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U S NAVY RESPONSES TO RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL
MANAGEMENT AND U S EPA REGION I COMMENTS ON THE DRAFT SAMPLING AND
ANALYSIS PLAN FOR THE QUONSET DEVELOPMENT CORPORATION OUTFALL 001
REMEDIAL INVESTIGATION NCBC DAVISVILLE RI
1/8/2014
RESOLUTION CONSULTANTS

**NAVY RESPONSES TO
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
COMMENTS DATED SEPTEMBER 16, 2013
ON THE DRAFT SAMPLING AND ANALYSIS PLAN,
QDC OUTFALL 001 REMEDIAL INVESTIGATION,
FORMER NAVAL CONSTRUCTION BATTALLION CENTER (NCBC) DAVISVILLE,
NORTH KINGSTOWN, RHODE ISLAND
(MARCH 29, 2013)**

Additional RIDEM comments on the Navy's Draft SAP QDC Outfall 001 Remedial Investigation (RI) are presented below. The original RIDEM comments are presented first, followed by the original Navy responses (*italics*), followed by RIDEM additional comments (underlined), followed by the Navy additional responses (underlined italics).

3. Section 2.0, Page 5, Second Paragraph. Navy proposes to evaluate risk from exposure to surface soils located 0 to 1 feet below ground surface (ft bgs), in accordance with United States Environmental Protection Agency (US EPA) risk assessment guidance. RIDEM Remediation Regulations, 2011 specify that surface soil is located from 0 to 2 ft bgs, that industrial/commercial direct exposure criterion (DEC) be applied to this depth range, and that this depth interval should be evaluated in the risk assessment. In addition, RIDEM residential DEC's, if applicable (i.e., no land use restrictions are imposed on the site), as well as either GA or GB leachability criteria, must be met throughout the vadose zone. It is unclear in the report at what depth the water table is located and whether soils greater than 4 ft bgs are within the vadose zone. It is therefore recommended that surface soils be defined to include the 0 to 2 ft bgs depth interval and that soils located greater than 4 ft bgs be included in the human health risk assessment (HHRA) if they are located above the water table. Additionally, with respect to subsurface soils, please provide justification why evaluation of impacted soils located at depths greater than 4 ft bgs is not necessary.

Navy Response - Surface soil will be defined as 0-1 ft bgs in accordance with EPA Region 1 guidance, consistent with other sites being evaluated in this program. In accordance with the Formal Dispute Resolution Agreement (January 12, 2012) between the Navy, EPA, and RIDEM, state Applicable or Relevant and Appropriate Requirements (ARARs) need to be addressed under CERCLA if the HHRA identifies an unacceptable site-related cumulative ELCR and/or total HI for a site. Therefore, as part of a remedial technology evaluation (e.g. Engineering Evaluation/Cost Analysis (EE/CA) or Feasibility Study (FS)), if the HHRA identifies any site-related risk-based COCs for the site, concentrations of chemicals detected on-site will be compared to RIDEM's Method 1 Direct Exposure Criteria for Soil and RIDEM's Method 1 Groundwater Objectives (RIDEM, 2011) for the projected land use, as appropriate. Therefore, RIDEM's Method 1 Objectives are not included in the Tier I COPC selection process. The Risk Assessment Technical Memorandum will be revised to state/clarify this. Due to the site being mainly a wetland, the depth to water in the area where soil samples are being collected is very shallow/close to the ground surface. The maximum soil depth for evaluation in the HHRA (applicable for a construction/utility worker exposure scenario) was selected based on the deepest depth proposed for sampling to characterize the nature and extent. It is anticipated that the vadose zone does not extend deeper than 4ft bgs adjacent to the wetland in the area of proposed soil samples. As stated in the response to specific comment 29, if evidence of impacts is observed in the 4 ft bgs soil interval, the borings at that location will be advanced until no

evidence of impacts is observed. Soil data collected deeper than 4 ft bgs will be considered for evaluation in the HHRA if they are located above the water table (i.e., are in the vadose zone).

RIDEM Comment - Please be advised that RIDEM will have difficulty concurring with a risk assessment that has not evaluated risk in comparison to RIDEM criteria. Please also note that RIDEM DEC have been used as criteria to assist in the COPC selection process for risk assessments conducted at other Navy sites, such as at NETC. Therefore, please include DEC as COPC screening criteria.

With respect to subsurface soils greater than 4ft bgs please explain how the Navy will determine impacted soils from non-impacted soils while out in the field , i.e. what analytical methods would be used in the field. It is agreed the water table should be near the surface. To avoid later concerns, and save on resources, it is suggested that the borings be advanced to at minimum the top of the water table which should not incur any great additional cost.

Navy Response - Comment is noted. Use of RIDEM DEC as criteria to assist in the COPC selection previously at NETC was done prior to the Formal Dispute Resolution Agreement (January 12, 2012). Consistent with the initial Navy response, surface soil will be defined as 0-1 ft bgs in accordance with EPA Region 1 guidance. The SAP will be revised so that soil borings will be installed to at least the top of the water table to measure subsurface soil concentrations throughout the vadose zone. All soil data collected above the water table will be evaluated in the HHRA for a future construction/utility worker exposure scenario. Evidence of impacts for continuing soil borings beyond 4 ft bgs include elevated PID readings and visual and/or olfactory evidence of impacts.

4. Section 2.0, Page 5, Third Paragraph. Please provide justification for collecting soil and sediment samples to only 4 ft bgs. Construction and utility work could extend deeper than 4 ft bgs.

Navy Response - The maximum soil depth for evaluation of a construction/utility worker in the HHRA was selected based on the deepest depth proposed for sampling to characterize the nature and extent. A construction/utility worker is not likely to access deeper soils in a wetland area. As stated in the response to specific comment 29, if evidence of impacts is observed in the 4 ft bgs soil interval, the borings at that location will be advanced until no evidence of impacts is observed. Soil and sediment data collected deeper than 4 ft bgs will be considered for evaluation in the HHRA if they are located above the water table (i.e., are in the vadose zone).

