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LETTER AND U S NAVY RESPONSE TO U S EPA REGION I AND RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT COMMENTS REGARDING DRAFT FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION SITE 8 NS NEWPORT RI
07/13/2011
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C-NAVY-07-11-4479W

July 13, 2011

Project Number 112G02124

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Mr. Gary Jablonski
Rhode Island Department of Environmental Management
235 Promenade Street
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Reference: CLEAN Contract No. N62470-08-D-1001
Contract Task Order No. WE19

Subject: Navy Responses to EPA and RIDEM Comments on the Draft Final Supplemental Remedial Investigation (SRI)
Site 8 – NUSC Disposal Area, Naval Station Newport, Newport, Rhode Island

Dear Ms. Lombardo, Mr. Jablonski:

On behalf of Ms. Maritza Montegross, U.S. Navy NAVFAC, Tetra Tech is pleased to provide the responses to EPA and RIDEM comments on the draft final SRI for Site 8 at the Naval Station Newport. As requested, replacement pages to the SRI are included. Upon approval of these responses, we will finalize the SRI document. If there are any remaining concerns, then we would like to discuss them at the July 20, 2011 meeting.

Please contact me at (978) 474-8449 or jim.ropp@tetratech.com should you have any questions.

Sincerely,

James Ropp, P.E.
Project Manager

Encl: Responses to EPA and RIDEM Comments on the Draft Final SRI (email and hardcopies, EPA-3, RIDEM-2)

c: M. Montegross, NAVFAC (w/ encl. – email, 1 hardcopy)
D. Moore, NAVSTA (w/ encl. – email, 1 hardcopy)
P. Steinberg, Mabbett (w/ encl. – email, 2 hardcopies)
P. Crump, RIDEM (w/ encl. – email)
K. Munney, USF&W (w/ encl. – email, 1 hardcopy)
S. Parker, Tetra Tech (w/ encl. – 1 hardcopy)
D. Seiken, Tetra Tech (w/o encl.)
AR c/o G. Wagner, Tetra Tech (w/encl. – email, 1 hardcopy)
G. Glenn, Tetra Tech (w/o encl.)
File G02124-3.2 (w/encl. – original)

Navy Responses to EPA Comments (dated June 15, 2011)
on the Draft Final Supplemental Remedial Investigation (dated May 13, 2011) for
Site 08 – Naval Undersea Systems Center (NUSC) Disposal Area
Naval Station Newport, Newport, Rhode Island
July 13, 2011

On June 15, EPA provided two comments on the draft final Supplemental Remedial Investigation (SRI) document and two additional comments to clarify EPA's position on addressing ecological risks at Site 08. EPA requested that replacement pages be submitted for the SRI comments. EPA also requested confirmation that the Navy concurs with the next steps on the ecological risks (to be addressed in the Feasibility Study; no replacement pages required).

SRI Comment 1 – *In response to EPA Specific Comment #22, text was added in Section 6.5 to include a qualitative discussion of the background risk associated with B(a)P and arsenic in sediment. Please add a concluding sentence indicating that since the ILCRs from arsenic and B(a)P in sediment at the site are similar to background ILCRs from these compounds, it is reasonable to eliminate arsenic and B(a)P as sediment COCs.*

Response: The Section 6 text has been revised accordingly (see attached replacement pages).

SRI Comment 2 – *Table 4-10: The table lists benzo(b)fluoranthene but should apparently list benzo(k)fluoranthene. See Navy's response to EPA Specific Comment #20 for the Draft SRI. The same comment applies to Table 6-6.*

Response: The tables were reviewed and were confirmed to be correct (no change required). Table 4-10 and Table 6-6 address benzo(b)fluoranthene in soil. The Navy's response to EPA Specific Comment #20 addressed benzo(k)fluoranthene in groundwater. Benzo(k)fluoranthene was eliminated as a chemical of concern (COC) in groundwater per Table 6-1 of the draft final SRI.

Ecological Comment 1 – *There appears to be a significant lead source to the on-site stream, which may reflect leaching from contaminated soil adjacent to the stream. The stream itself flows over exposed rock for much of its length, and contains little soft sediments, so it is possible that sediment remediation will not be practicable. EPA expects that, in the FS, the Navy will consider the potential for lead to be carried through the stream to the pond with potential adverse effects, and address the underlying source areas that are creating this potential hazard in the stream. This risk is not explicitly described in the RI documents, although lead has been retained as a COC in both stream and pond sediments.*

Response: Concur. The remedial alternatives being developed in the Feasibility Study (FS) will include mitigation of the lead source in soil as well as the lead levels in stream and pond sediment (as feasible based on the site conditions, as noted by EPA).

Ecological Comment 2 – *It is EPA's understanding that as we move into the FS stage, the finalizing of PRGs and evaluation of appropriate remedial actions will be based on the observed toxicity in all three pond samples, and lack of toxicity in the reference area. It is important to note that, historically, toxic sediments have been the primary driver of site clean-up actions related to ecological risk at Navy sites in Region I. With no non-toxic site samples available, it is recommended that, in the FS, the Navy develop PRGs based on a geometric mean of reference (as the NOEC) and lowest on-site (as the LOEC) sediment concentrations for each COC, as well as with a cumulative approach using PEC Quotients.*

Response: Concur. The sediment Preliminary Remediation Goals (PRGs) are being developed accordingly in the FS (geometric mean NOEC and LOEC sediment concentrations for each COC, as well as with a cumulative approach using PEC-Quotients).

Navy Responses to RIDEM Comments (dated June 16, 2011)
on the Draft Final Supplemental Remedial Investigation (dated May 13, 2011) for
Site 08 – Naval Undersea Systems Center (NUSC) Disposal Area
Naval Station Newport, Newport, Rhode Island
July 13, 2011

Comment 1 – *In response to RIDEM's comment 12, the Navy placed new language in the document on page 4-2. Please delete the following Navy updated underlined language in the text and update Tables 6-1 through 6-5: "RIDEM's DECs for residential soil and "GA" objectives for groundwater are also presented for informational purposes, but were not used to select COPCs in this CERCLA risk evaluation." Pursuant to CERCLA (section 300.430) and the FFA, the State Site Remediation Regulations are ARARs which shall be fully integrated with the site characterization activities of the remedial investigations and developed and modified throughout the RI/FS phase of the project. In addition, since the Navy for this Site has already presented a FS to the Agencies for review and comment and as the Navy has stated throughout the Navy's response to comments that this Supplemental RI is including steps from the FS to expedite the FS process, please delete this above underlined text from the draft final document and reevaluate the selection of COPCs throughout the document using RIDEM's Criteria.*

Response: The Section 4 and Section 6 text and tables have been revised accordingly (see the attached replacement pages).

Comment 2 – *In response to RIDEM's comment 14, the Navy placed new language in the document on page 4-6. Please delete the following Navy updated underlined language in the text: "Similarly, cumulative ILCRs greater than $1x10^{-5}$ are generally considered to be "unacceptable" by the state of Rhode Island; remediation may or may not be necessary when the cumulative ILRC exceeds $1x10^{-5}$." Under the State Remediation Regulation a contaminated site can not exceed this cumulative risk*

Response: The Section 4 text has been revised accordingly (see the attached replacement page).

Comment 3 – *In response to RIDEM's comments 11 and 21, the Navy provided Attachment A in regards to eliminating Arsenic in type "Se" soil. After review of the Navy's response to comments and Attachment A, this Office does not concur with the Navy's proposal to eliminate Arsenic in type "Se" soil onsite. Please update the text in this draft final document to keep Arsenic as a COC in both types of soil for this site.*

[On 6/23/11, RIDEM provided further clarification that it is concerned that the site soil may be better classified as "UD" rather than "Se" due to the presence of buildings, pavement, and fill material.]

Response: The Feasibility Study (FS) will indicate that arsenic in type "Se" soil on-site is greater than background levels in surface soil and is within background levels in subsurface soil. This is consistent with the geostatistical evaluation presented in Appendix F.6 of the final Remedial Investigation (RI) report (Tetra Tech 2010). In the SRI, Table 6-2 (residential exposure scenario) and Table 6-6 also have been updated accordingly for the identification of arsenic as a chemical of concern (COC) in soil (see attached replacement pages). The classification of the soil as type "Se" (rather than "UD") is being maintained because it is consistent with the completed background assessments in 2006 and 2008 as well as the RI.

Comment 4 – *In regards to moving forward to the Feasibility Study process, please be advised that according to RIDEM's Remediation Regulations each carcinogenic substance can not exceed a $1 X 10^{-6}$ excess lifetime cancer risk level and the cumulative excess lifetime cancer risk posed by the Contaminated-Site can not exceed $1 X 10^{-5}$. In addition, each non-carcinogenic substance can not exceed a Hazard Index of 1 and the cumulative Hazard Index posed by the Contaminated-Site can not exceed 1 for any target organ for each carcinogenic. Pursuant to the FFA and CERCLA, if any carcinogenic and/or non-carcinogenic substance concentration exceeds RIDEM's risk levels, than that substance will be*

considered a contaminant of concern and a preliminary remediation goal will need to be developed in the Feasibility Study process.

Response: Comment noted for the FS. The groundwater Preliminary Remediation Goals (PRGs) being developed in the FS are based on EPA Maximum Contaminant Levels (MCLs) (which are equivalent to the RIDEM GA Groundwater Objectives for the site COCs), or if an MCL was not available, then a risk-based concentration corresponding to a cancer risk of 1×10^{-6} or a hazard index of 1 was used as the PRG. For soil, the COCs are arsenic and carcinogenic polycyclic aromatic hydrocarbons (cPAHs). The soil PRGs being developed in the FS are based on background levels for arsenic and a 1×10^{-5} risk level for the combined cPAHs, expressed as benzo(a)pyrene equivalents.

SRI REPLACEMENT PAGES

(with mark-ups shown)

4.0 SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT

This section presents the results of a screening level human health risk assessment (HHRA) of chemical concentrations detected in supplemental environmental samples collected at Site 08, the NUSC Disposal Area. Chemicals of potential concern (COPCs) for the SRI data set were selected by comparing the chemical concentrations measured in each media (soil, groundwater, surface water, and sediment) to EPA RSLs and EPA MCLs. Risk estimates were approximated for the SRI data set by comparing the chemical concentrations in the supplemental samples to the chemical concentrations in the RI data set, and then scaling off the risk estimates published for the RI data set to approximate risk estimates for the SRI data set.

This is a qualitative evaluation of the new (SRI) data to the site risks identified in the HHRA. In this step with the SRI data, no COPCs were eliminated based on comparison to Site-specific background values. In the HHRA portion of the RI (Tetra Tech 2010a), the cumulative risk was measured for the site-related COPCs and the background COPCs. This SRI does not change the conclusions of the HHRA already published in the RI. However, in accordance with Navy policy, COPCs identified in the risk assessment that are within background levels will not be carried forward as COCs for the development of Preliminary Remediation Goals (PRGs) in the FS. Soil types for the NUSC complex, as used in the background assessment, are presented on Figure 4-1.

Further evaluation of these SRI COPCs is conducted with consideration of other data from the RI in Section 6 of this SRI report.

4.1 DERIVATION OF SCREENING CRITERIA

The primary criteria used to identify COPCs are based on EPA RSLs (2010). The RSLs are based on exposure pathways for which generally accepted methods, models, and assumptions have been developed (e.g., ingestion, dermal contact, and inhalation) for specific land-use conditions and do not consider impact to groundwater or ecological receptors. The screening concentrations based on the RSLs correspond to a systemic hazard quotient (HQ) of 0.1 for non-carcinogens or an incremental lifetime cancer risk (ILCR) of 1×10^{-6} for carcinogens. The RSLs for non-carcinogens are based on an HQ of 1, whereas the screening concentrations used in the selection of COPCs in this SRI were based on an HQ of 0.1 to account for the potential cumulative effects of several chemicals affecting the same target organ or producing the same adverse non-carcinogenic effect.

The COPC screening levels used for each medium in the risk assessment are discussed below and are summarized in Table 4-1 and 4-2. No contaminants were detected in surface water; therefore, no

screening levels were identified for surface water. RIDEM's DECs for residential soil and "GA" objectives for groundwater are also presented~~ for informational purposes, but were not used to select COPCs in this CERCLA risk evaluation~~. RIDEM's Remediation Regulations are potential Applicable or Relevant and Appropriate Requirements (ARARs) for the Site 08 cleanup and will be used during the development of PRGs in the FS.

Screening Levels for Soil and Sediment

RSLs for residential soil and soil to groundwater migration (EPA, 2010) were used to select COPCs for surface and subsurface soil and sediment. The risk-based screening levels used in the COPC selection for soil and sediment are presented in Table 4-1.

Soil and sediment concentrations were also compared to appropriate background concentrations presented in the *Background Study Report for Naval Station Newport* (Tetra Tech, 2008) and the *Background Soil Investigation Report for Site 08* (Tetra Tech, 2006).

Screening Levels for Groundwater

Screening levels based on the following criteria were used to select COPCs for groundwater:

- RSLs for tap water (EPA, 2010) (The screening levels for non-carcinogenic compounds were divided by 10 for a target HQ of 0.1)
- MCLs (EPA, 2009)
- EPA Groundwater Screening Levels for Evaluating the Vapor Intrusion into Indoor Air from Groundwater and Soils (EPA, 2002). (The screening values presented in the guidance are based on the MCL; Region 1 EPA requires that the screening criteria be risked-based. Therefore, the carcinogenic compound values have been adjusted for a $1x10^{-6}$ cancer risk level. The non-carcinogenic compound values are the screening level divided by 10 to correspond to a target HQ of 0.1).

