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FINAL RECORD OF DECISION FOR SITE 4 OU 16 NWS YORKTOWN VA
9/1/2005
BAKER ENVIRONMENTAL

9/1/05-01750

Final

Record of Decision

Site 4–Burning Pad Residue Landfill
Operable Unit No. XVI

Naval Weapons Station Yorktown
Yorktown, Virginia

September 2005

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A Transcript of February 16, 2005 Public Meeting

ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
CRP	Community Relations Program
CSF	Cancer Slope Factor
ERA	Ecological Risk Assessment
FFA	Federal Facility Agreement
HHRA	Human Health Risk Assessment
HI	Hazard Index
HQ	Hazard Quotient
ILCR	Incremental Lifetime Cancer Risk
NPL	National Priorities List
OU	Operable Unit
PCB	Polychlorinated Biphenyl
RA	Risk Assessment
RAB	Restoration Advisory Board
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
SVOC	Semivolatile Organic Compound
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WPNSTA	Naval Weapons Station

1.0 DECLARATION OF THE RECORD OF DECISION

1.1 Site Name and Location

Name: Site 18–Building 476 Discharge Area
Location: Naval Weapons Station (WPNSTA) Yorktown, Yorktown, Virginia
Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) ID: VA8170024170
CERCLIS Operable Unit (OU): 9

1.2 Statement of Basis and Purpose

This Record of Decision (ROD) documents that no remedial action is necessary to reduce the risks posed by contaminated media at Site 18 (the Site) at WPNSTA Yorktown, Virginia. The no action decision was made in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601 thru 9675 and, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. Section 2.2.3 of this ROD lists the documents that contain the information supporting the no action decision, and these documents are contained in the administrative record for WPNSTA Yorktown. The Commonwealth of Virginia concurs with the selected no action decision.

1.3 Description of the Selected Remedy

Previous investigations at Site 18 have determined that the Site poses no unacceptable human health or ecological risks from exposure to soil, groundwater, surface water, or sediment. Therefore, no CERCLA remedial action is necessary to protect human health or the environment.

1.4 Statutory Determination

The selected remedy protects human health and the environment and is cost effective. The Site does not require a five-year review because no hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

CAPT /USN — 2 Sep 05

Gerard O'Regan, CAPT, USN
Commanding Officer
Naval Weapons Station Yorktown

Date

9/26/05

Abraham Ferdas, Director
Hazardous Site Cleanup Division
United States Environmental Protection Agency, Region III

Date

2.0 DECISION SUMMARY

2.1 Site Name, Location, and Description

Name: Site 18–Building 476 Discharge Area
Location: WPNSTA Yorktown, Yorktown, Virginia
CERCLIS ID: VA8170024170
CERCLIS OU: 9

WPNSTA Yorktown is a 10,624-acre installation located on the Virginia Peninsula in York and James City Counties and the City of Newport News (Figure 2-1). WPNSTA is bounded on the northwest by the WPNSTA Yorktown Cheatham Annex and the King's Creek Commerce Center; on the northeast by the York River and the Colonial National Historic Parkway; on the southwest by Route 143 and Interstate 64; and on the southeast by Route 238 and the town of Lackey.

This ROD is jointly issued by the Navy (lead agency) and USEPA Region III. The Commonwealth of Virginia (support agency) concurs with the remedy.

2.2 Site History and Enforcement Activities

2.2.1 Site History

Originally named the U.S. Navy Mine Depot, WPNSTA Yorktown was established in 1918 to support the laying of mines in the North Sea during World War I. For 20 years after World War I, the depot received, reclaimed, stored, and issued mines, depth charges, and related materials. During World War II, the facility was expanded to include three additional 2,4,6-trinitrotoluene loading plants and new torpedo overhaul facilities. A research and development laboratory for experimentation with high 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. On August 7, 1959, the depot was renamed the U.S. Naval Weapons Station. 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.

Site 18 is a one-quarter mile long drainage ditch located north of Building 476 in the southeastern area of the installation along a small tributary leading to Lee Pond, approximately one mile downstream (Figure 2-2). This area was in use from the 1940s to the 1960s. The discharge into the ditch reportedly contained battery acid waste, consisting of hydrochloric acid or calcium hydroxide and dissolved metals such as lead, cadmium, nickel, and antimony. An estimated 100 to 200 pounds of metals may have been discharged. Battery acid waste no longer discharges from Building 476 into this drainageway. Currently, Site 18 is a drainageway that appears to be a natural stream in some areas and an excavated trench in others. From the amount of erosion present in portions of the drainageway, a good deal of water appears to flow through the area during storms.

2.2.2 Enforcement Activities

On October 15, 1992, WPNSTA Yorktown was included on the National Priorities List (NPL). A Federal Facility Agreement (FFA) between the United States Environmental Protection Agency (USEPA) Region III, the Commonwealth of Virginia, and the Department of the Navy (the Navy) was finalized for WPNSTA Yorktown in September of 1994. The FFA applies to the investigation, development, selection, and implementation of response actions for all releases or threatened releases

of hazardous substances, contaminants, hazardous wastes, hazardous constituents, or pollutants at or from WPNSTA Yorktown. No documented enforcement activities have been conducted to date at Site 18 under the FFA.

2.2.3 History of Previous Investigations

The Round One Remedial Investigation (RI) conducted at Site 18 in 1993 consisted of surface soil, groundwater, surface water, and sediment investigations (Baker and Weston, 1993). During the Round One RI, six surface soil samples, one groundwater sample, five surface water samples, and ten sediment samples were collected at Site 18. The soil samples contained arsenic and zinc at concentrations above Round One background levels at four sample locations, lead at two locations, and copper at three locations. Groundwater samples showed that no filtered samples contained inorganic concentrations that exceeded State or Federal criteria. Copper and zinc in surface water exceeded the State and Federal criteria, but not at the farthest downstream sampling point or in the branch northeast of Building 476. Sediment samples in the ditch also exceeded background inorganic concentrations for beryllium at only one location. Based on the results of the Round One RI, a human health and ecological risk screening was recommended.

During the Round Two RI conducted in 1997, additional data were collected to provide information necessary to characterize potential human health effects and ecological impacts resulting from previous site activities. Samples of surface and subsurface soil, groundwater, surface water, and sediment were collected. No organic contaminants were detected in the surface soil, subsurface soil, or groundwater. Inorganic contaminants were detected in all media. The results of the Human Health Risk Assessment (HHRA) and the Ecological Risk Assessment (ERA) completed as part of the Round Two RI confirmed that there are no unacceptable human health or ecological risks at Site 18 (Baker, 2004).

2.3 Highlights of Community Participation

The Proposed Plan for Site 18 was made available to the public in February of 2005. The Proposed Plan presented to the public that the chosen alternative for the Site was no action since there are no unacceptable risks to human health or the environment. The Proposed Plan and supporting documents can be found in the administrative record for WPNSTA Yorktown. Information for this site can be found at:

Virgil I. Grissom Public Library
366 Deshazor Drive
Newport News, VA 23506
(757) 369-3190

Additional information can be obtained from:

Robin Willis
Public Affairs Officer, Code 09PA
Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue, Building A-81
Norfolk, Virginia 23511
(757) 445-8732, ext. 3096

The notice of availability of the Proposed Plan was published in the *Daily Press* on February 13, 2005. A public comment period was held from February 13 to March 14, 2005. In addition, a public meeting was held on February 16, 2005 at the Charles E. Brown Community Building on Route 238 in Lackey, Virginia to inform interested members of the community about the preferred remedial alternative under consideration and to seek public comments. At this meeting, representatives from the Commonwealth of Virginia and the Navy were available to answer questions about Site 18 and the remedial alternative available for the Site. A transcript of the public meeting is included as Appendix A. No comments beyond clarifying questions were received at the public meeting or during the public comment period.

2.4 Scope and Role of the Remedy

The completed investigations at Site 18 are part of the comprehensive environmental investigations and remediation being conducted under the Installation Restoration Program at WPNSTA Yorktown. WPNSTA Yorktown is a large (10,624 acres) and complex Superfund site. To allow manageable projects, the Navy divided WPNSTA into 30 sites and several site screening areas. Some sites have been further divided into OUs. There are currently 18 OUs at WPNSTA. The remedial actions for OUs I through XII, OU XIV, XVI, XVII, and XVIII have been completed. OUs XIII, and XV are currently in the construction phase of the remedial action and are scheduled to continue into FY 2006.

Because there are no unacceptable human health or ecological risks at Site 18, no action is required and land use controls will not be implemented.

2.5 Summary of Site Characteristics

This section addresses analytical results of surface and subsurface soil, groundwater, surface water, and sediment samples collected as part of the Round Two Remedial Investigation (Baker, 2004).

2.5.1 Surface Soil

During the Round Two investigation, six surface soil samples (and one duplicate) were collected from the 0- to 6-inch interval and analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), nitramines, and inorganics. VOCs, SVOCs, PCBs, and nitramines were not detected in the samples. Five pesticides, alpha-BHC (detected in one of seven samples [1/7]), aldrin (1/7), heptachlor epoxide (1/7), 4,4'-DDE (2/7), and 4,4'-DDT (2/7), were detected in the surface soil. Inorganics were detected in all surface soil samples collected from Site 18.

