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EMAIL AND COMMENTS FROM U S EPA REGION III REGARDING RECORD OF DECISION  
FOR SITE 32 NWS YORKTOWN VA  
05/10/2011  
U S EPA REGION III

## Sawyer, Stephanie/VBO

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**Subject:** FW: EPA Comment- Site 32 ROD -EPA Comment  
**Attachments:** Draft ROD Site 32 RPM comment.docx; Drfat ROD Site 32- ORC comment.pdf

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**From:** [Oduwole.Moshood@epamail.epa.gov](mailto:Oduwole.Moshood@epamail.epa.gov) [<mailto:Oduwole.Moshood@epamail.epa.gov>]  
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**Subject:** EPA Comment- Site 32 ROD -EPA Comment

Team:

Please see the attached EPA comments for the Site 32 ROD ( my comment is the word file and the attorney's in the pdf file).

Regards

**Moshood Oduwole**  
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# Record of Decision Site 32 Wetlands Area Downgradient of Beaver Pond

Naval Weapons Station Yorktown, Yorktown, Virginia

April 2011

## 1 Declaration

*\* Isnt it No Further Action, since there was a NTCRA?*

This Record of Decision (ROD) presents the selected remedy of No Action for sediment and surface water at the Environmental Restoration Program (ERP) Site 32, the Wetlands Area Downgradient of Beaver Pond, at Naval Weapons Station (WPNSTA) Yorktown, Yorktown, Virginia (USEPA ID: VA8170024170). The No Action determination has been made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C §§ 9601 et. seq., and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision is based on information contained in the Administrative Record (AR) file for Site 32. Information not specifically summarized in this ROD or its references, but contained in the AR file, has been considered and is relevant to the No Action determination for Site 32. Thus, this ROD is based upon and relies on the entire AR file for Site 32 in making the decision. ✓

The United States Department of the Navy (Navy) is the lead agency and provides funding for ERP activities at Site 32. The Navy and United States Environmental Protection Agency (USEPA) Region 3, the lead regulatory agency, issue this No Action ROD jointly. The Commonwealth of Virginia Department of Environmental Quality (VDEQ), the support regulatory agency, participated throughout the investigation process, has reviewed this ROD and the materials on which it is based, and concurs with this decision for No Action. The No Action determination documented in this ROD for Site 32 does not include or affect any other sites at WPNSTA Yorktown.

### 1.1 Selected Remedy

Based on the findings of environmental investigations completed for surface water and sediment and the non-time critical removal action (NTCRA) completed for sediment at Site 32, there is no unacceptable risk to human health or the environment under current or potential future Site 32 uses. Groundwater and soil are not associated with Site 32. Therefore, the selected remedy for Site 32 is No Action for sediment and surface water. Because there are no hazardous substances, pollutants, or contaminants remaining onsite above the levels that allow for unrestricted use and unlimited exposure, a Five-year review will not be required.

*NFA?*

**TABLE 1**  
Previous Studies and Investigations Summary

Previous Study / Investigation* (Document and Document date)	Dates of Study/ Investigation	Investigation Activities
Limited Field Investigation	2003	After identifying the potential source of mercury in the wetland sediment, 39 surface and 12 subsurface sediment samples were collected in August 2003 to delineate total mercury concentrations in the vicinity of the sediment samples collected during the Site 12 LTM activities. Based on the analytical <i>results</i> <sup>2</sup> , the <i>partnering team agreed</i> <sup>3</sup> to move forward with a BERA to further characterize the nature and extent of mercury in the wetland area and to assess potential ecological impacts within the wetland area from exposure to mercury associated with the former STP 2 area.
Final Project Plans Step 3B and 4 of the BERA (Baker, 2005)	2005	<p>The <i>Project Plans, Step 3B (problem formulation) and 4 (study design/data quality objectives) of the BERA</i> were completed in October 2005 to define the key pathways, chemicals, and receptors that could be driving potential risks within Site 32 and to establish the measurement endpoints, study design, data quality objectives, and data analysis methods for additional Site 32 investigations necessary to complete the ERA.</p> <p>Since mercury may have been historically transported from the STP 2 trickling filter tank through a regulated outfall to Site 32, the collection of surface water, sediment, and fish and frog tissue samples for analytical testing, collection of sediment samples for toxicological testing, and collection of background samples for analytical and toxicological testing were recommended. In addition, although not associated with a release, toxicity tests of surface sediment samples for cadmium and silver analysis were recommended since they were detected in one or more of the sediment samples and could potentially function as a <i>confounding factor</i><sup>4</sup> in the toxicity tests.</p>
Final Steps 6 and 7 of the Aquatic BERA (CH2M HILL, 2008)	2008	In September 2005, the <i>partnering team agreed</i> <sup>5</sup> to the work outlined in the Project Plans, Step 3B and 4 BERA. <i>Sediment, surface water, and tissue samples</i> <sup>6</sup> were collected to assess the potential for mercury and the confounding metals (cadmium and silver) to adversely impact aquatic receptors at Site 32. The <i>analytical results</i> <sup>7</sup> indicated two areas where mercury, cadmium, and silver in sediment posed a <i>potential ecological risk</i> <sup>8</sup> at Site 32 and a remedial action was recommended.
Final Engineering Evaluation/Cost Analysis (EE/CA) Site Screening Area 25 (CH2M HILL, 2009)	2009	Three remedial action alternatives were evaluated in the EE/CA. Based on the <i>evaluation</i> <sup>9</sup> , wetland sediment excavation and offsite disposal was the selected alternative to address potential ecological risks at Site 32. <i>Preliminary remediation goals</i> <sup>10</sup> (PRGs) for cadmium, mercury, and silver were developed by the WPNSTA Yorktown ecological subgroup and agreed to by the WPNSTA Yorktown Partnering Team. The PRGs were established to be protective of ecological receptors. In addition, a Human Health Risk Screening (HHRs) was conducted to identify if any potential human health risk existed from exposure to inorganics in Site 32 sediment and surface water.
Final Construction Completion Report Removal Action at Site 32 (Shaw, 2010)	2010	Between July and October 2009, a NTCRA was conducted to mitigate direct contact by ecological receptors with contaminated sediment at Site 32. In total, approximately 2,041 tons of contaminated sediment was removed from Site 32. Following excavation, confirmation samples were collected and analyzed for cadmium, mercury, and silver. <i>Results were compared to the remediation goals</i> <sup>11</sup> (RGs) and additional excavation was conducted until the confirmation sample results were below the established RGs. Following removal, the site was restored to pre-construction conditions with clean fill and wetland vegetation to return it to the same hydrologic, topographic, and vegetative states.

