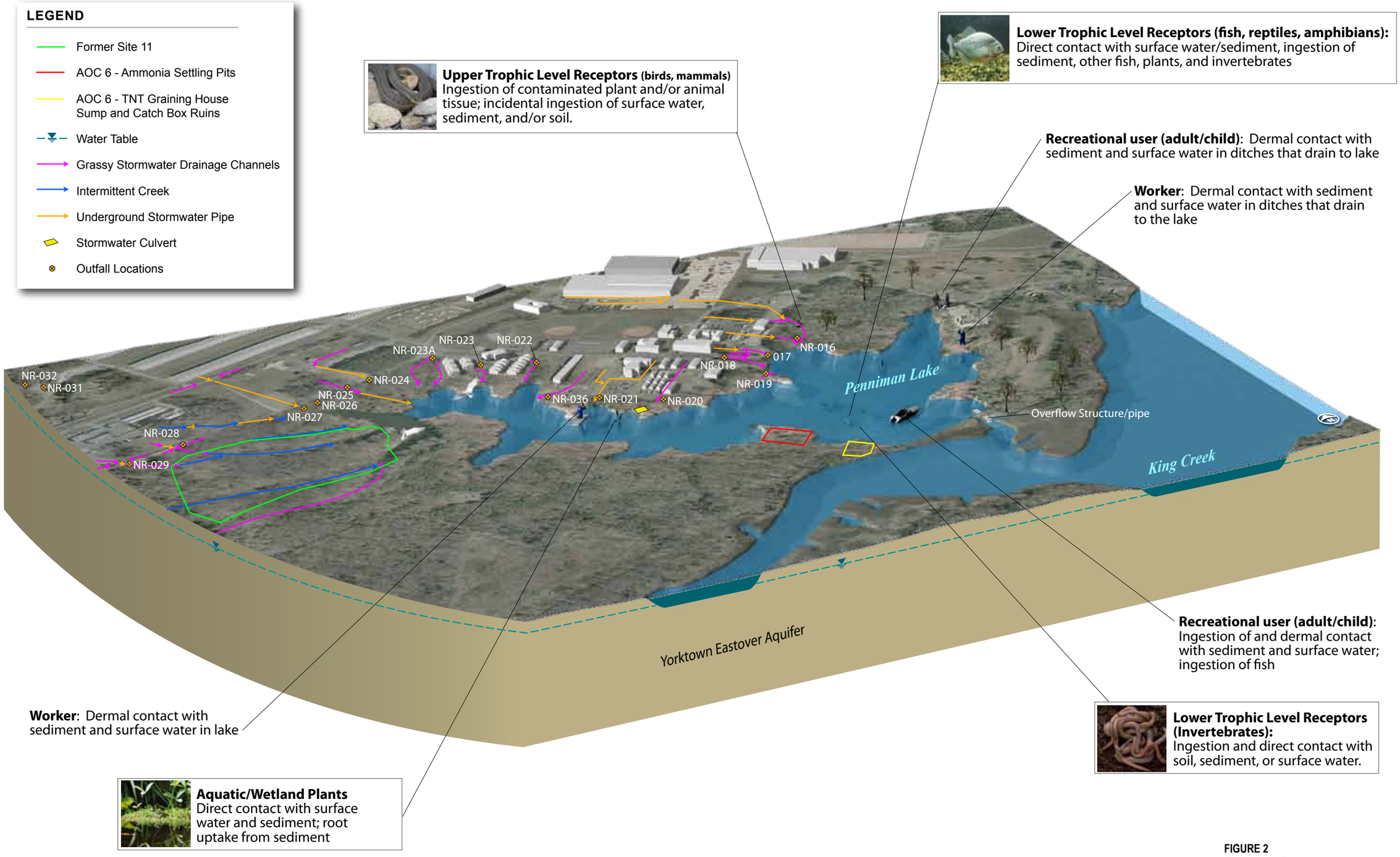
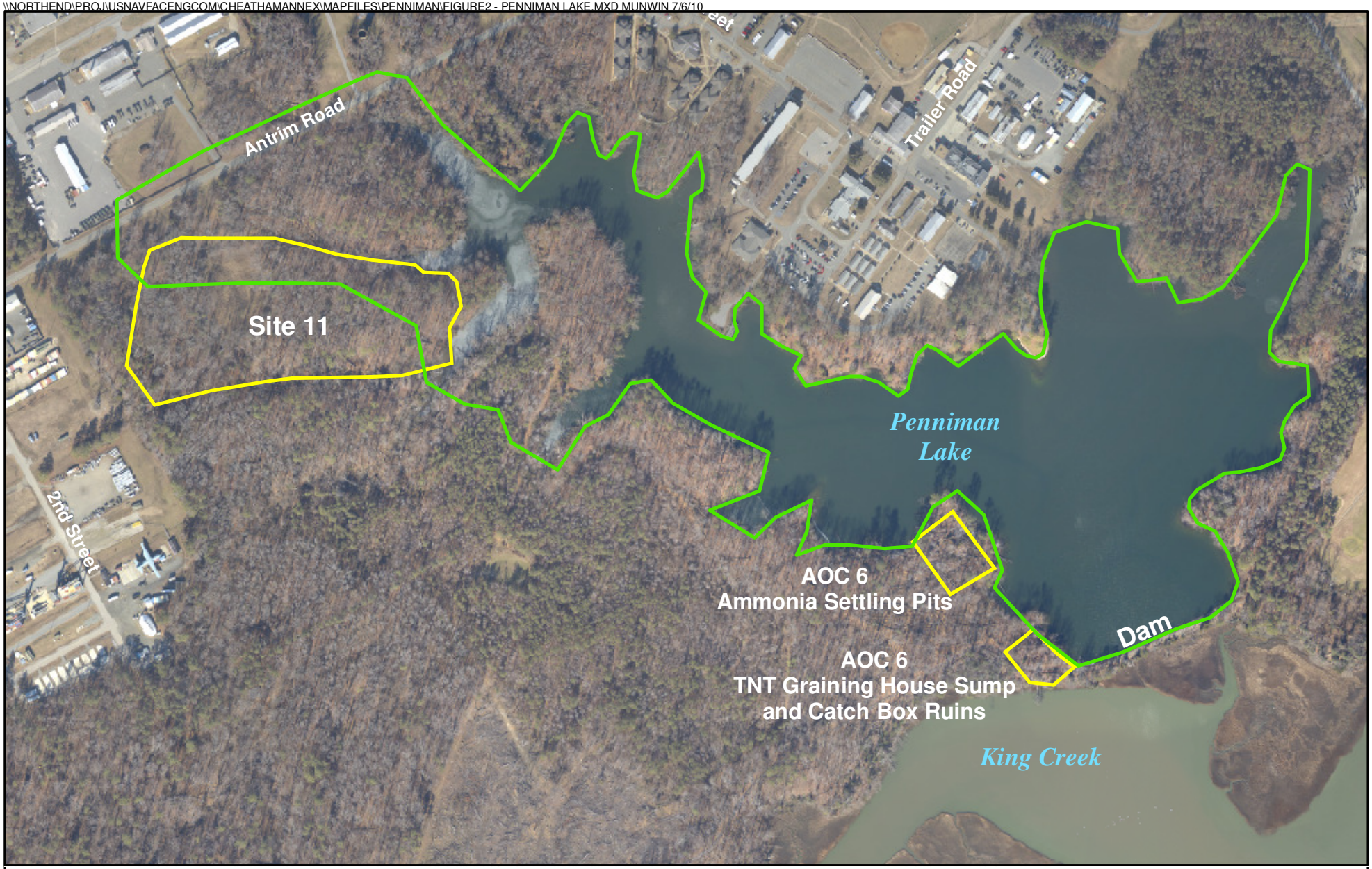


FIGURE 2
Conceptual Site Model
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

\\NORTHEND\PROJ\USNAVFACENGCOM\CHEATHAMANNEX\MAPFILES\PENNIMAN\FIGURE2 - PENNIMAN LAKE.MXD MUNWIN 7/6/10



Legend

- Adjacent Environmental Restoration Program Sites
- Approximate Study Area Boundary

N
W E
S

0 225 450
Feet

Figure 3
Penniman Lake
Layout Map
Cheatham Annex
Williamsburg, Virginia

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VBO \\NORTHEND\PROJ\USNAVFACENGCOM\CHEATHAMANNEX\MAPFILES\PENNIMAN\FIGURE4_PROPOSED_SS_SD.MXD CELEFTHE 11/22/2011 10:03:06 AM

Legend

- Proposed Surface Soil Sample Location
- Proposed Surface Sediment Sample Location
- 2002 Remedial Investigation (RI) Sediment Sample
- 2000 Pond Study Sediment Sample
- 1999 Weston SI Sediment and/of Surface Water Sample
- Stormwater Drop Inlets
- Elevation Contours (ft amsl)
- Outfall
- Road curbs
- Shoreline
- Buildings
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe
- 11SD18 Arocior 1260 5,400 ppb — Detect Exceeds Human Health Risk Screening Level (2,200 ppb for sediment)
- 11SD21 Arocior 1260 99 ppb — Detect Exceeds Ecological Risk Screening Level (59.8 ppb for sediment)

N / W / E / S

0 150 300 450 600 Feet

Figure 4
Proposed Surface Soil and Surface Sediment Sample Locations
and Previous Investigation Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

V:\USNAVFACENGCOM\CHEATHAMANNEX\MAPFILES\PENNIMAN\CTO_WE25\FIGURE 5 - SURFACE SOIL AROCLOR.MXD CELEETHE 11/22/2011 9:45:54 AM

Sample ID	CAPL-SS11-0811
Sample Date	8/1/11
Aroclor-1260	38,000

Sample ID	CAPL-SS13-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	560

Sample ID	CAPL-SS12-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	1,000

Sample ID	CAPL-SS14-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	340

Sample ID	CAPL-SS15-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	290

Sample ID	CAPL-SS16-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	18 U

Sample ID	CAPL-SS10-0811*
Sample Date	8/1/11
Aroclor-1260 ug/kg	17,000

Sample ID	CAPL-SS09-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	63,000

Sample ID	CAPL-SS21-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	49

Sample ID	CAPL-SS06-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	2,000

Sample ID	CAPL-SS07-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	73

Sample ID	CAPL-SS23-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	30

Sample ID	CAPL-SS01-0811*
Sample Date	8/1/11
Aroclor-1260 ug/kg	5,600

Sample ID	CAPL-SS18-0811*
Sample Date	8/1/11
Aroclor-1260 ug/kg	17 U

Sample ID	CAPL-SS02-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	23,000

Sample ID	CAPL-SS19-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	450

Sample ID	CAPL-SS22-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	150

Sample ID	CAPL-SS03-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	590

Sample ID	CAPL-SS24-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	22

Sample ID	CAPL-SS04-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	17,000

Sample ID	CAPL-SS25-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	390

Sample ID	CAPL-SS05-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	4,400

Sample ID	CAPL-SS26-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	30

Sample ID	CAPL-SS17-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	140

Sample ID	CAPL-SS08-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	94

Antrim Road
4th Street
2nd Street
Site 11
Penniman Lake
AOC 6
Ammonia Settling Pits
AOC 6
TNT Graining House Sump
and Catch Box Ruins
Dam
King Creek

Legend

- Surface Soil Sample Location (July/August 2011)
- Adjacent Environmental Restoration Program Sites
- Approximate Study Area Boundary
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe

Note:
* duplicate sample collected, most conservative presented

N
W E
S

0 200 400
Feet

Figure 5
Surface Soil Aroclor-1260 Resuts
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

V:\USNAVFACENGCOM\CHEATHAMANNEX\MAPFILES\PENNIMAN\CTO_WE25\FIGURE 6 - SURFACE SEDIMENT AROCLOR.MXD CELFETHE 11/22/2011 9:48:58 AM

Sample ID	CAPL-SD21-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	45

Sample ID	CAPL-SD20-0811*
Sample Date	8/2/11
Aroclor-1260 ug/kg	15 J

Sample ID	CAPL-SD27-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	150

Sample ID	CAPL-SD61-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	40

Sample ID	CAPL-SD22-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	16,000

Sample ID	CAPL-SD26-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	35

Sample ID	CAPL-SD31-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	180

Sample ID	CAPL-SD55-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	39

Sample ID	CAPL-SD18-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	4,100

Sample ID	CAPL-SD32-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	210

Sample ID	CAPL-SD57-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	48 J

Sample ID	CAPL-SD47-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	200

Sample ID	CAPL-SD19-0811
Sample Date	8/2/11
Aroclor-1260 ug/kg	2,600

Sample ID	CAPL-SD38-0711*
Sample Date	7/27/11
Aroclor-1260 ug/kg	91 J

Sample ID	CAPL-SD60-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	810

Sample ID	CAPL-SD23-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	6,200

Sample ID	CAPL-SD39-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	220

Sample ID	CAPL-SD56-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	280

Sample ID	CAPL-SD28-0711*
Sample Date	7/28/11
Aroclor-1260 ug/kg	590

Sample ID	CAPL-SD40-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	95

Sample ID	CAPL-SD59-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	410

Sample ID	CAPL-SD29-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	950

Sample ID	CAPL-SD54-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	230

Sample ID	CAPL-SD30-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	1,100

Sample ID	CAPL-SD46-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	390

Sample ID	CAPL-SD58-0711*
Sample Date	7/29/11
Aroclor-1260 ug/kg	240

Sample ID	CAPL-SD24-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	930

Sample ID	CAPL-SD53-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	180

Sample ID	CAPL-SD33-0711*
Sample Date	7/28/11
Aroclor-1260 ug/kg	1,000

Sample ID	CAPL-SD48-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	23 J

Sample ID	CAPL-SD35-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	390

Sample ID	CAPL-SD45-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	130

Sample ID	CAPL-SD25-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	18 U

Sample ID	CAPL-SD44-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	410

Sample ID	CAPL-SD52-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	400

Sample ID	CAPL-SD34-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	760

Sample ID	CAPL-SD37-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	380

Sample ID	CAPL-SD42-0711
Sample Date	7/27/11
Aroclor-1260 ug/kg	230

Sample ID	CAPL-SD51-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	250

Sample ID	CAPL-SD36-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	110

Sample ID	CAPL-SD43-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	110

Sample ID	CAPL-SD41-0711
Sample Date	7/28/11
Aroclor-1260 ug/kg	430

Sample ID	CAPL-SD49-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	270

Sample ID	CAPL-SD50-0711*
Sample Date	7/29/11
Aroclor-1260 ug/kg	540

Antrim Road

Site 11

Penniman Lake

AOC 6
Ammonia Settling Pits

AOC 6
TNT Graining House Sump and Catch Box Ruins

Dam

King Creek

Legend

- Sediment Sample Location (July/August 2011)
- Adjacent Environmental Restoration Program Sites
- Approximate Study Area Boundary
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe

Note:
* duplicate sample collected, most conservative presented

N
W E
S

0 200 400
Feet

Figure 6
Surface Sediment Aroclor-1260
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

Sample ID	CAPL-SS11-0811
Sample Date	8/1/11
Aroclor-1260	38,000

Sample ID	CAPL-SS12-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	1,000

Sample ID	CAPL-SS10-0811*
Sample Date	8/1/11
Aroclor-1260 ug/kg	17,000

Sample ID	CAPL-SS09-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	63,000

Sample ID	CAPL-SS06-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	2,000

Sample ID	CAPL-SS01-0811*
Sample Date	8/1/11
Aroclor-1260 ug/kg	5,600

Sample ID	CAPL-SS02-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	23,000

Sample ID	CAPL-SS04-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	17,000

Sample ID	CAPL-SS05-0811
Sample Date	8/1/11
Aroclor-1260 ug/kg	4,400

Sample ID	CAPL-SD60-0711
Sample Date	7/29/11
Aroclor-1260 ug/kg	810

Antrim Road
4th Street
Trailer Road
Site 11
2nd Street
Penniman Lake
AOC 6
Ammonia Settling Pits
AOC 6
TNT Graining House Sump
and Catch Box Ruins
Dam
King Creek

Legend

- Surface Soil Sample Location (July/August 2011)
- Adjacent Environmental Restoration Program Sites
- Approximate Study Area Boundary
- Areas Identified for Further Investigation
- Grassy Stormwater Drainage Channels
- Intermittent Creek
- Underground Stormwater Pipe
- Overflow pipe

Note:
* duplicate sample collected, most conservative presented

N
W E
S

0 200 400
Feet

Figure 7
Areas of Further Investigation
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

CH2MHILL

Appendix A
Analytical Results

Appendix A.1
Surface Soil Analytical Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SS01-0811	CAPL-SS01P-0811	CAPL-SS02-0811	CAPL-SS03-0811	CAPL-SS04-0811	CAPL-SS05-0811	CAPL-SS06-0811	CAPL-SS07-0811	CAPL-SS08-0811	CAPL-SS09-0811	CAPL-SS10-0811	CAPL-SS10P-0811	CAPL-SS11-0811	CAPL-SS12-0811
Sample Date	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11	8/1/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1016	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	NS	980 U	940 U	3200 U	14 U
Aroclor-1221	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U
Aroclor-1232	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U
Aroclor-1242	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U
Aroclor-1248	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U
Aroclor-1254	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U
Aroclor-1260	5,600	4,300	23,000	590	17,000	4,400	2,000	73	94	63,000	13,000	17,000	38,000	1,000
Aroclor-1262	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U
Aroclor-1268	16 U	16 U	2000 U	17 U	1500 U	16 U	16 U	17 U	18 U	3700 U	980 U	940 U	3200 U	14 U

Notes:

NS - Not sampled

U - The material was analyzed for, but not detected

UG/KG - Micrograms per kilogram

Appendix A.1
Surface Soil Analytical Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SS13-0811	CAPL-SS14-0811	CAPL-SS15-0811	CAPL-SS16-0811	CAPL-SS17-0811	CAPL-SS18-0811	CAPL-SS18P-0811	CAPL-SS19-0811	CAPL-SS21-0811	CAPL-SS22-0811	CAPL-SS23-0811	CAPL-SS24-0811	CAPL-SS25-0811	CAPL-SS26-0811
Sample Date	8/1/11	8/1/11	8/1/11	8/2/11	8/1/11	8/1/11	8/1/11	8/1/11	8/2/11	8/2/11	8/2/11	8/2/11	8/1/11	8/1/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1016	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1221	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1232	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1242	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1248	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1254	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1260	560	340	290	18 U	140	17 U	17 U	450	49	150	30	22	390	30
Aroclor-1262	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U
Aroclor-1268	18 U	17 U	15 U	18 U	17 U	17 U	17 U	15 U	17 U	14 U	15 U	17 U	14 U	14 U

Notes:

NS - Not sampled

U - The material was analyzed for, but not detected

UG/KG - Micrograms per kilogram

Appendix A.2
Surface Sediment Analytical Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SD18-0811	CAPL-SD19-0811	CAPL-SD20-0811	CAPL-SD20P-0811	CAPL-SD21-0811	CAPL-SD22-0711	CAPL-SD23-0711	CAPL-SD24-0711	CAPL-SD25-0711	CAPL-SD26-0811	CAPL-SD27-0711	CAPL-SD28-0711	CAPL-SD28P-0711	CAPL-SD29-0711
Sample Date	8/2/11	8/2/11	8/2/11	8/2/11	8/2/11	7/28/11	7/28/11	7/28/11	7/28/11	8/2/11	7/28/11	7/28/11	7/28/11	7/28/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1016	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1221	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1232	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1242	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1248	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1254	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1260	4,100	2,600	25 U	15 J	45	16,000	6,200	930	18 U	35	150	590	410	950
Aroclor-1262	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Aroclor-1268	25 U	17 U	25 U	27 U	17 U	89 U	65 U	110 U	18 U	19 U	100 U	88 U	83 U	86 U
Wet Chemistry (MG/KG)														
Total organic carbon (TOC)	34,000	3,800	110,000	NS	1,300	180,000	79,000	110,000	12,000	15,000	98,000	87,000	NS	78,000
Grain Size (PCT/P)														
GS03 Sieve 3" (75 mm)	100	100	100	NS	100	100	100	100	100	100	100	100	NS	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	NS	100	100	100	100	100	100	100	100	NS	100
GS08 Sieve 0.75" (19.0 mm)	96	100	96	NS	100	100	100	100	100	99	100	100	NS	100
GS10 Sieve 0.375" (9.5 mm)	95	98	92	NS	100	98	100	100	99	95	98	100	NS	100
Sieve No. 004 (4.75 mm)	91	95	86	NS	100	91	100	98	98	92	92	100	NS	100
Sieve No. 008 (2.36-MM)	88	91	80	NS	100	73	98	74	94	89	72	90	NS	94
Sieve No. 016 (1.18-MM)	84	82	70	NS	100	49	92	46	89	86	47	58	NS	75
Sieve No. 030 (600-UM)	79	65	55	NS	99	31	75	31	82	76	30	36	NS	52
Sieve No. 040 (425 um)	72	53	47	NS	96	24	64	26	76	65	24	30	NS	44
Sieve No. 050 (300-UM)	48	30	34	NS	75	20	56	22	52	41	20	25	NS	36
Sieve No. 100 (150 um)	8.2	3.3	10	NS	4.6	13	44	15	5.6	10	12	18	NS	28
Sieve No. 200 (75 um)	3.5	1.6	4	NS	0.8	8	25	9.2	1.5	3.5	6.8	11	NS	18

Notes:

J - Analyte present. Value may or may not be accurate or precise
NS - Not sampled
U - The material was analyzed for, but not detected
MG/KG - Milligrams per kilogram
PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

Appendix A.2
Surface Sediment Analytical Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SD30-0711	CAPL-SD31-0711	CAPL-SD32-0711	CAPL-SD33-0711	CAPL-SD33P-0711	CAPL-SD34-0711	CAPL-SD35-0711	CAPL-SD36-0711	CAPL-SD37-0711	CAPL-SD38-0711	CAPL-SD38P-0711	CAPL-SD39-0711	CAPL-SD40-0711	CAPL-SD41-0711
Sample Date	7/28/11	7/28/11	7/28/11	7/28/11	7/28/11	7/27/11	7/28/11	7/28/11	7/27/11	7/27/11	7/27/11	7/27/11	7/27/11	7/28/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1016	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	NS	88 U	59 U	46 U	74 U
Aroclor-1221	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Aroclor-1232	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Aroclor-1242	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Aroclor-1248	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Aroclor-1254	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Aroclor-1260	1,100	180	210	580	1,000	760	390	110	380	41 J	91 J	220	95	430
Aroclor-1262	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Aroclor-1268	72 U	59 U	56 U	76 U	90 U	67 U	85 U	54 U	85 U	53 U	88 U	59 U	46 U	74 U
Wet Chemistry (MG/KG)														
Total organic carbon (TOC)	75,000	68,000	110,000	80,000	NS	78,000	110,000	64,000	72,000	85,000	NS	68,000	47,000	81,000
Grain Size (PCT/P)														
GS03 Sieve 3" (75 mm)	100	100	100	100	NS	100	100	100	100	100	NS	100	100	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	100	NS	100	100	100	100	100	NS	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	NS	100	100	100	100	99	NS	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	100	99	100	NS	100	99	100	100	79	NS	100	100	100
Sieve No. 004 (4.75 mm)	100	100	96	100	NS	100	99	100	100	69	NS	99	100	100
Sieve No. 008 (2.36-MM)	89	92	87	92	NS	94	98	82	97	57	NS	96	96	87
Sieve No. 016 (1.18-MM)	59	72	72	60	NS	66	88	50	75	47	NS	90	83	56
Sieve No. 030 (600-UM)	38	54	57	35	NS	45	66	31	50	39	NS	84	70	35
Sieve No. 040 (425 um)	32	48	50	28	NS	38	57	26	42	36	NS	79	65	29
Sieve No. 050 (300-UM)	27	43	41	22	NS	33	47	21	34	33	NS	70	60	24
Sieve No. 100 (150 um)	20	25	20	14	NS	24	29	14	26	23	NS	62	44	17
Sieve No. 200 (75 um)	12	14	7	8.5	NS	15	17	8.4	14	12	NS	46	23	11

Notes:

J - Analyte present. Value may or may not be accurate or precis
NS - Not sampled
U - The material was analyzed for, but not detected
MG/KG - Milligrams per kilogram
PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

Appendix A.2
Surface Sediment Analytical Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SD42-0711	CAPL-SD43-0711	CAPL-SD44-0711	CAPL-SD45-0711	CAPL-SD46-0711	CAPL-SD47-0711	CAPL-SD48-0711	CAPL-SD49-0711	CAPL-SD50-0711	CAPL-SD50P-0711	CAPL-SD51-0711	CAPL-SD52-0711	CAPL-SD53-0711	CAPL-SD54-0711
Sample Date	7/27/11	7/28/11	7/28/11	7/28/11	7/27/11	7/27/11	7/29/11	7/29/11	7/29/11	7/29/11	7/29/11	7/29/11	7/29/11	7/27/11
Chemical Name														
Pesticide/Polychlorinated Biphenyls (UG/KG)														
Aroclor-1016	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1221	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1232	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1242	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1248	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1254	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1260	230	110	410	130	390	200	23 J	270	540	440	250	400	180	230
Aroclor-1262	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Aroclor-1268	85 U	59 U	98 U	41 U	88 U	84 U	24 U	82 U	68 U	77 U	77 U	67 U	53 U	76 U
Wet Chemistry (MG/KG)														
Total organic carbon (TOC)	80,000	150,000	130,000	5,500	80,000	100,000	8,200	130,000	66,000	NS	70,000	58,000	63,000	83,000
Grain Size (PCT/P)														
GS03 Sieve 3" (75 mm)	100	100	100	100	100	100	100	100	100	NS	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	100	100	100	100	100	100	NS	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	99	100	100	100	100	100	NS	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	97	100	99	100	100	100	100	100	NS	100	100	100	100
Sieve No. 004 (4.75 mm)	100	89	88	98	100	100	98	100	100	NS	100	100	100	99
Sieve No. 008 (2.36-MM)	84	72	40	97	86	96	95	97	97	NS	98	96	98	95
Sieve No. 016 (1.18-MM)	53	51	21	92	54	72	92	83	85	NS	82	75	85	81
Sieve No. 030 (600-UM)	34	34	11	75	35	49	72	64	68	NS	55	54	67	59
Sieve No. 040 (425 um)	28	29	8.4	58	29	42	50	55	60	NS	46	47	59	51
Sieve No. 050 (300-UM)	24	23	6.2	39	24	36	29	47	52	NS	38	40	52	43
Sieve No. 100 (150 um)	18	13	3.3	19	18	28	12	34	41	NS	28	31	40	32
Sieve No. 200 (75 um)	9.4	5.8	1.4	6.4	11	18	4.5	18	26	NS	18	20	22	20

Notes:

J - Analyte present. Value may or may not be accurate or precis
NS - Not sampled
U - The material was analyzed for, but not detected
MG/KG - Milligrams per kilogram
PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

Appendix A.2
Surface Sediment Analytical Results
Penniman Lake
Cheatham Annex
Williamsburg, Virginia

Sample ID	CAPL-SD55-0711	CAPL-SD56-0711	CAPL-SD57-0711	CAPL-SD58-0711	CAPL-SD58P-0711	CAPL-SD59-0711	CAPL-SD60-0711	CAPL-SD61-0811
Sample Date	7/27/11	7/27/11	7/27/11	7/29/11	7/29/11	7/27/11	7/29/11	8/2/11
Chemical Name								
Pesticide/Polychlorinated Biphenyls (UG/KG)								
Aroclor-1016	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1221	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1232	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1242	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1248	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1254	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1260	39	280	48 J	170	240	410	810	40
Aroclor-1262	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Aroclor-1268	22 U	74 U	46 U	67 U	92 U	85 U	64 U	20 U
Wet Chemistry (MG/KG)								
Total organic carbon (TOC)	19,000	84,000	35,000	74,000	NS	98,000	78,000	15,000
Grain Size (PCT/P)								
GS03 Sieve 3" (75 mm)	100	100	100	100	NS	100	100	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	100	NS	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	NS	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	100	100	100	NS	100	100	100
Sieve No. 004 (4.75 mm)	100	100	99	100	NS	100	99	99
Sieve No. 008 (2.36-MM)	99	96	97	93	NS	94	85	98
Sieve No. 016 (1.18-MM)	96	82	93	67	NS	69	60	96
Sieve No. 030 (600-UM)	88	62	82	49	NS	46	45	90
Sieve No. 040 (425 um)	79	53	68	43	NS	39	39	83
Sieve No. 050 (300-UM)	59	46	46	38	NS	33	34	50
Sieve No. 100 (150 um)	18	36	14	29	NS	25	26	17
Sieve No. 200 (75 um)	5.5	22	4.6	18	NS	16	17	5.8

Notes:

J - Analyte present. Value may or may not be accurate or precis
NS - Not sampled
U - The material was analyzed for, but not detected
MG/KG - Milligrams per kilogram
PCT/P - Percent Passed
UG/KG - Micrograms per kilogram

Attachment B
Analytical Results

Appendix B.1
CAX Penniman Lake
Composite Surface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO27	CAPL-SO28	CAPL-SO29		CAPL-SO30	CAPL-SO31	CAPL-SO32	CAPL-SO33	CAPL-SO34	CAPL-SO35	CAPL-SO36	CAPL-SO37	CAPL-SO38	CAPL-SO39		CAPL-SO40	CAPL-SO41	CAPL-SO42	CAPL-SO43
Sample ID	CAPL-SS27-1012	CAPL-SS28-1112	CAPL-SS29-1012	CAPL-SS29P-1012	CAPL-SS30-1012	CAPL-SS31-1012	CAPL-SS32-1012	CAPL-SS33-1012	CAPL-SS34-1112	CAPL-SS35-1112	CAPL-SS36-1112	CAPL-SS37-1112	CAPL-SS38-1012	CAPL-SS39-1012	CAPL-SS39P-1012	CAPL-SS40-1112	CAPL-SS41-1012	CAPL-SS42-1012	CAPL-SS43-1112
Sample Date	10/31/12	11/02/12	10/31/12	10/31/12	10/31/12	10/31/12	10/31/12	10/31/12	11/05/12	11/06/12	11/06/12	11/06/12	10/31/12	10/31/12	10/31/12	11/01/12	10/31/12	10/31/12	11/01/12
Chemical Name																			
Pesticide/Polychlorinated Biphenyls (µg/kg)																			
Aroclor-1260	4,350 J	117 J	94.2	150	26.6	627	34.9	10.6 U	44.6 J	10.4 UL	30.4 K	21.9 K	9.71 U	10.8 U	8.76 UL	9.22 U	16.2 J	10.3 UL	9.52 UL

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Notes:

Shading indicates detections
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
U - The material was analyzed for, but not detected
UL - Analyte not detected, quantitation limit is probably higher
µg/kg - Micrograms per kilogram

Appendix B.2
CAX Penniman Lake
Composite Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO34	CAPL-SO35	CAPL-SO36	CAPL-SO37	CAPL-SO38	CAPL-SO39	CAPL-SO40		CAPL-SO41	CAPL-SO42	CAPL-SO43
Sample ID	CAPL-SB34-1112	CAPL-SB35-1112	CAPL-SB36-1112	CAPL-SB37-1112	CAPL-SB38-1012	CAPL-SB39-1012	CAPL-SB40-1112	CAPL-SB40P-1112	CAPL-SB41-1012	CAPL-SB42-1012	CAPL-SB43-1112
Sample Date	11/05/12	11/06/12	11/06/12	11/06/12	10/31/12	10/31/12	11/01/12	11/01/12	10/31/12	10/31/12	11/01/12
Chemical Name											
Pesticide/Polychlorinated Biphenyls (µg/kg)											
Aroclor-1260	10.2 U	10.8 U	10.4 U	10.4 U	10.4 U	9.44 U	10.8 U	11.3 U	8.89 U	9.15 U	9.44 UL

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Notes:

Shading indicates detections

U - The material was analyzed for, but not detected

UL - Analyte not detected, quantitation limit is probably higher

µg/kg - Micrograms per kilogram

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO44	CAPL-SO45		CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49		CAPL-SO50	CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	
Sample ID	CAPL-SS44-1012	CAPL-SS45-1012	CAPL-SS45P-1012	CAPL-SS46-1012	CAPL-SS47-1012	CAPL-SS48-1012	CAPL-SS49-1012	CAPL-SS49P-1012	CAPL-SS50-1012	CAPL-SS55-1012	CAPL-SS56-1012	CAPL-SS57-1012	CAPL-SS58-1012	CAPL-SS59-1012	CAPL-SS59P-1012
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,1,1-Trichloroethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,1,2,2-Tetrachloroethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
1,1,2-Trichloroethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,1-Dichloroethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,1-Dichloroethene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,2,3-Trichlorobenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,2,4-Trichlorobenzene	3.17 UJ	3.4 UJ	3.41 UJ	3.67 UJ	2.67 UJ	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 UJ	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,2-Dibromo-3-chloropropane	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 UJ	6.52 UJ	6.39 UJ	8.07 UJ	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
1,2-Dibromoethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,2-Dichlorobenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,2-Dichloroethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,2-Dichloropropane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,3-Dichlorobenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
1,4-Dichlorobenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
2-Butanone	6.35 UJ	6.8 UJ	6.82 UJ	7.34 UJ	5.35 UJ	14.7 J	6.52 U	6.39 U	8.07 U	3.06 J	7.16 U	8.91 U	15.4 U	8.44 J	8.47 U
2-Hexanone	6.35 UJ	6.8 UJ	6.82 UJ	7.34 UJ	5.35 UJ	11.1 U	6.52 U	6.39 U	8.07 U	5.65 UJ	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
4-Methyl-2-pentanone	6.35 UJ	6.8 UJ	6.82 UJ	7.34 UJ	5.35 UJ	11.1 U	6.52 U	6.39 U	8.07 U	5.65 UJ	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
Acetone	7.77 J	8.33 J	13.6 UJ	14.7 UJ	10.7 UJ	186 L	13 UJ	12.8 UJ	16.1 UJ	96.8 J	14.3 UJ	15.2 J	30.2 J	149 J	20.5 J
Benzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Bromochloromethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Bromodichloromethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Bromoform	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Bromomethane	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
Carbon disulfide	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Carbon tetrachloride	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Chlorobenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Chloroethane	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
Chloroform	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Chloromethane	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
cis-1,2-Dichloroethene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
cis-1,3-Dichloropropene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Cyclohexane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Dibromochloromethane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Dichlorodifluoromethane (Freon-12)	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
Ethylbenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Isopropylbenzene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Methyl acetate	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	24	8.47 U
Methylcyclohexane	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Methylene chloride	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
Methyl-tert-butyl ether (MTBE)	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Styrene	38.2	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Tetrachloroethene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Toluene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
trans-1,2-Dichloroethene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 U	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
trans-1,3-Dichloropropene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Trichloroethene	3.17 U	3.4 U	3.41 U	3.67 U	2.67 U	5.54 UL	3.26 U	3.2 U	4.04 U	2.82 U	3.58 U	4.45 U	7.68 U	3.82 U	4.23 U
Trichlorofluoromethane (Freon-11)	6.35 U	6.8 U	6.82 U	7.34 U	5.35 U	11.1 U	6.52 U	6.39 U	8.07 U	5.65 U	7.16 U	8.91 U	15.4 U	7.65 U	8.47 U
Vinyl chloride	3.17 UJ	3.4 UJ	3.41 UJ	3.67 UJ	2.67 UJ	5.54 UJ	3.26 UJ	3.2 UJ	4.04 UJ	2.82 UJ	3.58 UJ	4.45 UJ	7.68 UJ	3.82 UJ	4.23 UJ
Xylene, total	9.52 U	10.2 U	10.2 U	11 U	8.02 U	16.6 UL	9.77 U	9.59 U	12.1 U	8.47 U	10.7 U	13.4 U	23 U	11.5 U	12.7 U

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO44	CAPL-SO45		CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49		CAPL-SO50	CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	
Sample ID	CAPL-SS44-1012	CAPL-SS45-1012	CAPL-SS45P-1012	CAPL-SS46-1012	CAPL-SS47-1012	CAPL-SS48-1012	CAPL-SS49-1012	CAPL-SS49P-1012	CAPL-SS50-1012	CAPL-SS55-1012	CAPL-SS56-1012	CAPL-SS57-1012	CAPL-SS58-1012	CAPL-SS59-1012	CAPL-SS59P-1012
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name															
Semivolatile Organic Compounds (µg/kg)															
1,1-Biphenyl	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
1,2,4,5-Tetrachlorobenzene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,2'-Oxybis(1-chloropropane)	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,3,4,6-Tetrachlorophenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,4,5-Trichlorophenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,4,6-Trichlorophenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,4-Dichlorophenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,4-Dimethylphenol	767 U	794 U	821 U	4,010 U	4,250 U	4,090 U	793 U	802 U	816 U	723 U	90.4 U	1,070 U	1,070 U	851 U	972 U
2,4-Dinitrophenol	1,920 U	1,990 U	2,050 U	10,000 U	10,700 U	10,300 R	1,980 U	2,010 U	2,040 U	1,810 U	226 U	2,670 U	2,680 U	2,130 U	2,430 U
2,4-Dinitrotoluene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2,6-Dinitrotoluene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2-Chloronaphthalene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2-Chlorophenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2-Methylnaphthalene	9.42	3.96 U	4.1 U	69.7 J	71.6 J	59 K	46 K	91.3	45.9 K	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
2-Methylphenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
2-Nitroaniline	767 U	794 U	821 U	4,010 U	4,250 U	4,090 U	793 U	802 U	816 U	723 U	90.4 U	1,070 U	1,070 U	851 U	972 U
2-Nitrophenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
3,3'-Dichlorobenzidine	192 U	199 U	205 U	1,000 U	1,070 U	1,030 R	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 UL	243 U
3-Nitroaniline	767 U	794 U	821 U	4,010 U	4,250 U	4,090 R	793 U	802 U	816 U	723 U	90.4 U	1,070 U	1,070 U	851 UL	972 U
4,6-Dinitro-2-methylpheno	1,920 U	1,990 U	2,050 U	10,000 U	10,700 U	10,300 R	1,980 U	2,010 U	2,040 U	1,810 U	226 U	2,670 U	2,680 U	2,130 U	2,430 U
4-Bromophenyl-phenylether	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
4-Chloro-3-methylpheno	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
4-Chloroaniline	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
4-Chlorophenyl-phenylether	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
4-Methylphenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
4-Nitroaniline	767 U	794 U	821 U	4,010 U	4,250 U	4,090 R	793 U	802 U	816 U	723 U	90.4 U	1,070 U	1,070 U	851 UL	972 U
4-Nitrophenol	767 U	794 U	821 U	4,010 U	4,250 U	4,090 U	793 U	802 U	816 U	723 U	90.4 U	1,070 U	1,070 U	851 U	972 U
Acenaphthene	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
Acenaphthylene	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	15	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
Acetophenone	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Anthracene	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
Atrazine	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Benzaldehyde	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Benzo(a)anthracene	5.75 J	3.96 U	4.1 U	86.6	72.4 J	56.1 J	23.5	47.3	92.3	4.19 J	6.82 J	5.33 U	5.34 U	4.25 U	4.85 U
Benzo(a)pyrene	6.85 J	3.96 U	4.1 U	122	78.4 J	86.6 K	23.6 K	51.5	90.9 K	3.61 U	4.53 U	5.33 U	6.2 J	5.61 J	4.85 U
Benzo(b)fluoranthene	11.5	4.78 J	4.97 J	197	187	137 K	50.5 K	75.9	135 K	4.31 J	9.95	5.33 U	8.22 J	9.68	8.38 J
Benzo(g,h,i)perylene	7.69	3.96 U	4.1 U	133	125	40.9 U	31.3 K	58.8	76.1 K	3.98 J	4.53 U	5.33 U	7.84 J	5.93 J	4.85 U
Benzo(k)fluoranthene	7.66 J	3.96 U	4.1 U	139	83.9 J	40.9 U	33	48.7	90.7	3.61 U	7.61 J	5.33 U	9.57 J	6.64 J	8.49 J
bis(2-Chloroethoxy)methane	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
bis(2-Chloroethyl)ether	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
bis(2-Ethylhexyl)phthalate	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	186 J	131 J
Butylbenzylphthalate	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Caprolactam	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Carbazole	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Chrysene	13.4	4.79 J	4.1 U	200	189	109 K	50.1 K	102	211 K	3.61 U	9.62	5.33 U	13.9	4.25 U	4.85 U
Dibenz(a,h)anthracene	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	9.61 K	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
Dibenzofuran	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Diethylphthalate	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Dimethyl phthalate	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Di-n-butylphthalate	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Di-n-octylphthalate	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Fluoranthene	10.3	3.96 U	4.1 U	246	211	145	63.8	107	298	5.6 J	4.77 J	6.21 J	11.3	16.2 B	17.4 B
Fluorene	3.83 U	3.96 U	4.1 U	40.1 U	42.5 U	40.9 U	3.96 U	4 U	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
Hexachlorobenzene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Hexachlorobutadiene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Hexachlorocyclopentadiene	192 UJ	199 UJ	205 UJ	1,000 UJ	1,070 UJ	1,030 R	198 U	201 U	204 U	181 UJ	22.6 UJ	267 UJ	268 UJ	213 U	243 U
Hexachloroethane	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Indeno(1,2,3-cd)pyrene	6.99 J	3.96 U	4.1 U	114	97.7	70 J	29.1	39.3	71.5	4.87 J	8.28 J	5.33 U	7.83 J	5.82 J	4.85 U
Isophorone	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Naphthalene	13.5	3.96 U	4.1 U	62.3 J	49.3 J	40.9 U	30.3 K	51.3	20.4 U	3.61 U	4.53 U	5.33 U	5.34 U	4.25 U	4.85 U
n-Nitroso-di-n-propylamine	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
n-Nitrosodiphenylamine	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Nitrobenzene	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Pentachlorophenol	767 U	794 U	821 U	4,010 U	4,250 U	4,090 U	793 U	802 U	816 U	723 U	90.4 U	1,070 U	1,070 U	851 U	972 U
Phenanthrene	5.93 J	3.96 U	4.1 U	108	143	92.8	55.7	106	69.5	3.61 U	4.53 U	5.33 U	5.95 J	6.9 B	5.98 B
Phenol	192 U	199 U	205 U	1,000 U	1,070 U	1,030 U	198 U	201 U	204 U	181 U	22.6 U	267 U	268 U	213 U	243 U
Pyrene	10.9	3.96 U	4.1 U	213	183	134 K	58.5 K	97.2	263 K	5.68 J	4.95 J	5.33 U	10.3 J	13.8 B	16.6 B

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO44	CAPL-SO45		CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49		CAPL-SO50	CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	
Sample ID	CAPL-SS44-1012	CAPL-SS45-1012	CAPL-SS45P-1012	CAPL-SS46-1012	CAPL-SS47-1012	CAPL-SS48-1012	CAPL-SS49-1012	CAPL-SS49P-1012	CAPL-SS50-1012	CAPL-SS55-1012	CAPL-SS56-1012	CAPL-SS57-1012	CAPL-SS58-1012	CAPL-SS59-1012	CAPL-SS59P-1012
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name															
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	0.566 J	0.295 J	0.398 J	22.6 J	17 J	26.8 J	44 J	78.5 J	27.3 J	0.356 UL	1.5 J	1.26 J	0.813 J	0.747 J	0.36 J
4,4'-DDE	1.92 L	2.14 L	1.89 L	179	53.6 J	206	186 J	254 J	285 K	0.32 L	2.92 L	1.93	3.76 L	2.44 J	4.52 J
4,4'-DDT	2.15 J	1.76 J	1.6 J	194 J	70.4 J	214 J	30.8 J	40.8	132 K	0.363 L	0.264 J	0.331 J	7.79 J	0.324 J	0.491 U
Aldrin	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.424 UL	0.401 U	0.406 U	0.395 U	0.356 UL	0.452 UL	0.528 U	2.56 L	0.432 UL	0.397 J
alpha-BHC	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.418 J	0.401 U	0.406 U	0.395 U	0.356 UL	0.496 J	0.211 J	0.722 J	0.514 J	1.05 J
alpha-Chlordane	0.394 UL	0.409 UL	0.407 UL	8.46 J	4.38 J	1.72 J	0.401 U	0.609 J	1.33 J	0.356 UL	0.452 UL	0.528 U	0.929 J	0.432 UL	0.491 UL
Aroclor-1260	177 J	134 L	103 L	16,500 J	9,980 J	1,600 J	386	589 J	1,170 J	8.72 UL	14.9 J	12.9 U	39.8 J	13.5 L	12 U
beta-BHC	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.211 J	0.401 U	0.406 U	0.395 U	0.356 UL	0.452 UL	0.528 U	0.536 UL	0.432 UL	0.491 U
delta-BHC	0.394 UL	0.409 UL	0.407 UL	0.209 J	0.438 UL	0.424 UL	0.401 UL	0.258 J	0.395 UL	0.356 UL	0.452 UL	0.528 U	0.213 J	0.432 UL	0.907 J
Dieldrin	2.25 L	1.19 L	1.48 J	253 J	140 L	16.8 J	1.49 J	13.7 J	18.8 J	0.356 UL	0.452 UL	0.528 U	0.565 J	0.432 UL	0.491 U
Endosulfan I	0.394 UL	0.409 UL	0.407 UL	0.385 L	0.438 UL	1.06 L	0.401 U	0.406 U	0.395 UJ	0.356 UL	0.452 UL	0.528 U	0.536 UL	0.432 UL	0.275 J
Endosulfan II	1.64 J	1.17 J	0.876 J	42.8 J	19.7 J	10.8 J	4.18 J	5.33 J	8.16 J	0.356 UL	0.452 UL	0.528 U	0.536 UL	0.432 UL	0.491 UL
Endosulfan sulfate	4.63 J	2.99 J	2.32 J	694 J	365 L	4.23 J	0.401 U	20.5	0.395 U	0.356 UL	0.399 L	0.528 U	0.648 J	0.432 UL	1.48 J
Endrin	0.432 J	0.279 J	0.205 J	77.7 J	43 J	3.25 J	4.55 J	1.65 J	3.09 J	0.356 UL	0.452 UL	0.528 U	0.536 UL	0.432 UL	0.491 UL
Endrin aldehyde	0.394 UL	0.409 UL	0.407 UL	22.9 J	16.5 J	1.34 J	0.597 J	0.746 J	1.59 J	0.356 UL	0.452 UL	0.528 U	0.536 UL	0.432 UL	0.953 J
Endrin ketone	0.756 J	0.558 J	0.452 J	45.9 J	83.3 J	5.46 J	1.18 J	1.81 J	2.62 J	0.356 UL	0.452 UL	0.528 U	0.273 J	0.432 UL	0.491 U
gamma-BHC (Lindane)	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.149 J	0.297 J	0.137 J	0.406 U	0.395 U	0.356 UL	0.452 UL	0.528 U	1.47 J	0.523 J	1.84 J
gamma-Chlordane	2.59 J	1.33 J	3.55 L	9.77 J	15.5 J	4.79 J	3.82 B	0.874 B	4.04 J	1.29 J	2.1 J	2.61 J	3.76 L	2.51 L	0.491 U
Heptachlor	0.394 UL	0.409 UL	0.407 UL	0.411 UL	0.438 UL	0.424 UL	0.401 U	0.406 U	0.395 UL	0.356 UL	0.452 UL	0.528 U	3.53 J	1.16 J	0.372 J
Heptachlor epoxide	0.394 UL	0.409 UL	0.407 UL	0.176 J	0.164 J	0.528 J	0.401 UL	0.517 J	0.258 J	0.356 UL	0.452 UL	0.528 U	0.536 UL	0.363 L	0.491 UL
Methoxychlor	0.367 J	0.649 J	0.375 J	74.9 J	29.9 J	13.3 J	1.74 J	0.873 J	5.18 J	0.199 L	0.438 J	2.38 J	5.53 J	0.392 J	6.65 J
Toxaphene	25.5 UJ	26.4 UJ	26.4 UJ	26.6 UJ	28.3 UJ	27.4 UJ	26 UJ	26.3 UJ	25.6 UJ	23 UJ	29.2 UJ	34.1 UJ	34.7 UJ	28 UJ	31.8 UJ
Explosives (µg/kg)															
1,3,5-Trinitrobenzene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
1,3-Dinitrobenzene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
2,4,6-Trinitrotoluene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
2-Amino-4,6-dinitrotoluene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
2-Nitrotoluene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
3,5-Dinitroaniline	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
3-Nitrotoluene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
4-Amino-2,6-dinitrotoluene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
4-Nitrotoluene	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
HMX	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
Nitroglycerin	435 U	455 U	476 U	500 U	459 U	455 U	455 U	455 U	476 U	495 U	467 U	391 U	866 J	481 U	452 U
Nitroguanidine	93.9 U	96.2 U	98.5 U	102 U	97.6 U	109 U	105 U	97.6 U	98.5 U	98 U	92.6 U	99 U	94.8 U	102 U	94.8 U
PETN	435 U	455 U	476 U	500 U	459 U	455 U	455 U	455 U	476 U	495 U	467 U	391 U	455 U	481 U	452 U
RDX	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
Tetryl	174 U	182 U	190 U	200 U	183 U	182 U	182 U	182 U	190 U	198 U	187 U	156 U	182 U	192 U	181 U
Total Metals (mg/kg)															
Aluminum	10,100	25,200	24,000	20,500	19,500	9,730	9,410	11,000	9,410	4,920	2,100	2,480	2,910	4,720	4,380
Antimony	0.914 U	2.45 U	2.46 U	2.46 U	2.7 U	2.55 U	2.48 U	2.59 U	2.38 U	0.901 U	1.09 J	1.28 U	1.34 U	1.03 U	1.16 U
Arsenic	2.54	7.03	6.21	6.07	6.69	6.35	5.54	5.69	5.48	1.64	1.55	1.17 J	1.12 J	1.45	1.73
Barium	36.1	43.5	39	73.7	84.5	46.6	76.1	60.6	50.5	23.2	13.9	16.8	17	16.4	14.9
Beryllium	0.397 J	1.64	1.46 J	0.97 J	1.24 J	0.491 J	0.749 J	0.718 J	0.854 J	0.199 J	0.274 U	0.166 J	0.335 U	0.257 J	0.238 J
Cadmium	0.228 U	0.612 U	0.615 U	1.14 J	2.32	0.639 U	0.333 J	0.648 U	0.387 J	0.225 U	0.274 U	0.213 J	1.89	0.724	0.538 J
Calcium	1,370	2,220	2,040	3,610	4,590	4,810	9,650 J	5,640 J	7,710	368 J	567 J	2,260	1,840	1,600	1,600
Chromium	14	45.9	46.3	41.4	35.3	17.2	16.1	17.7	19.9	5.46	3.54	4.76	4.26	6.91	6.69
Cobalt	1.71	4.96	4.78	3.76 J	4.71	2.38 J	3.09 J	3.02 J	2.94 J	0.861 J	1.37 U	1.07 J	0.938 J	1.23 J	1.24 J
Copper	6.4	6.59	5.42	24.9	39.3	11.9	18.1 J	12.7 J	19.8	2.07	3.12	1.97	4.16	7.11	5.67
Cyanide	0.284 U	0.296 U	0.312 U	0.306 U	0.302 U	0.315 U	0.307 U	0.305 U	0.298 U	0.272 U	0.336 U	0.383 U	0.383 U	0.314 U	0.358 U
Iron	10,100	48,000	43,400	26,000	25,100	13,400	14,500 J	22,500 J	15,300	6,440	2,780	2,310	3,990	7,050	7,610
Lead	17.6	16.5	14.4	141	211	65	61.6 J	40.7 J	81	12.5	9.1	29.3 J	13.1 J	12 J	11.7 J
Magnesium	856	2,650	2,740	2,450	3,130	1,240 J	1,360 J	1,300 J	2,060	400 J	232 J	327 J	732 J	1,290	1,320
Manganese	51.1	30.2	25.9	213	308	212	170	141	297	59	7.46	11.7	58.8	78.4	90.4
Mercury	0.0491 B	0.0603 B	0.0473 B	0.138	0.134	0.0712	0.061	0.0734	0.0472	0.0348 B	0.0421 B	0.0488 B	0.064 B	0.0204 B	0.0291 B
Nickel	3.72	13.2	11.3	9.03	11.1	5.96	6.9	6.44	7.18	2.47	1.35 J	2.31	2.43	2.87	3
Potassium	445 J	1,910	2,030	874 J	959 J	933 J	1,050 J	911 J	1,040 J	280 J	317 J	275 J	299 J	517 J	540 J
Selenium	0.571 U	1.53 U	1.54 U	1.54 U	1.69 U	1.6 U	1.55 U	1.62 U	1.49 U	0.563 U	0.686 U	0.799 U	0.837 U	0.644 U	0.727 U
Silver	0.228 U	0.612 U	0.615 U	0.615 U	0.675 U	0.639 UJ	0.62 U	0.648 U	0.596 U	0.225 U	0.274 U	0.32 U	0.335 U	0.257 U	0.291 U
Sodium	343 U	918 U	922 U	922 U	1,010 U	958 U	930 U	973 U	893 U	338 U	411 U	480 U	502 U	386 U	436 U
Thallium	0.457 U	1.22 U	1.23 U	1.23 U	1.35 U	1.28 U	1.24 U	1.3 U	1.19 U	0.45 U	0.549 U	0.639 U	0.67 U	0.515 U	0.581 U
Vanadium	19.6	67.3	64.5	45.8	43.9	28.9	22.8	23.4	22	9.48	5.28	7.73	7.3	11.4	11.1
Zinc	36.7	41	33.7	315	428	139	71	55.4	85.2	10.9	31.7	16.1	74.4	60.2	56.4
Wet Chemistry															
pH (ph)	5.99 H3	5.25 H3	NA	5.79 H3	6.46 H3	6.25 H3	7.65 H3	NA	7.55 H3	5.48 H3	5.71 H3	5.99 H3	6.38 H3	6.5 H3	NA
Total organic carbon (TOC) (mg/kg)	5,900	24,700	NA	24,400	36,000	42,600	44,200	NA	52,300	9,100	16,200	43,700	41,500	15,000	NA

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO44	CAPL-SO45		CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49		CAPL-SO50	CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	
Sample ID	CAPL-SS44-1012	CAPL-SS45-1012	CAPL-SS45P-1012	CAPL-SS46-1012	CAPL-SS47-1012	CAPL-SS48-1012	CAPL-SS49-1012	CAPL-SS49P-1012	CAPL-SS50-1012	CAPL-SS55-1012	CAPL-SS56-1012	CAPL-SS57-1012	CAPL-SS58-1012	CAPL-SS59-1012	CAPL-SS59P-1012
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12
Chemical Name															
GRAINSIZE (PCT)															
Coarse Sand (%)	0.6	0.2	NA	0.9	0.8	1	5.1	NA	3.9	0.9	0.5	0.8	1	4.9	NA
Fine Sand (%)	45.6	46.6	NA	37.9	29.2	43.3	37.7	NA	37	71.6	85.3	76.2	58.8	40.6	NA
Fines (%)	42.6	46	NA	53.4	65.9	40.2	39.3	NA	36.4	16.9	6.6	16.9	28.1	0.5	NA
Gravel (%)	0.7	2.8	NA	1.3	0	3.6	10.1	NA	13.3	0.2	0.3	0.4	2.5	45.1	NA
Medium Sand (%)	10.5	4.4	NA	6.5	4.1	11.9	7.8	NA	9.4	10.4	7.4	5.7	9.6	8.9	NA
Sand (%)	56.7	51.2	NA	45.3	34.1	56.2	50.6	NA	50.3	82.9	93.2	82.7	69.4	54.4	NA
GRAINSIZE (PCT/P)															
GS03 Sieve 3" (75 mm)	100	100	NA	100	100	100	100	NA	100	100	100	100	100	100	NA
GS05 Sieve 2" (50 mm)	100	100	NA	100	100	100	100	NA	100	100	100	100	100	100	NA
GS06 Sieve 1.5" (37.5 mm)	100	100	NA	100	100	100	100	NA	100	100	100	100	100	100	NA
GS07 Sieve 1" (25.0 mm)	100	100	NA	100	100	100	100	NA	100	100	100	100	100	100	NA
GS08 Sieve 0.75" (19.0 mm)	100	100	NA	100	100	100	100	NA	100	100	100	100	100	80.3	NA
GS10 Sieve 0.375" (9.5 mm)	100	98	NA	100	100	97.4	97.3	NA	92.8	100	100	100	98.4	58	NA
Sieve No. 004 (4.75 mm)	99.3	97.2	NA	98.7	100	96.4	89.9	NA	86.7	99.8	99.7	99.6	97.5	54.9	NA
Sieve No. 010 (2.00 mm)	98.7	97	NA	97.8	99.2	95.4	84.8	NA	82.8	98.9	99.2	98.8	96.5	50	NA
Sieve No. 020 (850 um)	96.3	96.3	NA	96.1	98.2	94.1	81.6	NA	78.9	97.3	98.6	98	94.5	46.7	NA
Sieve No. 040 (425 um)	88.2	92.6	NA	91.3	95.1	83.5	77	NA	73.4	88.5	91.8	93.1	86.9	41.1	NA
Sieve No. 060 (250 um)	66.6	70.8	NA	75.5	83.9	70.8	63.3	NA	59.9	55.5	53.2	63.8	63.6	27.3	NA
Sieve No. 080 (180 um)	53.8	56.5	NA	64.8	76.2	61.2	52.8	NA	49.7	33.2	22.6	38.3	45.6	15.7	NA
Sieve No. 100 (150 um)	49	52	NA	60.2	72.8	54.1	47.7	NA	44.6	25.3	12.1	27.8	37.2	8.7	NA
Sieve No. 200 (75 um)	42.6	46	NA	53.4	65.9	40.2	39.3	NA	36.4	16.9	6.6	16.9	28.1	0.5	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

N - The MS/MSD accuracy and or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

pct - Percent

ph - pH units

µg/kg - Micrograms per kilogram

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO60	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69		CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75
Sample ID	CAPL-SS60-1112	CAPL-SS61-1112	CAPL-SS62-1112	CAPL-SS63-1112	CAPL-SS64-1112	CAPL-SS65-1112	CAPL-SS66-1112	CAPL-SS67-1112	CAPL-SS68-1112	CAPL-SS69-1112	CAPL-SS69P-1112	CAPL-SS70-1112	CAPL-SS71-1112	CAPL-SS72-1112	CAPL-SS73-1112	CAPL-SS74-1112	CAPL-SS75-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12
Chemical Name																	
Volatile Organic Compounds (µg/kg)																	
1,1,1-Trichloroethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,1,2,2-Tetrachloroethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
1,1,2-Trichloroethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,1-Dichloroethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,1-Dichloroethene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,2,3-Trichlorobenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,2,4-Trichlorobenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,2-Dibromo-3-chloropropane	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
1,2-Dibromoethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,2-Dichlorobenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,2-Dichloroethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,2-Dichloropropane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,3-Dichlorobenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
1,4-Dichlorobenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
2-Butanone	5.22 U	6.56 U	4.14 U	5.2 U	23.5	5.38 J	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	7.37 J	4.4 J	7.92	4.61 U	5.79 U	7.06 U
2-Hexanone	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UL	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
4-Methyl-2-pentanone	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 U	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
Acetone	10.4 UJ	13.1 UJ	17.2 J	10.4 UJ	24.3 J	210 J	10.7 UJ	34.9 J	10.1 UJ	9.22 UJ	8.88 UJ	25.3 J	58.1 J	40.7 J	9.23 UJ	10.6 J	14.1 UJ
Benzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Bromochloromethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Bromodichloromethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Bromoform	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Bromomethane	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
Carbon disulfide	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Carbon tetrachloride	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Chlorobenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Chloroethane	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
Chloroform	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Chloromethane	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
cis-1,2-Dichloroethene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
cis-1,3-Dichloropropene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Cyclohexane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Dibromochloromethane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Dichlorodifluoromethane (Freon-12)	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
Ethylbenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Isopropylbenzene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Methyl acetate	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UL	4.61 U	4.44 U	4.14 UJ	4.09 UJ	3.95 UJ	4.61 U	5.79 U	7.06 U
Methylcyclohexane	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Methylene chloride	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
Methyl-tert-butyl ether (MTBE)	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Styrene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	15.2	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Tetrachloroethene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Toluene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
trans-1,2-Dichloroethene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UJ	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
trans-1,3-Dichloropropene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 UL	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Trichloroethene	2.61 U	3.28 U	2.07 U	2.6 U	2.33 U	3.34 U	2.67 U	2.39 U	2.53 U	2.31 U	2.22 U	2.07 U	2.04 U	1.98 U	2.31 U	2.9 U	3.53 U
Trichlorofluoromethane (Freon-11)	5.22 U	6.56 U	4.14 U	5.2 U	4.66 U	6.67 U	5.34 U	4.79 U	5.06 UJ	4.61 U	4.44 U	4.14 U	4.09 U	3.95 U	4.61 U	5.79 U	7.06 U
Vinyl chloride	2.61 UJ	3.28 UJ	2.07 UJ	2.6 UJ	2.33 UJ	3.34 UJ	2.67 UJ	2.39 UJ	2.53 UJ	2.31 UJ	2.22 UJ	2.07 UJ	2.04 UJ	1.98 UJ	2.31 UJ	2.9 UJ	3.53 UJ
Xylene, total	7.83 U	9.84 U	6.21 U	7.81 U	6.99 U	10 U	8.01 U	7.18 U	7.59 UL	6.92 U	6.66 U	6.21 U	6.13 U	5.93 U	6.92 U	8.69 U	10.6 U

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO60	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69		CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75
Sample ID	CAPL-SS60-1112	CAPL-SS61-1112	CAPL-SS62-1112	CAPL-SS63-1112	CAPL-SS64-1112	CAPL-SS65-1112	CAPL-SS66-1112	CAPL-SS67-1112	CAPL-SS68-1112	CAPL-SS69-1112	CAPL-SS69P-1112	CAPL-SS70-1112	CAPL-SS71-1112	CAPL-SS72-1112	CAPL-SS73-1112	CAPL-SS74-1112	CAPL-SS75-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12
Chemical Name																	
Semivolatile Organic Compounds (µg/kg)																	
1,1-Biphenyl	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
1,2,4,5-Tetrachlorobenzene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
2,2'-Oxybis(1-chloropropane)	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
2,3,4,6-Tetrachlorophenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
2,4,5-Trichlorophenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
2,4,6-Trichlorophenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
2,4-Dichlorophenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
2,4-Dimethylphenol	887 U	7,620 U	781 U	780 U	838 U	945 U	4,280 U	4,040 U	899 U	3,800 U	7,410 U	6,730 U	7,860 U	6,900 U	7,980 U	7,120 UL	8,370 U
2,4-Dinitrophenol	2,220 U	19,100 U	1,950 U	1,950 U	2,100 U	2,370 U	10,700 U	10,100 U	2,250 U	9,510 U	18,500 U	16,800 U	19,700 U	17,300 U	20,000 U	17,800 UL	20,900 U
2,4-Dinitrotoluene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
2,6-Dinitrotoluene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
2-Chloronaphthalene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
2-Chlorophenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
2-Methylnaphthalene	4.43 U	190 U	3.9 U	23.2 J	12.4	117	45.9 J	69.5 J	4.49 U	37.9 U	37 U	37.7 J	39.2 U	34.5 U	39.8 U	35.5 U	41.8 U
2-Methylphenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
2-Nitroaniline	887 U	7,620 U	781 U	780 U	838 U	945 U	4,280 U	4,040 U	899 U	3,800 U	7,410 U	6,730 U	7,860 U	6,900 U	7,980 U	7,120 U	8,370 U
2-Nitrophenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
3,3'-Dichlorobenzidine	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
3-Nitroaniline	887 U	7,620 U	781 U	780 U	838 U	945 U	4,280 U	4,040 U	899 U	3,800 U	7,410 U	6,730 U	7,860 U	6,900 U	7,980 U	7,120 U	8,370 U
4,6-Dinitro-2-methylphenol	2,220 U	19,100 U	1,950 U	1,950 U	2,100 U	2,370 U	10,700 U	10,100 U	2,250 U	9,510 U	18,500 U	16,800 U	19,700 U	17,300 U	20,000 U	17,800 UL	20,900 U
4-Bromophenyl-phenylether	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
4-Chloro-3-methylphenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
4-Chloroaniline	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
4-Chlorophenyl-phenylether	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
4-Methylphenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
4-Nitroaniline	887 U	7,620 U	781 U	780 U	838 U	945 U	4,280 U	4,040 U	899 U	3,800 U	7,410 U	6,730 U	7,860 U	6,900 U	7,980 U	7,120 U	8,370 U
4-Nitrophenol	887 U	7,620 U	781 U	780 U	838 U	945 U	4,280 U	4,040 U	899 U	3,800 U	7,410 U	6,730 U	7,860 U	6,900 U	7,980 U	7,120 UL	8,370 U
Acenaphthene	4.43 U	190 U	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	75.6 J	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	166	41.8 U
Acenaphthylene	4.43 U	190 U	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	144	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	35.5 U	41.8 U
Acetophenone	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Anthracene	4.43 U	271 J	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	1,690	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	512	41.8 U
Atrazine	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Benzaldehyde	222 U	1,910 U	195 U	195 U	210 U	517	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Benzo(a)anthracene	4.43 U	3,570	30.5	34.1 J	9.99	142	182	14,400	55.8	37.9 U	37 U	33.6 U	39.2 U	34.5 U	128	797	41.8 U
Benzo(a)pyrene	4.43 U	4,780	54.6	23.9 J	11.8	195	192	8,120	54.3	37.9 U	37 U	33.6 U	39.2 U	34.5 U	119	722	41.8 U
Benzo(b)fluoranthene	5.97 J	8,910	150	40.4	15.9	242	335	11,300	116	37.9 U	78.9	33.6 U	39.2 U	34.5 U	157	418	46.3 J
Benzo(g,h,i)perylene	4.43 U	4,730	73.4	47.8	11	153	172	3,320	45.5	37.9 U	37 U	33.6 U	39.2 U	34.5 U	114	399	41.8 U
Benzo(k)fluoranthene	4.52 J	7,950	85.2	40	7.92 J	289	330	8,830	70.6	40.3 J	37 U	33.6 U	39.2 U	34.5 U	128	506	41.8 U
bis(2-Chloroethoxy)methane	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
bis(2-Chloroethyl)ether	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
bis(2-Ethylhexyl)phthalate	141 J	1,910 U	195 U	205 J	210 U	137 J	1,070 U	1,010 U	1,000 J	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Butylbenzylphthalate	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Caprolactam	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Carbazole	222 U	968 J	195 U	195 U	210 U	237 U	1,070 U	1,450 J	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Chrysene	4.43 U	8,790	143	67	18.5	373	386	19,200	104	91.7	52.7 J	46.5 J	39.2 U	65.7 J	192	906	82.8 J
Dibenz(a,h)anthracene	4.43 U	1,260	17.6	19.5 U	4.18 U	62.6	42.7 U	2,080	15.8	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	137	41.8 U
Dibenzofuran	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Diethylphthalate	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Dimethyl phthalate	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Di-n-butylphthalate	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Di-n-octylphthalate	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Fluoranthene	5.38 J	12,200	118	62.9	17.1	115	384	72,300	112	64.4 J	43.7 J	36.7 J	40.5 J	34.5 U	260	1,510	69.7 J
Fluorene	4.43 U	190 U	3.9 U	19.5 U	4.18 U	4.72 U	42.7 U	40.4 U	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	169	41.8 U
Hexachlorobenzene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Hexachlorobutadiene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Hexachlorocyclopentadiene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Hexachloroethane	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Indeno(1,2,3-cd)pyrene	4.43 U	4,200	65.6	19.5 U	9.11	134	175	3,800	44.5	37.9 U	37 U	33.6 U	39.2 U	34.5 U	102	321	41.8 U
Isophorone	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Naphthalene	4.43 U	190 U	3.9 U	19.5 U	7.72 J	423	42.7 U	104	4.49 U	37.9 U	37 U	33.6 U	39.2 U	34.5 U	39.8 U	35.5 U	41.8 U
n-Nitroso-di-n-propylamine	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
n-Nitrosodiphenylamine	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Nitrobenzene	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 U	2,090 U
Pentachlorophenol	887 U	7,620 U	781 U	780 U	838 U	945 U	4,280 U	4,040 U	899 U	3,800 U	7,410 U	6,730 U	7,860 U	6,900 U	7,980 U	7,120 UL	8,370 U
Phenanthrene	10.2	3,190	17.4	33.9 J	19.7	213	121	6,370	17.1	42.1 J	37 U	44.2 J	39.2 U	73.8	172	1,910	53.3 J
Phenol	222 U	1,910 U	195 U	195 U	210 U	237 U	1,070 U	1,010 U	225 U	951 U	1,850 U	1,680 U	1,970 U	1,730 U	2,000 U	1,780 UL	2,090 U
Pyrene	6.11 J	13,300	119	67.7	17	135	374	54,600	118	60.8 J	38.9 J	51.6 J	46.1 J	47.8 J	231	2,080	54 J