2.5.2 Subsurface Soil

A total of six subsurface soil samples (and one duplicate) were collected from Site 18 during the Round Two investigation. These six samples were collected from depth intervals ranging from 10 to 28 feet below ground surface. Each sample was analyzed for VOCs, SVOCs, pesticides, PCBs, nitramines, and inorganics. VOCs, SVOCs, PCBs, and nitramines were not detected in the samples. Five pesticides, alpha-BHC (2/7), gamma-BHC (1/7), endosulfan I (2/7), heptachlor epoxide (2/7), and 4,4'-DDD (1/7), were detected in the subsurface soil. Inorganics were detected in all subsurface soil samples collected from Site 18.

2.5.3 Groundwater

Three groundwater samples (and one duplicate) were collected and analyzed for VOCs, SVOCs, pesticides, PCBs, nitramines, and total and dissolved inorganics during the Round Two investigation. No VOCs, SVOCs, PCBs, or nitramines were detected in the groundwater beneath Site 18. Endrin aldehyde (1/4) was the only detected pesticide in the groundwater. Total and dissolved inorganics were detected in the groundwater samples.

2.5.4 Surface Water

Four surface water samples (and one duplicate) were collected and analyzed for VOCs, SVOCs, pesticides, PCBs, nitramines, and total inorganics. No VOCs, pesticides, or PCBs were detected in the surface water. One SVOC, di-n-butylphthalate (1/5), and one nitramine, 2,4-DNT (1/5), were detected. Fifteen total inorganics were detected in the surface water at Site 18.

2.5.5 Sediment

Eight sediment samples (and one duplicate) were analyzed for VOCs, SVOCs, pesticides, PCBs, nitramines, and inorganics. No nitramines were detected in the samples. One VOC, acetone (1/9), and 16 SVOCs were detected in the sediment samples collected from Site 18. Five pesticides, 4,4'-DDD (2/9), 4,4'-DDE (4/9), 4,4'-DDT (1/9), alpha-chlordane (1/9), and gamma-chlordane (1/9), and one PCB, Aroclor-1254 (2/9), were detected in the sediment. Inorganics were detected in all sediment samples collected from Site 18.

2.6 Current and Potential Future Land and Resource Uses

Because the mission for WPNSTA Yorktown is to sustain war-fighting capabilities for all branches of the armed services, activities and land use at WPNSTA Yorktown are largely industrial. Site 18 is adjacent to Building 476 that contains industrial shops. Future land use will most likely remain as industrial.

2.7 Summary of Site Risks

A baseline risk assessment (RA) was conducted for Site 18. A baseline RA estimates what risks the Site might pose if no action is taken, and it provides the basis for taking remedial action at the Site. Both human health and ecological RAs were conducted at Site 18, and this section provides a brief summary of these RAs and identifies the contaminants and exposure pathways.

2.7.1 Human Health Risk Assessment

Human health risks are described by evaluating noncarcinogenic (systemic) and carcinogenic health effects. Reference dose (RfD) values developed by USEPA indicate the exposure dose at which the potential for adverse noncarcinogenic health effects exists from contaminants of potential concern. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. RfDs are derived from human epidemiological data or animal studies to which uncertainty factors have been applied to account for the use of animal data to predict effects on humans. These uncertainty factors help to ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with an RfD for a similar exposure period. The ratio of exposure

to the RfD is called a hazard quotient (HQ). HQ values are then summed to produce hazard indices (HIs) for each potential receptor and means of exposure (dermal, ingestion, inhalation). If an HI is greater than or equal to 1.0, the contaminants included in the HI are re-examined to see whether they affect the same target organ (e.g., liver). If they do, HIs are computed, summing HQ values only for contaminants that affect a single target organ. Contaminants that affect a single target organ and produce an HI greater than or equal to 1.0 are determined to be contaminants of concern (COCs), and remedial action is considered to reduce the risk of adverse, noncarcinogenic health effects in the exposed population.

Carcinogenic human health risks are expressed as a probability known as the incremental lifetime cancer risk (ILCR). This risk is the probability that an individual will develop cancer in his or her lifetime following exposure to a contaminant. These risks are usually expressed in scientific notation. An incremental lifetime cancer risk of $1x10^{-6}$, for example, indicates that an individual who receives an estimated reasonable maximum exposure to contaminants has one chance in a million of developing cancer as a result. This is referred to as an "incremental lifetime cancer risk" because it would be in addition to the risks of cancer that individuals face from other causes (for example, smoking). ILCR values for all potentially carcinogenic contaminants of potential concern (COPCs) to which a person may be exposed are added together to produce a total ILCR value. The total ILCR value is compared with USEPA's acceptable risk range of $1x10^{-6}$ to $1x10^{-4}$. The acceptable risk range is the range of cancer risks considered to be acceptable at most sites under most circumstances. For example, the upper end of USEPA's acceptable risk range, $1x10^{-4}$, means that one additional cancer case is estimated to occur in an exposed population of 10,000 as a result of exposure to the Site. It can also mean that an individual with an ILCR value of $1x10^{-4}$ has an estimated increased probability of 0.01 percent of developing cancer (over the course of a lifetime) following exposure. ILCR values of $1x10^{-4}$ or greater are evaluated to identify those contaminants in environmental media responsible for 95 percent of the unacceptable risk. These chemicals are considered to be COCs and remedial action is considered to reduce the cancer risk.

Surface soil, subsurface soil, groundwater, surface water, and sediment were evaluated in the HHRA. Both current- and future-potential human exposure scenarios were evaluated at Site 18. Current- and future-potential human receptors evaluated in the baseline HHRA for Site 18 include:

- Current Adult Maintenance Workers
- Current On-Station Adolescent Recreational Users and Trespassers (7 to 15 years old)
- Current On-Station Adult Recreational Users and Trespassers
- Future Adult Construction Workers
- Future Adult Industrial/Commercial Workers
- Future On-Station Young Child Residents (1 to 6 years old)
- Future On-Station Adult Residents

Potential receptors were selected based on available information concerning base activities and all foreseeable potential future land-use scenarios including future residential property use at Site 18.

The current adult maintenance worker scenario assumes that personnel could come into contact with the contaminated media during daily work at the Site. This receptor was evaluated for potential exposure to surface soil, surface water, and sediment via accidental ingestion, inhalation, and dermal contact while performing routine grounds keeping or other maintenance activities at the Site.

The current adult and adolescent trespasser scenario, although unlikely, assumes that WPNSTA personnel and adolescent children (family members) could trespass during recreational activities.

Potential exposure to the contaminated media for these potential current receptors includes accidental ingestion of and dermal contact with surface soil, surface water, and sediment. Total risks were estimated by site for the current potential trespassers using the concept of reasonable maximum exposure, which is the highest exposure that is reasonably expected to occur at a site and, in practice, is estimated by combining upper bound (90th and 95th percentile) values (USEPA, 1989).

Future construction and industrial/commercial workers were also evaluated at Site 18. Future construction workers were evaluated for potential exposures via accidental ingestion, dermal contact, and inhalation of COPCs in subsurface soil. Future industrial/commercial workers were evaluated for potential exposures via accidental ingestion, dermal contact, and inhalation of COPCs in surface soil.

Future residential development is unlikely at Site 18. However, the future on-Station adult and young child resident scenarios were evaluated to address all types of potential exposure and to provide a conservative estimate of future human risk. Future adult and child residents were evaluated for potential exposures via ingestion, dermal contact with, and inhalation of COPCs in surface soil, and ingestion of and dermal contact with COPCs in groundwater (when used for non-potable, beneficial purposes).

For each exposure route and potentially exposed population, ILCR values and HI values were calculated to quantify potential risks. The following subsections present a summary of risks (i.e., ILCR values greater than $1x10^{-4}$ and HI values greater than or equal to 1.0) for potential human receptors.

Cancer Slope Factor (CSF) and RfD values used to estimate potential human health risks are presented in Table 2-1. These toxicity criteria have been extracted from the most recent USEPA databases (e.g., IRIS) and other USEPA reference material (e.g., Environmental Criteria Assessment Office or Health Effects Assessment Summary Tables). CSF and RfD values are combined with estimates of potential exposure to produce ILCR and HI values for exposed populations.

Tables 2-2 through 2-6 present the surface soil, subsurface soil, groundwater, surface water, and sediment COPCs evaluated in the HHRA for Site 18.

2.7.1.1 Current Receptors

Table 2-7 presents total ILCR and HI values for the current adult maintenance workers and current adult and adolescent recreational users and trespassers. Carcinogenic and noncarcinogenic risks estimated for all current potential receptors were less than, or within, the appropriate USEPA target risk criteria.

2.7.1.2 Future Receptors

Table 2-7 presents the total ILCR and HI values for potential future construction and industrial/commercial workers and residents at Site 18. ILCR values for each potential human receptor fall within the USEPA acceptable risk range.