**Notes:**

\* The documentation listed is available in the AR and provides information used to support the no action determination for Site 32.

Site 32

A final ROD is pending for Site 28 (all media) and a final ROD is pending for Sites 22 (surface water and sediment), 4 and 21 (groundwater, surface water, and sediment). The no action determination documented in this ROD for Site 32 does not include or affect any other site at WPNSTA Yorktown.

## 2.4 Site Characteristics

Site 32 is a wetlands area located in the extreme eastern portion of WPNSTA Yorktown. The topography of this wetland area is characterized as a broad, flat area between steep upland slopes with elevations at the top of the slope on the order of 30 to 50 feet above mean sea level. One main surface water channel, along with numerous small braided surface water channels and small ponds, all no deeper than about 6 inches, are located between two impoundments within this wetlands area.

Upland canopy tree species, including American sycamore, loblolly pine, sweet gum, and yellow poplar, are present along the Site 32 perimeter and across each impoundment while freshwater emergent wetland vegetation is present within the wetland itself.

Even though groundwater is not associated with the site, groundwater within the vicinity of Site 32 is expected to first occur at relatively shallow depths (Columbia Aquifer) and discharge locally.

## 2.5 Current and Potential Future Land and Resource Uses

The current and potential future use for Site 32 is as a wetland area and not anticipated to change unless the mission of the base is altered. Site 32 is surrounded by two impounded portions of Ballard Creek. It is anticipated that WPNSTA Yorktown will remain a military installation for the foreseeable future, and Site 32 will remain the same. Even though groundwater is not associated with the site, there is no current or expected future use for groundwater as a drinking water supply in the immediate vicinity of Site 32 due to general low quality and yield and more readily available potable water. Potable water at WPNSTA Yorktown is supplied by the City of Newport News Waterworks.

## 2.6 Summary of Site Risks

A human health risk screening was conducted and evaluated in the EE/CA (Attachment 1). Potential ecological risks were evaluated and documented in the Steps 6 and 7 Aquatic BERA.

### 2.6.1 Human Health Risk Screening Summary

Prior to the removal action, a HHRS was conducted to identify if any potential human health risk existed from exposure to inorganics in Site 32 sediment. Sediment data, collected during the Steps 6 and 7 Aquatic BERA, were compared to adjusted residential human health screening levels (residential soil regional screening level  $\times$  10) to conservatively determine which constituents, if any, potentially posed a risk to human receptors. With the exception of arsenic in surface and subsurface sediment samples, the results of the comparison indicated no exceedances over the screening levels. The detected arsenic concentrations were determined to be acceptable for the following reasons:

- The maximum arsenic concentration in surface sediment was 34.3 mg/kg, which is only twice the background concentration (16.1 mg/kg). In addition, the average surface sediment arsenic concentration (prior to any removal action) was approximately 11 mg/kg, which is below background concentrations.
- The maximum arsenic concentration detected in subsurface sediment was 11.4 mg/kg, which is consistent with background concentrations (10.5 mg/kg). In addition, the average subsurface sediment arsenic concentration (prior to any removal action) was approximately 9 mg/kg, which is below background concentrations.

Since no other exceedances over the screening levels were identified for surface and subsurface sediment, a quantitative human health risk assessment, including the development of a human health conceptual site model (CSM) was not conducted.

Prior to the removal action, a human health risk screening was conducted to identify if any potential human health risks existed from exposure to inorganics in Site 32 surface water. Surface water data,

either use Site 32 or identify in the

Site 32

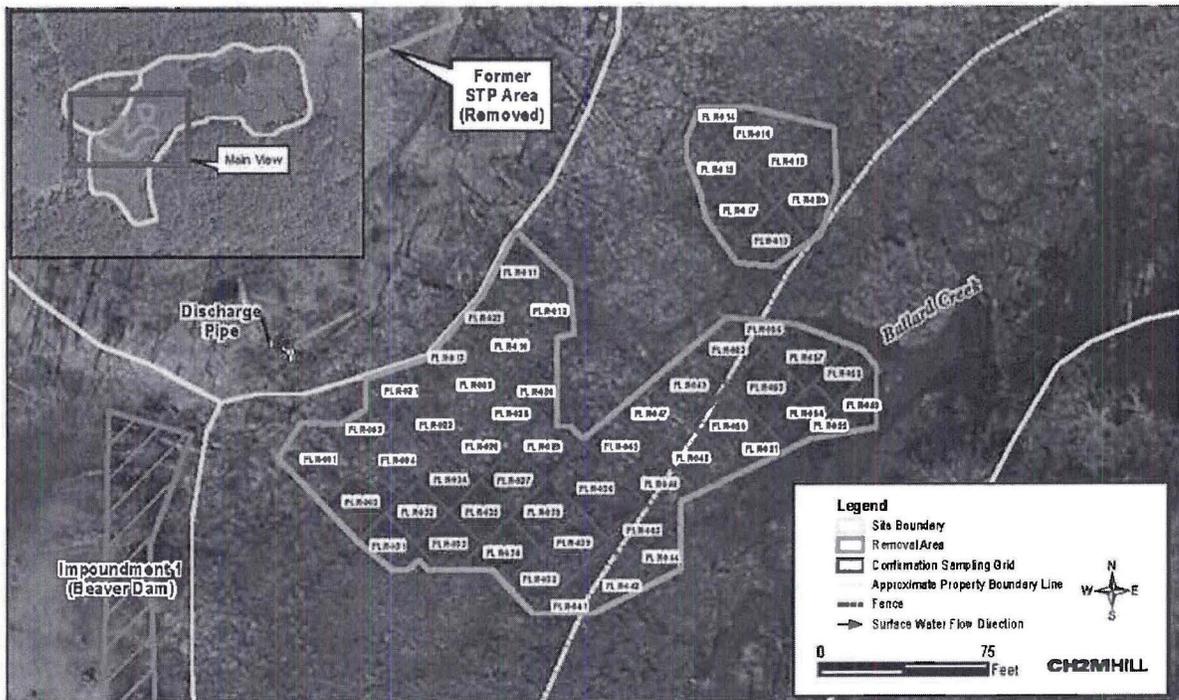
Attachment 1, section 2.4.1

Section 2.4.1

beginning (Site 32, or Sit

by the WPNSTA Yorktown Partnering Team. The remediation goals were determined to be site-specific, no observed adverse effect levels, and therefore protective of ecological receptors.