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO60	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69		CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75
Sample ID	CAPL-SS60-1112	CAPL-SS61-1112	CAPL-SS62-1112	CAPL-SS63-1112	CAPL-SS64-1112	CAPL-SS65-1112	CAPL-SS66-1112	CAPL-SS67-1112	CAPL-SS68-1112	CAPL-SS69-1112	CAPL-SS69P-1112	CAPL-SS70-1112	CAPL-SS71-1112	CAPL-SS72-1112	CAPL-SS73-1112	CAPL-SS74-1112	CAPL-SS75-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12
Chemical Name																	
Pesticide/Polychlorinated Biphenyls (µg/kg)																	
4,4'-DDD	0.442 U	10.9 J	0.386 UL	353	0.519 J	0.381 J	6.28 J	1.89 J	0.68 J	2 J	1.08 J	0.351 UJ	0.394 UJ	0.718 J	19.3 J	0.565 J	1.84 J
4,4'-DDE	0.442 UJ	127 K	1.28 L	2,640	1.68 L	4.44 J	91.1 K	4.92 J	0.459 UJ	4.22 J	3.34 J	0.351 UJ	0.394 UJ	4.42 J	146 L	2.46 J	16.4 J
4,4'-DDT	0.442 UJ	122 K	1 J	808	0.433 UJ	0.605 J	31.9 J	7.1 J	0.595 J	17.6 J	3.97 J	0.337 J	0.525 J	4.85 J	334 L	0.373 UJ	5.95 J
Aldrin	0.442 U	0.397 U	0.386 U	0.415 U	0.433 U	0.467 U	0.441 U	0.399 UL	0.459 U	0.392 U	0.37 U	0.351 U	0.394 UJ	0.358 L	0.398 UL	0.373 U	0.415 UL
alpha-BHC	0.442 U	0.397 U	0.386 U	0.415 U	0.433 U	0.467 U	0.441 U	0.399 U	0.459 U	0.392 U	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UL	0.373 U	0.415 UL
alpha-Chlordane	0.442 U	0.518 J	0.386 UL	8.88 L	0.433 UL	0.467 UL	0.441 UL	0.259 J	0.459 U	1.78 J	1.52 J	0.351 U	0.394 U	0.362 UJ	13.3 J	1.42 J	0.415 UJ
Aroclor-1260	10.8 U	627 J	42.3	397	10.6 U	11.4 U	2,770 J	9.77 U	36.9 J	266 J	283 J	8.59 U	12.1 J	34.9 L	4,630 J	9.13 U	357 J
beta-BHC	0.442 U	0.397 U	0.386 U	0.415 U	0.433 U	0.467 U	0.441 U	0.305 J	0.459 U	0.392 U	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UL	0.373 U	0.415 UL
delta-BHC	0.442 U	1.07 J	0.386 U	0.156 L	0.424 J	0.455 J	0.377 J	0.681 J	0.459 U	0.392 UL	0.37 UL	0.351 UJ	0.394 UJ	0.362 UL	0.398 UJ	0.373 U	0.415 UL
Dieldrin	0.442 U	13.3 J	0.462 J	7.09 L	0.433 U	0.344 J	26.5 K	0.399 U	0.264 J	5.69 L	5.53	0.351 U	0.394 U	0.453 J	19.1 J	0.306 J	0.704 J
Endosulfan I	0.442 U	0.397 U	0.386 U	0.263 J	0.433 U	0.467 U	0.441 U	1.14 J	0.459 U	0.392 UL	0.37 U	0.351 U	0.394 U	0.362 UJ	0.398 UL	0.373 U	0.415 UL
Endosulfan II	0.442 U	4.69 J	0.386 UL	9.2 L	0.231 J	0.467 U	6.04 J	2.5 J	0.387 J	2.99 J	3.26 J	0.351 U	0.394 U	0.273 L	39.2 L	0.373 U	0.415 UJ
Endosulfan sulfate	0.442 U	4.08 J	0.303 J	12.4 J	1.68 J	0.467 UL	64.2 L	0.347 J	0.459 U	9.13 L	10.1 L	0.351 U	0.394 U	9.86 J	0.559 J	0.373 U	2.3 L
Endrin	0.442 U	1.75 J	0.492 J	13.3 J	0.433 U	0.467 UL	13.6 J	0.399 U	0.459 U	2.62 J	2.5 J	0.351 UJ	0.394 UJ	0.362 UL	0.398 UJ	0.373 U	0.415 UJ
Endrin aldehyde	0.442 U	0.397 U	0.386 U	0.9 J	5.31 J	3.16 J	2.19 J	1.73 J	0.459 U	0.518 J	0.397 J	0.351 U	0.394 UJ	0.362 UL	7.81 J	0.373 U	0.759 J
Endrin ketone	0.442 UJ	4.97 J	0.359 L	4.05 L	0.433 UL	1.65 K	26.5 J	0.399 UL	0.459 U	3.04 J	0.834 J	0.351 U	0.394 U	0.362 UL	40.2 J	0.373 U	1.36 J
gamma-BHC (Lindane)	0.442 U	4.76 J	0.386 U	0.415 U	0.433 U	0.467 U	0.159 J	0.399 UL	0.205 J	0.392 U	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UL	0.373 UJ	0.415 UL
gamma-Chlordane	0.484 J	1.62 K	0.428 J	14.5	0.251 J	0.253 J	1.81 J	0.399 UL	0.402 J	1.55 J	1.24 J	0.642 J	0.916 L	0.53 J	12.7 L	3.31 J	0.765 L
Heptachlor	0.442 U	0.397 U	0.386 UL	0.417 L	0.433 UL	0.467 UL	0.148 J	0.399 UL	0.459 U	0.392 UL	0.37 U	0.351 U	0.394 U	0.362 UL	0.398 UJ	0.373 UJ	0.415 UL
Heptachlor epoxide	0.442 U	0.397 UL	0.386 U	9.28 J	0.433 UL	0.467 U	0.272 J	0.399 UL	0.459 U	0.392 UL	0.37 UL	0.351 UJ	0.394 UJ	0.362 UL	0.483 J	0.373 UJ	0.415 UJ
Methoxychlor	0.442 UJ	3.55 J	0.316 J	2.8 J	0.433 UL	2.72 K	10 J	1.91 J	0.459 UJ	0.712 J	0.206 J	0.351 UJ	0.394 UJ	0.215 J	21.2 J	0.373 UJ	1.52 J
Toxaphene	28.6 UJ	25.7 UJ	25 U	26.8 UJ	28 UJ	30.2 UJ	28.5 UL	25.8 UL	29.7 UJ	25.4 UJ	24 UJ	22.7 UJ	25.5 UJ	23.4 UJ	25.7 UJ	24.1 UJ	26.8 UJ
Explosives (µg/kg)																	
1,3,5-Trinitrobenzene	162 U	110 J	160 U	193 U	183 U	194 U	176 U	161 J	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
1,3-Dinitrobenzene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
2,4,6-Trinitrotoluene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
2-Amino-4,6-dinitrotoluene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
2-Nitrotoluene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
3,5-Dinitroaniline	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
3-Nitrotoluene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
4-Amino-2,6-dinitrotoluene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
4-Nitrotoluene	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
HMX	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
Nitroglycerin	405 U	446 U	400 U	483 U	457 U	485 U	441 U	478 U	433 U	400 U	439 U	465 U	478 U	478 U	426 U	435 U	433 U
Nitroguanidine	100 U	97.6 U	88.9 U	96.2 U	104 U	104 U	101 U	102 U	91.7 U	104 U	94.8 U	109 UJ	110 U	102 UJ	109 UJ	96.2 UJ	103 U
PETN	405 U	446 U	400 U	483 U	457 U	485 U	441 U	478 U	433 U	400 U	439 U	465 U	478 U	478 U	426 U	435 U	433 U
RDX	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
Tetryl	162 U	179 U	160 U	193 U	183 U	194 U	176 U	191 U	173 U	160 U	175 U	186 U	191 U	191 U	170 U	174 U	173 U
Total Metals (mg/kg)																	
Aluminum	14,800	11,100	5,400	6,090	13,700	6,660	8,330	4,340	25,800	10,300	10,000	6,070	9,460	3,260	5,380	7,640	9,110
Antimony	2.73 U	2.33 U	0.942 U	2.51 U	2.69 U	11.6	2.53 U	2.42 U	2.67 UL	2.46 U	2.28 U	0.787 U	2.3 U	2.14 U	2.33 U	2.27 U	2.65 U
Arsenic	19.3	8.12	3.47	8.93	10	2.44 J	6.5	2.69 J	14.4	5.74 J	7.9 J	1.19	2.1 J	0.941 J	2.6 J	5.29	7.22
Barium	80.8	50.2	44.8	27.4	48.2	175	66.3	39.9	81.8	52.6 J	37.1 J	10.9	14	46	34.1	66.4	61.1
Beryllium	1.4 J	0.838 J	0.571 J	1.3 J	0.866 J	0.887 J	0.677 J	0.441 J	1.44	0.537 J	0.418 J	1.63	1.35 J	0.535 U	0.363 J	0.521 J	0.759 J
Cadmium	0.412 J	1.94	0.413 J	1.21 J	0.674 U	0.989 J	0.613 J	0.606 U	0.668 U	0.615 U	0.57 U	0.197 U	0.575 U	0.535 U	0.984 J	0.568 U	0.339 J
Calcium	15,000	11,200	539 J	19,000	5,740	3,910	4,370	1,170 J	6,660	5,630 J	3,740 J	15,900	11,000	40,800	2,070	58,200	2,170
Chromium	40.3	69.7	10.9	66.7	29.9	8.21	18.5	8.3	56.1	19.4	21.1	5.78	10.5	7.84	16.7	23.3	19.3
Cobalt	6.04	4.6	2.53	2.73 J	3.28 J	2.91 J	3.75 J	3.03 U	5.81	2.12 J	1.61 J	2.09	2.05 J	2.01 J	2.02 J	3.8	3.66 J
Copper	5.81	26.1	6.24	12	8.2	10.7	20.1	5.05	9.67	12.4 J	7.95 J	3.29	4.57	6.47	44.8	28.3	51.5
Cyanide	0.322 U	0.279 U	0.286 U	0.291 U	0.317 U	0.354 U	0.323 U	0.289 U	0.334 U	0.281 U	0.261 U	0.246 U	0.29 U	0.265 U	0.297 U	0.272 U	0.155 J
Iron	53,300	22,300	8,330	32,800	33,300	8,680	17,500	9,300	49,100	18,400	16,800	10,400	15,100	6,370	11,100	10,900	18,500
Lead	14.5	107	25.3	46.8	21.3	42.5	77.7	28.8	14.7	29.9	22.7	12.9	10.3	15.1	127	14.7	159
Magnesium	3,950	2,050	654	1,960	2,110	1,590 J	2,080	580 J	4,380	1,290 J	1,230 J	2,530	2,620	22,800	1,480	2,520	1,680
Manganese	259	151	256	140	77.7	264	216	86.5	133 L	123 J	90.1 J	405	331	117	140	161	351
Mercury	0.0327 J	0.0835	0.11	0.145	0.0672	0.0499	0.247	0.034 J	0.0784	0.0476	0.0465	0.031 U	0.0355 U	0.0242 J	0.0861	0.0188 J	0.0835
Nickel	15.8	11.4	4.59	8.33	8.8	5.9	7.21	2.99 J	18.5	4.96 J	3.4 J	2.28	2.64 J	3.24	6.27	11.8	6.5
Potassium	4,240	1,600	401 J	1,840	1,800	451 J	807 J	437 J	3,420	795 J	821 J	667	987 J	421 J	414 J	1,280 J	975 J
Selenium	1.71 U	1.46 U	0.589 U	1.57 U	1.68 U	1.82 U	1.58 U	1.51 U	1.67 U	1.54 U	1.42 U	0.492 U	1.44 U	1.34 U	1.46 U	1.42 U	1.65 U
Silver	0.683 U	0.582 U	0.235 U	0.627 U	0.674 U	0.73 U	0.631 U	0.606 U	0.668 U	0.615 U	0.57 U	0.197 U	0.575 U	0.535 U	0.582 U	0.568 U	0.661 U
Sodium	1,020 U	873 U	353 U	940 U	1,010 U	1,090 U	947 U	909 U	200 U	923 U	855 U	295 U	863 U	803 U	874 U	852 U	992 U
Thallium	1.37 U	1.16 U	0.471 U	1.25 U	1.35 U	1.46 U	1.26 U	1.21 U	1.34 U	1.23 U	1.14 U	0.393 U	1.15 U	1.07 U	1.16 U	1.14 U	1.32 U
Vanadium	40.3	29.1	10.6	26.7	33.3	10.9	24.1	11.1	55.6	24.7	26.5	13.7	19.7	12.8	19.4	28.3	25.6
Zinc	63.4	235	45.5	83.9	59.6	190	142	35.2	73.9 K	58.6 J	40.2 J	44.6	33.3	21.7	175	47.5	196
Wet Chemistry																	
pH (ph)	7.66 H3	7.74 H3	6.06 H3	8.25 H3	7.96 H3	6.25 H3	7.5 H3	6.7 H3	7.77 H3	8.19 H3	NA	9.11 H3	9.12 H3	8.15 H3	7 H3	11.9 H3	5.85 H3
Total organic carbon (TOC) (mg/kg)	18,400	33,500 N	12,300 N	16,000 N	29,800	128,000	60,800	39,400	21,100 N	20,900 N	NA	7,450	9,410	13,500	29,600	13,200	40,100

Appendix B.3
CAX Penniman Lake
Surface Soil Analytical Results
October- November 2012

Station ID	CAPL-SO60	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69		CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75
Sample ID	CAPL-SS60-1112	CAPL-SS61-1112	CAPL-SS62-1112	CAPL-SS63-1112	CAPL-SS64-1112	CAPL-SS65-1112	CAPL-SS66-1112	CAPL-SS67-1112	CAPL-SS68-1112	CAPL-SS69-1112	CAPL-SS69P-1112	CAPL-SS70-1112	CAPL-SS71-1112	CAPL-SS72-1112	CAPL-SS73-1112	CAPL-SS74-1112	CAPL-SS75-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12
Chemical Name																	
GRAINSIZE (PCT)																	
Coarse Sand (%)	0.3	3.8	1.2	5.3	1	7.2	6	2.7	0.7	5.5	NA	18.2	11.5	10.9	4.4	20.3	2.8
Fine Sand (%)	46.7	51.4	67.1	52.7	38.8	41.6	33.1	55.6	27.7	36.4	NA	17.8	20.6	20.1	44.6	15.9	44.6
Fines (%)	49.1	31.3	24.8	22.3	43.9	21.8	32.4	31.3	67.2	28.7	NA	16	14.7	18.1	25.9	6.2	38.5
Gravel (%)	0.4	3.5	0.3	12.9	11	14.7	15.7	3.7	2.1	18.2	NA	25.6	36.3	32.3	1.3	38.6	2.1
Medium Sand (%)	3.5	10	6.6	6.8	5.3	14.7	12.8	6.7	2.3	11.2	NA	22.4	16.9	18.6	23.8	19	12
Sand (%)	50.5	65.2	74.9	64.8	45.1	63.5	51.9	65	30.7	53.1	NA	58.4	49	49.6	72.8	55.2	59.4
GRAINSIZE (PCT/P)																	
GS03 Sieve 3" (75 mm)	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS05 Sieve 2" (50 mm)	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	100	100	100	100	100	100	100	100	100	NA	100	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	100	100	100	95.4	91.4	94.2	89.2	98.4	100	89.5	NA	92.5	76.7	79.3	100	82.8	99.1
Sieve No. 004 (4.75 mm)	99.6	96.5	99.7	87.1	89	85.3	84.3	96.3	97.9	81.8	NA	74.4	63.7	67.7	98.7	61.4	97.9
Sieve No. 010 (2.00 mm)	99.3	92.7	98.5	81.8	88	78.1	78.3	93.6	97.2	76.3	NA	56.2	52.2	56.8	94.3	41.1	95.1
Sieve No. 020 (850 um)	98.5	88.4	97.5	78.7	86.5	72.3	73.2	91.7	96.4	71.8	NA	43.3	42.6	48.6	83.4	31.5	89.7
Sieve No. 040 (425 um)	95.8	82.7	91.9	75	82.7	63.4	65.5	86.9	94.9	65.1	NA	33.8	35.3	38.2	70.5	22.1	83.1
Sieve No. 060 (250 um)	73.8	64.4	63.2	59	65.8	44.5	49.5	62.8	85	50.6	NA	27.1	27	28.7	51.6	14.9	63
Sieve No. 080 (180 um)	57.3	49.9	44.3	39.8	53.4	32.3	40.6	43.5	76.1	40.7	NA	23.2	21.7	23.5	39.6	11.2	49.5
Sieve No. 100 (150 um)	53.5	42.4	35.3	30.2	49.3	27.8	37	37.7	73.5	36.2	NA	20.8	19.1	21.5	34	9.4	44.6
Sieve No. 200 (75 um)	49.1	31.3	24.8	22.3	43.9	21.8	32.4	31.3	67.2	28.7	NA	16	14.7	18.1	25.9	6.2	38.5

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

N - The MS/MSD accuracy and or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

pct - Percent

ph - pH units

µg/kg - Micrograms per kilogram

Appendix B.4
CAX Penniman Lake
Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO44	CAPL-SO45	CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49	CAPL-SO50		CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	CAPL-SO60	
Sample ID	CAPL-SB44-1012	CAPL-SB45-1012	CAPL-SB46-1012	CAPL-SB47-1012	CAPL-SB48-1012	CAPL-SB49-1012	CAPL-SB50-1012	CAPL-SB50P-1012	CAPL-SB55-1012	CAPL-SB56-1012	CAPL-SB57-1012	CAPL-SB58-1012	CAPL-SB59-1012	CAPL-SB60-1112	CAPL-SB60P-1112
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	11/01/12	11/01/12
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,1,1-Trichloroethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,1,2,2-Tetrachloroethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
1,1,2-Trichloroethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,1-Dichloroethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,1-Dichloroethene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,2,3-Trichlorobenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
1,2,4-Trichlorobenzene	2.58 UJ	3.5 UJ	3.8 UJ	2.97 UJ	3.14 U	2.64 U	3.78 U	3.45 U	2.53 UJ	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
1,2-Dibromo-3-chloropropane	5.16 U	6.99 U	7.61 U	5.95 U	6.28 UJ	5.28 UJ	7.55 UJ	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
1,2-Dibromoethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,2-Dichlorobenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
1,2-Dichloroethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,2-Dichloropropane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
1,3-Dichlorobenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
1,4-Dichlorobenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
2-Butanone	5.16 UJ	6.99 UJ	7.61 UJ	5.95 UJ	6.28 U	5.28 U	7.55 U	6.9 U	5.05 UJ	93.1	6.83 U	6.44 UJ	3.88 J	5.79 U	6.35 U
2-Hexanone	5.16 UJ	6.99 UJ	7.61 UJ	5.95 UJ	6.28 U	5.28 U	7.55 U	6.9 U	5.05 UJ	7.07 U	6.83 U	6.44 UJ	6.04 U	5.79 U	6.35 U
4-Methyl-2-pentanone	5.16 UJ	6.99 UJ	7.61 UJ	5.95 UJ	6.28 U	5.28 U	7.55 U	6.9 U	5.05 UJ	7.07 U	6.83 U	6.44 UJ	6.04 U	5.79 U	6.35 U
Acetone	10.3 UJ	14 UJ	15.2 UJ	6.84 J	61 J	10.6 UJ	15.1 UJ	13.8 UJ	7.89 J	261 J	13.7 UJ	9.05 J	14.8 J	11.6 UJ	12.7 UJ
Benzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Bromochloromethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Bromodichloromethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Bromoform	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Bromomethane	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
Carbon disulfide	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	2.89 J	3.42 U	3.22 U	1.93 J	2.89 U	3.18 U
Carbon tetrachloride	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Chlorobenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
Chloroethane	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
Chloroform	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Chloromethane	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
cis-1,2-Dichloroethene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
cis-1,3-Dichloropropene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Cyclohexane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Dibromochloromethane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Dichlorodifluoromethane (Freon-12)	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
Ethylbenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
Isopropylbenzene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
Methyl acetate	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
Methylcyclohexane	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
Methylene chloride	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
Methyl-tert-butyl ether (MTBE)	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Styrene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
Tetrachloroethene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Toluene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
trans-1,2-Dichloroethene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
trans-1,3-Dichloropropene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 U	3.02 U	2.89 U	3.18 U
Trichloroethene	2.58 U	3.5 U	3.8 U	2.97 U	3.14 U	2.64 U	3.78 U	3.45 U	2.53 U	3.54 U	3.42 U	3.22 UL	3.02 U	2.89 U	3.18 U
Trichlorofluoromethane (Freon-11)	5.16 U	6.99 U	7.61 U	5.95 U	6.28 U	5.28 U	7.55 U	6.9 U	5.05 U	7.07 U	6.83 U	6.44 U	6.04 U	5.79 U	6.35 U
Vinyl chloride	2.58 UJ	3.5 UJ	3.8 UJ	2.97 UJ	3.14 UJ	2.64 UJ	3.78 UJ	3.45 UJ	2.53 UJ	3.54 UJ	3.42 UJ	3.22 UJ	3.02 UJ	2.89 UJ	3.18 UJ
Xylene, total	7.74 U	10.5 U	11.4 U	8.92 U	9.42 U	7.91 U	11.3 U	10.4 U	7.58 U	10.6 U	10.2 U	9.66 UL	9.06 U	8.68 U	9.53 U

Appendix B.4
CAX Penniman Lake
Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO44	CAPL-SO45	CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49	CAPL-SO50		CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	CAPL-SO60	
Sample ID	CAPL-SB44-1012	CAPL-SB45-1012	CAPL-SB46-1012	CAPL-SB47-1012	CAPL-SB48-1012	CAPL-SB49-1012	CAPL-SB50-1012	CAPL-SB50P-1012	CAPL-SB55-1012	CAPL-SB56-1012	CAPL-SB57-1012	CAPL-SB58-1012	CAPL-SB59-1012	CAPL-SB60-1112	CAPL-SB60P-1112
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	11/01/12	11/01/12
Chemical Name															
Semivolatile Organic Compounds (µg/kg)															
1,1-Biphenyl	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
1,2,4,5-Tetrachlorobenzene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,2'-Oxybis(1-chloropropane)	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,3,4,6-Tetrachlorophenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,4,5-Trichlorophenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,4,6-Trichlorophenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,4-Dichlorophenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,4-Dimethylphenol	733 U	873 U	790 U	787 U	741 U	801 U	854 U	803 U	808 U	879 U	901 U	846 U	820 U	841 U	882 U
2,4-Dinitrophenol	1,830 U	2,190 U	1,980 U	1,970 U	1,850 U	2,010 U	2,140 U	2,010 U	2,020 U	2,200 U	2,260 U	2,120 U	2,050 U	2,110 U	2,210 U
2,4-Dinitrotoluene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2,6-Dinitrotoluene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2-Chloronaphthalene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2-Chlorophenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2-Methylnaphthalene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.56 J	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
2-Methylphenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
2-Nitroaniline	733 U	873 U	790 U	787 U	741 U	801 U	854 U	803 U	808 U	879 U	901 U	846 U	820 U	841 U	882 U
2-Nitrophenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
3,3'-Dichlorobenzidine	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
3-Nitroaniline	733 U	873 U	790 U	787 U	741 U	801 U	854 U	803 U	808 U	879 U	901 U	846 U	820 U	841 U	882 U
4,6-Dinitro-2-methylphenol	1,830 U	2,190 U	1,980 U	1,970 U	1,850 U	2,010 U	2,140 U	2,010 U	2,020 U	2,200 U	2,260 U	2,120 U	2,050 U	2,110 U	2,210 U
4-Bromophenyl-phenylether	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
4-Chloro-3-methylphenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
4-Chloroaniline	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
4-Chlorophenyl-phenylether	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
4-Methylphenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
4-Nitroaniline	733 U	873 U	790 U	787 U	741 U	801 U	854 U	803 U	808 U	879 U	901 U	846 U	820 U	841 U	882 U
4-Nitrophenol	733 U	873 U	790 U	787 U	741 U	801 U	854 U	803 U	808 U	879 U	901 U	846 U	820 U	841 U	882 U
Acenaphthene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Acenaphthylene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Acetophenone	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Anthracene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Atrazine	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Benzaldehyde	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Benzo(a)anthracene	3.66 U	4.36 U	3.94 U	3.93 U	23.8 J	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Benzo(a)pyrene	3.66 U	4.36 U	5.81 J	3.93 U	23.2 K	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Benzo(b)fluoranthene	3.66 U	4.36 U	22.4	3.93 U	57 K	4 U	4.26 U	5.56 K	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Benzo(g,h,i)perylene	3.66 U	4.36 U	11.9	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Benzo(k)fluoranthene	3.66 U	4.36 U	9.43	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	6.87 J	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
bis(2-Chloroethoxy)methane	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
bis(2-Chloroethyl)ether	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
bis(2-Ethylhexyl)phthalate	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Butylbenzylphthalate	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Caprolactam	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Carbazole	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Chrysene	3.66 U	4.36 U	17.3	3.93 U	31.6 K	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Dibenz(a,h)anthracene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Dibenzofuran	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Diethylphthalate	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Dimethyl phthalate	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Di-n-butylphthalate	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Di-n-octylphthalate	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Fluoranthene	3.66 U	4.36 U	17.5	3.93 U	49	4 U	4.26 U	5.42 J	4.57 J	10.7	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Fluorene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Hexachlorobenzene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Hexachlorobutadiene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Hexachlorocyclopentadiene	183 UJ	219 UJ	198 UJ	197 UJ	185 U	201 U	214 U	201 U	202 UJ	220 UJ	226 UJ	212 UJ	205 U	211 U	221 U
Hexachloroethane	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Indeno(1,2,3-cd)pyrene	3.66 U	4.36 U	9.69	3.93 U	23.3 J	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Isophorone	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Naphthalene	3.66 U	4.36 U	3.94 U	3.93 U	18.5 U	4 U	4.26 U	4.01 U	4.03 U	4.39 U	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
n-Nitroso-di-n-propylamine	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
n-Nitrosodiphenylamine	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Nitrobenzene	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Pentachlorophenol	733 U	873 U	790 U	787 U	741 U	801 U	854 U	803 U	808 U	879 U	901 U	846 U	820 U	841 U	882 U
Phenanthrene	3.66 U	4.36 U	6.01 J	3.93 U	30.2 J	4 U	4.26 U	7.26 J	4.03 U	8.77 J	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U
Phenol	183 U	219 U	198 U	197 U	185 U	201 U	214 U	201 U	202 U	220 U	226 U	212 U	205 U	211 U	221 U
Pyrene	3.66 U	4.36 U	16.5	3.93 U	43.5 K	4 U	4.26 U	6.22 K	4.22 J	10.7	4.5 U	4.23 U	4.1 U	4.2 U	4.4 U

Appendix B.4
CAX Penniman Lake
Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO44	CAPL-SO45	CAPL-SO46	CAPL-SO47	CAPL-SO48	CAPL-SO49	CAPL-SO50		CAPL-SO55	CAPL-SO56	CAPL-SO57	CAPL-SO58	CAPL-SO59	CAPL-SO60	
Sample ID	CAPL-SB44-1012	CAPL-SB45-1012	CAPL-SB46-1012	CAPL-SB47-1012	CAPL-SB48-1012	CAPL-SB49-1012	CAPL-SB50-1012	CAPL-SB50P-1012	CAPL-SB55-1012	CAPL-SB56-1012	CAPL-SB57-1012	CAPL-SB58-1012	CAPL-SB59-1012	CAPL-SB60-1112	CAPL-SB60P-1112
Sample Date	10/26/12	10/26/12	10/26/12	10/26/12	10/24/12	10/24/12	10/24/12	10/24/12	10/26/12	10/26/12	10/26/12	10/26/12	10/26/12	11/01/12	11/01/12
Chemical Name															
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	0.23 J	0.47 UL	0.851 J	3.08 J	13 J	1.69 J	2.68 J	0.675 J	0.396 UL	11.3 J	19.7 J	0.243 J	2.7 J	0.43 U	0.442 U
4,4'-DDE	0.456 L	0.47 UL	7.49 J	3.01 J	143 J	9.02	7.1	4.78	0.346 J	9.67	11.5 L	3.53 L	14.3 L	0.43 UJ	0.442 UJ
4,4'-DDT	0.353 J	0.47 UL	2.96 J	2.11 J	60 J	0.467 J	3.71 J	2.88 J	0.396 U	0.663 J	2.53 J	1.28 J	1.54 L	0.43 U	0.442 U
Aldrin	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.333 J	0.429 UL	0.43 U	0.442 U
alpha-BHC	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.307 J	0.444 UL	0.594 J	0.43 U	0.442 U
alpha-Chlordane	0.367 UL	0.47 UL	0.768 J	0.394 UL	0.656 J	0.412 U	0.441 U	0.398 U	0.396 U	0.449 UL	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
Aroclor-1260	35.6 J	23.2 L	414 L	284 J	428 L	13.9 J	39.7	31.7	9.7 U	54.3 J	19.9 L	35.2 L	9.07 L	10.5 U	7.83 J
beta-BHC	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.252 J	0.444 UL	0.429 UL	0.43 U	0.442 U
delta-BHC	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 UL	0.396 UL	0.449 UL	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
Dieldrin	0.602 L	0.47 UL	6.49 L	3.65 L	8.16 J	0.412 U	0.613 J	0.449 J	0.396 U	1.66 J	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
Endosulfan I	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
Endosulfan II	0.367 UL	0.47 UL	4.18 J	0.81 J	4.07 J	0.412 U	0.441 U	0.398 UL	0.396 U	0.449 UL	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
Endosulfan sulfate	0.937 J	0.484 J	29.3 J	9.05 L	0.367 UL	0.412 U	0.441 U	1.45 J	0.396 U	0.449 U	0.681 J	0.444 UL	0.227 J	0.43 U	0.442 U
Endrin	0.367 UL	0.47 UL	1.1 J	1.54 J	1.25 J	0.412 U	0.441 U	0.398 U	0.396 U	0.905 J	0.403 L	0.519 J	0.429 UL	0.43 U	0.442 U
Endrin aldehyde	0.367 UL	0.47 UL	0.452 J	0.441 J	0.646 J	0.412 U	0.441 U	0.398 U	0.396 U	1.15 J	0.429 J	0.444 UL	0.429 UL	0.43 U	0.442 U
Endrin ketone	0.367 UL	0.47 UL	1.84 J	0.81 J	1.73 J	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
gamma-BHC (Lindane)	0.367 UL	0.47 UL	0.411 U	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.444 UL	0.429 UL	0.43 U	0.442 U
gamma-Chlordane	2.17 J	1.76 J	2.1 J	1.88 L	3.66 B	0.412 UJ	0.366 B	0.411 B	1.45 J	0.296 J	0.303 J	3.23 L	2.5 L	0.301 J	0.538 J
Heptachlor	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.185 J	0.246 J	1.97 J	0.43 U	0.442 U
Heptachlor epoxide	0.367 UL	0.47 UL	0.411 UL	0.394 UL	0.367 UL	0.412 U	0.441 U	0.398 U	0.396 U	0.449 U	0.451 UL	0.201 L	0.437 J	0.43 U	0.442 U
Methoxychlor	0.367 UL	0.47 UL	3.49 J	0.85 J	4.95 J	0.412 UJ	0.441 U	0.398 U	0.396 U	1.63 J	3.61 J	0.52 J	1.28 J	0.43 U	0.442 U
Toxaphene	23.8 UJ	30.4 UJ	26.6 UJ	25.5 UJ	23.8 UJ	26.7 UJ	28.5 UJ	25.8 UJ	25.6 UJ	29.1 UJ	29.2 UJ	28.8 UJ	27.8 UJ	27.8 UJ	28.6 UJ
Explosives (µg/kg)															
1,3,5-Trinitrobenzene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
1,3-Dinitrobenzene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
2,4,6-Trinitrotoluene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
2-Amino-4,6-dinitrotoluene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
2-Nitrotoluene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
3,5-Dinitroaniline	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
3-Nitrotoluene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
4-Amino-2,6-dinitrotoluene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
4-Nitrotoluene	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
HMX	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
Nitroglycerin	455 U	493 U	498 U	478 U	455 U	500 U	500 U	455 U	478 U	465 U	469 U	493 U	452 U	446 U	500 U
Nitroguanidine	102 U	97.1 U	98.5 U	102 U	103 U	98 U	94.8 U	94.3 U	99 U	102 U	95.7 U	99 U	94.3 U	93.9 U	109 U
PETN	455 U	493 U	498 U	478 U	455 U	500 U	500 U	455 U	478 U	465 U	469 U	493 U	452 U	446 U	500 U
RDX	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
Tetryl	182 U	197 U	199 U	191 U	182 U	200 U	200 U	182 U	191 U	186 U	188 U	197 U	181 U	179 U	200 U
Total Metals (mg/kg)															
Aluminum	11,600	27,600	22,400	24,000	11,500	10,900	23,400	24,500	6,480	3,590	2,580	4,220	1,600	12,100	15,800
Antimony	0.874 U	2.79 U	2.44 U	2.51 U	2.28 UL	0.986 U	2.5 U	2.49 U	1.01 U	1.07 U	1.16 U	0.558 UL	1.02 U	2.67 U	2.79 U
Arsenic	2.12	16.3	4.87	4.01	4.51	2.91	11.5 J	7.98 J	1.9	2.76	1.44 J	1.5	1.11 J	14.2 J	22.4 J
Barium	33.4	52.8	39.6	46.8	26.2	47.3	55.7 J	87.3 J	29.4	18.4	12.2	24.3	7.04	49.2 J	77.2 J
Beryllium	0.421 J	1.89	0.786 J	0.552 J	0.323 J	0.52 J	1.1 J	1.07 J	0.263 J	0.21 J	0.228 J	0.25 J	0.254 U	0.95 J	1.32 J
Cadmium	0.218 U	0.697 U	0.61 U	0.627 U	0.57 U	0.246 U	0.626 U	0.622 U	0.252 U	0.268 U	0.204 J	1.64 K	0.254 U	0.668 U	0.365 J
Calcium	1,160	2,690	3,920	3,190	1,800	1,570	3,360	3,320	283 J	681	1,660	760 L	695	116,000 J	16,800 J
Chromium	15.1	58.5	44.9	42.6	19.1 K	15.2	41.8	37.7	6.74	5.6	5.41	5.56	3.67	30.9	41.8
Cobalt	2.54	6.45	2.62 J	1.97 J	1.51 J	2.69	4.1	4.62	1.27 J	1.07 J	2.16	0.947	1.27 U	4.52 J	9.11 J
Copper	3.59	8.05	4.26	8.85	5.1	3.71	5.35	4.65	3.02	3.17	2.37	3.54	1.26 J	4.48	5.19
Cyanide	0.257 U	0.343 U	0.276 U	0.283 U	0.256 U	0.297 U	0.313 U	0.294 U	0.284 U	0.327 U	0.333 U	0.328 U	0.313 U	0.321 U	0.325 U
Iron	10,300	63,500	33,600	27,100	14,200	13,400	52,600	38,700	5,460	5,560	2,570	4,220	2,470	42,300	51,100
Lead	7.96	16	11.9	9.33	23.6	9.17	15	12.4	13.3	8.58	22 J	16.8 K	4.59 J	9.66 J	14 J
Magnesium	844	4,280	2,740	1,750	957 J	969	2,440	2,080	489 J	341 J	312 J	601 K	268 J	3,300	3,790
Manganese	35.2	65.1	28.3	16.2	59.4	50.6	78.7 J	45 J	22.8	11.3	7.37	34.4 K	7.12	208 J	520 J
Mercury	0.0354 J	0.0947	0.0344 J	0.0446 J	0.0462	0.0298 J	0.0671	0.0642	0.0354 J	0.0226 J	0.0437	0.0454 L	0.036 U	0.0227 J	0.0316 J
Nickel	3.96	16.1	7.25	5.86	4.06	4.37	9.19	8.36	3.06 B	2.19 B	3.17 B	2.63 B	1.15 B	14	18.2
Potassium	483 J	4,420	1,920	863 J	744 J	593 J	1,510 J	887 J	362 J	412 J	351 J	315 K	364 J	2,730	3,170
Selenium	0.546 U	1.74 U	1.52 U	1.57 U	1.42 U	0.616 U	1.56 U	1.55 U	0.631 U	0.669 U	0.54 J	0.349 U	0.636 U	1.67 U	1.74 U
Silver	0.218 U	0.697 U	0.61 U	0.627 U	0.57 UL	0.246 UL	0.626 UL	0.622 UL	0.252 U	0.268 U	0.289 U	0.139 U	0.254 U	0.668 U	0.697 U
Sodium	328 U	1,050 U	915 U	941 U	855 U	370 U	939 U	932 U	379 U	402 U	434 U	209 U	381 U	1,000 U	1,050 U
Thallium	0.437 U	1.39 U	1.22 U	1.25 U	1.14 U	0.493 U	1.25 U	1.24 U	0.505 U	0.536 U	0.579 U	0.279 U	0.509 U	1.34 U	1.39 U
Vanadium	20.2	66.7	51.4	54.3	27.9 K	17.7	47.7	43.8	11.3	8.95	6.94	8.78 K	4.81	30.3	40
Zinc	14.1	48.8	43	20.2	42.3	16.8	29.5	25.7	11.7	48.2	13.2	72.7 K	52.7	44.8	51.5
Wet Chemistry															
pH (ph)	5.82 H3	5.06 H3	6.6 H3	5.52 H3	5.88 H3	7.86 H3	8.08 H3	NA	5.7 H3	6.02 H3	6.96 H3	5.82 H3	5.87 H3	8.14 H3	NA
Total organic carbon (TOC) (mg/kg)	4,100	1,770	3,180	5,670	20,300	3,740	5,900	NA	5,480	13,300	26,000	11,900	8,970	6,880	NA

C:\Users\kgraycoc\Desktop\anita\Appendix B - Analytical Data\[Appendix B Tables.xlsx], scamus, 03/08/2013

Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

N - The MS/MSD accuracy and or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter.

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

*- Exceeding quality control criteria are associated with the reported results

Appendix B.4
CAX Penniman Lake
Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69	CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75	
Sample ID	CAPL-SB61-1112	CAPL-SB62-1112	CAPL-SB63-1112	CAPL-SB64-1112	CAPL-SB65-1112	CAPL-SB66-1112	CAPL-SB67-1112	CAPL-SB68-1112	CAPL-SB69-1112	CAPL-SB70-1112	CAPL-SB71-1112	CAPL-SB72-1112	CAPL-SB73-1112	CAPL-SB74-1112	CAPL-SB75-1112	CAPL-SB75P-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12	11/05/12
Chemical Name																
Volatile Organic Compounds (µg/kg)																
1,1,1-Trichloroethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
1,1,2,2-Tetrachloroethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
1,1,2-Trichloroethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
1,1-Dichloroethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,1-Dichloroethene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
1,2,3-Trichlorobenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,2,4-Trichlorobenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,2-Dibromo-3-chloropropane	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
1,2-Dibromoethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,2-Dichlorobenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,2-Dichloroethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,2-Dichloropropane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,3-Dichlorobenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
1,4-Dichlorobenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
2-Butanone	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	4.75 J	4.16 U	4.24 J	4.76 U	4.9 U
2-Hexanone	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
4-Methyl-2-pentanone	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
Acetone	8.57 UJ	5.13 J	9.44 UJ	9.53 UJ	9.24 UJ	11.7 UJ	5.86 J	12.3 UJ	9.1 UJ	11.1 UJ	6.84 J	25.8 J	8.32 UJ	28.8 J	9.51 UJ	9.8 UJ
Benzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Bromochloromethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Bromodichloromethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Bromoform	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
Bromomethane	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
Carbon disulfide	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
Carbon tetrachloride	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
Chlorobenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Chloroethane	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
Chloroform	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Chloromethane	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
cis-1,2-Dichloroethene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
cis-1,3-Dichloropropene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Cyclohexane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Dibromochloromethane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Dichlorodifluoromethane (Freon-12)	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
Ethylbenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Isopropylbenzene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Methyl acetate	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 UJ	4.84 UJ	3.56 UJ	4.16 U	4.03 U	4.76 U	4.9 U
Methylcyclohexane	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Methylene chloride	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
Methyl-tert-butyl ether (MTBE)	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
Styrene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Tetrachloroethene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Toluene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
trans-1,2-Dichloroethene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 U	2.01 U	2.38 U	2.45 U
trans-1,3-Dichloropropene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Trichloroethene	2.14 U	2.04 U	2.36 U	2.38 U	2.31 U	2.92 U	2.86 U	3.07 U	2.28 U	2.77 U	2.42 U	1.78 U	2.08 UL	2.01 U	2.38 U	2.45 U
Trichlorofluoromethane (Freon-11)	4.29 U	4.09 U	4.72 U	4.76 U	4.62 U	5.84 U	5.72 U	6.15 U	4.55 U	5.54 U	4.84 U	3.56 U	4.16 U	4.03 U	4.76 U	4.9 U
Vinyl chloride	2.14 UJ	2.04 UJ	2.36 UJ	2.38 UJ	2.31 UJ	2.92 UJ	2.86 UJ	3.07 UJ	2.28 UJ	2.77 UJ	2.42 UJ	1.78 UJ	2.08 UJ	2.01 UJ	2.38 UJ	2.45 UJ
Xylene, total	6.43 U	6.13 U	7.08 U	7.15 U	6.93 U	8.76 U	8.58 U	9.22 U	6.83 U	8.3 U	7.26 U	5.33 U	6.24 UL	6.04 U	7.14 U	7.35 U

Appendix B.4
CAX Penniman Lake
Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69	CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75	
Sample ID	CAPL-SB61-1112	CAPL-SB62-1112	CAPL-SB63-1112	CAPL-SB64-1112	CAPL-SB65-1112	CAPL-SB66-1112	CAPL-SB67-1112	CAPL-SB68-1112	CAPL-SB69-1112	CAPL-SB70-1112	CAPL-SB71-1112	CAPL-SB72-1112	CAPL-SB73-1112	CAPL-SB74-1112	CAPL-SB75-1112	CAPL-SB75P-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12	11/05/12
Chemical Name																
Semivolatile Organic Compounds (µg/kg)																
1,1-Biphenyl	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
1,2,4,5-Tetrachlorobenzene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,2'-Oxybis(1-chloropropane)	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,3,4,6-Tetrachlorophenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,4,5-Trichlorophenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,4,6-Trichlorophenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,4-Dichlorophenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,4-Dimethylphenol	772 U	3,920 U	799 U	783 U	778 U	787 U	741 U	843 U	4,010 U	773 U	856 U	706 U	737 U	706 U	809 U	916 U
2,4-Dinitrophenol	1,930 U	9,830 U	2,000 U	1,960 U	1,950 U	1,970 U	1,860 U	2,110 U	10,000 U	1,930 U	2,140 U	1,770 U	1,850 U	1,770 U	2,020 U	2,290 U
2,4-Dinitrotoluene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2,6-Dinitrotoluene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2-Chloronaphthalene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2-Chlorophenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2-Methylnaphthalene	3.85 U	39.2 U	35.5	9.96	3.89 U	16.4	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	4.41 J	3.52 U	8.87	7.32 J
2-Methylphenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
2-Nitroaniline	772 U	3,920 U	799 U	783 U	778 U	787 U	741 U	843 U	4,010 U	773 U	856 U	706 U	737 U	706 U	809 U	916 U
2-Nitrophenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
3,3'-Dichlorobenzidine	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
3-Nitroaniline	772 U	3,920 U	799 U	783 U	778 U	787 U	741 U	843 U	4,010 U	773 U	856 U	706 U	737 U	706 U	809 U	916 U
4,6-Dinitro-2-methylphenol	1,930 U	9,830 U	2,000 U	1,960 U	1,950 U	1,970 U	1,860 U	2,110 U	10,000 U	1,930 U	2,140 U	1,770 U	1,850 U	1,770 U	2,020 U	2,290 U
4-Bromophenyl-phenylether	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
4-Chloro-3-methylphenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
4-Chloroaniline	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
4-Chlorophenyl-phenylether	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
4-Methylphenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
4-Nitroaniline	772 U	3,920 U	799 U	783 U	778 U	787 U	741 U	843 U	4,010 U	773 U	856 U	706 U	737 U	706 U	809 U	916 U
4-Nitrophenol	772 U	3,920 U	799 U	783 U	778 U	787 U	741 U	843 U	4,010 U	773 U	856 U	706 U	737 U	706 U	809 U	916 U
Acenaphthene	3.85 U	39.2 U	3.99 U	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Acenaphthylene	3.85 U	39.2 U	3.99 U	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Acetophenone	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Anthracene	3.85 U	83.6	65.4	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Atrazine	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Benzaldehyde	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Benzo(a)anthracene	3.85 U	610	3.99 U	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	122	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Benzo(a)pyrene	3.85 U	859	3.99 U	4.99 J	3.89 U	3.93 U	3.7 U	4.21 U	213	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	5.02 J	4.58 U
Benzo(b)fluoranthene	3.85 U	2,100	7.82 J	9.11	3.89 U	8	3.7 U	4.21 U	292	3.86 U	4.28 U	17.6 U	8.24	3.52 U	10.8	5.39 J
Benzo(g,h,i)perylene	3.85 U	1,140	3.99 U	6.09 J	3.89 U	5.27 J	3.7 U	4.21 U	186	3.86 U	4.28 U	17.6 U	3.96 J	3.52 U	5.46 J	4.58 U
Benzo(k)fluoranthene	3.85 U	2,210	3.99 U	5.51 J	3.89 U	3.93 U	3.7 U	4.21 U	274	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
bis(2-Chloroethoxy)methane	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
bis(2-Chloroethyl)ether	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
bis(2-Ethylhexyl)phthalate	167 J	512 J	200 U	196 U	130 J	197 U	186 U	553	1,000 U	109 J	167 J	302 J	185 U	177 U	202 U	164 J
Butylbenzylphthalate	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Caprolactam	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Carbazole	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Chrysene	3.85 U	3,070	14.8	22.8	3.89 U	16.4	3.7 U	4.21 U	346	3.86 U	4.28 U	24.1 J	10.5	3.52 U	20.4	11.8
Dibenz(a,h)anthracene	3.85 U	250	3.99 U	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	56.2 J	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Dibenzofuran	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Diethylphthalate	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Dimethyl phthalate	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Di-n-butylphthalate	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Di-n-octylphthalate	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Fluoranthene	3.85 U	3,360	6.05 J	6.26 J	3.89 U	5.35 J	3.7 U	4.21 U	343	3.86 U	4.28 U	17.6 U	6.38 J	3.52 U	7.37 J	4.58 U
Fluorene	3.85 U	39.2 U	8.88	3.91 U	3.89 U	3.93 U	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.04 U	4.58 U
Hexachlorobenzene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Hexachlorobutadiene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Hexachlorocyclopentadiene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Hexachloroethane	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Indeno(1,2,3-cd)pyrene	3.85 U	1,000	3.99 U	4.3 J	3.89 U	3.93 U	3.7 U	4.21 U	161	3.86 U	4.28 U	17.6 U	3.68 U	3.52 U	4.28 J	4.58 U
Isophorone	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Naphthalene	3.85 U	39.2 U	53	7.17 J	3.89 U	16.7	3.7 U	4.21 U	40.1 U	3.86 U	4.28 U	17.6 U	4.46 J	3.52 U	6.63 J	6.05 J
n-Nitroso-di-n-propylamine	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
n-Nitrosodiphenylamine	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Nitrobenzene	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Pentachlorophenol	772 U	3,920 U	799 U	783 U	778 U	787 U	741 U	843 U	4,010 U	773 U	856 U	706 U	737 U	706 U	809 U	916 U
Phenanthrene	3.85 U	405	46.7	17.7	3.89 U	17.5	3.7 U	4.21 U	88	3.86 U	4.28 U	26.1 J	8.88	3.52 U	19.4	12.6
Phenol	193 U	983 U	200 U	196 U	195 U	197 U	186 U	211 U	1,000 U	193 U	214 U	177 U	185 U	177 U	202 U	229 U
Pyrene	3.85 U	2,980	10.2	7.48 J	3.89 U	7.02 J	3.7 U	4.21 U	361	3.86 U	4.28 U	17.6 U	6.56 J	3.52 U	8.55	4.67 J

Appendix B.4
CAX Penniman Lake
Subsurface Soil Analytical Results
October-November 2012

Station ID	CAPL-SO61	CAPL-SO62	CAPL-SO63	CAPL-SO64	CAPL-SO65	CAPL-SO66	CAPL-SO67	CAPL-SO68	CAPL-SO69	CAPL-SO70	CAPL-SO71	CAPL-SO72	CAPL-SO73	CAPL-SO74	CAPL-SO75	
Sample ID	CAPL-SB61-1112	CAPL-SB62-1112	CAPL-SB63-1112	CAPL-SB64-1112	CAPL-SB65-1112	CAPL-SB66-1112	CAPL-SB67-1112	CAPL-SB68-1112	CAPL-SB69-1112	CAPL-SB70-1112	CAPL-SB71-1112	CAPL-SB72-1112	CAPL-SB73-1112	CAPL-SB74-1112	CAPL-SB75-1112	CAPL-SB75P-1112
Sample Date	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/01/12	11/02/12	11/02/12	11/02/12	11/05/12	11/05/12	11/05/12	11/05/12
Chemical Name																
Pesticide/Polychlorinated Biphenyls (µg/kg)																
4,4'-DDD	0.399 U	3.36 L	0.837	0.957 J	0.387 U	0.811 J	0.392 U	0.425 UL	5.6 J	0.407 U	0.421 U	0.356 UL	0.616 J	0.37 U	0.406 UJ	0.447 U
4,4'-DDE	0.399 UJ	23.1 K	8.29 J	3.66	0.387 UJ	0.347 J	0.392 UJ	0.217 J	5.45 J	0.407 U	0.421 U	0.356 UL	4.16 L	3.78 J	0.561 J	0.795 J
4,4'-DDT	0.399 U	32.1 L	1.13 J	0.801 J	0.387 UJ	0.401 U	0.392 UJ	1.41 J	19.6 L	0.407 UJ	0.421 UJ	0.356 UJ	3.63 J	0.37 UJ	0.406 U	0.447 U
Aldrin	0.399 U	0.929 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.594 J	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
alpha-BHC	0.399 U	0.352 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.251 J	0.409 U	0.407 UJ	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
alpha-Chlordane	0.399 U	0.512 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	1.9 J	0.407 U	0.421 U	0.356 UL	0.375 UJ	0.37 U	0.406 U	0.447 U
Aroclor-1260	9.77 U	704 J	9.88 U	75.9 J	9.49 U	13.5 J	9.61 U	141	211 J	9.97 U	10.3 U	8.72 UL	56.9	9.06 U	9.95 UL	11 UL
beta-BHC	0.399 U	0.403 U	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
delta-BHC	0.399 UL	0.403 UL	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 UL	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Dieldrin	0.399 U	2.91 L	0.403 U	1.02 J	0.387 U	0.401 U	0.392 U	4.4 L	4.36	0.407 U	0.421 U	0.356 UL	1 J	0.37 U	0.406 U	0.447 U
Endosulfan I	0.399 U	0.403 UL	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Endosulfan II	0.399 U	2.32 L	0.403 U	0.757 J	0.387 U	0.401 U	0.392 U	2.31 J	2.29 J	0.407 U	0.421 U	0.356 UL	0.375 UJ	0.37 U	0.406 U	0.447 U
Endosulfan sulfate	0.399 U	19.7 K	0.403 U	0.401 U	0.387 U	0.54 J	0.392 U	4.43 L	7.5 L	0.407 U	0.421 U	0.356 UJ	0.375 U	0.37 U	0.406 U	0.447 UL
Endrin	0.399 U	6.12 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	4.14 J	0.529 J	0.407 UJ	0.421 U	0.356 UL	0.375 UJ	0.37 U	0.406 U	0.447 U
Endrin aldehyde	0.399 U	1.27 K	0.403 U	0.523 J	0.387 U	0.401 U	0.392 U	0.276 J	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Endrin ketone	0.399 UL	7.34 L	0.403 U	0.401 U	0.387 U	0.401 UJ	0.392 U	1.36 L	2.52 J	0.407 U	0.421 U	0.356 UL	0.375 UL	0.37 U	0.406 U	0.447 UL
gamma-BHC (Lindane)	0.399 U	1.17 K	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
gamma-Chlordane	0.399 U	3.76 L	0.403 U	0.394 J	0.252 J	0.283 J	0.392 U	1.86	1.79	0.332 J	0.219 J	0.356 UJ	0.565 J	0.316 J	0.312 J	0.364 J
Heptachlor	0.399 U	0.27 L	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.425 U	0.409 U	0.407 U	0.421 U	0.356 UL	0.375 U	0.37 U	0.406 U	0.447 U
Heptachlor epoxide	0.399 U	1.44 K	0.403 U	0.401 U	0.387 U	0.401 U	0.392 U	0.187 J	0.409 UL	0.407 UJ	0.421 U	0.356 UL	0.375 UL	0.37 UJ	0.406 U	0.447 U
Methoxychlor	0.399 UJ	4.71 K	0.403 UJ	0.545 J	0.387 UJ	0.401 UJ	0.392 UJ	0.327 J	0.257 J	0.407 UJ	0.421 UJ	0.356 UJ	0.456 J	0.37 UJ	0.406 UJ	0.447 UL
Toxaphene	25.8 UJ	26.1 UJ	26.1 UJ	25.9 UJ	25.1 UJ	25.9 UJ	25.4 UJ	27.5 UJ	26.4 UJ	26.3 UJ	27.2 UJ	23 UJ	24.2 UJ	23.9 UJ	26.3 UJ	28.9 U
Explosives (µg/kg)																
1,3,5-Trinitrobenzene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
1,3-Dinitrobenzene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
2,4,6-Trinitrotoluene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
2-Amino-4,6-dinitrotoluene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
2-Nitrotoluene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
3,5-Dinitroaniline	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
3-Nitrotoluene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
4-Amino-2,6-dinitrotoluene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
4-Nitrotoluene	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
HMX	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
Nitroglycerin	435 U	566 J	441 U	448 U	467 U	485 U	457 U	488 U	493 U	444 U	403 U	410 U	488 U	433 U	413 U	441 U
Nitroguanidine	96.6 U	96.2 U	95.2 U	101 U	92.2 U	105 U	90.9 U	93 U	88.1 U	102 UJ	98.5 U	100 UJ	101 UL	98.5 UJ	106 U	104 U
PETN	435 U	435 U	441 U	448 U	467 U	485 U	457 U	488 U	493 U	444 U	403 U	410 U	488 U	433 U	413 U	441 U
RDX	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
Tetryl	174 U	174 U	176 U	179 U	187 U	194 U	183 U	195 U	197 U	178 U	161 U	164 U	195 U	173 U	165 U	176 U
Total Metals (mg/kg)																
Aluminum	16,400	8,930	11,600	13,600	16,800	8,500	18,100	15,300	10,300	8,670	13,700	5,140	8,690	13,400	12,900	11,400
Antimony	2.44 U	2.4 U	2.45 U	2.51 U	2.27 U	2.3 U	2.37 U	2.59 U	2.44 U	0.969 U	2.57 U	2.29 U	0.481 UL	2.14 U	2.46 U	2.81 U
Arsenic	1.9 J	2.64 J	3.41	10.7	6.91	6.85	11.9	17.1	7.05	1.82	7.08	1.51 J	2.69	11.6	6.7	7.79
Barium	38.2	48.8	40.5	49	71	89.3	64.7	61.8	37.7	26.9	70.6	44	62.8	31.7	212 J	99.8 J
Beryllium	0.45 J	0.495 J	0.431 J	0.821 J	0.908 J	0.737 J	1.21 J	1.14 J	0.555 J	0.251 J	0.965 J	0.573 U	0.454	0.88 J	1.24 J	0.858 J
Cadmium	0.609 U	1.02 J	0.613 U	0.628 U	0.566 U	0.574 U	0.592 U	0.647 U	0.61 U	0.242 U	0.642 U	0.573 U	0.196 J	0.535 U	0.616 U	0.703 U
Calcium	3,160	1,780	6,460	16,900	2,890	3,150	3,020	79,700	5,690	988	3,990	1,020 J	2,550	3,590	8,710 J	6,360 J
Chromium	34.6	20	19.7	31.7	33	19.2	39.6	39.4	22.2	13.9	37.3	8.4	16.5 K	33.3	22.6	25.8
Cobalt	3.05 U	1.88 J	1.89 J	3.4 J	3.27 J	2.13 J	3.67 J	5.26	2.12 J	1.28 J	3 J	2.87 U	1.52	2.71 J	2.63 J	2.9 J
Copper	4.89	10.1	5.31	6.64	2.95	5.04	4.57	4.12	12.6	3.48	2.57 U	2.77 J	10.9 L	3.96	11.5	11.7
Cyanide	0.275 U	0.297 U	0.298 U	0.296 U	0.289 U	0.29 U	0.276 U	0.325 U	0.301 U	0.299 U	0.312 U	0.275 U	0.286 U	0.274 U	0.292 U	0.33 U
Iron	26,600	12,700	19,300	38,600	37,200	22,500	51,400	34,400	23,800	10,200	37,600	8,050	14,700	64,700	25,900	34,200
Lead	14.4	66.5	11.2	190	8.99	14.8	10.7	10.8	23.2	6.49	8.19	6.53	34.4 L	10.6	18.4	21.7
Magnesium	1,490 J	983 J	1,100 J	8,710	1,770	1,670	2,180	3,870	2,280	632	3,290	545 J	886 K	1,670	2,960 J	2,050 J
Manganese	17.8	90.6	36.4	75.4	40.4	92.3	67.5	155	111	15.8	32.5	33.2	82 L	100	373 J	126 J
Mercury	0.0511	0.0674	0.0795	0.0789	0.0311 J	0.049	0.0358 J	0.0299 J	0.0432	0.053	0.0261 J	0.0251 J	0.0578	0.0324 U	0.0661 J	0.0387 UJ
Nickel	3.49	4.5	3.95	9.1	6.12	4.95	7.82	15.9	4.85	2.46	6	1.69 J	3.11	7.28	6.42	7.29
Potassium	665 J	547 J	532 J	2,000	769 J	1,470	1,690	3,620	1,270 J	276 J	3,450	860 U	421 K	1,570	1,510 J	1,540 J
Selenium	1.52 U	1.5 U	1.53 U	1.57 U	1.42 U	1.43 U	1.48 U	1.62 U	1.53 U	0.606 U	1.61 U	1.43 U	0.301 U	1.34 U	1.54 U	1.76 U
Silver	0.609 U	0.6 U	0.613 U	0.628 U	0.566 U	0.574 U	0.592 U	0.647 U	0.61 U	0.242 U	0.642 U	0.573 U	0.12 U	0.535 U	0.616 U	0.703 U
Sodium	914 U	899 U	919 U	942 U	850 U	861 U	888 U	970 U	915 U	364 U	964 U	860 U	180 U	803 U	924 U	1,050 U
Thallium	1.22 U	1.2 U	1.23 U	1.26 U	1.13 U	1.15 U	1.18 U	1.29 U	1.22 U	0.485 U	1.28 U	1.15 U	0.241 U	1.07 U	1.23 U	1.41 U
Vanadium	34	20.4	22.7	33.5	34.5	20.4	45.1	34.4	24.5	18.9	34	10.7	20.4	42.3	26.4	31.1
Zinc	24.3	98.6	16.2	32.2	17.1	27.4	22.9	49.9	53.8	6.44	24.6	29.9	36.5 L	21.2	37.4	38.8
Wet Chemistry																
pH (ph)	7.93 H3	6.73 H3	8.12 H3	8.12 H3	7.42 H3	7.73 H3	7.2 H3	8.16 H3	8.32 H3	7.35 H3	5.95 H3	8.03 H3	8.05 H3	7.8 H3	8.24 H3	NA
Total organic carbon (TOC) (mg/kg)	2,690 N	27,500 N	10,900 N*	32,800	3,960	9,110	3,180	1,640 J	15,600 N	1,480	1,940	6,290	14,300	2,880	13,800	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

N - The MS/MSD accuracy and or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter.

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

*- Exceeding quality control criteria are associated with the reported results

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70		CAPL-SD71		CAPL-SD72		CAPL-SD73				CAPL-SD74	CAPL-SD75	CAPL-SD76	CAPL-SD77	
Sample ID	CAPL-SD70-1012	CAPL-SD70-1012-V	CAPL-SD71-1012	CAPL-SD71-1012-V	CAPL-SD72-1012	CAPL-SD72-1012-V	CAPL-SD73-1012	CAPL-SD73P-1012	CAPL-SD73-1012-V	CAPL-SD73P-1012-V	CAPL-SD74-1012	CAPL-SD75-1012	CAPL-SD76-1012	CAPL-SD77-1012	CAPL-SD77-1012-V
Sample Date	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/16/12	10/25/12
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,1,1-Trichloroethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,1,2,2-Tetrachloroethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 UJ	NA	12.4 U
1,1,2-Trichloroethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,1-Dichloroethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,1-Dichloroethene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 UJ	NA	6.19 U
1,2,3-Trichlorobenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,2,4-Trichlorobenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 UL	13.4 UL	5.3 U	NA	6.19 U
1,2-Dibromo-3-chloropropane	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 U	NA	12.4 U
1,2-Dibromoethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,2-Dichlorobenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,2-Dichloroethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,2-Dichloropropane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,3-Dichlorobenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
1,4-Dichlorobenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
2-Butanone	NA	125	NA	131	NA	50.6 J	NA	NA	59.5 J	79.9	108	71.2	17.3 J	NA	42.7
2-Hexanone	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 U	NA	12.4 U
4-Methyl-2-pentanone	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 U	NA	12.4 U
Acetone	NA	330 J	NA	477 J	NA	181 J	NA	NA	215 J	309 J	418 J	273 J	60.6	NA	137 J
Benzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Bromochloromethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Bromodichloromethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Bromoform	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Bromomethane	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 UJ	NA	12.4 U
Carbon disulfide	NA	4.41 J	NA	13.6 J	NA	26.7 J	NA	NA	29.9 J	19 J	19.2 U	13.4 U	5.3 UJ	NA	6.19 U
Carbon tetrachloride	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Chlorobenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Chloroethane	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 UJ	NA	12.4 U
Chloroform	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Chloromethane	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 UJ	26.8 UJ	10.6 UJ	NA	12.4 U
cis-1,2-Dichloroethene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
cis-1,3-Dichloropropene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Cyclohexane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 UJ	NA	6.19 U
Dibromochloromethane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Dichlorodifluoromethane (Freon-12)	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 UJ	NA	12.4 U
Ethylbenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Isopropylbenzene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Methyl acetate	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 U	NA	12.4 U
Methylcyclohexane	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	26.4
Methylene chloride	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 UJ	NA	12.4 U
Methyl-tert-butyl ether (MTBE)	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Styrene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Tetrachloroethene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Toluene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
trans-1,2-Dichloroethene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
trans-1,3-Dichloropropene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Trichloroethene	NA	6.64 U	NA	15 U	NA	16.2 U	NA	NA	15.5 U	19.9 U	19.2 U	13.4 U	5.3 U	NA	6.19 U
Trichlorofluoromethane (Freon-11)	NA	13.3 U	NA	30 U	NA	32.3 U	NA	NA	31.1 U	39.8 U	38.4 U	26.8 U	10.6 U	NA	12.4 U
Vinyl chloride	NA	6.64 UJ	NA	15 UJ	NA	16.2 UJ	NA	NA	15.5 UJ	19.9 UJ	19.2 U	13.4 U	5.3 U	NA	6.19 UJ
Xylene, total	NA	19.9 U	NA	45 U	NA	48.5 U	NA	NA	46.6 U	59.7 U	57.7 U	40.2 U	15.9 U	NA	18.6 U

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70		CAPL-SD71		CAPL-SD72		CAPL-SD73				CAPL-SD74	CAPL-SD75	CAPL-SD76	CAPL-SD77	
Sample ID	CAPL-SD70-1012	CAPL-SD70-1012-V	CAPL-SD71-1012	CAPL-SD71-1012-V	CAPL-SD72-1012	CAPL-SD72-1012-V	CAPL-SD73-1012	CAPL-SD73P-1012	CAPL-SD73-1012-V	CAPL-SD73P-1012-V	CAPL-SD74-1012	CAPL-SD75-1012	CAPL-SD76-1012	CAPL-SD77-1012	CAPL-SD77-1012-V
Sample Date	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/16/12	10/25/12
Chemical Name															
Semivolatile Organic Compounds (µg/kg)															
1,1-Biphenyl	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
1,2,4,5-Tetrachlorobenzene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,2'-Oxybis(1-chloropropane)	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,3,4,6-Tetrachlorophenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,4,5-Trichlorophenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,4,6-Trichlorophenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,4-Dichlorophenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,4-Dimethylphenol	1,890 U	NA	3,080 U	NA	5,460 U	NA	3,240 U	3,400 U	NA	NA	4,260 U	3,330 U	1,340 U	1,680 U	NA
2,4-Dinitrophenol	4,740 U	NA	7,710 U	NA	13,700 U	NA	8,110 U	8,520 U	NA	NA	10,700 U	8,330 U	3,370 U	4,210 U	NA
2,4-Dinitrotoluene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2,6-Dinitrotoluene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2-Chloronaphthalene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2-Chlorophenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2-Methylnaphthalene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
2-Methylphenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
2-Nitroaniline	1,890 U	NA	3,080 U	NA	5,460 U	NA	3,240 U	3,400 U	NA	NA	4,260 U	3,330 U	1,340 U	1,680 U	NA
2-Nitrophenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
3,3'-Dichlorobenzidine	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
3-Nitroaniline	1,890 U	NA	3,080 U	NA	5,460 U	NA	3,240 U	3,400 U	NA	NA	4,260 U	3,330 U	1,340 U	1,680 U	NA
4,6-Dinitro-2-methylphenol	4,740 U	NA	7,710 U	NA	13,700 U	NA	8,110 U	8,520 U	NA	NA	10,700 U	8,330 U	3,370 U	4,210 U	NA
4-Bromophenyl-phenylether	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
4-Chloro-3-methylphenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
4-Chloroaniline	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
4-Chlorophenyl-phenylether	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
4-Methylphenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
4-Nitroaniline	1,890 U	NA	3,080 U	NA	5,460 U	NA	3,240 U	3,400 U	NA	NA	4,260 U	3,330 U	1,340 U	1,680 U	NA
4-Nitrophenol	1,890 U	NA	3,080 U	NA	5,460 U	NA	3,240 U	3,400 U	NA	NA	4,260 U	3,330 U	1,340 U	1,680 U	NA
Acenaphthene	140	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Acenaphthylene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Acetophenone	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Anthracene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Atrazine	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Benzaldehyde	323 J	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	184 J	421 U	NA
Benzo(a)anthracene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Benzo(a)pyrene	79.3 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	36.9	42 U	NA
Benzo(b)fluoranthene	143	NA	20.5 J	NA	27.2 U	NA	19.1 J	17 U	NA	NA	23.3 J	16.6 U	34.9	42 U	NA
Benzo(g,h,i)perylene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	29.9	42 U	NA
Benzo(k)fluoranthene	94.6 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	28.3	42 U	NA
bis(2-Chloroethoxy)methane	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
bis(2-Chloroethyl)ether	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
bis(2-Ethylhexyl)phthalate	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Butylbenzylphthalate	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Caprolactam	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Carbazole	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Chrysene	173	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Dibenz(a,h)anthracene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Dibenzofuran	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Diethylphthalate	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Dimethyl phthalate	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Di-n-butylphthalate	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Di-n-octylphthalate	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Fluoranthene	227	NA	32.5	NA	27.2 U	NA	22.4 J	17 U	NA	NA	34.9 J	16.6 U	48.2	42 U	NA
Fluorene	70.7 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
Hexachlorobenzene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Hexachlorobutadiene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Hexachlorocyclopentadiene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Hexachloroethane	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Indeno(1,2,3-cd)pyrene	66 J	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	23.2	42 U	NA
Isophorone	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Naphthalene	47.3 U	NA	15.4 U	NA	27.2 U	NA	16.2 U	17 U	NA	NA	21.2 U	16.6 U	6.71 U	42 U	NA
n-Nitroso-di-n-propylamine	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
n-Nitrosodiphenylamine	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Nitrobenzene	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Pentachlorophenol	1,890 U	NA	3,080 U	NA	5,460 U	NA	3,240 U	3,400 U	NA	NA	4,260 U	3,330 U	1,340 U	1,680 U	NA
Phenanthrene	138	NA	16.3 J	NA	27.2 U	NA	16.2 U	17 U	NA	NA	22.5 J	16.6 U	30.5	53.1 J	NA
Phenol	474 U	NA	771 U	NA	1,370 U	NA	811 U	852 U	NA	NA	1,070 U	833 U	337 U	421 U	NA
Pyrene	216	NA	29.6 J	NA	27.2 U	NA	23.7 J	17 U	NA	NA	32.4 J	16.6 U	53.3	42 U	NA