The risk-based screening levels and health-based standards used in the COPC selection for groundwater are presented in Table 4-2.

4.2 SELECTION OF COPCS

COPCs were selected for surface soil, subsurface soil, groundwater, and sediment using the EPA risk-based COPC screening levels described in Section 4.1. COPC selection information for each

medium is presented in Tables 4-3 through 4-9. Chemicals identified as COPCs for each medium from the SRI data set are presented in Table 4-10.

Surface Soil

A comparison of maximum detected surface soil concentrations to screening levels based on residential soil RSLs is presented in Table 4-3. The following chemicals were detected at maximum concentrations exceeding direct contact risk-based COPC screening levels and were retained as COPCs for surface soil:

- SVOCs [benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene equivalents]
- Inorganics (aluminum, arsenic, beryllium, cobalt, iron, and manganese)

Each of the above-listed chemicals were retained as COPCs for surface soil in the RI report. The maximum detected concentrations of aluminum, cobalt, iron, and manganese exceeded the screening toxicity levels (set at a~~n~~ hazard index [HI] of 0.1); however, they do not exceed the RSLs. Concentrations of aluminum, arsenic, beryllium, cobalt, iron, and manganese were within the range of the background concentrations.

Subsurface Soil

A comparison of maximum detected subsurface soil concentrations to screening levels based on residential soil RSLs is presented in Table 4-4. The following chemicals were detected at maximum concentrations exceeding direct contact risk-based COPC screening levels and were retained as COPCs for subsurface soil:

- SVOCs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and benzo(a)pyrene equivalents];
- Inorganics (aluminum, arsenic, beryllium, cobalt, iron, and manganese).

The above-listed chemicals also were retained as COPCs for subsurface soil in the RI report. The maximum detected concentrations of aluminum, iron, and manganese exceeded the screening toxicity levels (set at an HI of 0.1); however, they do not exceed the RSLs. Concentrations of arsenic, beryllium, iron, and manganese were within the range of background concentrations.

Overburden-Bedrock Interface Groundwater

A comparison of maximum detected groundwater concentrations to screening levels based on RSLs for tap water and MCLs is presented in Table 4-5. The following chemicals were detected at maximum concentrations exceeding the COPC screening levels and were retained as COPCs for overburden-bedrock interface groundwater:

- VOCs (1,1,1-TCA, 1,1-DCA, 1,1-DCE, PCE, and TCE)
- Energetics (PGDN)

1,1,1-TCA, 1,1-DCA, 1,1-DCE, TCE, and PGDN were not retained as COPCs for the overburden-bedrock interface groundwater in the RI report. Concentrations of PGDN exceeded screening toxicity levels (set at an HI of 0.1) but did not exceed RSLs. Concentrations of TCE exceeded RSLs but were less than MCLs.

A comparison of maximum detected groundwater VOC concentrations to EPA screening levels for chemical migration from groundwater through building foundations and into indoor air is presented in Table 4-6. The following chemicals were detected at maximum concentrations exceeding the COPC screening levels and were retained as COPCs for overburden-bedrock interface groundwater:

- VOCs (1,1,1-TCA, 1,1-DCA, isopropylbenzene, PCE, and TCE).

1,1,1-TCA, 1,1-DCA, and isopropylbenzene were not previously retained as COPCs for vapor intrusion in the RI. The maximum detected concentrations of 1,1,1-TCA, 1,1-DCA, and isopropylbenzene exceeded the screening toxicity levels (set at an HI of 0.1); however, they do not exceed the screening levels based on an HI of 1.

Bedrock Groundwater

A comparison of maximum detected groundwater concentrations to screening levels based on tap water RSLs and MCLs is presented in Table 4-7. The following chemicals were detected at maximum concentrations exceeding the COPC screening levels and were retained as COPCs for bedrock groundwater:

- VOCs (1,1,1-TCA, 1,1,2-TCA, 1,1-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, carbon tetrachloride, PCE, TCE, and vinyl chloride); and
- SVOCs (1,4-dioxane)

1,1,1-TCA, 1,1,2-TCA, 1,1-DCE were not retained as COPCs for the bedrock groundwater in the RI. Groundwater samples in the RI report were not analyzed for 1,4-dioxane. Concentrations of 1,1-DCE and 1,2,4-trimethylbenzene exceeded screening toxicity levels (set at an HI of 0.1) but did not exceed RSLs. Concentrations of carbon tetrachloride and PCE exceeded RSLs but were less than MCLs.

A comparison of maximum detected groundwater VOC concentrations to EPA screening levels for chemical migration from groundwater through building foundations and into indoor air is presented in Table 4-8. The following chemicals were detected at maximum concentrations exceeding the COPC screening levels and were retained as COPCs for bedrock groundwater:

- VOCs (1,1-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, carbon tetrachloride, cis-1,2-DCE, PCE, TCE, and vinyl chloride).

1,1,1-DCA, 1,1-DCE, and cis-1,2-DCE were not retained as COPCs for vapor intrusion in the RI report. Concentrations of 1,1,-DCA, 1,1-DCE, 1,2,4-trimethylbenzene, and cis-1,2-DCE exceeded screening toxicity levels (set at an HI of 0.1) but did not exceed RSLs. Concentrations of carbon tetrachloride and PCE exceeded RSLs but were less than MCLs.

Sediment

A comparison of maximum detected sediment concentrations to screening levels based on residential soil RSLs is presented in Table 4-9. The following chemicals were detected at maximum concentrations exceeding direct contact risk-based COPC screening levels and were retained as COPCs for sediment:

- SVOCs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and benzo(a)pyrene equivalents].

The above-listed chemicals also were retained as COPCs for sediment in the RI report. Concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene were within the range of the background concentrations.

Surface Water

No selection of COPCs was required for surface water. There were no identified risks associated with surface water and there were no COPCs identified in the RI.

4.3 COMPARISON OF CONCENTRATIONS TO EXPOSURE POINT CONCENTRATIONS USED IN THE HUMAN HEALTH RISK ASSESSMENT

This section presents a comparison of chemical concentrations in the SRI samples to the results of the existing HHRA presented in the RI (Tetra Tech, 2010a) to give an approximate estimation of risks associated with the supplemental samples. Tables 4-11 through 4-15 present a comparison of the concentrations of COPCs and exposure point concentrations (EPCs) from the RI report to the concentrations of COPCs and EPCs in this SRI. Table 4-16 presents a summary of the cancer risks and hazard indices associated with reasonable maximum exposures from the RI Report.

EPA defines the range of $1x10^{-4}$ to $1x10^{-6}$ as the ILCR target range for sites addressed under CERCLA and the Resource Conservation and Recovery Act (RCRA). Individual or cumulative ILCRs greater than $1x10^{-4}$ are generally considered "unacceptable" by EPA and risk management decisions are necessary when the ILCR is within $1x10^{-4}$ to $1x10^{-6}$. EPA typically does not require remediation when the cumulative ILCR is less than $1x10^{-6}$. Similarly, cumulative ILCRs greater than $1x10^{-5}$ are ~~generally~~ considered to be "unacceptable" by the State of Rhode Island~~; remediation may or may not be necessary when the cumulative ILCR exceeds $1x10^{-5}$~~.

Under RIDEM regulations, residential and recreational scenarios are considered to be equivalent; therefore in the discussion below, an exceedence of the residential risk scenario is also an exceedence of the RIDEM recreational risk scenario.

Surface Soil

Table 4-11 presents a comparison of COPC concentrations for surface soil (RI versus SRI data). The EPCs for carcinogenic PAHs in surface soil samples collected from the exposed and paved areas during the RI are slightly less than those in surface soil samples collected in the SRI. EPCs for metals in surface soil samples collected from the exposed and paved areas during the RI are slightly greater than those collected in the SRI. As shown in Table 4-16, carcinogenic PAHs were the major contributors to the cancer risk for the exposed area surface soils evaluated in the RI report. Consequently, because the EPCs for carcinogenic PAHs are slightly greater in the SRI surface soil samples, the cancer risks for the SRI surface soil would be slightly greater than those calculated for exposed and paved area surface soil samples in the RI. Cumulative cancer risks for exposures to exposed area surface soils by hypothetical child and lifelong residents exceeded EPA's target risk range of 10^{-4} to 10^{-6} in the RI report and would also exceed EPA's target risk range for exposures to surface soil samples collected in the SRI. Benzo(g,h,i)perylene is a non-carcinogenic PAH identified as a COPC from the SRI data that was not

identified as a COC in the RI. Benzo(g,h,i)perylene is not identified as a new COC because the range of concentrations detected in the SRI is within the range detected during the RI.

Cumulative non-cancer risks for exposures to surface soils were within acceptable levels for all receptors in the RI report and would also be within acceptable levels using analytical results for surface soil samples collected during the SRI.

Subsurface Soil

Table 4-12 presents a comparison of COPC concentrations for subsurface soil (RI versus SRI data). The EPCs for carcinogenic PAHs in subsurface soil samples collected from the exposed area during the RI are over 2,500 times greater than those calculated for the SRI samples taken from the same area. Similarly, EPCs for subsurface soil samples collected from the paved area are over an order of magnitude greater than those collected from the same area during the SRI. EPCs for metals in subsurface soil samples collected from the exposed and paved areas during the RI are similar to those collected during the SRI. As shown in Table 4-16 (estimates from the RI), carcinogenic PAHs were the major contributors to the cumulative cancer risk for the exposed area and paved area subsurface soils. Consequently, since the EPCs for the supplemental investigation samples are so much lower than the EPCs calculated for the RI samples, the associated risk estimates for SRI data would be less than the risk estimates determined using the RI data. The EPC for arsenic for the RI samples approximates that calculated for the SRI samples. With the exception of the construction worker, risk estimates presented in the RI for all receptors hypothetically exposed to the COPCs in subsurface soils exceeded the EPA's target cancer risk range (10^{-4} to 10^{-6}).

Cumulative non-cancer risks from exposures to subsurface soil for all receptors evaluated in the RI were within acceptable levels and would also be within acceptable levels if EPCs for subsurface soil samples collected during the SRI were evaluated.

Groundwater

Groundwater was evaluated as one exposure unit in the HHRA. Table 4-13 presents a comparison of COPC concentrations for groundwater (RI versus SRI data). EPCs calculated for 1,1-DCA and TCE based on the SRI groundwater dataset exceed those calculated for the RI groundwater dataset. In contrast, EPCs calculated for 1,2,4-trimethylbenzene, PCE, and vinyl chloride using the RI dataset are greater than those calculated for samples collected during the SRI. In addition, 1,1,1-TCA, 1,1,2-TCA, and 1,1-DCE were identified as COPCs for groundwater samples collected during the SRI but were not

identified as COPCs for groundwater samples collected during the RI. As shown in Table 4-16, VOCs were the major contributors to the cumulative cancer risk for groundwater.

Cumulative cancer risks presented in the RI for residents hypothetically using the groundwater for domestic purposes exceeded EPA's target risk range. Risk estimates would also exceed these benchmarks if COPC concentrations in the groundwater samples collected during the SRI were evaluated.

Cumulative cancer risks presented in the RI for construction workers exposed to groundwater did not exceed EPA's target risk range. Estimates developed based on COPC concentrations detected in the SRI samples would also not exceed EPA's target risk range.

Cumulative non-cancer risks presented in the RI for construction workers and hypothetical residents exposed to groundwater exceeded EPA acceptable levels. Metals were the major contributors to the unacceptable, cumulative non-cancer risks for construction workers and hypothetical residents. However, groundwater samples collected during the SRI were not analyzed for metals.

As discussed in Section 4.2, several VOCs were detected in groundwater samples collected during the SRI at concentrations exceeding the EPA screening levels for chemicals that may volatilize from groundwater and migrate through building foundations and into indoor air of a building. Groundwater samples were collected from the overburden-bedrock interface (approximately 10 feet bgs) and the bedrock (approximately 30 feet bgs). EPA's vapor intrusion guidance (2002) recommends that groundwater samples be collected from wells screened at or across the top of the water table. The samples collected from the overburden-bedrock interface were collected from wells screened across the top of the water table. Therefore, the groundwater samples collected from the overburden-bedrock interface are the samples which would be used to evaluate the vapor intrusion pathway.

Table 4-14 presents a comparison of COPC concentrations for groundwater (RI versus SRI data). The compounds 1,1,1-TCA, 1,1-DCA, and isopropylbenzene were not detected in the overburden-bedrock groundwater samples collected during the RI. As noted above in Section 4.2, the maximum detected concentration of these chemicals exceeded the adjusted screening criteria based on an HI of 0.1 but were less than the unadjusted screening criteria based on an HI of 1. The cumulative non-cancer risk for these chemicals would be within EPA acceptable levels. EPCs for PCE and TCE based on the SRI groundwater dataset are approximately four times higher than those based on groundwater samples collected during the RI. The cumulative cancer risk estimated in the RI report for exposures to VOCs migrating from groundwater to the indoor air of a building was 6×10^{-7} for hypothetical residents and 4×10^{-7} for industrial workers. The cumulative cancer risks based on groundwater samples from the SRI

would be approximately 2.4 x 10^{-6} for hypothetical residents and 1.6 x 10^{-6} for industrial workers, which are within EPA's target risk range.

Sediment

Table 4-15 presents a comparison of COPC concentrations for sediment (RI versus SRI data). EPCs for carcinogenic PAHs in sediment samples collected during the RI are one to two times greater than those in sediment samples collected in the SRI. As shown in Table 4-16, cumulative cancer risks presented in the RI for recreational users exposed to sediments were within EPA target risk range. Consequently, since the EPCs for carcinogenic PAHs in the supplemental data set are less than those calculated for samples collected during the RI, the cumulative cancer risks for the sediment samples collected during the SRI would be also be within the EPA target risk range.