**FIGURE 4**  
Sediment Removal and Sampling Map – Site 32, the Wetlands Area Downgradient of Beaver Pond



Following the removal action, **post-excavation confirmation sampling results**<sup>16</sup> verified that concentrations of cadmium, mercury, and silver in the sediment remaining on-site were below the established remediation goals (Table 2). Since sediment remediation goals were established to be protective of ecological receptors, the Navy, USEPA Region 3, and VDEQ agree that no potentially unacceptable risk remains on-site from exposure to sediment and no further investigation or remediation is warranted for potential ecological receptors.

**TABLE 2**  
Maximum Concentrations of COCs Remaining in Sediment following Removal Action

Contaminant of Concern	Cadmium	Mercury	Silver
Remediation Goal (mg/kg)	3.8	4.2	102
Maximum Remaining Concentration (mg/kg)	3.7	3.5	70.7

## 2.7 No Action Determination

Exposure to surface water and sediment at Site 32 poses no unacceptable risk to human health or the environment. The Navy, in partnership with the USEPA Region 3 and VDEQ, agrees that No Action is required under CERCLA for Site 32. Site conditions allow for unlimited use and unrestricted exposure. No further remedial response action and no restrictions on any land use are necessary at Site 32.

*Further?*

*Further*



are defined by sample results where concentrations of mercury, cadmium, and/or silver exceed proposed cleanup goals (PRGs), which are based upon the site-specific NOAELs. The fact that these areas are separated by an area where sample results indicate cleanup goals are not exceeded is likely evidence for differential sedimentation within the wetland area.

## 2.4 Streamlined Risk Evaluation

According to the 2008 BERA, SSA 25 wetland sediments pose a potential unacceptable ecological risk from exposure to mercury, cadmium, and silver (CH2M HILL, 2008). However, the BERA did not identify any potential unacceptable ecological risks at SSA 25 from exposure to surface water or from bioaccumulation of mercury or methyl mercury in fish or amphibian populations. Based on a human health risk screening evaluation completed as part of the EE/CA, there are no potential risks present at SSA 25 from exposure to sediment or surface water. Furthermore, with no shellfish and only very small fish present at the site (mosquito fish, no longer than about six centimeters), there is no potential human health risk associated with future consumption of fish. Finally, soil and groundwater are not considered media of interest at SSA 25 as discharge from the former STP #2 occurred directly to the wetland area.

### 2.4.1 Human Health Risk

10

Based on a risk screening evaluation completed as part of this EE/CA, there are no potential human health risks present at SSA 25 from exposure to sediment or surface water.

#### Sediment

Data collected as part of the Site 12 LTM within the SSA 25 wetland area indicates that select inorganics, and not VOCs, SVOCs, pesticides, and PCBs, are chemicals of potential concern (COPCs) at SSA 25 (Baker, 2005b). To identify any potential human health risk from exposure to inorganics in SSA 25 sediments, the full suite inorganic sediment dataset collected as part of the 2008 BERA (CH2M HILL, 2008) were compared to the residential human health screening level (residential soil regional screening level  $\times$  10) as part of this EE/CA. Arsenic is the only inorganic chemical detected in this sediment above the residential human health screening level. However, potential human health risks from exposure to arsenic in surface sediment (0-4 inches) are considered manageable based on a comparison to site-specific reference background identified in the BERA (CH2M HILL, 2008). Sample results indicate only two of the 32 samples exceed background for arsenic, the maximum concentration detected (34.3 mg/kg) is only twice background (16.1 mg/kg), and the average concentration that remains without taking an action (approximately 11 mg/kg) is less than background. Similarly, potential human health risks from exposure to arsenic in subsurface sediments (4-8 inches) are considered manageable based on a comparison to site-specific reference background identified in the BERA (CH2M HILL, 2008). These samples indicate the maximum concentration of arsenic detected (11.4 mg/kg) is consistent with background (10.5 mg/kg), and the average concentration that remains without taking any action (approximately 9 mg/kg) is below background.



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## Record of Decision Site 32 Wetlands Area Downgradient of Beaver Pond

Naval Weapons Station Yorktown, Yorktown, Virginia

April 2011

### 1 Declaration

This Record of Decision (ROD) presents the selected remedy of No Action for sediment and surface water at the Environmental Restoration Program (ERP) Site 32, the Wetlands Area Downgradient of Beaver Pond, at Naval Weapons Station (WPNSTA) Yorktown, Yorktown, Virginia (USEPA ID: VA8170024170). The No Action determination has been made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C §§ 9601 et. seq., and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. This decision is based on information contained in the Administrative Record (AR) file for Site 32. Information not specifically summarized in this ROD or its references, but contained in the AR file, has been considered and is relevant to the No Action determination for Site 32. Thus, this ROD is based upon and relies on the entire AR file for Site 32 in making the decision.

**Comment [m1]:** There was a NTCRA conducted at the site. This can no longer be called a "No Action" but a "No Further Action" ROD. Please revise all reference to 'No action' in this document.

The United States Department of the Navy (Navy) is the lead agency and provides funding for ERP activities at Site 32. The Navy and United States Environmental Protection Agency (USEPA) Region 3, the lead regulatory agency, issue this No Action ROD jointly. The Commonwealth of Virginia Department of Environmental Quality (VDEQ), the support regulatory agency, participated throughout the investigation process, has reviewed this ROD and the materials on which it is based, and concurs with this decision for No Action. The No Action determination documented in this ROD for Site 32 does not include or affect any other sites at WPNSTA Yorktown.

#### 1.1 Selected Remedy

Based on the findings of environmental investigations completed for surface water and sediment and the non-time critical removal action (NTCRA) completed for sediment at Site 32, there is no unacceptable risk to human health or the environment under current or potential future Site 32 uses. Groundwater and soil are not associated with Site 32. Therefore, the selected remedy for Site 32 is No Action for sediment and surface water. Because there are no hazardous substances, pollutants, or contaminants remaining onsite above the levels that allow for unrestricted use and unlimited exposure, a Five-year review will not be required.