RIDEM Comment - The response states that if impacts are observed at the 4 ft bgs soil interval the soil borings will be advanced until no evidence of impacts are observed. Please state what the Navy is defining as impacts. In addition, Rhode Island Building Code (Ch 3, Table R301.2(1) 10th Edition) states the depth to frost line is 40". RIDEM regulates sewer construction in the state. It is unlikely that an individual septic disposal system (ISDS) would be approved in this area. Therefore, any proposed building would be required to connect to a sewer system. Typically 8" diameter sewer pipes are used and it is required they be installed below the frost line with 6" of crushed stone underneath the pipe. This brings the depth to a minimum of 4.5' and does not even account for sloping of the pipe to allow for gravitational flow. Therefore, it is very likely that construction workers would be exposed to soil below four feet below ground surface. Please note there are exceptions to the above requirement, such as a sewer pipe underneath a

bridge, but this would require insulating the pipe which can be costly. The Navy should consider a deeper depth for construction worker soil exposure if the site assessment indicates contamination extends below 4' bgs.

Navy Response - As stated in the response to comment #3, the SAP will be revised so that soil borings will be installed to at least the top of the water table to measure subsurface soil concentrations throughout the vadose zone. All soil data collected above the water table will be evaluated in the HHRA for a future construction/utility worker exposure scenario. Evidence of impacts for continuing soil borings beyond 4 ft bgs include elevated PID readings and visual and/or olfactory evidence of impacts.

7. Section 3.2. 1, Page 10, Soil. Please include the RIDEM residential and Industrial/commercial DEC as soil screening levels.

Navy Response - In accordance with the Formal Dispute Resolution Agreement (January 12, 2012) between the Navy, USEPA, and RIDEM, state Applicable or Relevant and Appropriate Requirements (ARARs) need to be addressed under CERCLA if the HHRA identifies an unacceptable site-related cumulative ELCR and/or total HI for a site. Therefore, as part of a remedial technology evaluation (e.g., Engineering Evaluation/Cost Analysis (EE/CA) or Feasibility Study (FS)), if the HHRA identifies any site-related risk-based COCs for the site, concentrations of chemicals detected on-site will be compared to RIDEM's Method 1 Direct Exposure Criteria/or Soil and RIDEM's Method 1 Groundwater Objectives (RIDEM, 2011) for the projected land use. Therefore, RIDEM's Method 1 Objectives are not included in the Tier 1 COPC selection process. The Risk Assessment Technical Memorandum will be revised to state/clarify this.

RIDEM Comment - Please be advised that RIDEM will have difficulty concurring with a risk assessment that has not evaluated risk in comparison to RIDEM criteria. RIDEM DEC and Groundwater Objectives have been used at other Navy sites (NETC) as COPC screening criteria. RIDEM therefore requests that these be included as screening criteria in this risk assessment.

Navy Response - Comment is noted. Consistent with the initial Navy response, concentrations of chemicals detected on-site will be compared to RIDEM's Method 1 Soil Objectives for the projected land use only if the HHRA identifies any site-related risk-based COCs for the site. Therefore, RIDEM's Method 1 Soil Objectives will not be included in the Tier 1 COPC selection process. Use of RIDEM DEC as criteria to assist in the COPC selection previously at NETC was done prior to the Formal Dispute Resolution Agreement (January 12, 2012).

9. Section 3.2.1, Page 12, Surface Water, 1st Sentence. The text states that the wetland does not contain fish, although no mention of this is provided in Section 1.1. Please explain in the text why fish consumption should not be considered a relevant pathway.

Navy Response - Text will be added to Section 1.1 to indicate that the wetland does not contain fish and provide discussion on why fish consumption is not considered a relevant pathway.

RIDEM Comment - Prior to concurring with the response RIDEM would like to review the proposed language.

Navy Response - The following language will be added to Section 1.1: “The wetland and associated drainage feature do not contain fish as these areas only intermittently contain surface water during periods when the water table is high. Therefore, these areas are not a source of fish for human consumption and the fish ingestion pathway is not a complete pathway for the site.”

10. Section 3.2.1, Page 12, Groundwater. Please include the RIDEM GA and GB Groundwater Objectives as groundwater screening levels.

Navy Response - In accordance with the Formal Dispute Resolution Agreement (January 12, 2012) between the Navy, USEPA, and RIDEM, state Applicable or Relevant and Appropriate Requirements (ARARs) need to be addressed under CERCLA if the HHRA identifies an unacceptable site-related cumulative ELCR and/or total HI for a site. Therefore, as part of a remedial technology evaluation (e.g., Engineering Evaluation/Cost Analysis (EE/CA) or Feasibility Study (FS)), if the HHRA identifies any site-related risk-based COCs for the site, concentrations of chemicals detected on-site will be compared to RIDEM's Method 1 Direct Exposure Criteria for Soil and RIDEM's Method 1 Groundwater Objectives (RIDEM, 2011) for the projected land use. Therefore, RIDEM's Method 1 Objectives are not included in the Tier I COPC selection process. The Risk Assessment Technical Memorandum will be revised to state/clarify this.

RIDEM Comment - Please be advised that RIDEM will have difficulty concurring with a risk assessment that has not evaluated risk in comparison to RIDEM criteria. Please see evaluation of response to Comments 3 and 7.

Navy Response - Comment is noted. Consistent with the initial Navy response, concentrations of chemicals detected on-site will be compared to RIDEM's Method 1 Groundwater Objectives for the projected land use only if the HHRA identifies any site-related risk-based COCs for the site. Therefore, RIDEM's Method 1 Groundwater Objectives will not be included in the Tier I COPC selection process.

11. Section 3.3.1, Page 13, Current/Future Recreational/Trespasser (Adult and Child), First Bullet. RIDEM Remediation Regulations, 2011 specify that surface soil is located from 0 to 2 ft bgs. Please evaluate surface soils through inclusion of soil data representing the 0 to 2 ft bgs interval. Additionally, please explain why the dust inhalation pathway is considered to be insignificant.

Navy Response - Surface soil will be defined as 0-1 ft bgs in accordance with EPA Region 1 guidance, consistent with other sites being evaluated in this program.

Section 3.3.1 states that "exposure to volatile compounds in soil via the inhalation pathway is considered to be insignificant". However, the inhalation of fugitive dust/particulates from soil pathway is proposed for evaluation.