A potentially unacceptable total site risk was identified for future adult construction workers. Future adult construction workers were evaluated for exposures to contaminants in subsurface soil at Site 18. The total HI (1.6) exceeded the target value of 1.0 because of ingestion of arsenic, iron, and manganese in subsurface soil. Individual HQ values estimated for arsenic, iron, and manganese are less than 1.0. Since arsenic, iron, and manganese target different organs, no real adverse health effects are expected for construction workers after exposure to subsurface soil.

2.7.2 Ecological Risk Assessment

Because WPNSTA Yorktown was placed on the NPL, in part, as a result of ecological concerns (proximity to wetlands, etc.), potential ecological receptors are also evaluated at each site. Terrestrial and aquatic receptors are evaluated using a weight-of-evidence approach which consists of two phases: a general comparison to existing toxicity criteria and conservative contaminant uptake modeling to establish a site-specific body burden in an animal receptor and a comparison to published toxicity data for a similar animal. Both phases of the ERA culminate with the calculation of ecological HQs. Ecological HQ values equal to or greater than one indicate the potential for adverse effects on the environment. Chemicals producing HQs equal to or greater than one in both phases of the weight-of-evidence approach are considered ecological COCs pending a comparison to base-wide background levels. Remediation of these contaminants must, however, be considered carefully, so that the selected remedy does not create more short-term harm to ecological receptors than would be produced by leaving contaminants in place. That is, scientists must decide if more damage will be done by removing soil, thereby altering the existing habitat, or by having contaminants remain in the soil.

The objective of the ERA is to determine whether past site operations have adversely affected the ecological integrity of the terrestrial and aquatic community at Site 18. The Navy ERA process consists of eight steps organized into three tiers and represents a clarification and interpretation of the eight-step ERA process outlined in the USEPA ERA guidance for the Superfund program (USEPA, 1997). The ERA included the following steps:

- Screening level problem formulation and ecological effects evaluation (Step 1)
- Screening level exposure estimate and risk calculation (Step 2)
- Refinement of exposure estimation and risk calculation (Step 3a)

2.7.2.1 Screening Level Problem Formulation and Ecological Effects Evaluation

Under Navy policy, if the results of Step 1 and Step 2 (Tier 1 screening level ERA) indicate that, based on a set of conservative exposure assumptions, there are chemicals present in environmental media that may present a risk to receptor species/communities, the ERA process proceeds to the baseline ERA. According to Superfund guidance (USEPA, 1997), Step 3 represents the problem formulation phase of the baseline ERA. Under Navy policy, the baseline ERA is defined as Tier 2, and the first activity under Tier 2 is Step 3a. Step 3a precedes the baseline risk assessment problem formulation (Step 3b). In Step 3a, the conservative exposure assumptions applied in Tier 1 are refined and risk estimates are recalculated using the same conceptual site model. The evaluation of risks in Step 3a may also include consideration of background data, chemical bioavailability, and the frequency of detection. If the re-evaluation of the conservative exposure assumptions does not support an acceptable risk determination, the site continues in the baseline ERA process (Step 3b, baseline problem formulation).

2.7.2.2 Screening Level Exposure Estimate and Risk Calculation

The screening level problem formulation identifies the history of the site and the environmental setting and determines the available analytical data applicable to the risk assessment. In addition, a conceptual model is developed for the site to determine potential transport pathways. The ecological effects evaluation establishes chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects.

The screening level exposure estimate includes the selection of ecological receptors. The receptor species or species groups were selected based on complete exposure pathways identified in the conceptual model, the specific habitats present on the site, the biota known or likely to occur on the site, and the selected assessment endpoints. Maximum concentrations in surface soil, surface water, surface sediment, and subsurface sediments were used to conservatively estimate potential chemical exposures for ecological receptors at Site 18. The screening level risk calculation for Site 18 compares the maximum exposure concentrations in site surface soil, surface water, surface sediment, and subsurface sediment with corresponding screening values to derive screening risk estimates using the HQ method.

2.7.2.3 Refinement of exposure estimation and risk calculation

In Step 3a, the conservative assumptions employed in Tier 1 are refined and risk estimates are recalculated using the same conceptual model. Step 3a may also include consideration of background data, the frequency at which chemicals were detected, and chemical bioavailability.

2.7.2.4 Summary of Ecological Risk Assessment

No chemicals were identified as risk drivers for Site 18. The ERA concluded that levels of chemicals in site media do not pose an unacceptable risk to ecological receptor populations. This assessment is based on few detected exceedances of reference effects-based concentrations, on confirmation that there is no "dilution" of maximum concentrations requiring further investigations, and on comparisons of site conditions to reference areas. Though uncertainties exist, the available dataset was considered adequate in terms of analytical and spatial coverage to address the potential for risk at the site and downgradient habitats. Though SVOC, pesticide, PCB, and inorganic compounds were detected and identified as ecological COPCs in the Step 2 screen of the ERA, no risk drivers were identified, and no evaluation was recommended.

2.7.3 Summary of Baseline Risk Assessment Results

Based on results of the human health and ecological risk assessments, there are no unacceptable risks to human health or the environment from surface soil, subsurface soil, groundwater, surface water, or sediment at Site 18.

2.8 Documentation of Significant Changes

The Proposed Plan for Site 18 was released for public comment on February 13, 2005. The Proposed Plan identified no action as the preferred alternative. No written or verbal comments were submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

3.0 RESPONSIVENESS SUMMARY

During the public comment period, written comments, concerns, and questions were solicited. A public meeting was held on February 16, 2005, at the Charles E. Brown Community Building to formally present the Draft Proposed Plan and to answer questions and receive comments. The transcript of this meeting is presented in Appendix A of this ROD. No comments beyond clarifying questions were received at the public meeting or during the public comment period.

3.1 Overview

At the time of the public meeting on February 16, 2005, the Navy and USEPA Region III had endorsed the no action alternative in the Proposed Plan for Site 18 at WPNSTA Yorktown. The Commonwealth of Virginia concurs with the preferred alternative for Site 18. The community offered no comment, at the public meeting or in writing, in opposition to the selection of the preferred alternative.

3.2 Background on Community Involvement

Nearby communities have a good working relationship with WPNSTA Yorktown because it maintains a "good neighbor" policy through the Public Affairs Office. WPNSTA Yorktown participates in community events and celebrations to foster close ties with the community. As part of the ongoing Community Relations Program (CRP), community interviews were conducted in 1991 to inform the community of the Installation Restoration Program and solicit feedback on the listing of WPNSTA Yorktown as an NPL site. During these interviews, the community expressed concern about three issues: water resources, cleanup funding, and information availability/validity. This public openness has been maintained by the Public Affairs Office and the Environmental Directorate at WPNSTA Yorktown through the CRP and resulted in the formation of the Restoration Advisory Board (RAB). The RAB meets regularly, and progress at sites such as Site 18 is discussed from the work plan stage to selection of the remedial alternative (if necessary). Preliminary RI results for Site 18 have been discussed at RAB meetings.

3.3 Summary of Comments Received During the Public Comment Period

The public comment period on the Proposed Plan began on February 13, 2005 and ended on March 14, 2005. No comments were received from the public during the public comment period.

4.0 REFERENCES

Baker Environmental, Inc. 2004. Final Round Two Remedial Investigation Report for Sites 2, 8, 18, and SSA 14, Naval Weapons Station Yorktown, Yorktown, Virginia. June 2004.

Baker Environmental, Inc. 1995. Summary of Background Constituent Concentrations and Characterization of the Biotic Community from the York River Drainage Basin. July 1995.