Cumulative non-cancer risks were within acceptable levels for all receptors in the RI report and would also be within acceptable levels for sediment samples collected during the SRI.

4.4 UPDATED TOXICITY CRITERIA FOR 1,4-DIOXANE

1,4-Dioxane was evaluated in this analysis using the screening criteria presented on the May 2010 RSL table. On August 11, 2010, EPA issued a new oral cancer slope for 1,4-dioxane. The previously published oral cancer slope factor was 0.011 $(mg/kg/day)^{-1}$ and the new oral cancer slope factor is 0.1 $(mg/kg/day)^{-1}$. The current tap water RSL of 6.1 µg/L used in this analysis is based on the previous oral cancer slope factor. A RSL based on the new oral cancer slope factor would be 0.67 µg/L.

1,4-Dioxane was not detected in groundwater from the overburden-bedrock groundwater interface. Concentrations of 1,4-dioxane exceeded the current RSL in 1 of 14 bedrock groundwater samples. Concentrations of 1,4-dioxane would exceed the RSL based on the new oral cancer slope factor in five bedrock groundwater samples. The maximum detected concentration of 1,4-dioxane was 8.3 µg/L, which would correspond to a cancer risk of approximately 1 x 10^{-5} based on the revised oral cancer slope factor. The cancer risk of 1,4-dioxane based on the revised cancer slope factor is within EPA's target risk range but since the cumulative risk from exposure to all chemicals in groundwater exceeds EPA's target risk range 1,4-dioxane would be retained as a COC in bedrock groundwater.

4.5 SUMMARY

This screening level HHRA for Site 08 was conducted to estimate potential risks to likely human receptors exposed to the media sampled in the SRI. COPCs were identified for surface soil, subsurface soil,

groundwater, and sediment. Chemicals identified as COPCs from the SRI data set are summarized in Table 4-10.

Cancer and non-cancer risks were estimated by comparing COPC concentrations in samples collected during the SRI to the results of the HHRA present in the RI report. Cancer risks for the following receptors would exceed EPA's target risk range of 10^{-4} to 10^{-6} and RIDEM cumulative risk benchmark of 1×10^{-5}.

Medium	**Cumulative Cancer Risk Exceeding EPA's Target Risk Range of 10^{-4} to 10^{-6}**	**Cumulative Cancer Risk Exceeding RIDEM's Cumulative Risk Level of 10^{-5} (a)**
Surface Soil	Hypothetical Child Residents Hypothetical Lifelong Residents	Industrial Workers Child Recreational Users Lifelong Recreational Users Hypothetical Child Residents Hypothetical Adult Residents Hypothetical Lifelong Residents
Subsurface Soil	Cancer risks within target range	Hypothetical Child Residents Hypothetical Adult Residents Hypothetical Lifelong Residents
Groundwater	Hypothetical Child Residents Hypothetical Adult Residents Hypothetical Lifelong Residents	Hypothetical Child Residents Hypothetical Adult Residents Hypothetical Lifelong Residents
Sediment	Cancer risks within target range	Cancer risks less than acceptable level

(a) Under RIDEM regulations, residential and recreational scenarios are considered to be equivalent; therefore in the discussion below, an exceedence of the residential risk scenario is also an exceedence of the RIDEM recreational risk scenario.

Non-cancer risks for all receptors exposed to COPCs in surface soil, subsurface soil, groundwater, and sediment would be within EPA acceptable levels.

6.0 SUMMARY AND CONCLUSIONS

This SRI was performed to update and further characterize Site 8 contamination associated with the Building 179 CUST Area. In addition, this SRI was performed to acquire additional environmental data regarding the contamination at the NUSC Disposal Area in order to support the FS. The results of the SRI are summarized below. This section also presents an update to the selection of CERCLA COPCs to be forwarded to the FS.

6.1 NORTH MEADOW VOC PLUME

Figure 6-1 shows a cross-sectional view of the TCE plume in the North Meadow, perpendicular to the direction of groundwater flow. The SRI refined the CSM for the North Meadow as follows:

- As indicated by the presence of TCE in shallow groundwater samples collected near the northern edge of NUWC Pond, the VOC plume extends further north than previously delineated.

- The portion of the VOC plume with the highest TCE concentrations is in the vicinity of the new monitoring well MW-128B (TCE concentration of 1,206 µg/L).

- As indicated by decreasing concentrations of TCE over time in the more southern wells (MW-03B and MW-117B), and increasing concentrations of TCE over time in the more northern well (MW-118B), the TCE plume appears to be moving in a northerly or northwesterly direction with groundwater flow.

- TCE concentrations appear to decrease with depth.

- Based on the available data, geochemical conditions generally do not indicate conditions conducive for anaerobic reductive dechlorination; however, the presence of TCE breakdown products indicates that reductive dechlorination is occurring in some locations.

- A trace amount of 1,4-dioxane was detected in groundwater in the North Meadow (maximum concentration estimated at 0.42 µg/L, which does not exceed the RSL of 0.67 µg/L).

6.2 BUILDING 179 CUST AREA

Figure 6-2 shows a cross-sectional view of the 1,1,1-TCA plume in the Building 179 area, generally along the direction of groundwater flow. The SRI data provided the following information for the Building 179 CUST Area:

- The highest concentration of the CVOC plume in the Building 179 area still exists in the vicinity of the former release area (i.e., by MW-7A/B).
- The Building 179 CVOC plume extends from the former CUST toward the north and Deerfield Creek.
- 1,4-Dioxane is present in groundwater at concentrations ranging from an estimated concentration of 0.54 µg/L to 8.3 µg/L. The RSL was exceeded at one location (well MW-09B). The maximum concentration occurs in the northern (downgradient) portion of the Building 179 CUST area and decreases toward the leading edge of the plume moving north.
- At one location (MW-9B), a trace concentrations of cyanide was detected (5.6 J µg/L) slightly above the project action limit (5.2 µg/L) which was based upon the EPA National Recommended Water Quality Criteria (NRWQC) for fresh surface water; however, it did not exceed the MCL (200 µg/L).
- The bedrock groundwater geochemistry data show favorable reducing conditions to support anaerobic biodegradation of CVOCs.
- The overburden groundwater geochemistry data also indicate the possibility of anaerobic biodegradation of CVOCs.
- Contaminants were not detected in surface water in this area.
- PAHs, carbon disulfide, and TPH were detected in sediment samples in this area.

6.3 BUILDING 185 COMPLEX

The SRI data from this area indicates the following:

- The Otto Fuel component PGDN was not detected above RSLs in soil or groundwater.

- Groundwater and soil data suggest no historical releases from floor drains in the complex.

- Groundwater data between the Building 185 Area and the North Meadow show a decrease in CVOC concentrations from the south to north, suggesting migration of the CVOC plume in a northerly direction along the Deerfield Creek channel.

6.4 RISK ASSESSMENTS

In accordance with agreements with EPA and RIDEM, the new data set from this SRI was not used to recalculate risks already quantified in the RI, but the new data were screened against previous data to make an approximate risk estimate for the supplemental data set. This effort resulted in a qualitative determination as to whether additional COCs should be identified for consideration for PRG development in the FS (Section 4 of this SRI).

1,4-Dioxane was detected in groundwater at several locations in the SRI. Because this constituent was not sought in the original RI, risk was not calculated for it. Based on the published toxicity values, it is presumed that 1,4-dioxane will be included as a COPC based on this SRI data and risk calculation is not required.

Other COPCs identified in the SRI risk screening step had previously been identified as COPCs for the same receptors, and some COPCs had previously been identified as COPCs but for different receptors. In both of these cases, the candidate COPCs are not new COPCs and are already identified to be carried forward for PRG consideration.

However, some of the candidate COPCs identified in the SRI risk screening were not previously identified as COPCs in the RI, and were therefore further evaluated for inclusion as a COPC for the Site. This evaluation is summarized below:

Constituent (Shaded on Table 4-10)	Media	Data Evaluation	Retained as a new COPC?
1,1,1-TCA	Groundwater	SRI data are outside the range of RI data and also exceeds MCL	Yes
1,1,2-TCA	Groundwater	SRI data are similar to RI data	No
1,1-DCE	Groundwater	SRI data are outside of the range of RI data and also exceeds MCL	Yes
cis-1,2-DCE	Groundwater	SRI data are within the RI data range	No
Isopropylbenzene	Groundwater	SRI data are within the RI data range	No
1,4-Dioxane	Groundwater	Not analyzed/evaluated in the RI; presumed COPC in the SRI based on toxicity values	Yes
PGDN	Groundwater	Not detected in the RI; only one trace detection below screening levels during the SRI	No
Benzo(g,h,i)perylene	Surface Soil	SRI data are within the RI data range	No

Constituent (Shaded on Table 4-10)	Media	Data Evaluation	Retained as a new COPC?
Beryllium	Surface Soil	SRI data are within the RI data range	No
Beryllium	Subsurface Soil	SRI data are within the RI data range	No

Concentrations of 1,1,2-TCA, cis-1,2-DCE, and isopropylbenzene measured in groundwater and benzo(g,h,i)perylene and beryllium measured in soil during the SRI fall within the ranges previously detected in the RI for the respective media. Concentrations of 1.1.1-TCA and 1.1-DCE measured in groundwater during the SRI are greater than previously detected in the RI.

Constituent	Media	RI Data Range	SRI Data Range
1,1,1-Trichloroethane	Groundwater	0.4 – 4 µg/L	0.29 – 440 µg/L
1,1,2-Trichloroethane	Groundwater	0.3 µg/L (one detection)	0.48 µg/L (one detection)
1,1-DCE	Groundwater	0.5 – 7 µg/L	0.45 – 52 µg/L
cis-1,2-DCE	Groundwater	0.3 – 26 µg/L	0..37 – 26 µg/L
Isopropylbenzene	Groundwater	0.5 – 94 µg/L	0.51 – 1.3 µg/L
Benzo(g,h,i)perylene	Surface Soil	3 – 7,400 µg/kg	13 – 1,350 µg/kg
Beryllium	Surface Soil	0.21 – 0.74 µg/kg	0.205 – 0.43 µg/kg
Beryllium	Subsurface Soil	0.2 – 2.5 µg/kg	0.3 – 0.6 µg/kg

No further risk evaluation is needed for 1,1,2-TCA, cis-1,2-DCE, ~~and~~ isopropylbenzene, benzo(g,h,i)perylene, and beryllium given that these constituents have been previously evaluated in the RI at the same (or higher) concentrations and were screened out of the risk assessment. 1,4-dioxane is of new interest because it is a contaminant with high toxicity, high solubility, high mobility, and was detected in several SRI groundwater samples exceeding the newly published RSL of 0.67 µg/L. Similarly, 1,1,1-TCA and 1,1-DCE will be retained as COPCs because analytical results from the SRI show that the maximum concentration of each of these compounds are higher than those detected in the RI and exceed MCLs.

6.5 REFINEMENT OF COPCS

Because COCs were directly from the standardized risk calculation performed in the RI, there has been only limited consideration up to this point regarding presence in background or reference data, frequency of detection, presence of the constituents above target risk levels, and representativeness of the CERCLA-release contaminants that are related to the site. As a step prior to development of PRGs, the COPCs were reviewed using the RI and SRI data and background data, as well as consideration of naturally occurring elements and an evaluation of contaminants related to CERCLA releases. The purpose of this review is to determine which COPCs were appropriate to forward as COCs to the FS for PRG development.

In this COPC refinement process, the COPCs identified in the RI were compared to (1) the target risk values calculated from the risk assessment, and (2) to an appropriate background concentration (although no background data have been identified for groundwater). The representative site concentration was selected as the 95 percent upper confidence limit (95% UCL) of the available data set which includes both the RI and the SRI data.

Tables 6-1 through 6-5 present a refinement of COPCs and selection of CERCLA COCs that are recommended to be carried forward for development of PRGs in the FS. These tables are presented by media and receptor. The refinement step uses maximum and representative site values (e.g., 95% UCL), and compares those values to target risk levels (determined by calculation in the RI) and background concentrations documented previously.

Based on the refinement step, Table 6-6 summarizes the COCs to be carried forward to the FS for PRG development. By developing PRGs for the COCs selected, a Remedial Action can be designed and implemented directed at site-related CERCLA COCs for Site 08.

For surface water, no further COPC refinement was required. There were no identified risks associated with surface water and there were no COPCs identified in the RI.

In groundwater, arsenic and manganese area retained as COCs; however, they are associated with a “secondary release” at Site 08. Naturally-occurring arsenic and manganese in Site soil was likely mobilized to groundwater due to the reducing conditions resulting from the primary release of contaminants to the subsurface.

Chromium also is being retained as a groundwater COC at this time. As a conservative measure for risk evaluation, all the chromium was assumed to be present as hexavalent chromium (Cr^{6+}) rather than as the less toxic form, trivalent chromium (Cr^{3+}). Additional sampling may be conducted in the future to determine the actual speciation of chromium at Site 08. The risk evaluation would then be updated accordingly to determine whether chromium should be retained as a groundwater COC (i.e., likely would not be a groundwater COC if predominantly present as trivalent chromium).