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70		CAPL-SD71		CAPL-SD72		CAPL-SD73				CAPL-SD74	CAPL-SD75	CAPL-SD76	CAPL-SD77	
Sample ID	CAPL-SD70-1012	CAPL-SD70-1012-V	CAPL-SD71-1012	CAPL-SD71-1012-V	CAPL-SD72-1012	CAPL-SD72-1012-V	CAPL-SD73-1012	CAPL-SD73P-1012	CAPL-SD73-1012-V	CAPL-SD73P-1012-V	CAPL-SD74-1012	CAPL-SD75-1012	CAPL-SD76-1012	CAPL-SD77-1012	CAPL-SD77-1012-V
Sample Date	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/16/12	10/25/12
Chemical Name															
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	43.9 J	NA	1.52 J	NA	2.79 U	NA	1.66 J	1.23 J	NA	NA	2.13 U	1.67 U	23.3 J	2.64 L	NA
4,4'-DDE	121 J	NA	7.95 J	NA	6.03 J	NA	14 J	10.1 J	NA	NA	5.19 J	4.58 J	45.9 J	46.5 J	NA
4,4'-DDT	21 J	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.966 J	3.61 J	NA
Aldrin	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	0.83 U	NA
alpha-BHC	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	1.54 J	NA
alpha-Chlordane	29.6 L	NA	1.51 UL	NA	2.79 U	NA	1.97 J	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	9.57 L	NA
Aroclor-1260	8,240	NA	57.4 J	NA	68.2 U	NA	78.5 J	48.4 J	NA	NA	52.3 U	25.9 J	37.3 J	720 J	NA
beta-BHC	0.98 J	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	0.287 L	NA
delta-BHC	0.954 UL	NA	1.51 U	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	1.14 J	NA
Dieldrin	106 J	NA	1.68 J	NA	2.86 J	NA	2.64 J	1.48 J	NA	NA	2.13 U	1.67 U	0.377 L	15.1 J	NA
Endosulfan I	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	0.83 U	NA
Endosulfan II	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	23.8 J	0.69 UL	1.41 L	NA
Endosulfan sulfate	0.954 UL	NA	2.36 J	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	12.8 J	NA
Endrin	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.576 L	13.7	NA
Endrin aldehyde	16.4 J	NA	2.38 J	NA	3.95 J	NA	3.53 J	2.58 J	NA	NA	2.14 J	2.49 J	0.368 L	0.637 J	NA
Endrin ketone	34.7 J	NA	4.31 J	NA	4.6 J	NA	5.62 J	3.4 J	NA	NA	2.88 J	1.67 U	0.69 U	0.83 UL	NA
gamma-BHC (Lindane)	0.954 UL	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.485 J	0.364 J	NA
gamma-Chlordane	94.2 J	NA	5.18 J	NA	17 J	NA	1.8 J	2.98 J	NA	NA	12.7 J	3.09 J	4.03 L	35.9 J	NA
Heptachlor	0.954 UL	NA	1.51 U	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 U	1.97 J	NA
Heptachlor epoxide	2.42 J	NA	1.51 U	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	0.708 L	NA
Methoxychlor	82.2 J	NA	1.51 UL	NA	2.79 U	NA	1.64 U	1.73 U	NA	NA	2.13 U	1.67 U	0.69 UL	0.83 UL	NA
Toxaphene	61.7 UJ	NA	97.9 UJ	NA	180 UJ	NA	106 UJ	112 UJ	NA	NA	138 UJ	108 UJ	44.6 UJ	53.7 UJ	NA
Explosives (µg/kg)															
1,3,5-Trinitrobenzene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
1,3-Dinitrobenzene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	469 J	303 J	NA
2,4,6-Trinitrotoluene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
2-Amino-4,6-dinitrotoluene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
2-Nitrotoluene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
3,5-Dinitroaniline	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
3-Nitrotoluene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	882	198 U	NA
4-Amino-2,6-dinitrotoluene	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
4-Nitrotoluene	189 U	NA	195 U	NA	196 U	NA	198 U	104 J	NA	NA	192 U	330 J	194 U	198 U	NA
HMX	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
Nitroglycerin	472 U	NA	1,210 J	NA	490 U	NA	1,250 J	1,250	NA	NA	486 J	1,230 J	485 U	495 U	NA
Nitroguanidine	95.7 U	NA	101 U	NA	97.1 U	NA	104 U	96.2 U	NA	NA	109 U	102 U	101 U	101 U	NA
PETN	472 U	NA	488 U	NA	490 U	NA	495 U	488 U	NA	NA	481 U	493 U	485 U	495 U	NA
RDX	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	194 U	198 U	NA
Tetryl	189 U	NA	195 U	NA	196 U	NA	198 U	195 U	NA	NA	192 U	197 U	245 J	198 U	NA
Total Metals (mg/kg)															
Aluminum	8,670	NA	18,300	NA	28,200	NA	25,200	22,700	NA	NA	17,200	20,500	6,530	2,430	NA
Antimony	6.01 U	NA	9.2 U	NA	17.2 U	NA	9.92 U	10.3 U	NA	NA	5.35 U	4.27 U	1.65 U	1.03 U	NA
Arsenic	12.7	NA	33.9	NA	51.5	NA	51.7	50.9	NA	NA	42.4	47.3	5.56	9.1	NA
Barium	43	NA	72.6	NA	107	NA	93.9	85.5	NA	NA	75.4	88.3	28.1	12.9	NA
Beryllium	1.5 U	NA	2.3 U	NA	4.3 U	NA	2.48 U	2.57 U	NA	NA	0.949 J	1 J	0.283 J	0.171 J	NA
Cadmium	1.5 U	NA	2.3 U	NA	4.3 U	NA	2.48 U	2.57 U	NA	NA	1.34 U	1.07 U	0.414 U	0.144 J	NA
Calcium	32,700	NA	102,000	NA	122,000	NA	88,800	89,300	NA	NA	80,400	104,000	2,870	2,560	NA
Chromium	19.4	NA	36.6	NA	50.4	NA	46.3	43.1	NA	NA	36.1	38.7	9	5.73	NA
Cobalt	7.51 U	NA	11.5 U	NA	21.5 U	NA	12.4 U	12.8 U	NA	NA	4.99 J	5.77 J	1.46 J	1.71	NA
Copper	33	NA	43.1	NA	40.2	NA	50.1	43.7	NA	NA	46	56.9	4.7	4.63	NA
Cyanide	0.682 U	NA	1.05 U	NA	2.26 U	NA	1.27 U	1.24 U	NA	NA	1.66 U	1.18 U	0.522 U	0.641 U	NA
Iron	21,900	NA	30,100	NA	41,300	NA	39,300	36,000	NA	NA	34,900	34,000	5,960	4,360	NA
Lead	66.8	NA	72.8	NA	69.2	NA	81.6	74.7	NA	NA	56.2	69.3	16.3	15.2	NA
Magnesium	2,100 J	NA	2,900 J	NA	4,320 J	NA	3,820 J	3,440 J	NA	NA	2,800 J	3,270	531 J	337 J	NA
Manganese	102	NA	119	NA	206	NA	163	147	NA	NA	163	143	25.4	14.6	NA
Mercury	0.11	NA	0.134 J	NA	0.198 J	NA	0.147 J	0.164 J	NA	NA	0.126 J	0.136 J	0.0408 J	0.0656 J	NA
Nickel	11.7	NA	11.9	NA	18.1 J	NA	15.4	14.4	NA	NA	13	14.8	3.63	2.17	NA
Potassium	1,480 J	NA	2,400 J	NA	3,570 J	NA	3,070 J	2,770 J	NA	NA	2,390 J	2,570 J	397 J	384 J	NA
Selenium	3.75 U	NA	5.75 U	NA	10.7 U	NA	6.2 U	6.42 U	NA	NA	3.34 U	2.67 U	1.03 U	0.644 U	NA
Silver	1.5 U	NA	2.3 U	NA	4.3 U	NA	2.48 U	2.57 U	NA	NA	1.34 U	1.07 U	0.414 U	0.258 U	NA
Sodium	2,250 U	NA	3,450 U	NA	6,450 U	NA	3,720 U	3,850 U	NA	NA	2,010 U	755 J	621 U	386 U	NA
Thallium	3 U	NA	4.6 U	NA	8.6 U	NA	4.96 U	5.14 U	NA	NA	2.68 U	2.14 U	0.827 U	0.515 U	NA
Vanadium	25.4	NA	46.3	NA	69.9	NA	58.3	57.1	NA	NA	52.1	55.5	15	7.66	NA
Zinc	190	NA	173	NA	186	NA	173	160	NA	NA	133	148	18.7	48.6	NA

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70		CAPL-SD71		CAPL-SD72		CAPL-SD73				CAPL-SD74	CAPL-SD75	CAPL-SD76	CAPL-SD77	
Sample ID	CAPL-SD70-1012	CAPL-SD70-1012-V	CAPL-SD71-1012	CAPL-SD71-1012-V	CAPL-SD72-1012	CAPL-SD72-1012-V	CAPL-SD73-1012	CAPL-SD73P-1012	CAPL-SD73-1012-V	CAPL-SD73P-1012-V	CAPL-SD74-1012	CAPL-SD75-1012	CAPL-SD76-1012	CAPL-SD77-1012	CAPL-SD77-1012-V
Sample Date	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/16/12	10/25/12
Chemical Name															
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)															
Zinc, SEM	2.64	NA	1.66 D	NA	1.22	NA	1.54 D	NA	NA	NA	1.08	0.377 D	0.0847	0.597	NA
Acid volatile sulfide, SEM	10.3	NA	13.7	NA	14.4	NA	12.8	NA	NA	NA	19.8	4.16	0.411	4.96	NA
Cadmium, SEM	0.00566	NA	0.00245 J	NA	0.00191 J	NA	0.00176 J	NA	NA	NA	0.00246 J	4.06E-04 J	8.24E-04 U	0.00119 J	NA
Copper, SEM	0.112	NA	0.0751	NA	0.159	NA	0.303	NA	NA	NA	0.246	0.103	0.0079 J	0.0193 J	NA
Lead, SEM	0.324	NA	0.246 D	NA	0.162	NA	0.279 D	NA	NA	NA	0.18	0.0722 D	0.0256	0.0832	NA
Mercury, SEM	9.79E-05 U	NA	1.23E-04 U	NA	1.55E-04 U	NA	1.30E-04 U	NA	NA	NA	1.68E-04 U	4.41E-05 U	4.68E-05 U	7.61E-05 U	NA
Nickel, SEM	0.103	NA	0.0307 J	NA	0.0266 J	NA	0.0361 J	NA	NA	NA	0.0364 J	0.00837 J	0.00343 J	0.0116 J	NA
Silver, SEM	0.0047 U	NA	0.0069 MU	NA	0.00746 U	NA	0.00727 MU	NA	NA	NA	0.0094 MU	0.00247 MU	0.00225 U	0.00365 U	NA
Wet Chemistry															
pH (ph)	7.47 H3	NA	6.85 H3	NA	6.93 H3	NA	7.01 H3	NA	NA	NA	7.3 H3	7.34 H3	6.83 H3	6.71 H3	NA
Total organic carbon (TOC) (mg/kg)	98,300	NA	51,800	NA	107,000	NA	37,100	NA	NA	NA	79,300	84,300	51,400	91,100	NA
Grain Size (pct)															
Coarse Sand (%)	2.3	NA	0	NA	1.8	NA	0	NA	NA	NA	0	0	4	2.9	NA
Fine Sand (%)	42.5	NA	7.4	NA	14.2	NA	3.1	NA	NA	NA	5	4	75	56.3	NA
Fines (%)	46.7	NA	92.2	NA	79.7	NA	96.6	NA	NA	NA	94.6	95.8	12.4	26	NA
Gravel (%)	1.9	NA	0	NA	1.1	NA	0	NA	NA	NA	0	0	0.9	1.7	NA
Medium Sand (%)	6.6	NA	0.4	NA	3.2	NA	0.3	NA	NA	NA	0.4	0.2	7.7	13.1	NA
Sand (%)	51.4	NA	7.8	NA	19.2	NA	3.4	NA	NA	NA	5.4	4.2	86.7	72.3	NA
GRAINSIZE (PCT/P)															
GS03 Sieve 3" (75 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS05 Sieve 2" (50 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS06 Sieve 1.5" (37.5 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS07 Sieve 1" (25.0 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS08 Sieve 0.75" (19.0 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
GS10 Sieve 0.375" (9.5 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	NA
Sieve No. 004 (4.75 mm)	98.1	NA	100	NA	98.9	NA	100	NA	NA	NA	100	100	99.1	98.3	NA
Sieve No. 010 (2.00 mm)	95.8	NA	100	NA	97.1	NA	100	NA	NA	NA	100	100	95.1	95.4	NA
Sieve No. 020 (850 um)	94.3	NA	99.9	NA	96.1	NA	99.9	NA	NA	NA	100	100	93.6	92.2	NA
Sieve No. 040 (425 um)	89.2	NA	99.6	NA	93.9	NA	99.7	NA	NA	NA	99.6	99.8	87.4	82.3	NA
Sieve No. 060 (250 um)	66.2	NA	98.5	NA	90.6	NA	99.3	NA	NA	NA	98.8	99.4	57.1	53.6	NA
Sieve No. 080 (180 um)	54.9	NA	97	NA	88.1	NA	98.9	NA	NA	NA	98.1	99	31.9	36.7	NA
Sieve No. 100 (150 um)	52.2	NA	95.9	NA	86.2	NA	98.4	NA	NA	NA	97.5	98.6	22.5	30.6	NA
Sieve No. 200 (75 um)	46.7	NA	92.2	NA	79.7	NA	96.6	NA	NA	NA	94.6	95.8	12.4	26	NA

C:\Users\kgraycoc\Desktop\anita\Appendix B - Analytical Data\[Appendix B Tables.xlsx], ccampbe6, 03/12/2013

Notes:

Shading indicates detections

NA - Not analyzed

* - Exceeding quality control criteria are associated with the reported result

B - Analyte not detected above the level reported in blanks

D - Compound identified in an analysis at a secondary dilution factor

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

M - Indicates that the sample matrix interfered with the quantitation of the analyte

N- The MS/MSD accuracy and/ or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

Y- The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side

mg/kg - Milligrams per kilogram

pct - Percent

pct/p - Percent passed

ph - pH units

µg/kg - Micrograms per kilogram

µmol/g - Micromoles per gram

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD78	CAPL-SD79		CAPL-SD80	CAPL-SD81	CAPL-SD82	CAPL-SD83		CAPL-SD84		CAPL-SD85		CAPL-SD86	
Sample ID	CAPL-SD78-1012	CAPL-SD79-1012	CAPL-SD79P-1012	CAPL-SD80-1012	CAPL-SD81-1012	CAPL-SD82-1012	CAPL-SD83-1012	CAPL-SD83-1012-V	CAPL-SD84-1012	CAPL-SD84-1012-A	CAPL-SD85-1012	CAPL-SD85-1012-A	CAPL-SD86-1012	CAPL-SD86-1012-A
Sample Date	10/16/12	10/16/12	10/16/12	10/16/12	10/18/12	10/18/12	10/16/12	10/25/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12
Chemical Name														
Volatile Organic Compounds (µg/kg)														
1,1,1-Trichloroethane	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,1,2,2-Tetrachloroethane	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	10.4 UJ	9.81 UJ	13 UJ	10.1 UJ	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
1,1,2-Trichloroethane	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,1-Dichloroethane	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,1-Dichloroethene	5.21 UJ	4.9 UJ	6.48 UJ	5.03 UJ	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,2,3-Trichlorobenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,2,4-Trichlorobenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 UL	16.1 UL	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,2-Dibromo-3-chloropropane	10.4 U	9.81 U	13 U	10.1 U	19.8 U	32.3 U	NA	7.63 U	6.15 UJ	NA	6.08 UJ	NA	4.8 UJ	NA
1,2-Dibromoethane	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,2-Dichlorobenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,2-Dichloroethane	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,2-Dichloropropane	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,3-Dichlorobenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
1,4-Dichlorobenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
2-Butanone	23.1 J	23.8	39.7	42.7	42.2	90.7	NA	5.92 J	6.15 U	NA	3.93 J	NA	4.8 U	NA
2-Hexanone	10.4 U	9.81 U	13 U	10.1 U	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
4-Methyl-2-pentanone	10.4 U	9.81 U	13 U	10.1 U	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Acetone	77.5 J	85.3	121	150	229 J	399 J	NA	22.6 J	12.3 UJ	NA	21.3 J	NA	9.6 UJ	NA
Benzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Bromochloromethane	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Bromodichloromethane	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Bromoform	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Bromomethane	10.4 UJ	9.81 UJ	13 UJ	10.1 UJ	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Carbon disulfide	5.21 UL	4.9 UJ	6.48 UJ	3.5 J	9.22 J	11.7 J	NA	2.26 J	3.07 U	NA	3.04 U	NA	2.4 U	NA
Carbon tetrachloride	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Chlorobenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Chloroethane	10.4 UJ	9.81 UJ	13 UJ	10.1 UJ	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Chloroform	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Chloromethane	10.4 UJ	9.81 UJ	13 UJ	10.1 UJ	19.8 UJ	32.3 UJ	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
cis-1,2-Dichloroethene	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
cis-1,3-Dichloropropene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Cyclohexane	5.21 UL	4.9 UJ	6.48 UJ	5.03 UJ	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Dibromochloromethane	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Dichlorodifluoromethane (Freon-12)	10.4 UJ	9.81 UJ	13 UJ	10.1 UJ	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Ethylbenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Isopropylbenzene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Methyl acetate	10.4 UJ	5.12 J	8.47 J	10.1 U	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Methylcyclohexane	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Methylene chloride	10.4 UJ	9.81 UJ	13 UJ	10.1 UJ	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Methyl-tert-butyl ether (MTBE)	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Styrene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Tetrachloroethene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Toluene	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	6.87 J	3.07 U	NA	3.04 U	NA	2.4 U	NA
trans-1,2-Dichloroethene	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
trans-1,3-Dichloropropene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Trichloroethene	5.21 UL	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 U	3.07 U	NA	3.04 U	NA	2.4 U	NA
Trichlorofluoromethane (Freon-11)	10.4 U	9.81 U	13 U	10.1 U	19.8 U	32.3 U	NA	7.63 U	6.15 U	NA	6.08 U	NA	4.8 U	NA
Vinyl chloride	5.21 U	4.9 U	6.48 U	5.03 U	9.9 U	16.1 U	NA	3.82 UJ	3.07 UJ	NA	3.04 UJ	NA	2.4 UJ	NA
Xylene, total	15.6 UL	14.7 U	19.4 U	15.1 U	29.7 U	48.4 U	NA	11.4 U	9.22 U	NA	9.12 U	NA	7.2 U	NA

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD78	CAPL-SD79		CAPL-SD80	CAPL-SD81	CAPL-SD82	CAPL-SD83		CAPL-SD84		CAPL-SD85		CAPL-SD86	
Sample ID	CAPL-SD78-1012	CAPL-SD79-1012	CAPL-SD79P-1012	CAPL-SD80-1012	CAPL-SD81-1012	CAPL-SD82-1012	CAPL-SD83-1012	CAPL-SD83-1012-V	CAPL-SD84-1012	CAPL-SD84-1012-A	CAPL-SD85-1012	CAPL-SD85-1012-A	CAPL-SD86-1012	CAPL-SD86-1012-A
Sample Date	10/16/12	10/16/12	10/16/12	10/16/12	10/18/12	10/18/12	10/16/12	10/25/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12
Chemical Name														
Semivolatile Organic Compounds (µg/kg)														
1,1-Biphenyl	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
1,2,4,5-Tetrachlorobenzene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,2'-Oxybis(1-chloropropane)	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,3,4,6-Tetrachlorophenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,4,5-Trichlorophenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,4,6-Trichlorophenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,4-Dichlorophenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,4-Dimethylphenol	1,590 U	1,300 U	1,830 U	1,460 U	2,560 U	19,400 U	1,400 U	NA	784 U	NA	880 U	NA	813 U	NA
2,4-Dinitrophenol	3,980 R	3,260 U	4,590 U	3,650 U	6,400 U	48,600 U	3,490 U	NA	1,960 U	NA	2,200 U	NA	2,040 U	NA
2,4-Dinitrotoluene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2,6-Dinitrotoluene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2-Chloronaphthalene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2-Chlorophenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2-Methylnaphthalene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
2-Methylphenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
2-Nitroaniline	1,590 U	1,300 U	1,830 U	1,460 U	2,560 U	19,400 U	1,400 U	NA	784 U	NA	880 U	NA	813 U	NA
2-Nitrophenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
3,3'-Dichlorobenzidine	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
3-Nitroaniline	1,590 U	1,300 U	1,830 U	1,460 U	2,560 U	19,400 U	1,400 U	NA	784 U	NA	880 U	NA	813 U	NA
4,6-Dinitro-2-methylphenol	3,980 U	3,260 U	4,590 U	3,650 U	6,400 U	48,600 U	3,490 U	NA	1,960 U	NA	2,200 U	NA	2,040 U	NA
4-Bromophenyl-phenylether	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
4-Chloro-3-methylphenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
4-Chloroaniline	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
4-Chlorophenyl-phenylether	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
4-Methylphenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
4-Nitroaniline	1,590 U	1,300 U	1,830 U	1,460 U	2,560 U	19,400 U	1,400 U	NA	784 U	NA	880 U	NA	813 U	NA
4-Nitrophenol	1,590 U	1,300 U	1,830 U	1,460 U	2,560 U	19,400 U	1,400 U	NA	784 U	NA	880 U	NA	813 U	NA
Acenaphthene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Acenaphthylene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Acetophenone	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Anthracene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Atrazine	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Benzaldehyde	398 U	326 U	459 U	212 J	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Benzo(a)anthracene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Benzo(a)pyrene	39.7 U	9.18 J	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Benzo(b)fluoranthene	39.7 U	10.5 J	45.8 U	36.4 U	17.9 J	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Benzo(g,h,i)perylene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Benzo(k)fluoranthene	39.7 U	8.89 J	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
bis(2-Chloroethoxy)methane	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
bis(2-Chloroethyl)ether	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
bis(2-Ethylhexyl)phthalate	398 U	326 U	508 B	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Butylbenzylphthalate	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Caprolactam	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Carbazole	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Chrysene	57.2 J	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Dibenz(a,h)anthracene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Dibenzofuran	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Diethylphthalate	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Dimethyl phthalate	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Di-n-butylphthalate	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Di-n-octylphthalate	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Fluoranthene	39.7 U	22.4	45.8 U	36.4 U	18.5 J	96.9 U	6.97 U	NA	19.6 U	NA	22.2 J	NA	20.3 U	NA
Fluorene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Hexachlorobenzene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Hexachlorobutadiene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Hexachlorocyclopentadiene	398 R	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Hexachloroethane	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Indeno(1,2,3-cd)pyrene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Isophorone	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Naphthalene	39.7 U	6.51 U	45.8 U	36.4 U	12.8 U	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
n-Nitroso-di-n-propylamine	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
n-Nitrosodiphenylamine	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Nitrobenzene	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Pentachlorophenol	1,590 U	1,300 U	1,830 U	1,460 U	2,560 U	19,400 U	1,400 U	NA	784 U	NA	880 U	NA	813 U	NA
Phenanthrene	39.7 U	6.51 U	45.8 U	37 J	13.9 J	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA
Phenol	398 U	326 U	459 U	365 U	640 U	4,860 U	349 U	NA	196 U	NA	220 U	NA	204 U	NA
Pyrene	41.4 J	22.2	45.8 U	44.3 J	14.6 J	96.9 U	6.97 U	NA	19.6 U	NA	22 U	NA	20.3 U	NA

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD78	CAPL-SD79		CAPL-SD80	CAPL-SD81	CAPL-SD82	CAPL-SD83		CAPL-SD84		CAPL-SD85		CAPL-SD86	
Sample ID	CAPL-SD78-1012	CAPL-SD79-1012	CAPL-SD79P-1012	CAPL-SD80-1012	CAPL-SD81-1012	CAPL-SD82-1012	CAPL-SD83-1012	CAPL-SD83-1012-V	CAPL-SD84-1012	CAPL-SD84-1012-A	CAPL-SD85-1012	CAPL-SD85-1012-A	CAPL-SD86-1012	CAPL-SD86-1012-A
Sample Date	10/16/12	10/16/12	10/16/12	10/16/12	10/18/12	10/18/12	10/16/12	10/25/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12
Chemical Name														
Pesticide/Polychlorinated Biphenyls (µg/kg)														
4,4'-DDD	10.3 J	1.69 L	3.47 J	1.39 L	1.31 U	1.91 U	2.88 L	NA	10.2 J	NA	12.8 K	NA	6.53 J	NA
4,4'-DDE	12.6	13.6 J	23.6 J	21.5	1.22 J	3.49 J	2.15 L	NA	50.8 J	NA	64.9 J	NA	18.5 L	NA
4,4'-DDT	0.932 J	1.14 J	1.12 J	0.696 J	1.31 U	1.91 U	0.694 UJ	NA	137 K	NA	71 J	NA	27.6 J	NA
Aldrin	0.8 UL	0.66 U	0.328 J	0.505 L	1.31 U	1.91 U	0.468 L	NA	3.54 J	NA	1.2 J	NA	0.407 J	NA
alpha-BHC	0.536 J	0.66 U	0.912 U	0.585 L	1.31 U	1.91 U	0.49 L	NA	0.408 U	NA	0.443 U	NA	0.414 UL	NA
alpha-Chlordane	0.8 UL	0.914 J	0.302 J	0.715 U	1.31 U	1.91 U	0.694 UL	NA	6.82 J	NA	13.1 K	NA	8.56 J	NA
Aroclor-1260	66.1 L	212 J	354 J	156	32 U	46.9 U	29.3 L	NA	16,200 J	NA	8,300 J	NA	4,090 J	NA
beta-BHC	0.8 UL	0.66 U	0.912 U	0.744 L	1.31 U	1.91 U	0.694 UL	NA	0.408 UL	NA	2.09 K	NA	0.414 UL	NA
delta-BHC	0.8 U	1.5 J	0.912 U	0.503 J	1.31 U	1.91 U	0.694 UL	NA	0.208 J	NA	1.3 K	NA	0.505 J	NA
Dieldrin	0.8 U	4.13 J	6.63 J	2.42 L	1.31 U	1.91 U	0.694 UL	NA	364 K	NA	167 K	NA	66.6 J	NA
Endosulfan I	0.8 U	0.66 U	0.912 U	0.715 UL	1.31 U	1.91 U	0.694 UL	NA	0.408 U	NA	0.615 J	NA	0.325 J	NA
Endosulfan II	0.8 U	2.25 J	3.37 J	1.36 J	1.31 U	1.91 U	0.694 UL	NA	56.1 J	NA	26.1 K	NA	43.9 J	NA
Endosulfan sulfate	22.8 K	4.47 J	6.65 J	0.715 U	1.31 U	1.91 U	0.694 UL	NA	681 K	NA	319 K	NA	0.414 UL	NA
Endrin	1.14 L	3.07 L	5.37 J	0.715 UL	1.31 U	1.91 U	0.694 UL	NA	143 K	NA	51.7	NA	29.5 J	NA
Endrin aldehyde	0.8 UL	0.79 J	0.683 J	3.05 L	1.31 U	1.91 U	0.733 L	NA	17.4 J	NA	8.26 J	NA	4.39 J	NA
Endrin ketone	0.8 U	0.66 U	0.912 U	0.715 U	1.31 U	1.91 U	0.694 UL	NA	49.4 J	NA	22.2 J	NA	15.1 J	NA
gamma-BHC (Lindane)	1 J	0.573 J	0.744 J	0.715 U	1.31 U	1.91 U	0.694 UL	NA	0.135 J	NA	0.614 J	NA	0.414 UL	NA
gamma-Chlordane	2.58	3.78 J	6.3 J	2.71	0.735 J	2.58 J	0.694 UL	NA	22.7 J	NA	40.1	NA	17.2 J	NA
Heptachlor	0.9 L	0.66 U	0.744 J	0.715 UL	1.31 U	1.91 U	1.27 L	NA	0.361 B	NA	0.974	NA	0.414 UL	NA
Heptachlor epoxide	0.8 UL	0.66 UL	0.912 U	0.715 UL	1.31 U	1.91 U	0.343 L	NA	3.58 J	NA	5.37 K	NA	0.981 J	NA
Methoxychlor	4.11 J	0.66 UL	0.912 U	4.73 J	1.31 U	1.91 U	0.302 J	NA	49.2 J	NA	25.7 J	NA	12.8 J	NA
Toxaphene	51.8 UJ	42.7 UJ	59 UJ	46.2 UJ	84.4 UJ	124 UJ	44.9 UJ	NA	26.4 UJ	NA	28.7 UJ	NA	26.8 UJ	NA
Explosives (µg/kg)														
1,3,5-Trinitrobenzene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
1,3-Dinitrobenzene	151 J	179 U	384 J	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
2,4,6-Trinitrotoluene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
2-Amino-4,6-dinitrotoluene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
2-Nitrotoluene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
3,5-Dinitroaniline	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
3-Nitrotoluene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
4-Amino-2,6-dinitrotoluene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
4-Nitrotoluene	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
HMX	195 U	179 U	464 J	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
Nitroglycerin	488 U	448 U	493 U	500 U	476 U	641 J	490 U	NA	455 U	NA	435 U	NA	455 U	NA
Nitroguanidine	108 U	104 U	93 U	105 U	96.2 U	105 U	103 U	NA	105 U	NA	95.2 U	NA	94.3 U	NA
PETN	488 U	448 U	493 U	500 U	476 U	488 U	490 U	NA	455 U	NA	435 U	NA	455 U	NA
RDX	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
Tetryl	195 U	179 U	197 U	200 U	190 U	195 U	196 U	NA	182 U	NA	174 U	NA	182 U	NA
Total Metals (mg/kg)														
Aluminum	4,040	2,630	3,200	5,770	26,000	17,400	13,300	NA	2,310	NA	6,860	NA	2,270	NA
Antimony	0.952 UL	0.778 U	1.14 U	1.78 U	7.78 U	4.8 U	4.42 U	NA	0.502 U	NA	3.89	NA	0.995 U	NA
Arsenic	5.53	7.87	7.53	16.8	27.9	46.3	30.2	NA	3.22	NA	5.62	NA	2.24	NA
Barium	22.3	15.6	18.6	26.8	63.5	72.9	21.7 J	NA	12.9	NA	90.2	NA	22.8	NA
Beryllium	0.253 J	0.181 J	0.214 J	0.306 J	1.15 J	0.803 J	0.862 J	NA	0.22 J	NA	5.98	NA	1.19	NA
Cadmium	0.242 J	0.136 J	0.157 J	0.456 J	1.95 U	1.2 U	1.1 U	NA	0.112 J	NA	0.712 U	NA	0.249 U	NA
Calcium	4,310	3,380	3,720	23,100	18,700	87,900	2,070 J	NA	29,600	NA	50,700	NA	40,200	NA
Chromium	8.21	5.31	5.91	9.76	45.6 J	29.7	56.3	NA	7.75	NA	45	NA	11.3	NA
Cobalt	1.83	1.15 J	1.43 J	1.6 J	8.67 J	5.34 J	5.52 U	NA	1.03	NA	34.5	NA	5.24	NA
Copper	6.98	3.81	4.54	14.1	25.8	48.4	13.8	NA	3.99	NA	1,000	NA	98.3	NA
Cyanide	0.56 U	4.86	0.672 U	0.516 U	0.922 U	1.38 U	0.496 U	NA	0.155 J	NA	0.19 J	NA	0.306 U	NA
Iron	7,870	4,300	4,900	7,790	36,600	26,100	68,200	NA	8,880	NA	31,600	NA	9,880	NA
Lead	19.8	11.6	13.2	23	30.4	49.7	23.6	NA	90.3	NA	853	NA	126	NA
Magnesium	556 J	328 J	377 J	803 J	4,270 J	2,530 J	3,080	NA	772 J	NA	1,940 J	NA	742 J	NA
Manganese	14.9	13.4	15.5	40.2	199	144	98.5	NA	32.4	NA	275	NA	63.6	NA
Mercury	0.0413 J	0.0476 J	0.0733 J	0.0641 J	0.103 J	0.14 J	0.0342 J	NA	0.0174 J	NA	0.0196 J	NA	0.0397 U	NA
Nickel	3.06	1.99	2.31	3.72	18.4	13	6.27	NA	2.88	NA	564	NA	65.4	NA
Potassium	724 L	343 J	409 J	663 J	3,220 J	1,900 J	2,010 J	NA	780	NA	1,740 J	NA	730	NA
Selenium	0.53 J	0.486 U	0.71 U	1.11 U	4.86 U	3 U	2.76 U	NA	0.314 U	NA	1.78 U	NA	0.622 UL	NA
Silver	0.238 U	0.194 U	0.284 U	0.446 U	1.95 U	1.2 U	1.1 U	NA	0.125 UJ	NA	0.519 J	NA	0.249 UJ	NA
Sodium	357 U	292 U	426 U	668 U	2,920 U	1,800 U	5,040	NA	168 J	NA	519 J	NA	340 J	NA
Thallium	0.476 U	0.389 U	0.568 U	0.891 U	3.89 U	2.4 U	2.21 U	NA	0.251 U	NA	1.42 U	NA	0.497 U	NA
Vanadium	12.2	7.34	7.96	13.7	58.5	45	171	NA	9.12	NA	20.6	NA	7.99	NA
Zinc	83.1 L	33.5	37	70	89.5	110	111	NA	77.7	NA	2,950	NA	525	NA

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD78	CAPL-SD79		CAPL-SD80	CAPL-SD81	CAPL-SD82	CAPL-SD83		CAPL-SD84		CAPL-SD85		CAPL-SD86	
Sample ID	CAPL-SD78-1012	CAPL-SD79-1012	CAPL-SD79P-1012	CAPL-SD80-1012	CAPL-SD81-1012	CAPL-SD82-1012	CAPL-SD83-1012	CAPL-SD83-1012-V	CAPL-SD84-1012	CAPL-SD84-1012-A	CAPL-SD85-1012	CAPL-SD85-1012-A	CAPL-SD86-1012	CAPL-SD86-1012-A
Sample Date	10/16/12	10/16/12	10/16/12	10/16/12	10/18/12	10/18/12	10/16/12	10/25/12	10/24/12	10/26/12	10/24/12	10/26/12	10/24/12	10/26/12
Chemical Name														
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)														
Zinc, SEM	0.859	0.385	NA	0.764	0.53	0.752	0.439	NA	NA	0.282 D	NA	4.43 D	NA	0.974
Acid volatile sulfide, SEM	0.484 J	3.42	NA	5.52	5.47	14.9	7.68	NA	NA	0.114 J	NA	1.03	NA	2.08
Cadmium, SEM	0.00218 J	0.0013 J	NA	0.00383	0.00184 U	0.00272 U	0.00122 U	NA	NA	5.73E-04 U	NA	5.52E-04 U	NA	3.84E-04 J
Copper, SEM	0.0618	0.0117 J	NA	0.0865	0.0261 J	0.248	0.0202 J	NA	NA	0.0178	NA	0.675	NA	0.124
Lead, SEM	0.0796	0.0405	NA	0.0882	0.0617	0.164	0.0382	NA	NA	0.0463 D	NA	0.393 D	NA	0.101
Mercury, SEM	7.35E-05 U	7.04E-05 U	NA	6.03E-05 U	1.04E-04 U	1.55E-04 U	6.94E-05 U	NA	NA	3.26E-05 NU	NA	3.14E-05 NU	NA	3.08E-05 NU
Nickel, SEM	0.015 J	0.0071 J	NA	0.00828 J	0.0142 J	0.0206 J	0.0107 J	NA	NA	0.00368 JY	NA	0.468 Y	NA	0.112 Y
Silver, SEM	0.00353 U	0.00338 U	NA	0.0029 U	0.00585 MU	0.00867 MU	0.00333 U	NA	NA	0.00156 UY	NA	0.00151 UY	NA	0.00148 UY
Wet Chemistry														
pH (ph)	6.9 H3	6.98 H3	NA	7.29 H3	7.19 H3	7.16 H3	7.24 H3	NA	8.28 H3	NA	8.11 H3	NA	7.88 H3	NA
Total organic carbon (TOC) (mg/kg)	71,500	68,400	NA	69,200	108,000	134,000	36,100	NA	2,300	NA	3,440	NA	3,210	NA
Grain Size (pct)														
Coarse Sand (%)	5.1	2.2	NA	1	0	0.9	6.4	NA	6.5	NA	6.9	NA	3.6	NA
Fine Sand (%)	73.8	77.8	NA	51.2	3.7	5.7	30.4	NA	55.8	NA	56.1	NA	73.3	NA
Fines (%)	10.6	11.1	NA	40.6	95.9	92.8	13.7	NA	13.5	NA	2.1	NA	4.4	NA
Gravel (%)	2.3	0.3	NA	0.3	0	0.4	34.1	NA	11.6	NA	5.8	NA	4.1	NA
Medium Sand (%)	8.2	8.6	NA	6.9	0.4	0.2	15.4	NA	12.6	NA	29.2	NA	14.6	NA
Sand (%)	87.1	88.6	NA	59.1	4.1	6.8	52.2	NA	74.9	NA	92.2	NA	91.5	NA
GRAINSIZE (PCT/P)														
GS03 Sieve 3" (75 mm)	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA
GS05 Sieve 2" (50 mm)	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA
GS06 Sieve 1.5" (37.5 mm)	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA
GS07 Sieve 1" (25.0 mm)	100	100	NA	100	100	100	100	NA	100	NA	100	NA	100	NA
GS08 Sieve 0.75" (19.0 mm)	100	100	NA	100	100	100	76.3	NA	92.5	NA	100	NA	100	NA
GS10 Sieve 0.375" (9.5 mm)	98.7	100	NA	100	100	100	72.9	NA	91.9	NA	97.4	NA	97.6	NA
Sieve No. 004 (4.75 mm)	97.7	99.7	NA	99.7	100	99.6	65.9	NA	88.4	NA	94.2	NA	95.9	NA
Sieve No. 010 (2.00 mm)	92.6	97.5	NA	98.7	100	98.7	59.5	NA	81.9	NA	87.3	NA	92.3	NA
Sieve No. 020 (850 um)	91.2	96.4	NA	97.2	100	98.7	54.1	NA	75.9	NA	72.4	NA	87	NA
Sieve No. 040 (425 um)	84.4	88.9	NA	91.8	99.6	98.5	44.1	NA	69.3	NA	58.1	NA	77.7	NA
Sieve No. 060 (250 um)	57.8	57.1	NA	75	98.7	97.7	32.8	NA	42.8	NA	26.6	NA	42.6	NA
Sieve No. 080 (180 um)	35	31.4	NA	61.3	98	97.1	26.1	NA	22.5	NA	8.9	NA	16.3	NA
Sieve No. 100 (150 um)	21	20.6	NA	53.3	97.6	96.5	21.8	NA	17.2	NA	4.9	NA	9.1	NA
Sieve No. 200 (75 um)	10.6	11.1	NA	40.6	95.9	92.8	13.7	NA	13.5	NA	2.1	NA	4.4	NA

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Notes:

Shading indicates detections
NA - Not analyzed
* - Exceeding quality control criteria are associated with the reported result
B - Analyte not detected above the level reported in blanks
D - Compound identified in an analysis at a secondary dilution factor
H3- The sample for this analyte was received outside of the EPA recommended holding time
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher
M - Indicates that the sample matrix interfered with the quantitation of the analyte
N- The MS/MSD accuracy and/ or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
UL - Analyte not detected, quantitation limit is probably higher
Y- The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side
mg/kg - Milligrams per kilogram
pct - Percent
pct/p - Percent passed
ph - pH units
µg/kg - Micrograms per kilogram
µmol/g - Micromoles per gram

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD87		CAPL-SWSD62		CAPL-SWSD63		CAPL-SWSD64				CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SD87-1012	CAPL-SD87-1012-A	CAPL-SD62-1012	CAPL-SD62-1012-V	CAPL-SD63-1012	CAPL-SD63-1012-V	CAPL-SD64-1012	CAPL-SD64P-1012	CAPL-SD64-1012-V	CAPL-SD64P-1012-V	CAPL-SD65-1012	CAPL-SD66-1012	CAPL-SD67-1012	CAPL-SD68-1012	CAPL-SD69-1012
Sample Date	10/24/12	10/26/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/18/12	10/17/12
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,1,1-Trichloroethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 U	7.4 U
1,1,2,2-Tetrachloroethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 UJ	30.2 U	14.8 U
1,1,2-Trichloroethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 U	7.4 U
1,1-Dichloroethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 UL
1,1-Dichloroethene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 UJ	15.1 UL	7.4 U
1,2,3-Trichlorobenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,2,4-Trichlorobenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 UL	4.66 UL	4.35 U	15.1 UL	7.4 U
1,2-Dibromo-3-chloropropane	7.39 UJ	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 U	30.2 U	14.8 U
1,2-Dibromoethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,2-Dichlorobenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,2-Dichloroethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,2-Dichloropropane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,3-Dichlorobenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
1,4-Dichlorobenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
2-Butanone	28.8	NA	NA	101	NA	146	NA	NA	156	135	17.6 J	25.1	15.9 J	50.3 J	43.7
2-Hexanone	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 U	30.2 U	14.8 U
4-Methyl-2-pentanone	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 U	30.2 U	14.8 U
Acetone	111 J	NA	NA	323 J	NA	472 J	NA	NA	543 J	460 J	70.1 J	87 J	47.2	204 J	140 J
Benzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Bromochloromethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 U	7.4 U
Bromodichloromethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Bromoform	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Bromomethane	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 UJ	30.2 U	14.8 U
Carbon disulfide	3.7 U	NA	NA	9.93 J	NA	13.3 J	NA	NA	17.5 J	13.2 J	4.87 U	4.66 U	4.35 UJ	13.9 L	7.4 U
Carbon tetrachloride	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Chlorobenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Chloroethane	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 UJ	30.2 U	14.8 UJ
Chloroform	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Chloromethane	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 UJ	9.33 UJ	8.71 UJ	30.2 UL	14.8 UJ
cis-1,2-Dichloroethene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 U	7.4 U
cis-1,3-Dichloropropene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Cyclohexane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 UJ	15.1 UL	7.4 U
Dibromochloromethane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Dichlorodifluoromethane (Freon-12)	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 UJ	30.2 U	14.8 U
Ethylbenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Isopropylbenzene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Methyl acetate	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 U	30.2 U	14.8 U
Methylcyclohexane	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Methylene chloride	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 UJ	30.2 U	14.8 UJ
Methyl-tert-butyl ether (MTBE)	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 U	7.4 U
Styrene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 R	7.4 U
Tetrachloroethene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Toluene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
trans-1,2-Dichloroethene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
trans-1,3-Dichloropropene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Trichloroethene	3.7 U	NA	NA	11.3 U	NA	14.4 U	NA	NA	12.6 U	11.3 U	4.87 U	4.66 U	4.35 U	15.1 UL	7.4 U
Trichlorofluoromethane (Freon-11)	7.39 U	NA	NA	22.6 U	NA	28.8 U	NA	NA	25.1 U	22.5 U	9.74 U	9.33 U	8.71 U	30.2 U	14.8 U
Vinyl chloride	3.7 UJ	NA	NA	11.3 UJ	NA	14.4 UJ	NA	NA	12.6 UJ	11.3 UJ	4.87 U	4.66 U	4.35 U	15.1 U	7.4 U
Xylene, total	11.1 U	NA	NA	33.9 U	NA	43.2 U	NA	NA	37.7 U	33.8 U	14.6 U	14 U	13.1 U	45.3 UL	22.2 U

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD87		CAPL-SWSD62		CAPL-SWSD63		CAPL-SWSD64				CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SD87-1012	CAPL-SD87-1012-A	CAPL-SD62-1012	CAPL-SD62-1012-V	CAPL-SD63-1012	CAPL-SD63-1012-V	CAPL-SD64-1012	CAPL-SD64P-1012	CAPL-SD64-1012-V	CAPL-SD64P-1012-V	CAPL-SD65-1012	CAPL-SD66-1012	CAPL-SD67-1012	CAPL-SD68-1012	CAPL-SD69-1012
Sample Date	10/24/12	10/26/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/18/12	10/17/12
Chemical Name															
Semivolatile Organic Compounds (µg/kg)															
1,1-Biphenyl	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
1,2,4,5-Tetrachlorobenzene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,2'-Oxybis(1-chloropropane)	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,3,4,6-Tetrachlorophenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,4,5-Trichlorophenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,4,6-Trichlorophenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,4-Dichlorophenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,4-Dimethylphenol	812 U	NA	3,550 U	NA	2,600 U	NA	2,870 U	2,970 U	NA	NA	1,510 U	1,260 U	1,260 U	3,440 U	1,680 U
2,4-Dinitrophenol	2,030 U	NA	8,880 U	NA	6,520 U	NA	7,180 U	7,440 U	NA	NA	3,770 U	3,150 U	3,160 U	8,610 R	4,200 U
2,4-Dinitrotoluene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2,6-Dinitrotoluene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2-Chloronaphthalene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2-Chlorophenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2-Methylnaphthalene	20.3 U	NA	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
2-Methylphenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
2-Nitroaniline	812 U	NA	3,550 U	NA	2,600 U	NA	2,870 U	2,970 U	NA	NA	1,510 U	1,260 U	1,260 U	3,440 U	1,680 U
2-Nitrophenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
3,3'-Dichlorobenzidine	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 UL	420 U
3-Nitroaniline	812 U	NA	3,550 U	NA	2,600 U	NA	2,870 U	2,970 U	NA	NA	1,510 U	1,260 U	1,260 U	3,440 U	1,680 U
4,6-Dinitro-2-methylphenol	2,030 U	NA	8,880 U	NA	6,520 U	NA	7,180 U	7,440 U	NA	NA	3,770 U	3,150 U	3,160 U	8,610 R	4,200 U
4-Bromophenyl-phenylether	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
4-Chloro-3-methylphenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
4-Chloroaniline	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
4-Chlorophenyl-phenylether	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
4-Methylphenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
4-Nitroaniline	812 U	NA	3,550 U	NA	2,600 U	NA	2,870 U	2,970 U	NA	NA	1,510 U	1,260 U	1,260 U	3,440 UL	1,680 U
4-Nitrophenol	812 U	NA	3,550 U	NA	2,600 U	NA	2,870 U	2,970 U	NA	NA	1,510 U	1,260 U	1,260 U	3,440 U	1,680 U
Acenaphthene	336 K	NA	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
Acenaphthylene	20.3 U	NA	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
Acetophenone	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Anthracene	265	NA	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	41.3 J	85.8 U	8.37 U
Atrazine	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Benzaldehyde	203 U	NA	888 U	NA	384 J	NA	718 U	744 U	NA	NA	377 U	170 J	316 U	861 U	420 U
Benzo(a)anthracene	125	NA	17.7 U	NA	78.2 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	223	85.8 U	8.37 U
Benzo(a)pyrene	20.3 U	NA	17.7 U	NA	93.3 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	303	85.8 U	8.37 U
Benzo(b)fluoranthene	81.9 K	NA	17.7 U	NA	96.3 J	NA	14.3 U	14.8 U	NA	NA	13.2 J	6.29 U	400	85.8 U	8.37 U
Benzo(g,h,i)perylene	20.3 U	NA	17.7 U	NA	94.2 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	7.31 J	208	85.8 U	8.37 U
Benzo(k)fluoranthene	20.3 U	NA	17.7 U	NA	102 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	335	85.8 U	8.37 U
bis(2-Chloroethoxy)methane	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
bis(2-Chloroethyl)ether	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
bis(2-Ethylhexyl)phthalate	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Butylbenzylphthalate	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Caprolactam	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Carbazole	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Chrysene	130 K	NA	17.7 U	NA	185	NA	14.3 U	14.8 U	NA	NA	10.3 J	9.23 J	285	85.8 U	8.37 U
Dibenz(a,h)anthracene	20.3 U	NA	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	74.1	85.8 U	8.37 U
Dibenzofuran	125 J	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Diethylphthalate	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Dimethyl phthalate	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Di-n-butylphthalate	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Di-n-octylphthalate	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Fluoranthene	440	NA	17.7 U	NA	174	NA	16.5 J	20.8 J	NA	NA	16	12.2 J	123	85.8 U	8.37 U
Fluorene	285 K	NA	17.7 U	NA	99.7 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
Hexachlorobenzene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Hexachlorobutadiene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Hexachlorocyclopentadiene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 R	420 U
Hexachloroethane	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Indeno(1,2,3-cd)pyrene	24.2 J	NA	17.7 U	NA	90.1 J	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	238	85.8 U	8.37 U
Isophorone	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Naphthalene	20.3 U	NA	17.7 U	NA	65 U	NA	14.3 U	14.8 U	NA	NA	7.52 U	6.29 U	31.5 U	85.8 U	8.37 U
n-Nitroso-di-n-propylamine	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
n-Nitrosodiphenylamine	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Nitrobenzene	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Pentachlorophenol	812 U	NA	3,550 U	NA	2,600 U	NA	2,870 U	2,970 U	NA	NA	1,510 U	1,260 U	1,260 U	3,440 U	1,680 U
Phenanthrene	949	NA	17.7 U	NA	181	NA	14.3 U	14.8 U	NA	NA	12.9 J	10.5 J	69.7	85.8 U	8.37 U
Phenol	203 U	NA	888 U	NA	652 U	NA	718 U	744 U	NA	NA	377 U	315 U	316 U	861 U	420 U
Pyrene	497 K	NA	17.7 U	NA	194	NA	18.5 J	16.8 J	NA	NA	13.6 J	13.3	108	85.8 U	8.37 U

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD87		CAPL-SWSD62		CAPL-SWSD63		CAPL-SWSD64				CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SD87-1012	CAPL-SD87-1012-A	CAPL-SD62-1012	CAPL-SD62-1012-V	CAPL-SD63-1012	CAPL-SD63-1012-V	CAPL-SD64-1012	CAPL-SD64P-1012	CAPL-SD64-1012-V	CAPL-SD64P-1012-V	CAPL-SD65-1012	CAPL-SD66-1012	CAPL-SD67-1012	CAPL-SD68-1012	CAPL-SD69-1012
Sample Date	10/24/12	10/26/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/18/12	10/17/12
Chemical Name															
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	6.56 J	NA	1.81 UL	NA	7.08 J	NA	10.6 J	4.44 J	NA	NA	0.778 U	0.63 U	4.7 L	1.7 U	0.844 UL
4,4'-DDE	13.1	NA	9.69 J	NA	39.2 J	NA	16.5 J	8.72 J	NA	NA	6.29 J	4.74	23.7 L	1.7 U	0.844 UL
4,4'-DDT	18.3 J	NA	1.81 UL	NA	4.18 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	7.55 J	1.7 U	0.844 UL
Aldrin	0.681 J	NA	1.81 UL	NA	1.81 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.95 L	1.7 U	0.844 UL
alpha-BHC	0.419 U	NA	0.777 J	NA	1.32 U	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.427 L	1.7 U	0.844 UL
alpha-Chlordane	9.44	NA	1.5 J	NA	3.63 J	NA	2.22 J	1.48 U	NA	NA	1.02 J	0.63 U	4.25 L	1.7 U	0.844 UL
Aroclor-1260	3,780 J	NA	140 J	NA	1,270 J	NA	84.7 J	34.5 J	NA	NA	63.6	35.9	914 L	41.6 U	20.7 UL
beta-BHC	0.419 U	NA	1.81 UL	NA	1.32 U	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
delta-BHC	1.04 J	NA	1.81 UL	NA	2.71 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
Dieldrin	79.2	NA	3.58 J	NA	20.7 J	NA	2.41 J	1.34 J	NA	NA	1.5 J	0.63 U	4.55 L	1.7 U	0.844 UL
Endosulfan I	0.81 J	NA	1.81 UL	NA	0.68 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.523 L	1.7 U	0.844 UL
Endosulfan II	15.4 J	NA	1.32 J	NA	13.2 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	11.3 L	1.7 U	0.844 UL
Endosulfan sulfate	0.419 U	NA	1.81 UL	NA	41.1 J	NA	2.13 J	1.42 J	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
Endrin	35.7 J	NA	1.81 UL	NA	15.6 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.619 UL	1.7 U	0.844 UL
Endrin aldehyde	5.11 J	NA	3.54 J	NA	4.96 J	NA	1.5 UL	2.02 J	NA	NA	2.75	1.99	3.11 L	1.7 U	0.844 UL
Endrin ketone	12.6 J	NA	14.7 J	NA	1.66 J	NA	6.86 J	3.13 J	NA	NA	0.778 U	0.63 U	2.03 L	1.7 U	0.844 UL
gamma-BHC (Lindane)	0.419 U	NA	1.81 UL	NA	0.692 J	NA	1.5 UL	1.48 U	NA	NA	0.778 U	0.63 U	0.245 L	1.7 U	0.844 UL
gamma-Chlordane	28.4	NA	0.963 J	NA	41 J	NA	1.52 J	1 J	NA	NA	15.1 B	1.37	8.24 L	1.84 J	5.31 J
Heptachlor	0.177 B	NA	1.63 J	NA	1.32 UL	NA	1.5 UL	1.48 U	NA	NA	0.958 J	0.63 U	0.619 UL	1.7 U	0.844 UL
Heptachlor epoxide	1.22 J	NA	1.81 UL	NA	1.32 UL	NA	1.5 UL	1.48 U	NA	NA	0.929 J	0.63 U	1.24 L	1.7 U	0.844 UL
Methoxychlor	11.4 J	NA	1.81 UL	NA	10.7 J	NA	5.43 J	1.48 U	NA	NA	0.584 J	0.63 U	10.1 J	1.7 U	0.844 UL
Toxaphene	27.1 UJ	NA	117 UJ	NA	85.6 UJ	NA	97 UJ	96 UJ	NA	NA	50.3 UJ	40.8 UJ	40 UJ	110 UJ	54.6 UJ
Explosives (µg/kg)															
1,3,5-Trinitrobenzene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
1,3-Dinitrobenzene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
2,4,6-Trinitrotoluene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	125 J
2-Amino-4,6-dinitrotoluene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
2-Nitrotoluene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
3,5-Dinitroaniline	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
3-Nitrotoluene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
4-Amino-2,6-dinitrotoluene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
4-Nitrotoluene	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
HMX	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
Nitroglycerin	455 U	NA	328 J	NA	969 J	NA	1,410 J	311 J	NA	NA	490 U	478 U	478 U	500 U	469 U
Nitroguanidine	108 U	NA	95.2 U	NA	100 U	NA	104 U	103 U	NA	NA	103 U	105 U	96.2 U	104 U	103 U
PETN	455 U	NA	485 U	NA	490 U	NA	483 U	463 U	NA	NA	490 U	478 U	478 U	500 U	469 U
RDX	182 U	NA	194 U	NA	196 U	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 U	188 U
Tetryl	182 U	NA	194 U	NA	211 J	NA	193 U	185 U	NA	NA	196 U	191 U	191 U	200 R	188 U
Total Metals (mg/kg)															
Aluminum	2,890	NA	21,600	NA	19,800	NA	20,900	17,400	NA	NA	6,830	4,010	3,550	26,700	6,560
Antimony	1.07 U	NA	10.9 U	NA	7.82 U	NA	8.58 U	9.07 U	NA	NA	0.946 U	0.762 U	1.6 U	2.11 UL	5.25 U
Arsenic	2.42	NA	38.1	NA	36.5	NA	47.5	39.1	NA	NA	9.58	8.68	6.18	56.7	6.48 J
Barium	16.5	NA	77.3	NA	89	NA	80.5	66.3	NA	NA	26.7	19.7	30.2	80.2	21.2 J
Beryllium	0.393 J	NA	2.73 U	NA	1.14 J	NA	1.15 J	2.27 U	NA	NA	0.253 J	0.222 J	0.242 J	1.02 J	1.31 U
Cadmium	0.267 U	NA	2.73 U	NA	1.95 U	NA	2.14 U	2.27 U	NA	NA	0.237 U	0.204 J	0.239 J	0.528 U	1.31 U
Calcium	26,000	NA	75,900	NA	122,000	NA	93,700	77,900	NA	NA	26,600	12,500	10,100	33,500	3,630
Chromium	8.94	NA	49.4	NA	38.5	NA	44.9	36.9	NA	NA	11.8	7.22	6.45	45.6 K	16.1
Cobalt	1.54 J	NA	13.6 U	NA	5.25 J	NA	5.97 J	11.3 U	NA	NA	1.67	1.14 J	2.08 J	6.91	6.56 U
Copper	16.1	NA	43.9	NA	40.7	NA	51.4	44.5	NA	NA	10.1	8.22	4.58	26.3	4.31 J
Cyanide	0.354 J	NA	1.29 U	NA	0.937 U	NA	1.02 U	1.08 U	NA	NA	2.95	0.439 U	0.438 U	1.3 UL	0.649 U
Iron	6,810	NA	39,600	NA	34,000	NA	35,200	28,400	NA	NA	8,450	5,340	8,770	30,900	14,600
Lead	72.9	NA	80.7	NA	85.8	NA	78.2	63.8	NA	NA	14.8	11.7	12.4	33.3	6.8
Magnesium	638 J	NA	3,040 J	NA	3,090 J	NA	3,000 J	2,480 J	NA	NA	978	517	2,380	4,190 K	1,090 J
Manganese	20.6	NA	142	NA	143	NA	124	102	NA	NA	47.6	33.4	165	161	57.5
Mercury	0.0201 J	NA	0.154 J	NA	0.197	NA	1.48	1.23	NA	NA	0.0444 J	0.0325 J	0.0664 J	0.0995 J	0.0391 J
Nickel	11.1	NA	13.5 J	NA	12.2	NA	13.9	11.8	NA	NA	4.18	2.61	3.62	18.2	3.4 J
Potassium	785	NA	2,660 J	NA	2,330 J	NA	2,790 J	2,360 J	NA	NA	850	489	428 J	3,370 K	1,470 J
Selenium	0.668 U	NA	6.81 U	NA	4.89 U	NA	5.36 U	5.67 U	NA	NA	0.591 U	0.476 U	1 U	1.32 U	3.28 U
Silver	0.267 UJ	NA	2.73 U	NA	1.95 U	NA	2.14 U	2.27 U	NA	NA	0.237 U	0.191 U	0.4 U	0.528 U	1.31 U
Sodium	158 J	NA	4,090 U	NA	2,930 U	NA	3,220 U	3,400 U	NA	NA	175 J	286 U	600 U	1,290 J	1,970 U
Thallium	0.535 U	NA	5.45 U	NA	3.91 U	NA	4.29 U	4.54 U	NA	NA	0.473 U	0.381 U	0.8 U	1.06 U	2.62 U
Vanadium	8.37	NA	55	NA	45.9	NA	54.6	43.6	NA	NA	17.2	9.92	10.9	67.8	19.3
Zinc	119	NA	253	NA	201	NA	187	151	NA	NA	41.9	29.9	41.9	90.4	24.2

Appendix B.5
CAX Penniman Lake
Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD87		CAPL-SWSD62		CAPL-SWSD63		CAPL-SWSD64				CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SD87-1012	CAPL-SD87-1012-A	CAPL-SD62-1012	CAPL-SD62-1012-V	CAPL-SD63-1012	CAPL-SD63-1012-V	CAPL-SD64-1012	CAPL-SD64P-1012	CAPL-SD64-1012-V	CAPL-SD64P-1012-V	CAPL-SD65-1012	CAPL-SD66-1012	CAPL-SD67-1012	CAPL-SD68-1012	CAPL-SD69-1012
Sample Date	10/24/12	10/26/12	10/17/12	10/25/12	10/17/12	10/25/12	10/17/12	10/17/12	10/25/12	10/25/12	10/18/12	10/18/12	10/16/12	10/18/12	10/17/12
Chemical Name															
Acid Volatile Sulfide/Simultaneously Extractable Metals (µmol/g)															
Zinc, SEM	NA	0.676	2.29 D	NA	2.6 D	NA	1.53 D	NA	NA	NA	0.344	0.2	0.198	0.539	0.193
Acid volatile sulfide, SEM	NA	2.57	11.2	NA	13.2	NA	11.8	NA	NA	NA	4.49	3.95	2.85	9.51	6.38
Cadmium, SEM	NA	9.26E-04 J	0.00407 J	NA	0.00457 J	NA	0.00218 J	NA	NA	NA	0.00103 U	0.00104 J	5.00E-04 J	0.00224 U	0.00119 U
Copper, SEM	NA	0.0646	0.0655	NA	0.068	NA	0.0695	NA	NA	NA	0.0572	0.024	0.0162	0.124	0.0167 J
Lead, SEM	NA	0.0696	0.266 D	NA	0.345 D	NA	0.232 D	NA	NA	NA	0.0505	0.0281	0.0228	0.0974	0.021
Mercury, SEM	NA	3.63E-05 NU	1.17E-04 U	NA	1.21E-04 U	NA	1.15E-04 U	NA	NA	NA	5.87E-05 U	4.63E-05 U	2.95E-05 U	1.27E-04 U	6.74E-05 U
Nickel, SEM	NA	0.0503 Y	0.0338 J	NA	0.0436 J	NA	0.0388 J	NA	NA	NA	0.00866 J	0.00419 J	0.00377 J	0.0262 J	0.0114 J
Silver, SEM	NA	0.00174 UY	0.00654 MU	NA	0.00583 U	NA	0.0055 U	NA	NA	NA	0.00282 U	0.00222 U	0.00141 U	0.00712 MU	0.00324 U
Wet Chemistry															
pH (ph)	8.04 H3	NA	6.81 H3	NA	6.81 H3	NA	6.83 H3	NA	NA	NA	7.24 H3	7.1 H3	7.1 H3	7.1 H3	6.83 H3
Total organic carbon (TOC) (mg/kg)	7,080	NA	74,400	NA	71,400	NA	75,900	NA	NA	NA	37,900 *	35,000 *	106,000	116,000	72,200 *
Grain Size (pct)															
Coarse Sand (%)	3.8	NA	0	NA	0	NA	0	NA	NA	NA	0	0.5	6.4	0.4	2.8
Fine Sand (%)	71.9	NA	10.8	NA	8.5	NA	18.3	NA	NA	NA	56.3	69.4	44.6	7.6	39.2
Fines (%)	4.2	NA	88.1	NA	89.6	NA	80.3	NA	NA	NA	34.1	22.9	19	89.9	52.1
Gravel (%)	10.8	NA	0	NA	0	NA	0	NA	NA	NA	0	0.1	14.7	0	3.3
Medium Sand (%)	9.3	NA	1.1	NA	1.9	NA	1.4	NA	NA	NA	9.6	7.1	15.3	2.1	2.6
Sand (%)	85	NA	11.9	NA	10.4	NA	19.7	NA	NA	NA	65.9	77	66.3	10.1	44.6
GRAINSIZE (PCT/P)															
GS03 Sieve 3" (75 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS05 Sieve 2" (50 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS06 Sieve 1.5" (37.5 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS07 Sieve 1" (25.0 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS08 Sieve 0.75" (19.0 mm)	100	NA	100	NA	100	NA	100	NA	NA	NA	100	100	100	100	100
GS10 Sieve 0.375" (9.5 mm)	94.6	NA	100	NA	100	NA	100	NA	NA	NA	100	100	92.4	100	100
Sieve No. 004 (4.75 mm)	89.2	NA	100	NA	100	NA	100	NA	NA	NA	100	99.9	85.3	100	96.7
Sieve No. 010 (2.00 mm)	85.4	NA	100	NA	100	NA	100	NA	NA	NA	100	99.4	78.9	99.6	93.9
Sieve No. 020 (850 um)	82.2	NA	99.7	NA	99.2	NA	99.6	NA	NA	NA	98.6	98.6	74.5	99.4	93
Sieve No. 040 (425 um)	76.1	NA	98.9	NA	98.1	NA	98.6	NA	NA	NA	90.4	92.3	63.6	97.5	91.3
Sieve No. 060 (250 um)	44.4	NA	97.6	NA	96.6	NA	95.3	NA	NA	NA	66	61.1	43.1	95.1	84.4
Sieve No. 080 (180 um)	18.1	NA	95.6	NA	95.2	NA	90	NA	NA	NA	50	37.3	30.4	93.5	73.8
Sieve No. 100 (150 um)	10.1	NA	93.7	NA	94.1	NA	86.9	NA	NA	NA	42.7	29.2	24.9	92.7	66.2
Sieve No. 200 (75 um)	4.2	NA	88.1	NA	89.6	NA	80.3	NA	NA	NA	34.1	22.9	19	89.9	52.1

Notes:

Shading indicates detections
NA - Not analyzed
* - Exceeding quality control criteria are associated with the reported result
B - Analyte not detected above the level reported in blanks
D - Compound identified in an analysis at a secondary dilution factor
H3- The sample for this analyte was received outside of the EPA recommended holding time
J - Analyte present, value may or may not be accurate or precise
K - Analyte present, value may be biased high, actual value may be lower
L - Analyte present, value may be biased low, actual value may be higher
M - Indicates that the sample matrix interfered with the quantitation of the analyte
N- The MS/MSD accuracy and/ or precision are outside criteria or the predigested spike recovery is not within control limits for the associated parameter
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
UL - Analyte not detected, quantitation limit is probably higher
Y- The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side
mg/kg - Milligrams per kilogram
pct - Percent
pct/p - Percent passed
ph - pH units
µg/kg - Micrograms per kilogram
µmol/g - Micromoles per gram

Appendix B.6
CAX Penniman Lake
Subsurface Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70	CAPL-SD71	CAPL-SD72	CAPL-SD73	CAPL-SD74		CAPL-SD75	CAPL-SD76	CAPL-SD77	CAPL-SD78	CAPL-SD79		CAPL-SD80		CAPL-SD81	CAPL-SD82
Sample ID	CAPL-SSD70-1012	CAPL-SSD71-1012	CAPL-SSD72-1012	CAPL-SSD73-1012	CAPL-SSD74-1012	CAPL-SSD74P-1012	CAPL-SSD75-1012	CAPL-SSD76-1012	CAPL-SSD77-1012	CAPL-SSD78-1012	CAPL-SSD79-1012	CAPL-SSD79-1012-V	CAPL-SSD80-1012	CAPL-SSD80-1012-V	CAPL-SSD81-1012	CAPL-SSD82-1012
Sample Date	10/17/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/16/12	10/16/12	10/16/12	10/25/12	10/16/12	10/25/12	10/18/12	10/18/12
Chemical Name																
Volatile Organic Compounds (µg/kg)																
1,1,1-Trichloroethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,1,2,2-Tetrachloroethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 UJ	4.85 UJ	13.1 UJ	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
1,1,2-Trichloroethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,1-Dichloroethane	4.48 UL	9.37 UL	12 UL	11.8 UL	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,1-Dichloroethene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UJ	2.42 UJ	6.56 UJ	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,2,3-Trichlorobenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,2,4-Trichlorobenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 UL	12.1 UL	18.8 UL	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 UL	22.7 UL
1,2-Dibromo-3-chloropropane	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 U	4.85 U	13.1 U	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
1,2-Dibromoethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,2-Dichlorobenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,2-Dichloroethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,2-Dichloropropane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,3-Dichlorobenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
1,4-Dichlorobenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
2-Butanone	43.3	71.6	39.6 J	92.6	49.2 J	59.5	71.2 J	3.66 J	8.71 J	27.9	NA	3.88 J	NA	57.3	22.7 J	116
2-Hexanone	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 U	4.85 U	13.1 U	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
4-Methyl-2-pentanone	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 U	4.85 U	13.1 U	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Acetone	141 J	271 J	151 J	347 J	224 J	234 J	323 J	17.3 J	36.3	107	NA	17.2 J	NA	195 J	120 J	438 J
Benzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Bromochloromethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Bromodichloromethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Bromoform	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Bromomethane	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 UJ	4.85 UJ	13.1 UJ	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Carbon disulfide	4.48 U	9.37 U	11.5 J	11.8 U	13.4 J	9.4 J	9.7 J	2.46 UJ	2.42 UJ	6.56 UJ	NA	3.29 U	NA	7.31 J	29.7	22.7 U
Carbon tetrachloride	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Chlorobenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Chloroethane	8.95 UJ	18.7 UJ	24.1 UJ	23.7 UJ	27.1 U	24.1 U	37.6 U	4.91 UJ	4.85 UJ	13.1 UJ	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Chloroform	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Chloromethane	8.95 UJ	18.7 UJ	24.1 UJ	23.7 UJ	27.1 UJ	24.1 UJ	37.6 UJ	4.91 UJ	4.85 UJ	13.1 UJ	NA	6.57 U	NA	10.4 U	24.2 UJ	45.5 UJ
cis-1,2-Dichloroethene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
cis-1,3-Dichloropropene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Cyclohexane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 UJ	6.56 UJ	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Dibromochloromethane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Dichlorodifluoromethane (Freon-12)	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 UJ	4.85 UJ	13.1 UJ	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Ethylbenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Isopropylbenzene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Methyl acetate	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 U	4.85 U	13.1 U	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Methylcyclohexane	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Methylene chloride	8.95 UJ	18.7 UJ	24.1 UJ	23.7 UJ	27.1 U	24.1 U	37.6 U	4.91 UJ	4.85 UJ	13.1 UJ	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Methyl-tert-butyl ether (MTBE)	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Styrene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 UL	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Tetrachloroethene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Toluene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
trans-1,2-Dichloroethene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
trans-1,3-Dichloropropene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Trichloroethene	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 U	NA	5.2 U	12.1 U	22.7 U
Trichlorofluoromethane (Freon-11)	8.95 U	18.7 U	24.1 U	23.7 U	27.1 U	24.1 U	37.6 U	4.91 U	4.85 U	13.1 U	NA	6.57 U	NA	10.4 U	24.2 U	45.5 U
Vinyl chloride	4.48 U	9.37 U	12 U	11.8 U	13.6 U	12.1 U	18.8 U	2.46 U	2.42 U	6.56 U	NA	3.29 UJ	NA	5.2 UJ	12.1 U	22.7 U
Xylene, total	13.4 U	28.1 U	36.1 U	35.5 U	40.7 U	36.2 U	56.4 U	7.37 UL	7.27 U	19.7 U	NA	9.86 U	NA	15.6 U	36.3 U	68.2 U
Semivolatile Organic Compounds (µg/kg)																
1,1-Biphenyl	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
1,2,4,5-Tetrachlorobenzene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,2'-Oxybis(1-chloropropane)	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,3,4,6-Tetrachlorophenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,4,5-Trichlorophenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,4,6-Trichlorophenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,4-Dichlorophenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,4-Dimethylphenol	110,000 U	2,200 U	3,910 U	3,020 U	3,260 U	3,120 U	15,600 U	876 U	871 U	1,620 U	967 U	NA	1,240 U	NA	680 U	22,600 U
2,4-Dinitrophenol	275,000 U	5,500 U	9,790 U	7,560 U	8,160 U	7,820 U	39,000 U	2,190 U	2,180 U	4,040 U	2,420 U	NA	3,100 U	NA	1,700 U	56,600 U
2,4-Dinitrotoluene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2,6-Dinitrotoluene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2-Chloronaphthalene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2-Chlorophenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2-Methylnaphthalene	1,420	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	10.7	40.3 U	9.45 J	NA	6.18 U	NA	11.5 U	113 U
2-Methylphenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
2-Nitroaniline	110,000 U	2,200 U	3,910 U	3,020 U	3,260 U	3,120 U	15,600 U	876 U	871 U	1,620 U	967 U	NA	1,240 U	NA	680 U	22,600 U
2-Nitrophenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
3,3'-Dichlorobenzidine	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
3-Nitroaniline	110,000 U	2,200 U	3,910 U	3,020 U	3,260 U	3,120 U	15,600 U	876 U	871 U	1,620 U	967 U	NA	1,240 U	NA	680 U	22,600 U
4,6-Dinitro-2-methylphenol	275,000 U	5,500 U	9,790 U	7,560 U	8,160 U	7,820 U	39,000 U	2,190 U	2,180 U	4,040 U	2,420 U	NA	3,100 U	NA	1,700 U	56,600 U
4-Bromophenyl-phenylether	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U