RIDEM Comment - Please be advised that RIDEM will have difficulty concurring with a risk assessment that has not evaluated risk in comparison to RIDEM criteria. Please see evaluation of response to Comments 3 and 7.

Navy Response - See responses to comments #7 and #10.

13. Section 3.3.1, Page 13, Future Construction/Utility Worker, First Bullet. RIDEM Remediation Regulations, 2011 specify evaluation of subsurface soil located from 2 ft bgs extending through the entire vadose zone. Please either include deeper soils in the risk assessment or provide further justification for exclusion of soils/sediments greater than 4 ft bgs.

Navy Response - See response to specific comment 6.

RIDEM Comment - This comment addresses subsurface soil. RIDEM Comment 6 addressed 9/2008 Child-Specific Exposure Factors Handbook. Perhaps the Navy meant to reference RIDEM Comment 4 which addressed subsurface soil? If so, please see RIDEM Comment 4 to Navy Response 4.

Navy Response - As stated in the responses to comments #3 and #4, the SAP will be revised so that soil borings will be installed to at least the top of the water table to measure subsurface soil and sediment concentrations throughout the vadose zone. All data collected above the water table will be evaluated in the HHRA for a future construction/utility worker exposure scenario.

14. Section 3.3.1, Page 14. Hypothetical Future Off-Site Resident. If volatile organic compounds (VOCs) are detected in groundwater, then vapor intrusion into indoor air of off-property buildings may be a complete pathway. Please include inhalation of indoor air via vapor intrusion in the HHRA.

Navy Response - The area surrounding the wetland is wooded and undeveloped, with the exception of the QDC bike path. As shown on Figure 10-3, groundwater flows to the northeast from the wetland toward the drainage feature, underneath the bike path, toward Allan Harbor. This entire area is within the Federal Emergency Management Agency (FEMA) flood zone, (also shown on Figure 10-3). Therefore, future residential or commercial/industrial development of the on-site area and off-site area downgradient of the site is not likely to occur, making the future vapor intrusion pathway incomplete. If it is determined during the proposed investigation and evaluation that VOCs could migrate to current or future residential areas, RIDEM's comment will be revisited/reconsidered.

RIDEM Comment - The site is close to the border between Navy/QDC land and private land to the north of Sanford Road. Though unlikely, it is possible for someone to place a well and this area and transport the water off site. This would provide the pathway for on-site water to be transported to off-site residences. (There are houses on the other side of Sanford Road along Allen Harbor Landfill), Thus to make this risk assessment complete this possible scenario should be evaluated if VOCs are detected in groundwater.

Navy Response - In the unlikely event that a well is installed on-site to transport water off-site, this would not result in a complete vapor intrusion pathway since the transported water would only be available for direct contact through the tap/faucet and would not result in the migration of volatiles to the subsurface (i.e., beneath buildings) of the off-site area. However, as stated in the response to RIDEM comments dated September 6th - comment #7, although it is unlikely that the on-site area will be developed for residential use in the future due to its location being within the FEMA flood zone, a hypothetical future on-site residential exposure scenario will be added to the HHRA/SAP. Therefore, the vapor intrusion pathway will be evaluated for the hypothetical future on-site resident.

15. Section 3.3.1, Page 15, Calculation of Exposure Point Concentrations. The text states that the arithmetic mean concentration will be used as the exposure point concentration (EPC) for lead, in accordance with EPA guidance. RIDEM recommends using the 95% Upper Concentration Limit (UCL) of the mean concentration as the EPC for lead for consistency with the approach to development of EPCs for other chemicals of potential concern (COPCs) and to address variability in concentration. Although it is acknowledged that EPA guidance (OSWER 9200.1-78; 2007) states the arithmetic mean should be used for comparison, it is noted that EPA also recommends in this document that "if a risk assessor seeks to provide a conservative estimate of the average concentration of lead present in yard soil, an upper bound estimate on the mean may be appropriate for that purpose." (p. 1) The 95% UCL would therefore be an appropriate EPC, considering the size of the site and potential variability in soil lead concentrations.

Navy Response - The risk assessment is being conducted following EPA/CERCLA risk assessment guidance per Navy policy and approach taken on other Navy sites. Therefore, use of the arithmetic mean concentration/or evaluation of lead is considered appropriate per EPA lead guidance.

RIDEM Comment – RIDEM maintains that the 95% UCL should be used and is the appropriate way to evaluate the data, however, we know the Navy has used the arithmetic mean on other sites.

Navy Response – Comment noted. As stated in the Navy’s initial response, the EPC for lead will be equal to the arithmetic mean concentration per EPA lead guidance.

19. Section 4.3, Tier 2 – Baseline Ecological Risk Assessment. Page 30, Second Paragraph. Please include consideration of background contaminant levels in the Tier 2 Baseline Environmental Risk Assessment (BERA).

Navy Response – Background concentrations will be considered in the BERA if a suitable soil and wetland sediment data set is available.

RIDEM Comment – Navy response is acceptable, however, it is noted in the work plan that background sediment samples are not proposed.

Navy Response – Comment noted. If background samples are collected in the future or if acceptable background data is identified in the literature, it will be considered in the BERA.

**NAVY RESPONSES TO
RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
COMMENTS DATED SEPTEMBER 6, 2013
ON THE DRAFT SAMPLING AND ANALYSIS PLAN,
QDC OUTFALL 001 REMEDIAL INVESTIGATION,
FORMER NAVAL CONSTRUCTION BATTALLION CENTER (NCBC) DAVISVILLE,
NORTH KINGSTOWN, RHODE ISLAND
(MARCH 29, 2013)**

Additional RIDEM comments on the Navy's Draft SAP QDC Outfall 001 Remedial Investigation (RI) are presented below. The original RIDEM comments are presented first, followed by the original Navy responses (*italics*), followed by RIDEM additional comments (underlined), followed by the Navy additional responses (underlined italics).