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TABLE 2-1

HUMAN HEALTH RISK ASSESSMENT TOXICITY FACTORS
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Constituents	Oral CSF $(mg/kg/day)^{-1}$	Inhalation CSF $(mg/kg/day)^{-1}$	Oral RfD $(mg/kg/day)^{-1}$	Inhalation RfD $(mg/kg/day)^{-1}$	Dermal Absorption Values	Oral (o) and Inhalation (i) Target Organ : Critical Effect	Oral (o) and Inhalation (i) WOE
Volatiles							
1,1,1-Trichloroethane	--	--	2.80E-01 (E)	6.30E-01 (E)	100%	CNS : CNS Effects	D
1,1-Dichloroethene	6.00E-01 (I)	1.75E-01 (I)	9.00E-03 (I)	--	100%	(o) - Liver: Hepatic Lesions	C
1,2-Dichloroethene (cis)	--	--	1.00E-02 (H)	--	100%	(o) - CVS: Decreased hematocrit and hemoglobin	D
1,2-Dichloroethene (total)	--	--	9.00E-03 (H)	--	100%	(o) - Liver: Liver lesions	D
Chloroform	6.10E-03 (I)	8.10E-02 (I)	1.00E-02 (I)	8.60E-05 (E)	100%	(o) - Liver: Fatty cyst formation	B2
Chloromethane	1.30E-02 (H)	3.50E-03 (E)	--	2.60E-02 (I)	100%	(i) - CNS: Axonal swelling and degeneration of the spinal cord	(o) C, (i) E
Tetrachloroethene	5.20E-02 (E)	2.00E-03 (E)	1.00E-02 (I)	1.40E-01 (E)	100%	(o) - Liver / Whole Body: Hepatotoxicity and weight gain; (i) - Liver / Kidney / Brain: Hepatotoxicity, weight gain	C
Trichloroethene (TCE)	1.10E-02 (E)	6.00E-03 (E)	6.00E-03 (E)	--	100%	(o) - Kidney / Liver: Liver: Increase in relative liver weight due to the hypertrophy of the liver cells; Kidney: Inceased kidney weight and elevated levels of proteins and ketones	D
Vinyl Chloride	1.40E+00 (I)	3.00E-02 (I)	3.00E-03 (I)	2.80E-02 (I)	100%	Liver : Liver cell polymorphism	A
Semivolatiles							
Benzo(a)anthracene	7.30E-01 (E)	--	--	--	100%	--	(o) B2, (i) D
Benzo(a)pyrene	7.30E+00 (I)	3.10E+00 (E)	--	--	100%	--	B2
Benzo(b)fluoranthene	7.30E-01 (E)	--	--	--	100%	--	B2
Benzo(k)fluoranthene	7.30E-02 (E)	--	--	--	100%	--	B2
Carbazole	2.00E-02 (H)	--	--	--	100%	--	(o) B2, (i) D
Chrysene	7.30E-03 (E)	--	--	--	100%	--	B2
Dibenz(a,h)anthracene	7.30E+00 (E)	--	--	--	100%	--	(o) B2, (i) D
Indeno(1,2,3-cd)pyrene	7.30E-01 (E)	--	--	--	100%	--	B2
Nitrobenzene	--	--	5.00E-04 (I)	6.00E-04 (A)	100%	(o) - Liver / Kidney / CVS: Hematologic, adrenal, renal an hepatic lesions; (i) - Liver / Kidney / CVS: Hematological effects and lesions	D
Pesticides							
Dieldrin	1.60E+01 (I)	1.60E+01 (I)	5.00E-05 (I)	--	50%	(o) - Liver: Liver lesions	B2
PCBs							
Aroclor-1254	2.00E+00 (I)	2.00E+00 (I)	2.00E-05 (I)	--	89%	(o) - Whole Body / ImS: Ocular exudate, inflammes and prominent Meibomian glands, distorted growth of finger and toe nails; Decreased antibody response	B2
Aroclor-1260	2.00E+00 (I)	2.00E+00 (I)	--	--	89%	--	B2

TABLE 2-1 (Continued)

HUMAN HEALTH RISK ASSESSMENT TOXICITY FACTORS
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Constituents	Oral CSF $(mg/kg/day)^{-1}$	Inhalation CSF $(mg/kg/day)^{-1}$	Oral RfD $(mg/kg/day)^{-1}$	Inhalation RfD $(mg/kg/day)^{-1}$	Dermal Absorption Values	Oral (o) and Inhalation (i) Target Organ : Critical Effect	Oral (o) and Inhalation (i) WOE
Explosives							
2,4,6-Trinitrotoluene	3.00E-02 (I)	--	5.00E-04 (I)	--	100%	(o) - Liver: Liver effects	C
2,4-Dinitrotoluene	--	--	2.00E-03 (I)	--	100%	(o) - CNS: Neurotoxicity, Heinz bodies and biliary tract hyperplasia	B2
2,6-Dinitrotoluene	--	--	1.00E-03 (H)	--	100%	(o) - Whole Body / CNS / CVS / Kidney: Mortality / Neurotoxicity / Histopathology	B2
2-Amino-4,6-dinitrotoluene	--	--	6.00E-05 (E) [(1)]	--	100%	(o) - NOEL: NOEL	D
2-Nitrotoluene	--	--	1.00E-02 (H)	--	100%	(o) - Spleen: Lesions	D
4-Amino-2,6-dinitrotoluene	--	--	6.00E-05 (E) [(1)]	--	100%	(o) - NOEL: NOEL	D
4-Nitrotoluene	--	--	1.00E-02 (H)	--	100%	(o) - Spleen: Lesions	D
Amino dinitrotoluenes (mixture)	--	--	6.00E-05 (E)	--	100%	(o) - NOEL: NOEL	D
HMX	--	--	5.00E-02 (I)	--	100%	(o) - Liver: Hepatic Lesions	D
RDX	1.10E-01 (I)	--	3.00E-03 (I)	--	100%	(o) - Prostate: Inflammation	C
Tetryl	--	--	1.00E-02 (H)	--	100%	(o) - Liver / Kidney / Spleen: Histopathological effects	D
Inorganics							
Aluminum	--	--	1.00E+00 (E)	1.00E-03 (E)	27%	CNS : Developmental problems	D
Antimony	--	--	4.00E-04 (I)	--	10%	(o) - Whole Body: Longevity, blood glucose and cholesterol	D
Arsenic	1.50E+00 (I)	1.51E+01 (I)	3.00E-04 (I)	--	95%	(o) - Skin / CVS: Hyperpigmentation, keratosis, vascular complications	A
Barium	--	--	7.00E-02 (I)	1.40E-04 (A)	100%	(o) - Kidney: Increased kidney weight; (i) - Fetus: Fetotoxicity	(o) E, (i) D
Cadmium	--	6.30E+00 (I)	1.00E-03 (I)	5.70E-05 (E)	5%	(o) - Kidney: Significant proteinuria	(o) D, (i) B1
Chromium	--	4.10E+01 (H) [(2)]	3.00E-03 (I) [(2)]	3.00E-05 (I) [(2)]	1%	(o) - GIS: NOEL; (i) - RsS: Nasal septum atrophy (aerosols), lactate dehydrogenase in bronchioalveolar lavage fluid (particulates)	(o) D, (i) A
Cobalt	--	--	2.00E-02 (E)	5.00E-06 (E)	30%	(o) - CVS: Blood ?; (i) - RsS: Lesions on the respiratory tract	D
Copper	--	--	4.00E-02 (H)	--	60%	(o) - GIS: GIS Irritation	D
Iron	--	--	6.00E-01 (E)	--	100%	(o) - Liver / CVS / GIS: Lookup	D

TABLE 2-1 (Continued)

HUMAN HEALTH RISK ASSESSMENT TOXICITY FACTORS
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Constituents	Oral CSF $(mg/kg/day)^{-1}$	Inhalation CSF $(mg/kg/day)^{-1}$	Oral RfD $(mg/kg/day)^{-1}$	Inhalation RfD $(mg/kg/day)^{-1}$	Dermal Absorption Values	Oral (o) and Inhalation (i) Target Organ : Critical Effect	Oral (o) and Inhalation (i) WOE
Inorganics (Cont)							
Manganese	--	--	2.00E-02 (I)	1.43E-05 (I)	100%	(o) - CNS: CNS Effects; (i) - CNS: Impairment of neurobehavioral function	D
Mercury	--	--	3.00E-04 (O) (3)	8.60E-05 (I)	100%	(o) - ImS: Autoimmune effects; (i) - CNS: Hand tremor; increase in memory disturbances; slight subjective and objective evidence of autonomic dysfunction	D
Thallium	--	--	7.00E-05 (O)	--	100%	(o) - CVS: Increased levels of SGOT and LDH in blood	D
Vanadium	--	--	7.00E-03 (H)	--	2%	(o) - GIS: Gastrointestinal disturbances, Discoloration of mouth and tongue	D

Sources:
(I) IRIS = Integrated Risk Information System
(E) NCEA = National Center for Environmental Assessment, USEPA
(H) HEAST = Health Effects Assessment Summary Tables
(A) HEAST Alternative
(O) Other

CSF = Cancer Slope Factor
RfD = Reference Dose
WOE = Weight of Evidence

Target Organ Abbreviations:
CNS = Central Nervous System
CVS = Cardiovascular System
GIS = Gastrointestinal System
ImS = Immune System
RsS = Respiratory System
NOEL = No Observed Effect Level

WOE/EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Known/Likely (EPA classes A, B1, B2, C)
Cannot be Determined (EPA class D)
Not Likely (EPA class E)

-- = Not Available
(o) = Toxicty due to oral exposure
(i) = Toxicity due to inhalation exposure

(1) Value for amino-dinitrotoluenes
(2) Value for chromium VI
(3) Value for mercuric chloride