Appendix B.6
CAX Penniman Lake
Subsurface Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70	CAPL-SD71	CAPL-SD72	CAPL-SD73	CAPL-SD74		CAPL-SD75	CAPL-SD76	CAPL-SD77	CAPL-SD78	CAPL-SD79		CAPL-SD80		CAPL-SD81	CAPL-SD82
Sample ID	CAPL-SSD70-1012	CAPL-SSD71-1012	CAPL-SSD72-1012	CAPL-SSD73-1012	CAPL-SSD74-1012	CAPL-SSD74P-1012	CAPL-SSD75-1012	CAPL-SSD76-1012	CAPL-SSD77-1012	CAPL-SSD78-1012	CAPL-SSD79-1012	CAPL-SSD79-1012-V	CAPL-SSD80-1012	CAPL-SSD80-1012-V	CAPL-SSD81-1012	CAPL-SSD82-1012
Sample Date	10/17/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/16/12	10/16/12	10/16/12	10/25/12	10/16/12	10/25/12	10/18/12	10/18/12
Chemical Name																
4-Chloro-3-methylphenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
4-Chloroaniline	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
4-Chlorophenyl-phenylether	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
4-Methylphenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
4-Nitroaniline	110,000 U	2,200 U	3,910 U	3,020 U	3,260 U	3,120 U	15,600 U	876 U	871 U	1,620 U	967 U	NA	1,240 U	NA	680 U	22,600 U
4-Nitrophenol	110,000 U	2,200 U	3,910 U	3,020 U	3,260 U	3,120 U	15,600 U	876 U	871 U	1,620 U	967 U	NA	1,240 U	NA	680 U	22,600 U
Acenaphthene	79,800	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Acenaphthylene	548 U	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Acetophenone	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Anthracene	85,600	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Atrazine	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Benzaldehyde	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Benzo(a)anthracene	36,600	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	19.7	99.9	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Benzo(a)pyrene	20,500	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	9.1	18.9	87.4	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Benzo(b)fluoranthene	16,100	11 U	19.5 U	15.1 U	20.8 J	15.6 U	77.8 U	7.75 J	15.5	87.4	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Benzo(g,h,i)perylene	5,990	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	7.15 J	11	92	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Benzo(k)fluoranthene	17,700	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	5.29 J	18	68.1 J	4.83 U	NA	6.18 U	NA	11.5 U	113 U
bis(2-Chloroethoxy)methane	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
bis(2-Chloroethyl)ether	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
bis(2-Ethylhexyl)phthalate	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Butylbenzylphthalate	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Caprolactam	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Carbazole	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Chrysene	46,300	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	21.8	194	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Dibenz(a,h)anthracene	2,710	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Dibenzofuran	32,900 J	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Diethylphthalate	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Dimethyl phthalate	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Di-n-butylphthalate	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Di-n-octylphthalate	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Fluoranthene	125,000	11 U	19.5 U	15.1 U	27.1 J	15.6 U	77.8 U	6.27 J	24.2	186	16.2	NA	12.4 J	NA	11.5 U	113 U
Fluorene	81,700	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	40.3 U	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Hexachlorobenzene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Hexachlorobutadiene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Hexachlorocyclopentadiene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 R	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Hexachloroethane	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Indeno(1,2,3-cd)pyrene	5,960	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	5.21 J	10.6	63.3 J	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Isophorone	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Naphthalene	548 U	11 U	19.5 U	15.1 U	16.3 U	15.6 U	77.8 U	4.38 U	4.35 U	131	145	NA	6.18 U	NA	11.5 U	113 U
n-Nitroso-di-n-propylamine	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
n-Nitrosodiphenylamine	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Nitrobenzene	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Pentachlorophenol	110,000 U	2,200 U	3,910 U	3,020 U	3,260 U	3,120 U	15,600 U	876 U	871 U	1,620 U	967 U	NA	1,240 U	NA	680 U	22,600 U
Phenanthrene	287,000	11 U	19.5 U	15.1 U	22.3 J	15.6 U	77.8 U	4.38 U	4.35 U	131	4.83 U	NA	6.18 U	NA	11.5 U	113 U
Phenol	27,500 U	550 U	979 U	756 U	816 U	782 U	3,900 U	219 U	218 U	404 U	242 U	NA	310 U	NA	170 U	5,660 U
Pyrene	135,000	11 U	19.5 U	15.1 U	25.9 J	15.6 U	77.8 U	7.97 J	23.4	283	17.3	NA	11.1 J	NA	11.5 U	113 U
Pesticide/Polychlorinated Biphenyls (µg/kg)																
4,4'-DDD	70.7 J	3.85 J	1.98 U	6.99 J	2.96 J	1.86 J	1.58 U	3.16 J	0.438 UL	33.6 L	0.804 L	NA	0.607 U	NA	1.12 U	2.32 U
4,4'-DDE	50.1 J	8.61 J	1.98 U	21.6 J	6.22 J	5.12 J	3.67 J	6.3	20 J	251 J	32.7 J	NA	3.57 J	NA	1.12 U	4.8
4,4'-DDT	4.21 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.67 J	5.25 J	9.17 J	3.14 J	NA	0.607 U	NA	1.12 U	2.32 U
Aldrin	0.453 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.414 J	0.792 U	0.934 J	NA	0.607 U	NA	1.12 U	2.32 U
alpha-BHC	3.69 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 UL	0.438 UL	0.792 U	0.478 U	NA	0.606 J	NA	1.12 U	2.32 U
alpha-Chlordane	7.13 J	0.492 J	1.98 U	2.1 J	1.55 J	1.64 UL	1.58 U	0.447 U	3.88 L	34.7	9.94 L	NA	0.607 U	NA	1.12 U	2.32 U
Aroclor-1260	2,030 J	37.3 J	48.5 U	52.7 J	40.7 U	40.2 UL	38.6 U	10.9 U	1,170	3,020 J	630 J	NA	14.9 U	NA	27.4 U	36.6 J
beta-BHC	26.2 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.438 UL	0.792 U	1.12 L	NA	0.607 U	NA	1.12 U	2.32 U
delta-BHC	6.34 J	1.11 U	1.98 U	1.07 J	1.66 U	1.64 UL	1.58 U	0.447 UL	0.438 U	0.582 J	0.478 U	NA	0.607 U	NA	1.12 U	2.32 U
Dieldrin	8.03 J	2.1 J	1.98 U	3.01 J	1.66 U	0.919 J	1.58 U	0.447 U	5.14 J	50.1 L	6.88 J	NA	0.323 J	NA	1.12 U	2.32 U
Endosulfan I	0.571 UL	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.376 L	0.438 UL	1.21 J	0.22 J	NA	0.607 U	NA	1.12 U	2.32 U
Endosulfan II	0.806 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.438 UL	1.3 L	12.5 L	NA	0.607 U	NA	1.12 U	2.32 U
Endosulfan sulfate	45.9 J	0.946 J	1.98 U	1.48 J	0.921 J	1.64 UL	1.58 U	2.01 K	0.438 U	102 J	20.3 L	NA	0.607 U	NA	1.12 U	2.32 U
Endrin	23.9 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.355 J	0.438 UL	49 L	1.15 J	NA	0.607 U	NA	1.12 U	2.32 U
Endrin aldehyde	5.18 J	2.29 J	1.98 U	0.813 J	2.27 J	1.64 J	1.58 U	0.447 UL	3.54 J	16.2 L	2.1 J	NA	0.607 U	NA	1.12 U	2.32 U
Endrin ketone	3.62 J	2.73	1.98 U	3.04 J	1.66 U	1.64 L	1.58 U	0.447 U	3.41 J	8.6 J	1.72 J	NA	0.607 U	NA	1.12 U	2.32 U
gamma-BHC (Lindane)	0.201 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 U	0.438 U	0.683 J	0.478 U	NA	0.415 J	NA	1.12 U	2.32 U
gamma-Chlordane	26.9 J	1.11 J	16.4 J	2.69 J	14.7 J	8.95 J	1.8 J	0.667 L	26.1	212	40.6	NA	1.3	NA	1.85 J	3.72 J
Heptachlor	1.56 J	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	0.964 J	0.447 U	0.438 UL	0.792 U	0.478 U	NA	0.607 U	NA	1.12 U	2.32 U
Heptachlor epoxide	0.571 UL	1.11 U	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	0.447 UL	0.856 L	3.43 L	0.72 L	NA	0.607 U	NA	1.12 U	2.32 U
Methoxychlor	10.3 J	0.478 J	1.98 U	1.5 U	1.66 U	1.64 UL	1.58 U	1.12 J	3.14 J	276 J	9.38 J	NA	0.607 U	NA	1.12 U	2.32 U
Toxaphene	37 UL	71.9 UJ	128 UJ	97.2 UJ	108 UJ	106 UJ	102 UJ	28.9 UJ	28.4 UJ	51.3 UJ	30.9 UJ	NA	39.3 UJ	NA	72.5 UJ	150 UJ

Appendix B.6
CAX Penniman Lake
Subsurface Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD70	CAPL-SD71	CAPL-SD72	CAPL-SD73	CAPL-SD74		CAPL-SD75	CAPL-SD76	CAPL-SD77	CAPL-SD78	CAPL-SD79		CAPL-SD80		CAPL-SD81	CAPL-SD82
Sample ID	CAPL-SSD70-1012	CAPL-SSD71-1012	CAPL-SSD72-1012	CAPL-SSD73-1012	CAPL-SSD74-1012	CAPL-SSD74P-1012	CAPL-SSD75-1012	CAPL-SSD76-1012	CAPL-SSD77-1012	CAPL-SSD78-1012	CAPL-SSD79-1012	CAPL-SSD79-1012-V	CAPL-SSD80-1012	CAPL-SSD80-1012-V	CAPL-SSD81-1012	CAPL-SSD82-1012
Sample Date	10/17/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/16/12	10/16/12	10/16/12	10/25/12	10/16/12	10/25/12	10/18/12	10/18/12
Chemical Name																
Explosives (µg/kg)																
1,3,5-Trinitrobenzene	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
1,3-Dinitrobenzene	551	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	456	117 J	NA	199 U	NA	193 U	193 U
2,4,6-Trinitrotoluene	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
2-Amino-4,6-dinitrotoluene	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
2-Nitrotoluene	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
3,5-Dinitroaniline	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
3-Nitrotoluene	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
4-Amino-2,6-dinitrotoluene	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
4-Nitrotoluene	178 U	197 U	190 U	109 J	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
HMX	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
Nitroglycerin	444 U	928 J	476 U	1,160	485 U	493 U	842 J	467 U	500 U	498 U	483 U	NA	498 U	NA	483 U	968 J
Nitroguanidine	94.3 U	98 U	107 U	96.6 U	105 U	105 U	103 U	104 U	103 U	103 U	97.6 U	NA	103 U	NA	109 U	103 U
PETN	444 U	493 U	476 U	474 U	485 U	493 U	481 U	467 U	500 U	498 U	483 U	NA	498 U	NA	483 U	483 U
RDX	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
Tetryl	178 U	197 U	190 U	190 U	194 U	197 U	192 U	187 U	200 U	199 U	193 U	NA	199 U	NA	193 U	193 U
Total Metals (mg/kg)																
Aluminum	4,690	15,900	21,100	29,100	18,800	19,700	22,300	1,740	3,690	10,500	4,070	NA	3,660	NA	34,700	15,600
Antimony	3.53 U	6.84 U	11.9 U	9.26 U	4.01 U	3.93 U	3.83 U	0.577 UL	0.561 U	1.99 U	0.599 U	NA	1.47 U	NA	6.94 U	5.62 U
Arsenic	16.5	26.5	31.2	52	47	43.5	40.6	0.801	2.18	8.75	3.11	NA	4.29	NA	24.4	45.8
Barium	36.5	59.9	53.7 J	104	62.8	65.6	75.4	7.13	18.7	49.5	21.3	NA	17.1	NA	64.7	66.9
Beryllium	0.443 J	0.876 J	2.97 U	1.44 J	1.04 J	1.07 J	1.04 J	0.144 U	0.163 J	0.558 J	0.209 J	NA	0.26 J	NA	1.63 J	0.731 J
Cadmium	0.883 U	1.71 U	2.97 U	2.31 U	1 U	0.983 U	0.958 U	0.144 U	0.14 U	0.417 J	0.15 U	NA	0.188 J	NA	1.73 U	1.4 U
Calcium	27,300	96,100	20,800	92,000	54,700	59,900	68,300	481 K	667	4,650	1,650	NA	7,440	NA	8,270	85,200
Chromium	11.5	31.7	35.2	54.2	35.5	37.9	40.1	2.65	5.52	15.2	6.11	NA	7.39	NA	61.7	26.9
Cobalt	2.23 J	4.41 J	14.8 U	7.32 J	5.97 J	6.28	6.54	0.389 J	0.995	2.95 J	1.23	NA	0.949 J	NA	13.1	5.24 J
Copper	10.4	29.2	14.7 J	60	31.7	39.1	44	0.883	2.2	19.8	2.62	NA	3.4	NA	18.4	42.5
Cyanide	0.399 U	0.778 U	1.57 U	1.18 U	1.13 U	1.16 U	1.1 U	0.298 U	0.332 U	0.577 U	0.351 U	NA	0.434 U	NA	0.826 U	1.7 U
Iron	14,900	24,500	21,200	41,800	31,100	30,500	30,000	1,520	3,530	11,300	4,400	NA	4,880	NA	51,400	26,000
Lead	37.6	47.9	22.3	92.3	41.8	44	48.5	3.98	10.4	43	10.6	NA	9.16	NA	25	42.1
Magnesium	1,050 J	2,760 J	3,410 J	4,650 J	3,170	3,340	4,090	146 K	283 J	989 J	347 J	NA	579 J	NA	6,550	2,430 J
Manganese	48.4	106	120	180	151	150	142	5.77	8.18	32.3	12.3	NA	24.5	NA	317	144
Mercury	0.0538 J	0.12	0.167 U	0.13 J	0.106 J	0.106 J	0.113 J	0.0234 J	0.0244 J	0.0894 J	0.0331 J	NA	0.0297 J	NA	0.0813 J	0.0957 J
Nickel	4.07 J	9.94	12 J	18	13.4	14	15.8	0.945	1.94	6.36	2.15	NA	2.27	NA	26.1	12.5
Potassium	1,110 J	2,180 J	2,830 J	3,510 J	2,390 J	2,520	2,920	130 K	271 J	804 J	338 J	NA	486 J	NA	4,410	1,780 J
Selenium	2.21 U	4.28 U	7.42 U	5.79 U	2.51 U	2.46 U	2.4 U	0.36 U	0.351 U	1.24 U	0.374 U	NA	0.919 U	NA	4.33 U	3.51 U
Silver	0.883 U	1.71 U	2.97 U	2.31 U	1 U	0.983 U	0.958 U	0.144 U	0.14 U	0.497 U	0.15 U	NA	0.368 U	NA	1.73 U	1.4 U
Sodium	1,320 U	2,570 U	4,450 U	1,640 J	1,500 U	1,470 U	1,090 J	216 U	210 U	745 U	224 U	NA	552 U	NA	2,600 U	2,110 U
Thallium	1.77 U	3.42 U	5.94 U	4.63 U	2 U	1.97 U	1.92 U	0.288 U	0.28 U	0.993 U	0.299 U	NA	0.735 U	NA	3.47 U	2.81 U
Vanadium	14.7	41.1	48.9	67	48.8	50.2	52.9	3.89	7.92	23.5	9.04	NA	9.33	NA	76.9	39.8
Zinc	67.8	102	56.6	186	97.4	103	118	3.99	18.2	84.3	21.1	NA	20.3	NA	97.2	101
Wet Chemistry																
pH (ph)	7.02 H3	6.86 H3	7.36 H3	7.06 H3	7.71 H3	NA	7.13 H3	6.93 H3	7 H3	6.79 H3	7 H3	NA	7.53 H3	NA	7.25 H3	7.26 H3
Total organic carbon (TOC) (mg/kg)	33,600	44,500	165,000	57,300	124,000	NA	74,400	7,570	15,800	63,700	25,500	NA	37,000	NA	75,400	136,000

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

Appendix B.6
CAX Penniman Lake
Subsurface Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD84	CAPL-SD85	CAPL-SD86	CAPL-SD87	CAPL-SWSD62	CAPL-SWSD63	CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66		CAPL-SWSD67		CAPL-SWSD68	CAPL-SWSD69	
Sample ID	CAPL-SSD84-1012	CAPL-SSD85-1012	CAPL-SSD86-1012	CAPL-SSD87-1012	CAPL-SSD62-1012	CAPL-SSD63-1012	CAPL-SSD64-1012	CAPL-SSD65-1012	CAPL-SSD66-1012	CAPL-SSD66P-1012	CAPL-SSD67-1012	CAPL-SSD67-1012-V	CAPL-SSD68-1012	CAPL-SSD69-1012	CAPL-SSD69-1012-V
Sample Date	10/24/12	10/24/12	10/24/12	10/24/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/25/12	10/18/12	10/17/12	10/25/12
Chemical Name															
Volatile Organic Compounds (µg/kg)															
1,1,1-Trichloroethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,1,2,2-Tetrachloroethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
1,1,2-Trichloroethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,1-Dichloroethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 UL	12.1 UL	11.8 UL	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,1-Dichloroethene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,2,3-Trichlorobenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,2,4-Trichlorobenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 UL	2.55 UL	2.83 UL	NA	3.23 U	11.2 UL	NA	4.4 U
1,2-Dibromo-3-chloropropane	6.52 UJ	5.85 UJ	5.19 UJ	7.8 UJ	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
1,2-Dibromoethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,2-Dichlorobenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,2-Dichloroethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,2-Dichloropropane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,3-Dichlorobenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
1,4-Dichlorobenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
2-Butanone	7.37 J	3.55 J	6.23 J	23.9	89.3	138	117	19.4 J	6.49 J	8.17 J	NA	13.2	21.8 J	NA	44.8
2-Hexanone	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
4-Methyl-2-pentanone	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Acetone	25 J	16.7 J	26.3 J	90.6 J	331 J	459 J	415 J	77.6 J	35.4 J	35.8 J	NA	46.9 J	86.5 J	NA	133 J
Benzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Bromochloromethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Bromodichloromethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Bromoform	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Bromomethane	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Carbon disulfide	2.11 J	2.92 U	4.19 J	3.9 U	12.1 U	12.1 U	11.8 U	6.02 J	1.48 J	1.88 J	NA	3.23 U	14.8 J	NA	4.08 J
Carbon tetrachloride	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Chlorobenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Chloroethane	6.52 U	5.85 U	5.19 U	7.8 U	24.3 UJ	24.2 UJ	23.5 UJ	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Chloroform	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Chloromethane	6.52 U	5.85 U	5.19 U	7.8 U	24.3 UJ	24.2 UJ	23.5 UJ	14.8 UJ	5.1 UJ	5.66 UJ	NA	6.46 U	22.4 UJ	NA	8.8 U
cis-1,2-Dichloroethene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
cis-1,3-Dichloropropene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Cyclohexane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Dibromochloromethane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Dichlorodifluoromethane (Freon-12)	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Ethylbenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Isopropylbenzene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Methyl acetate	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Methylcyclohexane	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Methylene chloride	6.52 U	5.85 U	5.19 U	7.8 U	24.3 UJ	24.2 UJ	23.5 UJ	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Methyl-tert-butyl ether (MTBE)	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Styrene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Tetrachloroethene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Toluene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
trans-1,2-Dichloroethene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
trans-1,3-Dichloropropene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Trichloroethene	3.26 U	2.92 U	2.59 U	3.9 U	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 U	11.2 U	NA	4.4 U
Trichlorofluoromethane (Freon-11)	6.52 U	5.85 U	5.19 U	7.8 U	24.3 U	24.2 U	23.5 U	14.8 U	5.1 U	5.66 U	NA	6.46 U	22.4 U	NA	8.8 U
Vinyl chloride	3.26 UJ	2.92 UJ	2.59 UJ	3.9 UJ	12.1 U	12.1 U	11.8 U	7.41 U	2.55 U	2.83 U	NA	3.23 UJ	11.2 U	NA	4.4 UJ
Xylene, total	9.78 U	8.77 U	7.78 U	11.7 U	36.4 U	36.3 U	35.3 U	22.2 U	7.65 U	8.49 U	NA	9.69 U	33.5 U	NA	13.2 U
Semivolatile Organic Compounds (µg/kg)															
1,1-Biphenyl	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
1,2,4,5-Tetrachlorobenzene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,2'-Oxybis(1-chloropropane)	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,3,4,6-Tetrachlorophenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,4,5-Trichlorophenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,4,6-Trichlorophenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,4-Dichlorophenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,4-Dimethylphenol	820 U	822 U	842 U	944 U	2,520 U	2,560 U	2,620 U	1,980 U	921 U	920 U	1,100 U	NA	2,930 U	1,140 U	NA
2,4-Dinitrophenol	2,050 U	2,060 U	2,110 U	2,360 U	6,310 U	6,410 U	6,560 U	4,960 U	2,310 U	2,300 U	2,760 U	NA	7,350 U	2,850 U	NA
2,4-Dinitrotoluene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2,6-Dinitrotoluene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2-Chloronaphthalene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2-Chlorophenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2-Methylnaphthalene	4.09 U	4.1 U	4.2 U	47.2 U	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	8.35 J	NA	14.6 U	5.68 U	NA
2-Methylphenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
2-Nitroaniline	820 U	822 U	842 U	944 U	2,520 U	2,560 U	2,620 U	1,980 U	921 U	920 U	1,100 U	NA	2,930 U	1,140 U	NA
2-Nitrophenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
3,3'-Dichlorobenzidine	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
3-Nitroaniline	820 U	822 U	842 U	944 U	2,520 U	2,560 U	2,620 U	1,980 U	921 U	920 U	1,100 U	NA	2,930 U	1,140 U	NA
4,6-Dinitro-2-methylphenol	2,050 U	2,060 U	2,110 U	2,360 U	6,310 U	6,410 U	6,560 U	4,960 U	2,310 U	2,300 U	2,760 U	NA	7,350 U	2,850 U	NA
4-Bromophenyl-phenylether	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA

Appendix B.6
CAX Penniman Lake
Subsurface Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD84	CAPL-SD85	CAPL-SD86	CAPL-SD87	CAPL-SWSD62	CAPL-SWSD63	CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66		CAPL-SWSD67		CAPL-SWSD68	CAPL-SWSD69	
Sample ID	CAPL-SSD84-1012	CAPL-SSD85-1012	CAPL-SSD86-1012	CAPL-SSD87-1012	CAPL-SSD62-1012	CAPL-SSD63-1012	CAPL-SSD64-1012	CAPL-SSD65-1012	CAPL-SSD66-1012	CAPL-SSD66P-1012	CAPL-SSD67-1012	CAPL-SSD67-1012-V	CAPL-SSD68-1012	CAPL-SSD69-1012	CAPL-SSD69-1012-V
Sample Date	10/24/12	10/24/12	10/24/12	10/24/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/25/12	10/18/12	10/17/12	10/25/12
Chemical Name															
4-Chloro-3-methylphenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
4-Chloroaniline	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
4-Chlorophenyl-phenylether	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
4-Methylphenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
4-Nitroaniline	820 U	822 U	842 U	944 U	2,520 U	2,560 U	2,620 U	1,980 U	921 U	920 U	1,100 U	NA	2,930 U	1,140 U	NA
4-Nitrophenol	820 U	822 U	842 U	944 U	2,520 U	2,560 U	2,620 U	1,980 U	921 U	920 U	1,100 U	NA	2,930 U	1,140 U	NA
Acenaphthene	4.09 U	4.1 U	4.2 U	1,270 K	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	8.55 J	NA	14.6 U	5.68 U	NA
Acenaphthylene	4.09 U	4.1 U	4.2 U	47.2 U	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	5.49 U	NA	14.6 U	5.68 U	NA
Acetophenone	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Anthracene	4.09 U	4.1 U	4.2 U	2,650	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	25.1	NA	14.6 U	5.68 U	NA
Atrazine	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Benzaldehyde	205 U	206 U	211 U	236 U	631 U	931 J	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Benzo(a)anthracene	4.09 U	4.1 U	4.43 J	2,300	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	230	NA	14.6 U	5.68 U	NA
Benzo(a)pyrene	4.09 U	4.1 U	4.2 U	1,230 K	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	369	NA	14.6 U	5.68 U	NA
Benzo(b)fluoranthene	4.09 U	4.1 U	6.61 K	1,400 K	12.6 U	80.1 J	13.1 U	9.9 U	4.6 U	4.6 U	392	NA	14.6 U	5.68 U	NA
Benzo(g,h,i)perylene	4.09 U	4.1 U	4.2 U	466 K	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	246	NA	14.6 U	5.68 U	NA
Benzo(k)fluoranthene	4.09 U	4.1 U	4.2 U	726	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	467	NA	14.6 U	5.68 U	NA
bis(2-Chloroethoxy)methane	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
bis(2-Chloroethyl)ether	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
bis(2-Ethylhexyl)phthalate	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Butylbenzylphthalate	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Caprolactam	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Carbazole	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Chrysene	4.09 U	4.1 U	6.28 K	2,350 K	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	359	NA	14.6 U	5.68 U	NA
Dibenz(a,h)anthracene	4.09 U	4.1 U	4.2 U	134 K	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	77.5	NA	14.6 U	5.68 U	NA
Dibenzofuran	205 U	206 U	211 U	380 J	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Diethylphthalate	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Dimethyl phthalate	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Di-n-butylphthalate	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Di-n-octylphthalate	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Fluoranthene	9.91	4.1 U	11	6,230	12.6 U	127 J	13.1 U	9.9 U	4.6 U	4.6 U	199	NA	14.6 U	5.68 U	NA
Fluorene	4.09 U	4.1 U	4.2 U	1,340 K	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	10.7 J	NA	14.6 U	5.68 U	NA
Hexachlorobenzene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Hexachlorobutadiene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Hexachlorocyclopentadiene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 R	NA
Hexachloroethane	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Indeno(1,2,3-cd)pyrene	4.09 U	4.1 U	4.33 J	386	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	221	NA	14.6 U	5.68 U	NA
Isophorone	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Naphthalene	4.09 U	4.1 U	4.2 U	47.2 U	12.6 U	63.9 U	13.1 U	9.9 U	4.6 U	4.6 U	8.6 J	NA	14.6 U	5.68 U	NA
n-Nitroso-di-n-propylamine	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
n-Nitrosodiphenylamine	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Nitrobenzene	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Pentachlorophenol	820 U	822 U	842 U	944 U	2,520 U	2,560 U	2,620 U	1,980 U	921 U	920 U	1,100 U	NA	2,930 U	1,140 U	NA
Phenanthrene	6.8 J	4.1 U	4.95 J	7,590	12.6 U	112 J	13.1 U	9.9 U	4.6 U	4.6 U	64.4	NA	14.6 U	5.68 U	NA
Phenol	205 U	206 U	211 U	236 U	631 U	641 U	656 U	496 U	231 U	230 U	276 U	NA	735 U	285 U	NA
Pyrene	9.78 K	4.1 U	8.84 K	6,970 K	12.6 U	111 J	13.1 U	9.9 U	4.6 U	4.6 U	226	NA	14.6 U	5.68 U	NA
Pesticide/Polychlorinated Biphenyls (µg/kg)															
4,4'-DDD	0.422 U	3.02 J	7.08 L	13.6 J	17.7 J	3.06 J	5.53 J	0.986 U	0.471 U	0.465 U	2.18 L	NA	1.48 U	0.434 J	NA
4,4'-DDE	17.1 J	9.61	23.5 L	2.09 J	26.4 J	10.1 J	9.13 J	3.35 J	0.617 J	0.567 J	14 L	NA	1.48 U	1.51 J	NA
4,4'-DDT	218 J	11.2 J	13.9 J	0.441 J	0.848 J	0.959 J	1.36 UL	0.986 U	0.471 U	0.465 U	1.51 J	NA	1.48 U	0.569 UL	NA
Aldrin	5.33 J	0.196 J	0.715 J	0.493 UL	1.27 UL	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.531 L	NA	1.48 U	0.569 UL	NA
alpha-BHC	0.422 U	0.423 U	0.441 U	0.493 UL	0.563 J	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
alpha-Chlordane	13.4 J	3.34	17 J	1.48 J	1.64 L	1.04 L	1.44 L	0.457 J	0.471 U	0.465 U	0.908 L	NA	1.48 U	0.569 UL	NA
Aroclor-1260	34,200 J	1,840 J	3,700 J	138 L	169 J	217 J	33.4 UL	24.2 U	7.74 J	6.18 J	230 L	NA	36.1 U	13.9 UL	NA
beta-BHC	0.422 U	0.423 U	0.441 UL	1.26	1.27 UL	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
delta-BHC	0.505 J	0.423 U	0.642 L	0.387 L	1.27 UL	0.509 J	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
Dieldrin	709	4.07 J	62.4 J	3.49 J	4.65 J	4.36 J	1.36 UL	0.986 U	0.471 U	0.465 U	1.11 L	NA	1.48 U	1.07 J	NA
Endosulfan I	0.422 U	0.354 J	0.663 J	0.493 UL	1.27 UL	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
Endosulfan II	483 J	18.1 J	39.7 J	0.595 J	2.1 J	2.44 J	1.36 UL	0.986 U	0.471 U	0.465 U	0.604 L	NA	1.48 U	0.569 UL	NA
Endosulfan sulfate	129 J	0.423 U	0.441 U	0.493 UL	6.42 J	9.51 J	1.36 UL	1.66 J	0.471 U	0.465 U	0.355 L	NA	1.48 U	0.37 J	NA
Endrin	59.1 J	12.2 J	31.1 J	3.12 J	0.859 J	1.09 J	1.36 UL	0.986 U	0.471 U	0.465 U	3.15 L	NA	1.48 U	0.863 J	NA
Endrin aldehyde	30 J	1.56 J	2.55 J	0.284 J	5.11 L	4.52 J	1.36 UL	1.45 J	0.471 U	0.465 U	3.73 L	NA	1.48 U	0.867 J	NA
Endrin ketone	28 J	5.59 J	13.1 J	0.592 J	16.5 J	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
gamma-BHC (Lindane)	0.427 J	0.423 U	0.441 UL	0.493 UL	1.27 UL	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
gamma-Chlordane	40.8 B	11.6	38.1 B	7.05 L	2.12 J	12.2 L	1.26 J	9.23 B	1.01 J	1.23 J	5.22 L	NA	1.56 J	4.77 K	NA
Heptachlor	0.422 U	0.423 U	0.441 U	0.493 UL	1.27 UL	1.35 UL	1.36 UL	0.927 J	0.471 U	0.465 U	0.54 L	NA	1.48 U	0.569 U	NA
Heptachlor epoxide	6.42 J	0.965 J	1.75 L	0.422 J	1.27 UL	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	0.548 UL	NA	1.48 U	0.569 UL	NA
Methoxychlor	137 J	5.58 J	10.1 J	0.947 J	16.2 J	1.35 UL	1.36 UL	0.986 U	0.471 U	0.465 U	2.42 J	NA	1.48 U	0.569 U	NA
Toxaphene	27.3 UJ	27.4 UJ	28.5 UJ	31.9 UJ	82.4 UJ	87.5 UJ	88.2 UJ	63.8 UJ	30.5 UJ	30.1 UJ	35.5 UJ	NA	95.5 UJ	36.8 UJ	NA

Appendix B.6
CAX Penniman Lake
Subsurface Sediment Analytical Results
October - November 2012

Station ID	CAPL-SD84	CAPL-SD85	CAPL-SD86	CAPL-SD87	CAPL-SWSD62	CAPL-SWSD63	CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66		CAPL-SWSD67		CAPL-SWSD68	CAPL-SWSD69	
Sample ID	CAPL-SSD84-1012	CAPL-SSD85-1012	CAPL-SSD86-1012	CAPL-SSD87-1012	CAPL-SSD62-1012	CAPL-SSD63-1012	CAPL-SSD64-1012	CAPL-SSD65-1012	CAPL-SSD66-1012	CAPL-SSD66P-1012	CAPL-SSD67-1012	CAPL-SSD67-1012-V	CAPL-SSD68-1012	CAPL-SSD69-1012	CAPL-SSD69-1012-V
Sample Date	10/24/12	10/24/12	10/24/12	10/24/12	10/17/12	10/17/12	10/17/12	10/18/12	10/18/12	10/18/12	10/16/12	10/25/12	10/18/12	10/17/12	10/25/12
Chemical Name															
Explosives (µg/kg)															
1,3,5-Trinitrobenzene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
1,3-Dinitrobenzene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
2,4,6-Trinitrotoluene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
2-Amino-4,6-dinitrotoluene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
2-Nitrotoluene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
3,5-Dinitroaniline	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
3-Nitrotoluene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
4-Amino-2,6-dinitrotoluene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
4-Nitrotoluene	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
HMX	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
Nitroglycerin	500 U	455 U	455 U	476 U	326 J	490 U	996 J	459 U	444 U	455 U	495 U	NA	493 U	467 U	NA
Nitroguanidine	93.9 U	99.5 U	101 U	102 U	103 U	98 U	92.6 U	97.1 U	103 U	102 U	93 U	NA	109 U	99 U	NA
PETN	500 U	455 U	455 U	476 U	493 U	490 U	485 U	459 U	444 U	455 U	495 U	NA	493 U	467 U	NA
RDX	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
Tetryl	200 U	182 U	182 U	190 U	197 U	196 U	194 U	183 U	178 U	182 U	198 U	NA	197 U	187 U	NA
Total Metals (mg/kg)															
Aluminum	5,360	6,220	2,840	7,680	18,800	17,800	19,300	20,300	1,770	1,920	2,100	NA	30,700	3,460	NA
Antimony	1.04 U	2.58 J	2.59 U	2.86 U	7.6 U	8 U	8.22 U	5.96 U	0.564 U	0.56 U	1.32 U	NA	8.7 U	0.679 UL	NA
Arsenic	5.1	5.72	3.16 J	5.28	44.3	27.4	22.8	19	2.33	2.74	9.01	NA	22.5	5.86	NA
Barium	25.6	49.9	28.2	32.1	70.2	86.7	71.5	40.3	13.1 J	8.81 J	9.73	NA	60	10.2	NA
Beryllium	0.474 J	3.09	1.6 J	0.572 J	1.9 U	2 U	1.15 J	1.49 U	0.156 J	0.153 J	0.329 U	NA	1.14 J	0.224 J	NA
Cadmium	0.259 U	0.656 U	0.648 U	0.715 U	1.9 U	2 U	2.06 U	1.49 U	0.141 U	0.14 U	0.329 U	NA	2.17 U	0.17 U	NA
Calcium	74,500	61,500	36,500	34,300	82,000	104,000	74,300	8,410	1,290	1,350	2,130	NA	13,400	2,080	NA
Chromium	14.1	27.6	15.1	18.6	45	35.2	39.3	30.7 J	3.99 J	4.3	4.65	NA	51.4 J	10.3	NA
Cobalt	1.74	11.4	9.62	2.78 J	9.5 U	10 U	6.01 J	5.51 J	0.507 J	0.578 J	1.64 U	NA	6.73 J	0.761 J	NA
Copper	2.69	379	160	10.9	34.4	32.3	37.6	11.4	1.43	1.59	4.45	NA	16.3	3.46	NA
Cyanide	0.205 J	0.246 J	0.321 U	0.349 U	0.892 U	0.962 U	1.01 U	0.745 U	0.327 U	0.352 U	0.396 U	NA	1.04 U	0.399 UL	NA
Iron	14,000	28,400	9,490	15,300	30,400	33,700	29,600	25,600	2,530	2,870	4,330	NA	28,400	9,000	NA
Lead	13.5	236	236	26.4	107	68.4	57.6	15.6	3.41	4.1	18.2	NA	19.6	4.92	NA
Magnesium	1,430 J	2,210 J	846 J	1,370 J	2,500 J	2,720 J	2,620 J	3,260 J	247 J	262 J	405 J	NA	5,360 J	767 K	NA
Manganese	35.4	153	79.2	31.4	108	139	97.2	105	9.66	11.7	30.7	NA	160	24.6	NA
Mercury	0.0229 B	0.0155 B	0.0185 B	0.0922 B	0.115 J	0.252	1.45	0.0484 J	0.035 U	0.0384 U	0.0493 J	NA	0.0582 J	0.0233 J	NA
Nickel	3.58	242	118	7.09	11	10.9	12.7	12.6	1.08	1.21	1.55 J	NA	18.6	2.18 B	NA
Potassium	1,640	3,040	630 J	1,630 J	2,220 J	2,190 J	2,430 J	2,470 J	304 J	329 J	367 J	NA	4,110 J	1,190 K	NA
Selenium	0.647 U	1.64 U	1.62 U	1.79 U	4.75 U	5 U	5.14 U	3.73 U	0.353 U	0.35 U	0.822 U	NA	5.43 U	0.424 U	NA
Silver	0.259 UJ	0.656 UJ	0.648 UJ	0.715 UJ	1.9 U	2 U	2.06 U	1.49 U	0.141 U	0.14 U	0.329 U	NA	2.17 U	0.17 U	NA
Sodium	331 J	539 J	972 U	1,070 U	2,850 U	3,000 U	5,440	2,240 U	212 U	73.4 J	493 U	NA	1,850 J	255 U	NA
Thallium	0.518 U	1.31 U	1.3 U	1.43 U	3.8 U	4 U	4.11 U	2.98 U	0.282 U	0.28 U	0.658 U	NA	4.35 U	0.339 U	NA
Vanadium	13.8	21.2	8.15	20.4	45	40	46.6	39.6	6.04	6.62	6.4	NA	73.6	12.1	NA
Zinc	28.3	1,040	927	73.6	215	165	155	69	6.03	6.81	50.7	NA	74.6	14.7	NA
Wet Chemistry															
pH (ph)	8.02 H3	8.28 H3	7.91 H3	7.92 H3	7.31 H3	6.92 H3	6.89 H3	7.16 H3	7.35 H3	NA	7.34 H3	NA	7.53 H3	6.77 H3	NA
Total organic carbon (TOC) (mg/kg)	4,950	2,510	11,400	32,400	45,400	103,000	124,000	63,000	10,700	NA	30,900	NA	88,200	28,400	NA

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Notes:

Shading indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

H3- The sample for this analyte was received outside of the EPA recommended holding time

J - Analyte present, value may or may not be accurate or precise

K - Analyte present, value may be biased high, actual value may be lower

L - Analyte present, value may be biased low, actual value may be higher

R - Unreliable Result

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

UL - Analyte not detected, quantitation limit is probably higher

mg/kg - Milligrams per kilogram

ph - pH units

µg/kg - Micrograms per kilogram

Appendix B.7
CAX Penniman Lake
Surface Water Analytical Results
October 2012

Station ID	CAPL-SWSD62	CAPL-SWSD63		CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SW62-1012	CAPL-SW63-1012	CAPL-SW63P-1012	CAPL-SW64-1012	CAPL-SW65-1012	CAPL-SW66-1012	CAPL-SW67-1012	CAPL-SW68-1012	CAPL-SW69-1012
Sample Date	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12
Chemical Name									
Volatile Organic Compounds (µg/l)									
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,4-Dichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
4-Methyl-2-pentanone	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Acetone	63.7 J	22	5 U	5 U	2.51 J	5 U	5 U	5 U	5 U
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	1.86	3.08	6.88	0.5 U	4.84	6.48	6.01	6.69	6.25
cis-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cyclohexane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl acetate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylcyclohexane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl-tert-butyl ether (MTBE)	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane (Freon-11)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
Xylene, total	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U

Appendix B.7
CAX Penniman Lake
Surface Water Analytical Results
October 2012

Station ID	CAPL-SWSD62	CAPL-SWSD63		CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SW62-1012	CAPL-SW63-1012	CAPL-SW63P-1012	CAPL-SW64-1012	CAPL-SW65-1012	CAPL-SW66-1012	CAPL-SW67-1012	CAPL-SW68-1012	CAPL-SW69-1012
Sample Date	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12
Chemical Name									
Semivolatile Organic Compounds (µg/l)									
1,1-Biphenyl	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
1,2,4,5-Tetrachlorobenzene	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2,2'-Oxybis(1-chloropropane)	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2,3,4,6-Tetrachlorophenol	4.72 U	4.81 U	4.81 U	4.72 U	4.63 U	4.72 U	4.72 U	4.9 U	4.72 U
2,4,5-Trichlorophenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2,4,6-Trichlorophenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2,4-Dichlorophenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2,4-Dimethylphenol	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
2,4-Dinitrophenol	23.6 U	24 U	24 U	23.6 U	23.1 U	23.6 U	23.6 U	24.5 U	23.6 U
2,4-Dinitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
2,6-Dinitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
2-Chloronaphthalene	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2-Chlorophenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2-Methylnaphthalene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0943 U
2-Methylphenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
2-Nitroaniline	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
2-Nitrophenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
3,3'-Dichlorobenzidine	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
3-Nitroaniline	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
4,6-Dinitro-2-methylphenol	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
4-Bromophenyl-phenylether	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
4-Chloro-3-methylphenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
4-Chloroaniline	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
4-Chlorophenyl-phenylether	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
4-Methylphenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
4-Nitroaniline	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
4-Nitrophenol	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
Acenaphthene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.134 J	0.0943 U	0.098 U	0.0943 U
Acenaphthylene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0943 U
Acetophenone	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Anthracene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.126 J	0.0943 U	0.098 U	0.0943 U
Atrazine	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Benzaldehyde	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Benzo(a)anthracene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0707 J	0.0943 U	0.098 U	0.0563 J
Benzo(a)pyrene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0943 U
Benzo(b)fluoranthene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0549 J
Benzo(g,h,i)perylene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0684 J
Benzo(k)fluoranthene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0615 J
bis(2-Chloroethoxy)methane	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
bis(2-Chloroethyl)ether	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
bis(2-Ethylhexyl)phthalate	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Butylbenzylphthalate	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Caprolactam	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Carbazole	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Chrysene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0693 J	0.0943 U	0.098 U	0.0783 J
Dibenz(a,h)anthracene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0782 J
Dibenzofuran	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Diethylphthalate	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Dimethyl phthalate	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Di-n-butylphthalate	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Di-n-octylphthalate	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Fluoranthene	0.0604 J	0.0962 U	0.0668 J	0.0488 J	0.0926 U	0.173 J	0.0943 U	0.098 U	0.0943 U
Fluorene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.131 J	0.0943 U	0.098 U	0.0943 U
Hexachlorobenzene	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Hexachlorobutadiene	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Hexachlorocyclopentadiene	4.72 R	4.81 R	4.81 R	4.72 R	4.63 R	4.72 R	4.72 R	4.9 R	4.72 R
Hexachloroethane	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Indeno(1,2,3-cd)pyrene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.076 J
Isophorone	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Naphthalene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.0943 U	0.0943 U	0.098 U	0.0943 U
n-Nitroso-di-n-propylamine	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
n-Nitrosodiphenylamine	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Nitrobenzene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
Pentachlorophenol	9.43 U	9.62 U	9.62 U	9.43 U	9.26 U	9.43 U	9.43 U	9.8 U	9.43 U
Phenanthrene	0.189 U	0.192 U	0.192 U	0.189 U	0.185 U	0.455	0.189 U	0.196 U	0.189 U
Phenol	2.36 U	2.4 U	2.4 U	2.36 U	2.31 U	2.36 U	2.36 U	2.45 U	2.36 U
Pyrene	0.0943 U	0.0962 U	0.0962 U	0.0943 U	0.0926 U	0.19	0.0943 U	0.098 U	0.0943 U

Appendix B.7
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Station ID	CAPL-SWSD62	CAPL-SWSD63		CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SW62-1012	CAPL-SW63-1012	CAPL-SW63P-1012	CAPL-SW64-1012	CAPL-SW65-1012	CAPL-SW66-1012	CAPL-SW67-1012	CAPL-SW68-1012	CAPL-SW69-1012
Sample Date	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12
Chemical Name									
Pesticide/Polychlorinated Biphenyls (µg/l)									
4,4'-DDD	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
4,4'-DDE	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
4,4'-DDT	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Aldrin	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
alpha-BHC	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
alpha-Chlordane	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Aroclor-1260	0.25 U	0.25 U	0.25 U	0.24 U	0.24 U	0.245 U	0.236 U	0.24 U	0.236 U
beta-BHC	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
delta-BHC	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Dieldrin	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Endosulfan I	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Endosulfan II	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Endosulfan sulfate	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Endrin	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Endrin aldehyde	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Endrin ketone	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
gamma-BHC (Lindane)	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
gamma-Chlordane	0.0107 B	0.00709 B	0.0167 B	0.0211 B	0.00378 B	0.0105 B	0.00974 B	0.00962 U	0.00551 B
Heptachlor	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00538 J
Heptachlor epoxide	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Methoxychlor	0.01 U	0.01 U	0.01 U	0.00962 U	0.00962 U	0.0098 U	0.00943 U	0.00962 U	0.00943 U
Toxaphene	0.667 U	0.667 U	0.667 U	0.641 U	0.641 U	0.654 U	0.629 U	0.641 U	0.629 U
Explosives (µg/l)									
1,3,5-Trinitrobenzene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
1,3-Dinitrobenzene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
2,4,6-Trinitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
2-Amino-4,6-dinitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
2-Nitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
3,5-Dinitroaniline	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
3-Nitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
4-Amino-2,6-dinitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.108 L	0.157 UL	0.16 UL
4-Nitrotoluene	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
HMX	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
Nitroglycerin	0.444 U	0.392 U	0.392 U	0.444 U	0.396 U	0.471 U	0.444 UL	0.392 UL	0.4 UL
Nitroguanidine	10 UL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
PETN	0.444 U	0.392 U	0.392 U	0.444 U	0.396 U	0.471 U	0.444 UL	0.392 UL	0.4 UL
RDX	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 UL	0.157 UL	0.16 UL
Tetryl	0.178 U	0.157 U	0.157 U	0.178 U	0.158 U	0.188 U	0.178 R	0.157 UL	0.16 UL
Total Metals (µg/l)									
Aluminum	55.2 B	55.8 B	50.7 B	54 B	46.8 B	33.1 B	46.1 B	28.5 B	44.4 B
Antimony	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Arsenic	1.5 J	1.54 J	1.64 J	1.44 J	2.01 J	1.37 J	1.85 J	1.62 J	1.7 J
Barium	20.1	19.4	19.5	19.1	21.6	20.4	21	21	20.4
Beryllium	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cadmium	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Calcium	37,300	36,300	38,000	36,700	37,300	33,800	36,700	35,600	36,200
Chromium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cobalt	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Copper	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Cyanide	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	361	328	321	390	337	302	359	301	344
Lead	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Magnesium	1,550	1,560	1,570	1,530	1,590	1,380	1,590	1,400	1,490
Manganese	41.3	39.9	40.3	53.5	49.4	47.2	49	49.8	47.5
Mercury	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Potassium	2,770	2,750	2,800	2,730	2,820	2,640	2,840	2,660	2,780
Selenium	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U
Silver	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Sodium	9,100	9,200	9,210	9,020	9,370	8,330	9,410	8,370	8,970
Thallium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Zinc	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U

Appendix B.7
CAX Penniman Lake
Surface Water Analytical Results
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Station ID	CAPL-SWSD62	CAPL-SWSD63		CAPL-SWSD64	CAPL-SWSD65	CAPL-SWSD66	CAPL-SWSD67	CAPL-SWSD68	CAPL-SWSD69
Sample ID	CAPL-SW62-1012	CAPL-SW63-1012	CAPL-SW63P-1012	CAPL-SW64-1012	CAPL-SW65-1012	CAPL-SW66-1012	CAPL-SW67-1012	CAPL-SW68-1012	CAPL-SW69-1012
Sample Date	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12	10/15/12
Chemical Name									
Dissolved Metals (µg/l)									
Aluminum, Dissolved	27.2 B	26 B	30 B	27.3 B	17.1 B	19.4 B	21.6 B	21.1 B	25.4 B
Antimony, Dissolved	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Arsenic, Dissolved	1.31 J	1.2 J	1.32 J	1.17 J	1.19 J	1.26 J	1.24 J	1.15 J	1.42 J
Barium, Dissolved	18.5	19.5	18.1	18.4	19.5	19.1	19.2	20.1	19
Beryllium, Dissolved	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Cadmium, Dissolved	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Calcium, Dissolved	38,400	41,600	37,100	37,400	34,700	33,800	35,400	35,500	35,600
Chromium, Dissolved	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cobalt, Dissolved	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Copper, Dissolved	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Iron, Dissolved	62.4	83.1	73.4	71.7	73.5	73.2	83.8	76.7	97.6
Lead, Dissolved	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Magnesium, Dissolved	1,570	1,680	1,540	1,560	1,380	1,360	1,440	1,460	1,500
Manganese, Dissolved	14.9	16.1	14.4	13.6	9.88	9.86	12.6	10.4	10.4
Mercury, Dissolved	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
Nickel, Dissolved	1.5 U	1.5 U	1.5 U	1.5 U	1.96 J	1.5 U	1.5 U	1.5 U	1.5 U
Potassium, Dissolved	2,780	2,930	2,720	2,770	2,630	2,600	2,690	2,700	2,710
Selenium, Dissolved	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U
Silver, Dissolved	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Sodium, Dissolved	9,220	9,650	9,130	9,220	8,370	8,250	8,630	8,690	9,000
Thallium, Dissolved	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vanadium, Dissolved	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Zinc, Dissolved	2.5 U	1.33 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Wet Chemistry									
Hardness (mg/l)	91.3	90.7	NA	89.9	86.3	86.5	86.9	87.1	88.1

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Notes:

Shading indicates detections
NA - Not analyzed
B - Analyte not detected above the level reported in blanks
J - Analyte present, value may or may not be accurate or precise
L - Analyte present, value may be biased low, actual value may be higher
R - Unreliable Result
U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
UL - Analyte not detected, quantitation limit is probably higher
mg/l - Milligrams per liter
µg/l - Micrograms per liter

Attachment C
Human Health Risk Screening

APPENDIX C

Human Health Risk Screening

The human health risk screening (HHRS) was prepared to identify constituents to be analyzed in fish tissue samples collected from Penniman Lake. The sediment data collected from Penniman Lake were evaluated to identify constituents detected in sediment that may bioaccumulate in fish tissue at levels of potential concern to recreational fishermen and their families that might ingest fish caught in the lake.

The HHRS consisted of two parts: 1) a screening step to identify chemicals of potential concern (COPCs) in sediment to recreational anglers and their families that may ingest fish from the lake (i.e., chemicals that are considered bioaccumulative in biota such as fish), and 2) calculation of potential risks associated with ingestion of fish. The screening approach/methodology and results are presented in following sections. The HHRS tables provided in this Appendix are presented in the format recommended in the *RAGS: Volume I Human Health Evaluation Manual Part D* (USEPA, 2001).

Identification of COPCs

The identification of bioaccumulative COPCs in sediment includes data collection, evaluation, and screening steps.

Data Used in the HHRS

Surface sediment data from the lake proper were evaluated in the HHRS to identify constituents that may pose unacceptable risk if bioaccumulated in fish that are ingested by humans. The analytical data used in the risk screening were validated and are provided in Appendix B. Appendix D, Table D-1 lists the surface sediment samples collected from Penniman Lake in 2000, 2002, 2008, 2011, and 2012 that were evaluated in the HHRS. Although some of the sediment samples were analyzed for PCB congeners, PCB congeners were not evaluated in the HHRS. Some sediment samples were analyzed for Aroclors, and these data were evaluated in the HHRS. A fish consumption advisory is in place for the lake based on the presence of bioaccumulative constituents, in particular PCBs; however, the restriction was implemented as a conservative measure recommended in the Pond Study (Baker, 2001) and no biota sampling was conducted or human health risk assessment was prepared. Therefore, to determine if this advisory needs to remain in place, fish tissue should be analyzed for PCBs.

Surface water was not evaluated in the HHRS because preference was given to the biota-to-sediment accumulation factors (BSAF) and sediment concentrations over the use of the bioconcentration factors (BCF) and surface water concentrations in the modeling of fish tissue concentrations. The BSAF accounts for multi-pathway fish uptake of COPCs from surface water, sediment, and food items, and biomagnification and trophic transfer via the food chain.

A review of the data and past discussions with the USEPA and Navy identified the following criteria for data usability and usage of qualified data:

- Data qualified with a J, K, or L (estimated) were treated as unqualified, detected concentrations.
- Data qualified with an R (rejected) were not used in the risk assessment.
- Data qualified with a B (blank contamination) were used in the risk assessment as if the results were non-detects, with the blank-related concentrations of each constituent used as the sample detection limit.
- For duplicate samples, the maximum concentration between the two samples was used as the sample concentration.

Results of the sampling performed at Penniman Lake are presented in Section 4.

COPC Screening Criteria

Sediment screening criteria are not available for the consumption of fish exposure pathway; therefore, selection of COPCs in sediment was conducted based on a constituent's potential to bioaccumulate in an organism. Inorganic constituents in sediment were identified as COPCs if they were considered to be bioaccumulative according to USEPA's *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs* (USEPA, 2000a). Organic constituents detected in sediment were identified as COPCs if their log K_{ow} value exceeded 3. However, if an organic constituent with log K_{ow} value greater than 3 was not identified as bioaccumulative according to USEPA's *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs* (USEPA, 2000a), it was not identified as a COPC.

Constituents that are considered essential nutrients, present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and toxic only at very high doses were eliminated from the quantitative risk analysis. These constituents are calcium, magnesium, potassium, and sodium. Although iron and manganese are also considered essential nutrients and are only toxic at very high doses, iron and manganese were included in the HHRS because toxicity values are available for these two nutrients.

COPC Screening Results

Results of the COPC screening process for sediment are presented in RAGS Part D Table 2.1 of Appendix C. Ten metals, fifteen PAHs, one Aroclor (PCBs), and seventeen pesticides were identified as COPCs:

- Arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc
- Acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene
- Aroclor-1260
- 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, alpha-BHC, alpha-chlordane, beta-BHC, delta-BHC, dieldrin, endosulfan I, endosulfan II, endrin, gamma-BHC (lindane), gamma-chlordane, heptachlor, heptachlor epoxide, methoxychlor

Exposure Assessment

Exposure Pathways Quantified

Although Penniman Lake fishing is restricted to catch-and-release only (signs are posted at the lake), it was assumed for this evaluation that the fish caught from the lake may be ingested. Ingestion of fish caught in Penniman Lake was quantified for recreational anglers (adult, adolescent, and child).

Calculation of Exposure Point Concentrations

Exposure is quantified by estimating the exposure point concentrations (EPCs) for COPCs in environmental media and constituent intake by the receptor. EPCs are estimated constituent concentrations that a receptor may contact and are specific to each exposure medium. The EPCs for fish tissue are provided in RAGS Part D Tables 3.1 and 3.1 Supplement A of Appendix C.

The EPCs may be directly monitored or estimated using environmental models. Fate and transport modeling was used to estimate fish tissue concentrations using measured sediment data. For conservatism, the maximum detected sediment concentration of each COPC was used to calculate the EPC for fish tissue. This will likely result in an over-estimation of fish tissue concentrations and risks, as fish are not likely to remain in one location and the location of the maximum-detected concentration was not the same for each COPC.

The BSAFs were used to model fish tissue concentrations from sediment. The BSAF accounts for multi-pathway fish uptake of COPCs from surface water, sediment, and food items, and biomagnification and trophic transfer via the food chain. The BSAFs used to model fish tissue concentrations from sediment were obtained from USEPA's Biota-Sediment Accumulation Factor Data Set (2008a) and the Washington Department of Ecology (1995), and are presented in Appendix C, Table 3.1 Supplement A. Several factors (e.g., level of sediment contamination used in the study, fish habitat, sample type [fillet, whole body], size of the fish sampled) were taken into consideration to select

appropriate BSAFs for the HHRS. The parameters used to derive fish EPCs in units of mg of chemical per kg of fish on a wet weight basis included: a site-specific organic carbon content in sediment (5.9 percent), the USEPA's (2000b) default value for fish lipid content (5%), and the USEPA's (1993) default value for percent moisture in fish fillets (75%). The calculation of the EPCs for fish tissue is presented in Appendix C, Table 3.1 Supplement A.

Estimation of Chemical Intakes for Individual Pathways

Chemical intake is the amount of the chemical constituent entering the receptor's body. The quantification of exposure is based on an estimate of the chronic daily intake (CDI), the average amount of the chemical contaminant entering the receptor's body per day. The chemical intake equation for the fish ingestion pathway is presented in RAGS Part D Table 4.1 of Appendix C. The intake and exposure equations require exposure parameters that are specific to the exposure pathway. Some of the exposure parameters have default values, which were used for this assessment. These assumptions, based on estimates of body weights, media intake levels, and exposure frequencies and duration, are provided in USEPA guidance (USEPA; 1989; 1991; 1997a; and 2008b). The exposure parameters that were used for the ingestion of fish are presented in RAGS Part D Table 4.1 of Appendix C.

Toxicity Assessment

Toxicity assessment defines the relationship between the magnitude of exposure and possible severity of adverse effects, and weighs the quality of available toxicological evidence. Toxicity assessment generally consists of two steps: hazard identification and dose-response assessment. Hazard identification is the process of determining the potential adverse effects from exposure to the chemical along with the type of health effect involved. Dose-response assessment is the process of quantitatively evaluating the toxicity information and characterizing the relationship between the dose of the constituent administered or received and the incidence of adverse health effects in the exposed population. Toxicity criteria (e.g., reference doses [RfDs], cancer slope factors [CSFs]) are derived from the dose-response relationship. The USEPA recommends that a tiered approach be used to obtain the toxicity values (RfDs and CSFs) that are used to estimate non-carcinogenic hazards and carcinogenic risks (USEPA, 2003). The hierarchy of toxicity value sources is the following:

- Integrated Risk Information System (IRIS) (USEPA, 2013);
- Provisional Peer-Reviewed Toxicity Values (PPRTVs); and
- Other USEPA and non-USEPA sources, such as the Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997b), California Environmental Protection Agency (Cal/USEPA) Toxicity Criteria Database (Cal/USEPA, 2013), New Jersey Department of Environmental Protection (NJDEP) chromium workgroup (NJDEP, 2009), and Agency for Toxic Substances and Disease Registry (ATSDR).

The use of toxicity values in an HHRS from sources other than IRIS increases the uncertainty of the quantitative risk estimates. Some of the COPCs elicit both systemic (non-carcinogenic) toxic effects and cancer (carcinogenic) effects. Because of this, these constituents are evaluated as both non-carcinogens and carcinogens. The health risks for carcinogenic and non-carcinogenic effects were estimated separately based on different toxicity values.

The non-carcinogenic and carcinogenic toxicity values used in the HHRS are provided in RAGS Part D Tables 7.1 through 7.3 of Appendix C.

Risk Characterization

Methods for Estimating Risks

Potential human health risks are discussed independently for carcinogenic and non-carcinogenic constituents because of the different toxicological endpoints, relevant exposure durations, and methods used to characterize risk. Exposure to some constituents may result in both non-carcinogenic and carcinogenic effects (e.g., arsenic); therefore, these constituents were evaluated in both groups. The methodology used to estimate non-carcinogenic hazards and carcinogenic risks are described below.

Non-carcinogenic Hazard Estimation

The HHRS evaluated the potential for non-carcinogenic effects by comparing exposure intakes of each COPC over a specified time period (e.g., chronic) with RfDs derived for similar exposure periods. This ratio of exposure to toxicity is referred to as a hazard quotient (HQ). The HQ assumes that there is a level of exposure below which it is unlikely for even sensitive populations to experience adverse health effects. If the exposure level exceeds this threshold, there is the potential for non-cancer health effects to occur. The HQ is calculated as follows:

$$HQ = \frac{Intake}{RfD}$$

Intake and RfD are expressed in the same units (mg/kg-day) and represent the same exposure period (e.g., chronic or subchronic). An HQ that exceeds 1 (i.e., intake exceeds the RfD) indicates that there is a potential for adverse health effects associated with exposure to that COPC.

To assess the potential for non-carcinogenic health effects posed by exposure to multiple COPCs and exposure routes, an HI approach was used (USEPA, 1989). This approach assumes that non-carcinogenic hazards associated with exposure to more than one COPC and exposure route are additive. Synergistic or antagonistic interactions between COPCs are not quantified. The HI may exceed 1 even if all of the individual HQs are less than 1. The HI is equal to the sum of the HQs and is calculated as follows:

$$HI = \frac{I_1}{RfD_1} + \frac{I_2}{RfD_2} + \ldots \frac{I_i}{RfD_i}$$

where:

I = Intake level (mg/kg-day)

RfD = Reference dose (mg/kg-day)

Ii = Intake level for the “i”th constituent

RfDi = Reference dose for the “i”th constituent

Carcinogenic Risk Estimation

The potential for carcinogenic effects due to exposure to site media was evaluated by estimating the Excess Lifetime Carcinogenic Risk (ELCR). The ELCR is the incremental increase in the probability of developing cancer during one’s lifetime (as a result of exposure to site media) above the probability of developing cancer from non-site exposures.

Potential ELCRs associated with exposure to individual carcinogens were calculated using CSFs and chronic daily intakes (CDIs) for oral exposures. The linear low-dose equation was used to estimate the incremental probability of an individual developing cancer over a lifetime as a result of exposure to potential carcinogens. Estimated ELCRs are calculated by multiplying the CDI by the CSF:

$$ELCR = CDI \times CSF$$

where:

ELCR = excess lifetime carcinogenic risk, unitless probability of developing cancer

CDI = chronic daily intake averaged over 70 years (mg/kg-day)

CSF = cancer slope factor $(mg/kg\text{-}day)^{-1}$

The theoretical probability of developing cancer as a consequence of exposure to two or more COPCs and by two or more exposure pathways was calculated by summing the risk estimates for each COPC in the appropriate scenarios using the following equations:

$$Total\ \ ELCR = (I_1 \times CSF_1) + (I_2 \times CSF_2) + \ldots (I_i \times CSF_i)$$

where:

I = Intake level (mg/kg-day)

CSF = Cancer slope factor (mg/kg-day)-1

Ii = Intake level for the 'i'th constituent

CSFi = Cancer slope factor for the 'i'th constituent

As required under the NCP (USEPA, 1994a) "[f]or known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} to 10^{-6} using information on the relationship between dose and response." When a cumulative carcinogenic risk to a receptor under the assumed RME exposure conditions exceeds 1 in 10,000 (i.e., 10^{-4} ELCR), the Comprehensive Environmental Response, Compensation, and Liability Act generally requires remedial action to reduce risks at the site.

Lead

Lead was identified as a COPC in sediment for the fish ingestion exposure pathway. Lead does not have available published toxicity factors;therefore, potential risks associated with lead are evaluated differently than the other COPCs. The toxicity of lead is evaluated by USEPA based on blood-lead uptake using a physiologically based pharmacokinetic model called the Integrated Exposure Uptake Biokinetic (IEUBK) model. For this screening evaluation, the lead modeling was not conducted. As a conservative approach, lead is recommended as an analyte for the tissue samples of fish collected from Penniman Lake.

Risk Estimates

The risk estimates for fish ingestion are summarized below by receptor. The risk calculations are presented in the RAGS Part D Tables 7.1 through 7.3 in Appendix C. The COPCs that contribute an HI equal to or greater than 1 to a cumulative noncancer hazard that exceeds 1 or a carcinogenic risk greater than 1×10^{-6} to a cumulative carcinogenic risk that exceeds 1×10^{-4} are identified below. These COPCs are the potential risk drivers and are the recommended analytes for the tissue samples of fish collected from Penniman Lake.

Current/Future Adult Angler (Table 7.1, Appendix C)

The risk screening assumed a current and future adult angler could be exposed to COPCs in sediment via ingestion of fish. The total non-carcinogenic hazard (HI = 68) exceeds the target HI of 1. Four COPCs have HIs equal to or greater than one: arsenic, nickel, zinc, and dieldrin. The total carcinogenic risk (ELCR = 2×10^{-2}) is greater than the target risk range of 1×10^{-6} to 1×10^{-4}. Nine COPCs have ELCR greater than 1×10^{-6}, contributing to the total ELCR greater than 1×10^{-4} : arsenic, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, Arochlor-1260, dieldrin, gamma-chlordane, heptachlor, and heptachlor epoxide.

Current/Future Adolescent Angler (Table 7.2, Appendix C)

The risk screening assumed a current and future adolescent angler could be exposed to COPCs in sediment via ingestion of fish. The total non-carcinogenic hazard (HI = 120) exceeds the target HI of 1. Six COPCs have HIs equal to or greater than one: arsenic, copper, nickel, zinc, 4,4'-DDT, and dieldrin. The total carcinogenic risk (ELCR = 1×10^{-2}) is greater than the target risk range of 1×10^{-6} to 1×10^{-4}. Nine COPCs have ELCR greater than 1×10^{-6}, contributing to the total ELCR greater than 1×10^{-4}: arsenic, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, Arochlor-1260, dieldrin, gamma-chlordane, heptachlor, and heptachlor epoxide.

Current/Future Child Angler (Table 7.3, Appendix C)

The risk screening assumed a current and future adult angler could be exposed to COPCs in sediment via ingestion of fish. The total non-carcinogenic hazard (HI = 150) exceeds the target HI of 1. Six COPCs have HIs greater than one: arsenic, copper, nickel, zinc, 4,4'-DDT, and dieldrin. The total carcinogenic risk (ELCR = 1×10^{-2}) is greater than the target risk range of 1×10^{-6} to 1×10^{-4}. Eight COPCs have ELCR greater than 1×10^{-6}, contributing to the total ELCR greater than 1×10^{-4}: arsenic, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, Arochlor-1260, dieldrin, gamma-chlordane, and heptachlor epoxide.

Human Health Risk Screening Summary

The HHRS was conducted to identify constituents to be analyzed in tissue samples from fish collected in Penniman Lake. Constituents in sediment may bioaccumulate in fish and then pose potential unacceptable risk if the fish are ingested by humans. The HHRS consisted of a screening step to identify bioaccumulative constituents detected in sediment and a risk calculation step to identify potential risk drivers for ingestion of fish.

Results of the screening process for sediment indicated ten metals, fifteen PAHs, one Aroclor, and seventeen PCBs/pesticides as being bioaccumulative and were, therefore, identified as COPCs. Modeling was then used to calculate concentrations of COPCs in fish tissue based on maximum-detected concentrations in sediment. Finally, risks were quantified for ingestion of fish by recreational anglers (adult, adolescent, and child).

Risk calculations are provided in Tables 7.1 through 7.3 in Appendix C. The COPCs that contribute an HI greater than 1 or a carcinogenic risk greater than 1×10^{-6} to a total carcinogenic risk that exceeds 1×10^{-4} were identified as potential analytes for fish tissue samples. The total HIs and carcinogenic risks for adult, adolescent, and child anglers exceed the target HI of 1 and the target risk of 1×10^{-4}. The constituents identified for fish tissue analysis are metals (arsenic, copper, nickel, zinc), PCBs (Aroclor-1260), and pesticides (4,4'-DDE, 4,4'-DDT, alpha-chlordane, dieldrin, gamma-chlordane, heptachlor, and heptachlor epoxide). Lead is also identified as a COPC for all receptors because it is bioaccumulative.

Based on the human health risk screening and risk calculation results, it is recommended fish tissue analysis include the ten bioaccumulative metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), PCBs, and pesticides as presented in Section 6 of this TM.