**1.2 Navy Authorizing Signature for the No Action Record of Decision for Surface Water and Sediment at Site 32, the Wetlands Area Downgradient of Beaver Pond, WPNSTA Yorktown, Yorktown, Virginia**

\_\_\_\_\_  
Captain Charles B. Marks, III  
Commanding Officer  
Naval Weapons Station Yorktown

\_\_\_\_\_  
Date

**1.3 USEPA Region 3 Authorizing Signature for the No Action Record of Decision for Surface Water and Sediment at Site 32, the Wetlands Area Downgradient of Beaver Pond, WPNSTA Yorktown, Yorktown, Virginia**

\_\_\_\_\_  
Henry J. Sokolowski  
Director  
Office of Federal Facility Remediation and Site Assessment

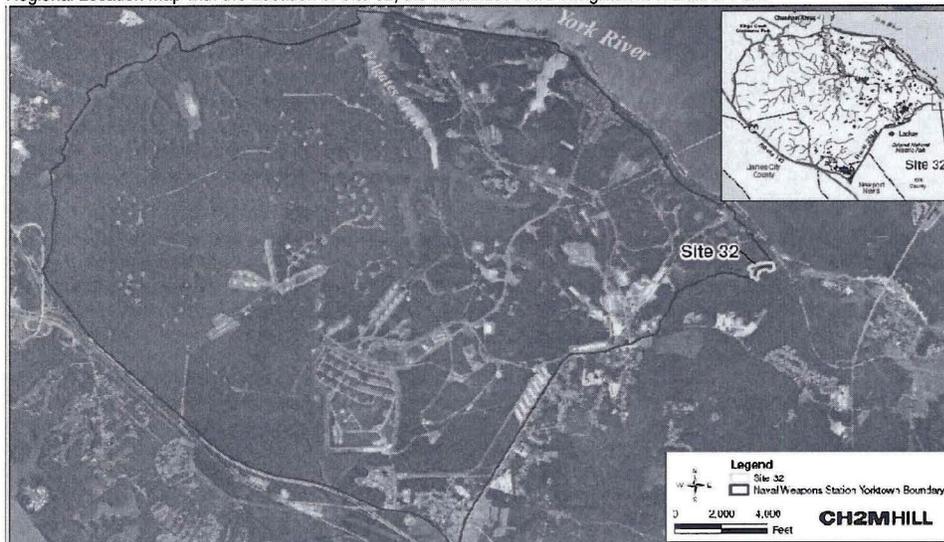
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Date

## 2 Decision Summary

### 2.1 Site Description and History

WPNSTA Yorktown is a 10,624-acre installation located on the Virginia Peninsula between the York River and James River in Virginia (Figure 1). WPNSTA Yorktown was established in 1918 to support the laying of mines in the North Sea during World War I. During World War II, the facility was expanded to include three trinitrotoluene loading plants and new torpedo overhaul facilities. A research and development laboratory for experimentation with explosives was established in 1944. In 1947, a quality evaluation laboratory was developed to monitor special tasks assigned to the facility, which included the design and development of depth charges and advanced underwater weapons. Today, the primary mission of WPNSTA Yorktown is to provide ordnance, technical support, and related services to sustain the war-fighting capability of the armed forces in support of national military strategy.

**FIGURE 1**  
Regional Location Map with the Location of Site 32, the Wetlands Area Downgradient of Beaver Pond



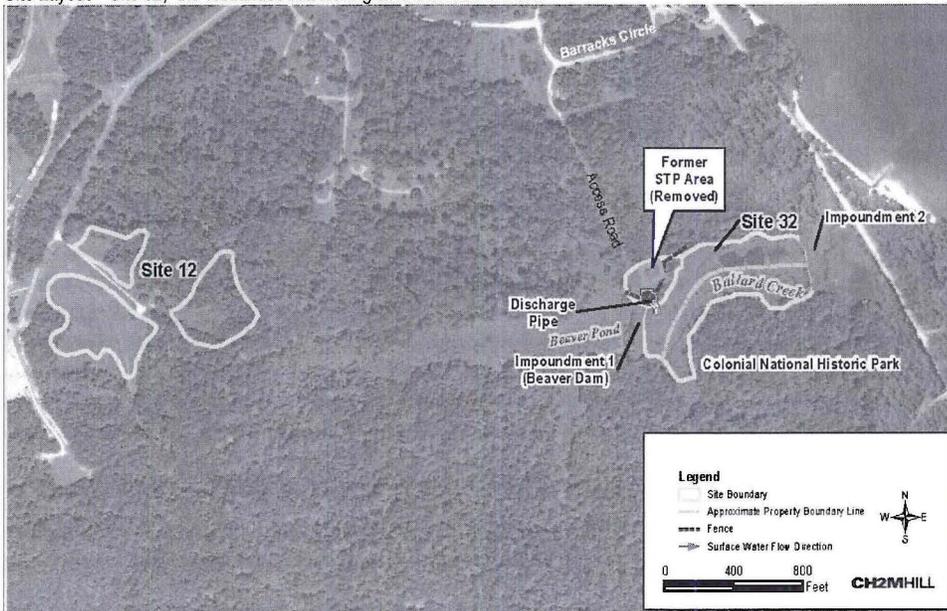
**Comment [m2]:** Please include a north arrow on the map. Anything in the Legend needs to be represented on the map.

Site 32 (formerly known as Site Screening Area [SSA] 25), the Wetlands Area Downgradient of Beaver Pond, encompasses an area of approximately 5.6-acres in the extreme eastern portion of WPNSTA Yorktown, the centerline of which represents the boundary between the installation and the National Park Service (NPS) Colonial National Historic Park (Figure 2). Site 32, consisting of only surface water and sediment, is located downgradient of Environmental Restoration (ER) Site 12 and Beaver Pond, between two impounded portions of Ballard Creek (Figure 2). Impoundment No. 1 is a natural beaver dam that forms the western boundary while Impoundment No. 2 forms the eastern boundary; the origin of Impoundment No. 2 is unclear. Ballard Creek flows around the northern edge of Impoundment No. 1, through the wetland area, around the southern edge of Impoundment No. 2, and eventually discharges to the York River. Groundwater and soil are not associated with Site 32.