In sediment, arsenic and benzo(a)pyrene were identified as human health COPCs but were not retained as COCs for the FS. The concentrations of arsenic and benzo(a)pyrene in sediment are within the range of background concentrations (Table 6-3). Also, the risks estimated in the HHRA for lifelong recreational users exposed to benzo(a)pyrene and arsenic in sediment are comparable to risks associated with background levels of these chemicals. The ILCRs estimated in the HHRA for lifetime recreational users

were $1x10^{-5}$ for benzo(a)pyrene and $5x10^{-6}$ for arsenic. The ILCRs for lifetime recreational users exposed to background concentrations of benzo(a)pyrene would be $2x10^{-5}$ based on the maximum concentration and $9x10^{-6}$ based on the average concentration. The ILCRs for lifetime recreational users exposed to background concentrations of arsenic would be $1x10^{-5}$ based on the maximum concentration and $6x10^{-6}$ based on the average concentration. The ILCRs from arsenic and benzo(a)pyrene in sediment at this site are similar to background ILCRs for these constituents; therefore, arsenic and benzo(a)pyrene can be eliminated as sediment COCs for human health.

TABLE 4-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

CAS Number	Chemical	Minimum Concentration(1)	Maximum Concentration(1)	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects(2)	Site Concentration Used for Screening(3)	Range of Background Concentrations(4)	EPA RSL Residential Soil(5)	RIDEM Residential Direct Exposure Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organic Compounds													
71-55-6	1,1,1-Trichloroethane	1.8 J	1.8 J	ug/kg	B179-SB1-0001-AVG	1/4	2.4 - 2.9	1.8	NA	870,000 N	540,000	No	BSL
78-93-3	2-Butanone	5.8 J	17.5 J	ug/kg	B179-SB1-0001-AVG	4/6	12	17.5	NA	2,800,000 N	10,000,000	No	BSL
591-78-6	2-Hexanone	15 J	15 J	ug/kg	127B-S-1-070910-0-2	1/6	12 - 14.5	15	NA	21,000 N	NA	No	BSL
67-64-1	Acetone	98 J	250 J	ug/kg	B179-SB1-0001-AVG	3/6	38 - 74	250	NA	6,100,000 N	7,800,000	No	BSL
67-66-3	Chloroform	0.96 J	0.96 J	ug/kg	B179-SB1-0001-AVG	1/4	2.4 - 2.9	0.96	NA	290 C	1,200	No	BSL
79-01-6	Trichloroethene	1.02 J	1.02 J	ug/kg	B179-SB1-0001-AVG	1/4	2.4 - 2.9	1.02	NA	2,800 C	13,000	No	BSL
Semivolatile Organic Compounds													
92-52-4	1,1-Biphenyl	140 J	140 J	ug/kg	B179-SB1-0001-AVG	1/3	245 - 280	140	NA	390,000 N	800	No	BSL
91-57-6	2-Methylnaphthalene	5.45 J	350 J	ug/kg	B179-SB1-0001-AVG	2/3	12	350	NA	31,000 N	123,000	No	BSL
83-32-9	Acenaphthene	6.5 J	900 J	ug/kg	B179-SB1-0001-AVG	4/5	12	900	NA	340,000 N	43,000	No	BSL
208-96-8	Acenaphthylene	8.8 J	8.8 J	ug/kg	B179-SB3-0001-NOV2010	1/2	12	8.8	NA	340,000 N(8)	23,000	No	BSL
120-12-7	Anthracene	3.2 J	1,550	ug/kg	B179-SB1-0001-AVG	5/5	- - -	1,550	NA	1,700,000 N	35,000	No	BSL
56-55-3	**Benzo(a)anthracene**	19 J	3,600 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	3,600	52 - 79	**150 C**	**900**	**Yes**	ASL
50-32-8	**Benzo(a)pyrene**	19 J	2,550 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	2,550	51 - 95	**15 C**	**400**	**Yes**	ASL
205-99-2	**Benzo(b)fluoranthene**	28 J	3,750 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	3,750	51 - 130	**150 C**	**900**	**Yes**	ASL
191-24-2	**Benzo(g,h,i)perylene**	13 J	1,350 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	1,350	55 - 100	170,000 N(9)	**800**	**Yes**	ASL
207-08-9	**Benzo(k)fluoranthene**	9.7 J	1,230	ug/kg	B179-SB1-0001-AVG	5/5	- - -	1,230	52 - 110	1,500 C	**900**	**Yes**	ASL
117-81-7	Bis(2-ethylhexyl)phthalate	130 J	150 J	ug/kg	B179-SB1-0001-AVG	2/3	280 - 280	150	130 - 160	35,000 C	46,000	No	BSL
86-74-8	Carbazole	1,150	1,150	ug/kg	B179-SB1-0001-AVG	1/3	245 - 280	1,150	NA	NA	NA	No	NTX
218-01-9	**Chrysene**	20 J	3,350 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	3,350	54 - 140	15,000 C	**400**	**Yes**	ASL
53-70-3	**Dibenzo(a,h)anthracene**	12 J	445 J	ug/kg	B179-SB1-0001-AVG	3/5	11 - 12	445	NA	**15 C**	**400**	**Yes**	ASL
132-64-9	Dibenzofuran	800	800	ug/kg	B179-SB1-0001-AVG	1/3	245 - 280	800	NA	7,800 N	NA	No	BSL
84-74-2	di-n-Butyl Phthalate	300 J	300 J	ug/kg	B179-SB1-0001-AVG	1/3	245 - 280	300	NA	610,000 N	NA	No	BSL
206-44-0	Fluoranthene	30 J	6,850 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	6,850	56 - 230	230,000 N	20,000	No	BSL
86-73-7	Fluorene	10 J	1,150 J	ug/kg	B179-SB1-0001-AVG	4/5	12	1,150	NA	230,000 N	28,000	No	BSL
193-39-5	**Indeno(1,2,3-cd)pyrene**	14 J	1,800	ug/kg	B179-SB1-0001-AVG	5/5	- - -	1,800	60 - 98	**150 C**	**900**	**Yes**	ASL
91-20-3	Naphthalene	11.8 J	1,400	ug/kg	B179-SB1-0001-AVG	2/3	12	1,400	NA	3,600 C	54,000	No	BSL
85-01-8	Phenanthrene	23 J	8,850 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	8,850	51 - 95	170,000 N(9)	40,000	No	BSL
129-00-0	Pyrene	31 J	6,150 J	ug/kg	B179-SB1-0001-AVG	5/5	- - -	6,150	44 - 190	170,000 N	13,000	No	BSL
50-32-8	**Benzo(a)pyrene Equivalents**	31.417	3,926	ug/kg	B179-SB1-0001-AVG	5/5	- - -	3,926	NA	**15 C**	NA	**Yes**	ASL
Pesticides/PCBs													
72-54-8	4,4'-DDD	3.6 J	3.6 J	ug/kg	B179-SB3-0001-NOV2010	1/2	2 - 2	3.6	NA	2,000 C	NA	No	BSL
72-55-9	4,4'-DDE	0.395 J	3.2 J	ug/kg	B179-SB2-0001-NOV2010	4/5	1.9	3.2	5.4 - 43	1,400 C	NA	No	BSL
50-29-3	4,4'-DDT	0.82 J	1.6 J	ug/kg	B179-SB2-0001-NOV2010	3/5	1.9 - 5.5	1.6	3.6 - 23	1,700 C	NA	No	BSL
60-57-1	Dieldrin	0.72 J	0.72 J	ug/kg	B179-SB3-0001-AVG	1/3	1.75 - 1.9	0.72	13 - 26	30 C	40	No	BSL
1031-07-8	Endosulfan Sulfate	1.35 J	11	ug/kg	B179-SB1-0001-AVG	2/3	1.9	11	NA	37,000 N(10)	NA	No	BSL
58-89-9	gamma-BHC (Lindane)	8.72 J	8.72 J	ug/kg	B179-SB1-0001-AVG	1/3	0.855 - 0.98	8.72	NA	520 C	NA	No	BSL
118-74-1	Hexachlorobenzene	0.57 J	0.57 J	ug/kg	B179-SB3-0001-AVG	1/3	1.75 - 1.9	0.57	NA	300 C	400	No	BSL
Metals													
7429-90-5	**Aluminum**	3,280 J	13,100	mg/kg	B179-SB2-0001-NOV2010	5/5	- - -	13,100	3,520 - 17,900	**7,700 N**	NA	**Yes**	ASL
7440-38-2	**Arsenic**	0.53 J	5 J	mg/kg	B179-SB1-0001-AVG	5/5	- - -	5	0.83 - 71.7	**0.39 C**	7	**Yes**	ASL
7440-39-3	Barium	20.5 J	33.1 J	mg/kg	B179-SB2-0001	5/5	- - -	33.1	6.3 - 61	1,500 N	5,500	No	BSL
7440-41-7	**Beryllium**	0.205 J	0.43 J	mg/kg	B179-SB2-0001-NOV2010	5/5	- - -	0.43	0.12 - 0.79	16 N	**0.4**	**Yes**	ASL

TABLE 4-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

CAS Number	Chemical	Minimum Concentration(1)	Maximum Concentration(1)	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects(2)	Site Concentration Used for Screening(3)	Range of Background Concentrations(4)	EPA RSL Residential Soil(5)	RIDEM Residential Direct Exposure Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
7440-43-9	Cadmium	0.905 J	0.905 J	mg/kg	B179-SB1-0001-AVG	1/3	0.045 - 0.085	0.905	0.068 - 0.53	7 N	39	No	BSL
Metals (Continued)													
7440-70-2	Calcium	766	2,580 J	mg/kg	B179-SB3-0001-AVG	5/5	- - -	2,580	222 - 4,830	NA	NA	No	NUT
7440-47-3	Chromium	3.3	18.7	mg/kg	B179-SB1-0001-AVG	5/5	- - -	18.7	4.8 - 28.2	120,000 N(11)	1,400 (11)	No	BSL
7440-48-4	**Cobalt**	1.9 J	6.65	mg/kg	B179-SB1-0001-AVG	5/5	- - -	6.65	0.85 - 13.8	**2.3 N**	NA	**Yes**	ASL
7440-50-8	Copper	2.6	18.8	mg/kg	B179-SB1-0001-AVG	5/5	- - -	18.8	1.6 - 20.3	310 N	3,100	No	BSL
7439-89-6	**Iron**	6,990	16,600	mg/kg	B179-SB1-0001-AVG	5/5	- - -	16,600	5,940 - 63,300	**5,500 N**	NA	**Yes**	ASL
7439-92-1	Lead	3.2	42.3	mg/kg	B179-SB1-0001-AVG	5/5	- - -	42.3	2.6 - 49.5	400	150	No	BSL
7439-95-4	Magnesium	1,380 J	2,470	mg/kg	B179-SB3-0001-NOV2010	5/5	- - -	2,470	555 - 2,930	NA	NA	No	NUT
7439-96-5	**Manganese**	142	324	mg/kg	B179-SB1-0001-AVG	5/5	- - -	324	27.9 - 615	**180 N**	390	**Yes**	ASL
7439-97-6	Mercury	0.02 J	1.25	mg/kg	B179-SB1-0001-AVG	3/5	0.016 - 0.017	1.25	0.016 - 0.68	2.3 N(12)	23	No	BSL
7439-98-7	Molybdenum	0.21 J	1.12 J	mg/kg	B179-SB1-0001-AVG	3/5	0.65 - 0.72	1.12	NA	39 N	NA	No	BSL
7440-02-0	Nickel	2 J	14.9	mg/kg	B179-SB1-0001-AVG	5/5	- - -	14.9	2.8 - 19.1	150 N	1,000	No	BSL
7440-09-7	Potassium	418 J	1,510 J	mg/kg	B179-SB2-0001	5/5	- - -	1,510	216 - 877	NA	NA	No	NUT
7782-49-2	Selenium	0.38 J	0.38 J	mg/kg	B179-SB2-0001-NOV2010	1/2	0.69	0.38	0.18 - 0.89	39 N	390	No	BSL
7440-22-4	Silver	0.27 J	5.1	mg/kg	B179-SB2-0001-NOV2010	4/5	0.4	5.1	NA	39 N	200	No	BSL
7440-23-5	Sodium	47.5 J	254	mg/kg	B179-SB1-0001-AVG	5/5	- - -	254	0.18 - 0.89	NA	NA	No	NUT
7440-28-0	Thallium	0.05 J	0.1 J	mg/kg	B179-SB2-0001	5/5	- - -	0.1	62.3 - 349	NA	5.5	No	BSL
7440-62-2	Vanadium	5.6	21.2	mg/kg	B179-SB2-0001-NOV2010	5/5	- - -	21.2	5.2 - 42.6	39 N	550	No	BSL
7440-66-6	Zinc	25.5	102	mg/kg	B179-SB1-0001-AVG	5/5	- - -	102	10.5 - 93.7	2,300 N	6,000	No	BSL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - Background Study Report for Naval Station Newport (Tetra Tech, 2008)
5 - EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, May 2010. The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).
6 - Rhode Island Department of Environmental Management (RIDEM), DEM-DSR-01-93, February 2004.
7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
8 - Value is for acenaphthene.
9 - Value is for pyrene.
10 - Value is for Endosulfan.
11 - Value is for trivalent chromium.
12 - Value is for mercury, inorganic salts
Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

B179-SB1-0001-AVG	127B-S-1-070910-0-2
B179-SB2-0001	B179-SB2-0001-NOV2010
B179-SB3-0001-AVG	B179-SB3-0001-NOV2010

Definitions:
C = Carcinogen
CAS = Chemical Abstracts Service
COPC = Chemical Of Potential Concern
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available

Rationale Codes:
For selection as a COPC:
ASL = Above Screening Level.