Specific Comments

4. Page 29 of 121, Worksheet 10-1, CSM Summary, Receptors and Exposure Pathways, Human Health, Paragraph 2 - "RIDEM has classified groundwater underlying the site as Class GB, which is a RIDEM designation for groundwater that is "not suitable for use as a current or potential source of drinking water" (RIDEM, 2011)". Please be more specific on the reference as this definition was not found either in Sections 3 (Definitions) or 8 (Risk Management). Please note that Section 9.1.3 of the RIDEM Groundwater Quality Regulations, June 2010 define GB groundwater as those resources designated by the Director which may not be suitable for public or private drinking water use without treatment due to known or presumed degradation.

In addition, salinity is not a barrier for use as a groundwater source. As noted in an email from Richard Gottlieb to David Barney et. al. dated 8 March 2013 regarding Groundwater ESD for the 5-year review, the Town of Swansea, MA is in the process of constructing a desalination plant which is expected to go on line during the summer of 2013.

Navy Response - The Navy is merely reiterating that RIDEM has designated the groundwater beneath the site as GB which is the RIDEM designation for groundwater "not suitable for use a current or potential source of drinking water."

RIDEM Comment - While the reference to "not suitable for use as a current or potential source of drinking water" was found in Section 8.03(B)(ii) of the RIDEM Remediation Regulations, RIDEM has always treated GB groundwater based on Section 9.1.3 of the RIDEM Groundwater Quality Rules, June 2010 which designates GB Groundwater as "groundwater resources which may not be suitable for public or private drinking water use without treatment due to known or presumed degradation."

Navy Response - The referenced text will be revised as follows: 'RIDEM has classified groundwater underlying the site as Class GB, which is a RIDEM designation for groundwater that 'may not be suitable for public or private drinking water use without treatment due to known or presumed degradation (RIDEM, 2010)' in accordance with RIDEM's Groundwater Quality Rules, June 2010.

The SAP indicates both groundwater salinity and total dissolved solids (TDS) data will be used to evaluate the potability of the aquifer.

5. Page 29 of 121, Worksheet 10-1, CSM Summary, Receptors and Exposure Pathways, Human Health, Current/Future recreational/trespasser (Adult and Child), Bullets 1 & 2 - These bullets note that surface soil extends from 0 to 1' bgs. Please be advised that RIDEM considers surface soil to be from 0 to 2' bgs. Please also include this analysis in the HHRA.

Navy Response - Surface soil will be defined as 0-1 ft below ground surface (bgs) in accordance with EPA Region I guidance, consistent with other sites being evaluated in this program.

RIDEM Comment - Please be advised that RIDEM will have difficulty concurring with a risk assessment that has not evaluated risk in comparison to RIDEM criteria.

Navy Response - Comment noted. See response to RIDEM comments dated September 16th - comment #3.

6. Page 30 of 121, Worksheet 10- 1, CSM Summary, Future Construction/Utility Worker, Bullets 1 & 2 - Please explain how the exposure to surface and subsurface soil was determined to be a maximum depth of 4'. The exposure depth at minimum should be based on the maximum invert elevation of the catch basins associated with this drainage system plus an additional foot to allow for base preparation.

Navy Response - The maximum soil depth for evaluation of a construction/utility worker in the human health Risk Assessment (HHRA) was selected based on the deepest depth proposed/or sampling to characterize the nature and extent. A construction/utility worker is not likely to access deeper soils in a wetland area. As stated in the response to EPA Specific Comment 29, if evidence of impacts are observed in the 4 ft bgs soil interval, the borings at that location will be advanced until no evidence of impacts is observed. Soil data collected deeper than 4 ft bgs will be considered for evaluation in the HHRA if they are located above the water table (i.e., are in the vadose zone).

RIDEM Comment - Rhode Island Building Code (Ch 3, Table R301.2(1), 10th Edition) states the depth to frost line is 40". RIDEM regulates sewer construction in the state. It is unlikely that an individual septic disposal system (ISDS) would be approved in this area. Therefore, any proposed building would be required to connect to a sewer system or have their own treatment system. In the event of a sewer system, typically 8" diameter pipes are used and it is required they be installed below the frost line with 6" of crushed stone underneath the pipe. This brings the depth to a minimum of 4.5' and does not even account for sloping of the pipe to allow for gravitational flow. Therefore, it is very likely that construction/utility workers would be exposed to soil below four feet ground surface. The Navy should consider a deeper depth for the construction/utility worker soil exposure. With respect to advancing the borings below four feet below ground surface for impacted soils please state what analytical methods the Navy will be using to make this determination of impacted soils.

Navy Response - See response to comment RIDEM comments dated September 6, 2013 – comment #6.

7. Page 30 of 121, Worksheet 10- 1, CSM Summary, Hypothetical Future Off-Site Resident
- As a baseline, the hypothetical residential scenario should apply the site itself, not just the hypothetical off-site resident. Please include the analysis.

***Navy Response** - As stated in the SAP the wetland cannot be developed for residential or commercial/industrial use without filling the wetland. The wetland has also been delineated as a State jurisdictional wetland pursuant to the Rhode Island Freshwater Wetlands Act. In addition, the wetland area is within the Federal Emergency Management Agency (FEMA) flood Zone, as shown on Figure 10-3. Therefore, it is assumed that future residential or commercial/industrial development of the on-site area is not likely to occur. For that reason, future onsite residential and commercial/industrial receptors will not be evaluated in the risk assessment.*

RIDEM Comment - The on-site residential scenario serves as a baseline condition whether it would occur or not as this would be considered the most conservative use of the land. If the Navy cannot document the risk level associated with this scenario RIDEM would have to assume that it is unacceptable and would require restriction on residential use.

***Navy Response**- Although it is unlikely that the on-site area will be developed for residential use in the future due to its location being within the FEMA flood zone, a hypothetical future on-site residential exposure scenario will be added to the HHRA/SAP.*

10. Page 34 of 121, Worksheet 11, Step 3 - Information Inputs, Risk Assessment Inputs -
Please provide the numerical risk assessment inputs for RIDEM review.