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Tables

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Sediment
Exposure Medium: Fish (Fish Consumer)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Background Value (1)	Screening Value (2)	Bioaccumulative (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
Penniman Lake	7429-90-5	Aluminum	8.32E+02	3.42E+04	MG/KG	CAPL-SSD81-1012	50/50	--	NA	NA	No		NA	NA	No	NBAC
	7440-36-0	Antimony	1.70E-01	3.89E+00	MG/KG	CAPL-SD85-1012	5/50	0.38-17.2	NA	NA	No		NA	NA	No	NBAC
	7440-38-2	Arsenic	1.20E+00	5.67E+01	MG/KG	CAPL-SD68-1012	49/50	1.2245-1.2245	NA	NA	Yes		NA	NA	Yes	BAC
	7440-39-3	Barium	4.10E+00	1.63E+02	MG/KG	PL-00-POND-SD12-0300	50/50	--	NA	NA	No		NA	NA	No	NBAC
	7440-41-7	Beryllium	7.00E-02	5.98E+00	MG/KG	CAPL-SD85-1012	28/50	0.17-4.3	NA	NA	No		NA	NA	No	NBAC
	7440-43-9	Cadmium	1.12E-01	5.90E+00	MG/KG	PL-00-POND-SD12-0300	10/50	0.02-4.3	NA	NA	Yes		NA	NA	Yes	BAC
	7440-70-2	Calcium	6.14E+02	2.22E+05	MG/KG	PL-00-POND-SD12-0300	50/50	--	NA	NA	No		NA	NA	No	NUT
	7440-47-3	Chromium	2.90E+00	9.10E+01	MG/KG	PL-00-POND-SD12-0300	50/50	--	NA	NA	Yes		NA	NA	Yes	BAC
	7440-48-4	Cobalt	3.50E-01	3.45E+01	MG/KG	CAPL-SD85-1012	44/50	6.56-21.5	NA	NA	No		NA	NA	No	NBAC
	7440-50-8	Copper	1.60E+00	1.00E+03	MG/KG	CAPL-SD85-1012	48/50	1.3-3.5	NA	NA	Yes		NA	NA	Yes	BAC
	57-12-5	Cyanide	1.55E-01	4.86E+00	MG/KG	CAPL-SD79-1012	5/50	0.036-8	NA	NA	No		NA	NA	No	NBAC
	7439-89-6	Iron	1.82E+03	6.94E+04	MG/KG	PL-00-POND-SD12-0300	50/50	--	NA	NA	No		NA	NA	No	NBAC
	7439-92-1	Lead	2.90E+00	8.53E+02	MG/KG	CAPL-SD85-1012	50/50	--	NA	NA	Yes		NA	NA	Yes	BAC
	7439-95-4	Magnesium	1.09E+02	7.10E+03	MG/KG	PL-00-POND-SD12-0300	50/50	--	NA	NA	No		NA	NA	No	NUT
	7439-96-5	Manganese	1.03E+01	4.67E+02	MG/KG	PL-00-POND-SD12-0300	50/50	--	NA	NA	No		NA	NA	No	NBAC
	7439-97-6	Mercury	1.74E-02	1.48E+00	MG/KG	CAPL-SD64-1012	34/50	0.0397-0.36	NA	NA	Yes		NA	NA	Yes	BAC
	7440-02-0	Nickel	8.80E-01	5.64E+02	MG/KG	CAPL-SD85-1012	46/50	14.28-17.16	NA	NA	Yes		NA	NA	Yes	BAC
	7440-09-7	Potassium	9.90E+01	5.90E+03	MG/KG	CAS011-11SD24-01-0602	50/50	--	NA	NA	No		NA	NA	No	NUT
	7782-49-2	Selenium	5.30E-01	1.80E+00	MG/KG	CAS011-11SD28-01-0602	4/50	0.314-10.7	NA	NA	Yes		NA	NA	Yes	BAC
	7440-22-4	Silver	5.19E-01	5.19E-01	MG/KG	CAPL-SD85-1012	1/50	0.125-4.3	NA	NA	Yes		NA	NA	Yes	BAC
	7440-23-5	Sodium	1.07E+01	2.22E+04	MG/KG	PL-00-POND-SD12-0300	21/50	--	NA	NA	No		NA	NA	No	NUT
	7440-62-2	Vanadium	3.80E+00	8.68E+01	MG/KG	CAPL-SD83-1012	50/50	--	NA	NA	No		NA	NA	No	NBAC
	7440-66-6	Zinc	6.90E+00	2.95E+03	MG/KG	CAPL-SD85-1012	50/50	--	NA	NA	Yes		NA	NA	Yes	BAC
	78-93-3	2-Butanone	3.93E-03	1.56E-01	MG/KG	CAPL-SD64-1012-V	33/48	0.0048-0.091	NA	2.90E-01	No		NA	NA	No	NBAC
	75-07-0	Acetaldehyde	8.90E-02	8.90E-02	MG/KG	CAS011-11SD29-00-0602	1/1	--	NA	-3.40E-01	No		NA	NA	No	NBAC
	67-64-1	Acetone	2.13E-02	7.30E-01	MG/KG	PL-00-POND-SD17-0300	31/48	0.002-0.46	NA	-2.40E-01	No		NA	NA	No	NBAC
	77-53-2	alpha-Cedrol	8.30E-01	8.30E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	75-15-0	Carbon disulfide	7.00E-04	2.99E-02	MG/KG	CAPL-SD73-1012-V	16/48	0.0024-0.091	NA	1.94E+00	No		NA	NA	No	NBAC
	74-87-3	Chloromethane	2.00E-03	2.00E-03	MG/KG	CAS011-11SD27-00-0602	1/48	0.0048-0.091	NA	9.10E-01	No		NA	NA	No	NBAC
	156-59-2	cis-1,2-Dichloroethene	1.30E-02	1.30E-02	MG/KG	CAS011-11SD24-00-0602	1/40	0.0024-0.042	NA	1.86E+00	No		NA	NA	No	NBAC
	79-20-9	Methyl acetate	8.47E-03	8.47E-03	MG/KG	CAPL-SD79-1012	1/40	0.0048-0.042	NA	1.80E-01	No		NA	NA	No	NBAC
	108-87-2	Methylcyclohexane	5.00E-03	2.64E-02	MG/KG	CAPL-SD77-1012-V	2/40	0.0024-0.042	NA	3.61E+00	No	(5)	NA	NA	No	NBAC
	75-09-2	Methylene chloride	8.00E-04	4.00E-03	MG/KG	CAS011-11SD20-00-0602	6/48	0.003-0.0398	NA	1.25E+00	No		NA	NA	No	NBAC
	79-01-6	Trichloroethene	5.00E-03	5.00E-03	MG/KG	CAS011-11SD24-00-0602	1/48	0.0024-0.091	NA	2.42E+00	No		NA	NA	No	NBAC
	56554-91-7	12-Octadecenyl	2.10E-01	2.10E-01	MG/KG	CAS011-11SD21-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	629-72-1	1-Bromopentadecane	4.60E-01	4.60E-01	MG/KG	CAS011-11SD27-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	2425-54-9	1-Chlorotetradecane	5.70E-01	5.70E-01	MG/KG	CAS011-11SD22-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	1599-67-3	1-Docosene	9.60E-01	1.90E+00	MG/KG	CAS011-11SD29-00-0602	2/2	--	NA	NA	NA		NA	NA	No	NTX
	4282-44-4	1-Iodoundecane	2.00E-01	2.00E-01	MG/KG	CAS011-11SD25-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	2765-11-9	1-Pentadecanal	2.20E-01	4.70E-01	MG/KG	CAS011-11SD22-00-0602	2/2	--	NA	NA	NA		NA	NA	No	NTX
	118-79-6	2,4,6-Tribromophenol	1.40E+00	6.90E+00	MG/KG	CAS011-11SD29-00-0602	15/15	--	NA	4.13E+00	No	(5)	NA	NA	No	NBAC
	6753-98-6	2,6,6,9-Tetramethylcycloundeca-1,4,8-triene	6.50E-01	6.50E-01	MG/KG	CAS011-11SD32-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	18956-15-5	2',6'-Dihydroxy-4'-methoxychalcone	6.80E-01	6.80E-01	MG/KG	CAS011-11SD32-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	36728-72-0	28-Nor-17-beta-(H)-hopane	7.10E-01	7.10E-01	MG/KG	CAS011-11SD23-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	19780-33-7	2-Ethyl-1-dodecanol	2.60E-01	2.60E-01	MG/KG	CAS011-11SD24-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	321-60-8	2-Fluorobiphenyl	8.80E-01	4.60E+00	MG/KG	CAS011-11SD29-00-0602	15/15	--	NA	3.96E+00	No	(5)	NA	NA	No	NBAC
	367-12-4	2-Fluorophenol	1.30E+00	6.40E+00	MG/KG	CAS011-11SD29-00-0602	15/15	--	NA	1.71E+00	No		NA	NA	No	NBAC
	2958-76-1	2-Methyldecalin	2.90E-02	2.90E-02	MG/KG	CAS011-11SD30-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	1743-61-9	4-Ethenyl-1,4-dimethyl-cyclohexene	2.20E-01	2.20E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	NA	NA		NA	NA	No	NTX
	83-32-9	Acenaphthene	2.90E-02	3.36E-01	MG/KG	CAPL-SD87-1012	3/50	0.00629-3	NA	3.92E+00	Yes		NA	NA	Yes	BAC
	208-96-8	Acenaphthylene	1.70E-02	1.70E-02	MG/KG	CAS011-11SD18-00-0602	1/50	0.00629-3	NA	3.94E+00	Yes		NA	NA	Yes	BAC
	98-86-2	Acetophenone	1.60E-02	4.70E-02	MG/KG	CAS011-11SD32-00-0602	5/42	0.196-4.86	NA	1.58E+00	No		NA	NA	No	NBAC

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Sediment
Exposure Medium: Fish (Fish Consumer)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Background Value (1)	Screening Value (2)	Bioaccumulative (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
	638-95-9	alpha-Amyrin	9.90E-01	1.00E+00	MG/KG	CAS011-11SD27-00-0602	2/2	--	NA	NA	NA	NA	NA	No	NTX
	120-12-7	Anthracene	2.70E-02	2.65E-01	MG/KG	CAPL-SD87-1012	5/50	0.00629-3	NA	4.45E+00	Yes	NA	NA	Yes	BAC
	489-39-4	Aromadendrene	3.30E-01	3.30E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	100-52-7	Benzaldehyde	1.50E-02	3.84E-01	MG/KG	CAPL-SD63-1012	18/42	0.196-4.86	NA	1.48E+00	No	NA	NA	No	NBAC
	56-55-3	Benzo(a)anthracene	2.10E-02	2.30E-01	MG/KG	PL-00-POND-SD10-0300	7/50	0.00629-3	NA	5.76E+00	Yes	NA	NA	Yes	BAC
	50-32-8	Benzo(a)pyrene	9.18E-03	3.03E-01	MG/KG	CAPL-SD67-1012	11/50	0.00629-3	NA	6.13E+00	Yes	NA	NA	Yes	BAC
	205-99-2	Benzo(b)fluoranthene	1.05E-02	5.90E-01	MG/KG	PL-00-POND-SD10-0300	21/50	0.00629-3	NA	5.78E+00	Yes	NA	NA	Yes	BAC
	191-24-2	Benzo(g,h,i)perylene	7.31E-03	2.08E-01	MG/KG	CAPL-SD67-1012	6/50	0.00752-3	NA	6.63E+00	Yes	NA	NA	Yes	BAC
	207-08-9	Benzo(k)fluoranthene	8.89E-03	3.35E-01	MG/KG	CAPL-SD67-1012	10/50	0.00629-3	NA	6.11E+00	Yes	NA	NA	Yes	BAC
	192-97-2	Benzo[e]pyrene	2.00E-01	2.00E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	6.70E+00	No (5)	NA	NA	No	NBAC
	559-70-6	beta-Amyrin	1.00E+00	1.00E+00	MG/KG	CAS011-11SD28-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	117-81-7	bis(2-Ethylhexyl)phthalate	3.30E+00	3.30E+00	MG/KG	CAA06-SD01-1008	1/50	0.022-4.86	NA	7.60E+00	No (5)	NA	NA	No	NBAC
	86-74-8	Carbazole	3.30E-02	3.30E-02	MG/KG	CAS011-11SD18-00-0602	1/50	0.196-4.86	NA	3.72E+00	No (5)	NA	NA	No	NBAC
	57-88-5	Cholesterol	1.30E-01	1.80E-01	MG/KG	CAS011-11SD19-00-0602	2/2	--	NA	NA	NA	NA	NA	No	NTX
	218-01-9	Chrysene	9.23E-03	4.30E-01	MG/KG	PL-00-POND-SD10-0300	17/50	0.00671-3	NA	5.81E+00	Yes	NA	NA	Yes	BAC
	122-69-0	Cinnamyl cinnamate	1.40E-01	1.90E-01	MG/KG	CAS011-11SD18-00-0602	2/2	--	NA	NA	NA	NA	NA	No	NTX
	152-58-9	Cortodoxone	1.20E-01	1.20E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	469-38-5	Cycloartenol	2.70E-01	2.70E-01	MG/KG	CAS011-11SD21-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	493-02-7	Decalin	2.10E-02	2.10E-02	MG/KG	CAS011-11SD30-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	53-70-3	Dibenz(a,h)anthracene	2.90E-02	7.41E-02	MG/KG	CAPL-SD67-1012	2/50	0.00629-3	NA	6.75E+00	Yes	NA	NA	Yes	BAC
	132-64-9	Dibenzofuran	1.25E-01	1.25E-01	MG/KG	CAPL-SD87-1012	1/50	0.196-4.86	NA	4.12E+00	No	NA	NA	No	NBAC
	84-74-2	Di-n-butylphthalate	1.50E-02	2.00E-02	MG/KG	CAS011-11SD21-00-0602	2/50	0.196-4.86	NA	4.50E+00	No (5)	NA	NA	No	NBAC
	117-84-0	Di-n-octylphthalate	1.90E-02	2.50E+00	MG/KG	CAA06-SD01-1008	6/50	0.196-4.86	NA	8.10E+00	No (5)	NA	NA	No	NBAC
	74685-30-6	E-5-Eicosene	5.00E-01	5.00E-01	MG/KG	CAS011-11SD21-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	206-44-0	Fluoranthene	1.22E-02	4.90E-01	MG/KG	PL-00-POND-SD10-0300	28/50	0.00837-3	NA	5.16E+00	Yes	NA	NA	Yes	BAC
	86-73-7	Fluorene	7.07E-02	2.85E-01	MG/KG	CAPL-SD87-1012	3/50	0.00629-3	NA	4.18E+00	Yes	NA	NA	Yes	BAC
	83-47-6	gamma-Sitosterol	3.70E-01	1.50E+01	MG/KG	CAS011-11SD30-00-0602	6/6	--	NA	NA	NA	NA	NA	No	NTX
	6765-39-5	Heptadec-1-ene	1.10E+00	1.10E+00	MG/KG	CAS011-11SD28-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	193-39-5	Indeno(1,2,3-cd)pyrene	1.20E-02	2.38E-01	MG/KG	CAPL-SD67-1012	12/50	0.00629-3	NA	6.70E+00	Yes	NA	NA	Yes	BAC
	638-66-4	Octadecanal	2.70E-01	4.20E-01	MG/KG	CAS011-11SD22-00-0602	2/2	--	NA	NA	NA	NA	NA	No	NTX
	85-01-8	Phenanthrene	1.05E-02	9.49E-01	MG/KG	CAPL-SD87-1012	20/50	0.00837-3	NA	4.46E+00	Yes	NA	NA	Yes	BAC
	129-00-0	Pyrene	1.33E-02	6.20E-01	MG/KG	PL-00-POND-SD10-0300	27/50	0.00837-3	NA	4.88E+00	Yes	NA	NA	Yes	BAC
	1058-61-3	Stigmast-4-en-3-one	3.80E-01	3.90E+00	MG/KG	CAS011-11SD30-00-0602	8/8	--	NA	NA	NA	NA	NA	No	NTX
	58-22-0	Testosterone	3.00E-01	3.00E-01	MG/KG	CAS011-11SD26-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	511-15-9	Totarol	4.40E-01	4.40E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	7.28E+00	No (5)	NA	NA	No	NBAC
	4630-07-3	Valencene	7.90E-01	7.90E-01	MG/KG	CAS011-11SD18-00-0602	1/1	--	NA	NA	NA	NA	NA	No	NTX
	59-02-9	Vitamin E	5.00E-01	8.10E-01	MG/KG	CAS011-11SD30-00-0602	3/3	--	NA	NA	NA	NA	NA	No	NTX
	72-54-8	4,4'-DDD	1.39E-03	4.39E-02	MG/KG	CAPL-SD70-1012	16/48	0.00063-0.030303	NA	6.02E+00	Yes	NA	NA	Yes	BAC
	72-55-9	4,4'-DDE	1.22E-03	1.90E-01	MG/KG	CAS011-11SD30-00-0602	43/48	0.000844-0.005	NA	6.51E+00	Yes	NA	NA	Yes	BAC
	50-29-3	4,4'-DDT	6.96E-04	9.20E-01	MG/KG	PL-00-POND-SD10-0300	16/48	0.00063-0.030303	NA	6.91E+00	Yes	NA	NA	Yes	BAC
	309-00-2	Aldrin	3.28E-04	3.54E-03	MG/KG	CAPL-SD84-1012	8/48	0.00063-0.015152	NA	6.50E+00	Yes	NA	NA	Yes	BAC
	319-84-6	alpha-BHC	4.27E-04	3.50E-03	MG/KG	CAS011-11SD23-00-0602	6/48	0.000408-0.015152	NA	3.80E+00	Yes	NA	NA	Yes	BAC
	5103-71-9	alpha-Chlordane	9.14E-04	2.96E-02	MG/KG	CAPL-SD70-1012	14/48	0.00063-0.015152	NA	6.10E+00	Yes	NA	NA	Yes	BAC
	11096-82-5	Aroclor-1260	2.30E-02	1.62E+01	MG/KG	CAPL-SD84-1012	76/87	0.018-0.094	NA	7.55E+00	Yes	NA	NA	Yes	BAC
	319-85-7	beta-BHC	2.87E-04	7.30E-03	MG/KG	CAS011-11SD23-00-0602	5/48	0.000408-0.015152	NA	3.78E+00	Yes	NA	NA	Yes	BAC
	319-86-8	delta-BHC	2.08E-04	2.71E-03	MG/KG	CAPL-SD63-1012	8/48	0.000619-0.015152	NA	4.14E+00	Yes	NA	NA	Yes	BAC
	60-57-1	Dieldrin	3.77E-04	3.64E-01	MG/KG	CAPL-SD84-1012	18/48	0.00063-0.030303	NA	5.40E+00	Yes	NA	NA	Yes	BAC
	959-98-8	Endosulfan I	3.25E-04	5.60E-02	MG/KG	CAS011-11SD30-00-0602	6/48	0.000408-0.015152	NA	3.83E+00	Yes	NA	NA	Yes	BAC
	33213-65-9	Endosulfan II	1.32E-03	5.61E-02	MG/KG	CAPL-SD84-1012	11/48	0.00063-0.030303	NA	3.83E+00	Yes	NA	NA	Yes	BAC
	1031-07-8	Endosulfan sulfate	2.13E-03	6.81E-01	MG/KG	CAPL-SD84-1012	11/48	0.000414-0.030303	NA	3.66E+00	No (5)	NA	NA	No	NBAC
	72-20-8	Endrin	5.76E-04	1.43E-01	MG/KG	CAPL-SD84-1012	10/48	0.000619-0.030303	NA	5.20E+00	Yes	NA	NA	Yes	BAC
	7421-93-4	Endrin aldehyde	3.68E-04	1.74E-02	MG/KG	CAPL-SD84-1012	20/48	0.0008-0.030303	NA	4.80E+00	No (5)	NA	NA	No	NBAC
	53494-70-5	Endrin ketone	1.66E-03	4.94E-02	MG/KG	CAPL-SD84-1012	17/48	0.00063-0.030303	NA	4.99E+00	No (5)	NA	NA	No	NBAC

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Sediment
Exposure Medium: Fish (Fish Consumer)

Exposure Point	CAS Number	Chemical	Minimum Concentration Qualifier	Maximum Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Background Value (1)	Screening Value (2)	Bioaccumulative (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Selection or Deletion (4)
	58-89-9	gamma-BHC (Lindane)	1.35E-04	1.00E-03	MG/KG	CAPL-SD78-1012	8/48	0.000414-0.015152	NA	3.72E+00	Yes	NA	NA	Yes	BAC
	5103-74-2	gamma-Chlordane	7.35E-04	9.42E-02	MG/KG	CAPL-SD70-1012	27/48	0.0021-0.015152	NA	6.22E+00	Yes	NA	NA	Yes	BAC
	76-44-8	Heptachlor	7.44E-04	1.97E-03	MG/KG	CAPL-SD77-1012	6/48	0.000177-0.015152	NA	6.10E+00	Yes	NA	NA	Yes	BAC
	1024-57-3	Heptachlor epoxide	7.08E-04	9.10E-03	MG/KG	PL-00-POND-SD10-0300	9/48	0.00063-0.015152	NA	4.98E+00	Yes	NA	NA	Yes	BAC
	72-43-5	Methoxychlor	5.84E-04	8.22E-02	MG/KG	CAPL-SD70-1012	11/48	0.00063-0.151515	NA	5.08E+00	Yes	NA	NA	Yes	BAC
	99-65-0	1,3-Dinitrobenzene	1.51E-01	4.69E-01	MG/KG	CAPL-SD76-1012	4/35	0.1-0.25	NA	1.49E+00	No	NA	NA	No	NBAC
	118-96-7	2,4,6-Trinitrotoluene	1.25E-01	1.25E-01	MG/KG	CAPL-SD69-1012	1/35	0.1-0.25	NA	1.60E+00	No	NA	NA	No	NBAC
	99-08-1	3-Nitrotoluene	8.82E-01	8.82E-01	MG/KG	CAPL-SD76-1012	1/35	0.174-0.25	NA	2.45E+00	No	NA	NA	No	NBAC
	19406-51-0	4-Amino-2,6-dinitrotoluene	1.10E-01	1.10E-01	MG/KG	CAA06-SD01-1008	1/35	0.1-0.25	NA	1.84E+00	No	NA	NA	No	NBAC
	99-99-0	4-Nitrotoluene	1.04E-01	3.30E-01	MG/KG	CAPL-SD75-1012	2/35	0.174-0.25	NA	2.37E+00	No	NA	NA	No	NBAC
	2691-41-0	HMX	4.64E-01	4.64E-01	MG/KG	CAPL-SD79-1012	1/35	0.174-0.5	NA	1.60E-01	No	NA	NA	No	NBAC
	55-63-0	Nitroglycerin	3.28E-01	1.41E+00	MG/KG	CAPL-SD64-1012	8/26	0.435-2.5	NA	1.62E+00	No	NA	NA	No	NBAC
	479-45-8	Tetryl	2.11E-01	2.45E-01	MG/KG	CAPL-SD76-1012	2/34	0.174-0.65	NA	1.64E+00	No	NA	NA	No	NBAC

(1) No background available

(2) Kow values (Oak Ridge National Laboratory, 2012). Available online: http://rais.ornl.gov/cgi-bin/tools/TOX_search

(3) Organic chemicals (except PAHs) considered bioaccumulative if log Kow exceeded 3 and inorganic chemicals considered bioaccumulative according to EPA's Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs (EPA, 2000).

(4) Rationale Codes

Selection Reason: Bioaccumulative (BAC)
Deletion Reason: Not Bioaccumulative (NBAC)
Essential Nutrient (NUT)
Below Background (BKG)
No Kow Available (NTX)

(5) Not considered bioaccumulative according to EPA's Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment - Status and Needs (EPA, 2000).

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
NA = Not available or not applicable

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Sediment
Exposure Medium: Fish

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
	Arsenic	mg/kg	NA	NA	5.7E+01	5.7E+01	mg/kg	Maximum Detected Concentration	(1)
	Cadmium	mg/kg	NA	NA	5.9E+00	5.9E+00	mg/kg	Maximum Detected Concentration	(1)
	Chromium	mg/kg	NA	NA	9.1E+01	9.1E+01	mg/kg	Maximum Detected Concentration	(1)
	Copper	mg/kg	NA	NA	1.0E+03	1.0E+03	mg/kg	Maximum Detected Concentration	(1)
	Lead	mg/kg	NA	NA	8.5E+02	8.5E+02	mg/kg	Maximum Detected Concentration	(1)
	Mercury	mg/kg	NA	NA	1.5E+00	1.5E+00	mg/kg	Maximum Detected Concentration	(1)
	Nickel	mg/kg	NA	NA	5.6E+02	5.6E+02	mg/kg	Maximum Detected Concentration	(1)
	Selenium	mg/kg	NA	NA	1.8E+00	1.8E+00	mg/kg	Maximum Detected Concentration	(1)
	Silver	mg/kg	NA	NA	5.2E-01	5.2E-01	mg/kg	Maximum Detected Concentration	(1)
	Zinc	mg/kg	NA	NA	3.0E+03	3.0E+03	mg/kg	Maximum Detected Concentration	(1)
	Acenaphthene	mg/kg	NA	NA	3.4E-01	3.4E-01	mg/kg	Maximum Detected Concentration	(1)
	Acenaphthylene	mg/kg	NA	NA	1.7E-02	1.7E-02	mg/kg	Maximum Detected Concentration	(1)
	Anthracene	mg/kg	NA	NA	2.7E-01	2.7E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(a)anthracene	mg/kg	NA	NA	2.3E-01	2.3E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(a)pyrene	mg/kg	NA	NA	3.0E-01	3.0E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(b)fluoranthene	mg/kg	NA	NA	5.9E-01	5.9E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(g,h,i)perylene	mg/kg	NA	NA	2.1E-01	2.1E-01	mg/kg	Maximum Detected Concentration	(1)
	Benzo(k)fluoranthene	mg/kg	NA	NA	3.4E-01	3.4E-01	mg/kg	Maximum Detected Concentration	(1)
	Chrysene	mg/kg	NA	NA	4.3E-01	4.3E-01	mg/kg	Maximum Detected Concentration	(1)
	Dibenz(a,h)anthracene	mg/kg	NA	NA	7.4E-02	7.4E-02	mg/kg	Maximum Detected Concentration	(1)
	Dibenzofuran	mg/kg	NA	NA	1.3E-01	1.3E-01	mg/kg	Maximum Detected Concentration	(1)
	Fluoranthene	mg/kg	NA	NA	4.9E-01	4.9E-01	mg/kg	Maximum Detected Concentration	(1)
	Fluorene	mg/kg	NA	NA	2.9E-01	2.9E-01	mg/kg	Maximum Detected Concentration	(1)
	Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	2.4E-01	2.4E-01	mg/kg	Maximum Detected Concentration	(1)
	Phenanthrene	mg/kg	NA	NA	9.5E-01	9.5E-01	mg/kg	Maximum Detected Concentration	(1)
	Pyrene	mg/kg	NA	NA	6.2E-01	6.2E-01	mg/kg	Maximum Detected Concentration	(1)
	4,4'-DDD	mg/kg	NA	NA	4.4E-02	4.4E-02	mg/kg	Maximum Detected Concentration	(1)
	4,4'-DDE	mg/kg	NA	NA	1.9E-01	1.9E-01	mg/kg	Maximum Detected Concentration	(1)
	4,4'-DDT	mg/kg	NA	NA	9.2E-01	9.2E-01	mg/kg	Maximum Detected Concentration	(1)

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Sediment
Exposure Medium: Fish

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
	Aldrin	mg/kg	NA	NA	3.5E-03	3.5E-03	mg/kg	Maximum Detected Concentration	(1)
	alpha-BHC	mg/kg	NA	NA	3.5E-03	3.5E-03	mg/kg	Maximum Detected Concentration	(1)
	alpha-Chlordane	mg/kg	NA	NA	3.0E-02	3.0E-02	mg/kg	Maximum Detected Concentration	(1)
	Aroclor-1260	mg/kg	NA	NA	1.6E+01	1.6E+01	mg/kg	Maximum Detected Concentration	(1)
	beta-BHC	mg/kg	NA	NA	7.3E-03	7.3E-03	mg/kg	Maximum Detected Concentration	(1)
	delta-BHC	mg/kg	NA	NA	2.7E-03	2.7E-03	mg/kg	Maximum Detected Concentration	(1)
	Dieldrin	mg/kg	NA	NA	3.6E-01	3.6E-01	mg/kg	Maximum Detected Concentration	(1)
	Endosulfan I	mg/kg	NA	NA	5.6E-02	5.6E-02	mg/kg	Maximum Detected Concentration	(1)
	Endosulfan II	mg/kg	NA	NA	5.6E-02	5.6E-02	mg/kg	Maximum Detected Concentration	(1)
	Endrin	mg/kg	NA	NA	1.4E-01	1.4E-01	mg/kg	Maximum Detected Concentration	(1)
	gamma-BHC (Lindane)	mg/kg	NA	NA	1.0E-03	1.0E-03	mg/kg	Maximum Detected Concentration	(1)
	gamma-Chlordane	mg/kg	NA	NA	9.4E-02	9.4E-02	mg/kg	Maximum Detected Concentration	(1)
	Heptachlor	mg/kg	NA	NA	2.0E-03	2.0E-03	mg/kg	Maximum Detected Concentration	(1)
	Heptachlor epoxide	mg/kg	NA	NA	9.1E-03	9.1E-03	mg/kg	Maximum Detected Concentration	(1)
	Methoxychlor	mg/kg	NA	NA	8.2E-02	8.2E-02	mg/kg	Maximum Detected Concentration	(1)

(1) The maximum detected concentration was used for this chemical.

mg/kg= milligrams/kilograms
NA = Not applicable

TABLE 3.1.RME Supplement A
BIOTA-TO-SEDIMENT ACCUMULATION FACTORS FOR COPCS IN SEDIMENT
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

CAS Number	COPC (1)	Log Kow	Log Kow Reference	BSAF (2) Value (unitless)	Organism Used for Deriving BSAF	Tissue Used for Deriving BSAF	BSAF Reference	Sediment EPC (5) (mg/kg-sediment)	Fish EPC (6) (mg/kg-tissue)
7440-38-2	Arsenic	NA		1.2E-01	Fish (Perca flavescens)	Whole body	WDE, 1995	5.7E+01	1.7E+00
7440-43-9	Cadmium	NA		1.8E-01	Carnivorous, Omnivorous, and Herbivorous Fish	Whole body	WDE, 1995	5.9E+00	2.7E-01
7440-47-3	Chromium	NA		4.3E-02	Fish (Perca flavescens)	Whole body	WDE, 1995	9.1E+01	9.8E-01
7440-50-8	Copper	NA		3.4E-01	Mollusc (Elliptio complanata)	Whole body	WDE, 1995	1.0E+03	8.5E+01
7439-92-1	Lead	NA		1.6E-01	Carnivorous, Omnivorous, and Herbivorous Fish	Whole body	WDE, 1995	8.5E+02	3.4E+01
7439-97-6	Mercury	NA		3.5E-01	Fish (Available fish species)	Whole body and muscle	WDE, 1995	1.5E+00	1.3E-01
7440-02-0	Nickel	NA		1.0E+00	--		(3)	5.6E+02	1.4E+02
7782-49-2	Selenium	NA		1.0E+00	--		(3)	1.8E+00	4.5E-01
7440-22-4	Silver	NA		1.0E+00	--		(3)	5.2E-01	1.3E-01
7440-66-6	Zinc	NA		1.3E+00	Carnivorous, Omnivorous, and Herbivorous Fish	Whole body	WDE, 1995	3.0E+03	9.6E+02
83-32-9	Acenaphthene	3.9E+00	ORNL, 2012	4.2E+00	Largemouth Bass (Micropterus salmoides)	Fillet	EPA, 2008	3.4E-01	3.1E-01
208-96-8	Acenaphthylene	3.9E+00	ORNL, 2012	2.2E+00	Largemouth Bass (Micropterus salmoides)	Fillet	EPA, 2008	1.7E-02	8.0E-03
120-12-7	Anthracene	4.5E+00	ORNL, 2012	5.3E-01	Largemouth Bass (Micropterus salmoides)	Fillet	EPA, 2008	2.7E-01	3.1E-02
56-55-3	Benzo(a)anthracene	5.8E+00	ORNL, 2012	2.0E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	2.3E-01	1.0E-04
50-32-8	Benzo(a)pyrene	6.1E+00	ORNL, 2012	2.1E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	3.0E-01	1.4E-04
205-99-2	Benzo(b)fluoranthene	5.8E+00	ORNL, 2012	2.5E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	5.9E-01	3.1E-04
191-24-2	Benzo(g,h,i)perylene	6.6E+00	ORNL, 2012	2.4E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	2.1E-01	1.1E-04
207-08-9	Benzo(k)fluoranthene	6.1E+00	ORNL, 2012	2.3E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	3.4E-01	1.7E-04
218-01-9	Chrysene	5.8E+00	ORNL, 2012	9.1E-04	Largemouth Bass (Micropterus salmoides)	Fillet	EPA, 2008	4.3E-01	8.4E-05
53-70-3	Dibenz(a,h)anthracene	6.8E+00	ORNL, 2012	2.2E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	7.4E-02	3.4E-05
132-64-9	Dibenzofuran	4.1E+00	ORNL, 2012	1.0E+00	--		(3)	1.3E-01	2.7E-02
206-44-0	Fluoranthene	5.2E+00	ORNL, 2012	9.0E-02	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	4.9E-01	9.5E-03
86-73-7	Fluorene	4.2E+00	ORNL, 2012	2.3E-01	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	2.9E-01	1.4E-02
193-39-5	Indeno(1,2,3-cd)pyrene	6.7E+00	ORNL, 2012	2.2E-03	White Sucker (Catostomus commersoni)	Whole Body	EPA, 2008	2.4E-01	1.1E-04
85-01-8	Phenanthrene	4.5E+00	ORNL, 2012	1.8E-01	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	9.5E-01	3.6E-02
129-00-0	Pyrene	4.9E+00	ORNL, 2012	8.1E-02	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	6.2E-01	1.1E-02
72-54-8	4,4'-DDD	6.0E+00	ORNL, 2012	2.4E+00	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	4.4E-02	2.2E-02
72-55-9	4,4'-DDE	6.5E+00	ORNL, 2012	5.3E+00	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	1.9E-01	2.2E-01
50-29-3	4,4'-DDT	6.9E+00	ORNL, 2012	6.1E+00	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	9.2E-01	1.2E+00
309-00-2	Aldrin	6.5E+00	ORNL, 2012	1.5E-01	Freshwater Fish (All Available fish species)	Unknown	EPA, 2008	3.5E-03	1.2E-04
319-84-6	alpha-BHC	3.8E+00	ORNL, 2012	1.0E+00	--		(3)	3.5E-03	7.5E-04
5103-71-9	alpha-Chlordane	6.1E+00	ORNL, 2012	1.0E+01	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	3.0E-02	6.4E-02
11096-82-5	Aroclor-1260	7.6E+00	ORNL, 2012	1.6E+00	Freshwater Fish (All Available fish species)	Whole Body	EPA, 2008	1.6E+01	5.7E+00
319-85-7	beta-BHC	3.8E+00	ORNL, 2012	1.0E+00	--		(3)	7.3E-03	1.6E-03
319-86-8	delta-BHC	4.1E+00	ORNL, 2012	1.0E+00	--		(3)	2.7E-03	5.8E-04
60-57-1	Dieldrin	5.4E+00	ORNL, 2012	1.1E+02	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	3.6E-01	8.8E+00
959-98-8	Endosulfan I	3.8E+00	ORNL, 2012	1.0E+00	--		(3)	5.6E-02	1.2E-02
33213-65-9	Endosulfan II	3.8E+00	ORNL, 2012	1.0E+00	--		(3)	5.6E-02	1.2E-02
72-20-8	Endrin	5.2E+00	ORNL, 2012	2.8E-02	Freshwater Fish (Ictalurus punctatus and Cyprinus carpio)	Unknown	EPA, 2008	1.4E-01	8.7E-04
58-89-9	gamma-BHC (Lindane)	3.7E+00	ORNL, 2012	1.0E+00	--		(3)	1.0E-03	2.2E-04
5103-74-2	gamma-Chlordane	6.2E+00	ORNL, 2012	3.1E+00	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	9.4E-02	6.3E-02
76-44-8	Heptachlor	6.1E+00	ORNL, 2012	7.6E+00	Freshwater Fish (Ictalurus nebulosus)	Fillet	EPA, 2008	2.0E-03	3.2E-03
1024-57-3	Heptachlor epoxide	5.0E+00	ORNL, 2012	8.8E+00	Freshwater Fish (All Available fish species)	Fillet	EPA, 2008	9.1E-03	1.7E-02
72-43-5	Methoxychlor	5.1E+00	ORNL, 2012	1.0E+00	--		(3)	8.2E-02	1.8E-02

TABLE 3.1.RME Supplement A
BIOTA-TO-SEDIMENT ACCUMULATION FACTORS FOR COPCS IN SEDIMENT
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Notes:
(1) COPCs identified for sediment are presented in Table 2.1.
(2) BSAFs for metals are presented in kg-sed[dw]/kg-fish[dw]; BSAFs for organics are presented in kg-OC[dw]/kg-lipid[dw].
(3) A default value of 1 was assumed if no BSAF was available.
(4) A BSAF for Total PCBs was used as a surrogate for Aroclor-1260.
(5) Sediment EPCs are presented in Table 3.1.
(6) Fish EPCs were calculated using the following equations:

Metals: Fish EPC (mg/kg-tissue [ww]) = Sed EPC (mg/kg-sed [dw]) x BSAF (kg-sed [dw]/kg-tissue [dw]) x 0.25 (kg-tissue [dw]/kg-tissue [ww]).
Organics: Fish EPC (mg/kg-tissue [ww]) = Sed EPC (mg/kg-sed [dw]) x lipid normalized BSAF (kg-OC [dw]/kg-lipid [dw]) x (%lipid / %OC) x 0.25 (kg-tissue [dw]/kg-tissue [ww]).
Fish EPCs were calculated assuming 5.8% organic carbon (site-specific) in sediment and 5% lipid (EPA, 2000) and 75% moisture in tissue/crab tissue (EPA, 1993).

COPC - chemical of potential concern
EPC - exposure point concentration
BSAF - biota-sediment accumulation factor
OC - organic carbon
Kow - octanol/water partition coefficient
NA - not available / not applicable
dw - dry weight basis
ww -wet weight basis

Sources:

EPA, 2000. Bioaccumulation testing and interpretation for the purpose of sediment quality assessment - status and needs. EPA/823/R-00/001.
EPA, 2008. Biota-Sediment Accumulation Factor Data Set, Version 1.0. Prepared for the U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Mid-Continent Ecology Division (MED), Duluth, Minnesota. Prepared Computer Sciences Corporation Duluth, Minnesota Contract 68 W-02 032, Task 5003 and 5004. January 2008. http://www.epa.gov/med/Prods_Pubs/bsaf.htm
Kow values (Oak Ridge National Laboratory, 2012). Available online: http://rais.ornl.gov/cgi-bin/tools/TOX_search
Washington Department of Ecology (WDE), 1995. Bioaccumulation Factor Approach Analysis for Metals and Polar Organic Compounds.

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Medium: Surface Sediment
Exposure Medium: Fish

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Angler	Adult	Penniman Lake	CFish	Chemical Concentration in Fish	Tables 3.1.RME Supp and 3.1.RME Supp	mg/kg	Tables 3.1.RME Supp and 3.1.RME Supp	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Fish	Ingestion of Fish	25	g/day	EPA, 1997 (1)	CFish x IR-Fish x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.001	kg/g	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
		Adolescent	Penniman Lake	CFish	Chemical Concentration in Fish	Tables 3.1.RME Supp and 3.1.RME Supp	mg/kg	Tables 3.1.RME Supp and 3.1.RME Supp	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Fish	Ingestion of Fish	25	g/day	EPA, 1997 (1)	CFish x IR-Fish x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	9	years	(2)	
				CF	Conversion Factor	0.001	kg/g	- -	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
		Child	Penniman Lake	CFish	Chemical Concentration in Fish	Tables 3.1.RME Supp and 3.1.RME Supp	mg/kg	Tables 3.1.RME Supp and 3.1.RME Supp	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Fish	Ingestion of Fish	12	g/day	EPA, 2008 (4)	CFish x IR-Fish x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF	Conversion Factor	0.001	kg/g	- -	
				BW	Body Weight	18.6	kg	EPA, 2008	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

Notes:
(1) 95th percentile recreational adult anglers fish ingestion rate for freshwater.
(2) Professional judgment assuming adolescents from 9 to 18 years of age.
(3) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
(4) Fish ingestion rate for child is from EPA, 2008, Table 10-1, ingestion rate of Freshwater/Estuarine Fish for 3 to < 6 years, 95th percentile value.

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPA, 1997: Exposure Factors Handbook. EPA/ 600/P-95/Fa, Fb, and Fc.
EPA, 2008: Child-Specific Exposure Factors Handbook. September .

Table 7.1.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Fish (Penniman Lake)	Sediment Fish (Penniman Lake)	Ingestion	Arsenic	1.7E+00	mg/kg-fish	2.0E-04	mg/kg-day	1.5E+00	1/(mg/kg-day)	3.0E-04	5.8E-04	mg/kg-day	3.0E-04	mg/kg-day	1.9E+00
				Cadmium	2.7E-01	mg/kg-fish	3.1E-05	mg/kg-day	NA	NA	NA	9.1E-05	mg/kg-day	1.0E-03	mg/kg-day	9.1E-02
				Chromium	9.8E-01	mg/kg-fish	1.1E-04	mg/kg-day	5.0E-01	1/(mg/kg-day)	5.7E-05	3.4E-04	mg/kg-day	3.0E-03	mg/kg-day	1.1E-01
				Copper	8.5E+01	mg/kg-fish	1.0E-02	mg/kg-day	NA	NA	NA	2.9E-02	mg/kg-day	4.0E-02	mg/kg-day	7.3E-01
				Lead	3.4E+01	mg/kg-fish	4.0E-03	mg/kg-day	NA	NA	NA	1.2E-02	mg/kg-day	NA	NA	NA
				Mercury	1.3E-01	mg/kg-fish	1.5E-05	mg/kg-day	NA	NA	NA	4.4E-05	mg/kg-day	3.0E-04	mg/kg-day	1.5E-01
				Nickel	1.4E+02	mg/kg-fish	1.7E-02	mg/kg-day	NA	NA	NA	4.8E-02	mg/kg-day	2.0E-02	mg/kg-day	2.4E+00
				Selenium	4.5E-01	mg/kg-fish	5.3E-05	mg/kg-day	NA	NA	NA	1.5E-04	mg/kg-day	5.0E-03	mg/kg-day	3.1E-02
				Silver	1.3E-01	mg/kg-fish	1.5E-05	mg/kg-day	NA	NA	NA	4.4E-05	mg/kg-day	5.0E-03	mg/kg-day	8.9E-03
				Zinc	9.6E+02	mg/kg-fish	1.1E-01	mg/kg-day	NA	NA	NA	3.3E-01	mg/kg-day	3.0E-01	mg/kg-day	1.1E+00
				Acenaphthene	3.1E-01	mg/kg-fish	3.6E-05	mg/kg-day	NA	NA	NA	1.0E-04	mg/kg-day	6.0E-02	mg/kg-day	1.7E-03
				Acenaphthylene	8.0E-03	mg/kg-fish	9.4E-07	mg/kg-day	NA	NA	NA	2.7E-06	mg/kg-day	NA	NA	NA
				Anthracene	3.1E-02	mg/kg-fish	3.6E-06	mg/kg-day	NA	NA	NA	1.0E-05	mg/kg-day	3.0E-01	mg/kg-day	3.5E-05
				Benzo(a)anthracene	1.0E-04	mg/kg-fish	1.2E-08	mg/kg-day	7.3E-01	1/(mg/kg-day)	8.7E-09	3.5E-08	mg/kg-day	NA	NA	NA
				Benzo(a)pyrene	1.4E-04	mg/kg-fish	1.6E-08	mg/kg-day	7.3E+00	1/(mg/kg-day)	1.2E-07	4.7E-08	mg/kg-day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-04	mg/kg-fish	3.7E-08	mg/kg-day	7.3E-01	1/(mg/kg-day)	2.7E-08	1.1E-07	mg/kg-day	NA	NA	NA
				Benzo(g,h,i)perylene	1.1E-04	mg/kg-fish	1.3E-08	mg/kg-day	NA	NA	NA	3.7E-08	mg/kg-day	NA	NA	NA
				Benzo(k)fluoranthene	1.7E-04	mg/kg-fish	1.9E-08	mg/kg-day	7.3E-02	1/(mg/kg-day)	1.4E-09	5.7E-08	mg/kg-day	NA	NA	NA
				Chrysene	8.4E-05	mg/kg-fish	9.9E-09	mg/kg-day	7.3E-03	1/(mg/kg-day)	7.2E-11	2.9E-08	mg/kg-day	NA	NA	NA
				Dibenz(a,h)anthracene	3.4E-05	mg/kg-fish	4.0E-09	mg/kg-day	7.3E+00	1/(mg/kg-day)	2.9E-08	1.2E-08	mg/kg-day	NA	NA	NA
				Dibenzofuran	2.7E-02	mg/kg-fish	3.2E-06	mg/kg-day	NA	NA	NA	9.2E-06	mg/kg-day	1.0E-03	mg/kg-day	9.2E-03
				Fluoranthene	9.5E-03	mg/kg-fish	1.1E-06	mg/kg-day	NA	NA	NA	3.3E-06	mg/kg-day	4.0E-02	mg/kg-day	8.2E-05
				Fluorene	1.4E-02	mg/kg-fish	1.7E-06	mg/kg-day	NA	NA	NA	4.9E-06	mg/kg-day	4.0E-02	mg/kg-day	1.2E-04
				Indeno(1,2,3-cd)pyrene	1.1E-04	mg/kg-fish	1.3E-08	mg/kg-day	7.3E-01	1/(mg/kg-day)	9.5E-09	3.8E-08	mg/kg-day	NA	NA	NA
				Phenanthrene	3.6E-02	mg/kg-fish	4.2E-06	mg/kg-day	NA	NA	NA	1.2E-05	mg/kg-day	NA	NA	NA
				Pyrene	1.1E-02	mg/kg-fish	1.3E-06	mg/kg-day	NA	NA	NA	3.7E-06	mg/kg-day	3.0E-02	mg/kg-day	1.2E-04
				4,4'-DDD	2.2E-02	mg/kg-fish	2.6E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	6.3E-07	7.6E-06	mg/kg-day	NA	NA	NA
				4,4'-DDE	2.2E-01	mg/kg-fish	2.5E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	8.6E-06	7.4E-05	mg/kg-day	NA	NA	NA
				4,4'-DDT	1.2E+00	mg/kg-fish	1.4E-04	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.8E-05	4.1E-04	mg/kg-day	5.0E-04	mg/kg-day	8.3E-01
				Aldrin	1.2E-04	mg/kg-fish	1.4E-08	mg/kg-day	1.7E+01	1/(mg/kg-day)	2.4E-07	4.0E-08	mg/kg-day	3.0E-05	mg/kg-day	1.3E-03
				alpha-BHC	7.5E-04	mg/kg-fish	8.9E-08	mg/kg-day	6.3E+00	1/(mg/kg-day)	5.6E-07	2.6E-07	mg/kg-day	8.0E-03	mg/kg-day	3.2E-05
				alpha-Chlordane	6.4E-02	mg/kg-fish	7.5E-06	mg/kg-day	3.5E-01	1/(mg/kg-day)	2.6E-06	2.2E-05	mg/kg-day	5.0E-04	mg/kg-day	4.4E-02
				Aroclor-1260	5.7E+00	mg/kg-fish	6.7E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	1.3E-03	2.0E-03	mg/kg-day	NA	NA	NA
				beta-BHC	1.6E-03	mg/kg-fish	1.8E-07	mg/kg-day	1.8E+00	1/(mg/kg-day)	3.3E-07	5.4E-07	mg/kg-day	NA	NA	NA
				delta-BHC	5.8E-04	mg/kg-fish	6.9E-08	mg/kg-day	1.8E+00	1/(mg/kg-day)	1.2E-07	2.0E-07	mg/kg-day	NA	NA	NA
				Dieldrin	8.8E+00	mg/kg-fish	1.0E-03	mg/kg-day	1.6E+01	1/(mg/kg-day)	1.7E-02	3.0E-03	mg/kg-day	5.0E-05	mg/kg-day	6.0E+01
				Endosulfan I	1.2E-02	mg/kg-fish	1.4E-06	mg/kg-day	NA	NA	NA	4.1E-06	mg/kg-day	6.0E-03	mg/kg-day	6.9E-04
				Endosulfan II	1.2E-02	mg/kg-fish	1.4E-06	mg/kg-day	NA	NA	NA	4.1E-06	mg/kg-day	6.0E-03	mg/kg-day	6.9E-04
				Endrin	8.7E-04	mg/kg-fish	1.0E-07	mg/kg-day	NA	NA	NA	3.0E-07	mg/kg-day	3.0E-04	mg/kg-day	1.0E-03
				gamma-BHC (Lindane)	2.2E-04	mg/kg-fish	2.5E-08	mg/kg-day	1.1E+00	1/(mg/kg-day)	2.8E-08	7.4E-08	mg/kg-day	3.0E-04	mg/kg-day	2.5E-04
				gamma-Chlordane	6.3E-02	mg/kg-fish	7.4E-06	mg/kg-day	3.5E-01	1/(mg/kg-day)	2.6E-06	2.2E-05	mg/kg-day	5.0E-04	mg/kg-day	4.3E-02
				Heptachlor	3.2E-03	mg/kg-fish	3.8E-07	mg/kg-day	4.5E+00	1/(mg/kg-day)	1.7E-06	1.1E-06	mg/kg-day	5.0E-04	mg/kg-day	2.2E-03
				Heptachlor epoxide	1.7E-02	mg/kg-fish	2.0E-06	mg/kg-day	9.1E+00	1/(mg/kg-day)	1.9E-05	5.9E-06	mg/kg-day	1.3E-05	mg/kg-day	4.6E-01
				Methoxychlor	1.8E-02	mg/kg-fish	2.1E-06	mg/kg-day	NA	NA	NA	6.1E-06	mg/kg-day	5.0E-03	mg/kg-day	1.2E-03
			Exp. Route Total								1.8E-02					6.8E+01
		Exposure Point Total									1.8E-02					6.8E+01
	Exposure Medium Total										1.8E-02					6.8E+01
Sediment Total											1.8E-02					6.8E+01

Table 7.2.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Fish (Penniman Lake)	Sediment Fish (Penniman Lake)	Ingestion	Arsenic	1.7E+00	mg/kg-fish	1.3E-04	mg/kg-day	1.5E+00	1/(mg/kg-day)	2.0E-04	1.0E-03	mg/kg-day	3.0E-04	mg/kg-day	3.5E+00
				Cadmium	2.7E-01	mg/kg-fish	2.1E-05	mg/kg-day	NA	NA	NA	1.6E-04	mg/kg-day	1.0E-03	mg/kg-day	1.6E-01
				Chromium	9.8E-01	mg/kg-fish	7.7E-05	mg/kg-day	5.0E-01	1/(mg/kg-day)	3.9E-05	6.0E-04	mg/kg-day	3.0E-03	mg/kg-day	2.0E-01
				Copper	8.5E+01	mg/kg-fish	6.7E-03	mg/kg-day	NA	NA	NA	5.2E-02	mg/kg-day	4.0E-02	mg/kg-day	1.3E+00
				Lead	3.4E+01	mg/kg-fish	2.7E-03	mg/kg-day	NA	NA	NA	2.1E-02	mg/kg-day	NA	NA	NA
				Mercury	1.3E-01	mg/kg-fish	1.0E-05	mg/kg-day	NA	NA	NA	8.0E-05	mg/kg-day	3.0E-04	mg/kg-day	2.7E-01
				Nickel	1.4E+02	mg/kg-fish	1.1E-02	mg/kg-day	NA	NA	NA	8.7E-02	mg/kg-day	2.0E-02	mg/kg-day	4.3E+00
				Selenium	4.5E-01	mg/kg-fish	3.6E-05	mg/kg-day	NA	NA	NA	2.8E-04	mg/kg-day	5.0E-03	mg/kg-day	5.5E-02
				Silver	1.3E-01	mg/kg-fish	1.0E-05	mg/kg-day	NA	NA	NA	8.0E-05	mg/kg-day	5.0E-03	mg/kg-day	1.6E-02
				Zinc	9.6E+02	mg/kg-fish	7.6E-02	mg/kg-day	NA	NA	NA	5.9E-01	mg/kg-day	3.0E-01	mg/kg-day	2.0E+00
				Acenaphthene	3.1E-01	mg/kg-fish	2.4E-05	mg/kg-day	NA	NA	NA	1.9E-04	mg/kg-day	6.0E-02	mg/kg-day	3.1E-03
				Acenaphthylene	8.0E-03	mg/kg-fish	6.3E-07	mg/kg-day	NA	NA	NA	4.9E-06	mg/kg-day	NA	NA	NA
				Anthracene	3.1E-02	mg/kg-fish	2.4E-06	mg/kg-day	NA	NA	NA	1.9E-05	mg/kg-day	3.0E-01	mg/kg-day	6.3E-05
				Benzo(a)anthracene	1.0E-04	mg/kg-fish	8.0E-09	mg/kg-day	7.3E-01	1/(mg/kg-day)	5.8E-09	6.2E-08	mg/kg-day	NA	NA	NA
				Benzo(a)pyrene	1.4E-04	mg/kg-fish	1.1E-08	mg/kg-day	7.3E+00	1/(mg/kg-day)	7.9E-08	8.4E-08	mg/kg-day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-04	mg/kg-fish	2.5E-08	mg/kg-day	7.3E-01	1/(mg/kg-day)	1.8E-08	1.9E-07	mg/kg-day	NA	NA	NA
				Benzo(g,h,i)perylene	1.1E-04	mg/kg-fish	8.5E-09	mg/kg-day	NA	NA	NA	6.6E-08	mg/kg-day	NA	NA	NA
				Benzo(k)fluoranthene	1.7E-04	mg/kg-fish	1.3E-08	mg/kg-day	7.3E-02	1/(mg/kg-day)	9.6E-10	1.0E-07	mg/kg-day	NA	NA	NA
				Chrysene	8.4E-05	mg/kg-fish	6.7E-09	mg/kg-day	7.3E-03	1/(mg/kg-day)	4.9E-11	5.2E-08	mg/kg-day	NA	NA	NA
				Dibenz(a,h)anthracene	3.4E-05	mg/kg-fish	2.7E-09	mg/kg-day	7.3E+00	1/(mg/kg-day)	2.0E-08	2.1E-08	mg/kg-day	NA	NA	NA
				Dibenzofuran	2.7E-02	mg/kg-fish	2.1E-06	mg/kg-day	NA	NA	NA	1.7E-05	mg/kg-day	1.0E-03	mg/kg-day	1.7E-02
				Fluoranthene	9.5E-03	mg/kg-fish	7.5E-07	mg/kg-day	NA	NA	NA	5.9E-06	mg/kg-day	4.0E-02	mg/kg-day	1.5E-04
				Fluorene	1.4E-02	mg/kg-fish	1.1E-06	mg/kg-day	NA	NA	NA	8.8E-06	mg/kg-day	4.0E-02	mg/kg-day	2.2E-04
				Indeno(1,2,3-cd)pyrene	1.1E-04	mg/kg-fish	8.7E-09	mg/kg-day	7.3E-01	1/(mg/kg-day)	6.4E-09	6.8E-08	mg/kg-day	NA	NA	NA
				Phenanthrene	3.6E-02	mg/kg-fish	2.8E-06	mg/kg-day	NA	NA	NA	2.2E-05	mg/kg-day	NA	NA	NA
				Pyrene	1.1E-02	mg/kg-fish	8.5E-07	mg/kg-day	NA	NA	NA	6.6E-06	mg/kg-day	3.0E-02	mg/kg-day	2.2E-04
				4,4'-DDD	2.2E-02	mg/kg-fish	1.8E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	4.2E-07	1.4E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	2.2E-01	mg/kg-fish	1.7E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	5.8E-06	1.3E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	1.2E+00	mg/kg-fish	9.5E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	3.2E-05	7.4E-04	mg/kg-day	5.0E-04	mg/kg-day	1.5E+00
				Aldrin	1.2E-04	mg/kg-fish	9.3E-09	mg/kg-day	1.7E+01	1/(mg/kg-day)	1.6E-07	7.3E-08	mg/kg-day	3.0E-05	mg/kg-day	2.4E-03
				alpha-BHC	7.5E-04	mg/kg-fish	6.0E-08	mg/kg-day	6.3E+00	1/(mg/kg-day)	3.8E-07	4.6E-07	mg/kg-day	8.0E-03	mg/kg-day	5.8E-05
				alpha-Chlordane	6.4E-02	mg/kg-fish	5.1E-06	mg/kg-day	3.5E-01	1/(mg/kg-day)	1.8E-06	3.9E-05	mg/kg-day	5.0E-04	mg/kg-day	7.9E-02
				Aroclor-1260	5.7E+00	mg/kg-fish	4.5E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	9.1E-04	3.5E-03	mg/kg-day	NA	NA	NA
				beta-BHC	1.6E-03	mg/kg-fish	1.2E-07	mg/kg-day	1.8E+00	1/(mg/kg-day)	2.2E-07	9.7E-07	mg/kg-day	NA	NA	NA
				delta-BHC	5.8E-04	mg/kg-fish	4.6E-08	mg/kg-day	1.8E+00	1/(mg/kg-day)	8.3E-08	3.6E-07	mg/kg-day	NA	NA	NA
				Dieldrin	8.8E+00	mg/kg-fish	7.0E-04	mg/kg-day	1.6E+01	1/(mg/kg-day)	1.1E-02	5.4E-03	mg/kg-day	5.0E-05	mg/kg-day	1.1E+02
				Endosulfan I	1.2E-02	mg/kg-fish	9.5E-07	mg/kg-day	NA	NA	NA	7.4E-06	mg/kg-day	6.0E-03	mg/kg-day	1.2E-03
				Endosulfan II	1.2E-02	mg/kg-fish	9.6E-07	mg/kg-day	NA	NA	NA	7.4E-06	mg/kg-day	6.0E-03	mg/kg-day	1.2E-03
				Endrin	8.7E-04	mg/kg-fish	6.9E-08	mg/kg-day	NA	NA	NA	5.4E-07	mg/kg-day	3.0E-04	mg/kg-day	1.8E-03
				gamma-BHC (Lindane)	2.2E-04	mg/kg-fish	1.7E-08	mg/kg-day	1.1E+00	1/(mg/kg-day)	1.9E-08	1.3E-07	mg/kg-day	3.0E-04	mg/kg-day	4.4E-04
				gamma-Chlordane	6.3E-02	mg/kg-fish	5.0E-06	mg/kg-day	3.5E-01	1/(mg/kg-day)	1.8E-06	3.9E-05	mg/kg-day	5.0E-04	mg/kg-day	7.8E-02
				Heptachlor	3.2E-03	mg/kg-fish	2.5E-07	mg/kg-day	4.5E+00	1/(mg/kg-day)	1.1E-06	2.0E-06	mg/kg-day	5.0E-04	mg/kg-day	4.0E-03
				Heptachlor epoxide	1.7E-02	mg/kg-fish	1.4E-06	mg/kg-day	9.1E+00	1/(mg/kg-day)	1.2E-05	1.1E-05	mg/kg-day	1.3E-05	mg/kg-day	8.2E-01
				Methoxychlor	1.8E-02	mg/kg-fish	1.4E-06	mg/kg-day	NA	NA	NA	1.1E-05	mg/kg-day	5.0E-03	mg/kg-day	2.2E-03
			Exp. Route Total								1.2E-02					1.2E+02
		Exposure Point Total									1.2E-02					1.2E+02
	Exposure Medium Total										1.2E-02					1.2E+02
Sediment Total											1.2E-02					1.2E+02

Table 7.3.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Fish Consumer
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF		Cancer Risk	Intake/Exposure Concentration		RfD		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Fish (Penniman Lake)	Sediment Fish (Penniman Lake)	Ingestion	Arsenic	1.7E+00	mg/kg-fish	1.1E-04	mg/kg-day	1.5E+00	1/(mg/kg-day)	1.7E-04	1.3E-03	mg/kg-day	3.0E-04	mg/kg-day	4.3E+00
				Cadmium	2.7E-01	mg/kg-fish	1.7E-05	mg/kg-day	NA	NA	NA	2.0E-04	mg/kg-day	1.0E-03	mg/kg-day	2.0E-01
				Chromium	9.8E-01	mg/kg-fish	6.4E-05	mg/kg-day	5.0E-01	1/(mg/kg-day)	3.2E-05	7.5E-04	mg/kg-day	3.0E-03	mg/kg-day	2.5E-01
				Copper	8.5E+01	mg/kg-fish	5.6E-03	mg/kg-day	NA	NA	NA	6.5E-02	mg/kg-day	4.0E-02	mg/kg-day	1.6E+00
				Lead	3.4E+01	mg/kg-fish	2.2E-03	mg/kg-day	NA	NA	NA	2.6E-02	mg/kg-day	NA	NA	NA
				Mercury	1.3E-01	mg/kg-fish	8.5E-06	mg/kg-day	NA	NA	NA	9.9E-05	mg/kg-day	3.0E-04	mg/kg-day	3.3E-01
				Nickel	1.4E+02	mg/kg-fish	9.3E-03	mg/kg-day	NA	NA	NA	1.1E-01	mg/kg-day	2.0E-02	mg/kg-day	5.4E+00
				Selenium	4.5E-01	mg/kg-fish	3.0E-05	mg/kg-day	NA	NA	NA	3.5E-04	mg/kg-day	5.0E-03	mg/kg-day	6.9E-02
				Silver	1.3E-01	mg/kg-fish	8.5E-06	mg/kg-day	NA	NA	NA	1.0E-04	mg/kg-day	5.0E-03	mg/kg-day	2.0E-02
				Zinc	9.6E+02	mg/kg-fish	6.3E-02	mg/kg-day	NA	NA	NA	7.4E-01	mg/kg-day	3.0E-01	mg/kg-day	2.5E+00
				Acenaphthene	3.1E-01	mg/kg-fish	2.0E-05	mg/kg-day	NA	NA	NA	2.4E-04	mg/kg-day	6.0E-02	mg/kg-day	3.9E-03
				Acenaphthylene	8.0E-03	mg/kg-fish	5.2E-07	mg/kg-day	NA	NA	NA	6.1E-06	mg/kg-day	NA	NA	NA
				Anthracene	3.1E-02	mg/kg-fish	2.0E-06	mg/kg-day	NA	NA	NA	2.3E-05	mg/kg-day	3.0E-01	mg/kg-day	7.8E-05
				Benzo(a)anthracene	1.0E-04	mg/kg-fish	6.6E-09	mg/kg-day	7.3E-01	1/(mg/kg-day)	4.8E-09	7.7E-08	mg/kg-day	NA	NA	NA
				Benzo(a)pyrene	1.4E-04	mg/kg-fish	9.0E-09	mg/kg-day	7.3E+00	1/(mg/kg-day)	6.6E-08	1.1E-07	mg/kg-day	NA	NA	NA
				Benzo(b)fluoranthene	3.1E-04	mg/kg-fish	2.1E-08	mg/kg-day	7.3E-01	1/(mg/kg-day)	1.5E-08	2.4E-07	mg/kg-day	NA	NA	NA
				Benzo(g,h,i)perylene	1.1E-04	mg/kg-fish	7.0E-09	mg/kg-day	NA	NA	NA	8.2E-08	mg/kg-day	NA	NA	NA
				Benzo(k)fluoranthene	1.7E-04	mg/kg-fish	1.1E-08	mg/kg-day	7.3E-02	1/(mg/kg-day)	8.0E-10	1.3E-07	mg/kg-day	NA	NA	NA
				Chrysene	8.4E-05	mg/kg-fish	5.6E-09	mg/kg-day	7.3E-03	1/(mg/kg-day)	4.1E-11	6.5E-08	mg/kg-day	NA	NA	NA
				Dibenz(a,h)anthracene	3.4E-05	mg/kg-fish	2.3E-09	mg/kg-day	7.3E+00	1/(mg/kg-day)	1.7E-08	2.6E-08	mg/kg-day	NA	NA	NA
				Dibenzofuran	2.7E-02	mg/kg-fish	1.8E-06	mg/kg-day	NA	NA	NA	2.1E-05	mg/kg-day	1.0E-03	mg/kg-day	2.1E-02
				Fluoranthene	9.5E-03	mg/kg-fish	6.3E-07	mg/kg-day	NA	NA	NA	7.3E-06	mg/kg-day	4.0E-02	mg/kg-day	1.8E-04
				Fluorene	1.4E-02	mg/kg-fish	9.5E-07	mg/kg-day	NA	NA	NA	1.1E-05	mg/kg-day	4.0E-02	mg/kg-day	2.8E-04
				Indeno(1,2,3-cd)pyrene	1.1E-04	mg/kg-fish	7.3E-09	mg/kg-day	7.3E-01	1/(mg/kg-day)	5.3E-09	8.5E-08	mg/kg-day	NA	NA	NA
				Phenanthrene	3.6E-02	mg/kg-fish	2.4E-06	mg/kg-day	NA	NA	NA	2.8E-05	mg/kg-day	NA	NA	NA
				Pyrene	1.1E-02	mg/kg-fish	7.1E-07	mg/kg-day	NA	NA	NA	8.3E-06	mg/kg-day	3.0E-02	mg/kg-day	2.8E-04
				4,4'-DDD	2.2E-02	mg/kg-fish	1.5E-06	mg/kg-day	2.4E-01	1/(mg/kg-day)	3.5E-07	1.7E-05	mg/kg-day	NA	NA	NA
				4,4'-DDE	2.2E-01	mg/kg-fish	1.4E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	4.8E-06	1.7E-04	mg/kg-day	NA	NA	NA
				4,4'-DDT	1.2E+00	mg/kg-fish	7.9E-05	mg/kg-day	3.4E-01	1/(mg/kg-day)	2.7E-05	9.3E-04	mg/kg-day	5.0E-04	mg/kg-day	1.9E+00
				Aldrin	1.2E-04	mg/kg-fish	7.8E-09	mg/kg-day	1.7E+01	1/(mg/kg-day)	1.3E-07	9.1E-08	mg/kg-day	3.0E-05	mg/kg-day	3.0E-03
				alpha-BHC	7.5E-04	mg/kg-fish	5.0E-08	mg/kg-day	6.3E+00	1/(mg/kg-day)	3.1E-07	5.8E-07	mg/kg-day	8.0E-03	mg/kg-day	7.2E-05
				alpha-Chlordane	6.4E-02	mg/kg-fish	4.2E-06	mg/kg-day	3.5E-01	1/(mg/kg-day)	1.5E-06	4.9E-05	mg/kg-day	5.0E-04	mg/kg-day	9.9E-02
				Aroclor-1260	5.7E+00	mg/kg-fish	3.8E-04	mg/kg-day	2.0E+00	1/(mg/kg-day)	7.5E-04	4.4E-03	mg/kg-day	NA	NA	NA
				beta-BHC	1.6E-03	mg/kg-fish	1.0E-07	mg/kg-day	1.8E+00	1/(mg/kg-day)	1.9E-07	1.2E-06	mg/kg-day	NA	NA	NA
				delta-BHC	5.8E-04	mg/kg-fish	3.8E-08	mg/kg-day	1.8E+00	1/(mg/kg-day)	6.9E-08	4.5E-07	mg/kg-day	NA	NA	NA
				Dieldrin	8.8E+00	mg/kg-fish	5.8E-04	mg/kg-day	1.6E+01	1/(mg/kg-day)	9.3E-03	6.8E-03	mg/kg-day	5.0E-05	mg/kg-day	1.4E+02
				Endosulfan I	1.2E-02	mg/kg-fish	7.9E-07	mg/kg-day	NA	NA	NA	9.3E-06	mg/kg-day	6.0E-03	mg/kg-day	1.5E-03
				Endosulfan II	1.2E-02	mg/kg-fish	7.9E-07	mg/kg-day	NA	NA	NA	9.3E-06	mg/kg-day	6.0E-03	mg/kg-day	1.5E-03
				Endrin	8.7E-04	mg/kg-fish	5.7E-08	mg/kg-day	NA	NA	NA	6.7E-07	mg/kg-day	3.0E-04	mg/kg-day	2.2E-03
				gamma-BHC (Lindane)	2.2E-04	mg/kg-fish	1.4E-08	mg/kg-day	1.1E+00	1/(mg/kg-day)	1.6E-08	1.7E-07	mg/kg-day	3.0E-04	mg/kg-day	5.5E-04
				gamma-Chlordane	6.3E-02	mg/kg-fish	4.2E-06	mg/kg-day	3.5E-01	1/(mg/kg-day)	1.5E-06	4.9E-05	mg/kg-day	5.0E-04	mg/kg-day	9.7E-02
				Heptachlor	3.2E-03	mg/kg-fish	2.1E-07	mg/kg-day	4.5E+00	1/(mg/kg-day)	9.5E-07	2.5E-06	mg/kg-day	5.0E-04	mg/kg-day	4.9E-03
				Heptachlor epoxide	1.7E-02	mg/kg-fish	1.1E-06	mg/kg-day	9.1E+00	1/(mg/kg-day)	1.0E-05	1.3E-05	mg/kg-day	1.3E-05	mg/kg-day	1.0E+00
				Methoxychlor	1.8E-02	mg/kg-fish	1.2E-06	mg/kg-day	NA	NA	NA	1.4E-05	mg/kg-day	5.0E-03	mg/kg-day	2.7E-03
			Exp. Route Total								1.0E-02					1.5E+02
		Exposure Point Total									1.0E-02					1.5E+02
	Exposure Medium Total										1.0E-02					1.5E+02
Sediment Total											1.0E-02					1.5E+02

NA = Not applicable.

Attachment D
Ecological Risk Screening

APPENDIX D

Ecological Risk Screening

The ecological risk screening was prepared to identify constituents for the Penniman Lake fish and frog tissue sample analyses. The list of surface sediment samples used in the evaluation is contained in **Table D-1**.

Site-specific food web modeling was conducted for constituents on the list of bioaccumulative chemicals in USEPA (2000) guidance that were analyzed in Penniman Lake surface water and surface sediment samples using the following receptor species with a significant fish or frog dietary component:

- Osprey (*Pandion haliaetus*) – semi-aquatic avian piscivore
- Belted kingfisher (*Ceryle alcyon*) – semi-aquatic avian invertivore/piscivore
- Great blue heron (*Ardea herodias*) – semi-aquatic avian piscivore
- Mink (*Mustela vison*) – semi-aquatic mammalian piscivore
- Raccoon (*Procyon lotor*) – semi-aquatic mammalian omnivore

Maximum surface water and sediment concentrations were used in the modeling for conservatism. Two scenarios were run. The first scenario used maximum media concentrations and screening (SERA) model parameter values. The second scenario used maximum media concentrations and baseline (BERA) model parameter values. The bioaccumulation factors (BAFs) used in the food web models are contained in **Tables D-2** (aquatic plants), **D-3** (benthic invertebrates), and **D-4** (fish). Invertebrate and fish BAFs for some organic constituents were derived using the mean total organic carbon (TOC) value of 6.62 percent from the Penniman Lake surface sediment samples (**Table D-5**). Receptor-specific exposure parameter values are contained in **Tables D-6 and D-7**. Ingestion-based toxicity reference values (TRVs) are listed in **Tables D-8** (mammals) and **D-9** (birds).

Upper trophic level receptor exposures via food webs to chemicals present in surface sediment and surface water were determined using estimated chemical concentrations in each relevant dietary component for each upper trophic level receptor. Incidental ingestion of surface sediment was also included when calculating the total exposure, as were drinking water exposures.

Dietary intakes for each upper trophic level receptor were calculated using the following formula (modified from USEPA [1993]):

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

where:

	DI_x	=	Dietary intake for chemical x (mg chemical/kg body weight/day)
	FIR	=	Food ingestion rate (kg/day, dry-weight)
	FC_{xi}	=	Concentration of chemical x in food item i (mg/kg, dry-weight)
	PDF_i	=	Proportion of diet composed of food item i (dry-weight basis)
	SC_x	=	Concentration of chemical x in sediment (mg/kg, dry-weight)
	PDS	=	Proportion of diet composed of sediment (dry-weight basis)
	WIR	=	Water ingestion rate (L/day)
	WC_x	=	Concentration of chemical x in water (mg/L)
	BW	=	Body weight (kg)

Incidental ingestion of sediment was modeled as a dietary component rather than using a separate sediment ingestion rate. When measured food ingestion rates were not available for a receptor from the literature, the rates were estimated using allometric equations from Nagy (2001). When measured water ingestion rates were not available for a receptor from the literature, the rates were estimated using allometric equations from USEPA (1993).

The SERA exposure parameter values were selected to provide for a conservative evaluation. Examples of these conservative assumptions include:

- All of the dietary items consumed by the receptor are obtained from the site (i.e., an Area Use Factor [AUF] of one was assumed) at the point of maximum concentration.
- Chemicals are 100 percent bioavailable.
- Maximum food and water ingestion rates were used (calculated maximum ingestion rates using allometric equations were based on the maximum adult body weight).
- Minimum adult body weights were used. The selection focused on the most geographically appropriate values available from standard literature sources (e.g., USEPA, 1993).

For the BERA parameter values:

- Central tendency estimates (e.g., mean, median, or midpoint) for adult body weight and ingestion rates were used. Central tendency estimates for these exposure parameters are more relevant for a BERA because they better represent the characteristics of a greater proportion of the individuals in the population.

Ecological Risk Screening Results

The results of the site-specific food web modeling are contained in **Tables D-10 through D-15** for the first scenario using conservative model inputs (SERA) and maximum surface water and surface sediment concentrations. Based on No Observed Adverse Effect Levels (NOAELs), copper, lead, mercury, nickel, zinc, Aroclor-1221, Aroclor-1260, 4,4'-DDE, 4,4'-DDT, dieldrin, endrin, toxaphene, and hexachlorobenzene had HQs equaling or exceeding one for at least one receptor. The NOAEL-based exceedances for Aroclor-1221, toxaphene, and hexachlorobenzene were based on maximum detection limits.

The results of the site-specific food web modeling are contained in **Tables D-16 through D-21** for the second scenario using BERA model inputs and maximum surface water and surface sediment concentrations. Based on NOAELs, copper, lead, mercury, nickel, Aroclor-1221, Aroclor-1260, dieldrin, endrin, toxaphene, and hexachlorobenzene had HQs equaling or exceeding one for at least one receptor. The NOAEL-based exceedances for Aroclor-1221, toxaphene, and hexachlorobenzene were based on maximum detection limits.

Based on the ecological risk screening results, it is recommended that the fish and frog tissue samples be analyzed for the ten bioaccumulative metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), PCBs, and pesticides.