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

TABLE 4-4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	Range of Background Concentrations[4]	EPA RSL Residential Soil[5]	RIDEM Residential Direct Exposure Criteria[6]	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
Volatile Organic Compounds													
71-55-6	1,1,1-Trichloroethane	0.45 J	1.5 J	ug/kg	B179-SB3-0709	4/18	2 - 3	1.5	NA	870,000 N	540,000	No	BSL
75-34-3	1,1-Dichloroethane	3.4 J	3.4 J	ug/kg	B179-SB3-0709	1/16	2 - 3	3.4	NA	3,300 C	920,000	No	BSL
95-63-6	1,2,4-Trimethylbenzene	1.1 J	4.2 J	ug/kg	B179-SB1-0507	2/18	2 - 3	4.2	NA	6,200 N	NA	No	BSL
78-93-3	2-Butanone	8.5 J	15 J	ug/kg	B185A1-SB4-0103	3/18	9.9 - 15	15	NA	2,800,000 N	10,000,000	No	BSL
67-64-1	Acetone	200	200	ug/kg	B185A1-SB4-0103	2/18	12 - 73	200	NA	6,100,000 N	7,800,000	No	BSL
75-15-0	Carbon Disulfide	3.3 J	5.6 J	ug/kg	B179-SB1-0507	3/18	2 - 3	5.6	NA	82,000 N	NA	No	BSL
156-59-2	cis-1,2-Dichloroethene	6.4	6.4	ug/kg	B185A1-SB2-0103	1/18	2 - 3	6.4	NA	78,000 N	630,000	No	BSL
100-41-4	Ethylbenzene	0.76 J	0.76 J	ug/kg	B179-SB1-0507	1/18	2 - 3	0.76	NA	5,400 C	71,000	No	BSL
98-82-8	Isopropylbenzene	1.6 J	4.5 J	ug/kg	B179-SB1-0507	2/18	2 - 3	4.5	NA	210,000 N	27,000	No	BSL
68411-44-9	N-Butylbenzene	1.4 J	3.3 J	ug/kg	B185A1-SB1-0708	2/18	2 - 3	3.3	NA	NA	NA	No	NTX
103-65-1	N-Propylbenzene	2.2 J	2.2 J	ug/kg	B179-SB1-0507, B185A1-SB1-0708	2/18	2 - 3	2.2	NA	340,000 N	NA	No	BSL
135-98-8	sec-Butylbenzene	1 J	13 J	ug/kg	B179-SB1-0507	3/18	2 - 3	13	NA	NA	NA	No	NTX
98-06-6	Tert-Butylbenzene	2.2 J	2.2 J	ug/kg	B179-SB1-0507	1/18	2 - 3	2.2	NA	NA	NA	No	NTX
127-18-4	Tetrachloroethene	7.4	7.4	ug/kg	B185A1-SB4-0507	1/18	2 - 3	7.4	NA	550 C	12,000	No	BSL
540-59-0	Total 1,2-Dichloroethene	15.7	15.7	ug/kg	B185A1-SB2-0103	1/18	2 - 3	15.7	NA	70,000 N	NA	No	BSL
156-60-5	trans-1,2-Dichloroethene	9.3	9.3	ug/kg	B185A1-SB2-0103	1/18	2 - 3	9.3	NA	15,000 N	1,100,000	No	BSL
79-01-6	Trichloroethene	0.75 J	7.3	ug/kg	B185A1-SB2-0103	5/18	2 - 3	7.3	NA	2,800 C	13,000	No	BSL
75-01-4	Vinyl Chloride	2.8 J	2.8 J	ug/kg	B185A1-SB2-0103	1/18	4 - 6	2.8	NA	60 C	20	No	BSL
Semivolatile Organic Compounds													
91-57-6	2-Methylnaphthalene	2.5 J	6.3 J	ug/kg	B185A1-SB2-0103	4/15	11 - 13	6.3	NA	31,000 N	123,000	No	BSL
88-74-4	2-Nitroaniline	120 J	120 J	ug/kg	B185A1-SB2-0103	1/15	640 - 790	120	NA	61,000 N	NA	No	BSL
83-32-9	Acenaphthene	2.2 J	30 J	ug/kg	B185A1-SB4-0103	10/15	11 - 12	30	NA	340,000 N	43,000	No	BSL
208-96-8	Acenaphthylene	1.8 J	2.8 J	ug/kg	B185A1-SB4-0103	4/15	10 - 12	2.8	NA	340,000 N[8]	23,000	No	BSL
120-12-7	Anthracene	2.4 J	39 J	ug/kg	B185A1-SB4-0103	11/15	11 - 12	39	NA	1,700,000 N	35,000	No	BSL
56-55-3	**Benzo(a)anthracene**	5.2 J	160 J	ug/kg	B185A1-SB4-0103	13/15	11	160	NA	**150 C**	900	**Yes**	ASL
50-32-8	**Benzo(a)pyrene**	4.9 J	140 J	ug/kg	B185A1-SB4-0103	13/15	11	140	NA	**15 C**	400	**Yes**	ASL
205-99-2	**Benzo(b)fluoranthene**	17 J	220 J	ug/kg	B185A1-SB4-0103	11/15	9 - 11	220	NA	**150 C**	900	**Yes**	ASL
191-24-2	Benzo(g,h,i)perylene	3.2 J	92 J	ug/kg	B185A1-SB4-0103	13/15	11	92	NA	170,000 N[9]	800	No	BSL
207-08-9	Benzo(k)fluoranthene	3.4 J	65 J	ug/kg	B185A1-SB4-0103	13/15	11	65	NA	1,500 C	900	No	BSL
117-81-7	Bis(2-ethylhexyl)phthalate	230 J	230 J	ug/kg	B179-SB2-0709	1/13	260 - 320	230	NA	35,000 C	46,000	No	BSL
218-01-9	Chrysene	6.6 J	180 J	ug/kg	B185A1-SB4-0103	13/15	11	180	NA	15,000 C	400	No	BSL
53-70-3	**Dibenzo(a,h)anthracene**	2.3 J	23 J	ug/kg	B185A1-SB4-0103	8/15	10 - 12	23	NA	**15 C**	400	**Yes**	ASL
206-44-0	Fluoranthene	3.7 J	400	ug/kg	B185A1-SB4-0103	14/15	11	400	NA	230,000 N	20,000	No	BSL
86-73-7	Fluorene	4.7 J	44 J	ug/kg	B185A1-SB4-0103	8/15	11 - 12	44	NA	230,000 N	28,000	No	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	4.7 J	130 J	ug/kg	B185A1-SB4-0103	13/15	11	130	NA	150 C	900	No	BSL
91-20-3	Naphthalene	4.3 J	6.4 J	ug/kg	B185A1-SB2-0103	2/15	10 - 13	6.4	NA	3,600 C	54,000	No	BSL
85-01-8	Phenanthrene	2.7 J	510	ug/kg	B185A1-SB4-0103	13/15	11 - 12	510	NA	170,000 N[9]	40,000	No	BSL
129-00-0	Pyrene	5.1 J	380	ug/kg	B185A1-SB4-0103	14/15	11	380	NA	170,000 N	13,000	No	BSL
50-32-8	**Benzo(a)pyrene Equivalents**	11.9	215	ug/kg	B185A1-SB4-0103	13/15	11	215	NA	**15 C**	NA	**Yes**	ASL

TABLE 4-4
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Pesticides/PCBs													
72-54-8	4,4'-DDD	0.81 J	3.2 J	ug/kg	B179-SB1-0507	3/15	1.7 - 2	3.2	NA	2,000 C	NA	No	BSL
72-55-9	4,4'-DDE	0.37 J	1.5 J	ug/kg	B179-SB1-0507	4/15	1.7 - 2	1.5	NA	1,400 C	NA	No	BSL
50-29-3	4,4'-DDT	0.68 J	0.9 J	ug/kg	B185A1-SB3-0103	2/15	1.7 - 2	0.9	NA	1,700 C	NA	No	BSL
319-86-8	delta-BHC	0.72 J	0.84 J	ug/kg	B185A1-SB4-0103	2/15	0.9 - 1.04	0.84	NA	77 C[10]	NA	No	BSL
60-57-1	Dieldrin	0.52 J	0.52 J	ug/kg	B179-SB1-0507	1/15	1.7 - 2	0.52	NA	30 C	40	No	BSL
959-98-8	Endosulfan I	1 J	1 J	ug/kg	B185A1-SB4-0507	1/15	0.9 - 1.04	1	NA	37,000 N[11]	NA	No	BSL
33213-65-9	Endosulfan II	0.84 J	0.84 J	ug/kg	B179-SB1-0507	1/15	1.7 - 2	0.84	NA	37,000 N[11]	NA	No	BSL
53494-70-5	Endrin Ketone	0.56 J	1.8 J	ug/kg	B185A1-SB3-0305	2/15	1.7 - 2	1.8	NA	1,800 N[12]	NA	No	BSL
5103-74-2	gamma-Chlordane	0.35 J	0.35 J	ug/kg	B185A1-SB1-0708	1/15	0.9 - 1.04	0.35	NA	1,600 C[13]	0.5 [13]	No	BSL
76-44-8	Heptachlor	0.49 J	0.49 J	ug/kg	B185A1-SB1-0708	1/15	0.9 - 1.04	0.49	NA	110 C	NA	No	BSL
118-74-1	Hexachlorobenzene	1.5 J	1.5 J	ug/kg	B185A1-SB4-0507	1/13	1.7 - 2	1.5	NA	300 C	400	No	BSL
Energetics													
6423-43-4	1,2-Propylene Glycol Dinitrate	260	420	ug/kg	B185A1-SB2-0103	2/13	100	420	NA	5,700 N	NA	No	BSL
Metals													
7429-90-5	**Aluminum**	8,230 J	21,000	mg/kg	B185A1-SB1-0708	15/15	- - -	21,000	5,520 - 15,000	**7,700 N**	NA	**Yes**	ASL
7440-38-2	**Arsenic**	2.8 J	27.3	mg/kg	B185A1-SB3-0103	15/15	- - -	27.3	1.9 - 49.4	**0.39 C**	**7**	**Yes**	ASL
7440-39-3	Barium	12.5 J	43.1	mg/kg	B185A1-SB4-0507	15/15	- - -	43.1	13.6 - 45.5	1,500 N	5,500	No	BSL
7440-41-7	**Beryllium**	0.3 J	0.6 J	mg/kg	B185A1-SB4-0507	15/15	- - -	0.6	0.28 - 0.78	16 N	**0.4**	**Yes**	ASL
7440-70-2	Calcium	630 J	2,120	mg/kg	B185A1-SB1-0708	15/15	- - -	2,120	314 - 1,870	NA	NA	No	NUT
7440-47-3	Chromium	7.9	23.5	mg/kg	B185A1-SB1-0708	15/15	- - -	23.5	6.2 - 21.3	120,000 N[14]	1,400 [14]	No	BSL
7440-48-4	**Cobalt**	4.2	23.8	mg/kg	B185A1-SB1-0708	15/15	- - -	23.8	4.6 - 19.9	**2.3 N**	NA	**Yes**	ASL
7440-50-8	Copper	3.4	26.5	mg/kg	B179-SB3-0709	15/15	- - -	26.5	6.1 - 43.7	310 N	3,100	No	BSL
7439-89-6	**Iron**	13,300	40,700	mg/kg	B185A1-SB1-0708	15/15	- - -	40,700	10,600 - 57,100	**5,500 N**	NA	**Yes**	ASL
7439-92-1	Lead	7	16.7	mg/kg	B185A1-SB1-0708	15/15	- - -	16.7	5.2 - 15.4	400	150	No	BSL
7439-95-4	Magnesium	1,660 J	7,750	mg/kg	B185A1-SB1-0708	15/15	- - -	7,750	1,880 - 4,580	NA	NA	No	NUT
7439-96-5	**Manganese**	154	1,100	mg/kg	B185A1-SB4-0507	15/15	- - -	1,100	157 - 1,750	**180 N**	**390**	**Yes**	ASL
7439-97-6	Mercury	0.008 J	0.03 J	mg/kg	B185A3-SB1-0103	9/15	0.017 - 0.021	0.03	0.013 - 0.023	2.3 N[15]	23	No	BSL
7439-98-7	Molybdenum	0.23 J	1.5 J	mg/kg	B179-SB2-0709	3/15	0.22 - 1.7	1.5	NA	39 N	NA	No	BSL
7440-02-0	Nickel	8	38.2	mg/kg	B185A1-SB1-0708	15/15	- - -	38.2	7.6 - 37.1	150 N	1,000	No	BSL
7440-09-7	Potassium	292 J	1,200 J	mg/kg	B179-SB2-0709	15/15	- - -	1,200	288 - 2,440	NA	NA	No	NUT
7782-49-2	Selenium	0.35 J	1.9 J	mg/kg	B179-SB3-0709	12/15	0.67 - 1.5	1.9	0.2225 - 0.71	39 N	390	No	BSL
7440-22-4	Silver	0.08 J	0.69 J	mg/kg	B185A1-SB4-0507	12/15	0.31 - 0.83	0.69	NA	39 N	200	No	BSL
7440-23-5	Sodium	42.5 J	172	mg/kg	B179-SB1-0507	11/15	39.1 - 52	172	54.1 - 107	NA	NA	No	NUT
7440-28-0	Thallium	0.01 J	0.1 J	mg/kg	B185A1-SB4-0507	15/15	- - -	0.1	NA	NA	5.5	No	BSL
7440-62-2	Vanadium	12.5	23.4	mg/kg	B185A1-SB4-0103	15/15	- - -	23.4	8.6 - 28.5	39 N	550	No	BSL
7440-66-6	Zinc	27.9	81.9	mg/kg	B185A1-SB1-0708	15/15	- - -	81.9	18.7 - 76.2	2,300 N	6,000	No	BSL

TABLE 4-4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
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NAVAL STATION NEWPORT, RHODE ISLAND

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Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - Background Study Report for Naval Station Newport (Tetra Tech, 2008)
5 - EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, May 2010. The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).
6 - Rhode Island Department of Environmental Management (RIDEM), DEM-DSR-01-93, February 2004.
7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
8 - Value is for acenaphthene.
9 - Value is for pyrene.
10 - Value is for alpha-BHC.
11 - Value is for Endosulfan.
12 - Value is for Endrin.
13 - Value is for chlordane.
14 - Value is for trivalent chromium.
15 - Value is for mercury, inorganic salts.
Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples
B179-SB1-0507
B179-SB2-0709
B179-SB3-0709
B185A1-SB1-0103
B185A1-SB1-0708
B185A1-SB2-0103
B185A1-SB2-0305
B185A1-SB3-0103
B185A1-SB3-0305
B185A1-SB4-0103
B185A1-SB4-0507
B185A3-SB1-0103
B185A3-SB1-0305
127B-S-3-070910-4-6
128B-071210-2-4
128B-071210-4-6
B179-SB2-0204-AVG
B179-SB3-0406

Definitions:
C = Carcinogen
CAS = Chemical Abstracts Service
COPC = Chemical Of Potential Concern
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available

Rationale Codes:
For selection as a COPC:
ASL = Above Screening Level.