***Navy Response** - The exposure assumption inputs were provided in Tables in Appendix C (Risk Assessment Work Plan Tech Memo). The hierarchy/sources of Toxicity/dose-response values and risk-based screening levels were also provided in Appendix C. The compound-specific values cannot be determined until the list of detected compounds per media is known. RIDEM should be able to provide sufficient review from the hierarchy of sources provided.*

RIDEM Response - Table C-1 of Appendix C Please explain why the exposed skin surface area is consistently higher for the soil pathway than the surface water pathway. Assuming the people are exposing themselves to soil their clothes, to a large degree would provide a barrier to skin contact, where as if they are in surface water the water can penetrate the cloths and come into contact with skin.

For Table C-4 of Appendix C - For the drinking water ingestion pathway the exposure frequency is listed as 234 days/yr for the CTE. For a residential scenario this should also be 350 days/yr similar to the RME.

***Navy Response** - The skin surface areas for the soil pathway are based on contact with hands, forearms, lower legs, head, (and feet for the child receptors only), consistent with USEPA (2004) guidance. The skin surface areas for the sediment and surface water pathways are based on contact with hands, lower legs, and feet based on a scenario in which a recreational/trespassing adult/child wades into the wetland. Based on the nature of the wetland, a swimming exposure scenario is not appropriate/applicable. Therefore, contact with surface water is expected to be limited to the hands and lower extremities only.*

The proposed exposure duration for the CTE Hypothetical Future Off-Site Resident scenario was obtained from the USEPA Superfund Standard Default Exposure Factors For the Central Tendency and Reasonable Maximum Exposure, Preliminary Review Draft, May 5, 1993 document. It is reasonable for the exposure frequency to be lower for the CTE scenario to distinguish from the RME scenario, which will evaluate the longer exposure frequency of 350 days/year.

13. Page 38 of 121, Worksheet II, Step 5, Goal 1, Bullet 3 & Goal 3, Bullet 2 – In lieu of an interim removal action please state if the Navy given any consideration to interim LUCs.

Navy Response - There are existing restrictions in the lease with QDC. The Navy is not considering interim LUCs at this time.

RIDEM Comment - Please state if the existing restrictions prevent contact with the contaminated soil or at least make people aware of the possible contamination.

Navy Response - A chain link fence impedes people from entering the RI study area but does not exclusively prevent trespassers from coming in contact with the contaminated soil or make people aware of possible contamination.

14. Page 38 of 121, Worksheet II, Step 5, Goal 2, Bullet 1 - Please note that the deletion of COPCs must meet the requirements of Section 8.01 of the RIDEM Remediation Regulations.

Navy Response – In accordance with the Formal Dispute Resolution Agreement (January 12, 2012) between the Navy, EPA, and RIDEM, state Applicable or Relevant and Appropriate Requirements (ARARs) need to be addressed under CERCLA if the HHRA identifies an unacceptable site related cumulative ELCR and/or total HI for a site, Therefore, as part of a remedial technology evaluation (e.g., Engineering Evaluation/Cost Analysis (EE/CA) or Feasibility Study (FS)), if the HHRA identifies any site-related risk-based COCs for the site, concentrations of chemicals detected on-site will be compared to RIDEM's Method 1 Direct Exposure Criteria for Soil and RIDEMs' Method 1 Groundwater Objectives (RIDEM, 2011) for the projected land use, as appropriate. Therefore, RIDEM's Method 1 Objectives are not included in the Tier I COPC selection process. The Risk Assessment Technical Memorandum will be revised to state/clarify this.

RIDEM Comment - Please be advised that RIDEM will have difficulty concurring with a risk assessment that has not evaluated risk in comparison to RIDEM criteria.

Navy Response - Comment noted. See response to RIDEM comments dated September 16th – comment #7 and #10.

16. Page 41 of 121, Worksheet II, Step 6, Performance Criteria, Managing Decision Error, Managing Laboratory Sampling Error - This section notes the homogenization of samples. Please be advised that RIDEM does not accept homogenized samples.

Navy Response - For non-discreet (i.e., non-VOC) samples, it is standard practice for the laboratory to homogenize the sample in the sample container prior to selecting an aliquot for extraction/digestion.

RIDEM Comment- RIDEM would accept a "homogenized" sample from a boring core from no more than a two foot interval for non VOC related analysis provided the sample appeared to be homogeneous. If there is clear evidence of contamination it is expected the analytical sample would be biased towards the contaminated portion of the bore sample. For clarification, RIDEM would not accept composite samples from different horizontal locations.

Navy Response - *Comment noted. All homogenized samples will be from cores of two feet or less. If evidence of contamination (e.g., PID readings, visual/olfactory) is present in a specific horizon of the core, sample collection will be biased towards this area and the occurrence will be documented in the field notes. The Navy has never proposed compositing samples from different locations in this SAP.*

17. Page 43 of 121, Worksheet II , Step 7, Obtaining the Data, Groundwater Sampling - The upgradient well location appears to be located near catch basin CB-05. If this catch basin has a soft bottom contaminants could have percolated through the ground and affect this proposed well location. In addition the proposed upgradient well is due east of Site 1 which also drained into this system based on drainage line drawings in this area. Since groundwater now would be from Site 1 to the wetland (Outfall 001) it would stand to reason that anything we measured in the proposed "upgradient" well would be the contaminants that came from Site 1 and Building 224. Perhaps another location should be selected for this well.

Navy Response - *The location of the upgradient well location will be reviewed against available groundwater contours for the area and moved if appropriate. As RIDEM notes, the proposed well location would be upgradient of the wetland and downgradient of Site 1, Building 224, and the NIKE PR-58 Site.*

RIDEM Comment - RIDEM would like to coordinate with the Navy on the final location of the proposed upgradient well location.

Navy Response - *Comment noted. The Navy will coordinate with RIDEM on the final location of the proposed upgradient well location.*

18. Page 47 of 121, Worksheet 14-1, Summary of Project Tasks, Clearing - Prior to any intrusive activities in the wetlands coordination with the RIDEM Wetlands Section is required.

Navy Response - *Coordination with the RIDEM Wetlands Section will take place; all clearing will be performed in accordance with section 6.14 of the RIDEM Wetlands Regulations.*

RIDEM Comment - RIDEM apologizes. The Navy should be coordinating with Coastal Resources Management Council, not RIDEM Wetlands, as they have jurisdiction over the area in question.