TABLE 2-2

SURFACE SOIL DATA AND COPC SELECTION SUMMARY
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant	Criteria (1)	Contaminant Frequency/Range		Background (2)	COPC Selection	COPC Selection	
	Region III Residential Soil RBC Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Range of Positive Detects	Selected as a COPC?	Selected as a COPC?	Rational for Selection or Deletion
PESTICIDES/PCBS (ug/kg)							
4,4'-DDE	1,879 C	2/7	1.1 J - 3 K	ND	No	No	BSL
4,4'-DDT	1,879 C	2/7	0.3 J - 0.44 K	ND	No	No	BSL
BHC, alpha-	101 C	1/7	0.59 K	ND	No	No	BSL
Aldrin	37.6 C	1/7	2.5 K	ND	No	No	BSL
Heptachlor Epoxide	70.2 C	1/7	0.16 K	ND	No	No	BSL
TOTAL INORGANICS (mg/kg)							
Aluminum	7,821 N	7/7	2920 - 6670	1960 -24100	No	No	BSL
Arsenic	0.426 C	7/7	1.1 - 1.9	0.46L-63.9	Yes	Yes	ASL
Barium	548 N	7/7	12.1 - 37.4	4.2J-80.2	No	No	BSL
Calcium +	NE	7/7	139 J - 1040	39.4J-7820	No	No	NUT
Chromium	23.5 N (3)	7/7	3.4 L - 6.7	2.6 -33.5	No	No	BSL
Cobalt	156 N	7/7	0.99 - 1.7	0.88J-6.7J	No	No	BSL
Copper	313 N	7/7	1 - 3.2	1.2J-24.4	No	No	BSL
Iron	4,693 N	7/7	2620 - 5740	1440 -46400	Yes	Yes	ASL
Lead	400 N (4)	7/7	10.7 - 39.7	2.1 -43.1	No	No	BSL
Magnesium +	NE	7/7	177 - 397	61.5J-2700	No	No	NUT
Manganese	156 N	7/7	32.7 J - 272	7.6L-491	Yes	Yes	ASL
Mercury	2.35 N (5)	1/7	0.07	0.05	No	No	BSL
Nickel	156 N	7/7	1.8 - 3.9	3.8J-12.5	No	No	BSL
Potassium +	NE	7/7	120 - 221	387J-1640J	No	No	NUT
Vanadium	54.8 N	7/7	8.9 - 18.5	5.2J-64.7	No	No	BSL
Zinc	2,346 N	7/7	6.3 K - 27.3	3.2KJ-48.4	No	No	BSL

Notes:
COPC - Chemical of Potential Concern
NE - Not Established
ND - Non Detect
\+ - Essential Nutrient
Shaded constituents were identified as COPCs for quantitative risk evaluation.
J - Analyte present - Reported value is estimated
L - Analyte present - Reported value is biased low
K - Analyte present - Reported value is biased high
(ASL) Above Screening Level
(BSL) Below Screening Level
(NUT) Essential Nutrient
(1) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals.
USEPA Region III COC Screening Value (derived from USEPA Region III RBC Table - October, 2001)
(2) WPNSTA Background Study (Baker, 1995).
(3) Screening value for chromium VI used.
(4) Action level for lead.
(5) Screening value for mercuric chloride used as a surrogate.

C = Carcinogenic
N = Non-Carcinogenic

TABLE 2-3

SUBSURFACE SOIL DATA AND COPC SELECTION SUMMARY
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant	Criteria (1)	Contaminant Frequency/Range		Background (2)	COPC Selection	COPC Selection	
	Region III Residential Soil RBC Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Range of Positive Detects	Selected as a COPC?	Selected as a COPC?	Rational for Selection or Deletion
PESTICIDES/PCBS (ug/kg)							
4,4'-DDD	2,661 C	1/7	0.5 J	ND	No	No	BSL
BHC, alpha-	101 C	2/7	0.4 J - 1.4 J	ND	No	No	BSL
BHC, gamma- (Lindane)	491 C	1/7	0.49 J	ND	No	No	BSL
Endosulfan I	46,929 N (3)	2/7	0.33 - 0.36 J	ND	No	No	BSL
Heptachlor Epoxide	70.2 C	2/7	0.31 J - 1 J	ND	No	No	BSL
TOTAL INORGANICS (mg/kg)							
Aluminum	7,821 N	7/7	3020 - 11000	ND	Yes	Yes	ASL
Arsenic	0.426 C	7/7	1.1 - 49.9	ND	Yes	Yes	ASL
Barium	548 N	7/7	4.5 - 54.4	ND	No	No	BSL
Beryllium	15.6 N	4/7	0.27 - 0.95	ND	No	No	BSL
Cadmium	3.91 N	1/7	1.8	ND	No	No	BSL
Calcium +	NE	7/7	87.9 - 8950	ND	No	No	NUT
Chromium	23.5 N (4)	7/7	5.2 - 67.5	ND	Yes	Yes	ASL
Cobalt	156 N	7/7	0.56 - 17.6	ND	No	No	BSL
Copper	313 N	7/7	2.7 - 10.7	ND	No	No	BSL
Iron	4,693 N	7/7	8470 - 65200	ND	Yes	Yes	ASL
Lead	400 N (5)	7/7	4.7 - 17.3	ND	No	No	BSL
Magnesium +	NE	7/7	48.8 - 2900	ND	No	No	NUT
Manganese	156 N	7/7	6 J - 1490	ND	Yes	Yes	ASL
Nickel	156 N	7/7	1.5 - 44.5	ND	No	No	BSL
Potassium +	NE	7/7	138 - 2590	ND	No	No	NUT
Selenium	39.1 N	1/7	1.4 K	ND	No	No	BSL
Sodium +	NE	2/7	130 - 249	ND	No	No	NUT
Vanadium	54.8 N	7/7	8.3 - 92	ND	Yes	Yes	ASL
Zinc	2,346 N	7/7	6.4 J - 159	ND	No	No	BSL

Notes:
COPC - Chemical of Potential Concern
NE - Not Established
ND - Non Detect
+ - Essential Nutrient
C = Carcinogenic
N = Non-Carcinogenic
Shaded constituents were identified as COPCs for quantitative risk evaluation.
J - Analyte present - Reported value is estimated
K - Analyte present - Reported value is biased high
(ASL) Above Screening Level
(BSL) Below Screening Level
(NUT) Essential Nutrient
(1) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals.
USEPA Region III COC Screening Value (derived from USEPA Region III RBC Table - October, 2001)
(2) WPNSTA Background Study (Baker, 1995).
(3) Screening value for endosulfan used as a surrogate.
(4) Screening value for chromium VI used.
(5) Action level for lead.

TABLE 2-4

GROUNDWATER DATA AND COPC SELECTION SUMMARY
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant	Criteria (1)	Contaminant Frequency/Range		Background (2)	COPC Selection	
	Region III Tap Water RBC Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Range of Positive Detects	Selected as a COPC?	Rational for Selection or Deletion
PESTICIDES/PCBS (ug/L)						
Endrin Aldehyde	1.095 N (3)	1/4	0.022 J	ND	No	BSL
DISSOLVED INORGANICS (ug/L)						
Barium	256 N	4/4	17.9 - 23.2	5.9J-73.4J	No	BSL
Calcium +	NE	4/4	59700 - 79500	25200 -116000	No	NUT
Cobalt	73.0 N	3/4	1.2 - 1.2	ND	No	BSL
Iron	2,190 N	2/4	11.6 - 18.8	2.8J-347	No	BSL
Magnesium +	NE	4/4	1670 - 2190	70.2J-9810	No	NUT
Manganese	73 N	4/4	13.9 - 183	2.4J-54.4	Yes	ASL
Potassium +	NE	4/4	1050 - 11900	1090J-17900	No	NUT
Sodium +	NE	4/4	7630 J - 12800 J	3780J-27800	No	NUT
TOTAL INORGANICS (ug/L)						
Arsenic	0.0446 C	2/4	2.1 - 3.1	5J-36.4	Yes	ASL
Barium	256 N	4/4	17.4 - 24.8	20.4J-97.5J	No	BSL
Calcium +	NE	4/4	60500 - 85800	48300 -530000	No	NUT
Cobalt	73.0 N	3/4	1.2 - 1.2	2.5J-22.4J	No	BSL
Cyanide	73.0 N	1/4	1.4	ND	No	BSL
Iron	2,190 N	2/4	27.3 - 449	483 -48200	No	BSL
Magnesium +	NE	4/4	1720 - 2320	720J-9770	No	NUT
Manganese	73.0 N	4/4	20.2 - 202	8.5J-413	Yes	ASL
Potassium +	NE	4/4	1100 - 15100	1240J-17000	No	NUT
Sodium +	NE	3/4	7650 - 14300	3760J-27200	No	NUT
Vanadium	25.6 N	1/4	1.7	2.9J-66.6	No	BSL

Notes:
COPC - Chemical of Potential Concern
NE - Not Established
ND - Non Detect
\+ - Essential Nutrient
C = Carcinogenic
N = Non-Carcinogenic
Shaded constituents were identified as COPCs for quantitative risk evaluation.
J - Analyte present - Reported value is estimated
(ASL) Above Screening Level
(BSL) Below Screening Level
(NUT) Essential Nutrient
(1) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals.
USEPA Region III COC Screening Value (derived from USEPA Region III RBC Table - October, 2001)
(2) WPNSTA Background Study (Baker, 1995).
(3) Screening value for endrin used as a surrogate.