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

TABLE 4-5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER (OVERBURDEN-BEDROCK INTERFACE)
SITE 08, NUSC DISPOSAL AREA
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Volatile Organic Compounds														
71-55-6	**1,1,1-Trichloroethane**	440	440	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	440	NA	910 N	**200** 200	**EPA-MCL** RIDEM	**Yes**	ASL
75-34-3	**1,1-Dichloroethane**	0.84 J	1,000	ug/L	DA-MW7A-062310	2/7	0.5 - 0.5	1,000	NA	**2.4 C**	NA NA	NA NA	**Yes**	ASL
75-35-4	**1,1-Dichloroethene**	11 J	11 J	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	11	NA	34 N	**7** 7	**EPA-MCL** RIDEM	**Yes**	ASL
95-63-6	1,2,4-Trimethylbenzene	0.51 J	0.51 J	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	0.51	NA	1.5 N	NA NA	NA NA	No	BSL
67-64-1	Acetone	9.6	11	ug/L	DA-MW6A-062310	2/7	2.5 - 2.5	11	NA	2,200 N	NA NA	NA NA	No	BSL
75-00-3	Chloroethane	1,000	1,000	ug/L	DA-MW7A-062310	1/7	1 - 1	1,000	NA	2,100 N	NA NA	NA NA	No	BSL
74-87-3	Chloromethane	0.37 J	0.37 J	ug/L	DA-MW-08A-062910	1/7	1 - 1	0.37	NA	19 N	NA NA	NA NA	No	BSL
156-59-2	cis-1,2-Dichloroethene	0.23 J	2.2	ug/L	DA-MW7A-062310	3/7	0.5 - 0.5	2.2	NA	37 N	70 70	EPA-MCL RIDEM	No	BSL
98-82-8	Isopropylbenzene	1.3	1.3	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	1.3	NA	68 N	NA NA	NA NA	No	BSL
95-47-6	o-Xylene	0.34 J	0.34 J	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	0.34	NA	120 N	NA NA	NA NA	No	BSL
135-98-8	sec-Butylbenzene	0.89 J	0.89 J	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	0.89	NA	NA	NA NA	NA NA	No	NTX
98-06-6	tert-Butylbenzene	0.34 J	0.34 J	ug/L	DA-MW7A-062310	1/7	0.5 - 0.5	0.34	NA	NA	NA NA	NA NA	No	NTX
127-18-4	**Tetrachloroethene**	0.58 J	8.3	ug/L	DA-MW7A-062310	3/7	0.5 - 0.5	8.3	NA	**0.11 C**	**5** 5	**EPA-MCL** RIDEM	**Yes**	ASL
540-59-0	Total 1,2-Dichloroethene	0.23 J	2.2	ug/L	DA-MW7A-062310	3/7	0.5 - 0.5	2.2	NA	33 N	NA NA	NA NA	No	BSL
1330-20-7	Total Xylenes	0.34 J	0.34 J	ug/L	DA-MW7A-062310	1/7	0.75 - 0.75	0.34	NA	20 N	10,000 10,000	EPA-MCL RIDEM	No	BSL
79-01-6	**Trichloroethene**	0.57 J	3.9	ug/L	DA-MW7A-062310	3/7	0.5 - 0.5	3.9	NA	**2 C**	5 5	EPA-MCL RIDEM	**Yes**	ASL
Volatile Gases														
74-84-0	Ethane	0.88 J	0.88 J	ug/L	GW-B185A3-SB1	1/4	2 - 2	0.88	NA	NA	NA	NA	No	NTX
74-85-1	Ethene	0.76 J	0.76 J	ug/L	GW-B185A3-SB1	1/4	2 - 2	0.76	NA	NA	NA	NA	No	NTX
74-82-8	Methane	3.2 J	160 J	ug/L	DA-MW7A-062310	4/4	-	160	NA	NA	NA	NA	No	NTX
Energetics														
6423-43-4	**1,2-Propylene Glycol Dinitrate**	0.11 J	0.11 J	ug/L	GW-B185A3-SB1	1/5	0.1 - 0.1	0.11	NA	**0.057 N**	NA	NA	**Yes**	ASL
Miscellaneous Parameters														
7664-41-7	Ammonia-N	0.039 J	2.4	mg/L	DA-MW7A-062310	3/4	0.05 - 0.05	2.4	NA	NA	NA	NA	No	NTX
14797-55-8	Nitrate-N	0.0192 J	3.4	mg/L	DA-MW-12-063010	3/4	0.025 - 0.025	3.4	NA	5.8 N	10	EPA-MCL	No	BSL
14797-65-0	Nitrite-N	0.14	0.14	mg/L	GW-B185A3-SB1	1/4	0.025 - 0.025	0.14	NA	0.37 N	1	EPA-MCL	No	BSL
--	Orthophosphate-P	0.068 J	0.068 J	mg/L	GW-B185A3-SB1	1/4	0.05 - 0.05	0.068	NA	NA	NA	NA	No	NTX

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NAVAL STATION NEWPORT, RHODE ISLAND

CAS Number	Chemical	Minimum Concentration(1)	Maximum Concentration(1)	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects(2)	Concentration Used for Screening(3)	Range of Background Concentrations(4)	EPA RSL Tap Water(5)	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(6)
14808-79-8	Sulfate	9	23	mg/L	DA-MW-12-063010	4/4	-	23	NA	NA	NA	NA	No	NTX
18496-25-8	Sulfide	0.73 J	1	mg/L	DA-MW7A-062310	2/4	0.8 - 0.8	1	NA	NA	NA	NA	No	NTX
--	Total Organic Carbon	1	10	mg/L	DA-MW7A-062310	4/4	-	10	NA	NA	NA	NA	No	NTX

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - Background samples were not collected for the SRI.
5 - EPA Regional Screening Level (RSL). The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) and were not adjusted, May 2010.
6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples
GW-B185A3-SB1
DA-DW-15-0610
DA-DW-16-0610
DA-MW6A-062310
DA-MW7A-062310
DA-MW-08A-062910
DA-MW-11-062910-AVG
DA-MW-12-063010
DA-MW-122-063010

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
C = Carcinogen
CAS = Chemical Abstracts Service
COPC = Chemical Of Potential Concern
EPA-MCL = US Environmental Protection Agency Maximum Contaminant Level (EPA, 2009)
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available

Rationale Codes:
For selection as a COPC:
ASL = Above Screening Level/ARAR/TBC

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

TABLE 4-7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER (BEDROCK)
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND
PAGE 1 OF 2

CAS Number	Chemical	Minimum Concentration[1]	Maximum Concentration[1]	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects[2]	Concentration Used for Screening[3]	Range of Background Concentrations[4]	EPA RSL Tap Water[5]	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection[7]
Volatile Organic Compounds														
71-55-6	**1,1,1-Trichloroethane**	0.29 J	290	ug/L	DA-MW7B-062210	11/21	0.5 - 0.5	290	NA	910 N	**200** 200	**EPA-MCL** RIDEM	**Yes**	ASL
79-00-5	**1,1,2-Trichloroethane**	0.48 J	0.48 J	ug/L	DA-GW-MW128B-080910	1/21	0.5 - 0.5	0.48	NA	**0.24 C**	5 5	EPA-MCL RIDEM	**Yes**	ASL
75-34-3	**1,1-Dichloroethane**	0.28 J	510	ug/L	DA-MW101B-062310	13/21	0.5 - 0.5	510	NA	**2.4 C**	NA NA	NA NA	**Yes**	ASL
75-35-4	**1,1-Dichloroethene**	0.45 J	52 J	ug/L	DA-MW101B-062310	14/21	0.5 - 0.5	52	NA	**34 N**	**7** 7	**EPA-MCL** RIDEM	**Yes**	ASL
95-63-6	**1,2,4-Trimethylbenzene**	3.6	3.6	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	3.6	NA	**1.5 N**	NA NA	NA NA	**Yes**	ASL
108-67-8	1,3,5-Trimethylbenzene	0.66 J	0.66 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.66	NA	37 N	NA NA	NA NA	No	BSL
67-64-1	Acetone	3.6 J	5.2	ug/L	DA-MW7B-062210	2/21	2.5 - 27	5.2	NA	2,200 N	NA NA	NA NA	No	BSL
56-23-5	**Carbon Tetrachloride**	1.85	1.85	ug/L	DA-MW-03B-062810-AVG	1/21	0.5 - 0.5	1.85	NA	**0.44 C**	5 5	EPA-MCL RIDEM	**Yes**	ASL
75-00-3	Chloroethane	1.9 J	94	ug/L	DA-MW101B-062310	4/21	1 - 1	94	NA	2,100 N	NA NA	NA NA	No	BSL
156-59-2	cis-1,2-Dichloroethene	0.37 J	26	ug/L	DA-GW-MW128B-080910	14/21	0.5 - 0.5	26	NA	37 N	70 70	EPA-MCL RIDEM	No	BSL
100-41-4	Ethylbenzene	0.76 J	0.76 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.76	NA	1.5 C	700 700	EPA-MCL RIDEM	No	BSL
98-82-8	Isopropylbenzene	0.51 J	0.51 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.51	NA	68 N	NA NA	NA NA	No	BSL
104-51-8	N-Butylbenzene	0.39 J	0.39 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.39	NA	NA	NA NA	NA NA	No	NTX
103-65-1	N-Propylbenzene	0.9 J	0.9 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.9	NA	130 N	NA NA	NA NA	No	BSL
95-47-6	o-Xylene	0.79 J	0.79 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.79	NA	120 N	NA NA	NA NA	No	BSL
135-98-8	sec-Butylbenzene	0.48 J	0.48 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.48	NA	NA	NA NA	NA NA	No	NTX
127-18-4	**Tetrachloroethene**	0.53 J	2.7	ug/L	DA-MW104B-061810	5/21	0.5 - 0.5	2.7	NA	**0.11 C**	5 5	EPA-MCL RIDEM	**Yes**	ASL
108-88-3	Toluene	0.68 J	0.68 J	ug/L	DA-MW7B-062210	1/21	0.5 - 0.5	0.68	NA	230 N	1,000 1,000	EPA-MCL RIDEM	No	BSL
540-59-0	Total 1,2-Dichloroethene	0.37 J	29.7	ug/L	DA-GW-MW128B-080910	14/21	0.5 - 0.5	29.7	NA	33 N	NA NA	NA NA	No	BSL
1330-20-7	Total Xylenes	0.79 J	0.79 J	ug/L	DA-MW7B-062210	1/21	0.75 - 0.75	0.79	NA	20 N	10,000 10,000	EPA-MCL RIDEM	No	BSL
156-60-5	trans-1,2-Dichloroethene	0.36 J	3.7	ug/L	DA-GW-MW128B-080910	2/21	0.5 - 0.5	3.7	NA	11 N	100 100	EPA-MCL RIDEM	No	BSL
79-01-6	**Trichloroethene**	0.37 J	1,200	ug/L	DA-GW-MW128B-080910	16/21	0.5 - 0.5	1,200	NA	**2 C**	**5** 5	**EPA-MCL** RIDEM	**Yes**	ASL