Navy Response - *The Navy will coordinate with the Coastal Resources Management Council, a Coastal Zone Management Consistency Determination will be prepared prior to the start of the sampling program.*

20. Page 47 of 121, Worksheet 14-1, Summary of Project Tasks, Surface and Subsurface Sediment Sample Collection - Please be advised that RIDEM does not accept composite samples.

Navy Response - See response to comment 29. Response from Comment 29- "Non discreet (i.e., non VOC samples) from individual locations and individual depths (e.g, boring SB-01 2-3') will be homogenized individually in stainless steel bowls prior to collecting the individual sample aliquots for the different analyses. No compositing of samples from different locations mixed together will be performed."

RIDEM Comment - RIDEM would accept a "homogenized" sample from a boring core from no more than a two foot interval for non VOC related analysis provided the sample appeared to be homogeneous. If there is clear evidence of contamination the sample should be biased towards the contaminated portion of the bore sample. For clarification, RIDEM would not accept composite samples from different horizontal location.

Navy Response - See response to comment 16.

21. Page 48 of 121, Worksheet 14- 1, Summary of Project Tasks, Surface and Subsurface Soil Sample Collection - Please be advised that RIDEM does not accept composite samples.

Navy Response - See response to comment 29.

RIDEM Comment - See RIDEM comment on Navy Response to Comment 20.

Navy Response - See response to comment 16.

22. Page 48 of 121, Worksheet 14-1, Summary of Project Tasks, Monitoring Well Installation, Bullet 1 - Please note RIDEM's concerns with the location of the upgradient well.

Navy Response - See response to comment 17.

RIDEM Comment - RIDEM would like to coordinate with the Navy on the final location of the proposed upgradient well location.

Navy Response - See response to comment 17.

23. Page 48 of 121, Worksheet 14-1, Summary of Project Tasks, Monitoring Well Installation, Last Paragraph This paragraph states that well screens will be constructed to bracket the stabilized water table which is expected to be approximately 3 to 10 feet. Please state how deep the Navy anticipates the wells to be and what length of screen is the Navy proposing for the wells.

Navy Response - The following text will be added to better detail the screened intervals of the shallow and intermediate wells in and around the wetland: "Shallow wells in and adjacent to the wetland will be screened from 2 ft to 12 ft bgs to properly seal the well at the surface. If a clear determination can be made in the field between fill material and underlying native materials, the screen length may be reduced to fully span the upper hydrostratigraphic unit (e.g. if the native materials are observed less than 12 ft bgs, the shallow well will be installed to that depth). Intermediate monitoring wells will be installed using a 10 foot screen length from the upper hydrostratigraphic boundary (fill/native boundary) to 10 feet into the native materials. A determination of the start and end depth of the intermediate monitoring well screens will be

determined in the field. If a clear boundary is not observed, then the intermediate well screens will be installed from 12ft to 22 ft bgs."

RIDEM Comment - In general the Navy response is acceptable, however, please clarify the following situation: If the upper hydrostratigraphic layer is less than 12' deep would the well screen for the intermediate well screen start at that level. For example if the upper hydrostratigraphic layer is 5 feet deep, would the intermediate well screen extend from 5 bgs to 15' bgs?

Navy Response - Yes.

27. Page 75 of 121, Worksheet 17- 1, Sampling Design and Rationale, Sediment Sampling, Paragraph 1, Last Sentence - This sentence states that the ecological risk assessment will evaluate only the surface sediment in the 0 - 0.5 foot range. Is the Navy not considering burrowing animals which can make their homes up to 3 feet below the ground surface?

Navy Comment - Sediment samples will be collected from within the emergent wetland which contains standing water. Therefore, burrowing animals are unlikely to be present. Risks to wetland/benthic invertebrates, plants, birds, and mammals will be based on exposure to the surface sediments (0 – 0.5 ft). For soil samples that are adjacent the wetland, the depth to water is very shallow (i.e., less than 3 feet bgs). Therefore burrowing animals are also unlikely to be present in the soil adjacent to the wetland.

RIDEM Comment - RIDEM understands the Navy's rationale, however, based on a number of site visits the entire site is not under water at all times of the year which leaves the possibility of burrowing animals. See Navy response to Comment #28. A couple of samples should be taken at a deeper depth to account for the burrowing animals.

Navy Response - Both surface (0 to 0.5 ft) and subsurface (0.5 to 1 ft bgs, 1 to 2 ft bgs, 2 to 4 ft bgs) sediment will be collected within the wetland. As stated previously, the ERA will evaluate sediment samples collected from the 0 to 0.5 ft horizon. If standing water is seasonally not present within portions of the wetland, the sediments typically remain saturated and the depth to water remains very shallow. These conditions are expected to preclude the use of the wetland by burrowing animals. As stated in a previous response to comments (see response to RIDEM's comment 17 dated June 13, 2013), impacts to burrowing animals will be evaluated in the upland portions of the Site if the delineation of soil concentrations indicates higher concentrations in deeper soils relative to the shallow (0 to 1 ft bgs) soils.

29. Worksheet 17-1, Sampling Design and Rationale. General Comments – Please note that RIDEM does not accept composite samples i.e., samples from different locations mixed together. If it alters sampling procedures, locations or depths the Navy should be considering the residential scenario as a baseline condition even though it is an unlikely scenario for this location.

Navy Response - Non discreet (i.e., non VOC) samples from individual locations and individual depths (e.g, boring SB-01 2-3') will be homogenized individually in stainless steel bowls prior to collecting the individual sample aliquots for the different analyses. No compositing of samples from different locations mixed together will be performed."

RIDEM Comment - Navy response is acceptable, but for clarification please see RIDEM comment to Navy response for comment #20.

Navy Response - See response to comment 16.

**NAVY RESPONSES TO
U. S. ENVIRONMENTAL PROTECTION AGENCY
COMMENTS DATED NOVEMBER 14, 2013
ON THE DRAFT SAMPLING AND ANALYSIS PLAN,
QDC OUTFALL 001 REMEDIAL INVESTIGATION,
FORMER NAVAL CONSTRUCTION BATTALLION CENTER (NCBC) DAVISVILLE,
NORTH KINGSTOWN, RHODE ISLAND
(MARCH 29, 2013)**

Additional EPA comments on the Navy's Draft SAP QDC Outfall 001 Remedial Investigation (RI) are presented below. The original EPA comments are presented first, followed by the original Navy responses (*italics*), followed by EPA additional comments (underlined), followed by the Navy additional responses (underlined italics).