TABLE 2-5

SURFACE WATER DATA AND COPC SELECTION SUMMARY
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant	Criteria (1)	Contaminant Frequency/Range		Background (2)	COPC Selection	
	Region III Tap Water*10 RBC Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Range of Positive Detects	Selected as a COPC?	Rational for Selection or Deletion
SEMIVOLATILES (ug/L)						
Di-n-butyl Phthalate (DBP)	3,650 N	1/5	2 J	ND	No	BSL
EXPLOSIVES (ug/L)						
2,4-Dinitrotoluene	73.0 N	1/5	0.21	ND	Yes	HIST
TOTAL INORGANICS (ug/L)						
Aluminum	36,500 N	5/5	177 - 1350	171J-5600	No	BSL
Arsenic	0.446 C	1/5	2.9	1.2L-3.5L	Yes	ASL
Barium	2,555 N	5/5	18 - 35.1	26.6J-49.9J	No	BSL
Calcium +	NE	5/5	26500 - 97600	29200J-198000J	No	NUT
Chromium	110 N (3)	1/5	1.7	ND	No	BSL
Cobalt	730 N	5/5	1.1 - 1.2	5.3J-8.5J	No	BSL
Copper	1,460 N	3/5	2.1 - 58.9	5.6J-6.7J	No	BSL
Iron	21,900 N	5/5	229 - 2240	289J-6650	No	BSL
Lead	150 N (4)	2/5	1.8 - 2.2	1.2L-5.4L	No	BSL
Magnesium +	NE	5/5	1210 - 2640	23000 -656000J	No	NUT
Manganese	730 N	5/5	7.2 - 114	33.1 -379	No	BSL
Potassium +	NE	5/5	1190 - 1800	8210 -220000J	No	NUT
Sodium +	NE	5/5	7230 - 12400	180000 -5760000J	No	NUT
Vanadium	256 N	3/5	1.5 - 4.6	5J-14.4J	No	BSL
Zinc	10,950 N	3/5	25.8 - 88.8	7.9J-20.2	No	BSL

Notes:
COPC - Chemical of Potential Concern
NE - Not Established
ND - Non Detect
\+ - Essential Nutrient
C = Carcinogenic
N = Non-Carcinogenic
Shaded constituents were identified as COPCs for quantitative risk evaluation.
J - Analyte present - Reported value is estimated
L - Analyte present - Reported value is biased low
(ASL) Above Screening Level
(BSL) Below Screening Level
(HIST) Historically Associated
(NUT) Essential Nutrient
(1) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals.
USEPA Region III COC Screening Value*10 (derived from USEPA Region III RBC Table - October, 2001)
(2) WPNSTA Background Study (Baker, 1995).
(3) Screening value for chromium VI used.
(4) Action level for lead.

TABLE 2-6

SEDIMENT DATA AND COPC SELECTION SUMMARY
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant	Criteria [1]	Contaminant Frequency/Range		Background [2]	COPC Selection	
	Region III Residential Soil*10 RBC Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Range of Positive Detects	Selected as a COPC?	Rational for Selection or Deletion
VOLATILES (ug/kg)						
Acetone	7,821,429 N	1/9	100 J	14J-870J	No	BSL
SEMIVOLATILES (ug/kg)						
Anthracene	23,464,286 N	2/9	38 J - 120 J	ND	No	BSL
Benzo(a)anthracene	8,750 C	2/9	370 J - 860	ND	No	BSL
Benzo(a)pyrene	875 C	2/9	280 J - 670	ND	No	BSL
Benzo(b)fluoranthene	8,750 C	2/9	440 J - 940	ND	No	BSL
Benzo(g,h,i)perylene	2,346,429 N [3]	2/9	200 J - 470 J	ND	No	BSL
Benzo(k)fluoranthene	87,497 C	2/9	130 J - 320 J	ND	No	BSL
Bis(2-ethylhexyl)phthalate	456,233 C	2/9	680 - 760	290	No	BSL
Butyl Benzyl Phthalate	15,642,857 N	1/9	75 J	ND	No	BSL
Carbazole	319,363 C	1/9	120 J	ND	No	BSL
Chrysene	874,967 C	2/9	430 J - 930	ND	No	BSL
Dibenz(a,h)anthracene	875 C	1/9	110 J	ND	No	BSL
Di-n-octyl Phthalate	1,564,286 N	1/9	200 J	ND	No	BSL
Fluoranthene	3,128,571 N	2/9	830 - 1900	ND	No	BSL
Indeno(1,2,3-cd)pyrene	8,750 C	2/9	230 J - 580	ND	No	BSL
Phenanthrene	2,346,429 N [3]	2/9	280 J - 760	ND	No	BSL
Pyrene	2,346,429 N	3/9	44 J - 2600	ND	No	BSL
PESTICIDES/PCBS (ug/kg)						
4,4'-DDD	26,614 C	2/9	0.95 J - 4.5 J	ND	No	BSL
4,4'-DDE	18,786 C	4/9	0.27 J - 5.8 J	ND	No	BSL
4,4'-DDT	18,786 C	1/9	1.8 J	ND	No	BSL
Chlordane, alpha-	18,249 C [4]	1/9	8.7 L	ND	No	BSL
Chlordane, gamma-	18,249 C [4]	1/9	0.16 J	ND	No	BSL
Aroclor-1254	3,194 C	2/9	100 J - 240 J	ND	No	BSL
TOTAL INORGANICS (mg/kg)						
Aluminum	78,214 N	9/9	1150 - 6020	1510 -40500	No	BSL
Arsenic	4.26 C	9/9	1.6 - 16.4	1.4J-13.1	Yes	ASL
Barium	5,475 N	9/9	6.7 - 32.3	3.6J-93.2J	No	BSL
Beryllium	156 N	3/9	0.39 - 0.59	0.55J-1.6J	No	BSL
Cadmium	39.1 N	2/9	0.49 - 0.86	ND	No	BSL
Calcium +	NE	9/9	752 - 23800	217J-4220	No	NUT
Chromium	235 N [5]	9/9	5 - 42.4	3.8 -66.1	No	BSL

TABLE 2-6 (Continued)

SEDIMENT DATA AND COPC SELECTION SUMMARY
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Contaminant	Criteria (1)	Contaminant Frequency/Range		Background (2)	COPC Selection	
	Region III Residential Soil*10 RBC Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Range of Positive Detects	Selected as a COPC?	Rational for Selection or Deletion
TOTAL INORGANICS (mg/kg) (Cont)						
Cobalt	1,564 N	7/9	1.5 - 8.2	3.8J-15J	No	BSL
Copper	3,129 N	9/9	2.7 - 64	3.7J-43.1	No	BSL
Cyanide	1,564 N	6/9	0.07 - 0.17	ND	No	BSL
Iron	46,929 N	9/9	4760 - 49000	3060 -46000	Yes	ASL
Lead	4,000 N (6)	9/9	4.9 - 90.6	3.4 -51.6	No	BSL
Magnesium +	NE	8/9	180 - 950	292J-9720K	No	NUT
Manganese	1,564 N	9/9	27.7 - 313	7.4 -1980	No	BSL
Mercury	23.5 N (7)	5/9	0.07 K - 0.09	0.18L-0.29L	No	BSL
Nickel	1,564 N	9/9	1.4 - 10.4	9.3K-55.2	No	BSL
Potassium +	NE	9/9	112 - 986	1200J-6080	No	NUT
Silver	391 N	1/9	0.63	2.2	No	BSL
Sodium +	NE	1/9	264	177J-16700	No	NUT
Thallium	5.48 N	4/9	0.91 K - 1.3 K	ND	No	BSL
Vanadium	548 N	9/9	7 - 41.2	4.8J-67.6	No	BSL
Zinc	23,464 N	9/9	16 L - 135 L	4J-202J	No	BSL

Notes:
COPC - Chemical of Potential Concern
NE - Not Established
ND - Non Detect
\+ - Essential Nutrient
J - Analyte present - Reported value is estimated
L - Analyte present - Reported value is biased low
K - Analyte present - Reported value is biased high
Shaded constituents were identified as COPCs for quantitative risk evaluation.
(ASL) Above Screening Level
(BSL) Below Screening Level
(NUT) Essential Nutrient

C = Carcinogenic
N = Non-Carcinogenic

(1) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals. USEPA Region III COC Screening Value*10 (derived from USEPA Region III RBC Table - October, 2001)
(2) WPNSTA Background Study (Baker, 1995).
(3) Screening value for pyrene used as a surrogate.
(4) Screening value for chlordane used as a surrogate.
(5) Screening value for chromium VI used.
(6) Action level for lead.
(7) Screening value for mercuric chloride used as a surrogate.