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Tables

Table D-1
Surface Sediment Samples Used in the Ecological Risk Screening
Penniman Lake

Station ID	Sample ID	Date	Study	Pond	Area	Use	Depth (in)	Comment	Group
Penniman Lake-SD10	PL-00-POND-SD10-0300	3/29/2000	Pond Study	Yes	NW - N	Yes	0-4	Frogs 6-9	1
Penniman Lake-SD10	PL-00-POND-SD10D-0300	3/29/2000	Pond Study	Yes	NW - N	Yes	0-4	Frogs 6-9	1
Penniman Lake-SD11	PL-00-POND-SD11-0300	3/30/2000	Pond Study	Yes	NW - C	Yes	0-4	Frogs 6-9	1
CAPL-SWSD18	CAPL-SD18-0811	8/2/2011	PL Phase 1	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SWSD19	CAPL-SD19-0811	8/2/2011	PL Phase 1	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SWSD22	CAPL-SD22-0711	7/28/2011	PL Phase 1	Yes	NW - N	Yes	0-4	Frogs 6-9	1
CAPL-SWSD23	CAPL-SD23-0711	7/28/2011	PL Phase 1	Yes	NW - N	Yes	0-4	Frogs 6-9	1
CAPL-SWSD24	CAPL-SD24-0711	7/28/2011	PL Phase 1	Yes	NW - C	Yes	0-4	Frogs 6-9	1
CAPL-SD70	CAPL-SD70-1012	10/17/2012	PL Phase 2	Yes	NW - N	Yes	0-4	Frogs 6-9	1
CAPL-SD70	CAPL-SD70-1012-V	10/25/2012	PL Phase 2	Yes	NW - N	Yes	0-4	Frogs 6-9	1
CAPL-SD84	CAPL-SD84-1012	10/24/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD84	CAPL-SD84-1012-A	10/26/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD85	CAPL-SD85-1012	10/24/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD85	CAPL-SD85-1012-A	10/26/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD86	CAPL-SD86-1012	10/24/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD86	CAPL-SD86-1012-A	10/26/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD87	CAPL-SD87-1012	10/24/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAPL-SD87	CAPL-SD87-1012-A	10/26/2012	PL Phase 2	No	NW - N Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD18	CAS011-11SD18-00-0602	6/13/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD18	CAS011-11SD18-00D-0602	6/13/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD19	CAS011-11SD19-00-0602	6/13/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD20	CAS011-11SD20-00-0602	6/13/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD21	CAS011-11SD21-00-0602	6/14/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD21	CAS011-11SD21-00D-0602	6/14/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD22	CAS011-11SD22-00-0602	6/14/2002	Site 11 RI	No	NW - C Trib	Yes	0-4	Frogs 6-9	1
CAS011-11SD23	CAS011-11SD23-00-0602	6/17/2002	Site 11 RI	Yes	NW - C	Yes	0-4	Frogs 6-9	1
CAS011-11SD29	CAS011-11SD29-00-0602	6/17/2002	Site 11 RI	Yes	NW - C	Yes	0-4	Frogs 6-9	1
CAS011-11SD30	CAS011-11SD30-00-0602	6/18/2002	Site 11 RI	Yes	NW - N	Yes	0-4	Frogs 6-9	1
Penniman Lake-SD12	PL-00-POND-SD12-0300	3/29/2000	Pond Study	Yes	NW - S	Yes	0-4	Frogs 1-5	2
CAPL-SWSD25	CAPL-SD25-0711	7/28/2011	PL Phase 1	Yes	NW - S	Yes	0-4	Frogs 1-5	2
CAS011-11SD24	CAS011-11SD24-00-0602	6/13/2002	Site 11 RI	No	NW - S Trib	Yes	0-4	Frogs 1-5	2
CAS011-11SD25	CAS011-11SD25-00-0602	6/13/2002	Site 11 RI	No	NW - S Trib	Yes	0-4	Frogs 1-5	2
CAS011-11SD26	CAS011-11SD26-00-0602	6/17/2002	Site 11 RI	No	NW - S Trib	Yes	0-4	Frogs 1-5	2
CAS011-11SD27	CAS011-11SD27-00-0602	6/17/2002	Site 11 RI	Yes	NW - S	Yes	0-4	Frogs 1-5	2
CAS011-11SD28	CAS011-11SD28-00-0602	6/17/2002	Site 11 RI	Yes	NW - S	Yes	0-4	Frogs 1-5	2
Penniman Lake-SD17	PL-00-POND-SD17-0300	3/29/2000	Pond Study	Yes	NE Lobe	Yes	0-4		3
CAPL-SWSD59	CAPL-SD59-0711	7/27/2011	PL Phase 1	Yes	NE Lobe	Yes	0-4		3
CAPL-SWSD60	CAPL-SD60-0711	7/29/2011	PL Phase 1	Yes	NE Lobe	Yes	0-4		3
CAPL-SWSD66	CAPL-SD66-1012	10/18/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD76	CAPL-SD76-1012	10/16/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD77	CAPL-SD77-1012	10/16/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD77	CAPL-SD77-1012-V	10/25/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD78	CAPL-SD78-1012	10/16/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD79	CAPL-SD79-1012	10/16/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD79	CAPL-SD79P-1012	10/16/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAPL-SD80	CAPL-SD80-1012	10/16/2012	PL Phase 2	Yes	NE Lobe	Yes	0-4		3
CAA06-SD01	CAA06-SD01-1008	10/23/2008	AOC 6 SI	Yes	East	Yes	0-4		4
CAA06-SD01	CAA06-SD01P-1008	10/23/2008	AOC 6 SI	Yes	East	Yes	0-4		4
CAA06-SD02	CAA06-SD02-1008	10/23/2008	AOC 6 SI	Yes	East	Yes	0-4		4
Penniman Lake-SD13	PL-00-POND-SD13-0300	3/30/2000	Pond Study	Yes	Center	Yes	0-4		4
Penniman Lake-SD14	PL-00-POND-SD14-0300	3/29/2000	Pond Study	Yes	Center	Yes	0-4		4
Penniman Lake-SD15	PL-00-POND-SD15-0300	3/29/2000	Pond Study	Yes	East	Yes	0-4		4
Penniman Lake-SD16	PL-00-POND-SD16-0300	3/29/2000	Pond Study	Yes	East	Yes	0-4		4
CAPL-SWSD27	CAPL-SD27-0711	7/28/2011	PL Phase 1	Yes	NW	Yes	0-4		4
CAPL-SWSD28	CAPL-SD28-0711	7/28/2011	PL Phase 1	Yes	NW	Yes	0-4		4
CAPL-SWSD28	CAPL-SD28P-0711	7/28/2011	PL Phase 1	Yes	NW	Yes	0-4		4
CAPL-SWSD29	CAPL-SD29-0711	7/28/2011	PL Phase 1	Yes	NW	Yes	0-4		4
CAPL-SWSD30	CAPL-SD30-0711	7/28/2011	PL Phase 1	Yes	NW	Yes	0-4		4
CAPL-SWSD31	CAPL-SD31-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD32	CAPL-SD32-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD33	CAPL-SD33-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD33	CAPL-SD33P-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD34	CAPL-SD34-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD35	CAPL-SD35-0711	7/28/2011	PL Phase 1	Yes	NW	Yes	0-4		4
CAPL-SWSD36	CAPL-SD36-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4

Table D-1
Surface Sediment Samples Used in the Ecological Risk Screening
Penniman Lake

Station ID	Sample ID	Date	Study	Pond	Area	Use	Depth (in)	Comment	Group
CAPL-SWSD37	CAPL-SD37-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD38	CAPL-SD38-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD38	CAPL-SD38P-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD39	CAPL-SD39-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD40	CAPL-SD40-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD41	CAPL-SD41-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD42	CAPL-SD42-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD44	CAPL-SD44-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD45	CAPL-SD45-0711	7/28/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD46	CAPL-SD46-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD47	CAPL-SD47-0711	7/27/2011	PL Phase 1	Yes	Center	Yes	0-4		4
CAPL-SWSD48	CAPL-SD48-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD49	CAPL-SD49-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD50	CAPL-SD50-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD50	CAPL-SD50P-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD51	CAPL-SD51-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD52	CAPL-SD52-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD53	CAPL-SD53-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD54	CAPL-SD54-0711	7/27/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD55	CAPL-SD55-0711	7/27/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD56	CAPL-SD56-0711	7/27/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD57	CAPL-SD57-0711	7/27/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD58	CAPL-SD58-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD58	CAPL-SD58P-0711	7/29/2011	PL Phase 1	Yes	East	Yes	0-4		4
CAPL-SWSD62	CAPL-SD62-1012	10/17/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD62	CAPL-SD62-1012-V	10/25/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD63	CAPL-SD63-1012	10/17/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD63	CAPL-SD63-1012-V	10/25/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD64	CAPL-SD64-1012	**10/17/2012**	**PL Phase 2**	Yes	NW	Yes	0-4		4
CAPL-SWSD64	CAPL-SD64P-1012	10/17/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD64	CAPL-SD64-1012-V	10/25/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD64	CAPL-SD64P-1012-V	10/25/2012	PL Phase 2	Yes	NW	Yes	0-4		4
CAPL-SWSD65	CAPL-SD65-1012	10/18/2012	PL Phase 2	Yes	East	Yes	0-4		4
CAPL-SWSD67	CAPL-SD67-1012	10/16/2012	PL Phase 2	Yes	East	Yes	0-4		4
CAPL-SWSD68	CAPL-SD68-1012	10/18/2012	PL Phase 2	Yes	East	Yes	0-4		4
CAPL-SWSD69	CAPL-SD69-1012	10/17/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD71	CAPL-SD71-1012	10/17/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD71	CAPL-SD71-1012-V	10/25/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD72	CAPL-SD72-1012	10/17/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD72	CAPL-SD72-1012-V	10/25/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD73	CAPL-SD73-1012	10/17/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD73	CAPL-SD73P-1012	10/17/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD73	CAPL-SD73-1012-V	10/25/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD73	CAPL-SD73P-1012-V	10/25/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD74	CAPL-SD74-1012	10/18/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD75	CAPL-SD75-1012	10/18/2012	PL Phase 2	Yes	Center	Yes	0-4		4
CAPL-SD81	CAPL-SD81-1012	10/18/2012	PL Phase 2	Yes	East	Yes	0-4		4
CAPL-SD82	CAPL-SD82-1012	10/18/2012	PL Phase 2	Yes	East	Yes	0-4		4
CAS011-11SD31	CAS011-11SD31-00-0602	6/18/2002	Site 11 RI	Yes	NW	Yes	0-4		4
CAS011-11SD32	CAS011-11SD32-00-0602	6/18/2002	Site 11 RI	Yes	NW	Yes	0-4		4
CAPL-SD83	CAPL-SD83-1012	10/16/2012	PL Phase 2	No	King Creek	No	0-4	No tissue	5
CAPL-SD83	CAPL-SD83-1012-V	10/25/2012	PL Phase 2	No	King Creek	No	0-4	No tissue	5
CAPL-SWSD20	CAPL-SD20-0811	8/2/2011	PL Phase 1	No	NW - Other Trib	No	0-4	No tissue	999
CAPL-SWSD20	CAPL-SD20P-0811	8/2/2011	PL Phase 1	No	NW - Other Trib	No	0-4	No tissue	999
CAPL-SWSD21	CAPL-SD21-0811	8/2/2011	PL Phase 1	No	NW - Other Trib	No	0-4	No tissue	999
CAPL-SWSD26	CAPL-SD26-0811	8/2/2011	PL Phase 1	No	NW - Other Trib	No	0-4	No tissue	999
CAPL-SWSD43	CAPL-SD43-0711	7/28/2011	PL Phase 1	No	Trib - Center	No	0-4	No tissue	999
CAPL-SWSD61	CAPL-SD61-0811	8/2/2011	PL Phase 1	No	Trib - East	No	0-4	No tissue	999

Shaded cells indicate field duplicates

Table D-2
Soil Bioccumulation Factors For Terrestrial Plants (Extrapolated to Sediments and Aquatic Plants)
Penniman Lake

	SERA			BERA			Regression[1]		
	Soil-Plant BAF (dry weight)			Soil-Plant BAF (dry weight)					
Chemical	Value	Basis	Reference	Value	Basis	Reference	B0	B1	Reference
Metals									
Arsenic	1.103	90th percentile	Bechtel Jacobs 1998a	0.037	Geometric mean	Bechtel Jacobs 1998a	-1.992	0.564	Bechtel Jacobs 1998a
Cadmium	3.250	90th percentile	Bechtel Jacobs 1998a	0.586	Median	Bechtel Jacobs 1998a	-0.476	0.546	Bechtel Jacobs 1998a
Chromium	0.084	90th percentile	Bechtel Jacobs 1998a	0.041	Median	Bechtel Jacobs 1998a	--	--	--
Copper	0.625	90th percentile	Bechtel Jacobs 1998a	0.123	Geometric mean	Bechtel Jacobs 1998a	0.669	0.394	Bechtel Jacobs 1998a
Lead	0.468	90th percentile	Bechtel Jacobs 1998a	0.039	Median	Bechtel Jacobs 1998a	-1.328	0.561	Bechtel Jacobs 1998a
Mercury	5.000	90th percentile	Bechtel Jacobs 1998a	0.652	Median	Bechtel Jacobs 1998a	-0.996	0.544	Bechtel Jacobs 1998a
Nickel	1.411	90th percentile	Bechtel Jacobs 1998a	0.018	Median	Bechtel Jacobs 1998a	-2.224	0.748	Bechtel Jacobs 1998a
Selenium	3.012	90th percentile	Bechtel Jacobs 1998a	0.567	Geometric mean	Bechtel Jacobs 1998a	-0.678	1.104	Bechtel Jacobs 1998a
Silver	0.037	90th percentile	Bechtel Jacobs 1998a	0.014	Median	Bechtel Jacobs 1998a	--	--	--
Zinc	1.820	90th percentile	Bechtel Jacobs 1998a	0.358	Geometric mean	Bechtel Jacobs 1998a	1.575	0.555	Bechtel Jacobs 1998a
Pesticides									
4,4'-DDD	0.079	Maximum	DDT value	0.037	Median	DDT value	-2.512	0.752	USEPA 2007f
4,4'-DDE	0.620	Maximum	USEPA 2007f	0.136	Median	USEPA 2007f	-2.512	0.752	USEPA 2007f
4,4'-DDT	0.079	Maximum	USEPA 2007f	0.037	Median	USEPA 2007f	-2.512	0.752	USEPA 2007f
Aldrin	0.139	Calculated	USEPA 2007f	0.139	Calculated	USEPA 2007f	--	--	--
alpha-BHC	1.735	Calculated	USEPA 2007f	1.735	Calculated	USEPA 2007f	--	--	--
alpha-Chlordane	0.165	Calculated	USEPA 2007f	0.165	Calculated	USEPA 2007f	--	--	--
beta-BHC	1.719	Calculated	USEPA 2007f	1.719	Calculated	USEPA 2007f	--	--	--
delta-BHC	1.311	Calculated	USEPA 2007f	1.311	Calculated	USEPA 2007f	--	--	--
Dieldrin	1.500	90th percentile	USEPA 2007f	0.410	Median	USEPA 2007f	--	--	--
Endosulfan I	1.687	Calculated	USEPA 2007f	1.687	Calculated	USEPA 2007f	--	--	--
Endosulfan II	0.886	Calculated	USEPA 2007f	0.886	Calculated	USEPA 2007f	--	--	--
Endrin	0.535	Calculated	USEPA 2007f	0.535	Calculated	USEPA 2007f	--	--	--
gamma-BHC (Lindane)	1.852	Calculated	USEPA 2007f	1.852	Calculated	USEPA 2007f	--	--	--
gamma-Chlordane	0.165	Calculated	USEPA 2007f	0.165	Calculated	USEPA 2007f	--	--	--
Heptachlor	0.174	Calculated	USEPA 2007f	0.174	Calculated	USEPA 2007f	--	--	--
Heptachlor epoxide	0.566	Calculated	USEPA 2007f	0.566	Calculated	USEPA 2007f	--	--	--
Methoxychlor	0.525	Calculated	USEPA 2007f	0.525	Calculated	USEPA 2007f	--	--	--
Toxaphene	0.355	Calculated	USEPA 2007f	0.355	Calculated	USEPA 2007f	--	--	--
PCBs									
Aroclor-1016	0.323	Calculated	USEPA 2007f	0.323	Calculated	USEPA 2007f	--	--	--
Aroclor-1221	0.749	Calculated	USEPA 2007f	0.749	Calculated	USEPA 2007f	--	--	--
Aroclor-1232	0.515	Calculated	USEPA 2007f	0.515	Calculated	USEPA 2007f	--	--	--
Aroclor-1242	0.323	Calculated	USEPA 2007f	0.323	Calculated	USEPA 2007f	--	--	--
Aroclor-1248	0.184	Calculated	USEPA 2007f	0.184	Calculated	USEPA 2007f	--	--	--
Aroclor-1254	0.139	Calculated	USEPA 2007f	0.139	Calculated	USEPA 2007f	--	--	--
Aroclor-1260	0.105	Calculated	USEPA 2007f	0.105	Calculated	USEPA 2007f	--	--	--
Aroclor-1262	0.105	Calculated	USEPA 2007f	0.105	Calculated	USEPA 2007f	--	--	--
Aroclor-1268	0.105	Calculated	USEPA 2007f	0.105	Calculated	USEPA 2007f	--	--	--
Volatile/Semivolatile Organics									
1,1,2,2-Tetrachloroethane	1.000	Assumed	--	1.000	Assumed	--	--	--	--
1,2,4,5-Tetrachlorobenzene	0.792	Calculated	USEPA 2007f	0.792	Calculated	USEPA 2007f	--	--	--
1,2,4-Trichlorobenzene	1.426	Calculated	USEPA 2007f	1.426	Calculated	USEPA 2007f	--	--	--
1,2-Dichlorobenzene	2.452	Calculated	USEPA 2007f	2.452	Calculated	USEPA 2007f	--	--	--
1,3-Dichlorobenzene	2.296	Calculated	USEPA 2007f	2.296	Calculated	USEPA 2007f	--	--	--
1,4-Dichlorobenzene	2.475	Calculated	USEPA 2007f	2.475	Calculated	USEPA 2007f	--	--	--
4-Bromophenyl-phenylether	0.566	Calculated	USEPA 2007f	0.566	Calculated	USEPA 2007f	--	--	--
4-Chlorophenyl-phenylether	0.593	Calculated	USEPA 2007f	0.593	Calculated	USEPA 2007f	--	--	--
Acenaphthene	34.20	90th percentile	USEPA 2007f	7.300	Median	USEPA 2007f	-5.562	-0.856	USEPA 2007f
Acenaphthylene	1.000	Assumed	--	1.000	Assumed	--	-1.144	0.791	USEPA 2007f
Anthracene	3.190	90th percentile	USEPA 2007f	1.500	Median	USEPA 2007f	-0.989	0.778	USEPA 2007f
Benzo(a)anthracene	0.940	90th percentile	USEPA 2007f	0.320	Median	USEPA 2007f	-2.708	0.594	USEPA 2007f
Benzo(a)pyrene	0.710	90th percentile	USEPA 2007f	0.100	Median	USEPA 2007f	-2.062	0.975	USEPA 2007f
Benzo(b)fluoranthene	0.480	Maximum	USEPA 2007f	0.310	Median	USEPA 2007f	--	--	--
Benzo(g,h,i)perylene	0.970	90th percentile	USEPA 2007f	0.210	Median	USEPA 2007f	-0.931	1.183	USEPA 2007f
Benzo(k)fluoranthene	0.530	90th percentile	USEPA 2007f	0.240	Median	USEPA 2007f	-2.158	0.860	USEPA 2007f
Chrysene	0.940	90th percentile	USEPA 2007f	0.320	Median	USEPA 2007f	-2.708	0.594	USEPA 2007f
Dibenz(a,h)anthracene	0.230	Maximum	USEPA 2007f	0.130	Median	USEPA 2007f	--	--	--
Fluoranthene	4.700	90th percentile	USEPA 2007f	0.500	Median	USEPA 2007f	--	--	--
Fluorene	34.20	90th percentile	USEPA 2007f	7.300	Median	USEPA 2007f	-5.562	-0.856	USEPA 2007f
Hexachlorobenzene	0.246	Calculated	USEPA 2007f	0.246	Calculated	USEPA 2007f	--	--	--
Hexachlorobutadiene	0.675	Calculated	USEPA 2007f	0.675	Calculated	USEPA 2007f	--	--	--
Hexachlorocyclopentadiene	0.393	Calculated	USEPA 2007f	0.393	Calculated	USEPA 2007f	--	--	--
Hexachloroethane	1.439	Calculated	USEPA 2007f	1.439	Calculated	USEPA 2007f	--	--	--
Indeno(1,2,3-cd)pyrene	0.150	Maximum	USEPA 2007f	0.110	Median	USEPA 2007f	--	--	--
Pentachlorophenol	30.10	90th percentile	USEPA 2007f	5.930	Median	USEPA 2007f	--	--	--
Phenanthrene	6.580	90th percentile	USEPA 2007f	2.100	Median	USEPA 2007f	-0.167	0.620	USEPA 2007f
Pyrene	2.400	90th percentile	USEPA 2007f	0.720	Median	USEPA 2007f	--	--	--

[1] C_p = Concentration in aboveground portion of plant (mg/kg dry wt) and C_s = Concentration in soil (mg/kg dry wt)

$C_p = e^{(B0 + B1(\ln Cs))}$

Table D-3
Sediment Bioccumulation Factors For Benthic Invertebrates
Penniman Lake

Chemical	SERA Sediment-Invertebrate BAF (dry weight) Value	Basis	Reference	BERA Sediment-Invertebrate BAF (dry weight) Value	Basis	Reference	Regression[1] B0	B1	Reference
Metals									
Arsenic	0.690	90th percentile	Bechtel Jacobs 1998b	0.172	Geometric mean	Bechtel Jacobs 1998b	-0.292	0.754	Bechtel Jacobs 1998b
Cadmium	3.073	90th percentile	Bechtel Jacobs 1998b	0.410	Geometric mean	Bechtel Jacobs 1998b	-0.314	0.513	Bechtel Jacobs 1998b
Chromium	0.468	90th percentile	Bechtel Jacobs 1998b	0.115	Geometric mean	Bechtel Jacobs 1998b	0.209	0.365	Bechtel Jacobs 1998b
Copper	7.957	90th percentile	Bechtel Jacobs 1998b	0.824	Geometric mean	Bechtel Jacobs 1998b	--	--	--
Lead	0.326	90th percentile	Bechtel Jacobs 1998b	0.082	Geometric mean	Bechtel Jacobs 1998b	-0.515	0.653	Bechtel Jacobs 1998b
Mercury	2.868	90th percentile	Bechtel Jacobs 1998b	1.186	Geometric mean	Bechtel Jacobs 1998b	--	--	--
Nickel	0.214	90th percentile	Bechtel Jacobs 1998b	0.134	Median	Bechtel Jacobs 1998b	-0.440	0.695	Bechtel Jacobs 1998b
Selenium	1.000	Assumed	--	1.000	Assumed	--	--	--	--
Silver	0.180	Mean	Hirsch 1998	0.180	Mean	Hirsch 1998	--	--	--
Zinc	4.759	90th percentile	Bechtel Jacobs 1998b	0.897	Geometric mean	Bechtel Jacobs 1998b	1.890	0.126	Bechtel Jacobs 1998b
Pesticides									
4,4'-DDD	1.625	Single value	USACOE 2010	1.625	Single value	USACOE 2010	--	--	--
4,4'-DDE	1.625	Single value	DDD value	1.625	Single value	DDD value	--	--	--
4,4'-DDT	0.296	90th percentile	USACOE 2010	0.214	Median	USACOE 2010	--	--	--
Aldrin	0.447	Single value	USACOE 2010	0.447	Single value	USACOE 2010	--	--	--
alpha-BHC	0.788	Single value	USACOE 2010	0.788	Single value	USACOE 2010	--	--	--
alpha-Chlordane	1.625	Single value	USACOE 2010	1.625	Single value	USACOE 2010	--	--	--
beta-BHC	0.788	Single value	alpha-BHC value	0.788	Single value	alpha-BHC value	--	--	--
delta-BHC	0.788	Single value	alpha-BHC value	0.788	Single value	alpha-BHC value	--	--	--
Dieldrin	4.920	Geometric mean	Standley 1997	4.920	Geometric mean	Standley 1997	--	--	--
Endosulfan I	0.063	Single value	USACOE 2010 (endosulfan sulfate)	0.063	Single value	USACOE 2010 (endosulfan sulfate)	--	--	--
Endosulfan II	0.063	Single value	USACOE 2010 (endosulfan sulfate)	0.063	Single value	USACOE 2010 (endosulfan sulfate)	--	--	--
Endrin	0.518	Single value	USACOE 2010 (endrin aldehyde)	0.518	Single value	USACOE 2010 (endrin aldehyde)	--	--	--
gamma-BHC (Lindane)	1.688	90th percentile	USACOE 2010	0.371	Median	USACOE 2010	--	--	--
gamma-Chlordane	2.292	Single value	USACOE 2010	2.292	Single value	USACOE 2010	--	--	--
Heptachlor	0.065	90th percentile	USACOE 2010	0.049	Median	USACOE 2010	--	--	--
Heptachlor epoxide	0.322	Single value	USACOE 2010	0.322	Single value	USACOE 2010	--	--	--
Methoxychlor	1.000	Assumed	--	1.000	Assumed	--	--	--	--
Toxaphene	1.000	Assumed	--	1.000	Assumed	--	--	--	--
PCBs									
Aroclor-1016 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1221 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1232 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1242 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1248 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1254 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1260 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1262 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Aroclor-1268 (infauna)	21.9	90th percentile	Bechtel Jacobs 1998b	4.49	Geometric mean	Bechtel Jacobs 1998b	0.590	1.110	Bechtel Jacobs 1998b
Volatile/Semivolatile Organics									
1,1,2,2-Tetrachloroethane	1.000	Assumed	--	1.000	Assumed	--	--	--	--
1,2,4,5-Tetrachlorobenzene	0.624	Maximum	Oliver and Niimi 1988	0.397	Mean	Oliver and Niimi 1988	--	--	--
1,2,4-Trichlorobenzene	0.482	Maximum	Oliver and Niimi 1988	0.257	Mean	Oliver and Niimi 1988	--	--	--
1,2-Dichlorobenzene	1.000	Assumed	--	1.000	Assumed	--	--	--	--
1,3-Dichlorobenzene	1.000	Assumed	--	1.000	Assumed	--	--	--	--
1,4-Dichlorobenzene	1.000	Assumed	--	1.000	Assumed	--	--	--	--
4-Bromophenyl-phenylether	1.000	Assumed	--	1.000	Assumed	--	--	--	--
4-Chlorophenyl-phenylether	1.000	Assumed	--	1.000	Assumed	--	--	--	--
Acenaphthene	0.811	90th percentile	USEPA 2009; USACOE 2010	0.056	Median	USEPA 2009; USACOE 2010	--	--	--
Acenaphthylene	1.115	90th percentile	USEPA 2009; USACOE 2010	0.136	Median	USEPA 2009; USACOE 2010	--	--	--
Anthracene	1.140	90th percentile	USACOE 2010	0.604	Median	USACOE 2010	--	--	--
Benzo(a)anthracene	0.387	90th percentile	USACOE 2010	0.171	Median	USACOE 2010	--	--	--
Benzo(a)pyrene	1.307	90th percentile	USACOE 2010	0.065	Median	USACOE 2010	--	--	--
Benzo(b)fluoranthene	0.464	90th percentile	USACOE 2010	0.004	Median	USACOE 2010	--	--	--
Benzo(g,h,i)perylene	0.280	90th percentile	USACOE 2010	0.003	Median	USACOE 2010	--	--	--
Benzo(k)fluoranthene	0.397	90th percentile	USACOE 2010	0.262	Median	USACOE 2010	--	--	--
Chrysene	0.462	90th percentile	USACOE 2010	0.197	Median	USACOE 2010	--	--	--
Dibenz(a,h)anthracene	0.200	90th percentile	USEPA 2009; USACOE 2010	0.036	Median	USEPA 2009; USACOE 2010	--	--	--
Fluoranthene	0.320	90th percentile	USACOE 2010	0.165	Median	USACOE 2010	--	--	--
Fluorene	1.642	90th percentile	Maruya et al. 1997	0.555	Median	Maruya et al. 1997	--	--	--
Hexachlorobenzene	0.857	Maximum	Oliver and Niimi 1988	0.512	Mean	Oliver and Niimi 1988	--	--	--
Hexachlorobutadiene	0.612	Maximum	Oliver and Niimi 1988	0.385	Mean	Oliver and Niimi 1988	--	--	--
Hexachlorocyclopentadiene	1.000	Assumed	--	1.000	Assumed	--	--	--	--
Hexachloroethane	1.000	Assumed	--	1.000	Assumed	--	--	--	--
Indeno(1,2,3-cd)pyrene	0.226	90th percentile	USACOE 2010	0.003	Median	USACOE 2010	--	--	--
Pentachlorophenol	1.000	Assumed	--	1.000	Assumed	--	--	--	--
Phenanthrene	0.528	90th percentile	USACOE 2010	0.458	Median	USACOE 2010	--	--	--
Pyrene	2.828	90th percentile	USEPA 2009; USACOE 2010	0.538	Median	USEPA 2009; USACOE 2010	--	--	--

[1] C_i = Concentration in benthic invertebrate (mg/kg dry wt) and C_{sd} = Concentration in sediment (mg/kg dry wt)

$C_i = 10^{(B0 + B1(\log Csd))}$

Table D-4
Sediment Bioccumulation Factors For Fish
Penniman Lake

Chemical	SERA			BERA		
	Sediment-Fish BAF (dry weight)			Sediment-Fish (dry weight)		
	Value	Basis	Reference	Value	Basis	Reference
Metals						
Arsenic	0.126	Mean	Pascoe et al. 1996	0.126	Mean	Pascoe et al. 1996
Cadmium	0.164	Mean	Pascoe et al. 1996	0.164	Mean	Pascoe et al. 1996
Chromium	0.038	Mean	Krantzberg and Boyd 1992	0.038	Mean	Krantzberg and Boyd 1992
Copper	0.100	Mean	Krantzberg and Boyd 1992	0.100	Mean	Krantzberg and Boyd 1992
Lead	0.070	Mean	Krantzberg and Boyd 1992	0.070	Mean	Krantzberg and Boyd 1992
Mercury	4.580	Maximum	Cope et al. 1990	3.250	Average mean	Cope et al. 1990
Nickel	1.000	assumed	--	1.000	assumed	--
Selenium	1.000	assumed	--	1.000	assumed	--
Silver	1.000	assumed	--	1.000	assumed	--
Zinc	0.147	Mean	Pascoe et al. 1996	0.147	Mean	Pascoe et al. 1996
Pesticides						
4,4'-DDD	5.572	90th percentile	USEPA 2009; USACOE 2010	2.678	Median	USEPA 2009; USACOE 2010
4,4'-DDE	62.60	90th percentile	USEPA 2009; USACOE 2010	4.408	Median	USEPA 2009; USACOE 2010
4,4'-DDT	6.336	90th percentile	USEPA 2009; USACOE 2010	2.888	Median	USEPA 2009; USACOE 2010
Aldrin	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
alpha-BHC	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
alpha-Chlordane	9.468	90th percentile	USEPA 2009; USACOE 2010	3.686	Median	USEPA 2009; USACOE 2010
beta-BHC	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
delta-BHC	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
Dieldrin	19.58	90th percentile	USEPA 2009; USACOE 2010	2.781	Median	USEPA 2009; USACOE 2010
Endosulfan I	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
Endosulfan II	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
Endrin	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
gamma-BHC (Lindane)	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
gamma-Chlordane	7.259	90th percentile	USEPA 2009; USACOE 2010	4.128	Median	USEPA 2009; USACOE 2010
Heptachlor	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
Heptachlor epoxide	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
Methoxychlor	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
Toxaphene	6.526	Median	USEPA 1997a	6.526	Median	USEPA 1997a
PCBs						
Aroclor-1016	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1221	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1232	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1242	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1248	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1254	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1260	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1262	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Aroclor-1268	6.707	Median	USEPA 1997a	6.707	Median	USEPA 1997a
Volatile/Semivolatile Organics						
1,1,2,2-Tetrachloroethane	1.000	assumed	--	1.000	assumed	--
1,2,4,5-Tetrachlorobenzene	0.131	Median	Parkerton et al. 1993	0.131	Median	Parkerton et al. 1993
1,2,4-Trichlorobenzene	0.634	90th percentile	USEPA 2009	0.479	Median	USEPA 2009
1,2-Dichlorobenzene	0.406	Single value	USEPA 2009	0.406	Single value	USEPA 2009
1,3-Dichlorobenzene	0.073	Single value	USEPA 2009	0.073	Single value	USEPA 2009
1,4-Dichlorobenzene	0.051	Single value	USEPA 2009	0.051	Single value	USEPA 2009
4-Bromophenyl-phenylether	1.000	assumed	--	1.000	assumed	--
4-Chlorophenyl-phenylether	1.000	assumed	--	1.000	assumed	--
Acenaphthene	0.155	90th percentile	USEPA 2009; USACOE 2010	0.127	Median	USEPA 2009; USACOE 2010
Acenaphthylene	0.096	90th percentile	USEPA 2009; USACOE 2010	0.050	Median	USEPA 2009; USACOE 2010
Anthracene	0.048	90th percentile	USEPA 2009; USACOE 2010	0.030	Median	USEPA 2009; USACOE 2010
Benzo(a)anthracene	0.113	90th percentile	USEPA 2009; USACOE 2010	0.009	Median	USEPA 2009; USACOE 2010
Benzo(a)pyrene	0.013	90th percentile	USEPA 2009; USACOE 2010	0.007	Median	USEPA 2009; USACOE 2010
Benzo(b)fluoranthene	0.014	90th percentile	USEPA 2009; USACOE 2010	0.009	Median	USEPA 2009; USACOE 2010
Benzo(g,h,i)perylene	0.206	90th percentile	USEPA 2009; USACOE 2010	0.015	Median	USEPA 2009; USACOE 2010
Benzo(k)fluoranthene	0.013	90th percentile	USEPA 2009; USACOE 2010	0.009	Median	USEPA 2009; USACOE 2010
Chrysene	0.081	90th percentile	USEPA 2009; USACOE 2010	0.010	Median	USEPA 2009; USACOE 2010
Dibenz(a,h)anthracene	0.013	90th percentile	USEPA 2009; USACOE 2010	0.008	Median	USEPA 2009; USACOE 2010
Fluoranthene	0.035	90th percentile	USEPA 2009; USACOE 2010	0.010	Median	USEPA 2009; USACOE 2010
Fluorene	0.451	90th percentile	USEPA 2009; USACOE 2010	0.086	Median	USEPA 2009; USACOE 2010
Hexachlorobenzene	0.326	Median	USEPA 1997a	0.326	Median	USEPA 1997a
Hexachlorobutadiene	0.131	Median	Parkerton et al. 1993	0.131	Median	Parkerton et al. 1993
Hexachlorocyclopentadiene	1.000	assumed	--	1.000	assumed	--
Hexachloroethane	1.000	assumed	--	1.000	assumed	--
Indeno(1,2,3-cd)pyrene	0.145	90th percentile	USEPA 2009; USACOE 2010	0.009	Median	USEPA 2009; USACOE 2010
Pentachlorophenol	1.486	Median	Parkerton et al. 1993	1.486	Median	Parkerton et al. 1993
Phenanthrene	0.226	90th percentile	USEPA 2009; USACOE 2010	0.030	Median	USEPA 2009; USACOE 2010
Pyrene	0.168	90th percentile	USEPA 2009; USACOE 2010	0.012	Median	USEPA 2009; USACOE 2010

Table D-5
Total Organic Carbon - Surface Sediment
Penniman Lake

Station ID	Sample ID	Sample Date	Total Organic Carbon (MG/KG)
Penniman Lake-SD10	PL-00-POND-SD10-0300	3/29/2000	29,700
Penniman Lake-SD11	PL-00-POND-SD11-0300	3/30/2000	106,000
CAPL-SWSD18	CAPL-SD18-0811	8/2/2011	34,000
CAPL-SWSD19	CAPL-SD19-0811	8/2/2011	3,800
CAPL-SWSD22	CAPL-SD22-0711	7/28/2011	180,000
CAPL-SWSD23	CAPL-SD23-0711	7/28/2011	79,000
CAPL-SWSD24	CAPL-SD24-0711	7/28/2011	110,000
CAPL-SD70	CAPL-SD70-1012	10/17/2012	98,300
CAPL-SD84	CAPL-SD84-1012	10/24/2012	2,300
CAPL-SD85	CAPL-SD85-1012	10/24/2012	3,440
CAPL-SD86	CAPL-SD86-1012	10/24/2012	3,210
CAPL-SD87	CAPL-SD87-1012	10/24/2012	7,080
CAS011-11SD18	CAS011-11SD18-00-0602	6/13/2002	24,000
CAS011-11SD19	CAS011-11SD19-00-0602	6/13/2002	41,000
CAS011-11SD20	CAS011-11SD20-00-0602	6/13/2002	9,030
CAS011-11SD21	CAS011-11SD21-00-0602	6/14/2002	80,800
CAS011-11SD22	CAS011-11SD22-00-0602	6/14/2002	123,000
CAS011-11SD23	CAS011-11SD23-00-0602	6/17/2002	90,600
CAS011-11SD29	CAS011-11SD29-00-0602	6/17/2002	149,000
CAS011-11SD30	CAS011-11SD30-00-0602	6/18/2002	53,300
Penniman Lake-SD12	PL-00-POND-SD12-0300	3/29/2000	49,100
CAPL-SWSD25	CAPL-SD25-0711	7/28/2011	12,000
CAS011-11SD24	CAS011-11SD24-00-0602	6/13/2002	20,500
CAS011-11SD25	CAS011-11SD25-00-0602	6/13/2002	15,000
CAS011-11SD26	CAS011-11SD26-00-0602	6/17/2002	51,600
CAS011-11SD27	CAS011-11SD27-00-0602	6/17/2002	71,500
CAS011-11SD28	CAS011-11SD28-00-0602	6/17/2002	34,300
Penniman Lake-SD17	PL-00-POND-SD17-0300	3/29/2000	28,600
CAPL-SWSD59	CAPL-SD59-0711	7/27/2011	98,000
CAPL-SWSD60	CAPL-SD60-0711	7/29/2011	78,000
CAPL-SWSD66	CAPL-SD66-1012	10/18/2012	35,000
CAPL-SD76	CAPL-SD76-1012	10/16/2012	51,400
CAPL-SD77	CAPL-SD77-1012	10/16/2012	91,100
CAPL-SD78	CAPL-SD78-1012	10/16/2012	71,500
CAPL-SD79	CAPL-SD79-1012	10/16/2012	68,400
CAPL-SD80	CAPL-SD80-1012	10/16/2012	69,200
CAA06-SD01	CAA06-SD01-1008	10/23/2008	69,000
CAA06-SD02	CAA06-SD02-1008	10/23/2008	23,000
Penniman Lake-SD13	PL-00-POND-SD13-0300	3/30/2000	88,500
Penniman Lake-SD14	PL-00-POND-SD14-0300	3/29/2000	25,300
Penniman Lake-SD15	PL-00-POND-SD15-0300	3/29/2000	27,800
Penniman Lake-SD16	PL-00-POND-SD16-0300	3/29/2000	30,600
CAPL-SWSD27	CAPL-SD27-0711	7/28/2011	98,000
CAPL-SWSD28	CAPL-SD28-0711	7/28/2011	87,000
CAPL-SWSD29	CAPL-SD29-0711	7/28/2011	78,000
CAPL-SWSD30	CAPL-SD30-0711	7/28/2011	75,000
CAPL-SWSD31	CAPL-SD31-0711	7/28/2011	68,000

Table D-5
Total Organic Carbon - Surface Sediment
Penniman Lake

Station ID	Sample ID	Sample Date	Total Organic Carbon (MG/KG)
CAPL-SWSD32	CAPL-SD32-0711	7/28/2011	110,000
CAPL-SWSD33	CAPL-SD33-0711	7/28/2011	80,000
CAPL-SWSD34	CAPL-SD34-0711	7/27/2011	78,000
CAPL-SWSD35	CAPL-SD35-0711	7/28/2011	110,000
CAPL-SWSD36	CAPL-SD36-0711	7/28/2011	64,000
CAPL-SWSD37	CAPL-SD37-0711	7/27/2011	72,000
CAPL-SWSD38	CAPL-SD38-0711	7/27/2011	85,000
CAPL-SWSD39	CAPL-SD39-0711	7/27/2011	68,000
CAPL-SWSD40	CAPL-SD40-0711	7/27/2011	47,000
CAPL-SWSD41	CAPL-SD41-0711	7/28/2011	81,000
CAPL-SWSD42	CAPL-SD42-0711	7/27/2011	80,000
CAPL-SWSD44	CAPL-SD44-0711	7/28/2011	130,000
CAPL-SWSD45	CAPL-SD45-0711	7/28/2011	5,500
CAPL-SWSD46	CAPL-SD46-0711	7/27/2011	80,000
CAPL-SWSD47	CAPL-SD47-0711	7/27/2011	100,000
CAPL-SWSD48	CAPL-SD48-0711	7/29/2011	8,200
CAPL-SWSD49	CAPL-SD49-0711	7/29/2011	130,000
CAPL-SWSD50	CAPL-SD50-0711	7/29/2011	66,000
CAPL-SWSD51	CAPL-SD51-0711	7/29/2011	70,000
CAPL-SWSD52	CAPL-SD52-0711	7/29/2011	58,000
CAPL-SWSD53	CAPL-SD53-0711	7/29/2011	63,000
CAPL-SWSD54	CAPL-SD54-0711	7/27/2011	83,000
CAPL-SWSD55	CAPL-SD55-0711	7/27/2011	19,000
CAPL-SWSD56	CAPL-SD56-0711	7/27/2011	84,000
CAPL-SWSD57	CAPL-SD57-0711	7/27/2011	35,000
CAPL-SWSD58	CAPL-SD58-0711	7/29/2011	74,000
CAPL-SWSD62	CAPL-SD62-1012	10/17/2012	74,400
CAPL-SWSD63	CAPL-SD63-1012	10/17/2012	71,400
CAPL-SWSD64	CAPL-SD64-1012	10/17/2012	75,900
CAPL-SWSD65	CAPL-SD65-1012	10/18/2012	37,900
CAPL-SWSD67	CAPL-SD67-1012	10/16/2012	106,000
CAPL-SWSD68	CAPL-SD68-1012	10/18/2012	116,000
CAPL-SWSD69	CAPL-SD69-1012	10/17/2012	72,200
CAPL-SD71	CAPL-SD71-1012	10/17/2012	51,800
CAPL-SD72	CAPL-SD72-1012	10/17/2012	107,000
CAPL-SD73	CAPL-SD73-1012	10/17/2012	37,100
CAPL-SD74	CAPL-SD74-1012	10/18/2012	79,300
CAPL-SD75	CAPL-SD75-1012	10/18/2012	84,300
CAPL-SD81	CAPL-SD81-1012	10/18/2012	108,000
CAPL-SD82	CAPL-SD82-1012	10/18/2012	134,000
CAS011-11SD31	CAS011-11SD31-00-0602	6/18/2002	17,100
CAS011-11SD32	CAS011-11SD32-00-0602	6/18/2002	94,300
		N	89
		Minimum	2,300
		Maximum	180,000
		Mean	**66,184**

Table D-6
Exposure Parameters for Upper Trophic Level Ecological Receptors - SERA
Penniman Lake

Receptor	Minimum Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day -		Dietary Composition (percent)				Sediment Ingestion (percent)	
	Value	Reference	Value	Reference	Value	Reference	Aquatic Plants	Aquatic Invert.	Fish	Reference	Value	Reference
Mammals												
Mink	0.726	Silva and Downing 1995	0.0286	USEPA 1993	0.0349	USEPA 1993	0.0	0.0	100	USEPA 1993	0.0	Sample and Suter 1994
Raccoon	4.230	Silva and Downing 1995	0.6092	allometric equation[1]	0.1307	Conover 1989	40.0	43.6	7.0	USEPA 1993	9.4	Beyer et al. 1994
Birds												
Belted kingfisher	0.125	Dunning 2008	0.0211	allometric equation[1]	0.0262	USEPA 1993	0.0	0.16	0.84	USEPA 1993	0.0	Sample and Suter 1994
Great blue heron	2.100	Butler 1992	0.1090	allometric equation[1]	0.1356	allometric equation[2]	0.0	0.0	100	USEPA 1993; Quinney and Smith 1980	0.0	Sample and Suter 1994
Osprey	1.235	Dunning 2008	0.0858	allometric equation[1]	0.0919	USEPA 1993	0.0	0.0	100	USEPA 1993	0.0	Assumed based on diet

1 - USEPA 1993
2 - Nagy 2001

Table D-7
Exposure Parameters for Upper Trophic Level Ecological Receptors - BERA
Penniman Lake

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day -		Dietary Composition (percent)				Sediment Ingestion (percent)	
	Value	Reference	Value	Reference	Value	Reference	Aquatic Plants	Aquatic Invert.	Fish	Reference	Value	Reference
Mammals												
Mink	0.777	Silva and Downing 1995	0.0218	USEPA 1993	0.0266	USEPA 1993	0.0	0.0	100.0	USEPA 1993	0.0	Sample and Suter 1994
Raccoon	5.940	Silva and Downing 1995	0.4921	allometric equation[1]	0.1031	Conover 1989	40.0	43.6	7.0	USEPA 1993	9.4	Beyer et al. 1994
Birds												
Belted kingfisher	0.148	Dunning 2008	0.0164	allometric equation[1]	0.0180	USEPA 1993	0.0	0.16	0.84	USEPA 1993	0.0	Sample and Suter 1994
Great blue heron	2.230	Quinney 1982	0.1010	allometric equation[1]	0.1254	allometric equation[2]	0.0	0.0	100.0	USEPA 1993; Quinney and Smith 1980	0.0	Sample and Suter 1994
Osprey	1.486	Dunning 2008	0.0769	allometric equation[1]	0.0780	USEPA 1993	0.0	0.0	100	USEPA 1993	0.0	Assumed based on diet

1 - USEPA 1993
2 - Nagy 2001

Table D-8
Toxicity Reference Values for Mammals
Penniman Lake

Chemical	Chemical Form	Test Organism	Duration	Critical Life Stage?	Exposure Route	Effect/Endpoint	NOAEL (mg/kg/d)	MATC (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Mink	Raccoon
Metals												
Arsenic	--	dog	chronic	--	oral	--	1.04	1.31	1.66	USEPA 2005a	X	X
Cadmium	--	rat	chronic	--	oral	--	0.77	2.43	7.70	USEPA 2005b	X	X
Chromium	Cr+3	multiple	chronic	--	oral	--	2.40	5.37	12.0	USEPA 2008	X	X
Copper	Copper sulfate	mink	357 days	Yes	oral in diet	reproduction	11.7	13.3	15.1	Sample et al. 1996	X	X
Lead	--	rat	chronic	--	oral	--	4.70	6.47	8.90	USEPA 2005c	X	X
Mercury	Methyl mercury chloride	mink	93 days	No	oral in diet	survival/weight loss/ataxia	0.150	0.192	0.247	Sample et al. 1996	X	X
Nickel	--	multiple	chronic	--	oral	--	1.70	2.40	3.40	USEPA 2007b	X	X
Selenium	Potassium selenate (SeO4)	rat	1 year	Yes	oral in water	reproduction	0.20	0.26	0.33	Sample et al. 1996	X	X
Silver	--	pig	chronic	--	oral	--	12.0	26.9	60.2	USEPA 2006	X	X
Zinc	--	multiple	chronic	--	oral	--	75.4	169	377	USEPA 2007c	X	X
Pesticides												
4,4'-DDD	--	rat	chronic	--	oral	--	0.147	0.329	0.735	USEPA 2007g	X	X
4,4'-DDE	--	rat	chronic	--	oral	--	0.147	0.329	0.735	USEPA 2007g	X	X
4,4'-DDT	--	rat	chronic	--	oral	--	0.147	0.329	0.735	USEPA 2007g	X	X
Aldrin	--	rat	3 generations	Yes	oral in diet	reproduction	0.20	0.45	1.00	Sample et al. 1996	X	X
alpha-BHC	BHC - mixed isomers	rat	4 generations	Yes	oral in diet	reproduction	1.60	2.26	3.20	Sample et al. 1996	X	X
alpha-Chlordane	--	mouse	6 generations	Yes	oral in diet	reproduction	4.58	6.48	9.16	Sample et al. 1996	X	X
beta-BHC	BHC - mixed isomers	rat	4 generations	Yes	oral in diet	reproduction	1.60	2.26	3.20	Sample et al. 1996	X	X
delta-BHC	BHC - mixed isomers	rat	4 generations	Yes	oral in diet	reproduction	1.60	2.26	3.20	Sample et al. 1996	X	X
Dieldrin	--	rat	chronic	--	oral	--	0.015	0.021	0.030	USEPA 2007h	X	X
Endosulfan I	Endosulfan	rat	30 days	No	oral (gavage)	reproduction	0.15	0.34	0.75	Sample et al. 1996	X	X
Endosulfan II	Endosulfan	rat	30 days	No	oral (gavage)	reproduction	0.15	0.34	0.75	Sample et al. 1996	X	X
Endrin	--	mouse	120 days	Yes	oral in diet	reproduction	0.184	0.411	0.920	Sample et al. 1996	X	X
gamma-BHC (Lindane)	--	rat	3 generations	Yes	oral in diet	reproduction	8.00	17.9	40.0	Sample et al. 1996	X	X
gamma-Chlordane	--	mouse	6 generations	Yes	oral in diet	reproduction	4.58	6.48	9.16	Sample et al. 1996	X	X
Heptachlor	--	mink	181 days	Yes	oral in diet	reproduction	0.20	0.45	1.00	Sample et al. 1996	X	X
Heptachlor epoxide	--	mink	181 days	Yes	oral in diet	reproduction	0.20	0.45	1.00	Heptachlor value	X	X
Methoxychlor	--	rat	11 months	Yes	oral in diet	reproduction	4.00	5.66	8.00	Sample et al. 1996	X	X
Toxaphene	--	rat	3 generations	Yes	oral in diet	reproduction	8.00	17.9	40.0	Sample et al. 1996	X	X
PCBs												
Aroclor-1016	--	mink	18 months	Yes	oral in diet	reproduction	1.37	2.17	3.43	Sample et al. 1996	X	X
Aroclor-1221	--	mink	7 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Aroclor-1242 value	X	X
Aroclor-1232	--	mink	7 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Aroclor-1242 value	X	X
Aroclor-1242	--	mink	7 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Sample et al. 1996	X	X
Aroclor-1248	--	mink	4.5 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Aroclor-1254 value	X	X
Aroclor-1254	--	mink	4.5 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Sample et al. 1996	X	X
Aroclor-1260	--	mink	4.5 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Aroclor-1254 value	X	X
Aroclor-1262	--	mink	4.5 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Aroclor-1254 value	X	X
Aroclor-1268	--	mink	4.5 months	Yes	oral in diet	reproduction	0.137	0.306	0.685	Aroclor-1254 value	X	X
Volatile/Semivolatile Organics												
1,1,2,2-Tetrachloroethane	--	rat	78 weeks	Yes	oral (gavage)	reproduction	76.0	170	380	ATSDR 2008	X	X
1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	NA	NA	NA	--	X	X
1,2,4-Trichlorobenzene	--	rat	3 generations	Yes	oral in water	reproduction	53.0	75.0	106	Coulston and Kolbye 1994	X	X
1,2-Dichlorobenzene	--	rat	chronic	No	oral (gavage)	liver/kidney	85.7	192	429	Coulston and Kolbye 1994	X	X
1,3-Dichlorobenzene	--	rat	chronic	No	oral (gavage)	liver/kidney	85.7	192	429	1,2-Dichlorobenzene value	X	X
1,4-Dichlorobenzene	--	rat	2 generations	Yes	oral (gavage)	developmental	30.0	52.0	90.0	ATSDR 2006	X	X
4-Bromophenyl-phenylether	--	--	--	--	--	--	NA	NA	NA	--	X	X
4-Chlorophenyl-phenylether	--	--	--	--	--	--	NA	NA	NA	--	X	X
Acenaphthene	--	rat	chronic	--	oral	--	65.6	147	328	USEPA 2007e	X	X
Acenaphthylene	--	rat	chronic	--	oral	--	65.6	147	328	USEPA 2007e	X	X
Anthracene	--	rat	chronic	--	oral	--	65.6	147	328	USEPA 2007e	X	X
Benzo(a)anthracene	--	mouse	chronic	--	oral	--	0.615	1.37	3.07	USEPA 2007e	X	X
Benzo(a)pyrene	--	mouse	chronic	--	oral	--	0.615	1	3.07	USEPA 2007e	X	X
Benzo(b)fluoranthene	--	mouse	chronic	--	oral	--	0.615	1	3.07	USEPA 2007e	X	X
Benzo(g,h,i)perylene	--	mouse	chronic	--	oral	--	0.615	1	3.07	USEPA 2007e	X	X
Benzo(k)fluoranthene	--	mouse	chronic	--	oral	--	0.615	1.37	3.07	USEPA 2007e	X	X
Chrysene	--	mouse	chronic	--	oral	--	0.615	1.37	3.07	USEPA 2007e	X	X
Dibenz(a,h)anthracene	--	mouse	chronic	--	oral	--	0.615	1.37	3.07	USEPA 2007e	X	X
Fluoranthene	--	rat	chronic	--	oral	--	65.6	147	328	USEPA 2007e	X	X
Fluorene	--	rat	chronic	--	oral	--	65.6	147	328	USEPA 2007e	X	X
Hexachlorobenzene	--	rat	4 generations	Yes	oral in diet	reproduction	2.00	2.83	4.00	ATSDR 2002	X	X
Hexachlorobutadiene	--	rat	GD 1-22; LD 1-21	Yes	oral in diet	developmental	2.00	6.32	20.0	ATSDR 1994	X	X
Hexachlorocyclopentadiene	--	mouse	GD 6-15	Yes	oral (gavage)	developmental	75.0	168	375	ATSDR 1999	X	X
Hexachloroethane	--	rat	GD 6-16	Yes	oral (gavage)	reproduction	100	224	500	ATSDR 1997	X	X
Indeno(1,2,3-cd)pyrene	--	mouse	chronic	--	oral	--	0.615	1.37	3.07	USEPA 2007e	X	X
Pentachlorophenol	--	multiple	chronic	--	oral	--	8.42	18.8	42.1	USEPA 2007d	X	X
Phenanthrene	--	rat	chronic	--	oral	--	65.6	147	328	USEPA 2007e	X	X
Pyrene	--	mouse	chronic	--	oral	--	0.615	1.37	3.07	USEPA 2007e	X	X

NA - TRV Not Available

Table D-9
Toxicity Reference Values for Birds
Penniman Lake

Chemical	Chemical Form	Test Organism	Duration	Critical Life Stage?	Exposure Route	Effect/Endpoint	NOAEL (mg/kg/d)	MATC (mg/kg/d)	LOAEL (mg/kg/d)	Reference	Great blue heron	Belted Kingfisher	Osprey
Metals													
Arsenic	Sodium arsenite	mallard	128 days	No	oral in diet	survival	5.14	8.12	12.8	Sample et al. 1996	X	X	X
Cadmium	--	multiple	chronic	--	oral	--	1.47	3.29	7.35	USEPA 2005b	X	X	X
Chromium	Cr+3	multiple	chronic	--	oral	--	2.66	5.95	13.3	USEPA 2008	X	X	X
Copper	--	chicken	chronic	--	oral	--	4.05	7.00	12.1	USEPA 2007a	X	X	X
Lead	Metallic	American kestrel	7 months	Yes	oral in diet	reproduction	3.85	8.61	19.3	Sample et al. 1996	X	X	X
Mercury	Methyl mercury	mallard	3 generations	Yes	oral in diet	reproduction	0.026	0.045	0.078	USEPA 1997b	X	X	
Mercury	--	red-tailed hawk	12 weeks	Yes	oral in diet	survival/neurological	0.49	0.77	1.20	USEPA 1995			X
Nickel	--	multiple	chronic	--	oral	--	6.710	15.0	33.6	USEPA 2007c	X	X	X
Selenium	Selanomethionine	black-crowned night-heron	94 days	Yes	oral in diet	reproduction	1.80	4.02	9.00	Sample et al. 1996	X	X	X
Silver	--	turkey	chronic	--	oral	--	4.04	9.03	20.2	USEPA 2006	X	X	X
Zinc	--	multiple	chronic	--	oral	--	66.1	148	331	USEPA 2007c	X	X	X
Pesticides													
4,4'-DDD	--	bald eagle	112 days	No	oral in diet	survival	0.30	0.95	3.00	DDT value	X	X	X
4,4'-DDE	--	bald eagle	112 days	No	oral in diet	survival	0.30	0.95	3.00	DDT value	X	X	X
4,4'-DDT	--	bald eagle	112 days	No	oral in diet	survival	0.30	0.95	3.00	USEPA 1995	X	X	X
Aldrin	--	mallard	5 days	No	oral in diet	survival	0.16	0.35	0.78	Hill et al. 1975	X	X	X
alpha-BHC	BHC - mixed isomers	Japanese quail	90 days	Yes	oral in diet	reproduction	0.56	1.13	2.25	Sample et al. 1996	X	X	X
alpha-Chlordane	--	mallard	not specified	Yes	oral in diet	reproduction	0.80	1.79	4.00	Wiemeyer 1996	X	X	X
beta-BHC	BHC - mixed isomers	Japanese quail	90 days	Yes	oral in diet	reproduction	0.56	1.13	2.25	Sample et al. 1996	X	X	X
delta-BHC	BHC - mixed isomers	Japanese quail	90 days	Yes	oral in diet	reproduction	0.56	1.13	2.25	Sample et al. 1996	X	X	X
Dieldrin	--	mallard	chronic	--	oral	--	0.07	0.52	3.78	USEPA 2007h	X	X	X
Endosulfan I	Endosulfan	gray partridge	4 weeks	Yes	oral in diet	reproduction	10.0	22.4	50.0	Sample et al. 1996	X	X	X
Endosulfan II	Endosulfan	gray partridge	4 weeks	Yes	oral in diet	reproduction	10.0	22.4	50.0	Sample et al. 1996	X	X	X
Endrin	--	mallard	>200 days	Yes	oral in diet	reproduction	0.30	0.67	1.50	Sample et al. 1996	X	X	
Endrin	--	screech owl	>83 days	Yes	oral in diet	reproduction	0.02	0.05	0.10	Sample et al. 1996			X
gamma-BHC (Lindane)	--	mallard	8 weeks	Yes	oral (gavage)	reproduction	4.00	8.94	20.0	Sample et al. 1996	X	X	X
gamma-Chlordane	--	mallard	not specified	Yes	oral in diet	reproduction	0.80	1.79	4.00	Wiemeyer 1996	X	X	X
Heptachlor	--	mallard	5 days	No	oral in diet	survival	0.48	1.07	2.40	Hill et al. 1975	X	X	X
Heptachlor epoxide	--	mallard	5 days	No	oral in diet	survival	0.48	1.07	2.40	Heptachor value	X	X	X
Methoxychlor	--	chicken	16 weeks	Yes	oral in diet	reproduction	355	794	1,775	Wiemeyer 1996	X	X	X
Toxaphene	--	American black duck	2 seasons	Yes	oral in diet	reproduction	1.00	2.24	5.00	Wiemeyer 1996	X	X	X
PCBs													
Aroclor-1016	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1016	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1221	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1221	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1232	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1232	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1242	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1242	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Sample et al. 1996			X
Aroclor-1248	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1248	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1254	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	USEPA 1995	X	X	
Aroclor-1254	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1260	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1260	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1262	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1262	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Aroclor-1268	--	mallard	1 month	Yes	oral in diet	reproduction	1.50	3.35	7.50	Aroclor-1254 value	X	X	
Aroclor-1268	--	screech owl	2 generations	Yes	oral in diet	reproduction	0.41	0.92	2.05	Aroclor-1242 value			X
Volatiles/Semivolatile Organics													
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	NA	NA	NA	--	X	X	X
1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	NA	NA	NA	--	X	X	X
1,2,4-Trichlorobenzene	--	northern bobwhite	14 days	No	oral	survival	80.4	180	402	1,4-Dichlorobenzene value	X	X	X
1,2-Dichlorobenzene	--	northern bobwhite	14 days	No	oral	survival	80.4	180	402	1,4-Dichlorobenzene value	X	X	X
1,3-Dichlorobenzene	--	northern bobwhite	14 days	No	oral	survival	80.4	180	402	1,4-Dichlorobenzene value	X	X	X
1,4-Dichlorobenzene	--	northern bobwhite	14 days	No	oral	survival	80.4	180	402	TERRETOX 2002	X	X	X
4-Bromophenyl-phenylether	--	--	--	--	--	--	NA	NA	NA	--	X	X	X
4-Chlorophenyl-phenylether	--	--	--	--	--	--	NA	NA	NA	--	X	X	X
Acenaphthene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Acenaphthylene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Anthracene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Benzo(a)anthracene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Benzo(a)pyrene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Rigdon and Neal 1963	X	X	X
Benzo(b)fluoranthene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Benzo(g,h,i)perylene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Benzo(k)fluoranthene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Chrysene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Dibenz(a,h)anthracene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Fluoranthene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Fluorene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Hexachlorobenzene	--	Japanese quail	90 days	Yes	oral in diet	reproduction	0.11	0.25	0.57	Coulston and Kolbye 1994; TERRETOX 2002	X	X	X
Hexachlorobutadiene	--	Japanese quail	90 days	Yes	oral in diet	reproduction	3.39	7.58	17.0	Coulston and Kolbye 1994; TERRETOX 2002	X	X	X
Hexachlorocyclopentadiene	--	--	--	--	--	--	NA	NA	NA	--	X	X	X
Hexachloroethane	--	--	--	--	--	--	NA	NA	NA	--	X	X	X
Indeno(1,2,3-cd)pyrene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Pentachlorophenol	--	chicken	chronic	--	oral	--	6.73	21.3	67.3	USEPA 2007d	X	X	X
Phenanthrene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X
Pyrene	--	chicken	35 days	No	oral in diet	reproduction	7.10	15.9	35.5	Benzo(a)pyrene value	X	X	X

NA - TRV Not Available

Table D-10
Summary of Hazard Quotients for Food Web Exposures - SERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Belted Kingfisher			Great Blue Heron			Osprey			Mink			Raccoon		
	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL
Metals															
Arsenic	3.15E-01	1.99E-01	1.26E-01	8.98E-02	5.68E-02	3.59E-02	1.03E-01	6.54E-02	4.14E-02	3.31E-01	2.62E-01	2.07E-01	3.28E-01	2.60E-01	2.06E-01
Cadmium	1.43E-01	6.41E-02	2.87E-02	4.25E-02	1.90E-02	8.51E-03	4.90E-02	2.19E-02	9.80E-03	6.05E-02	1.91E-02	6.05E-03	7.24E-02	2.29E-02	7.24E-03
Chromium	3.35E-01	1.50E-01	6.69E-02	8.40E-02	3.76E-02	1.68E-02	9.67E-02	4.33E-02	1.93E-02	6.93E-02	3.10E-02	1.39E-02	2.00E-01	8.93E-02	3.99E-02
Copper	**7.02E+01**	**4.06E+01**	**2.35E+01**	**1.59E+00**	9.23E-01	5.34E-01	**1.84E+00**	**1.06E+00**	6.15E-01	4.11E-01	3.61E-01	3.18E-01	**9.45E+00**	**8.31E+00**	**7.31E+00**
Lead	**2.95E+00**	**1.32E+00**	5.89E-01	**1.00E+00**	4.48E-01	2.00E-01	**1.15E+00**	5.16E-01	2.31E-01	6.11E-01	4.44E-01	3.23E-01	6.57E-01	4.77E-01	3.47E-01
Mercury	**5.14E+01**	**2.96E+01**	**1.71E+01**	**1.68E+01**	**9.72E+00**	**5.61E+00**	**1.03E+00**	6.58E-01	4.20E-01	**2.17E+00**	**1.69E+00**	**1.32E+00**	5.45E-01	4.25E-01	3.31E-01
Nickel	**1.49E+01**	**6.68E+00**	**2.99E+00**	**5.43E+00**	**2.43E+00**	**1.09E+00**	**6.25E+00**	**2.80E+00**	**1.25E+00**	**1.60E+01**	**1.13E+01**	**7.98E+00**	**2.01E+00**	**1.42E+00**	**1.00E+00**
Selenium	2.10E-01	9.37E-02	4.19E-02	6.46E-02	2.89E-02	1.29E-02	7.44E-02	3.33E-02	1.49E-02	4.33E-01	3.37E-01	2.63E-01	2.28E-01	1.77E-01	1.38E-01
Silver	2.34E-02	1.05E-02	4.68E-03	8.30E-03	3.71E-03	1.66E-03	9.57E-03	4.28E-03	1.91E-03	2.08E-03	9.28E-04	4.15E-04	3.48E-04	1.56E-04	6.97E-05
Zinc	**1.26E+00**	5.64E-01	2.52E-01	4.24E-01	1.90E-01	8.48E-02	4.88E-01	2.18E-01	9.76E-02	2.77E-01	1.24E-01	5.54E-02	2.31E-01	1.03E-01	4.61E-02
Polychlorinated Biphenyls															
Aroclor-1016	2.62E-01	1.17E-01	5.23E-02	8.75E-02	3.91E-02	1.75E-02	3.69E-01	1.65E-01	7.38E-02	7.14E-02	4.51E-02	2.85E-02	1.49E-02	9.41E-03	5.95E-03
Aroclor-1221	5.27E-01	2.36E-01	1.05E-01	1.75E-01	7.83E-02	3.50E-02	7.38E-01	3.30E-01	1.48E-01	**1.43E+00**	6.38E-01	2.86E-01	3.37E-01	1.51E-01	6.75E-02
Aroclor-1232	2.62E-01	1.17E-01	5.23E-02	8.75E-02	3.91E-02	1.75E-02	3.69E-01	1.65E-01	7.38E-02	7.14E-01	3.19E-01	1.43E-01	1.54E-01	6.90E-02	3.08E-02
Aroclor-1242	2.62E-01	1.17E-01	5.23E-02	8.75E-02	3.91E-02	1.75E-02	3.69E-01	1.65E-01	7.38E-02	7.14E-01	3.19E-01	1.43E-01	1.49E-01	6.66E-02	2.98E-02
Aroclor-1248	2.62E-01	1.17E-01	5.23E-02	8.75E-02	3.91E-02	1.75E-02	3.69E-01	1.65E-01	7.38E-02	7.14E-01	3.19E-01	1.43E-01	1.45E-01	6.49E-02	2.90E-02
Aroclor-1254	2.62E-01	1.17E-01	5.23E-02	8.75E-02	3.91E-02	1.75E-02	3.69E-01	1.65E-01	7.38E-02	7.14E-01	3.19E-01	1.43E-01	1.44E-01	6.44E-02	2.88E-02
Aroclor-1260	**1.47E+01**	**6.56E+00**	**2.93E+00**	**4.68E+00**	**2.09E+00**	9.36E-01	**1.97E+01**	**8.82E+00**	**3.94E+00**	**3.82E+01**	**1.71E+01**	**7.63E+00**	**1.06E+01**	**4.75E+00**	**2.13E+00**
Aroclor-1262	9.41E-02	4.21E-02	1.88E-02	3.18E-02	1.42E-02	6.35E-03	1.34E-01	5.99E-02	2.68E-02	2.59E-01	1.16E-01	5.18E-02	4.80E-02	2.15E-02	9.60E-03
Aroclor-1268	9.41E-02	4.21E-02	1.88E-02	3.18E-02	1.42E-02	6.35E-03	1.34E-01	5.99E-02	2.68E-02	2.59E-01	1.16E-01	5.18E-02	4.80E-02	2.15E-02	9.60E-03
Pesticides															
4,4'-DDD	1.51E-01	4.79E-02	1.51E-02	5.27E-02	1.67E-02	5.27E-03	6.07E-02	1.92E-02	6.07E-03	8.01E-02	3.58E-02	1.60E-02	1.17E-02	5.22E-03	2.33E-03
4,4'-DDE	**7.01E+00**	**2.22E+00**	7.01E-01	**2.56E+00**	8.10E-01	2.56E-01	**2.95E+00**	9.33E-01	2.95E-01	**3.89E+00**	**1.74E+00**	7.79E-01	2.09E-01	9.35E-02	4.18E-02
4,4'-DDT	**3.45E+00**	**1.09E+00**	3.45E-01	**1.26E+00**	3.97E-01	1.26E-01	**1.45E+00**	4.57E-01	1.45E-01	**1.91E+00**	8.53E-01	3.82E-01	1.35E-01	6.05E-02	2.71E-02
Aldrin	2.66E-02	1.19E-02	5.32E-03	9.63E-03	4.31E-03	1.93E-03	1.11E-02	4.96E-03	2.22E-03	5.56E-03	2.49E-03	1.11E-03	4.45E-04	1.99E-04	8.91E-05
alpha-BHC	7.35E-03	3.66E-03	1.83E-03	2.64E-03	1.31E-03	6.56E-04	3.04E-03	1.51E-03	7.55E-04	6.87E-04	4.86E-04	3.44E-04	1.08E-04	7.65E-05	5.41E-05
alpha-Chlordane	6.37E-02	2.85E-02	1.27E-02	2.26E-02	1.01E-02	4.53E-03	2.61E-02	1.17E-02	5.21E-03	2.94E-03	2.08E-03	1.47E-03	3.06E-04	2.16E-04	1.53E-04
beta-BHC	1.53E-02	7.64E-03	3.81E-03	5.50E-03	2.74E-03	1.37E-03	6.33E-03	3.16E-03	1.58E-03	1.43E-03	1.01E-03	7.16E-04	2.24E-04	1.58E-04	1.12E-04
delta-BHC	5.69E-03	2.84E-03	1.42E-03	2.04E-03	1.02E-03	5.08E-04	2.35E-03	1.17E-03	5.85E-04	5.32E-04	3.76E-04	2.66E-04	7.51E-05	5.31E-05	3.76E-05
Dieldrin	**1.85E+01**	**2.54E+00**	3.48E-01	**6.49E+00**	8.89E-01	1.22E-01	**7.48E+00**	**1.02E+00**	1.40E-01	**2.29E+01**	**1.62E+01**	**1.14E+01**	**3.16E+00**	**2.23E+00**	**1.58E+00**
Endosulfan I	6.44E-03	2.88E-03	1.29E-03	2.36E-03	1.06E-03	4.72E-04	2.72E-03	1.22E-03	5.44E-04	1.17E-01	5.24E-02	2.34E-02	1.45E-02	6.47E-03	2.89E-03
Endosulfan II	6.45E-03	2.89E-03	1.29E-03	2.36E-03	1.06E-03	4.73E-04	2.72E-03	1.22E-03	5.45E-04	1.17E-01	5.25E-02	2.35E-02	1.08E-02	4.82E-03	2.16E-03
Endrin	5.56E-01	2.49E-01	1.11E-01	2.01E-01	8.99E-02	4.02E-02	**3.34E+00**	**1.49E+00**	6.68E-01	2.44E-01	1.09E-01	4.88E-02	2.38E-02	1.06E-02	4.76E-03
gamma-BHC (Lindane)	3.02E-04	1.35E-04	6.03E-05	1.06E-04	4.72E-05	2.11E-05	1.22E-04	5.44E-05	2.43E-05	3.93E-05	1.76E-05	7.86E-06	8.01E-06	3.58E-06	1.60E-06
gamma-Chlordane	1.59E-01	7.13E-02	3.19E-02	5.52E-02	2.47E-02	1.10E-02	6.36E-02	2.84E-02	1.27E-02	7.18E-03	5.08E-03	3.59E-03	1.06E-03	7.50E-04	5.30E-04
Heptachlor	4.72E-03	2.11E-03	9.45E-04	1.73E-03	7.74E-04	3.46E-04	1.99E-03	8.91E-04	3.99E-04	3.09E-03	1.38E-03	6.19E-04	2.01E-04	9.00E-05	4.03E-05
Heptachlor epoxide	2.20E-02	9.83E-03	4.40E-03	7.99E-03	3.57E-03	1.60E-03	9.21E-03	4.12E-03	1.84E-03	1.43E-02	6.39E-03	2.86E-03	1.30E-03	5.80E-04	2.59E-04
Methoxychlor	2.74E-04	1.22E-04	5.47E-05	9.76E-05	4.36E-05	1.95E-05	1.12E-04	5.03E-05	2.25E-05	6.45E-03	4.56E-03	3.23E-03	7.60E-04	5.37E-04	3.80E-04
Toxaphene	**1.79E+00**	8.01E-01	3.58E-01	6.39E-01	2.86E-01	1.28E-01	7.36E-01	3.29E-01	1.47E-01	5.95E-02	2.66E-02	1.19E-02	6.62E-03	2.96E-03	1.32E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.79E-05	2.59E-05	1.16E-05	3.79E-05	1.70E-05	7.59E-06
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	4.77E-03	2.13E-03	9.54E-04	1.53E-03	6.84E-04	3.06E-04	1.76E-03	7.88E-04	3.52E-04	1.73E-03	1.22E-03	8.64E-04	1.61E-03	1.14E-03	8.04E-04
1,2-Dichlorobenzene	3.92E-03	1.75E-03	7.84E-04	9.79E-04	4.38E-04	1.96E-04	1.13E-03	5.04E-04	2.26E-04	6.84E-04	3.06E-04	1.37E-04	1.67E-03	7.45E-04	3.33E-04
1,3-Dichlorobenzene	1.73E-03	7.73E-04	3.46E-04	1.75E-04	7.83E-05	3.50E-05	2.02E-04	9.02E-05	4.03E-05	1.22E-04	5.47E-05	2.45E-05	1.57E-03	7.03E-04	3.15E-04
1,4-Dichlorobenzene	1.59E-03	7.09E-04	3.17E-04	1.23E-04	5.49E-05	2.45E-05	1.41E-04	6.32E-05	2.83E-05	2.45E-04	1.41E-04	8.16E-05	4.71E-03	2.72E-03	1.57E-03
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	2.58E-03	1.16E-03	5.17E-04	4.76E-04	2.13E-04	9.52E-05	5.48E-04	2.45E-04	1.10E-04	3.84E-05	1.72E-05	7.67E-06	7.47E-05	3.34E-05	1.49E-05
Acenaphthylene	1.32E-04	5.92E-05	2.65E-05	1.56E-05	6.98E-06	3.12E-06	1.81E-05	8.10E-06	3.62E-06	1.26E-06	5.63E-07	2.52E-07	7.30E-06	3.27E-06	1.46E-06
Anthracene	1.74E-03	7.79E-04	3.48E-04	1.16E-04	5.17E-05	2.31E-05	1.33E-04	5.96E-05	2.67E-05	9.32E-06	4.17E-06	1.86E-06	9.94E-05	4.45E-05	1.99E-05
Benzo(a)anthracene	1.06E-03	4.76E-04	2.13E-04	2.36E-04	1.06E-04	4.72E-05	2.72E-04	1.22E-04	5.44E-05	2.03E-03	9.08E-04	4.06E-04	3.70E-03	1.66E-03	7.42E-04
Benzo(a)pyrene	1.97E-03	8.80E-04	3.94E-04	3.60E-05	1.61E-05	7.21E-06	4.16E-05	1.86E-05	8.33E-06	3.10E-04	1.39E-04	6.21E-05	1.09E-02	4.90E-03	2.19E-03
Benzo(b)fluoranthene	1.50E-03	6.72E-04	3.00E-04	7.72E-05	3.45E-05	1.54E-05	8.90E-05	3.98E-05	1.78E-05	6.64E-04	2.97E-04	1.33E-04	1.45E-02	6.49E-03	2.91E-03
Benzo(g,h,i)perylene	1.34E-03	5.98E-04	2.67E-04	3.90E-04	1.74E-04	7.79E-05	4.49E-04	2.01E-04	8.97E-05	3.35E-03	1.50E-03	6.71E-04	3.66E-03	1.64E-03	7.33E-04
Benzo(k)fluoranthene	7.39E-04	3.30E-04	1.48E-04	4.07E-05	1.82E-05	8.13E-06	4.69E-05	2.10E-05	9.38E-06	3.50E-04	1.57E-04	7.01E-05	5.43E-03	2.43E-03	1.09E-03
Chrysene	1.80E-03	8.06E-04	3.61E-04	3.17E-04	1.42E-04	6.35E-05	3.66E-04	1.63E-04	7.31E-05	2.73E-03	1.22E-03	5.47E-04	7.33E-03	3.28E-03	1.47E-03
Dibenz(a,h)anthracene	9.59E-05	4.29E-05	1.92E-05	9.45E-06	4.23E-06	1.89E-06	1.10E-05	4.91E-06	2.20E-06	8.14E-05	3.64E-05	1.63E-05	1.04E-03	4.65E-04	2.08E-04
Fluoranthene	1.17E-03	5.22E-04	2.33E-04	1.57E-04	7.01E-05	3.13E-05	1.81E-04	8.08E-05	3.61E-05	1.26E-05	5.65E-06	2.53E-06	4.89E-04	2.19E-04	9.77E-05
Fluorene	5.40E-03	2.41E-03	1.08E-03	1.17E-03	5.23E-04	2.34E-04	1.35E-03	6.03E-04	2.70E-04	9.44E-05	4.22E-05	1.89E-05	1.15E-04	5.16E-05	2.31E-05
Hexachlorobenzene	**3.71E+00**	**1.66E+00**	7.42E-01	9.08E-01	4.06E-01	1.82E-01	**1.05E+00**	4.68E-01	2.09E-01	3.82E-02	2.70E-02	1.91E-02	4.44E-02	3.14E-02	2.22E-02
Hexachlorobutadiene	6.25E-02	2.79E-02	1.25E-02	1.21E-02	5.42E-03	2.42E-03	1.40E-02	6.25E-03	2.79E-03	1.53E-02	4.84E-03	1.53E-03	4.82E-02	1.53E-02	4.82E-03
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.12E-03	1.39E-03	6.24E-04	1.52E-03	6.78E-04	3.03E-04
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.34E-03	1.05E-03	4.68E-04	1.77E-03	7.91E-04	3.54E-04
Indeno(1,2,3-cd)pyrene	1.11E-03	4.97E-04	2.22E-04	3.14E-04	1.41E-04	6.29E-05	3.62E-04	1.62E-04	7.24E-05	2.70E-03	1.21E-03	5.41E-04	3.16E-03	1.41E-03	6.33E-04
Pentachlorophenol	8.51E-01	2.69E-01	8.51E-02	2.77E-01	8.75E-02	2.77E-02	3.19E-01	1.01E-01	3.19E-02	1.65E-01	7.37E-02	3.30E-02	9.02E-01	4.04E-01	1.80E-01
Phenanthrene	7.70E-03	3.44E-03	1.54E-03	1.96E-03	8.76E-04	3.92E-04	2.26E-03	1.01E-03	4.51E-04	1.58E-04	7.06E-05	3.16E-05	3.07E-04	1.37E-04	6.15E-05
Pyrene	1.09E-02	4.86E-03	2.17E-03	9.46E-04	4.23E-04	1.89E-04	1.09E-03	4.88E-04	2.18E-04	8.14E-03	3.64E-03	1.63E-03	7.16E-02	3.21E-02	1.44E-02