TABLE 4-7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER (BEDROCK)
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND
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CAS Number	Chemical	Minimum Concentration(1)	Maximum Concentration(1)	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects(2)	Concentration Used for Screening(3)	Range of Background Concentrations(4)	EPA RSL Tap Water(5)	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organic Compounds (Continued)														
75-01-4	**Vinyl Chloride**	0.31 J	3.7	ug/L	DA-MW-103B-070110	8/21	1 - 1	3.7	NA	**0.016 C**	**2** 2	**EPA-MCL** RIDEM	**Yes**	ASL
Volatile Gases														
74-84-0	Ethane	3.5 J	3.5 J	ug/L	DA-MW-09B-062910	1/11	2 - 2	3.5	NA	NA	NA NA	NA NA	No	NTX
74-82-8	Methane	1.4 J	6,000 J	ug/L	DA-MW-09B-062910	11/11	-	6,000	NA	NA	NA NA	NA NA	No	NTX
Semivolatile Organic Compounds														
123-91-1	**1,4-Dioxane**	0.054 J	8.3	ug/L	DA-MW-09B-062910	9/14	0.104 - 0.55	8.3	NA	**6.1 C**	NA NA	NA NA	**Yes**	ASL
Miscellaneous Parameters														
7664-41-7	Ammonia-N	0.17	4.9	mg/L	DA-MW-09B-062910	2/11	0.05 - 0.05	4.9	NA	NA	NA NA	NA NA	No	NTX
14797-55-8	Nitrate-N	0.018 J	0.695	mg/L	DA-MW-03B-062810-AVG	9/11	0.025 - 0.025	0.695	NA	5.8 N	10 NA	EPA-MCL NA	No	BSL
14808-79-8	Sulfate	1.1	39	mg/L	DA-MW-127B-081010	11/11	-	39	NA	NA	NA NA	NA NA	No	NTX
18496-25-8	Sulfide	0.7 J	2.2	mg/L	DA-MW101B-062310	3/11	0.8 - 0.8	2.2	NA	NA	NA NA	NA NA	No	NTX
--	Total Organic Carbon	0.57 J	2.8	mg/L	DA-MW-09B-062910	11/11	-	2.8	NA	NA	NA NA	NA NA	No	NTX
57-12-5	Cyanide	5.6 J	5.6 J	ug/L	DA-MW-09B-062910	1/5	5 - 5	5.6	NA	73 N	200 200	EPA-MCL RIDEM	No	BSL

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - To determine whether chemical concentrations were within background levels, a statistical analysis was conducted using the site and background datasets.
5 - USEPA Regional Screening Level (RSL). The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag), May 2010.
6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

DA-MW-03B-062810-AVG	DA-MW-103B-070110	DA-MW-118B-D1-081010	DA-MW101B-062310
DA-MW-04B-063010	DA-MW104B-061810	DA-MW-118B-D2-081010	DA-MW-117B-D2-081110
DA-MW6B-061710	DA-MW-105B-062810	DA-MW-127B-081010	DA-MW-13B-063010
DA-MW7B-062210	DA-GW-MW116B-D1-0810	DA-GW-MW128B-080910	
DA-MW8B-062210	DA-GW-MW116B-D2-0810	DA-MW-129B-081010-AVG	
DA-MW-09B-062910	DA-MW-117B-D1-081110	DA-GW-MW130B-080910	

Definitions:
ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
C = Carcinogen
CAS = Chemical Abstracts Service
COPC = Chemical Of Potential Concern
EPA-MCL = US Environmental Protection Agency Maximum Contaminant Level (USEPA, 2009)
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available
RIDEM = Rhode Island Department of Environmental Management GA Groundwater Objective (February, 2004).

Rationale Codes:
For selection as a COPC:
ASL = Above Screening Level/ARAR/TBC

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

TABLE 4-9
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SEDIMENT
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

CAS Number	Chemical	Minimum Concentration(1)	Maximum Concentration(1)	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects(2)	Concentration Used for Screening(3)	Range of Background Concentrations(4)	EPA RSL Residential Soil(5)	RIDEM Residential Direct Exposure Criteria(6)	COPC Flag	Rationale for Contaminant Deletion or Selection(7)
Volatile Organic Compounds													
71-55-6	1,1,1-Trichloroethane	1.6 J	1.6 J	ug/kg	DA-SD-B179-04-0006	1/3	3 - 6.8	1.6	NA	870,000 N	540,000	No	BSL
75-34-3	1,1-Dichloroethane	3.7 J	3.7 J	ug/kg	DA-SD-B179-04-0006	1/3	3 - 6.8	3.7	NA	3,300 C	920,000	No	BSL
67-64-1	Acetone	27 J	120 J	ug/kg	DA-SD-B179-01-081210	2/3	11 - 11	120	NA	6,100,000 N	7,800,000	No	BSL
75-15-0	Carbon Disulfide	14 J	14 J	ug/kg	DA-SD-B179-01-081210	1/3	1.3 - 2.1	14	NA	82,000 N	NA	No	BSL
Semivolatile Organic Compounds													
91-57-6	2-Methylnaphthalene	23.5 J	23.5 J	ug/kg	DA-SD-B179-01-0006-AVG	1/3	12 - 16	23.5	8.25 - 40	31,000 N	123,000	No	BSL
83-32-9	Acenaphthene	12 J	155 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	155	12 - 130	340,000 N	43,000	No	BSL
120-12-7	Anthracene	26	210 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	210	20 - 680	1,700,000 N	35,000	No	BSL
56-55-3	**Benzo(a)anthracene**	71	780	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	780	100 - 1,900	**150 C**	900	**Yes**	ASL
50-32-8	**Benzo(a)pyrene**	69	590 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	590	120 - 2,500	**15 C**	**400**	**Yes**	ASL
205-99-2	**Benzo(b)fluoranthene**	120	845	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	845	210 - 4,300	**150 C**	900	**Yes**	ASL
191-24-2	Benzo(g,h,i)perylene	43	330	ug/kg	DA-SD-B179-02-0006	3/3	-	330	89 - 2,800	170,000 N(8)	800	No	BSL
207-08-9	Benzo(k)fluoranthene	47	235	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	235	62 - 1,700	1,500 C	900	No	BSL
86-74-8	Carbazole	230 J	230 J	ug/kg	DA-SD-B179-01-0006-AVG	1/3	290 - 380	230	60 - 410	NA	NA	No	BSL
218-01-9	**Chrysene**	74	735	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	735	130 - 3,200	15,000 C	**400**	**Yes**	ASL
53-70-3	**Dibenzo(a,h)anthracene**	12 J	81.5	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	81.5	20 - 620	**15 C**	400	**Yes**	ASL
132-64-9	Dibenzofuran	180 J	180 J	ug/kg	DA-SD-B179-01-0006-AVG	1/3	290 - 380	180	230 - 230	7,800 N	NA	No	BSL
206-44-0	Fluoranthene	160	1,800 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	1,800	280 - 4,600	230,000 N	20,000	No	BSL
86-73-7	Fluorene	8.9 J	180 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	180	16 - 250	230,000 N	28,000	No	BSL
193-39-5	**Indeno(1,2,3-cd)pyrene**	60	325	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	325	81 - 2,100	**150 C**	900	**Yes**	ASL
91-20-3	Naphthalene	5.1 J	134 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	134	9.25 - 360	3,600 C	54,000	No	BSL
85-01-8	Phenanthrene	98	1,420 J	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	1,420	100 - 2,900	170,000 N(8)	40,000	No	BSL
129-00-0	Pyrene	140	1,450	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	1,450	190 - 4,600	170,000 N	13,000	No	BSL
--	**Benzo(a)pyrene Equivalents**	94.7	788	ug/kg	DA-SD-B179-01-0006-AVG	3/3	-	788	NA	**15 C**	**400**	**Yes**	ASL
Petroleum Hydrocarbons													
- -	TPH (C09-C36)	34 J	640 J	mg/kg	DA-SD-B179-01-081210	3/3	-	640	NA	NA	**500**	No	NTX

Footnotes:
1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
2 - Values presented are sample-specific quantitation limits.
3 - The maximum detected concentration is used for screening purposes.
4 - No background data is available for sediment.
5 - EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, May 2010. The noncarcinogenic values (denoted with a "N" flag) are the screening level divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag).
6 - Rhode Island Department of Environmental Management (RIDEM), DEM-DSR-01-93, February 2004.
7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
8 - Value is for pyrene.
Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples
DA-SD-B179-02-0006
DA-SD-B179-04-0006
DA-SD-B179-01-081210
DA-SD-B179-02-081210-AVG
DA-SD-B179-04-081210
DA-SD-B179-01-0006-AVG

Definitions:
C = Carcinogen
CAS = Chemical Abstracts Service
COPC = Chemical Of Potential Concern
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available

Rationale Codes:
For selection as a COPC:
ASL = Above Screening Level.

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

TABLE 4-10
CHEMICALS IDENTIFIED AS COPCs FROM THE SRI DATA
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

Parameter	Surface Soil	Subsurface Soil	Groundwater				Surface Water	Sediment
			Overburden-Bedrock Interface		Bedrock			
	Direct Contact	Direct Contact	Direct Contact	Vapor Intrusion	Direct Contact	Vapor Intrusion		
Volatile Organic Compounds								
1,1,1-Trichloroethane			X	X	X			
1,1,2-Trichloroethane					X			
1,1-Dichloroethane			X	X	X	X		
1,1-Dichloroethene			X		X	X		
1,2,4-Trimethylbenzene					X	X		
Carbon Tetrachloride					X	X		
cis-1,2-Dichloroethene						X		
Isopropylbenzene				X				
Tetrachloroethene			X	X	X	X		
Trichloroethene			X	X	X	X		
Vinyl Chloride					X	X		
Semivolatile Organic Compounds								
1,4-Dioxane					X			
Benzo(a)anthracene	X	X						X, B
Benzo(a)pyrene	X	X						X, B
Benzo(b)fluoranthene	X	X						X, B
Benzo(g,h,i)perylene	X							
Benzo(k)fluoranthene	X							
Chrysene	X							X, B
Dibenzo(a,h)anthracene	X	X						X, B
Indeno(1,2,3-cd)pyrene	X							X, B
Benzo(a)pyrene Equivalents	X	X						X
Energetics								
1,2-Propylene Glycol Dinitrate			X					
Metals								
Aluminum	X, B	X						
Arsenic	X, B	X, B						
Beryllium	X, B	X, B						
Cobalt	X, B	X						
Iron	X, B	X, B						
Manganese	X, B	X, B						

Notes:
X - Chemical was retained as a COPC in the SRI evaluation.
B - Concentrations of chemicals are within the range of base-wide background concentrations.
Chemicals which were not identified as COPCs in the RI report are shaded.

TABLE 4-11
COMPARISON OF SURFACE SOIL CONCENTRATIONS
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

Parameter	RI Report[1]				Supplemental RI	
	Exposed Area		Paved Area			
	Range of Detections	Exposure Point Concentration[2]	Range of Detections	Exposure Point Concentration[2]	Range of Detections	Exposure Point Concentration[2]
Semivolatile Organic Compounds (ug/kg)						
Benzo(a)anthracene	15 - 20,000	3,220	2.6 - 5,600	2,690	19 - 3,600	3,600
Benzo(a)pyrene	18 - 17,000	2,440	7.3 - 4,800	2,320	19 - 2,550	2,550
Benzo(b)fluoranthene	24.5 - 15,000	2,550	14 - 5,700	2,750	28 - 3,750	3,750
Benzo(g,h,i)perylene	12 - 7,400	960	3 - 2,000	551	13 - 1,350	1,350
Benzo(k)fluoranthene	13 - 12,000	1,880	6.8 - 3,900	1,100	9.7 - 1,230	1,230
Chrysene	13 - 17,000	2,870	2.8 - 5,700	1,500	20 - 3,350	3,350
Dibenzo(a,h)anthracene	5.4 - 3,500	400	10 - 760	141	12 - 445	445
Indeno(1,2,3-cd)pyrene	15 - 9,200	1,100	8.25 - 2,200	1,120	14 - 1,800	1,800
Metals (mg/kg)						
Aluminum	1,800 - 20,700	12,256	4,100 - 19,500	10,938	3,280 - 13,100	13,100
Arsenic	0.29 - 90	23.9	1.7 - 41	18.6	0.53 - 5	5
Beryllium	0.21 - 0.74	0.434	0.21 - 0.57	0.395	0.205 - 0.43	0.43
Cobalt	0.82 - 218	27.1	2.7 - 28	12.9	1.9 - 6.65	6.65
Iron	5270 - 43,700	27,468	8,540 - 38,900	26,054	6,990 - 16,600	16,600
Manganese	79.8 - 2,020	436	150 - 827	418	142 - 324	324

Notes:
1 - Remedial Investigation for Site 08, NUSC Disposal Area (Tetra Tech 2010a)
2 - The 95% UCL as calculated by EPA's ProUCL was used as the exposure point concentratinon for soil.

TABLE 4-12
COMPARISON OF SUBSURFACE SOIL CONCENTRATIONS
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

Parameter	RI Report[1]				Supplemental RI	
	Exposed Area		Paved Area			
	Range of Detections	Exposure Point Concentration[2]	Range of Detections	Exposure Point Concentration[2]	Range of Detections	Exposure Point Concentration[2]
Semivolatile Organic Compounds (ug/kg)						
Benzo(a)anthracene	3.2 - 1,900,000	302,000	5.4 - 7,700	2,800	5.2 - 160	78.9
Benzo(a)pyrene	6.2 - 1,500,000	243,000	5.6 - 5,700	1,400	4.9 - 140	72.2
Benzo(b)fluoranthene	7.2 - 1,300,000	210,000	12.2 - 6,500	1,590	17 - 220	73.0
Dibenzo(a,h)anthracene	4.5 - 330,000	52,700	6.9 - 700	108	2.3 - 23	10.7
Metals (mg/kg)						
Aluminum	4,450 - 27,200	13,532	3,800 - 20,700	12,570	8,230 - 21,000	13,663
Arsenic	2.7 - 40	17.7	2.25 - 122	35	2.8 - 27.3	15.5
Beryllium	0.21 - 2.5	0.518	0.2 - 0.76	0.47	0.3 - 0.6	0.433
Cobalt	3.4 - 35.6	16.1	5.7 - 21.5	13.5	4.2 - 23.8	13.3
Iron	3,800 - 134,000	41,374	13,000 - 40,000	29,083	13,300 - 40,700	27,442
Manganese	180 - 3,300	835	171 - 2,820	1,100	154 - 1,100	503

Notes:
1 - Remedial Investigation for Site 08, NUSC Disposal Area (Tetra Tech 2010a)
2 - The 95% UCL as calculated by EPA's ProUCL was used as the exposure point concentratinon for soil.