Sewage Treatment Plant 2 (STP 2), consisting of a clarifier, settling tanks, and sludge drying beds was formerly located north of Impoundment No. 1 (Figure 2). During its operational period, the STP 2

trickling filter discharged directly to Site 32 through a regulated discharge pipe. This trickling filter used elemental mercury (approximately 4 to 6 ounces) as a water seal in the pivot point. Though this seal was maintained, it is likely that mercury leaked into the trickling filter tank and was subsequently discharged to Site 32 through the regulated discharge pipe. In 2000, when STP 2 was dismantled and removed, beaded elemental mercury was discovered at the base of the trickling filter.

**FIGURE 2**  
Site Layout – Site 32, the Wetlands Area Downgradient of Beaver Pond



**Comment [m3]:** There is need to mention here that STP 2 will be investigated (or currently under investigation?) in order to make sure it is not a continuous source of discharge to Site 32

**Comment [m4]:** Show north arrow on the map

## 2.2 Previous Investigations and Removal Actions

Sampling of sediment at Site 32 began as part of WPNSTA Yorktown ER Site 12 long-term monitoring (LTM) activities. As outlined in the ER Site 12 ROD, the selected remedy for surface water and sediment within Ballard Creek was LTM. **Results<sup>a</sup>** of the Site 12 LTM activities conducted in 1998 and between 2000 and 2003 indicated that mercury, cadmium, and silver concentrations in sediment were elevated relative to background concentrations. Following the discovery of beaded elemental mercury at the base of the trickling filter during former STP 2 removal activities in 2000, it was determined that sediment within the wetlands area downgradient of Beaver Pond (Site 32) may have been impacted by mercury releases from STP 2 as opposed to ER Site 12. As a result, further investigations for Site 32 were conducted. Detailed information from previous investigations conducted at Site 32 is available in the AR for Yorktown. The investigations conducted at Site 32 are summarized and listed in **Table 1**.

<sup>a</sup>**Bold Italicized Text** identifies detailed site information available in the Administrative Record and listed in numerical order in the References Table.

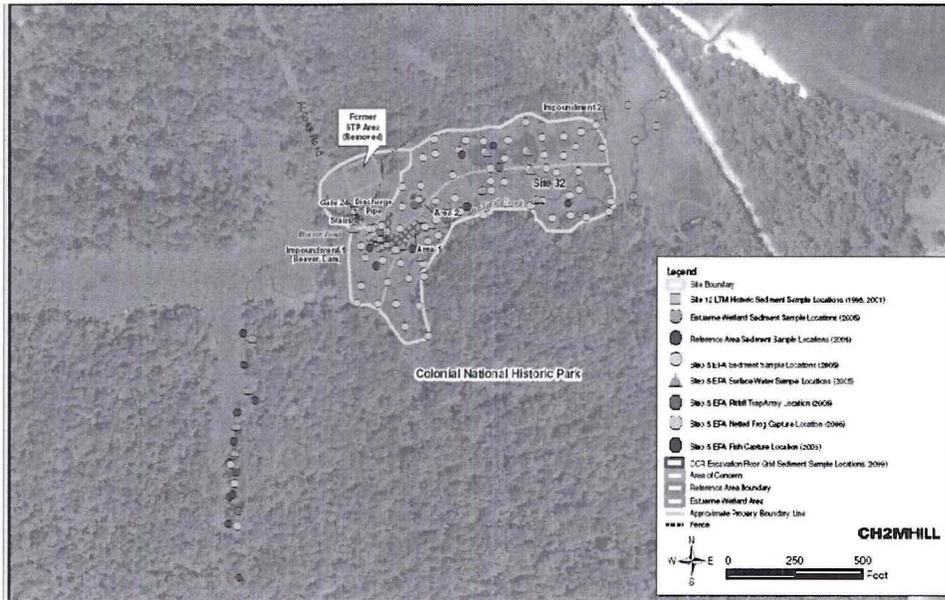
**TABLE 1**  
Previous Studies and Investigations Summary

Previous Study / Investigation* (Document and Document date)	Dates of Study/ Investigation	Investigation Activities
Limited Field Investigation	2003	After identifying the potential source of mercury in the wetland sediment, 39 surface and 12 subsurface sediment samples were collected in August 2003 to delineate total mercury concentrations in the vicinity of the sediment samples collected during the Site 12 LTM activities. Based on the analytical <b>results<sup>2</sup></b> , the <b>partnering team agreed<sup>3</sup></b> to move forward with a BERA to further characterize the nature and extent of mercury in the wetland area and to assess potential ecological impacts within the wetland area from exposure to mercury associated with the former STP 2 area.
Final Project Plans Step 3B and 4 of the BERA (Baker, 2005)	2005	The <i>Project Plans, Step 3B (problem formulation) and 4 (study design/data quality objectives) of the BERA</i> were completed in October 2005 to define the key pathways, chemicals, and receptors that could be driving potential risks within Site 32 and to establish the measurement endpoints, study design, data quality objectives, and data analysis methods for additional Site 32 investigations necessary to complete the ERA.  Since mercury may have been historically transported from the STP 2 trickling filter tank through a regulated outfall to Site 32, the collection of surface water, sediment, and fish and frog tissue samples for analytical testing, collection of sediment samples for toxicological testing, and collection of background samples for analytical and toxicological testing were recommended. In addition, although not associated with a release, toxicity tests of surface sediment samples for cadmium and silver analysis were recommended since they were detected in one or more of the sediment samples and could potentially function as a <b>confounding factor<sup>4</sup></b> in the toxicity tests.
Final Steps 6 and 7 of the Aquatic BERA (CH2M HILL, 2008)	2008	In September 2005, the <b>partnering team agreed<sup>5</sup></b> to the work outlined in the Project Plans, Step 3B and 4 BERA. <b>Sediment, surface water, and tissue samples<sup>6</sup></b> were collected to assess the potential for mercury and the confounding metals (cadmium and silver) to adversely impact aquatic receptors at Site 32. The <b>analytical results<sup>7</sup></b> indicated two areas where mercury, cadmium, and silver in sediment posed a <b>potential ecological risk<sup>8</sup></b> at Site 32 and a remedial action was recommended.
Final Engineering Evaluation/Cost Analysis (EE/CA) Site Screening Area 25 (CH2M HILL, 2009)	2009	Three remedial action alternatives were evaluated in the EE/CA. Based on the <b>evaluation<sup>9</sup></b> , wetland sediment excavation and offsite disposal was the selected alternative to address potential ecological risks at Site 32. <b>Preliminary remediation goals<sup>10</sup></b> (PRGs) for cadmium, mercury, and silver were developed by the WPNSTA Yorktown ecological subgroup and agreed to by the WPNSTA Yorktown Partnering Team. The PRGs were established to be protective of ecological receptors. In addition, a Human Health Risk Screening (HHRS) was conducted to identify if any potential human health risk existed from exposure to inorganics in Site 32 sediment and surface water.
Final Construction Completion Report Removal Action at Site 32 (Shaw, 2010)	2010	Between July and October 2009, a NTCRA was conducted to mitigate direct contact by ecological receptors with contaminated sediment at Site 32. In total, approximately 2,041 tons of contaminated sediment was removed from Site 32. Following excavation, confirmation samples were collected and analyzed for cadmium, mercury, and silver. <b>Results were compared to the remediation goals<sup>11</sup></b> (RGs) and additional excavation was conducted until the confirmation sample results were below the established RGs. Following removal, the site was restored to pre-construction conditions with clean fill and wetland vegetation to return it to the same hydrologic, topographic, and vegetative states.