Shaded cells indicate HQ > 1
NA - TRV Not Available

Table D-11
Summary of Belted Kingfisher Exposure Doses - SERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	1.62E+00	5.14	8.12	12.8	3.15E-01	1.99E-01	1.26E-01
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	2.11E-01	1.47	3.29	7.35	1.43E-01	6.41E-02	2.87E-02
Chromium	9.10E+01	Regression	8.40E+00	0.084	7.63E+00	0.038	3.46E+00	1.00E-03	8.90E-01	2.66	5.95	13.3	3.35E-01	1.50E-01	6.69E-02
Copper	1.00E+03	7.957	7.96E+03	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	2.84E+02	4.05	7.00	12.1	**7.02E+01**	**4.06E+01**	**2.35E+01**
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	1.13E+01	3.85	8.61	19.3	**2.95E+00**	**1.32E+00**	5.89E-01
Mercury	1.48E+00	2.868	4.24E+00	Regresson	4.57E-01	4.580	6.78E+00	1.60E-04	1.34E+00	0.026	0.045	0.078	**5.14E+01**	**2.96E+01**	**1.71E+01**
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	1.00E+02	6.71	15.0	33.6	**1.49E+01**	**6.68E+00**	**2.99E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	3.77E-01	1.80	4.02	9.00	2.10E-01	9.37E-02	4.19E-02
Silver	5.19E-01	0.180	9.34E-02	0.037	1.90E-02	1.000	5.19E-01	5.00E-04	9.45E-02	4.04	9.03	20.2	2.34E-02	1.05E-02	4.68E-03
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	8.34E+01	66.1	148	331	**1.26E+00**	5.64E-01	2.52E-01
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	3.92E-01	1.50	3.35	7.50	2.62E-01	1.17E-01	5.23E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	7.90E-01	1.50	3.35	7.50	5.27E-01	2.36E-01	1.05E-01
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	3.92E-01	1.50	3.35	7.50	2.62E-01	1.17E-01	5.23E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	3.92E-01	1.50	3.35	7.50	2.62E-01	1.17E-01	5.23E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	3.92E-01	1.50	3.35	7.50	2.62E-01	1.17E-01	5.23E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	3.92E-01	1.50	3.35	7.50	2.62E-01	1.17E-01	5.23E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	2.20E+01	1.50	3.35	7.50	**1.47E+01**	**6.56E+00**	**2.93E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	1.41E-01	1.50	3.35	7.50	9.41E-02	4.21E-02	1.88E-02
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	1.41E-01	1.50	3.35	7.50	9.41E-02	4.21E-02	1.88E-02
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	5.572	2.45E-01	1.00E-05	4.54E-02	0.30	0.95	3.00	1.51E-01	4.79E-02	1.51E-02
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	62.60	1.19E+01	1.00E-05	2.10E+00	0.30	0.95	3.00	**7.01E+00**	**2.22E+00**	7.01E-01
4,4'-DDT	9.20E-01	0.296	2.72E-01	Regresson	7.62E-02	6.336	5.83E+00	1.00E-05	1.03E+00	0.30	0.95	3.00	**3.45E+00**	**1.09E+00**	3.45E-01
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	4.12E-03	0.155	0.347	0.775	2.66E-02	1.19E-02	5.32E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	4.11E-03	0.56	1.12	2.25	7.35E-03	3.66E-03	1.83E-03
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	9.468	2.80E-01	1.00E-05	5.09E-02	0.80	1.79	4.00	6.37E-02	2.85E-02	1.27E-02
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	8.58E-03	0.56	1.12	2.25	1.53E-02	7.64E-03	3.81E-03
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	3.19E-03	0.56	1.12	2.25	5.69E-03	2.84E-03	1.42E-03
Dieldrin	3.64E-01	4.920	1.79E+00	1.500	5.46E-01	19.58	7.13E+00	1.00E-05	1.31E+00	0.071	0.518	3.780	**1.85E+01**	**2.54E+00**	3.48E-01
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	6.44E-02	10.0	22.4	50.0	6.44E-03	2.88E-03	1.29E-03
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	6.45E-02	10.0	22.4	50.0	6.45E-03	2.89E-03	1.29E-03
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	1.67E-01	0.30	0.67	1.50	5.56E-01	2.49E-01	1.11E-01
gamma-BHC (Lindane)	1.00E-03	1.688	1.69E-03	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	1.21E-03	4.00	8.9	20.0	3.02E-04	1.35E-04	6.03E-05
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	7.259	6.84E-01	2.11E-05	1.28E-01	0.80	1.79	4.00	1.59E-01	7.13E-02	3.19E-02
Heptachlor	1.97E-03	0.065	1.28E-04	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	2.27E-03	0.48	1.07	2.40	4.72E-03	2.11E-03	9.45E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	1.05E-02	0.48	1.07	2.40	2.20E-02	9.83E-03	4.40E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	9.72E-02	355	794	1,775	2.74E-04	1.22E-04	5.47E-05
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	1.79E+00	1.00	2.24	5.00	**1.79E+00**	8.01E-01	3.58E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	1.91E-02	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.624	3.03E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	2.14E-01	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.482	1.45E+00	1.426	4.28E+00	0.634	1.90E+00	5.00E-04	3.83E-01	80.4	180	402	4.77E-03	2.13E-03	9.54E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	3.15E-01	80.4	180	402	3.92E-03	1.75E-03	7.84E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.39E-01	80.4	180	402	1.73E-03	7.73E-04	3.46E-04
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	1.27E-01	80.4	180	402	1.59E-03	7.09E-04	3.17E-04
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	1.02E+00	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	1.02E+00	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.811	2.73E-01	Regresson	9.77E-03	0.155	5.22E-02	1.34E-04	1.83E-02	7.10	15.9	35.5	2.58E-03	1.16E-03	5.17E-04
Acenaphthylene	1.70E-02	1.115	1.89E-02	Regresson	1.27E-02	0.096	1.64E-03	9.80E-05	9.40E-04	7.10	15.9	35.5	1.32E-04	5.92E-05	2.65E-05
Anthracene	2.65E-01	1.140	3.02E-01	Regresson	1.32E-01	0.048	1.26E-02	1.26E-04	1.24E-02	7.10	15.9	35.5	1.74E-03	7.79E-04	3.48E-04
Benzo(a)anthracene	2.30E-01	0.387	8.91E-02	Regresson	2.78E-02	0.113	2.59E-02	7.07E-05	7.55E-03	7.10	15.9	35.5	1.06E-03	4.76E-04	2.13E-04
Benzo(a)pyrene	3.03E-01	1.307	3.96E-01	Regresson	3.97E-02	0.013	3.88E-03	9.80E-05	1.40E-02	7.10	15.9	35.5	1.97E-03	8.80E-04	3.94E-04
Benzo(b)fluoranthene	5.90E-01	0.464	2.74E-01	0.480	2.83E-01	0.014	8.44E-03	5.49E-05	1.07E-02	7.10	15.9	35.5	1.50E-03	6.72E-04	3.00E-04
Benzo(g,h,i)perylene	2.08E-01	0.280	5.83E-02	Regresson	6.15E-02	0.206	4.28E-02	6.84E-05	9.49E-03	7.10	15.9	35.5	1.34E-03	5.98E-04	2.67E-04
Benzo(k)fluoranthene	3.35E-01	0.397	1.33E-01	Regresson	4.51E-02	0.013	4.42E-03	6.15E-05	5.24E-03	7.10	15.9	35.5	7.39E-04	3.30E-04	1.48E-04
Chrysene	4.30E-01	0.462	1.99E-01	Regresson	4.04E-02	0.081	3.48E-02	7.83E-05	1.28E-02	7.10	15.9	35.5	1.80E-03	8.06E-04	3.61E-04
Dibenz(a,h)anthracene	7.41E-02	0.200	1.48E-02	0.230	1.70E-02	0.013	9.76E-04	7.82E-05	6.81E-04	7.10	15.9	35.5	9.59E-05	4.29E-05	1.92E-05
Fluoranthene	4.90E-01	0.320	1.57E-01	4.700	2.30E+00	0.035	1.71E-02	1.73E-04	8.29E-03	7.10	15.9	35.5	1.17E-03	5.22E-04	2.33E-04
Fluorene	2.85E-01	1.642	4.68E-01	Regresson	1.12E-02	0.451	1.29E-01	1.31E-04	3.83E-02	7.10	15.9	35.5	5.40E-03	2.41E-03	1.08E-03
Hexachlorobenzene	4.86E+00	0.857	4.17E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	4.19E-01	0.113	0.253	0.565	**3.71E+00**	**1.66E+00**	7.42E-01
Hexachlorobutadiene	4.86E+00	0.612	2.97E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	2.12E-01	3.39	7.58	17.0	6.25E-02	2.79E-02	1.25E-02
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	1.02E+00	NA	NA	NA	NA	NA	NA
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	1.02E+00	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.38E-01	0.226	5.38E-02	0.150	3.57E-02	0.145	3.45E-02	7.60E-05	7.88E-03	7.10	15.9	35.5	1.11E-03	4.97E-04	2.22E-04
Pentachlorophenol	1.94E+01	1.000	1.94E+01	30.10	5.84E+02	1.486	2.88E+01	9.80E-03	5.73E+00	6.73	21.3	67.3	8.51E-01	2.69E-01	8.51E-02
Phenanthrene	9.49E-01	0.528	5.01E-01	Regresson	8.20E-01	0.226	2.15E-01	4.55E-04	5.47E-02	7.10	15.9	35.5	7.70E-03	3.44E-03	1.54E-03
Pyrene	6.20E-01	2.828	1.75E+00	2.400	1.49E+00	0.168	1.04E-01	1.90E-04	7.71E-02	7.10	15.9	35.5	1.09E-02	4.86E-03	2.17E-03

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0262 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.160 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.840 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0211 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.125 = Body weight (kg)

Table D-12
Summary of Great Blue Heron Exposure Doses - SERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	4.62E-01	5.14	8.12	12.8	8.98E-02	5.68E-02	3.59E-02
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	6.25E-02	1.47	3.29	7.35	4.25E-02	1.90E-02	8.51E-03
Chromium	9.10E+01	Regression	8.40E+00	0.084	7.63E+00	0.038	3.46E+00	1.00E-03	2.23E-01	2.66	5.95	13.3	8.40E-02	3.76E-02	1.68E-02
Copper	1.00E+03	7.957	7.96E+03	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	6.46E+00	4.05	7.00	12.1	**1.59E+00**	9.23E-01	5.34E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	3.86E+00	3.85	8.61	19.3	**1.00E+00**	4.48E-01	2.00E-01
Mercury	1.48E+00	2.868	4.24E+00	Regresson	4.57E-01	4.580	6.78E+00	1.60E-04	4.38E-01	0.026	0.045	0.078	**1.68E+01**	**9.72E+00**	**5.61E+00**
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	3.64E+01	6.71	15.0	33.6	**5.43E+00**	**2.43E+00**	**1.09E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	1.16E-01	1.80	4.02	9.00	6.46E-02	2.89E-02	1.29E-02
Silver	5.19E-01	0.180	9.34E-02	0.037	1.90E-02	1.000	5.19E-01	5.00E-04	3.36E-02	4.04	9.03	20.2	8.30E-03	3.71E-03	1.66E-03
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	2.80E+01	66.1	148	331	4.24E-01	1.90E-01	8.48E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.31E-01	1.50	3.35	7.50	8.75E-02	3.91E-02	1.75E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	2.63E-01	1.50	3.35	7.50	1.75E-01	7.83E-02	3.50E-02
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	1.31E-01	1.50	3.35	7.50	8.75E-02	3.91E-02	1.75E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.31E-01	1.50	3.35	7.50	8.75E-02	3.91E-02	1.75E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	1.31E-01	1.50	3.35	7.50	8.75E-02	3.91E-02	1.75E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	1.31E-01	1.50	3.35	7.50	8.75E-02	3.91E-02	1.75E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	7.02E+00	1.50	3.35	7.50	**4.68E+00**	**2.09E+00**	9.36E-01
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	4.77E-02	1.50	3.35	7.50	3.18E-02	1.42E-02	6.35E-03
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	4.77E-02	1.50	3.35	7.50	3.18E-02	1.42E-02	6.35E-03
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	5.572	2.45E-01	1.00E-05	1.58E-02	0.30	0.95	3.00	5.27E-02	1.67E-02	5.27E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	62.60	1.19E+01	1.00E-05	7.68E-01	0.30	0.95	3.00	**2.56E+00**	8.10E-01	2.56E-01
4,4'-DDT	9.20E-01	0.296	2.72E-01	Regresson	7.62E-02	6.336	5.83E+00	1.00E-05	3.77E-01	0.30	0.95	3.00	**1.26E+00**	3.97E-01	1.26E-01
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	1.49E-03	0.155	0.347	0.775	9.63E-03	4.31E-03	1.93E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	1.48E-03	0.56	1.12	2.25	2.64E-03	1.31E-03	6.56E-04
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	9.468	2.80E-01	1.00E-05	1.81E-02	0.80	1.79	4.00	2.26E-02	1.01E-02	4.53E-03
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	3.08E-03	0.56	1.12	2.25	5.50E-03	2.74E-03	1.37E-03
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	1.14E-03	0.56	1.12	2.25	2.04E-03	1.02E-03	5.08E-04
Dieldrin	3.64E-01	4.920	1.79E+00	1.500	5.46E-01	19.58	7.13E+00	1.00E-05	4.60E-01	0.071	0.518	3.780	**6.49E+00**	8.89E-01	1.22E-01
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	2.36E-02	10.0	22.4	50.0	2.36E-03	1.06E-03	4.72E-04
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	2.36E-02	10.0	22.4	50.0	2.36E-03	1.06E-03	4.73E-04
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	6.03E-02	0.30	0.67	1.50	2.01E-01	8.99E-02	4.02E-02
gamma-BHC (Lindane)	1.00E-03	1.688	1.69E-03	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	4.22E-04	4.00	8.9	20.0	1.06E-04	4.72E-05	2.11E-05
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	7.259	6.84E-01	2.11E-05	4.42E-02	0.80	1.79	4.00	5.52E-02	2.47E-02	1.10E-02
Heptachlor	1.97E-03	0.065	1.28E-04	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	8.31E-04	0.48	1.07	2.40	1.73E-03	7.74E-04	3.46E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	3.84E-03	0.48	1.07	2.40	7.99E-03	3.57E-03	1.60E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	3.46E-02	355	794	1,775	9.76E-05	4.36E-05	1.95E-05
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	6.39E-01	1.00	2.24	5.00	6.39E-01	2.86E-01	1.28E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	5.90E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.624	3.03E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	4.11E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.482	1.45E+00	1.426	4.28E+00	0.634	1.90E+00	5.00E-04	1.23E-01	80.4	180	402	1.53E-03	6.84E-04	3.06E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	7.87E-02	80.4	180	402	9.79E-04	4.38E-04	1.96E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.41E-02	80.4	180	402	1.75E-04	7.83E-05	3.50E-05
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	9.86E-03	80.4	180	402	1.23E-04	5.49E-05	2.45E-05
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	3.14E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	3.14E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.811	2.73E-01	Regresson	9.77E-03	0.155	5.22E-02	1.34E-04	3.38E-03	7.10	15.9	35.5	4.76E-04	2.13E-04	9.52E-05
Acenaphthylene	1.70E-02	1.115	1.89E-02	Regresson	1.27E-02	0.096	1.64E-03	9.80E-05	1.11E-04	7.10	15.9	35.5	1.56E-05	6.98E-06	3.12E-06
Anthracene	2.65E-01	1.140	3.02E-01	Regresson	1.32E-01	0.048	1.26E-02	1.26E-04	8.21E-04	7.10	15.9	35.5	1.16E-04	5.17E-05	2.31E-05
Benzo(a)anthracene	2.30E-01	0.387	8.91E-02	Regresson	2.78E-02	0.113	2.59E-02	7.07E-05	1.68E-03	7.10	15.9	35.5	2.36E-04	1.06E-04	4.72E-05
Benzo(a)pyrene	3.03E-01	1.307	3.96E-01	Regresson	3.97E-02	0.013	3.88E-03	9.80E-05	2.56E-04	7.10	15.9	35.5	3.60E-05	1.61E-05	7.21E-06
Benzo(b)fluoranthene	5.90E-01	0.464	2.74E-01	0.480	2.83E-01	0.014	8.44E-03	5.49E-05	5.48E-04	7.10	15.9	35.5	7.72E-05	3.45E-05	1.54E-05
Benzo(g,h,i)perylene	2.08E-01	0.280	5.83E-02	Regresson	6.15E-02	0.206	4.28E-02	6.84E-05	2.77E-03	7.10	15.9	35.5	3.90E-04	1.74E-04	7.79E-05
Benzo(k)fluoranthene	3.35E-01	0.397	1.33E-01	Regresson	4.51E-02	0.013	4.42E-03	6.15E-05	2.89E-04	7.10	15.9	35.5	4.07E-05	1.82E-05	8.13E-06
Chrysene	4.30E-01	0.462	1.99E-01	Regresson	4.04E-02	0.081	3.48E-02	7.83E-05	2.25E-03	7.10	15.9	35.5	3.17E-04	1.42E-04	6.35E-05
Dibenz(a,h)anthracene	7.41E-02	0.200	1.48E-02	0.230	1.70E-02	0.013	9.76E-04	7.82E-05	6.71E-05	7.10	15.9	35.5	9.45E-06	4.23E-06	1.89E-06
Fluoranthene	4.90E-01	0.320	1.57E-01	4.700	2.30E+00	0.035	1.71E-02	1.73E-04	1.11E-03	7.10	15.9	35.5	1.57E-04	7.01E-05	3.13E-05
Fluorene	2.85E-01	1.642	4.68E-01	Regresson	1.12E-02	0.451	1.29E-01	1.31E-04	8.31E-03	7.10	15.9	35.5	1.17E-03	5.23E-04	2.34E-04
Hexachlorobenzene	4.86E+00	0.857	4.17E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	1.03E-01	0.113	0.253	0.565	9.08E-01	4.06E-01	1.82E-01
Hexachlorobutadiene	4.86E+00	0.612	2.97E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	4.11E-02	3.39	7.58	17.0	1.21E-02	5.42E-03	2.42E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	3.14E-01	NA	NA	NA	NA	NA	NA
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	3.14E-01	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.38E-01	0.226	5.38E-02	0.150	3.57E-02	0.145	3.45E-02	7.60E-05	2.23E-03	7.10	15.9	35.5	3.14E-04	1.41E-04	6.29E-05
Pentachlorophenol	1.94E+01	1.000	1.94E+01	30.10	5.84E+02	1.486	2.88E+01	9.80E-03	1.86E+00	6.73	21.3	67.3	2.77E-01	8.75E-02	2.77E-02
Phenanthrene	9.49E-01	0.528	5.01E-01	Regresson	8.20E-01	0.226	2.15E-01	4.55E-04	1.39E-02	7.10	15.9	35.5	1.96E-03	8.76E-04	3.92E-04
Pyrene	6.20E-01	2.828	1.75E+00	2.400	1.49E+00	0.168	1.04E-01	1.90E-04	6.72E-03	7.10	15.9	35.5	9.46E-04	4.23E-04	1.89E-04

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.1356 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.1090 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 2.10 = Body weight (kg)

Table D-13
Summary of Osprey Exposure Doses - SERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	5.32E-01	5.14	8.12	12.8	1.03E-01	6.54E-02	4.14E-02
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	7.20E-02	1.47	3.29	7.35	4.90E-02	2.19E-02	9.80E-03
Chromium	9.10E+01	Regression	8.40E+00	0.084	7.63E+00	0.038	3.46E+00	1.00E-03	2.57E-01	2.66	5.95	13.3	9.67E-02	4.33E-02	1.93E-02
Copper	1.00E+03	7.957	7.96E+03	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	7.44E+00	4.05	7.00	12.1	**1.84E+00**	**1.06E+00**	6.15E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	4.44E+00	3.85	8.61	19.3	**1.15E+00**	5.16E-01	2.31E-01
Mercury	1.48E+00	2.868	4.24E+00	Regresson	4.57E-01	4.580	6.78E+00	1.60E-04	5.04E-01	0.49	0.77	1.20	**1.03E+00**	6.58E-01	4.20E-01
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	4.20E+01	6.71	15.0	33.6	**6.25E+00**	**2.80E+00**	**1.25E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	1.34E-01	1.80	4.02	9.00	7.44E-02	3.33E-02	1.49E-02
Silver	5.19E-01	0.180	9.34E-02	0.037	1.90E-02	1.000	5.19E-01	5.00E-04	3.86E-02	4.04	9.03	20.2	9.57E-03	4.28E-03	1.91E-03
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	3.23E+01	66.1	148	331	4.88E-01	2.18E-01	9.76E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.51E-01	0.41	0.92	2.05	3.69E-01	1.65E-01	7.38E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	3.02E-01	0.41	0.92	2.05	7.38E-01	3.30E-01	1.48E-01
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	1.51E-01	0.41	0.92	2.05	3.69E-01	1.65E-01	7.38E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.51E-01	0.41	0.92	2.05	3.69E-01	1.65E-01	7.38E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	1.51E-01	0.41	0.92	2.05	3.69E-01	1.65E-01	7.38E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	1.51E-01	0.41	0.92	2.05	3.69E-01	1.65E-01	7.38E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	8.08E+00	0.41	0.92	2.05	**1.97E+01**	**8.82E+00**	**3.94E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	5.49E-02	0.41	0.92	2.05	1.34E-01	5.99E-02	2.68E-02
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	5.49E-02	0.41	0.92	2.05	1.34E-01	5.99E-02	2.68E-02
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	5.572	2.45E-01	1.00E-05	1.82E-02	0.30	0.95	3.00	6.07E-02	1.92E-02	6.07E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	62.60	1.19E+01	1.00E-05	8.85E-01	0.30	0.95	3.00	**2.95E+00**	9.33E-01	2.95E-01
4,4'-DDT	9.20E-01	0.296	2.72E-01	Regresson	7.62E-02	6.336	5.83E+00	1.00E-05	4.34E-01	0.30	0.95	3.00	**1.45E+00**	4.57E-01	1.45E-01
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	1.72E-03	0.155	0.347	0.775	1.11E-02	4.96E-03	2.22E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	1.70E-03	0.56	1.12	2.25	3.04E-03	1.51E-03	7.55E-04
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	9.468	2.80E-01	1.00E-05	2.08E-02	0.80	1.79	4.00	2.61E-02	1.17E-02	5.21E-03
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	3.54E-03	0.56	1.12	2.25	6.33E-03	3.16E-03	1.58E-03
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	1.32E-03	0.56	1.12	2.25	2.35E-03	1.17E-03	5.85E-04
Dieldrin	3.64E-01	4.920	1.79E+00	1.500	5.46E-01	19.58	7.13E+00	1.00E-05	5.30E-01	0.071	0.518	3.780	**7.48E+00**	**1.02E+00**	1.40E-01
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	2.72E-02	10.0	22.4	50.0	2.72E-03	1.22E-03	5.44E-04
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	2.72E-02	10.0	22.4	50.0	2.72E-03	1.22E-03	5.45E-04
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	6.94E-02	0.021	0.047	0.104	**3.34E+00**	**1.49E+00**	6.68E-01
gamma-BHC (Lindane)	1.00E-03	1.688	1.69E-03	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	4.86E-04	4.00	8.9	20.0	1.22E-04	5.44E-05	2.43E-05
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	7.259	6.84E-01	2.11E-05	5.09E-02	0.80	1.79	4.00	6.36E-02	2.84E-02	1.27E-02
Heptachlor	1.97E-03	0.065	1.28E-04	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	9.57E-04	0.48	1.07	2.40	1.99E-03	8.91E-04	3.99E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	4.42E-03	0.48	1.07	2.40	9.21E-03	4.12E-03	1.84E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	3.99E-02	355	794	1,775	1.12E-04	5.03E-05	2.25E-05
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	7.36E-01	1.00	2.24	5.00	7.36E-01	3.29E-01	1.47E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	6.80E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.624	3.03E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	4.74E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.482	1.45E+00	1.426	4.28E+00	0.634	1.90E+00	5.00E-04	1.42E-01	80.4	180	402	1.76E-03	7.88E-04	3.52E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	9.07E-02	80.4	180	402	1.13E-03	5.04E-04	2.26E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.62E-02	80.4	180	402	2.02E-04	9.02E-05	4.03E-05
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	1.14E-02	80.4	180	402	1.41E-04	6.32E-05	2.83E-05
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	3.62E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	3.62E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.811	2.73E-01	Regresson	9.77E-03	0.155	5.22E-02	1.34E-04	3.89E-03	7.10	15.9	35.5	5.48E-04	2.45E-04	1.10E-04
Acenaphthylene	1.70E-02	1.115	1.89E-02	Regresson	1.27E-02	0.096	1.64E-03	9.80E-05	1.29E-04	7.10	15.9	35.5	1.81E-05	8.10E-06	3.62E-06
Anthracene	2.65E-01	1.140	3.02E-01	Regresson	1.32E-01	0.048	1.26E-02	1.26E-04	9.46E-04	7.10	15.9	35.5	1.33E-04	5.96E-05	2.67E-05
Benzo(a)anthracene	2.30E-01	0.387	8.91E-02	Regresson	2.78E-02	0.113	2.59E-02	7.07E-05	1.93E-03	7.10	15.9	35.5	2.72E-04	1.22E-04	5.44E-05
Benzo(a)pyrene	3.03E-01	1.307	3.96E-01	Regresson	3.97E-02	0.013	3.88E-03	9.80E-05	2.96E-04	7.10	15.9	35.5	4.16E-05	1.86E-05	8.33E-06
Benzo(b)fluoranthene	5.90E-01	0.464	2.74E-01	0.480	2.83E-01	0.014	8.44E-03	5.49E-05	6.32E-04	7.10	15.9	35.5	8.90E-05	3.98E-05	1.78E-05
Benzo(g,h,i)perylene	2.08E-01	0.280	5.83E-02	Regresson	6.15E-02	0.206	4.28E-02	6.84E-05	3.19E-03	7.10	15.9	35.5	4.49E-04	2.01E-04	8.97E-05
Benzo(k)fluoranthene	3.35E-01	0.397	1.33E-01	Regresson	4.51E-02	0.013	4.42E-03	6.15E-05	3.33E-04	7.10	15.9	35.5	4.69E-05	2.10E-05	9.38E-06
Chrysene	4.30E-01	0.462	1.99E-01	Regresson	4.04E-02	0.081	3.48E-02	7.83E-05	2.60E-03	7.10	15.9	35.5	3.66E-04	1.63E-04	7.31E-05
Dibenz(a,h)anthracene	7.41E-02	0.200	1.48E-02	0.230	1.70E-02	0.013	9.76E-04	7.82E-05	7.80E-05	7.10	15.9	35.5	1.10E-05	4.91E-06	2.20E-06
Fluoranthene	4.90E-01	0.320	1.57E-01	4.700	2.30E+00	0.035	1.71E-02	1.73E-04	1.28E-03	7.10	15.9	35.5	1.81E-04	8.08E-05	3.61E-05
Fluorene	2.85E-01	1.642	4.68E-01	Regresson	1.12E-02	0.451	1.29E-01	1.31E-04	9.57E-03	7.10	15.9	35.5	1.35E-03	6.03E-04	2.70E-04
Hexachlorobenzene	4.86E+00	0.857	4.17E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	1.18E-01	0.113	0.253	0.565	**1.05E+00**	4.68E-01	2.09E-01
Hexachlorobutadiene	4.86E+00	0.612	2.97E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	4.74E-02	3.39	7.58	17.0	1.40E-02	6.25E-03	2.79E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	3.62E-01	NA	NA	NA	NA	NA	NA
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	3.62E-01	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.38E-01	0.226	5.38E-02	0.150	3.57E-02	0.145	3.45E-02	7.60E-05	2.57E-03	7.10	15.9	35.5	3.62E-04	1.62E-04	7.24E-05
Pentachlorophenol	1.94E+01	1.000	1.94E+01	30.10	5.84E+02	1.486	2.88E+01	9.80E-03	2.15E+00	6.73	21.3	67.3	3.19E-01	1.01E-01	3.19E-02
Phenanthrene	9.49E-01	0.528	5.01E-01	Regresson	8.20E-01	0.226	2.15E-01	4.55E-04	1.60E-02	7.10	15.9	35.5	2.26E-03	1.01E-03	4.51E-04
Pyrene	6.20E-01	2.828	1.75E+00	2.400	1.49E+00	0.168	1.04E-01	1.90E-04	7.74E-03	7.10	15.9	35.5	1.09E-03	4.88E-04	2.18E-04

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0919 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0858 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 1.235 = Body weight (kg)

Table D-14
Summary of Mink Exposure Doses - SERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	3.44E-01	1.04	1.31	1.66	3.31E-01	2.62E-01	2.07E-01
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	4.66E-02	0.77	2.43	7.70	6.05E-02	1.91E-02	6.05E-03
Chromium	9.10E+01	Regression	8.40E+00	0.084	7.63E+00	0.038	3.46E+00	1.00E-03	1.66E-01	2.40	5.37	12.0	6.93E-02	3.10E-02	1.39E-02
Copper	1.00E+03	7.957	7.96E+03	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	4.81E+00	11.7	13.3	15.1	4.11E-01	3.61E-01	3.18E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	2.87E+00	4.70	6.47	8.90	6.11E-01	4.44E-01	3.23E-01
Mercury	1.48E+00	2.868	4.24E+00	Regresson	4.57E-01	4.580	6.78E+00	1.60E-04	3.26E-01	0.150	0.192	0.247	**2.17E+00**	**1.69E+00**	**1.32E+00**
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	2.71E+01	1.70	2.40	3.40	**1.60E+01**	**1.13E+01**	**7.98E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	8.67E-02	0.20	0.26	0.33	4.33E-01	3.37E-01	2.63E-01
Silver	5.19E-01	0.180	9.34E-02	0.037	1.90E-02	1.000	5.19E-01	5.00E-04	2.50E-02	12.0	26.9	60.2	2.08E-03	9.28E-04	4.15E-04
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	2.09E+01	75.4	169	377	2.77E-01	1.24E-01	5.54E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.71	2.03E+00	0.00E+00	9.78E-02	1.37	2.17	3.43	7.14E-02	4.51E-02	2.85E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.71	4.06E+00	0.00E+00	1.96E-01	0.137	0.306	0.685	**1.43E+00**	6.38E-01	2.86E-01
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.71	2.03E+00	0.00E+00	9.78E-02	0.137	0.306	0.685	7.14E-01	3.19E-01	1.43E-01
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.71	2.03E+00	0.00E+00	9.78E-02	0.137	0.306	0.685	7.14E-01	3.19E-01	1.43E-01
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.71	2.03E+00	0.00E+00	9.78E-02	0.137	0.306	0.685	7.14E-01	3.19E-01	1.43E-01
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.71	2.03E+00	0.00E+00	9.78E-02	0.137	0.306	0.685	7.14E-01	3.19E-01	1.43E-01
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.71	1.09E+02	2.50E-04	5.23E+00	0.137	0.306	0.685	**3.82E+01**	**1.71E+01**	**7.63E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.71	7.38E-01	0.00E+00	3.55E-02	0.137	0.306	0.685	2.59E-01	1.16E-01	5.18E-02
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.71	7.38E-01	0.00E+00	3.55E-02	0.137	0.306	0.685	2.59E-01	1.16E-01	5.18E-02
Pesticides															
4,4'-DDD	4.39E-02	1.63	7.13E-02	Regresson	7.72E-03	5.57	2.45E-01	1.00E-05	1.18E-02	0.147	0.329	0.735	8.01E-02	3.58E-02	1.60E-02
4,4'-DDE	1.90E-01	1.63	3.09E-01	Regresson	2.33E-02	62.6	1.19E+01	1.00E-05	5.72E-01	0.147	0.329	0.735	**3.89E+00**	**1.74E+00**	7.79E-01
4,4'-DDT	9.20E-01	0.296	2.72E-01	Regresson	7.62E-02	6.34	5.83E+00	1.00E-05	2.81E-01	0.147	0.329	0.735	**1.91E+00**	8.53E-01	3.82E-01
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.53	2.31E-02	1.00E-05	1.11E-03	0.20	0.45	1.00	5.56E-03	2.49E-03	1.11E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.53	2.28E-02	1.00E-05	1.10E-03	1.60	2.26	3.20	6.87E-04	4.86E-04	3.44E-04
alpha-Chlordane	2.96E-02	1.63	4.81E-02	0.165	4.88E-03	9.47	2.80E-01	1.00E-05	1.35E-02	4.58	6.48	9.16	2.94E-03	2.08E-03	1.47E-03
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.53	4.76E-02	1.00E-05	2.29E-03	1.60	2.26	3.20	1.43E-03	1.01E-03	7.16E-04
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.53	1.77E-02	1.00E-05	8.51E-04	1.60	2.26	3.20	5.32E-04	3.76E-04	2.66E-04
Dieldrin	3.64E-01	4.920	1.79E+00	1.500	5.46E-01	19.6	7.13E+00	1.00E-05	3.43E-01	0.015	0.021	0.030	**2.29E+01**	**1.62E+01**	**1.14E+01**
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.53	3.65E-01	1.00E-05	1.76E-02	0.15	0.34	0.75	1.17E-01	5.24E-02	2.34E-02
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.53	3.66E-01	1.00E-05	1.76E-02	0.15	0.34	0.75	1.17E-01	5.25E-02	2.35E-02
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.53	9.33E-01	1.00E-05	4.49E-02	0.184	0.411	0.920	2.44E-01	1.09E-01	4.88E-02
gamma-BHC (Lindane)	1.00E-03	1.69	1.69E-03	1.852	1.85E-03	6.53	6.53E-03	1.00E-05	3.14E-04	8.00	17.9	40.0	3.93E-05	1.76E-05	7.86E-06
gamma-Chlordane	9.42E-02	2.29	2.16E-01	0.165	1.55E-02	7.26	6.84E-01	2.11E-05	3.29E-02	4.58	6.48	9.16	7.18E-03	5.08E-03	3.59E-03
Heptachlor	1.97E-03	0.065	1.28E-04	0.174	3.43E-04	6.53	1.29E-02	5.38E-06	6.19E-04	0.20	0.45	1.00	3.09E-03	1.38E-03	6.19E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.53	5.94E-02	1.00E-05	2.86E-03	0.20	0.45	1.00	1.43E-02	6.39E-03	2.86E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.53	5.36E-01	1.00E-05	2.58E-02	4.00	5.66	8.00	6.45E-03	4.56E-03	3.23E-03
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.53	9.89E+00	6.67E-04	4.76E-01	8.00	17.9	40.0	5.95E-02	2.66E-02	1.19E-02
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	4.40E-03	76.0	170	380	5.79E-05	2.59E-05	1.16E-05
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.624	3.03E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	3.06E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.482	1.45E+00	1.426	4.28E+00	0.634	1.90E+00	5.00E-04	9.16E-02	53.0	75.0	106	1.73E-03	1.22E-03	8.64E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	5.86E-02	85.7	192	429	6.84E-04	3.06E-04	1.37E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.05E-02	85.7	192	429	1.22E-04	5.47E-05	2.45E-05
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	7.35E-03	30.0	52.0	90.0	2.45E-04	1.41E-04	8.16E-05
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	2.34E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	2.34E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.811	2.73E-01	Regresson	9.77E-03	0.155	5.22E-02	1.34E-04	2.52E-03	65.6	147	328	3.84E-05	1.72E-05	7.67E-06
Acenaphthylene	1.70E-02	1.115	1.89E-02	Regresson	1.27E-02	0.096	1.64E-03	9.80E-05	8.26E-05	65.6	147	328	1.26E-06	5.63E-07	2.52E-07
Anthracene	2.65E-01	1.140	3.02E-01	Regresson	1.32E-01	0.048	1.26E-02	1.26E-04	6.11E-04	65.6	147	328	9.32E-06	4.17E-06	1.86E-06
Benzo(a)anthracene	2.30E-01	0.387	8.91E-02	Regresson	2.78E-02	0.113	2.59E-02	7.07E-05	1.25E-03	0.62	1.37	3.07	2.03E-03	9.08E-04	4.06E-04
Benzo(a)pyrene	3.03E-01	1.307	3.96E-01	Regresson	3.97E-02	0.013	3.88E-03	9.80E-05	1.91E-04	0.62	1.37	3.07	3.10E-04	1.39E-04	6.21E-05
Benzo(b)fluoranthene	5.90E-01	0.464	2.74E-01	0.480	2.83E-01	0.014	8.44E-03	5.49E-05	4.08E-04	0.62	1.37	3.07	6.64E-04	2.97E-04	1.33E-04
Benzo(g,h,i)perylene	2.08E-01	0.280	5.83E-02	Regresson	6.15E-02	0.206	4.28E-02	6.84E-05	2.06E-03	0.62	1.37	3.07	3.35E-03	1.50E-03	6.71E-04
Benzo(k)fluoranthene	3.35E-01	0.397	1.33E-01	Regresson	4.51E-02	0.013	4.42E-03	6.15E-05	2.15E-04	0.62	1.37	3.07	3.50E-04	1.57E-04	7.01E-05
Chrysene	4.30E-01	0.462	1.99E-01	Regresson	4.04E-02	0.081	3.48E-02	7.83E-05	1.68E-03	0.62	1.37	3.07	2.73E-03	1.22E-03	5.47E-04
Dibenz(a,h)anthracene	7.41E-02	0.200	1.48E-02	0.230	1.70E-02	0.013	9.76E-04	7.82E-05	5.00E-05	0.62	1.37	3.07	8.14E-05	3.64E-05	1.63E-05
Fluoranthene	4.90E-01	0.320	1.57E-01	4.700	2.30E+00	0.035	1.71E-02	1.73E-04	8.29E-04	65.6	147	328	1.26E-05	5.65E-06	2.53E-06
Fluorene	2.85E-01	1.64	4.68E-01	Regresson	1.12E-02	0.451	1.29E-01	1.31E-04	6.19E-03	65.6	147	328	9.44E-05	4.22E-05	1.89E-05
Hexachlorobenzene	4.86E+00	0.857	4.17E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	7.64E-02	2.00	2.83	4.00	3.82E-02	2.70E-02	1.91E-02
Hexachlorobutadiene	4.86E+00	0.612	2.97E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	3.06E-02	2.00	6.32	20.0	1.53E-02	4.84E-03	1.53E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	2.34E-01	75.0	168	375	3.12E-03	1.39E-03	6.24E-04
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	2.34E-01	100	224	500	2.34E-03	1.05E-03	4.68E-04
Indeno(1,2,3-cd)pyrene	2.38E-01	0.226	5.38E-02	0.150	3.57E-02	0.145	3.45E-02	7.60E-05	1.66E-03	0.62	1.37	3.07	2.70E-03	1.21E-03	5.41E-04
Pentachlorophenol	1.94E+01	1.000	1.94E+01	30.10	5.84E+02	1.486	2.88E+01	9.80E-03	1.39E+00	8.42	18.8	42.1	1.65E-01	7.37E-02	3.30E-02
Phenanthrene	9.49E-01	0.528	5.01E-01	Regresson	8.20E-01	0.226	2.15E-01	4.55E-04	1.04E-02	65.6	147	328	1.58E-04	7.06E-05	3.16E-05
Pyrene	6.20E-01	2.83	1.75E+00	2.400	1.49E+00	0.168	1.04E-01	1.90E-04	5.01E-03	0.62	1.37	3.07	8.14E-03	3.64E-03	1.63E-03

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0349 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0286 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.726 = Body weight (kg)

Table D-15
Summary of Raccoon Exposure Doses - SERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	3.41E-01	1.04	1.31	1.66	3.28E-01	2.60E-01	2.06E-01
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	5.58E-02	0.77	2.43	7.70	7.24E-02	2.29E-02	7.24E-03
Chromium	9.10E+01	Regression	8.40E+00	0.084	7.63E+00	0.038	3.46E+00	1.00E-03	4.79E-01	2.40	5.37	12.0	2.00E-01	8.93E-02	3.99E-02
Copper	1.00E+03	7.957	7.96E+03	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	1.11E+02	11.7	13.3	15.1	**9.45E+00**	**8.31E+00**	**7.31E+00**
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	3.09E+00	4.70	6.47	8.90	6.57E-01	4.77E-01	3.47E-01
Mercury	1.48E+00	2.868	4.24E+00	Regresson	4.57E-01	4.580	6.78E+00	1.60E-04	8.18E-02	0.150	0.192	0.247	5.45E-01	4.25E-01	3.31E-01
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	3.41E+00	1.70	2.40	3.40	**2.01E+00**	**1.42E+00**	**1.00E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	4.55E-02	0.20	0.26	0.33	2.28E-01	1.77E-01	1.38E-01
Silver	5.19E-01	0.180	9.34E-02	0.037	1.90E-02	1.000	5.19E-01	5.00E-04	4.20E-03	12.0	26.9	60.2	3.48E-04	1.56E-04	6.97E-05
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	1.74E+01	75.4	169	377	2.31E-01	1.03E-01	4.61E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.71	2.03E+00	0.00E+00	2.04E-02	1.37	2.17	3.43	1.49E-02	9.41E-03	5.95E-03
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.71	4.06E+00	0.00E+00	4.62E-02	0.137	0.306	0.685	3.37E-01	1.51E-01	6.75E-02
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.71	2.03E+00	0.00E+00	2.11E-02	0.137	0.306	0.685	1.54E-01	6.90E-02	3.08E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.71	2.03E+00	0.00E+00	2.04E-02	0.137	0.306	0.685	1.49E-01	6.66E-02	2.98E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.71	2.03E+00	0.00E+00	1.99E-02	0.137	0.306	0.685	1.45E-01	6.49E-02	2.90E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.71	2.03E+00	0.00E+00	1.97E-02	0.137	0.306	0.685	1.44E-01	6.44E-02	2.88E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.71	1.09E+02	2.50E-04	1.46E+00	0.137	0.306	0.685	**1.06E+01**	**4.75E+00**	**2.13E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.71	7.38E-01	0.00E+00	6.58E-03	0.137	0.306	0.685	4.80E-02	2.15E-02	9.60E-03
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.71	7.38E-01	0.00E+00	6.58E-03	0.137	0.306	0.685	4.80E-02	2.15E-02	9.60E-03
Pesticides															
4,4'-DDD	4.39E-02	1.63	7.13E-02	Regresson	7.72E-03	5.57	2.45E-01	1.00E-05	1.71E-03	0.147	0.329	0.735	1.17E-02	5.22E-03	2.33E-03
4,4'-DDE	1.90E-01	1.63	3.09E-01	Regresson	2.33E-02	62.6	1.19E+01	1.00E-05	3.07E-02	0.147	0.329	0.735	2.09E-01	9.35E-02	4.18E-02
4,4'-DDT	9.20E-01	0.296	2.72E-01	Regresson	7.62E-02	6.34	5.83E+00	1.00E-05	1.99E-02	0.147	0.329	0.735	1.35E-01	6.05E-02	2.71E-02
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.53	2.31E-02	1.00E-05	8.91E-05	0.20	0.45	1.00	4.45E-04	1.99E-04	8.91E-05
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.53	2.28E-02	1.00E-05	1.73E-04	1.60	2.26	3.20	1.08E-04	7.65E-05	5.41E-05
alpha-Chlordane	2.96E-02	1.63	4.81E-02	0.165	4.88E-03	9.47	2.80E-01	1.00E-05	1.40E-03	4.58	6.48	9.16	3.06E-04	2.16E-04	1.53E-04
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.53	4.76E-02	1.00E-05	3.58E-04	1.60	2.26	3.20	2.24E-04	1.58E-04	1.12E-04
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.53	1.77E-02	1.00E-05	1.20E-04	1.60	2.26	3.20	7.51E-05	5.31E-05	3.76E-05
Dieldrin	3.64E-01	4.920	1.79E+00	1.500	5.46E-01	19.6	7.13E+00	1.00E-05	4.73E-02	0.015	0.021	0.030	**3.16E+00**	**2.23E+00**	**1.58E+00**
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.53	3.65E-01	1.00E-05	2.17E-03	0.15	0.34	0.75	1.45E-02	6.47E-03	2.89E-03
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.53	3.66E-01	1.00E-05	1.62E-03	0.15	0.34	0.75	1.08E-02	4.82E-03	2.16E-03
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.53	9.33E-01	1.00E-05	4.38E-03	0.184	0.411	0.920	2.38E-02	1.06E-02	4.76E-03
gamma-BHC (Lindane)	1.00E-03	1.69	1.69E-03	1.852	1.85E-03	6.53	6.53E-03	1.00E-05	6.41E-05	8.00	17.9	40.0	8.01E-06	3.58E-06	1.60E-06
gamma-Chlordane	9.42E-02	2.29	2.16E-01	0.165	1.55E-02	7.26	6.84E-01	2.11E-05	4.85E-03	4.58	6.48	9.16	1.06E-03	7.50E-04	5.30E-04
Heptachlor	1.97E-03	0.065	1.28E-04	0.174	3.43E-04	6.53	1.29E-02	5.38E-06	4.03E-05	0.20	0.45	1.00	2.01E-04	9.00E-05	4.03E-05
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.53	5.94E-02	1.00E-05	2.59E-04	0.20	0.45	1.00	1.30E-03	5.80E-04	2.59E-04
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.53	5.36E-01	1.00E-05	3.04E-03	4.00	5.66	8.00	7.60E-04	5.37E-04	3.80E-04
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.53	9.89E+00	6.67E-04	5.29E-02	8.00	17.9	40.0	6.62E-03	2.96E-03	1.32E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	2.88E-03	76.0	170	380	3.79E-05	1.70E-05	7.59E-06
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.624	3.03E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	1.04E-01	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.482	1.45E+00	1.426	4.28E+00	0.634	1.90E+00	5.00E-04	8.52E-02	53.0	75.0	106	1.61E-03	1.14E-03	8.04E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	1.43E-01	85.7	192	429	1.67E-03	7.45E-04	3.33E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.35E-01	85.7	192	429	1.57E-03	7.03E-04	3.15E-04
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	1.41E-01	30.0	52.0	90.0	4.71E-03	2.72E-03	1.57E-03
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	1.24E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	1.26E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.811	2.73E-01	Regresson	9.77E-03	0.155	5.22E-02	1.34E-04	4.90E-03	65.6	147	328	7.47E-05	3.34E-05	1.49E-05
Acenaphthylene	1.70E-02	1.115	1.89E-02	Regresson	1.27E-02	0.096	1.64E-03	9.80E-05	4.79E-04	65.6	147	328	7.30E-06	3.27E-06	1.46E-06
Anthracene	2.65E-01	1.140	3.02E-01	Regresson	1.32E-01	0.048	1.26E-02	1.26E-04	6.52E-03	65.6	147	328	9.94E-05	4.45E-05	1.99E-05
Benzo(a)anthracene	2.30E-01	0.387	8.91E-02	Regresson	2.78E-02	0.113	2.59E-02	7.07E-05	2.28E-03	0.62	1.37	3.07	3.70E-03	1.66E-03	7.42E-04
Benzo(a)pyrene	3.03E-01	1.307	3.96E-01	Regresson	3.97E-02	0.013	3.88E-03	9.80E-05	6.73E-03	0.62	1.37	3.07	1.09E-02	4.90E-03	2.19E-03
Benzo(b)fluoranthene	5.90E-01	0.464	2.74E-01	0.480	2.83E-01	0.014	8.44E-03	5.49E-05	8.92E-03	0.62	1.37	3.07	1.45E-02	6.49E-03	2.91E-03
Benzo(g,h,i)perylene	2.08E-01	0.280	5.83E-02	Regresson	6.15E-02	0.206	4.28E-02	6.84E-05	2.25E-03	0.62	1.37	3.07	3.66E-03	1.64E-03	7.33E-04
Benzo(k)fluoranthene	3.35E-01	0.397	1.33E-01	Regresson	4.51E-02	0.013	4.42E-03	6.15E-05	3.34E-03	0.62	1.37	3.07	5.43E-03	2.43E-03	1.09E-03
Chrysene	4.30E-01	0.462	1.99E-01	Regresson	4.04E-02	0.081	3.48E-02	7.83E-05	4.51E-03	0.62	1.37	3.07	7.33E-03	3.28E-03	1.47E-03
Dibenz(a,h)anthracene	7.41E-02	0.200	1.48E-02	0.230	1.70E-02	0.013	9.76E-04	7.82E-05	6.39E-04	0.62	1.37	3.07	1.04E-03	4.65E-04	2.08E-04
Fluoranthene	4.90E-01	0.320	1.57E-01	4.700	2.30E+00	0.035	1.71E-02	1.73E-04	3.21E-02	65.6	147	328	4.89E-04	2.19E-04	9.77E-05
Fluorene	2.85E-01	1.64	4.68E-01	Regresson	1.12E-02	0.451	1.29E-01	1.31E-04	7.57E-03	65.6	147	328	1.15E-04	5.16E-05	2.31E-05
Hexachlorobenzene	4.86E+00	0.857	4.17E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	8.88E-02	2.00	2.83	4.00	4.44E-02	3.14E-02	2.22E-02
Hexachlorobutadiene	4.86E+00	0.612	2.97E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	9.65E-02	2.00	6.32	20.0	4.82E-02	1.53E-02	4.82E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	1.14E-01	75.0	168	375	1.52E-03	6.78E-04	3.03E-04
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	1.77E-01	100	224	500	1.77E-03	7.91E-04	3.54E-04
Indeno(1,2,3-cd)pyrene	2.38E-01	0.226	5.38E-02	0.150	3.57E-02	0.145	3.45E-02	7.60E-05	1.94E-03	0.62	1.37	3.07	3.16E-03	1.41E-03	6.33E-04
Pentachlorophenol	1.94E+01	1.000	1.94E+01	30.10	5.84E+02	1.486	2.88E+01	9.80E-03	7.60E+00	8.42	18.8	42.1	9.02E-01	4.04E-01	1.80E-01
Phenanthrene	9.49E-01	0.528	5.01E-01	Regresson	8.20E-01	0.226	2.15E-01	4.55E-04	2.02E-02	65.6	147	328	3.07E-04	1.37E-04	6.15E-05
Pyrene	6.20E-01	2.83	1.75E+00	2.400	1.49E+00	0.168	1.04E-01	1.90E-04	4.41E-02	0.62	1.37	3.07	7.16E-02	3.21E-02	1.44E-02

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.1307 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.436 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.400 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.070 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.094 = Proportion of diet composed of sediment
WIR = 0.6092 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 4.23 = Body weight (kg)

Table D-16
Summary of Hazard Quotients for Food Web Exposures - BERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Belted Kingfisher			Great Blue Heron			Osprey			Mink			Raccoon		
	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL
Metals															
Arsenic	1.83E-01	1.16E-01	7.32E-02	7.82E-02	4.95E-02	3.13E-02	7.30E-02	4.62E-02	2.92E-02	2.35E-01	1.86E-01	1.47E-01	1.84E-01	1.46E-01	1.15E-01
Cadmium	8.34E-02	3.73E-02	1.67E-02	3.70E-02	1.66E-02	7.41E-03	3.46E-02	1.55E-02	6.91E-03	4.31E-02	1.36E-02	4.31E-03	4.07E-02	1.29E-02	4.07E-03
Chromium	1.95E-01	8.70E-02	3.89E-02	7.31E-02	3.27E-02	1.46E-02	6.83E-02	3.05E-02	1.37E-02	4.94E-02	2.21E-02	9.87E-03	1.01E-01	4.51E-02	2.02E-02
Copper	**6.49E+00**	**3.76E+00**	**2.17E+00**	**1.39E+00**	8.04E-01	4.65E-01	**1.30E+00**	7.50E-01	4.34E-01	2.92E-01	2.57E-01	2.26E-01	7.00E-01	6.15E-01	5.41E-01
Lead	**1.71E+00**	7.66E-01	3.43E-01	8.72E-01	3.90E-01	1.74E-01	8.14E-01	3.64E-01	1.63E-01	4.35E-01	3.16E-01	2.30E-01	3.69E-01	2.68E-01	1.95E-01
Mercury	**2.02E+01**	**1.17E+01**	**6.75E+00**	**1.04E+01**	**6.01E+00**	**3.47E+00**	5.15E-01	3.29E-01	2.10E-01	**1.10E+00**	8.56E-01	6.67E-01	1.65E-01	1.28E-01	1.00E-01
Nickel	**8.69E+00**	**3.88E+00**	**1.74E+00**	**4.73E+00**	**2.11E+00**	9.46E-01	**4.41E+00**	**1.97E+00**	8.83E-01	**1.14E+01**	**8.03E+00**	**5.68E+00**	**1.13E+00**	7.97E-01	5.63E-01
Selenium	1.22E-01	5.45E-02	2.44E-02	5.63E-02	2.52E-02	1.13E-02	5.25E-02	2.35E-02	1.05E-02	3.08E-01	2.40E-01	1.87E-01	1.28E-01	9.96E-02	7.75E-02
Silver	1.36E-02	6.09E-03	2.72E-03	7.23E-03	3.23E-03	1.45E-03	6.75E-03	3.02E-03	1.35E-03	1.48E-03	6.61E-04	2.96E-04	1.89E-04	8.45E-05	3.78E-05
Zinc	7.34E-01	3.28E-01	1.47E-01	3.69E-01	1.65E-01	7.38E-02	3.44E-01	1.54E-01	6.89E-02	1.97E-01	8.81E-02	3.94E-02	1.30E-01	5.80E-02	2.59E-02
Polychlorinated Biphenyls															
Aroclor-1016	1.52E-01	6.80E-02	3.04E-02	7.62E-02	3.41E-02	1.52E-02	2.60E-01	1.16E-01	5.20E-02	5.08E-02	3.21E-02	2.03E-02	8.37E-03	5.29E-03	3.34E-03
Aroclor-1221	3.06E-01	1.37E-01	6.12E-02	1.52E-01	6.82E-02	3.05E-02	5.20E-01	2.33E-01	1.04E-01	**1.02E+00**	4.54E-01	2.03E-01	1.89E-01	8.47E-02	3.79E-02
Aroclor-1232	1.52E-01	6.80E-02	3.04E-02	7.62E-02	3.41E-02	1.52E-02	2.60E-01	1.16E-01	5.20E-02	5.08E-01	2.27E-01	1.02E-01	8.66E-02	3.87E-02	1.73E-02
Aroclor-1242	1.52E-01	6.80E-02	3.04E-02	7.62E-02	3.41E-02	1.52E-02	2.60E-01	1.16E-01	5.20E-02	5.08E-01	2.27E-01	1.02E-01	8.37E-02	3.74E-02	1.67E-02
Aroclor-1248	1.52E-01	6.80E-02	3.04E-02	7.62E-02	3.41E-02	1.52E-02	2.60E-01	1.16E-01	5.20E-02	5.08E-01	2.27E-01	1.02E-01	8.16E-02	3.65E-02	1.63E-02
Aroclor-1254	1.52E-01	6.80E-02	3.04E-02	7.62E-02	3.41E-02	1.52E-02	2.60E-01	1.16E-01	5.20E-02	5.08E-01	2.27E-01	1.02E-01	8.09E-02	3.62E-02	1.62E-02
Aroclor-1260	**8.52E+00**	**3.81E+00**	**1.70E+00**	**4.07E+00**	**1.82E+00**	8.15E-01	**1.39E+01**	**6.22E+00**	**2.78E+00**	**2.72E+01**	**1.21E+01**	**5.43E+00**	**5.97E+00**	**2.67E+00**	**1.19E+00**
Aroclor-1262	5.47E-02	2.45E-02	1.09E-02	2.77E-02	1.24E-02	5.53E-03	9.45E-02	4.22E-02	1.89E-02	1.84E-01	8.25E-02	3.69E-02	2.70E-02	1.21E-02	5.40E-03
Aroclor-1268	5.47E-02	2.45E-02	1.09E-02	2.77E-02	1.24E-02	5.53E-03	9.45E-02	4.22E-02	1.89E-02	1.84E-01	8.25E-02	3.69E-02	2.70E-02	1.21E-02	5.40E-03
Pesticides															
4,4'-DDD	4.47E-02	1.41E-02	4.47E-03	2.20E-02	6.97E-03	2.20E-03	2.06E-02	6.51E-03	2.06E-03	2.74E-02	1.22E-02	5.48E-03	5.50E-03	2.46E-03	1.10E-03
4,4'-DDE	3.06E-01	9.67E-02	3.06E-02	1.57E-01	4.97E-02	1.57E-02	1.47E-01	4.63E-02	1.47E-02	1.95E-01	8.73E-02	3.90E-02	2.60E-02	1.16E-02	5.21E-03
4,4'-DDT	9.19E-01	2.91E-01	9.19E-02	4.98E-01	1.58E-01	4.98E-02	4.65E-01	1.47E-01	4.65E-02	6.19E-01	2.77E-01	1.24E-01	4.59E-02	2.05E-02	9.18E-03
Aldrin	1.55E-02	6.91E-03	3.09E-03	8.39E-03	3.75E-03	1.68E-03	7.83E-03	3.50E-03	1.57E-03	3.96E-03	1.77E-03	7.91E-04	2.50E-04	1.12E-04	5.01E-05
alpha-BHC	4.27E-03	2.13E-03	1.06E-03	2.29E-03	1.14E-03	5.71E-04	2.14E-03	1.07E-03	5.33E-04	4.89E-04	3.46E-04	2.45E-04	6.08E-05	4.30E-05	3.04E-05
alpha-Chlordane	1.51E-02	6.76E-03	3.03E-03	7.67E-03	3.43E-03	1.53E-03	7.16E-03	3.20E-03	1.43E-03	8.16E-04	5.77E-04	4.08E-04	1.27E-04	8.95E-05	6.33E-05
beta-BHC	8.91E-03	4.44E-03	2.22E-03	4.79E-03	2.39E-03	1.19E-03	4.47E-03	2.23E-03	1.11E-03	1.02E-03	7.21E-04	5.10E-04	1.26E-04	8.89E-05	6.29E-05
delta-BHC	3.31E-03	1.65E-03	8.23E-04	1.78E-03	8.87E-04	4.42E-04	1.66E-03	8.28E-04	4.13E-04	3.79E-04	2.68E-04	1.89E-04	4.22E-05	2.99E-05	2.11E-05
Dieldrin	**1.95E+00**	2.67E-01	3.66E-02	8.03E-01	1.10E-01	1.51E-02	7.50E-01	1.03E-01	1.41E-02	**2.31E+00**	**1.63E+00**	**1.16E+00**	**1.09E+00**	7.74E-01	5.47E-01
Endosulfan I	3.75E-03	1.68E-03	7.49E-04	2.06E-03	9.19E-04	4.11E-04	1.92E-03	8.58E-04	3.84E-04	8.34E-02	3.73E-02	1.67E-02	8.12E-03	3.63E-03	1.62E-03
Endosulfan II	3.75E-03	1.68E-03	7.51E-04	2.06E-03	9.21E-04	4.12E-04	1.92E-03	8.60E-04	3.84E-04	8.36E-02	3.74E-02	1.67E-02	6.06E-03	2.71E-03	1.21E-03
Endrin	3.23E-01	1.44E-01	6.46E-02	1.75E-01	7.82E-02	3.50E-02	**2.36E+00**	**1.05E+00**	4.71E-01	1.74E-01	7.77E-02	3.47E-02	1.34E-02	5.98E-03	2.67E-03
gamma-BHC (Lindane)	1.69E-04	7.56E-05	3.38E-05	9.19E-05	4.11E-05	1.84E-05	8.58E-05	3.84E-05	1.72E-05	2.80E-05	1.25E-05	5.59E-06	3.26E-06	1.46E-06	6.51E-07
gamma-Chlordane	5.50E-02	2.46E-02	1.10E-02	2.73E-02	1.22E-02	5.47E-03	2.55E-02	1.14E-02	5.10E-03	2.91E-03	2.06E-03	1.45E-03	5.17E-04	3.66E-04	2.59E-04
Heptachlor	2.75E-03	1.23E-03	5.49E-04	1.51E-03	6.74E-04	3.01E-04	1.41E-03	6.29E-04	2.81E-04	2.20E-03	9.85E-04	4.40E-04	1.12E-04	5.01E-05	2.24E-05
Heptachlor epoxide	1.28E-02	5.71E-03	2.56E-03	6.96E-03	3.11E-03	1.39E-03	6.50E-03	2.91E-03	1.30E-03	1.02E-02	4.55E-03	2.03E-03	7.28E-04	3.26E-04	1.46E-04
Methoxychlor	1.59E-04	7.12E-05	3.18E-05	8.50E-05	3.80E-05	1.70E-05	7.93E-05	3.55E-05	1.59E-05	4.59E-03	3.25E-03	2.30E-03	4.27E-04	3.02E-04	2.13E-04
Toxaphene	**1.04E+00**	4.66E-01	2.08E-01	5.56E-01	2.49E-01	1.11E-01	5.19E-01	2.32E-01	1.04E-01	4.23E-02	1.89E-02	8.47E-03	3.72E-03	1.66E-03	7.43E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.12E-05	1.84E-05	8.24E-06	2.13E-05	9.54E-06	4.26E-06
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	2.01E-03	9.01E-04	4.03E-04	1.00E-03	4.49E-04	2.01E-04	9.38E-04	4.19E-04	1.88E-04	9.28E-04	6.56E-04	4.64E-04	7.96E-04	5.63E-04	3.98E-04
1,2-Dichlorobenzene	2.28E-03	1.02E-03	4.56E-04	8.52E-04	3.81E-04	1.70E-04	7.96E-04	3.56E-04	1.59E-04	4.87E-04	2.18E-04	9.74E-05	9.35E-04	4.18E-04	1.87E-04
1,3-Dichlorobenzene	1.00E-03	4.49E-04	2.01E-04	1.52E-04	6.82E-05	3.05E-05	1.42E-04	6.37E-05	2.85E-05	8.71E-05	3.90E-05	1.74E-05	8.84E-04	3.95E-04	1.77E-04
1,4-Dichlorobenzene	9.22E-04	4.12E-04	1.84E-04	1.07E-04	4.78E-05	2.14E-05	9.97E-05	4.46E-05	1.99E-05	1.74E-04	1.01E-04	5.81E-05	2.65E-03	1.53E-03	8.82E-04
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	6.70E-04	3.00E-04	1.34E-04	3.40E-04	1.52E-04	6.79E-05	3.17E-04	1.42E-04	6.34E-05	2.24E-05	1.00E-05	4.48E-06	1.25E-05	5.60E-06	2.50E-06
Acenaphthylene	2.01E-05	8.99E-06	4.02E-06	7.35E-06	3.29E-06	1.47E-06	7.00E-06	3.13E-06	1.40E-06	4.85E-07	2.17E-07	9.71E-08	2.17E-06	9.71E-07	4.34E-07
Anthracene	5.57E-04	2.49E-04	1.11E-04	6.44E-05	2.88E-05	1.29E-05	6.02E-05	2.69E-05	1.20E-05	4.24E-06	1.90E-06	8.48E-07	3.94E-05	1.76E-05	7.87E-06
Benzo(a)anthracene	1.38E-04	6.16E-05	2.76E-05	1.61E-05	7.20E-06	3.22E-06	1.51E-05	6.76E-06	3.02E-06	1.13E-04	5.06E-05	2.27E-05	1.42E-03	6.37E-04	2.85E-04
Benzo(a)pyrene	8.82E-05	3.95E-05	1.76E-05	1.86E-05	8.31E-06	3.72E-06	1.75E-05	7.82E-06	3.50E-06	1.31E-04	5.85E-05	2.62E-05	1.51E-03	6.77E-04	3.03E-04
Benzo(b)fluoranthene	8.53E-05	3.82E-05	1.71E-05	4.30E-05	1.92E-05	8.59E-06	4.02E-05	1.80E-05	8.04E-06	3.02E-04	1.35E-04	6.05E-05	3.68E-03	1.65E-03	7.37E-04
Benzo(g,h,i)perylene	4.68E-05	2.09E-05	9.35E-06	2.46E-05	1.10E-05	4.92E-06	2.30E-05	1.03E-05	4.61E-06	1.73E-04	7.74E-05	3.46E-05	1.27E-03	5.68E-04	2.54E-04
Benzo(k)fluoranthene	2.84E-04	1.27E-04	5.69E-05	2.37E-05	1.06E-05	4.73E-06	2.22E-05	9.92E-06	4.44E-06	1.66E-04	7.45E-05	3.33E-05	2.49E-03	1.12E-03	4.99E-04
Chrysene	2.94E-04	1.31E-04	5.88E-05	3.33E-05	1.49E-05	6.67E-06	3.12E-05	1.40E-05	6.24E-06	2.34E-04	1.05E-04	4.69E-05	2.66E-03	1.19E-03	5.33E-04
Dibenz(a,h)anthracene	1.68E-05	7.53E-06	3.37E-06	5.09E-06	2.28E-06	1.02E-06	4.86E-06	2.17E-06	9.72E-07	3.59E-05	1.61E-05	7.19E-06	3.49E-04	1.56E-04	7.00E-05
Fluoranthene	2.99E-04	1.34E-04	5.98E-05	4.18E-05	1.87E-05	8.36E-06	3.93E-05	1.76E-05	7.85E-06	2.76E-06	1.23E-06	5.52E-07	4.78E-05	2.14E-05	9.55E-06
Fluorene	7.89E-04	3.53E-04	1.58E-04	1.95E-04	8.71E-05	3.89E-05	1.82E-04	8.13E-05	3.64E-05	1.28E-05	5.74E-06	2.57E-06	2.71E-05	1.21E-05	5.43E-06
Hexachlorobenzene	**1.87E+00**	8.35E-01	3.73E-01	7.90E-01	3.53E-01	1.58E-01	7.38E-01	3.30E-01	1.48E-01	2.72E-02	1.92E-02	1.36E-02	1.86E-02	1.31E-02	9.30E-03
Hexachlorobutadiene	3.00E-02	1.34E-02	6.00E-03	1.06E-02	4.72E-03	2.11E-03	9.86E-03	4.41E-03	1.97E-03	1.09E-02	3.45E-03	1.09E-03	2.29E-02	7.25E-03	2.29E-03
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.22E-03	9.93E-04	4.44E-04	8.51E-04	3.81E-04	1.70E-04
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.67E-03	7.45E-04	3.33E-04	9.94E-04	4.44E-04	1.99E-04
Indeno(1,2,3-cd)pyrene	3.40E-05	1.52E-05	6.80E-06	1.73E-05	7.76E-06	3.47E-06	1.63E-05	7.29E-06	3.26E-06	1.22E-04	5.46E-05	2.44E-05	9.51E-04	4.26E-04	1.90E-04
Pentachlorophenol	4.95E-01	1.56E-01	4.95E-02	2.41E-01	7.62E-02	2.41E-02	2.25E-01	7.12E-02	2.25E-02	1.17E-01	5.25E-02	2.35E-02	1.20E-01	5.38E-02	2.41E-02
Phenanthrene	1.61E-03	7.21E-04	3.22E-04	2.29E-04	1.02E-04	4.58E-05	2.14E-04	9.59E-05	4.29E-05	1.51E-05	6.75E-06	3.02E-06	1.62E-04	7.22E-05	3.23E-05
Pyrene	1.03E-03	4.61E-04	2.06E-04	6.23E-05	2.79E-05	1.25E-05	5.84E-05	2.61E-05	1.17E-05	4.38E-04	1.96E-04	8.77E-05	1.08E-02	4.85E-03	2.17E-03