TABLE 4-15
COMPARISON OF SEDIMENT CONCENTRATIONS
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, RHODE ISLAND

Parameter	RI Report[1]		Supplemental RI	
	Range of Detections	Exposure Point Concentration[2]	Range of Detections	Exposure Point Concentration[2]
Semivolatile Organic Compounds (ug/kg)				
Benzo(a)anthracene	16 - 3,400	1,370	71 - 780	780
Benzo(a)pyrene	15 - 2,600	1,130	69 - 590	590
Benzo(b)fluoranthene	27 - 2,300	1,060	120 - 845	845
Chrysene	8.7 - 3,300	1,380	74 - 735	735
Dibenzo(a,h)anthracene	11 - 640	140	12 - 81.5	81.5
Indeno(1,2,3-cd)pyrene	9.5 - 1,700	677	60 - 325	325

Notes:
1 - Remedial Investigation for Site 08, NUSC Disposal Area (Tetra Tech 2010a)
2 - The 95% UCL as calculated by EPA's ProUCL was used as the exposure point concentratinon for sediment.

TABLE 6-2
REFINEMENT OF CHEMICALS OF CONCERN IN SOIL (HUMAN HEALTH)
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, NEWPORT RI
PAGE 1 OF 3

Constituent	Site Data (mg/kg) [1]			Target Risk Level				Background[2]				Chemical to be Forwarded as a COC to the FS?
	Maximum Detected Concentration	95% UCL	Average Concentration	Incremental Cancer Risk of $1x10^{-6}$ (mg/kg)	Incremental Cancer Risk of $1x10^{-5}$ (mg/kg)	Incremental Cancer Risk of $1x10^{-4}$ (mg/kg)	Hazard Index = 1 (mg/kg)	Maximum Detected Concentration (mg/kg)	95% UCL for PmB soil (mg/kg)	95% UCL for Se Soil (mg/kg)	Site Concentration> Background Concentration? (mg/kg)	
CONSTRUCTION WORKERS												
Benzo(a)anthracene	1,900	92.862	25.8	41	410	4,100	NA	0.079	0.066	0.079	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Benzo(a)pyrene	1,500	74.598	21.5	4.1	41	410	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	41	410	4,100	NA	0.130	0.120	0.130	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	4.1	41	410	NA	ND	ND	ND	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	41	410	4,100	NA	0.098	0.060	0.098	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
INDUSTRIAL WORKERS												
Benzo(a)anthracene	1,900	92.862	25.8	2.1	21	210	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.21	2.1	21	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	2.1	21	210	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	21	210	2,100	NA	0.110	0.069	0.110	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Chrysene	1,700	82.646	22.8	211	2,110	21,100	NA	0.140	0.090	0.140	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.21	2.1	21	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	2.1	21	210	NA	0.098	0.060	0.098	Y	Yes
Arsenic	122	17.87	16.4	1.6	16	160	256	71.7	49.8	23.2	Y	No. The representative site concentration is consistent with the calculated risk value (ILCR=10-5) and background.
ADOLESCENT TRESPASSERS												
Benzo(a)anthracene	1,900	92.862	25.8	3.3	33	330	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.33	3.3	33	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	3.3	33	330	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	33	330	3,300	NA	0.110	0.069	0.110	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.33	3.3	33	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	10	100	1,000	NA	0.098	0.060	0.098	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Arsenic	122	17.87	16.4	1.6	16	160	768	71.7	49.8	23.2	Y	No. The representative site concentration is consistent with the calculated risk value (ILCR=10-5) and background.
CHILD RECREATIONAL USERS												
Benzo(a)anthracene	1,900	92.862	25.8	1.3	13	130	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.13	1.3	13	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	1.3	13	130	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	13	130	1,300	NA	0.110	0.069	0.110	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Chrysene	1,700	82.646	22.8	125	1,250	12,500	NA	0.140	0.090	0.140	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.13	1.3	13	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	1.3	13	130	NA	0.098	0.060	0.098	Y	Yes
Arsenic	122	17.87	16.4	4.1	41	410	158	71.7	49.8	23.2	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5) and is consistent with background.

TABLE 6-2
REFINEMENT OF CHEMICALS OF CONCERN IN SOIL (HUMAN HEALTH)
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, NEWPORT RI
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Constituent	Site Data (mg/kg) [1]			Target Risk Level				Background[2]				Chemical to be Forwarded as a COC to the FS?
	Maximum Detected Concentration	95% UCL	Average Concentration	Incremental Cancer Risk of $1x10^{-6}$ (mg/kg)	Incremental Cancer Risk of $1x10^{-5}$ (mg/kg)	Incremental Cancer Risk of $1x10^{-4}$ (mg/kg)	Hazard Index = 1 (mg/kg)	Maximum Detected Concentration (mg/kg)	95% UCL for PmB soil (mg/kg)	95% UCL for Se Soil (mg/kg)	Site Concentration> Background Concentration? (mg/kg)	
ADULT RECREATIONAL USERS												
Benzo(a)anthracene	1,900	92.862	25.8	7.6	76	760	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.76	7.6	76	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	7.6	76	760	NA	0.130	0.120	0.130	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Benzo(k)fluoranthene	1,200	61.064	17.6	76	760	7,600	NA	0.110	0.069	0.110	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.76	7.6	76	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	7.6	76	760	NA	0.098	0.060	0.098	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Arsenic	122	17.87	16.4	9.2	92	920	1,426	71.7	49.8	23.2	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5) and is consistent with background.
LIFELONG RECREATIONAL USERS												
Benzo(a)anthracene	1,900	92.862	25.8	1.1	11	110	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.11	1.1	11	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	1.1	11	110	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	11	110	1,100	NA	0.110	0.069	0.110	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Chrysene	1,700	82.646	22.8	108	1,080	10,800	NA	0.140	0.090	0.140	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.11	1.1	11	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	1.1	11	110	NA	0.098	0.060	0.098	Y	Yes
Arsenic	122	17.87	16.4	2.8	28	280	NA	71.7	49.8	23.2	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5) and is consistent with background.
HYPOTHETICAL CHILD RESIDENTS												
Benzo(a)anthracene	1,900	92.862	25.8	0.170	1.7	17	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.017	0.17	1.7	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	0.170	1.7	17	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	1.7	17	170	NA	0.110	0.069	0.110	Y	Yes
Chrysene	1,700	82.646	22.8	17	170	1,700	NA	0.140	0.090	0.140	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.017	0.17	1.7	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	0.170	1.7	17	NA	0.098	0.060	0.098	Y	Yes
Total Aroclors	5.22	0.2083	0.447	0.328	3.28	32.8	NA	0.086	0.086	0.034	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Arsenic	122	17.87	16.4	0.560	5.6	56	22	71.7	49.8	23.2	Y	Yes
HYPOTHETICAL ADULT RESIDENTS												
Benzo(a)anthracene	1,900	92.862	25.8	1	10	100	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.1	1	10	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	1	10	100	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	10	100	1,000	NA	0.110	0.069	0.110	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Chrysene	1,700	82.646	22.8	105	1,050	10,500	NA	0.140	0.090	0.140	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.1	1	10	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	1	10	100	NA	0.098	0.060	0.098	Y	Yes
Naphthalene	220	10.885	5.31	11	110	1100	9,600	ND	ND	ND	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Total Aroclors	5.22	0.2083	0.447	0.68	6.8	68	NA	0.086	0.086	0.034	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Arsenic	122	17.87	16.4	1.3	13	130	195	71.7	49.8	23.2	Y	Yes

TABLE 6-2
REFINEMENT OF CHEMICALS OF CONCERN IN SOIL (HUMAN HEALTH)
SITE 08, NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, NEWPORT RI
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Constituent	Site Data (mg/kg) [1]			Target Risk Level				Background[2]				Chemical to be Forwarded as a COC to the FS?
	Maximum Detected Concentration	95% UCL	Average Concentration	Incremental Cancer Risk of $1x10^{-6}$ (mg/kg)	Incremental Cancer Risk of $1x10^{-5}$ (mg/kg)	Incremental Cancer Risk of $1x10^{-4}$ (mg/kg)	Hazard Index = 1 (mg/kg)	Maximum Detected Concentration (mg/kg)	95% UCL for PmB soil (mg/kg)	95% UCL for Se Soil (mg/kg)	Site Concentration> Background Concentration? (mg/kg)	
HYPOTHETICAL LIFELONG RESIDENTS												
Benzo(a)anthracene	1,900	92.862	25.8	0.150	1.5	15	NA	0.079	0.066	0.079	Y	Yes
Benzo(a)pyrene	1,500	74.598	21.5	0.015	0.15	1.5	NA	0.095	0.078	0.095	Y	Yes
Benzo(b)fluoranthene	1,300	64.554	19.3	0.150	1.5	15	NA	0.130	0.120	0.130	Y	Yes
Benzo(k)fluoranthene	1,200	61.064	17.6	1.5	15	150	NA	0.110	0.069	0.110	Y	Yes
Chrysene	1,700	82.646	22.8	15	150	1,500	NA	0.140	0.090	0.140	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Dibenzo(a,h)anthracene	330	16.157	6.5	0.015	0.15	1.5	NA	ND	ND	ND	Y	Yes
Indeno(1,2,3-cd)pyrene	850	42.428	13.3	0.150	1.5	15	NA	0.098	0.060	0.098	Y	Yes
Naphthalene	220	10.885	5.31	9.3	93	930	NA	ND	ND	ND	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Total Aroclors	5.22	0.2083	0.447	0.221	2.21	22.1	NA	0.086	0.086	0.034	Y	No. The representative site concentration is below the calculated risk value (ILCR=10-5).
Arsenic	122	17.87	16.4	0.40	4	40	NA	71.7	21	69.3	Y	Yes

NOTES:
1 - Site maximum, 95% UCL and average values are derived from a combined data set using RI and SRI data.
2 - Background data includes soil background data from the NUSC background data report (Tetra Tech, 2006)
3 - Total Aroclors in background are represented by Aroclor-1260, detected in 22 of 60 background samples.
4 - The maximum site concentration exceeds the maximum background concentration, but the average site concentration does not exceed the average background concentration

Soil site and background values are the average of detected values, and does not use half non-detect values.

TABLE 6-6
SUMMARY OF COCs RETAINED FOR THE FS
SITE 08 - NUSC DISPOSAL AREA
SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT
NAVAL STATION NEWPORT, NEWPORT RI

Medium	COPC	Human Health Receptors	Ecological Receptors	Maximum Concentration (a)	Units
Soil	Benzo(a)anthracene	1,2,3,5,6,7,8,9	--	1,900	mg/kg
	Benzo(a)pyrene	1,2,3,4,5,6,7,8,9	--	1,500	mg/kg
	Benzo(b)fluoranthene	1,2,3,5,6,7,9	--	1,300	mg/kg
	Benzo(k)fluoranthene	1,3	--	1,200	mg/kg
	Dibenzo(a,h)anthracene	1,2,3,5,6,7,8,9	--	330	mg/kg
	Indeno(1,2,3-cd)pyrene	1,2,3,5,7,8,9	--	850	mg/kg
	Arsenic (b)	1,2,3	--	122	mg/kg
	Cadmium	--	12	2.4 J	mg/kg
	Chromium	--	12	28.8	mg/kg
Groundwater	1,1,1-Trichloroethane	Not Quantified	--	1,600	ug/L
	1,1-Dichloroethane	1,2,3	--	1,000	µg/L
	1,1-Dichloroethene	Not Quantified	--	79	ug/L
	1,3,5-Trimethybenzene	1	--	290	µg/L
	1,4-Dioxane	Not Quantified	--	8.3	µg/L
	Carbon Tetrachloride	3	--	1.85	µg/L
	Chloromethane	2,3	--	16	µg/L
	Ethylbenzene	1,2,3	--	58	µg/L
	Tetrachloroethene	1,2,3	--	12	µg/L
	Trichloroethene	1,2,3	--	1,200	µg/L
	Vinyl Chloride	1,2,3	--	19	µg/L
	Arsenic (f)	1,2,3	--	503	µg/L
	Chromium (d)	1,2,4	--	868	µg/L
	Cobalt	1,2	--	637	µg/L
	Lead (e)	1,2,3	--	1,890	µg/L
	Manganese (f)	1,2	--	13,800	µg/L
	Nickel (e)	1	--	1,160	µg/L
	Vanadium (e)	1,2	--	832	µg/L
Sediment (c)	Total Aroclors	--	11	2.93	mg/kg
	Lead	--	11	27,200	mg/kg

(a) Maximum Concentrations are presented for illustrative purposes
(b) For type PmB surface and subsurface soil (North Meadow) and type Se surface soil (remainder of site).
(c) Alternatively, a Probable Effects Concentration Quotient (PEC-Q) approach may be considered in the FS.
(d) Pending sampling to determine whether present as Cr+6 or Cr+3 (the latter may not be identified as a COC).
(e) Based on unfiltered sample data. If filtered metals had been used to calculate risks from residential exposures to groundwater then lead, nickel, and vanadium would not have been retained as COCs.
(f) Arsenic and manganese are associated with a secondary release to groundwater.

Receptors:

1 Hypothetical Child Residents
2 Hypothetical Adult Residents
3 Hypothetical Lifelong Residents
4 Construction Workers
5 Industrial Workers
6 Adolescent Trespassers
7 Child Recreational Users
8 Adult Recreational Users
9 Lifelong Recreational Users
10 Ecological - Pond Invertebrates
11 Ecological - Stream Invertebrates
12 Ecological - Soil Invertebrates