Specific Comments

EPA Specific Comment 6: Pages 12-16, Worksheets 9-1, 9-2, and 9-3: EPA notes there was no EPA or RIDEM involvement in scoping meetings. The UFP-QAPP process is intended to be collaborative in nature and should involve as many stakeholders as possible. At the very least, these worksheets should clearly define what, if any, input was received from the regulatory agencies and how this input was incorporated into the sampling design and risk assessment approach for the project.

Navy Response: If necessary, a scoping meeting with EPA and/or Rhode Island Department of Environmental Management (RIDEM) will be arranged to discuss the response to comments and path forward for finalizing the SAP. The Navy did incorporate input received on the Drain Line Investigation report from EPA and RIDEM while developing this SAP.

EPA Response: Please add a Worksheet 9-4 documenting the changes to sampling locations discussed during the Navy/EPA site visit to observe the former plugged culvert.

Navy Response - Worksheet 9-4 will be added as requested.

EPA Specific Comment 9: Page 21, Worksheet 10, 2nd paragraph: This paragraph states the contaminants detected in the Drain Line Investigation and Data Report are not "entirely consistent" with those known to have been released at Sites 2 and 3 and Study Areas 1 and 4 (Former Construction Equipment Department), however Building 224 (and the vehicle wash pad and oil-water separator adjacent to Building 224) are identified as probable sources of contamination to the outfall. Has the Navy considered additional investigation in the Building 224 area to rule out subsurface contamination originating from the vehicle wash pad and oil/water separator?

Navy Response: The Navy is not proposing investigation at the former wash pad or oil water separator, which were demolished or removed by QDC. The conceptual site model is that the wash pad received contaminants and the storm drain transported them to the oil water separator and subsequently to the wetland.

EPA Response: Navy response does not clarify what is meant by the statement that contaminants detected in a previous investigation are not "entirely consistent" with those known to have been released at the Former CED. Does Navy believe the characterization of the Building 224 former wash pad/oil-water separator is complete?

Navy Response - The text that states contaminants detected in the Drain Line Investigation and Data Report are not entirely consistent with those known to have been released at Sites 2 and 3 and Study Areas 1 and 4 (Former Construction Equipment Department) will be removed. The conceptual site model text will be revised to state that the wash pad received contaminants during vehicle washing and maintenance and the storm drain transported them to the oil water separator and subsequently to the wetland. The characterization of the Building 224 former vehicle wash pad/oil-water separator is complete.

EPA Specific Comment 11: Pages 25-26, Worksheet 10: Navy should be more specific when making reference to the Davisville metals background surface soil data. Which data set is being utilized for the comparison of site data to background?

Navy Response: The data set that will be used for the soil metals background is from the NCBC Davisville Phase II RI background data set. This will be clarified in the text.

EPA Response: EPA does require a risk be determined by any chemicals that are within the background range, although during the risk management phase background can be taken into account. The Phase II background data set is not very robust nor were the samples taken in wetlands. The applicability of this data set to the OU10 Outfall 001 RI is not clear. Please explain. Ecological risk should be evaluated at this wetland. Navy has submitted several ecological risk assessments in the Allen Harbor Watershed that should be looked at for any applicable background data sets.

Navy Response - If a more suitable background data set than the NCBC Davisville Phase II RI background data set is identified, it will be considered.

Ecological risks will be evaluated for the OU10 Outfall 001 wetland. If wetland background samples are collected in the future or if acceptable background data is identified in the literature, it will be considered in the BERA.

Human health risks will be evaluated for both site-related and non-site related COPCs (i.e., COPCs determined to be consistent with background) in addition to the total cancer risk and HI based on both site-related and non-site-related COPCs. Site-related COPCs that cause an exceedance of target levels will be identified as 'risk-based chemicals of concern (COC). Non-site related COPCs that cause an exceedance of target levels will be discussed in the uncertainty section.

EPA Specific Comment 15: Page 27, Worksheet 10, Nature and Extent of Contamination, 2nd paragraph: Navy states the extent of soil contamination must be delineated both horizontally and vertically, however on Figure 10-6 there are no soil samples proposed outside of the excavation area to evaluate the horizontal extent of contamination.

Navy Response: Two additional soil borings will be added on the northwest side of the excavation and two additional soil borings will be added on the southeast side of the excavation. Text and figures will be updated as appropriate.

EPA Response: Please document this decision in a new Worksheet 9.

Navy Response - *This change will be documented in a new Worksheet 9 as requested.*

EPA Specific Comment 26 Page 35, Table 1 1-1PCB Homologs/Congeners: Congeners should be considered and EPA recommends sampling for PCB congeners, particularly in surface soil, shallow soil, and sediment.

Navy Response: *PCB congeners will not be analyzed. PCBs have been analyzed as Aroclors during previous historical investigations at NCBC Davisville and will continue to do so for consistency.*

EPA Response: Current state of the art analysis for PCBs is congener/homolog analysis. Navy has used this analysis at OU1 Allen Harbor Landfill recently. In addition, this is a new OU and therefore should be using the more up to date sampling and analysis techniques. EPA prefers to see congener/homolog analysis. See also the EPA response to Comment # 56.

Navy Response - *PCB congeners may be appropriate for sites where fish ingestion is a complete exposure pathway. However, it's typically not necessary/applicable for upland sites such as the Davisville site. Therefore, PCB congeners will not be analyzed for the Davisville site consistent with the approach used in the previous investigations at the site. Previous investigations at the Davisville site have identified low detections of PCBs, primarily Aroclors 1254 and 1260, indicating that weathering has not interfered with identifying the presence of PCBs as Aroclors. For these reasons, PCB congeners will not be analyzed for at the Davisville site, consistent with the approach used in the previous investigations at the site.*

EPA Specific Comment 37: Page 47, Worksheet 14, Utility Clearance: The utility clearance process should include input from Quonset Development Corporation personnel in addition to DigSafe notification. Additionally, will the actual sampling locations be cleared using ground penetrating radar or similar technology?