**Notes:**

\* The documentation listed is available in the AR and provides information used to support the no action determination for Site 32.

**FIGURE 3**  
Historical Sampling Locations – Site 32, the Wetlands Area Downgradient of Beaver Pond



Comment [m5]: North arrow?

### 2.3 Scope and Role of Operable Unit

Comprehensive environmental restoration activities at WPNSTA Yorktown began in 1984 under the Navy Assessment and Control of Installation Pollutants program prior to state and federal regulatory oversight of environmental activities at the installation. The Navy Assessment and Control of Installation Pollutants program was modified to become the ERP in 1986 (then known as the Installation Restoration Program [IRP]) to meet the requirements of CERCLA as amended. WPNSTA Yorktown was added to the National Priorities List (NPL) on October 15, 1992 (USEPA ID: VA8170024170). A Federal Facilities Agreement (FFA) between the Navy and USEPA Region 3 was signed in August 1994. This FFA identified CERCLA sites, SSAs, and areas of concern (AOCs) for investigation and possible cleanup, and provided the framework and a schedule to accomplish this work. Subsequent to the FFA, additional sites, SSAs, and AOCs were added to the ERP. Site 32 was evaluated in accordance with CERCLA and the NCP under the Navy's ERP, the status of which can be found in the current version of the Site Management Plan in the AR file for WPNSTA Yorktown.

The following sites are currently in the RI/FS stage of the CERCLA process:

- Groundwater – Sites 9 and 19
- Groundwater, surface water, and sediment – Sites 1, 3, and 6
- All associated media – Sites 8, 23, 24, 25, 26, 28, 31, 33, and 34

The following sites have a final ROD in place:

- Soil and waste – Sites 1, 3, 4, 6, 21, and 22
- Soil, surface water and sediment – Site 9
- Soil – Site 19
- All associated media – Sites 5, 7, 11, 12, 16, 17, 18, 27, 29, and 30

A final ROD is pending for Site 28 (all media) and a final ROD is pending for Sites 22 (surface water and sediment), 4 and 21 (groundwater, surface water, and sediment). The no action determination documented in this ROD for Site 32 does not include or affect any other site at WPNSTA Yorktown.

## 2.4 Site Characteristics

Site 32 is a wetlands area located in the extreme eastern portion of WPNSTA Yorktown. The topography of this wetland area is characterized as a broad, flat area between steep upland slopes with elevations at the top of the slope on the order of 30 to 50 feet above mean sea level. One main surface water channel, along with numerous small braided surface water channels and small ponds, all no deeper than about 6 inches, are located between two impoundments within this wetlands area.

Upland canopy tree species, including American sycamore, loblolly pine, sweet gum, and yellow poplar, are present along the Site 32 perimeter and across each impoundment while freshwater emergent wetland vegetation is present within the wetland itself.

Even though groundwater is not associated with the site, groundwater within the vicinity of Site 32 is expected to first occur at relatively shallow depths (Columbia Aquifer) and discharge locally.

## 2.5 Current and Potential Future Land and Resource Uses

The current and potential future use for Site 32 is as a wetland area and not anticipated to change unless the mission of the base is altered. Site 32 is surrounded by two impounded portions of Ballard Creek. It is anticipated that WPNSTA Yorktown will remain a military installation for the foreseeable future, and Site 32 will remain the same. Even though groundwater is not associated with the site, there is no current or expected future use for groundwater as a drinking water supply in the immediate vicinity of Site 32 due to general low quality and yield and more readily available potable water. Potable water at WPNSTA Yorktown is supplied by the City of Newport News Waterworks.

## 2.6 Summary of Site Risks

A human health risk screening was conducted and evaluated in the EE/CA (**Attachment 1**). Potential ecological risks were evaluated and documented in the Steps 6 and 7 Aquatic BERA.

### 2.6.1 Human Health Risk Screening Summary

Prior to the removal action, a HHRS was conducted to identify if any potential human health risk existed from exposure to inorganics in Site 32 sediment. Sediment data, collected during the Steps 6 and 7 Aquatic BERA, were compared to adjusted residential human health screening levels (residential soil regional screening level  $\times$  10) to conservatively determine which constituents, if any, potentially posed a risk to human receptors. With the exception of arsenic in surface and subsurface sediment samples, the results of the comparison indicated no exceedances over the screening levels. The detected arsenic concentrations were determined to be acceptable for the following reasons:

- The maximum arsenic concentration in surface sediment was 34.3 mg/kg, which is only twice the background concentration (16.1 mg/kg). In addition, the average surface sediment arsenic concentration (prior to any removal action) was approximately 11 mg/kg, which is below background concentrations.
- The maximum arsenic concentration detected in subsurface sediment was 11.4 mg/kg, which is consistent with background concentrations (10.5 mg/kg). In addition, the average subsurface sediment arsenic concentration (prior to any removal action) was approximately 9 mg/kg, which is below background concentrations.

Since no other exceedances over the screening levels were identified for surface and subsurface sediment, a quantitative human health risk assessment, including the development of a human health conceptual site model (CSM) was not conducted.