TABLE 2-7

TOTAL INCREMENTAL LIFETIME CANCER RISK AND
HAZARD INDEX VALUES FOR POTENTIAL HUMAN RECEPTORS
SITE 18
NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

Receptors	Total ILCR	Total HI
Current Adult Maintenance Workers	9.3E-06	0.13
Current On-Station Adolescent Recreational Users and Trespassers	8.5E-07	0.03
Current On-Station Adult Recreational Users and Trespassers	3.6E-06	0.03
Future Adult Construction Workers	3.9E-06	1.60
Future Adult Industrial/Commercial Workers	7.3E-07	0.02
Future On-Station Young Child Residents - RME	3.2E-06	0.32
Future On-Station Young Child Residents - CT	1.1E-06	0.11
Future On-Station Adult Residents - RME	1.8E-06	0.04
Future On-Station Adult Residents - CT	7.1E-07	0.02

Notes:
Shading indicates exceedances of USEPA acceptable target risk criteria
RME - Reasonable Maximum Exposure
CT - Central Tendency

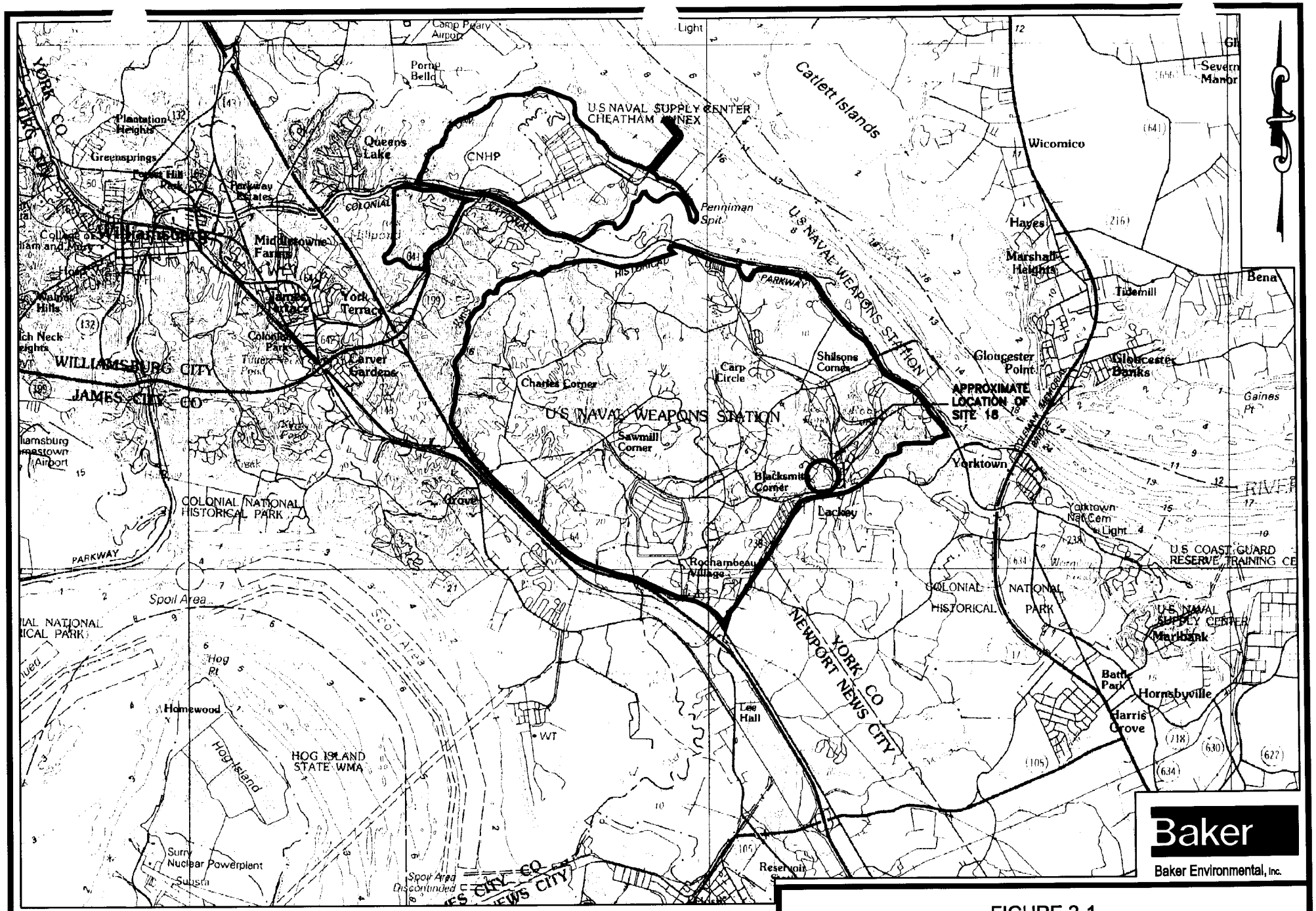

FIGURE 2-1
LOCATION OF NAVAL WEAPONS STATION YORKTOWN
YORKTOWN, VIRGINIA

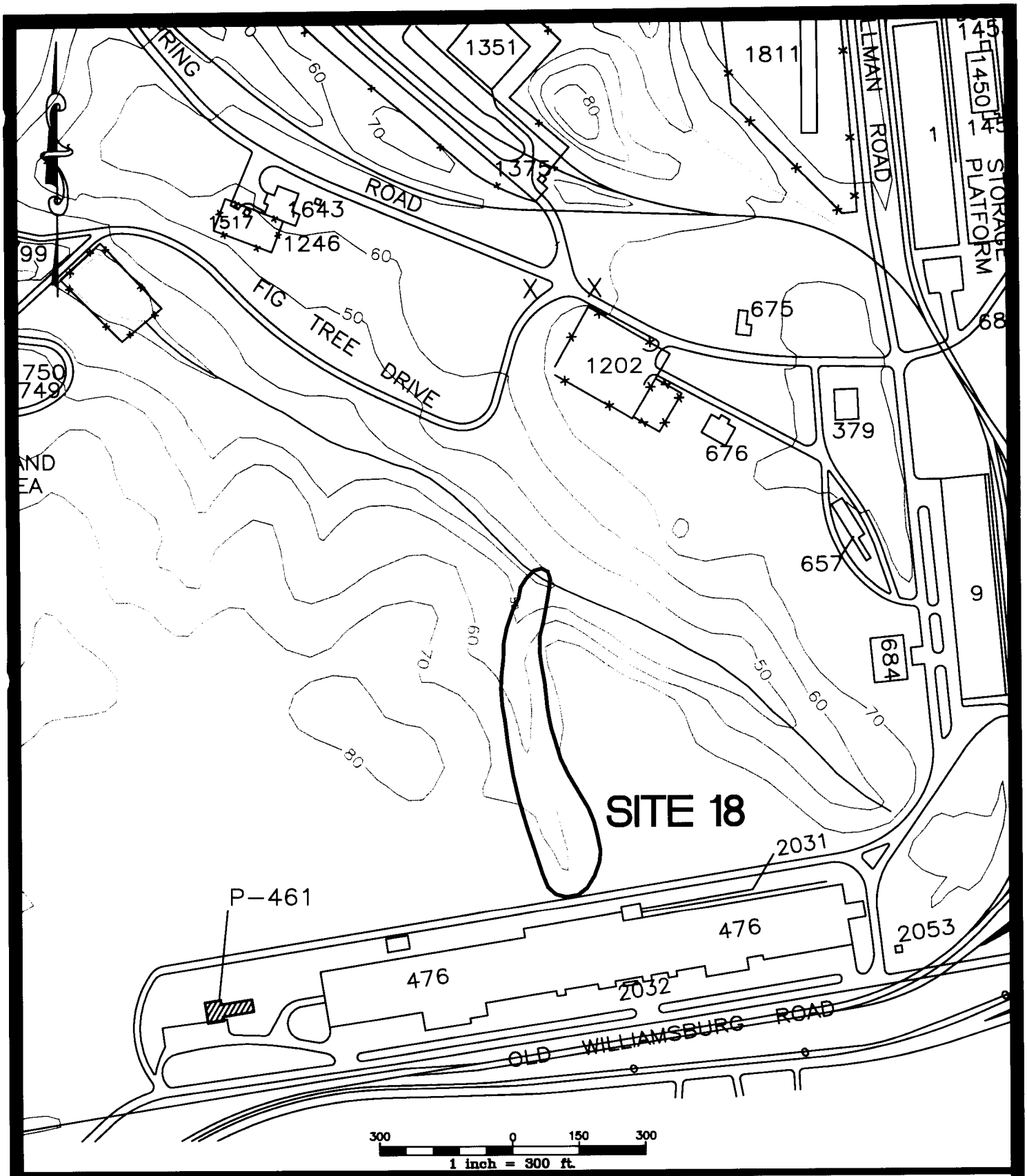

FIGURE 2-2
VICINITY MAP
SITE 18

NAVAL WEAPONS STATION YORKTOWN, YORKTOWN, VIRGINIA

APPENDIX A
TRANSCRIPT OF FEBRUARY 16, 2005 PUBLIC MEETING

CERTIFIED ORIGINAL

NAVAL WEAPONS STATION YORKTOWN

SITE 18 - BUILDING 476 DISCHARGE AREA

PROPOSED PLAN

Public Meeting

February 16, 2005

TAYLOE ASSOCIATES, INC.