Navy Response: *Agreed, utility clearance will be coordinated with QDC in addition to the DigSafe notification, text will updated accordingly. Use of ground penetrating radar (GPR) is not anticipated at this time.*

EPA Response: Please add this discussion to Worksheet 14.

Navy Response - *This information will be added to Worksheet 14.*

EPA Specific Comment 55: Table C-12, Column 4 (Food Ingestion Rate), for Short-tailed Shrew. EPA (2007) provides a value in Table I (Attachment 4-1), for Food Ingestion Rate (FIR) of 0.209 kg dw/kg bw/day for shrew. Using a body weight value of 0.015 kg for shrew this converts to 0.003 kg dw food/day for the conservative FIR for shrew. Please use this value to be consistent with use of other data from the EcoSSL Guidance EPA (2007), or provide an explanation of why these data are not preferred over the values selected. Similarly, using a FIR

of 0.1672 kg dw/kg bw/day (mean values from EPA 2007) and a body weight value (for BERA) of 0.0168 kg, the FIR for the BERA model would be 0.0028 kg dw/day.

***Navy Response:** Allometric equations from Nagy (2001) have been used to derive the food ingestion rates for all of the receptors in Table C-1 2. These statistically significant ($p < 0.05$) regression equations are available for several classes of birds and mammals and account for differences in feeding rates at different body weights. These equations have been selected over individual values presented in EcoSSL Guidance (USEPA 2007) or the Wildlife Exposure Factors Handbook (USEPA 1993) because they represent a statistically significant approach to evaluating ingestion rates relative to body mass. The FIRs identified in EcoSSL Guidance (USEPA 2007) were selected based on small data sets ($n=2$ to 6 depending upon the receptor) while the regression equations presented in Table C-12 are typically based on larger data sets (ranging from $n=4$ for quail to $n=26$ for herbivorous mammals and insectivorous birds). The Uncertainty section of the ERA will discuss the potential changes in risk estimates (higher or lower) based on the use of alternative ingestion rates available in the literature.*

EPA Response: The Navy's response to our comment is acceptable. The Navy should cite the source for the selected ingestion rates in the document.

***Navy Response -** The source for the selected ingested rates will be added.*

EPA General Comment 56: PCB congeners should be analyzed in surface and subsurface soil to permit better assessment of inhalation exposure to volatile PCBs by the construction worker and to residential soil exposures.

***Navy Response:** As stated in the SAP, including Appendix C, exposure to volatile compounds, including PCBs, in soil via the inhalation pathway is considered to be an insignificant exposure pathway and is therefore not quantitatively evaluated in the human health risk assessment (HHRA). Therefore, the evaluation of congeners is not considered necessary for evaluation of the referenced pathway.*

EPA Response: The Navy's response refers to the statement in the SAP that exposure to volatile compounds in soil via the inhalation pathway is considered to be an insignificant exposure. The statement in the SAP does not reference PCBs, although the response from the Navy states "volatile compounds, including PCBs".

EPA agrees exposure to volatilized VOCs from soil is an insignificant pathway at this site; however the potential for volatilization of PCBs should be evaluated. Although PCBs have low vapor pressures and volatilize slowly at 20°-25°C, the surface temperature of soil can reach temperatures over 30°C. Because PCBs are stable and persistent, total loss via volatilization from soil may be significant over time.

Given that the PCBs at the site may be weathered, and weathered PCBs often do not "match" with the Aroclor peaks (potentially underestimating the total concentration of PCBs) Navy should perform congener analysis on soil samples collected during the RI. If the Navy can demonstrate that the PCBs present in the soil and sediment are not weathered or degraded, then Aroclor analysis may be acceptable.

Navy Response: As stated in the response to EPA comment #26, PCB congeners may be appropriate for sites where fish ingestion is a complete exposure pathway. However, it's typically not necessary/applicable for upland sites such as the Davisville site. Previous investigations at the Davisville site have identified low detections of PCBs, primarily Aroclors 1254 and 1260, indicating that weathering has not interfered with identifying the presence of PCBs as Aroclors. For these reasons, PCB congeners will not be analyzed for at the Davisville site, consistent with the approach used in the previous investigations at the site.

EPA states that it agrees that exposure to volatilized VOCs from soil is an insignificant pathway at this site. The reference to volatile compounds used in the SAP refers to all volatile compounds. Therefore, it doesn't seem necessary to call out volatile PCBs specifically in the SAP. In general, PCBs are not considered volatile compounds and have a strong affinity to adhere to soil particles. Therefore, the ingestion, dermal contact, and inhalation of particulates/fugitive dust pathways are more likely to drive risk for soil exposures. Only Aroclors 1221 and 1232 (the less chlorinated, less toxic of the Aroclors) are considered to have the potential to volatilize, and there have not been any detections of these Aroclors in soil in previous investigations at the Davisville site. The volatilization from soil to outdoor air pathway is considered insignificant for all volatile compounds, including the volatile PCBs, and is not considered to be a risk driver in the HHRA. Therefore, the Navy maintains that evaluation of the volatilization to outdoor air pathway is not necessary for PCBs and that analysis of PCB Aroclors in soil is appropriate to evaluate other exposure pathways.

EPA Specific Comment 60: PCB Homologs/Congeners: Congeners should be considered and EPA recommends sampling for PCB congeners, particularly in surface soil and shallow soil. Congener analysis will allow a better assessment of inhalation exposure by the future construction worker. Because of differences in 3 volatilities of different congeners, it is difficult to use homolog data to model airborne concentrations of PCBs.

Navy Response: As stated in the SAP, including Appendix C, exposure to volatile compounds, including PCBs, in soil via the inhalation pathway is considered to be an insignificant exposure pathway and is therefore not quantitatively evaluated in the HHRA. Therefore, the evaluation of congeners is not considered necessary for evaluation of the referenced pathway.

EPA Response: See EPA Comment on Navy's Response to General Comment No. 56.

Navy Response - See response to EPA comment #56.