Prior to the removal action, a human health risk screening was conducted to identify if any potential human health risks existed from exposure to inorganics in Site 32 surface water. Surface water data,

collected during the Steps 6 and 7 Aquatic BERA, were compared to the freshwater Federal Water Quality Criteria, tap water regional screening level  $\times 10$ , and maximum contaminant level (MCL) to conservatively determine which constituents, if any, potentially posed a risk to human receptors. The results of the comparison indicated no exceedances over the screening levels; therefore, a quantitative human health risk assessment including the development of a human health CSM was not conducted.

### 2.6.2 Ecological Risk Assessment Summary

Based on detected mercury concentrations measured during the August 2003 Limited Field Investigation and established screening values, maximum hazard quotients (HQs) for surface and subsurface sediment were calculated to characterize the potential for mercury to pose unacceptable ecological risk using conservative exposure assumptions. The HQs represented a ratio of the maximum mercury detection to the sediment screening value and were an estimate of potential risk. Based on the **results**<sup>12</sup> of these calculations, the Yorktown Team agreed to complete a BERA, foregoing Steps 1 through 3a of the ecological risk assessment (ERA) process.

The BERA conducted for Site 32 consisted of Steps 3b through 7, in accordance with Navy and USEPA policy and guidance. Mercury was the only contaminant of concern identified at Site 32. Exposure routes evaluated included direct contact exposures by lower trophic level wetland receptors (benthic invertebrates, fish, and amphibians) to mercury in wetland surface waters and sediments, ingestion-based exposures by lower trophic level wetland receptors (benthic invertebrates, fish, and amphibians) to mercury in wetland surface waters and sediments, ingestion-based exposures by upper trophic level piscivorous birds and mammals to mercury in wetland surface waters and sediments, and indirect exposures (via food web exposure to contaminated prey items) by upper trophic level piscivorous birds and mammals to mercury in wetland surface water and sediment. Soil and groundwater are not associated with Site 32 and therefore were not evaluated as part of this investigation.

In order to assess risk to ecological receptors, the environmental setting, chemical fate and transport, ecotoxicity and potential receptors and complete exposure pathways were first identified. This information was used to develop an **ecological conceptual site model**<sup>13</sup> (CSM) (**Attachment 2**). Aquatic pathways were assessed to be complete at Site 32. This receptor pathway was based on contaminants in surface water and sediment.

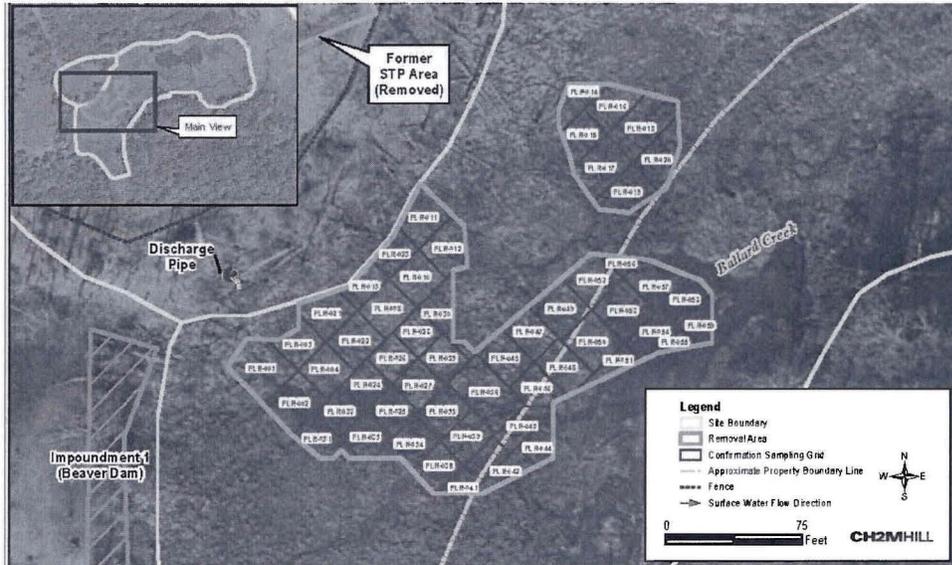
Toxicity tests were conducted on aquatic indicator species (fish, frogs, and invertebrate amphipods) in order to directly evaluate the toxicity and bioavailability of contaminants in surface water and sediment. The effects of chemical concentrations on organism survival, growth, and/or fecundity were evaluated by placing each organism in lab-controlled microcosms composed of soil and sediment from Site 32, the nearby reference reach, or laboratory-prepared reference media over an extended period of time. Surface water was evaluated by running laboratory-prepared water over sediment to mimic the contributions of Site 32 sediment to surface water. Laboratory-prepared reference media were used as a negative control to ensure that organisms used in the study were in good health prior to the study and not negatively impacted by conditions unrelated to Site 32 media. **Results of the toxicity testing**<sup>14</sup> were statistically compared to determine if effects of exposure to Site 32 media were significantly different from the reference reach.

The Steps 6 and 7 Aquatic BERA identified **potentially unacceptable risk**<sup>15</sup> to aquatic receptors due to exposure to mercury in wetland sediment. However, based on the co-location of mercury, cadmium, and silver, and the correlation between concentrations of these three metals and observed toxic responses, the remediation of the cadmium and silver was recommended in addition to remediation of mercury to ensure the protectiveness of the selected remedy for wetland sediments.

An NTCRA was conducted in 2009 to excavate and dispose of the sediment posing risk to ecological receptors (**Figure 4**). Remediation goals for cadmium, mercury, and silver were developed by the WPNSTA Yorktown ecological subgroup (comprised of technical representatives from the Navy, USEPA Region 3, (Biological Technical Assistance Group [BTAG]), and VDEQ) and were agreed to

by the WPNSTA Yorktown Partnering Team. The remediation goals were determined to be site-specific, no observed adverse effect levels, and therefore protective of ecological receptors.

**FIGURE 4**  
Sediment Removal and Sampling Map – Site 32, the Wetlands Area Downgradient of Beaver Pond



Comment [m6]: North arrow?

Following the removal action, *post-excavation confirmation sampling results*<sup>16</sup> verified that concentrations of cadmium, mercury, and silver in the sediment remaining on-site were below the established remediation goals (Table 2). Since sediment remediation goals were established to be protective of ecological receptors, the Navy, USEPA Region 3, and VDEQ agree that no potentially unacceptable risk remains on-site from exposure to sediment and no further investigation or remediation is warranted for potential ecological receptors.