Shaded cells indicate HQ > 1
NA - TRV Not Available

Table D-17
Summary of Belted Kingfisher Exposure Doses - BERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	9.40E-01	5.14	8.12	12.8	1.83E-01	1.16E-01	7.32E-02
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	1.23E-01	1.47	3.29	7.35	8.34E-02	3.73E-02	1.67E-02
Chromium	9.10E+01	Regression	8.40E+00	0.041	3.73E+00	0.038	3.46E+00	1.00E-03	5.18E-01	2.66	5.95	13.3	1.95E-01	8.70E-02	3.89E-02
Copper	1.00E+03	0.824	8.24E+02	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	2.63E+01	4.05	7.00	12.1	**6.49E+00**	**3.76E+00**	**2.17E+00**
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	6.60E+00	3.85	8.61	19.3	**1.71E+00**	7.66E-01	3.43E-01
Mercury	1.48E+00	1.186	1.75E+00	Regresson	4.57E-01	3.250	4.81E+00	1.60E-04	5.26E-01	0.026	0.045	0.078	**2.02E+01**	**1.17E+01**	**6.75E+00**
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	5.83E+01	6.71	15.0	33.6	**8.69E+00**	**3.88E+00**	**1.74E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	2.19E-01	1.80	4.02	9.00	1.22E-01	5.45E-02	2.44E-02
Silver	5.19E-01	0.180	9.34E-02	0.014	7.27E-03	1.000	5.19E-01	5.00E-04	5.50E-02	4.04	9.03	20.2	1.36E-02	6.09E-03	2.72E-03
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	4.85E+01	66.1	148	331	7.34E-01	3.28E-01	1.47E-01
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	2.28E-01	1.50	3.35	7.50	1.52E-01	6.80E-02	3.04E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	4.59E-01	1.50	3.35	7.50	3.06E-01	1.37E-01	6.12E-02
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	2.28E-01	1.50	3.35	7.50	1.52E-01	6.80E-02	3.04E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	2.28E-01	1.50	3.35	7.50	1.52E-01	6.80E-02	3.04E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	2.28E-01	1.50	3.35	7.50	1.52E-01	6.80E-02	3.04E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	2.28E-01	1.50	3.35	7.50	1.52E-01	6.80E-02	3.04E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	1.28E+01	1.50	3.35	7.50	**8.52E+00**	**3.81E+00**	**1.70E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	8.20E-02	1.50	3.35	7.50	5.47E-02	2.45E-02	1.09E-02
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	8.20E-02	1.50	3.35	7.50	5.47E-02	2.45E-02	1.09E-02
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	2.678	1.18E-01	1.00E-05	1.34E-02	0.30	0.95	3.00	4.47E-02	1.41E-02	4.47E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	4.408	8.37E-01	1.00E-05	9.17E-02	0.30	0.95	3.00	3.06E-01	9.67E-02	3.06E-02
4,4'-DDT	9.20E-01	0.214	1.97E-01	Regresson	7.62E-02	2.888	2.66E+00	1.00E-05	2.76E-01	0.30	0.95	3.00	9.19E-01	2.91E-01	9.19E-02
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	2.40E-03	0.155	0.347	0.775	1.55E-02	6.91E-03	3.09E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	2.39E-03	0.56	1.12	2.25	4.27E-03	2.13E-03	1.06E-03
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	3.686	1.09E-01	1.00E-05	1.21E-02	0.80	1.79	4.00	1.51E-02	6.76E-03	3.03E-03
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	4.99E-03	0.56	1.12	2.25	8.91E-03	4.44E-03	2.22E-03
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	1.85E-03	0.56	1.12	2.25	3.31E-03	1.65E-03	8.23E-04
Dieldrin	3.64E-01	4.920	1.79E+00	0.410	1.49E-01	2.781	1.01E+00	1.00E-05	1.38E-01	0.071	0.518	3.780	**1.95E+00**	2.67E-01	3.66E-02
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	3.75E-02	10.0	22.4	50.0	3.75E-03	1.68E-03	7.49E-04
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	3.75E-02	10.0	22.4	50.0	3.75E-03	1.68E-03	7.51E-04
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	9.69E-02	0.30	0.67	1.50	3.23E-01	1.44E-01	6.46E-02
gamma-BHC (Lindane)	1.00E-03	0.371	3.71E-04	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	6.76E-04	4.00	8.9	20.0	1.69E-04	7.56E-05	3.38E-05
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	4.128	3.89E-01	2.11E-05	4.40E-02	0.80	1.79	4.00	5.50E-02	2.46E-02	1.10E-02
Heptachlor	1.97E-03	0.049	9.69E-05	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	1.32E-03	0.48	1.07	2.40	2.75E-03	1.23E-03	5.49E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	6.13E-03	0.48	1.07	2.40	1.28E-02	5.71E-03	2.56E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	5.65E-02	355	794	1,775	1.59E-04	7.12E-05	3.18E-05
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	1.04E+00	1.00	2.24	5.00	**1.04E+00**	4.66E-01	2.08E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	1.11E-02	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.397	1.93E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	1.03E-01	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.257	7.71E-01	1.426	4.28E+00	0.479	1.44E+00	5.00E-04	1.62E-01	80.4	180	402	2.01E-03	9.01E-04	4.03E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	1.83E-01	80.4	180	402	2.28E-03	1.02E-03	4.56E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	8.08E-02	80.4	180	402	1.00E-03	4.49E-04	2.01E-04
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	7.41E-02	80.4	180	402	9.22E-04	4.12E-04	1.84E-04
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	5.92E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	5.92E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.056	1.87E-02	Regresson	9.77E-03	0.127	4.28E-02	1.34E-04	4.76E-03	7.10	15.9	35.5	6.70E-04	3.00E-04	1.34E-04
Acenaphthylene	1.70E-02	0.136	2.31E-03	Regresson	1.27E-02	0.050	8.49E-04	9.80E-05	1.43E-04	7.10	15.9	35.5	2.01E-05	8.99E-06	4.02E-06
Anthracene	2.65E-01	0.604	1.60E-01	Regresson	1.32E-01	0.030	8.02E-03	1.26E-04	3.95E-03	7.10	15.9	35.5	5.57E-04	2.49E-04	1.11E-04
Benzo(a)anthracene	2.30E-01	0.171	3.94E-02	Regresson	2.78E-02	0.009	1.97E-03	7.07E-05	9.78E-04	7.10	15.9	35.5	1.38E-04	6.16E-05	2.76E-05
Benzo(a)pyrene	3.03E-01	0.065	1.97E-02	Regresson	3.97E-02	0.007	2.27E-03	9.80E-05	6.26E-04	7.10	15.9	35.5	8.82E-05	3.95E-05	1.76E-05
Benzo(b)fluoranthene	5.90E-01	0.004	2.53E-03	0.310	1.83E-01	0.009	5.38E-03	5.49E-05	6.06E-04	7.10	15.9	35.5	8.53E-05	3.82E-05	1.71E-05
Benzo(g,h,i)perylene	2.08E-01	0.003	6.49E-04	Regresson	6.15E-02	0.015	3.05E-03	6.84E-05	3.32E-04	7.10	15.9	35.5	4.68E-05	2.09E-05	9.35E-06
Benzo(k)fluoranthene	3.35E-01	0.262	8.78E-02	Regresson	4.51E-02	0.009	2.94E-03	6.15E-05	2.02E-03	7.10	15.9	35.5	2.84E-04	1.27E-04	5.69E-05
Chrysene	4.30E-01	0.197	8.49E-02	Regresson	4.04E-02	0.010	4.14E-03	7.83E-05	2.09E-03	7.10	15.9	35.5	2.94E-04	1.31E-04	5.88E-05
Dibenz(a,h)anthracene	7.41E-02	0.036	2.64E-03	0.130	9.63E-03	0.008	5.80E-04	7.82E-05	1.19E-04	7.10	15.9	35.5	1.68E-05	7.53E-06	3.37E-06
Fluoranthene	4.90E-01	0.165	8.10E-02	0.500	2.45E-01	0.010	5.14E-03	1.73E-04	2.12E-03	7.10	15.9	35.5	2.99E-04	1.34E-04	5.98E-05
Fluorene	2.85E-01	0.555	1.58E-01	Regresson	1.12E-02	0.086	2.45E-02	1.31E-04	5.60E-03	7.10	15.9	35.5	7.89E-04	3.53E-04	1.58E-04
Hexachlorobenzene	4.86E+00	0.512	2.49E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	2.11E-01	0.113	0.253	0.565	**1.87E+00**	8.35E-01	3.73E-01
Hexachlorobutadiene	4.86E+00	0.385	1.87E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	1.02E-01	3.39	7.58	17.0	3.00E-02	1.34E-02	6.00E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	5.92E-01	NA	NA	NA	NA	NA	NA
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	5.92E-01	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.38E-01	0.003	7.88E-04	0.110	2.62E-02	0.009	2.13E-03	7.60E-05	2.42E-04	7.10	15.9	35.5	3.40E-05	1.52E-05	6.80E-06
Pentachlorophenol	1.94E+01	1.000	1.94E+01	5.930	1.15E+02	1.486	2.88E+01	9.80E-03	3.33E+00	6.73	21.3	67.3	4.95E-01	1.56E-01	4.95E-02
Phenanthrene	9.49E-01	0.458	4.35E-01	Regresson	8.20E-01	0.030	2.85E-02	4.55E-04	1.14E-02	7.10	15.9	35.5	1.61E-03	7.21E-04	3.22E-04
Pyrene	6.20E-01	0.538	3.34E-01	0.720	4.46E-01	0.012	7.71E-03	1.90E-04	7.31E-03	7.10	15.9	35.5	1.03E-03	4.61E-04	2.06E-04

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0180 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.160 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.840 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0164 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.1480 = Body weight (kg)

Table D-18
Summary of Great Blue Heron Exposure Doses - BERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	4.02E-01	5.14	8.12	12.8	7.82E-02	4.95E-02	3.13E-02
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	5.44E-02	1.47	3.29	7.35	3.70E-02	1.66E-02	7.41E-03
Chromium	9.10E+01	Regression	8.40E+00	0.041	3.73E+00	0.038	3.46E+00	1.00E-03	1.95E-01	2.66	5.95	13.3	7.31E-02	3.27E-02	1.46E-02
Copper	1.00E+03	0.824	8.24E+02	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	5.62E+00	4.05	7.00	12.1	**1.39E+00**	8.04E-01	4.65E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	3.36E+00	3.85	8.61	19.3	8.72E-01	3.90E-01	1.74E-01
Mercury	1.48E+00	1.186	1.75E+00	Regresson	4.57E-01	3.250	4.81E+00	1.60E-04	2.71E-01	0.026	0.045	0.078	**1.04E+01**	**6.01E+00**	**3.47E+00**
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	3.17E+01	6.71	15.0	33.6	**4.73E+00**	**2.11E+00**	9.46E-01
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	1.01E-01	1.80	4.02	9.00	5.63E-02	2.52E-02	1.13E-02
Silver	5.19E-01	0.180	9.34E-02	0.014	7.27E-03	1.000	5.19E-01	5.00E-04	2.92E-02	4.04	9.03	20.2	7.23E-03	3.23E-03	1.45E-03
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	2.44E+01	66.1	148	331	3.69E-01	1.65E-01	7.38E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.14E-01	1.50	3.35	7.50	7.62E-02	3.41E-02	1.52E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	2.29E-01	1.50	3.35	7.50	1.52E-01	6.82E-02	3.05E-02
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	1.14E-01	1.50	3.35	7.50	7.62E-02	3.41E-02	1.52E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.14E-01	1.50	3.35	7.50	7.62E-02	3.41E-02	1.52E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	1.14E-01	1.50	3.35	7.50	7.62E-02	3.41E-02	1.52E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	1.14E-01	1.50	3.35	7.50	7.62E-02	3.41E-02	1.52E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	6.11E+00	1.50	3.35	7.50	**4.07E+00**	**1.82E+00**	8.15E-01
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	4.15E-02	1.50	3.35	7.50	2.77E-02	1.24E-02	5.53E-03
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	4.15E-02	1.50	3.35	7.50	2.77E-02	1.24E-02	5.53E-03
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	2.678	1.18E-01	1.00E-05	6.61E-03	0.30	0.95	3.00	2.20E-02	6.97E-03	2.20E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	4.408	8.37E-01	1.00E-05	4.71E-02	0.30	0.95	3.00	1.57E-01	4.97E-02	1.57E-02
4,4'-DDT	9.20E-01	0.214	1.97E-01	Regresson	7.62E-02	2.888	2.66E+00	1.00E-05	1.49E-01	0.30	0.95	3.00	4.98E-01	1.58E-01	4.98E-02
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	1.30E-03	0.155	0.347	0.775	8.39E-03	3.75E-03	1.68E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	1.29E-03	0.56	1.12	2.25	2.29E-03	1.14E-03	5.71E-04
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	3.686	1.09E-01	1.00E-05	6.14E-03	0.80	1.79	4.00	7.67E-03	3.43E-03	1.53E-03
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	2.68E-03	0.56	1.12	2.25	4.79E-03	2.39E-03	1.19E-03
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	9.95E-04	0.56	1.12	2.25	1.78E-03	8.87E-04	4.42E-04
Dieldrin	3.64E-01	4.920	1.79E+00	0.410	1.49E-01	2.781	1.01E+00	1.00E-05	5.69E-02	0.071	0.518	3.780	8.03E-01	1.10E-01	1.51E-02
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	2.06E-02	10.0	22.4	50.0	2.06E-03	9.19E-04	4.11E-04
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	2.06E-02	10.0	22.4	50.0	2.06E-03	9.21E-04	4.12E-04
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	5.25E-02	0.30	0.67	1.50	1.75E-01	7.82E-02	3.50E-02
gamma-BHC (Lindane)	1.00E-03	0.371	3.71E-04	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	3.68E-04	4.00	8.9	20.0	9.19E-05	4.11E-05	1.84E-05
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	4.128	3.89E-01	2.11E-05	2.19E-02	0.80	1.79	4.00	2.73E-02	1.22E-02	5.47E-03
Heptachlor	1.97E-03	0.049	9.69E-05	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	7.23E-04	0.48	1.07	2.40	1.51E-03	6.74E-04	3.01E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	3.34E-03	0.48	1.07	2.40	6.96E-03	3.11E-03	1.39E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	3.02E-02	355	794	1,775	8.50E-05	3.80E-05	1.70E-05
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	5.56E-01	1.00	2.24	5.00	5.56E-01	2.49E-01	1.11E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	5.14E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.397	1.93E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	3.58E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.257	7.71E-01	1.426	4.28E+00	0.479	1.44E+00	5.00E-04	8.08E-02	80.4	180	402	1.00E-03	4.49E-04	2.01E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	6.85E-02	80.4	180	402	8.52E-04	3.81E-04	1.70E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.23E-02	80.4	180	402	1.52E-04	6.82E-05	3.05E-05
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	8.59E-03	80.4	180	402	1.07E-04	4.78E-05	2.14E-05
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	2.73E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	2.73E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.056	1.87E-02	Regresson	9.77E-03	0.127	4.28E-02	1.34E-04	2.41E-03	7.10	15.9	35.5	3.40E-04	1.52E-04	6.79E-05
Acenaphthylene	1.70E-02	0.136	2.31E-03	Regresson	1.27E-02	0.050	8.49E-04	9.80E-05	5.22E-05	7.10	15.9	35.5	7.35E-06	3.29E-06	1.47E-06
Anthracene	2.65E-01	0.604	1.60E-01	Regresson	1.32E-01	0.030	8.02E-03	1.26E-04	4.57E-04	7.10	15.9	35.5	6.44E-05	2.88E-05	1.29E-05
Benzo(a)anthracene	2.30E-01	0.171	3.94E-02	Regresson	2.78E-02	0.009	1.97E-03	7.07E-05	1.14E-04	7.10	15.9	35.5	1.61E-05	7.20E-06	3.22E-06
Benzo(a)pyrene	3.03E-01	0.065	1.97E-02	Regresson	3.97E-02	0.007	2.27E-03	9.80E-05	1.32E-04	7.10	15.9	35.5	1.86E-05	8.31E-06	3.72E-06
Benzo(b)fluoranthene	5.90E-01	0.004	2.53E-03	0.310	1.83E-01	0.009	5.38E-03	5.49E-05	3.05E-04	7.10	15.9	35.5	4.30E-05	1.92E-05	8.59E-06
Benzo(g,h,i)perylene	2.08E-01	0.003	6.49E-04	Regresson	6.15E-02	0.015	3.05E-03	6.84E-05	1.75E-04	7.10	15.9	35.5	2.46E-05	1.10E-05	4.92E-06
Benzo(k)fluoranthene	3.35E-01	0.262	8.78E-02	Regresson	4.51E-02	0.009	2.94E-03	6.15E-05	1.68E-04	7.10	15.9	35.5	2.37E-05	1.06E-05	4.73E-06
Chrysene	4.30E-01	0.197	8.49E-02	Regresson	4.04E-02	0.010	4.14E-03	7.83E-05	2.37E-04	7.10	15.9	35.5	3.33E-05	1.49E-05	6.67E-06
Dibenz(a,h)anthracene	7.41E-02	0.036	2.64E-03	0.130	9.63E-03	0.008	5.80E-04	7.82E-05	3.62E-05	7.10	15.9	35.5	5.09E-06	2.28E-06	1.02E-06
Fluoranthene	4.90E-01	0.165	8.10E-02	0.500	2.45E-01	0.010	5.14E-03	1.73E-04	2.97E-04	7.10	15.9	35.5	4.18E-05	1.87E-05	8.36E-06
Fluorene	2.85E-01	0.555	1.58E-01	Regresson	1.12E-02	0.086	2.45E-02	1.31E-04	1.38E-03	7.10	15.9	35.5	1.95E-04	8.71E-05	3.89E-05
Hexachlorobenzene	4.86E+00	0.512	2.49E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	8.93E-02	0.113	0.253	0.565	7.90E-01	3.53E-01	1.58E-01
Hexachlorobutadiene	4.86E+00	0.385	1.87E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	3.58E-02	3.39	7.58	17.0	1.06E-02	4.72E-03	2.11E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	2.73E-01	NA	NA	NA	NA	NA	NA
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	2.73E-01	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.38E-01	0.003	7.88E-04	0.110	2.62E-02	0.009	2.13E-03	7.60E-05	1.23E-04	7.10	15.9	35.5	1.73E-05	7.76E-06	3.47E-06
Pentachlorophenol	1.94E+01	1.000	1.94E+01	5.930	1.15E+02	1.486	2.88E+01	9.80E-03	1.62E+00	6.73	21.3	67.3	2.41E-01	7.62E-02	2.41E-02
Phenanthrene	9.49E-01	0.458	4.35E-01	Regresson	8.20E-01	0.030	2.85E-02	4.55E-04	1.63E-03	7.10	15.9	35.5	2.29E-04	1.02E-04	4.58E-05
Pyrene	6.20E-01	0.538	3.34E-01	0.720	4.46E-01	0.012	7.71E-03	1.90E-04	4.42E-04	7.10	15.9	35.5	6.23E-05	2.79E-05	1.25E-05

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.1254 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.1010 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 2.230 = Body weight (kg)

Table D-19
Summary of Osprey Exposure Doses - BERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	3.75E-01	5.14	8.12	12.8	7.30E-02	4.62E-02	2.92E-02
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	5.08E-02	1.47	3.29	7.35	3.46E-02	1.55E-02	6.91E-03
Chromium	9.10E+01	Regression	8.40E+00	0.041	3.73E+00	0.038	3.46E+00	1.00E-03	1.82E-01	2.66	5.95	13.3	6.83E-02	3.05E-02	1.37E-02
Copper	1.00E+03	0.824	8.24E+02	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	5.25E+00	4.05	7.00	12.1	**1.30E+00**	7.50E-01	4.34E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	3.13E+00	3.85	8.61	19.3	8.14E-01	3.64E-01	1.63E-01
Mercury	1.48E+00	1.186	1.75E+00	Regresson	4.57E-01	3.250	4.81E+00	1.60E-04	2.53E-01	0.49	0.77	1.20	5.15E-01	3.29E-01	2.10E-01
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	2.96E+01	6.71	15.0	33.6	**4.41E+00**	**1.97E+00**	8.83E-01
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	9.46E-02	1.80	4.02	9.00	5.25E-02	2.35E-02	1.05E-02
Silver	5.19E-01	0.180	9.34E-02	0.014	7.27E-03	1.000	5.19E-01	5.00E-04	2.73E-02	4.04	9.03	20.2	6.75E-03	3.02E-03	1.35E-03
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	2.28E+01	66.1	148	331	3.44E-01	1.54E-01	6.89E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.07E-01	0.41	0.92	2.05	2.60E-01	1.16E-01	5.20E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	2.13E-01	0.41	0.92	2.05	5.20E-01	2.33E-01	1.04E-01
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	1.07E-01	0.41	0.92	2.05	2.60E-01	1.16E-01	5.20E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.07E-01	0.41	0.92	2.05	2.60E-01	1.16E-01	5.20E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	1.07E-01	0.41	0.92	2.05	2.60E-01	1.16E-01	5.20E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	1.07E-01	0.41	0.92	2.05	2.60E-01	1.16E-01	5.20E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	5.70E+00	0.41	0.92	2.05	**1.39E+01**	**6.22E+00**	**2.78E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	3.87E-02	0.41	0.92	2.05	9.45E-02	4.22E-02	1.89E-02
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	3.87E-02	0.41	0.92	2.05	9.45E-02	4.22E-02	1.89E-02
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	2.678	1.18E-01	1.00E-05	6.17E-03	0.30	0.95	3.00	2.06E-02	6.51E-03	2.06E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	4.408	8.37E-01	1.00E-05	4.40E-02	0.30	0.95	3.00	1.47E-01	4.63E-02	1.47E-02
4,4'-DDT	9.20E-01	0.214	1.97E-01	Regresson	7.62E-02	2.888	2.66E+00	1.00E-05	1.40E-01	0.30	0.95	3.00	4.65E-01	1.47E-01	4.65E-02
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	1.21E-03	0.155	0.347	0.775	7.83E-03	3.50E-03	1.57E-03
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	1.20E-03	0.56	1.12	2.25	2.14E-03	1.07E-03	5.33E-04
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	3.686	1.09E-01	1.00E-05	5.73E-03	0.80	1.79	4.00	7.16E-03	3.20E-03	1.43E-03
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	2.50E-03	0.56	1.12	2.25	4.47E-03	2.23E-03	1.11E-03
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	9.29E-04	0.56	1.12	2.25	1.66E-03	8.28E-04	4.13E-04
Dieldrin	3.64E-01	4.920	1.79E+00	0.410	1.49E-01	2.781	1.01E+00	1.00E-05	5.31E-02	0.071	0.518	3.780	7.50E-01	1.03E-01	1.41E-02
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	1.92E-02	10.0	22.4	50.0	1.92E-03	8.58E-04	3.84E-04
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	1.92E-02	10.0	22.4	50.0	1.92E-03	8.60E-04	3.84E-04
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	4.90E-02	0.021	0.047	0.104	**2.36E+00**	**1.05E+00**	4.71E-01
gamma-BHC (Lindane)	1.00E-03	0.371	3.71E-04	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	3.43E-04	4.00	8.9	20.0	8.58E-05	3.84E-05	1.72E-05
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	4.128	3.89E-01	2.11E-05	2.04E-02	0.80	1.79	4.00	2.55E-02	1.14E-02	5.10E-03
Heptachlor	1.97E-03	0.049	9.69E-05	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	6.75E-04	0.48	1.07	2.40	1.41E-03	6.29E-04	2.81E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	3.12E-03	0.48	1.07	2.40	6.50E-03	2.91E-03	1.30E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	2.82E-02	355	794	1,775	7.93E-05	3.55E-05	1.59E-05
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	5.19E-01	1.00	2.24	5.00	5.19E-01	2.32E-01	1.04E-01
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	4.80E-03	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.397	1.93E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	3.34E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.257	7.71E-01	1.426	4.28E+00	0.479	1.44E+00	5.00E-04	7.54E-02	80.4	180	402	9.38E-04	4.19E-04	1.88E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	6.40E-02	80.4	180	402	7.96E-04	3.56E-04	1.59E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	1.14E-02	80.4	180	402	1.42E-04	6.37E-05	2.85E-05
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	8.02E-03	80.4	180	402	9.97E-05	4.46E-05	1.99E-05
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	2.55E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	2.55E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.056	1.87E-02	Regresson	9.77E-03	0.127	4.28E-02	1.34E-04	2.25E-03	7.10	15.9	35.5	3.17E-04	1.42E-04	6.34E-05
Acenaphthylene	1.70E-02	0.136	2.31E-03	Regresson	1.27E-02	0.050	8.49E-04	9.80E-05	4.97E-05	7.10	15.9	35.5	7.00E-06	3.13E-06	1.40E-06
Anthracene	2.65E-01	0.604	1.60E-01	Regresson	1.32E-01	0.030	8.02E-03	1.26E-04	4.28E-04	7.10	15.9	35.5	6.02E-05	2.69E-05	1.20E-05
Benzo(a)anthracene	2.30E-01	0.171	3.94E-02	Regresson	2.78E-02	0.009	1.97E-03	7.07E-05	1.07E-04	7.10	15.9	35.5	1.51E-05	6.76E-06	3.02E-06
Benzo(a)pyrene	3.03E-01	0.065	1.97E-02	Regresson	3.97E-02	0.007	2.27E-03	9.80E-05	1.24E-04	7.10	15.9	35.5	1.75E-05	7.82E-06	3.50E-06
Benzo(b)fluoranthene	5.90E-01	0.004	2.53E-03	0.310	1.83E-01	0.009	5.38E-03	5.49E-05	2.85E-04	7.10	15.9	35.5	4.02E-05	1.80E-05	8.04E-06
Benzo(g,h,i)perylene	2.08E-01	0.003	6.49E-04	Regresson	6.15E-02	0.015	3.05E-03	6.84E-05	1.64E-04	7.10	15.9	35.5	2.30E-05	1.03E-05	4.61E-06
Benzo(k)fluoranthene	3.35E-01	0.262	8.78E-02	Regresson	4.51E-02	0.009	2.94E-03	6.15E-05	1.57E-04	7.10	15.9	35.5	2.22E-05	9.92E-06	4.44E-06
Chrysene	4.30E-01	0.197	8.49E-02	Regresson	4.04E-02	0.010	4.14E-03	7.83E-05	2.22E-04	7.10	15.9	35.5	3.12E-05	1.40E-05	6.24E-06
Dibenz(a,h)anthracene	7.41E-02	0.036	2.64E-03	0.130	9.63E-03	0.008	5.80E-04	7.82E-05	3.45E-05	7.10	15.9	35.5	4.86E-06	2.17E-06	9.72E-07
Fluoranthene	4.90E-01	0.165	8.10E-02	0.500	2.45E-01	0.010	5.14E-03	1.73E-04	2.79E-04	7.10	15.9	35.5	3.93E-05	1.76E-05	7.85E-06
Fluorene	2.85E-01	0.555	1.58E-01	Regresson	1.12E-02	0.086	2.45E-02	1.31E-04	1.29E-03	7.10	15.9	35.5	1.82E-04	8.13E-05	3.64E-05
Hexachlorobenzene	4.86E+00	0.512	2.49E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	8.34E-02	0.113	0.253	0.565	7.38E-01	3.30E-01	1.48E-01
Hexachlorobutadiene	4.86E+00	0.385	1.87E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	3.34E-02	3.39	7.58	17.0	9.86E-03	4.41E-03	1.97E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	2.55E-01	NA	NA	NA	NA	NA	NA
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	2.55E-01	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.38E-01	0.003	7.88E-04	0.110	2.62E-02	0.009	2.13E-03	7.60E-05	1.16E-04	7.10	15.9	35.5	1.63E-05	7.29E-06	3.26E-06
Pentachlorophenol	1.94E+01	1.000	1.94E+01	5.930	1.15E+02	1.486	2.88E+01	9.80E-03	1.51E+00	6.73	21.3	67.3	2.25E-01	7.12E-02	2.25E-02
Phenanthrene	9.49E-01	0.458	4.35E-01	Regresson	8.20E-01	0.030	2.85E-02	4.55E-04	1.52E-03	7.10	15.9	35.5	2.14E-04	9.59E-05	4.29E-05
Pyrene	6.20E-01	0.538	3.34E-01	0.720	4.46E-01	0.012	7.71E-03	1.90E-04	4.15E-04	7.10	15.9	35.5	5.84E-05	2.61E-05	1.17E-05

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0780 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0769 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 1.486 = Body weight (kg)

Table D-20
Summary of Mink Exposure Doses - BERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	2.45E-01	1.04	1.31	1.66	2.35E-01	1.86E-01	1.47E-01
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	3.32E-02	0.77	2.43	7.70	4.31E-02	1.36E-02	4.31E-03
Chromium	9.10E+01	Regression	8.40E+00	0.041	3.73E+00	0.038	3.46E+00	1.00E-03	1.18E-01	2.40	5.37	12.0	4.94E-02	2.21E-02	9.87E-03
Copper	1.00E+03	0.824	8.24E+02	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	3.43E+00	11.7	13.3	15.1	2.92E-01	2.57E-01	2.26E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	2.05E+00	4.70	6.47	8.90	4.35E-01	3.16E-01	2.30E-01
Mercury	1.48E+00	1.186	1.75E+00	Regresson	4.57E-01	3.250	4.81E+00	1.60E-04	1.65E-01	0.150	0.192	0.247	**1.10E+00**	8.56E-01	6.67E-01
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	1.93E+01	1.70	2.40	3.40	**1.14E+01**	**8.03E+00**	**5.68E+00**
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	6.17E-02	0.20	0.26	0.33	3.08E-01	2.40E-01	1.87E-01
Silver	5.19E-01	0.180	9.34E-02	0.014	7.27E-03	1.000	5.19E-01	5.00E-04	1.78E-02	12.0	26.9	60.2	1.48E-03	6.61E-04	2.96E-04
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	1.49E+01	75.4	169	377	1.97E-01	8.81E-02	3.94E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	6.96E-02	1.37	2.17	3.43	5.08E-02	3.21E-02	2.03E-02
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	1.39E-01	0.137	0.306	0.685	**1.02E+00**	4.54E-01	2.03E-01
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	6.96E-02	0.137	0.306	0.685	5.08E-01	2.27E-01	1.02E-01
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	6.96E-02	0.137	0.306	0.685	5.08E-01	2.27E-01	1.02E-01
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	6.96E-02	0.137	0.306	0.685	5.08E-01	2.27E-01	1.02E-01
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	6.96E-02	0.137	0.306	0.685	5.08E-01	2.27E-01	1.02E-01
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	3.72E+00	0.137	0.306	0.685	**2.72E+01**	**1.21E+01**	**5.43E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	2.53E-02	0.137	0.306	0.685	1.84E-01	8.25E-02	3.69E-02
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	2.53E-02	0.137	0.306	0.685	1.84E-01	8.25E-02	3.69E-02
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	2.678	1.18E-01	1.00E-05	4.03E-03	0.147	0.329	0.735	2.74E-02	1.22E-02	5.48E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	4.408	8.37E-01	1.00E-05	2.87E-02	0.147	0.329	0.735	1.95E-01	8.73E-02	3.90E-02
4,4'-DDT	9.20E-01	0.214	1.97E-01	Regresson	7.62E-02	2.888	2.66E+00	1.00E-05	9.10E-02	0.147	0.329	0.735	6.19E-01	2.77E-01	1.24E-01
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	7.91E-04	0.20	0.45	1.00	3.96E-03	1.77E-03	7.91E-04
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	7.83E-04	1.60	2.26	3.20	4.89E-04	3.46E-04	2.45E-04
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	3.686	1.09E-01	1.00E-05	3.74E-03	4.58	6.48	9.16	8.16E-04	5.77E-04	4.08E-04
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	1.63E-03	1.60	2.26	3.20	1.02E-03	7.21E-04	5.10E-04
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	6.06E-04	1.60	2.26	3.20	3.79E-04	2.68E-04	1.89E-04
Dieldrin	3.64E-01	4.920	1.79E+00	0.410	1.49E-01	2.781	1.01E+00	1.00E-05	3.47E-02	0.015	0.021	0.030	**2.31E+00**	**1.63E+00**	**1.16E+00**
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	1.25E-02	0.15	0.34	0.75	8.34E-02	3.73E-02	1.67E-02
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	1.25E-02	0.15	0.34	0.75	8.36E-02	3.74E-02	1.67E-02
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	3.20E-02	0.184	0.411	0.920	1.74E-01	7.77E-02	3.47E-02
gamma-BHC (Lindane)	1.00E-03	0.371	3.71E-04	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	2.24E-04	8.00	17.9	40.0	2.80E-05	1.25E-05	5.59E-06
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	4.128	3.89E-01	2.11E-05	1.33E-02	4.58	6.48	9.16	2.91E-03	2.06E-03	1.45E-03
Heptachlor	1.97E-03	0.049	9.69E-05	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	4.40E-04	0.20	0.45	1.00	2.20E-03	9.85E-04	4.40E-04
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	2.03E-03	0.20	0.45	1.00	1.02E-02	4.55E-03	2.03E-03
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	1.84E-02	4.00	5.66	8.00	4.59E-03	3.25E-03	2.30E-03
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	3.39E-01	8.00	17.9	40.0	4.23E-02	1.89E-02	8.47E-03
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	3.13E-03	76.0	170	380	4.12E-05	1.84E-05	8.24E-06
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.397	1.93E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	2.18E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.257	7.71E-01	1.426	4.28E+00	0.479	1.44E+00	5.00E-04	4.92E-02	53.0	75.0	106	9.28E-04	6.56E-04	4.64E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	4.17E-02	85.7	192	429	4.87E-04	2.18E-04	9.74E-05
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	7.46E-03	85.7	192	429	8.71E-05	3.90E-05	1.74E-05
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	5.23E-03	30.0	52.0	90.0	1.74E-04	1.01E-04	5.81E-05
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	1.67E-01	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	1.67E-01	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.056	1.87E-02	Regresson	9.77E-03	0.127	4.28E-02	1.34E-04	1.47E-03	65.6	147	328	2.24E-05	1.00E-05	4.48E-06
Acenaphthylene	1.70E-02	0.136	2.31E-03	Regresson	1.27E-02	0.050	8.49E-04	9.80E-05	3.18E-05	65.6	147	328	4.85E-07	2.17E-07	9.71E-08
Anthracene	2.65E-01	0.604	1.60E-01	Regresson	1.32E-01	0.030	8.02E-03	1.26E-04	2.78E-04	65.6	147	328	4.24E-06	1.90E-06	8.48E-07
Benzo(a)anthracene	2.30E-01	0.171	3.94E-02	Regresson	2.78E-02	0.009	1.97E-03	7.07E-05	6.96E-05	0.62	1.37	3.07	1.13E-04	5.06E-05	2.27E-05
Benzo(a)pyrene	3.03E-01	0.065	1.97E-02	Regresson	3.97E-02	0.007	2.27E-03	9.80E-05	8.04E-05	0.62	1.37	3.07	1.31E-04	5.85E-05	2.62E-05
Benzo(b)fluoranthene	5.90E-01	0.004	2.53E-03	0.310	1.83E-01	0.009	5.38E-03	5.49E-05	1.86E-04	0.62	1.37	3.07	3.02E-04	1.35E-04	6.05E-05
Benzo(g,h,i)perylene	2.08E-01	0.003	6.49E-04	Regresson	6.15E-02	0.015	3.05E-03	6.84E-05	1.06E-04	0.62	1.37	3.07	1.73E-04	7.74E-05	3.46E-05
Benzo(k)fluoranthene	3.35E-01	0.262	8.78E-02	Regresson	4.51E-02	0.009	2.94E-03	6.15E-05	1.02E-04	0.62	1.37	3.07	1.66E-04	7.45E-05	3.33E-05
Chrysene	4.30E-01	0.197	8.49E-02	Regresson	4.04E-02	0.010	4.14E-03	7.83E-05	1.44E-04	0.62	1.37	3.07	2.34E-04	1.05E-04	4.69E-05
Dibenz(a,h)anthracene	7.41E-02	0.036	2.64E-03	0.130	9.63E-03	0.008	5.80E-04	7.82E-05	2.21E-05	0.62	1.37	3.07	3.59E-05	1.61E-05	7.19E-06
Fluoranthene	4.90E-01	0.165	8.10E-02	0.500	2.45E-01	0.010	5.14E-03	1.73E-04	1.81E-04	65.6	147	328	2.76E-06	1.23E-06	5.52E-07
Fluorene	2.85E-01	0.555	1.58E-01	Regresson	1.12E-02	0.086	2.45E-02	1.31E-04	8.42E-04	65.6	147	328	1.28E-05	5.74E-06	2.57E-06
Hexachlorobenzene	4.86E+00	0.512	2.49E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	5.44E-02	2.00	2.83	4.00	2.72E-02	1.92E-02	1.36E-02
Hexachlorobutadiene	4.86E+00	0.385	1.87E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	2.18E-02	2.00	6.32	20.0	1.09E-02	3.45E-03	1.09E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	1.66E-01	75.0	168	375	2.22E-03	9.93E-04	4.44E-04
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	1.67E-01	100	224	500	1.67E-03	7.45E-04	3.33E-04
Indeno(1,2,3-cd)pyrene	2.38E-01	0.003	7.88E-04	0.110	2.62E-02	0.009	2.13E-03	7.60E-05	7.50E-05	0.62	1.37	3.07	1.22E-04	5.46E-05	2.44E-05
Pentachlorophenol	1.94E+01	1.000	1.94E+01	5.930	1.15E+02	1.486	2.88E+01	9.80E-03	9.88E-01	8.42	18.8	42.1	1.17E-01	5.25E-02	2.35E-02
Phenanthrene	9.49E-01	0.458	4.35E-01	Regresson	8.20E-01	0.030	2.85E-02	4.55E-04	9.90E-04	65.6	147	328	1.51E-05	6.75E-06	3.02E-06
Pyrene	6.20E-01	0.538	3.34E-01	0.720	4.46E-01	0.012	7.71E-03	1.90E-04	2.69E-04	0.62	1.37	3.07	4.38E-04	1.96E-04	8.77E-05

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.0266 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.000 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 1.000 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.000 = Proportion of diet composed of sediment
WIR = 0.0218 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.777 = Body weight (kg)

Table D-21
Summary of Raccoon Exposure Doses - BERA Exposure Parameters - Maximum Concentrations
Penniman Lake

Chemical	Maximum Sediment Concentration (mg/kg)	Sediment-Invertebrate BAF	Aquatic Invertebrate Concentration (mg/kg dw)	Sediment-Plant BAF	Aquatic Plant Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Maximum Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	MATC TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	MATC HQ	LOAEL HQ
Metals															
Arsenic	5.67E+01	Regression	1.07E+01	Regresson	1.33E+00	0.126	7.14E+00	2.01E-03	1.92E-01	1.04	1.31	1.66	1.84E-01	1.46E-01	1.15E-01
Cadmium	5.90E+00	Regression	1.21E+00	Regresson	1.64E+00	0.164	9.68E-01	5.00E-04	3.13E-02	0.77	2.43	7.70	4.07E-02	1.29E-02	4.07E-03
Chromium	9.10E+01	Regression	8.40E+00	0.041	3.73E+00	0.038	3.46E+00	1.00E-03	2.42E-01	2.40	5.37	12.0	1.01E-01	4.51E-02	2.02E-02
Copper	1.00E+03	0.824	8.24E+02	Regresson	2.97E+01	0.100	1.00E+02	2.00E-03	8.19E+00	11.7	13.3	15.1	7.00E-01	6.15E-01	5.41E-01
Lead	8.53E+02	Regression	2.51E+01	Regresson	1.17E+01	0.070	5.97E+01	7.50E-04	1.73E+00	4.70	6.47	8.90	3.69E-01	2.68E-01	1.95E-01
Mercury	1.48E+00	1.186	1.75E+00	Regresson	4.57E-01	3.250	4.81E+00	1.60E-04	2.47E-02	0.150	0.192	0.247	1.65E-01	1.28E-01	1.00E-01
Nickel	5.64E+02	Regression	2.97E+01	Regresson	1.24E+01	1.000	5.64E+02	1.50E-03	1.92E+00	1.70	2.40	3.40	**1.13E+00**	7.97E-01	5.63E-01
Selenium	1.80E+00	1.000	1.80E+00	Regresson	9.71E-01	1.000	1.80E+00	1.25E-03	2.56E-02	0.20	0.26	0.33	1.28E-01	9.96E-02	7.75E-02
Silver	5.19E-01	0.180	9.34E-02	0.014	7.27E-03	1.000	5.19E-01	5.00E-04	2.28E-03	12.0	26.9	60.2	1.89E-04	8.45E-05	3.78E-05
Zinc	2.95E+03	Regression	2.12E+02	Regresson	4.07E+02	0.147	4.34E+02	2.50E-03	9.77E+00	75.4	169	377	1.30E-01	5.80E-02	2.59E-02
Polychlorinated Biphenyls															
Aroclor-1016	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.15E-02	1.37	2.17	3.43	8.37E-03	5.29E-03	3.34E-03
Aroclor-1221	6.06E-01	Regression	2.23E+00	0.749	4.54E-01	6.707	4.06E+00	0.00E+00	2.60E-02	0.137	0.306	0.685	1.89E-01	8.47E-02	3.79E-02
Aroclor-1232	3.03E-01	Regression	1.03E+00	0.515	1.56E-01	6.707	2.03E+00	0.00E+00	1.19E-02	0.137	0.306	0.685	8.66E-02	3.87E-02	1.73E-02
Aroclor-1242	3.03E-01	Regression	1.03E+00	0.323	9.79E-02	6.707	2.03E+00	0.00E+00	1.15E-02	0.137	0.306	0.685	8.37E-02	3.74E-02	1.67E-02
Aroclor-1248	3.03E-01	Regression	1.03E+00	0.184	5.59E-02	6.707	2.03E+00	0.00E+00	1.12E-02	0.137	0.306	0.685	8.16E-02	3.65E-02	1.63E-02
Aroclor-1254	3.03E-01	Regression	1.03E+00	0.139	4.22E-02	6.707	2.03E+00	0.00E+00	1.11E-02	0.137	0.306	0.685	8.09E-02	3.62E-02	1.62E-02
Aroclor-1260	1.62E+01	Regression	8.56E+01	0.105	1.71E+00	6.707	1.09E+02	2.50E-04	8.18E-01	0.137	0.306	0.685	**5.97E+00**	**2.67E+00**	**1.19E+00**
Aroclor-1262	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	3.70E-03	0.137	0.306	0.685	2.70E-02	1.21E-02	5.40E-03
Aroclor-1268	1.10E-01	Regression	3.36E-01	0.105	1.16E-02	6.707	7.38E-01	0.00E+00	3.70E-03	0.137	0.306	0.685	2.70E-02	1.21E-02	5.40E-03
Pesticides															
4,4'-DDD	4.39E-02	1.625	7.13E-02	Regresson	7.72E-03	2.678	1.18E-01	1.00E-05	8.09E-04	0.147	0.329	0.735	5.50E-03	2.46E-03	1.10E-03
4,4'-DDE	1.90E-01	1.625	3.09E-01	Regresson	2.33E-02	4.408	8.37E-01	1.00E-05	3.83E-03	0.147	0.329	0.735	2.60E-02	1.16E-02	5.21E-03
4,4'-DDT	9.20E-01	0.214	1.97E-01	Regresson	7.62E-02	2.888	2.66E+00	1.00E-05	6.75E-03	0.147	0.329	0.735	4.59E-02	2.05E-02	9.18E-03
Aldrin	3.54E-03	0.447	1.58E-03	0.139	4.93E-04	6.526	2.31E-02	1.00E-05	5.01E-05	0.20	0.45	1.00	2.50E-04	1.12E-04	5.01E-05
alpha-BHC	3.50E-03	0.788	2.76E-03	1.735	6.07E-03	6.526	2.28E-02	1.00E-05	9.73E-05	1.60	2.26	3.20	6.08E-05	4.30E-05	3.04E-05
alpha-Chlordane	2.96E-02	1.625	4.81E-02	0.165	4.88E-03	3.686	1.09E-01	1.00E-05	5.79E-04	4.58	6.48	9.16	1.27E-04	8.95E-05	6.33E-05
beta-BHC	7.30E-03	0.788	5.75E-03	1.719	1.25E-02	6.526	4.76E-02	1.00E-05	2.01E-04	1.60	2.26	3.20	1.26E-04	8.89E-05	6.29E-05
delta-BHC	2.71E-03	0.788	2.13E-03	1.311	3.55E-03	6.526	1.77E-02	1.00E-05	6.75E-05	1.60	2.26	3.20	4.22E-05	2.99E-05	2.11E-05
Dieldrin	3.64E-01	4.920	1.79E+00	0.410	1.49E-01	2.781	1.01E+00	1.00E-05	1.64E-02	0.015	0.021	0.030	**1.09E+00**	7.74E-01	5.47E-01
Endosulfan I	5.60E-02	0.063	3.52E-03	1.687	9.45E-02	6.526	3.65E-01	1.00E-05	1.22E-03	0.15	0.34	0.75	8.12E-03	3.63E-03	1.62E-03
Endosulfan II	5.61E-02	0.063	3.52E-03	0.886	4.97E-02	6.526	3.66E-01	1.00E-05	9.09E-04	0.15	0.34	0.75	6.06E-03	2.71E-03	1.21E-03
Endrin	1.43E-01	0.518	7.41E-02	0.535	7.65E-02	6.526	9.33E-01	1.00E-05	2.46E-03	0.184	0.411	0.920	1.34E-02	5.98E-03	2.67E-03
gamma-BHC (Lindane)	1.00E-03	0.371	3.71E-04	1.852	1.85E-03	6.526	6.53E-03	1.00E-05	2.61E-05	8.00	17.9	40.0	3.26E-06	1.46E-06	6.51E-07
gamma-Chlordane	9.42E-02	2.292	2.16E-01	0.165	1.55E-02	4.128	3.89E-01	2.11E-05	2.37E-03	4.58	6.48	9.16	5.17E-04	3.66E-04	2.59E-04
Heptachlor	1.97E-03	0.049	9.69E-05	0.174	3.43E-04	6.526	1.29E-02	5.38E-06	2.24E-05	0.20	0.45	1.00	1.12E-04	5.01E-05	2.24E-05
Heptachlor epoxide	9.10E-03	0.322	2.93E-03	0.566	5.15E-03	6.526	5.94E-02	1.00E-05	1.46E-04	0.20	0.45	1.00	7.28E-04	3.26E-04	1.46E-04
Methoxychlor	8.22E-02	1.000	8.22E-02	0.525	4.31E-02	6.526	5.36E-01	1.00E-05	1.71E-03	4.00	5.66	8.00	4.27E-04	3.02E-04	2.13E-04
Toxaphene	1.52E+00	1.000	1.52E+00	0.355	5.37E-01	6.526	9.89E+00	6.67E-04	2.97E-02	8.00	17.9	40.0	3.72E-03	1.66E-03	7.43E-04
Volatile/Semivolatile Organics															
1,1,2,2-Tetrachloroethane	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	1.000	9.10E-02	5.00E-04	1.62E-03	76.0	170	380	2.13E-05	9.54E-06	4.26E-06
1,2,4,5-Tetrachlorobenzene	4.86E+00	0.397	1.93E+00	0.792	3.85E+00	0.131	6.34E-01	2.45E-03	5.02E-02	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	3.00E+00	0.257	7.71E-01	1.426	4.28E+00	0.479	1.44E+00	5.00E-04	4.22E-02	53.0	75.0	106	7.96E-04	5.63E-04	3.98E-04
1,2-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.452	7.35E+00	0.406	1.22E+00	5.00E-04	8.02E-02	85.7	192	429	9.35E-04	4.18E-04	1.87E-04
1,3-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.296	6.89E+00	0.073	2.18E-01	5.00E-04	7.57E-02	85.7	192	429	8.84E-04	3.95E-04	1.77E-04
1,4-Dichlorobenzene	3.00E+00	1.000	3.00E+00	2.475	7.42E+00	0.051	1.52E-01	5.00E-04	7.94E-02	30.0	52.0	90.0	2.65E-03	1.53E-03	8.82E-04
4-Bromophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.566	2.75E+00	1.000	4.86E+00	2.45E-03	6.99E-02	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	4.86E+00	1.000	4.86E+00	0.593	2.88E+00	1.000	4.86E+00	2.45E-03	7.08E-02	NA	NA	NA	NA	NA	NA
Acenaphthene	3.36E-01	0.056	1.87E-02	Regresson	9.77E-03	0.127	4.28E-02	1.34E-04	8.21E-04	65.6	147	328	1.25E-05	5.60E-06	2.50E-06
Acenaphthylene	1.70E-02	0.136	2.31E-03	Regresson	1.27E-02	0.050	8.49E-04	9.80E-05	1.42E-04	65.6	147	328	2.17E-06	9.71E-07	4.34E-07
Anthracene	2.65E-01	0.604	1.60E-01	Regresson	1.32E-01	0.030	8.02E-03	1.26E-04	2.58E-03	65.6	147	328	3.94E-05	1.76E-05	7.87E-06
Benzo(a)anthracene	2.30E-01	0.171	3.94E-02	Regresson	2.78E-02	0.009	1.97E-03	7.07E-05	8.75E-04	0.62	1.37	3.07	1.42E-03	6.37E-04	2.85E-04
Benzo(a)pyrene	3.03E-01	0.065	1.97E-02	Regresson	3.97E-02	0.007	2.27E-03	9.80E-05	9.30E-04	0.62	1.37	3.07	1.51E-03	6.77E-04	3.03E-04
Benzo(b)fluoranthene	5.90E-01	0.004	2.53E-03	0.310	1.83E-01	0.009	5.38E-03	5.49E-05	2.26E-03	0.62	1.37	3.07	3.68E-03	1.65E-03	7.37E-04
Benzo(g,h,i)perylene	2.08E-01	0.003	6.49E-04	Regresson	6.15E-02	0.015	3.05E-03	6.84E-05	7.80E-04	0.62	1.37	3.07	1.27E-03	5.68E-04	2.54E-04
Benzo(k)fluoranthene	3.35E-01	0.262	8.78E-02	Regresson	4.51E-02	0.009	2.94E-03	6.15E-05	1.53E-03	0.62	1.37	3.07	2.49E-03	1.12E-03	4.99E-04
Chrysene	4.30E-01	0.197	8.49E-02	Regresson	4.04E-02	0.010	4.14E-03	7.83E-05	1.64E-03	0.62	1.37	3.07	2.66E-03	1.19E-03	5.33E-04
Dibenz(a,h)anthracene	7.41E-02	0.036	2.64E-03	0.130	9.63E-03	0.008	5.80E-04	7.82E-05	2.15E-04	0.62	1.37	3.07	3.49E-04	1.56E-04	7.00E-05
Fluoranthene	4.90E-01	0.165	8.10E-02	0.500	2.45E-01	0.010	5.14E-03	1.73E-04	3.13E-03	65.6	147	328	4.78E-05	2.14E-05	9.55E-06
Fluorene	2.85E-01	0.555	1.58E-01	Regresson	1.12E-02	0.086	2.45E-02	1.31E-04	1.78E-03	65.6	147	328	2.71E-05	1.21E-05	5.43E-06
Hexachlorobenzene	4.86E+00	0.512	2.49E+00	0.246	1.20E+00	0.326	1.59E+00	2.45E-03	3.72E-02	2.00	2.83	4.00	1.86E-02	1.31E-02	9.30E-03
Hexachlorobutadiene	4.86E+00	0.385	1.87E+00	0.675	3.28E+00	0.131	6.34E-01	2.45E-03	4.58E-02	2.00	6.32	20.0	2.29E-02	7.25E-03	2.29E-03
Hexachlorocyclopentadiene	4.86E+00	1.000	4.86E+00	0.393	1.91E+00	1.000	4.86E+00	0.00E+00	6.39E-02	75.0	168	375	8.51E-04	3.81E-04	1.70E-04
Hexachloroethane	4.86E+00	1.000	4.86E+00	1.439	7.00E+00	1.000	4.86E+00	2.45E-03	9.94E-02	100	224	500	9.94E-04	4.44E-04	1.99E-04
Indeno(1,2,3-cd)pyrene	2.38E-01	0.003	7.88E-04	0.110	2.62E-02	0.009	2.13E-03	7.60E-05	5.85E-04	0.62	1.37	3.07	9.51E-04	4.26E-04	1.90E-04
Pentachlorophenol	1.94E+01	1.000	1.94E+01	5.930	1.15E+02	1.486	2.88E+01	9.80E-03	1.01E+00	8.42	18.8	42.1	1.20E-01	5.38E-02	2.41E-02
Phenanthrene	9.49E-01	0.458	4.35E-01	Regresson	8.20E-01	0.030	2.85E-02	4.55E-04	1.06E-02	65.6	147	328	1.62E-04	7.22E-05	3.23E-05
Pyrene	6.20E-01	0.538	3.34E-01	0.720	4.46E-01	0.012	7.71E-03	1.90E-04	6.66E-03	0.62	1.37	3.07	1.08E-02	4.85E-03	2.17E-03

Orange shading indicates concentration based on maximum detection limit; chemical was not detected

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

	Invertebrates	Bivalves	Fish
Lipids (%):	2.58	1.48	6.00
TOC (%):	6.62	6.62	6.62
Percent soilds:	0.21	0.21	0.25

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.1031 = Food ingestion rate (kg/day dry weight)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic invertebrates, dry weight basis)
PDFi = 0.436 = Proportion of diet composed of food item (aquatic invertebrates)
FCxi = Chemical-specific = Concentration of chemical in food item (aquatic plants, dry weight basis)
PDFi = 0.400 = Proportion of diet composed of food item (aquatic plants)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis)
PDFi = 0.070 = Proportion of diet composed of food item (fish)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.094 = Proportion of diet composed of sediment
WIR = 0.4921 = Water ingestion rate (L/day)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 5.940 = Body weight (kg)

Attachment E
February 2012 Team Conference Call Minutes

CAX Partnering Team Conference Call

Date: February 1, 2012, 10:00 to 12:00

Subject: PCB Congener Analysis Discussion

Attendees:

CAX Partnering Team	Technical Support
Krista Parra, NAVFAC Mid-Atlantic (CAX RPM) John Burchette, USEPA, Region 3 (CAX RPM) Marlene Ivester, CH2M HILL (CAX Activity Manager) Stephanie Sawyer, CH2M HILL (CAX Deputy Activity Manager) Wade Smith, VDEQ (CAX RPM)	Jennifer Corrack, Navy and Marine Corps Public Health Center (Human Health) Jennifer Wright, NAVFAC Atlantic (Ecological Risk) Dave Barclift, NAVFAC Atlantic (Ecological Risk) John McCloskey, US Fish and Wildlife Service (USEPA Region 3 BTAG) Dawn Ioven, USEPA, Region 3 (Toxicologist) Kyle Newman, VDEQ (Ecological Risk) William (Bill) Kappleman, CH2M HILL (Senior Ecological Risk Assessor) Roni Warren, CH2M HILL (Senior Human Health Risk Assessor) Anita Dodson, CH2M HILL (Penniman Lake PM)

Purpose: During the December 2011 Youth Pond scoping session conference call, Wade mentioned VDEQ would be interested in PCB congener analysis for the fish tissue samples. There are two additional CAX projects (Penniman Lake and Site 4) involving tissue collection and analysis for PCBs; therefore, the CAX Partnering Team (the Team) discussed congener analysis during the January Partnering meeting to determine how to address it for each project. The Team decided a conference call with technical support was necessary to resolve this issue.

Discussion:

Krista started the discussion and asked VDEQ to state their concern with conducting Aroclor analysis only. Kyle replied congener analysis could help identify the source (fingerprinting) and would give better PCB concentration estimates because PCBs can weather over time, which presents some difficulties with Aroclor analyses. Krista said the source of the PCBs is the Navy and proposed doing Aroclor analysis only and see the results, then decide whether or not to do congener analysis (or analyze for homologues). Kyle felt it would be more costly in the long run to do it that way.

John Burchette (John B.) asked if only fish tissue was the issue? What about sediment? We currently have Aroclor analysis only for sediment. John B. asked the EPA human health and eco risk assessors if they were comfortable with making decisions on PCBs using Aroclor data only, in particular human health decisions. Dawn replied that dioxin-like congener data would be good to have to conduct risk assessments and analysis; however, the tests are expensive. She recommended analyzing a percentage of samples for dioxin-like congeners.

Dave commented that if EPA Region 3 is interested in dioxin-like PCBs, then we should focus the study that way, and he agreed with collecting a subset of samples for dioxin-like congener analysis, but added,

a subset will work for Youth Pond and Penniman Lake, but Site 4 is different as there are likely no human health exposures for this pathway. John McCloskey (John M.) said he was not familiar with homologue analysis, but the sampling needs to consider the differential uptake of the various PCB components. Dave does not know if there is much ecological risk information on congeners and felt it was based on total PCBs. Bill replied the ecological risk estimates for food chain exposures would involve some extrapolation (either for concentration estimation or derivation of effect levels) no matter what route was taken – either congeners, homologues, or Aroclors. John M. mentioned the PCB Congener memorandum[1] from Bruce Pluta previously forwarded to the Team. Dave replied he looked it over, but there is still the question of exposure to uptake to risk. John M. said the differential uptake is important and cannot measure it in birds and mammals (without sampling them directly), so need to extrapolate it with the lower trophic level organisms (e.g., fish). Kyle agreed with Dawn's recommendation to conduct congener analysis (or subset of congeners) on a percentage of samples.

Krista asked if the Team had decided to conduct an analysis for a subset of the total congeners. Bill mentioned it is important to keep in mind how the data will be used – if we do a subset, how will it look – homologues, congeners, dioxin-like congeners. Krista asked the Team to come to an agreement on what subset to use. Dave recommended the 12 dioxin-like PCB congeners. Dawn agreed and said it would be sufficient for human health, along with Aroclor (or total PCB concentration) data. Kyle concurred with the 12 dioxin-like PCB congener proposal, as well. However, Kyle wants more data than the dioxin-like PCBs for ecological risk. Dave asked if Kyle meant better data or more data? Kyle replied a better estimate of total PCBs, like with congeners or homologues, to have a more accurate picture of the risk to the receptors up the food chain (birds, mammals, etc.). Krista asked if we are talking dioxin-like PCBs AND homologues or just homologues? Kyle replied both for the ecological tissue samples. Bill pointed out that if dioxin-like congeners and homologues are both sampled, Aroclor analysis would not be needed for these samples. Kyle concurred. Stephanie asked if this would be all of the samples or a subset? For Site 4 and Youth Pond, these analyses (dioxin-like and homologues) can be conducted on all proposed ecological tissue samples (12 dioxin-like and Aroclors would be analyzed for Youth Pond human health tissue samples). Dave said the Navy and CH will internally discuss the cost of conducting the 12 dioxin-like PCBs and homologue analyses versus the cost to conduct the full congener list. If the cost is the same or more to conduct both the 12 dioxin-like PCBs and homologue analyses, then the full congener list would be used since this list can be used to calculate total PCBs and includes the dioxin-like congeners.

Bill asked if we are discussing fish tissue only and if Aroclors only for sediment was okay. John M. said it would be fine for eco risk since the tissue would be measured directly.

Stephanie asked EPA and VDEQ if they were okay with freezing the tissue samples, then analyzing them later after the analyte list is agreed upon. EPA is fine with freezing the tissue as long as it is okay with lab SOPs. VDEQ agreed. Anita replied it is not uncommon to freeze tissue and analyze later and that there is no official hold time, but most labs consider it to be one year.

In summary, it was agreed that sediment samples would be analyzed for Aroclors only, human health tissue samples would be analyzed for the 12 dioxin-like congeners and Aroclors, and ecological tissue samples would be analyzed for the 12 dioxin-like congeners and homologues (unless the cost to do this was greater than or equal to full congener analysis, in which case the full 209 congeners would be used).

[1] Cleverly, David. 2005. *Memorandum: Response to Ecological Risk Assessment Forum Request for Information on the Benefits of PCB Congener-Specific Analysis*. March. [U.S. EPA National Center for Environmental Assessment, Office of Research and Development, Washington, D.C. (NCEA-C-1315/ERASC-002F)]

This would apply to all samples, not to subsets of tissue samples. Tissue samples can be frozen for up to one year.

The discussion became focused on ecological sampling, so the human health risk assessors (Jenn Corrack, Dawn, and Roni) left the call.

For Penniman Lake, eight fish tissue samples are proposed. How many of these would need the additional analysis, that is, should we subsample? Kyle said three would be too few. Anita asked what about five. John M. said he was reluctant to agree to a number for tissue samples because we don't know what the biota sampling plan is at this time. John M. asked if the biosurvey would be only a fish survey; Bill replied that for Site 4 it would encompass fish, amphibians, and invertebrates. John M. also said if there are abundant frogs at Penniman Lake, we need to consider sampling them, especially up in the coves where frogs may be a more important food source than fish. He said to base sampling on important food sources – sample the abundant food sources. He requested that option be in the SAP and don't limit the tissue sampling to fish. Bill replied he always puts this as a contingency in SAPs (and is already in the Site 4 SAP) and that the most important criteria for the selection of species for collection is relative abundance and guild.

Dave asked about the number of samples – with eight fish tissues being proposed, will this number of samples be reduced by adding frog tissue samples. John M. replied that was a concern, and he would not want to lower the number of fish tissue samples if adding frogs samples because it could result in an inadequate sample set. Jen Wright asked if collecting for frogs in the coves meant small fish collection in the coves would be unnecessary. John M. replied no, that he would want to see both sampled. Kyle agreed and added don't take away samples for one type of tissue in order to stay at a certain sample size.

John M. added he would want frogs and small fish (whole body) and that the larger fish fillet data (that will be collected for human health) would work to look at risk to eagles, ospreys, etc., species that eat larger fish but do not consume them whole. The fillets might be underestimated than if had whole body data, but it could work. Bill K. said adjustments to fillet data can be made to estimate whole body concentrations for some constituents but that for PCBs, lipid content of the tissue is most important since PCBs preferentially accumulate in lipids. Krista asked if frogs are sampled, how many samples are needed – two, three, etc.? Dave said it would depend on the frog species available. Bill replied generally it was five samples for frogs and smaller fish (that is, five samples for each distinct sample group). Depending on the analyte list and volume lab needs, composite samples for small fish and frogs will likely be necessary. Bill also feels composite samples are more representative of what is at the site, even if it is not necessary to meet tissue volume requirements. Dave and John M. agreed. Spatial aspect is important as well because frogs are fairly localized, meaning they don't typically roam large distances during most of the year. Krista asked if we need to walk away from this call with a sample count or can it be made in the field? John M. replied the count and assumptions can be put in the SAP, then adjusted based on field conditions. John M. said the number of samples would depend on whether they were composite or not. Krista asked if we had agreed on composites? John M. said it would depend on the species found. Dave felt composites would be fine. John agreed as long as the sample is representative. The team agreed that composite samples are preferred for whole-body samples.

Kyle said to make sure the sample set is robust enough to be able to make decisions. Right now, it is hard to make tissue sampling decisions for Penniman Lake when we don't have a full conceptual site model. John M. wants frogs and small fish (something that stays local and not one that travels in open water) sampled up the coves where the PCBs are highest. It was pointed out that tissue won't just be collected from areas with the highest concentrations because tissue should be collected from areas with a range of concentrations so that tissue samples would be representative of higher trophic level intake.

Bill asked John M. if tadpole collection would be okay because they tend to have more sediment exposure, or if sampling should be targeted at adult frogs. John M. said we would not get tadpoles during our fall sampling timeframe. Bill replied it depends on the species. John M. said it was okay to sample tadpoles If we can get tadpoles that live several years (e.g., bull frog), but not something that is a tadpole for a short time (like a month or so). Dave said he thought adult frogs would be appropriate. John M. and Kyle agreed. Bill replied it will depend on what is found in the field, that adults may be the preference, but need flexibility in the field. Bill said it was important to have major elements worked out upfront, because changes to the SAP can be a long process. Anita summed up the frog discussion, stating everyone prefers adult frogs over tadpoles. Everyone agreed. John M. asked if the frog species would be identified in the field. Bill replied yes for adult frogs, but not for tadpoles. John said one composite sample of adult frogs per cove may be okay, but also need to consider sampling frogs further up the drainages if frogs live up there as well.

Krista asked if the PMs have everything they need to prepare the SAPs. Anita and Stephanie replied yes.

Agreement:

1. Aroclor analysis only for sediment.
2. Human health tissue data (fillets) - Aroclor and 12 dioxin-like PCB analyses.
3. Ecological tissue data (whole body) - 12 dioxin-like PCBs and homologue analyses. No Aroclor data.
4. Conduct Aroclor (HHRA), 12 dioxin-like PCBs (HHRA and ERA), and homologue analyses (ERA) for all tissue samples proposed for Youth Pond; for Site 4, only eco samples will be collected based upon the habitat present (to be confirmed during the biosurvey). The specific number of samples will be proposed in their respective SAPs. Note: if the cost is the same or more to conduct both the 12 dioxin-like PCBs and homologue analyses, then the full congener list would be used since this list can be used to calculate total PCBs and includes the dioxin-like congeners.
5. Freezing tissue to analyze later is fine (within one year).
6. For Penniman Lake:
    a. Sample all major ecological food sources present, such as frogs and small fish.
    b. It is assumed at this time that large fish from the open lake (for fillets; HHRA and ERA), and frogs and small fish (whole body; for ERA) from coves with high PCB concentrations will be sampled. The type and number of samples will be determined after the biosurvey is conducted. A call may be necessary to agree upon the type and number of samples to collect after the biosurvey is complete. Contingencies will be written into the SAP.
    c. Adult frogs are preferred over tadpoles.
    d. Composite samples are preferred for whole-body samples.
    e. Conduct Aroclor (HHRA), 12 dioxin-like PCBs (HHRA and ERA), and homologue (ERA) analyses for all the tissue samples.

Action Items:

The Navy and CH will internally discuss the cost of conducting the 12 dioxin-like PCBs and homologue analyses versus the cost to conduct the full congener list.

Response to Comments

Response to Comments
Technical Memorandum
"Summary of Step 2 Field Investigations and Recommendations On Analytical Suites for Tissue Analyses"
AOC 9 – Penniman Lake
Naval Weapons Station Yorktown Cheatham Annex
Williamsburg, VA
August 23, 2013

Comment provided by the Virginia Department of Environmental Quality (VDEQ) via track changes in the draft document Word file in an email dated July 19, 2013. All editorial changes were accepted.

VDEQ Comment (Section 6, note under table): *Please include the call minutes as an attachment and reference the discussion section that specifies team agreement on 12 dioxin-like PCB congeners analysis or include additional language that details team agreement on 12 dioxin-like PCB congeners thus eliminating the need for Whole Body Aroclor 1260 analysis.*

Navy Response: Additional language has been added to the note under the table in Section 6. In addition, the referenced February 2012 conference call minutes have been added to the document as Attachment E, and the parts of the discussion and team agreement on not needing Aroclor 1260 analysis for the whole body tissue for the ecological risk evaluation have been highlighted. As noted in the minutes, sediment Aroclor data are sufficient for the ecological risk evaluation and eliminate the need for whole body tissue Aroclor analysis.

Regulatory Acceptance

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
TDD (804) 698-4021
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Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

August 23, 2013

Mr. Scott Park
NAVFAC MIDLANT, Building N-26
Hampton Roads Restoration Product Line, Code OPHREV4
9742 Maryland Avenue
Norfolk, VA 23511-3095

Technical Memorandum
AOC 9 – Penniman Lake
Naval Weapons Station Yorktown
Cheatham Annex
Williamsburg, Virginia

Dear Mr. Park:

The Virginia Department of Environmental Quality (DEQ) has received the *Response to Comments* (RTCs) associated with the Technical Memorandum (Tech Memo) for AOC 9 – Penniman Lake at Naval Weapons Station Yorktown, Cheatham Annex (CAX), Williamsburg, Virginia. The RTCs, prepared by CH2M HILL, were received by the DEQ (electronically) on August 23, 2013.

Thank you for providing the DEQ's Office of Remediation Programs the opportunity to review the above-referenced RTCs. Subsequent to DEQ's internal review, this office concurs with the proposed text revisions and recommends submittal of the *Final Tech Memo*.

Please contact me at (804) 698-4125 or wade.smith@deq.virginia.gov with any additional questions.

Sincerely,

Wade M. Smith
Remediation Project Manager
Office of Remediation Programs

cc: Jerry Hoover, EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

August 19, 2013

Mr. Scott Park
NAVFAC MIDLANT, Building N-26, Room 3208
Attention: Code OPHE3, Mr. Scott Park
9742 Maryland Avenue
Norfolk, VA 23511-3095

Subject: Draft Technical Memorandum, Summary of Step 2 Field Investigations and Recommendations on Analytical Suites for Tissue Analyses, Penniman Lake, Step 2 Site Inspection, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia, June 2013

Mr. Park:

Thank you for the opportunity to review the subject document. EPA has no comments on this document. Please submit a final copy of the subject document for our records.

If you have any questions, please contact me at 215-814-2077.

Sincerely,

Gerald F. Hoover

Gerald F. Hoover, RPM
NPL/BRAC Federal Facilities Branch

cc: Wade Smith, VDEQ