Registered Professional Reporters

Telephone: (757) 461-1984

Norfolk, Virginia

1 BOARD MEMBERS PRESENT:

2

3 DON JOINER, P.E., Baker Environmental

4 CHANNING BLACKWELL, CNRMA

5 STEVE MIHALKO, VDEQ

6 ELIZABETH ROGERS, Community Member

7 CINDY BARBEAU, Community Member

8 JAY DEWING, Community Co-Chair

9 DAVE LAMBERT, CDR, Naval Weapons Station Yorktown

10 CAROLYN NEILL, Navy

11 PAO JIM KEMP, Navy Public Affairs Officer

12 CHARLES WILSON, Navy

13 LINDA COLE, NAVAC MidLANT

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1 MR. JOINER: Good to be here again. Good to see
2 everybody. There were three different handouts for tonight.
3 The bound handout was for the RAB meeting. There's a
4 separate stapled handout of this presentation that I'm going
5 to go through now.
6 We brought copies of the actual proposed plan.
7 Thank you, Jim. This is -- the presentation, the stapled
8 document, is kind of to talk about the pamphlet which has
9 been issued and is available now for public comment.
10 Hopefully we can do this presentation in about 20
11 minutes or so, and it is a public participation requirement.
12 Because we're in the NPL program we're required to provide
13 this opportunity to the public to comment on what the Navy
14 is proposing.
15 We're going to give you some background by way of
16 weapons station history, and please keep in mind this is a
17 rehash of information for many of you within a public
18 meeting setting.
19 It's probably a good idea to review where we are
20 in terms of the station's history, what the Navy's IR or
21 restoration program means, present a history of the site
22 itself, and then summarize the circular documentation that's
23 has been completed to get us to this preferred remedy for
24 the site, and then the PRAP, of course, the proposed plan,
25 gives the opportunity for community -- participation in the

1 community.

2 This is a slide. It's in your handout, but this

3 is your six-bullet history of the weapons station and really

4 focuses on what's happened here that has effected the

5 environment and why we're now in the installation

6 restoration process.

7 I'm not going to go through all these, kind of

8 just hit the high points. A number of the sites that we

9 were just talking about in the previous RAB meeting, we're

10 cleaning up areas that were disposal areas from previous

11 operations at the weapons stations. Mr. Hughes was talking

12 about -- Bill Hughes was talking about Site 6 just before

13 the break and part of the contamination at Site 6 was the

14 result of the shell loading plants, the TNT contamination.

15 Here we are now, the current mission, I guess, of

16 the station is providing the ordnance of technical support

17 to maintain more capability, but a number of the IR sites,

18 including this site, Site 18, were the result of facilities

19 and operations that took place primarily in that World War II

20 and afterwards time frame.

21 Now, the IR, the Navy installation program, is the

22 reason we have these RAB meetings. It's implemented, of

23 course, to look at contamination, environmental

24 contamination, resulting from Navy or DOD operations. So,

25 we're dealing with hazardous waste, we're dealing with toxic

1 materials.

2 In terms of the installation restoration program

3 for Yorktown, and we talked about some related documents

4 earlier this evening, the weapons station was placed on EPA's

5 NPL in October of 1992. The federal facility's agreement

6 for weapons station was signed and finalized in 1994.

7 The federal facility agreement outlines how the

8 Navy will work towards site cleanup and site enclosure of

9 the installation restoration sites and defines the

10 relationship between the Navy, the U.S.D.A. and Virginia

11 DEQ.

12 The historical information in current processes in

13 the IR program are identified in the annual site management

14 plan, and we usually provide notification to Jay when that

15 document comes out on a yearly basis.

16 We have 13 active sites, or site screening areas,

17 SSAs in the program, and Linda in her presentation earlier

18 this evening gave us the status of where we stand on that

19 work.

20 Now, Site 18 -- let me walk over here. It's

21 really -- I guess Site 18 is the closest site to this

22 building. We could have walked over there. It's right off

23 of Old Williamsburg Road. It's on what would be the north

24 side of the building -- and I have a slide that shows

25 this -- the north side of Building 476, and it's a small

1 drainage channel from a portion of that building. So,
2 really, it's only less than a quarter of a mile, maybe a
3 quarter of a mile across the road from us here.
4 It was a drainage channel. There was -- part of
5 the Building 476 facility, there was a discharge of some
6 battery acid and battery waste acids from the World War II
7 era, the sixth era into the 1960's.
8 There were two different sets of documentation
9 completed for the site, what we call the Remedial
10 Investigations Reports. The first one was done around 1993,
11 and then the second document that Linda actually mentioned
12 earlier this evening was completed in 2004.
13 Now, that's kind of just a blow-up of our station
14 map. This is Building 476, and this is actually the
15 Weapons Station boundary and Williamsburg Road. This is all
16 a wooded area behind the site, and this is kind of a
17 boundary of this drainage basin from the building. It's --
18 as you can see, it's relatively flat, not a whole lot of
19 relief until you get down towards this little tributary that
20 runs on down into Lee Pond. You can see that this is a
21 heavily wooded area right here.
22 So, this was a drainage, a pond, that runs
23 underneath this road behind Building 476 that discharged
24 into a small ditch.
25 MR. BLACKWELL: The road to the far right, is

1 that -- would that be along the road?

2 MR. JOINER: Yeah, I think this is -- we're

3 sitting down right here, and the post office would be right

4 next door to us here. The more recent, the 2004 remedial

5 investigation, as any remedial investigation we do, has kind

6 of a couple of focuses, and the biggest is to evaluate human

7 health and ecological risks to the medial concern.

8 In this case we're talking about soil, both

9 surface and sub-surface, surface water, ground water and

10 sediment.

11 So, there were samples collected of all of those

12 media as part of the remedial investigation, and the risk

13 assessments were completed using the data from those samples

14 to evaluate both human health and ecological risks.

15 The human health risk scenarios would include a

16 construction worker, would include a future residential

17 user, would include an industrial-use type scenario with

18 industrial-type exposure.

19 For the ecological risks, you look at the plants

20 and animals that might come in contact or be exposed to any

21 contamination, any media that's been contaminated. So, we

22 look at all the birds, the frogs, and the reason we're here

23 tonight, the good news is that there were no unacceptable

24 risks to the environment or to human health, meaning the

25 regulators.

1 Steve, representing Virginia DEQ and EPA, have
2 reviewed the documentation and the remedial investigation
3 concur that we don't have any unacceptable risks at the
4 site.
5 That allows the Navy then to move forward with a
6 proposed plan for the site, and since we have no risks we
7 can propose a no-further-action alternative. The Navy is
8 not required to do anything else at this site. There are no
9 unacceptable risks.
10 So, this proposed plan summarizes the findings of
11 the remedial investigation, and it mentions -- it discusses
12 how we can evaluate the different media of concern.
13 Now, we mentioned this is a public participation
14 requirement. The document is available in the Grissom
15 Library for public review, and we have Mr. Kemp and John
16 Peters at NFEC, that's Public Affairs Office's point of
17 contact.
18 Channing mentioned in the introduction, "Well,
19 what's next?" After this public meeting tonight the Navy
20 will finalize this proposed plan. If there are comments we
21 will address those comments, and by addressing those
22 comments that may result in a change in some of the language
23 in the plan or some clarification of information that's in
24 the proposed plan, and then once that document is finalized
25 the Navy can go ahead and issue a no-further-action rod or

1 record of restriction of the site.

2 Because there are no unacceptable risks, this is

3 what we were talking about earlier this evening, there are

4 no land use restrictions now on this site, there's no --

5 there will not be any long-term monitoring required at this

6 site.

7 That's the formal presentation. I'm open to

8 entertaining any questions.

9 MR. MIHALKO: We're looking for a date.

10 MR. JOINER: I'm thinking --

11 MS. COLE: I think we're looking at quarters.

12 MR. MIHALKO: In June?

13 MS. COLE: The public comment period ends the 14th

14 of March. So, maybe two weeks to give your comments and

15 stuff. So, probably by the end of June.

16 MR. JOINER: Unofficially, I think it would be a

17 goal of the Navy to try to have it by the end of the fiscal

18 year.

19 MS. COLE: Definitely by the end of the year.

20 MR. JOINER: Any other questions? Okay. That

21 concludes the formal presentation. Jim, do you have any

22 other --

23 MR. KEMP: Thanks, Don. If we don't have any

24 other questions --

25 MS. COLE: I just want to make sure everyone

1 understands. This document, take it home and read it at
2 your leisure. If you have comments, we'll entertain
3 comments up until the 14th of March, and you can get with
4 Mr. Kemp or Mr. Peters.
5 MR. KEMP: Mr. Dewing, do you have any closing
6 comments?
7 MR. DEWING: No. I'm glad to see another one
8 completed and so forth, going pretty good here in the last
9 couple of years, finally getting it done.
10 MR. KEMP: Thank you for your service. Appreciate
11 it. Good luck to you.
12 MR. JOINER: This next meeting will be May 18.
13 Thank you all.
14 (Whereupon, the public meeting was
15 concluded at 8:00 p.m.)
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1 COURT REPORTER'S CERTIFICATE

2

3 I, Susan A. Ronan, Court Reporter, certify that I
4 recorded verbatim by stenotype the proceedings in the
5 captioned cause Yorktown, Virginia, on February 16, 2005.
6 I further certify that to the best of my knowledge
7 and belief, the foregoing transcript constitutes a true and
8 correct transcript of the said proceedings.
9 Given under my hand this 28th day of February,
10 2005, Norfolk, Virginia.
11
12 Susan A. Ronan/MC
13 Susan A. Ronan
14 Court Reporter
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