**TABLE 2**  
Maximum Concentrations of COCs Remaining in Sediment following Removal Action

Contaminant of Concern	Cadmium	Mercury	Silver
Remediation Goal (mg/kg)	3.8	4.2	102
Maximum Remaining Concentration (mg/kg)	3.7	3.5	70.7

## 2.7 No Action Determination

Exposure to surface water and sediment at Site 32 poses no unacceptable risk to human health or the environment. The Navy, in partnership with the USEPA Region 3 and VDEQ, agrees that No Action is required under CERCLA for Site 32. Site conditions allow for unlimited use and unrestricted exposure. No further remedial response action and no restrictions on any land use are necessary at Site 32.

## 2.8 Community Participation

Community participation at WPNSTA Yorktown includes a Restoration Advisory Board (RAB), public meetings, public information repositories, newsletters, fact sheets, public notices, and an ERP website. The Community Involvement Plan for WPNSTA Yorktown provides detailed information on community participation for the ERP. The RAB was formed in 1994 and consists of community members and representatives of the USEPA Region 3, the VDEQ, and the Navy. RAB meetings are held twice per year and are open to the public to provide opportunity for public comment and input.

The investigations conducted at Site 32, the findings, and the Proposed Plan (PP) that forms the basis for this No Action ROD have been presented and discussed with the RAB. In addition, in accordance with Section 117(a) of CERCLA, the Navy provided a public comment period from February 20, 2011 through April 5, 2011 for the Site 32 No Action PP. In accordance with 40 CFR 300.430(f) (3)(1)(A), a notice of availability was published in *The Virginia Gazette* and the *Daily Press* on February 19 and 20, 2011, respectively. The PP was available for review during the public comment period at the York County Public Library - Yorktown (8500 George Washington Memorial Highway, Yorktown, VA 23692, 757-890-3377). The public comment period included a public meeting to present the PP which was held on March 10, 2011 at the York County Public Library – Yorktown. No comments were received during the public comment period for the Site 32 No Action PP.

This ROD, the PP, and all other information that supports this No Action determination are available in the AR. The AR is accessible to the public at:

Public Affairs Office  
NAVFAC Atlantic  
6506 Hampton Blvd  
Norfolk, VA 23508-1278  
757-322-4785

### 3 Responsiveness Summary

The participants in the public meeting included RAB members representing the Navy and USEPA. Since no one from the public or RAB members outside the Navy and USEPA attended the meeting, no presentation was made and no questions or concerns were received during the meeting. No meeting transcript was generated. In addition, no written comments, concerns, or questions were received by the Navy, USEPA, or VDEQ during the public comment period.



## References

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
1	results	Section 2.2	Baker. 2005. Final Site 12 Final Long-term Monitoring (LTM) Report (1998-2003), Naval Weapons Station, Yorktown, Virginia. Figures 9-5, 9-8, 9-10. AR No. 02078
2	results	Table 1	Baker. 2005. Final Project Plans Step 3B and 4 of the Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. Figure 2-7. AR No. 01873
3	partnering team agreed	Table 1	Yorktown Tier I Partnering Team. 2004. <i>Consensus Statement 5-18-04-37, Naval Weapons Station Yorktown, Yorktown, Virginia.</i> May.
4	confounding factor	Table 1	Baker. 2005. Final Project Plans Step 3B and 4 of the Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. Section 5.3.2.2. AR No. 01873
5	partnering team agreed	Table 1	Yorktown Tier I Partnering Team. 2005. <i>Consensus Statement 8-17-05-42, Naval Weapons Station Yorktown, Yorktown, Virginia.</i> September.
6	Sediment, surface water, and tissue samples	Table 1	CH2M HILL. 2008. Final Steps 6 and 7 of the Aquatic Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. November. Tables 3-1 through 3-6. AR No. 02412
7	analytical results	Table 1	CH2M HILL. 2008. Final Steps 6 and 7 of the Aquatic Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. November. Tables 4-24, 4-24, and 4-25. AR No. 02412
8	potential ecological risk	Table 1	CH2M HILL. 2008. Final Steps 6 and 7 of the Aquatic Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. November. Figure 4-9. AR No. 02412

REFERENCES

Item	Reference Phrase in ROD	Location in ROD	Identification of Referenced Document Available in the Administrative Record
9	evaluation	Table 1	CH2M HILL. 2009. Final Engineering Evaluation/Cost Analysis (EE/CA) Site Screening Area 25, Naval Weapons Station, Yorktown, Virginia. July. Section 4. AR No. 00104
10	Preliminary remediation goals	Table 1	CH2M HILL. 2009. Final Engineering Evaluation/Cost Analysis (EE/CA) Site Screening Area 25, Naval Weapons Station, Yorktown, Virginia. July. Table 3-1. AR No. 00104
11	Results were compared to the remediation goals	Table 1	Shaw. 2010. Final Construction Completion Report Removal Action at Site 32, Naval Weapons Station, Yorktown, Virginia. August. Tables 3 through 10. AR No. 00113
12	Results	Section 2.6.2	Baker. 2005. Final Project Plans Step 3B and 4 of the Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. Tables 2-5 and 2-6. AR No. 01873
13	ecological conceptual site model	Section 2.6.2	CH2M HILL. 2008. Final Steps 6 and 7 of the Aquatic Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. November. Figure 2-9. AR No. 02412
14	Results of the toxicity testing	Section 2.6.2	CH2M HILL. 2008. Final Steps 6 and 7 of the Aquatic Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. November. Tables 4-23 through 4-25. AR No. 02412
15	potentially unacceptable risk	Section 2.6.2	CH2M HILL. 2008. Final Steps 6 and 7 of the Aquatic Baseline Ecological Risk Assessment, Naval Weapons Station Yorktown, Yorktown, Virginia. November. Figure 4-9. AR No. 02412
16	post-excavation confirmation sampling results		Shaw. 2010. Final Construction Completion Report Removal Action at Site 32, Naval Weapons Station, Yorktown, Virginia. August. Section 2.4 and Tables 3 through 10. AR No. 00113

Detailed site information reference in this ROD in bold blue text is contained in the Administrative Record.

For access to information contained in the Administrative Record for WPNSTA Yorktown please contact:

Public Affairs Office, NAVFAC Atlantic  
 6506 Hampton Blvd  
 Norfolk, Virginia 23508-1278  
 Phone: (757) 322-4785

**Attachment 1**

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## **Attachment 2**

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