

9/1/03-00217

Final

**Site Management Plan
Fiscal Years 2004 through 2009
St Juliens Creek Annex
Chesapeake, Virginia**



Prepared for

**Department of the Navy
Atlantic Division
Naval Facilities Engineering Command
Norfolk, Virginia**

Contract No. N62470-02-D-3052
CTO-0010

September 2003

Prepared by

CH2MHILL

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**Under the
LANTDIV CLEAN III Program
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Acronyms and Abbreviations

ABM	abrasive blast media
AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirement
BERA	Baseline Ecological Risk Assessment
bgs	below ground surface
BTAG	Biological Technical Assistance Group
CAD	cartridge activated devices
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CHF	Chemical Hazard Factor
CLEAN	Comprehensive Long-Term Environmental Action - Navy
CTO	Contract Task Order
DDD	dichlorodiphenyldi-chloroethane
DDE	dichlorodiphenyldichloro-ethene
DDT	dichlorodiphenyltrichloro-ethane
DoD	Department of Defense
DPG	DoD Program Goal
DRMO	Defense Reutilization and Marketing Office
EE/CA	Engineering Evaluation/Cost Analysis
EOD	Explosive Ordnance Disposal
EPIC	Environmental Photographic Interpretation Center
ERA	Ecological Risk Assessment
ERS	Ecological Risk Screening
FFA	Federal Facilities Agreement
FS	Feasibility Study
ft	feet, foot
FY	fiscal year
HHRA	Human Health Risk Assessment
HHRS	Human Health Risk Screening
HRS	Hazard Ranking System
IAS	Initial Assessment Study
IR	Installation Restoration
IRP	Installation Restoration Program
LANTDIV	U.S. Navy, Naval Facilities Engineering Command, Atlantic Division
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
MPF	Migration Pathway Factor
NACIP	Navy Assessment and Control of Installation Pollutants

NAPEC	Naval Ammunition Production Engineering Center
NCP	National Contingency Plan
NFA	no further action
NPL	National Priorities List
NTCRA	Non-Time Critical Removal Action
OESO	Ordnance Environmental Support Office
ORP	Other Regulated Materials
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCP	pentachlorophenol
POTW	Publicly Operated Treatment Works
ppb	parts per billion
ppm	parts per million
PRAP	Proposed Remedial Action Plan
PWC	Public Works Center
QC	quality control
RA	Remedial Action
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RF	Receptor Factor
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
RRR	Relative Risk Ranking
SIMA	Shore Intermediate Maintenance Activity
SI	Site Inspection/Site Investigation
SJCA	St. Juliens Creek Annex
SMP	Site Management Plan
SPCC	Spill Prevention Control and Countermeasure
SSA	Site Screening Assessment
SSP	Site Screening Process
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TCL	Target Compound List
TNT	trinitrotoluene
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency
UST	underground storage tank
UXO	unexploded ordnance

VDEQ	Virginia Department of Environmental Quality
VOC	volatile organic compound
VSI	Visual Site Inspection
yd ³	cubic yards

Introduction

This document presents the Site Management Plan (SMP) for St. Juliens Creek Annex (SJCA) for fiscal years (FY) 2004 through 2009. The U.S. Navy, Naval Facilities Engineering Command, Atlantic Division (LANTDIV) is currently preparing a Federal Facilities Agreement (FFA) where the Navy, Region III of the United States Environmental Protection Agency (USEPA), and Virginia Department of Environmental Quality (VDEQ) will agree to address environmental contamination at applicable SJCA sites. The SMP meets the requirements of the FFA under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The SMP is being submitted for use by the SJCA Installation Restoration (IR) Partnering Team and their respective organizations (LANTDIV, SJCA, USEPA, and VDEQ).

1.1 Purpose

The purpose of the SMP is to provide a management tool for LANTDIV, SJCA, VDEQ, and USEPA personnel to use in the planning and scheduling of environmental remedial response activities to be conducted at SJCA under CERCLA. The SMP establishes schedules, conceptual approaches, and scopes of work that USEPA, VDEQ, and the Navy have agreed to. The schedules and work descriptions consist of:

- Detailed schedules, near-term milestones, and descriptions of proposed activities for the current FY 2004 and 2005.
- Conceptual schedules and general work approaches for activities planned for FY 2006 through FY 2009.

The prioritization of activities and the proposed schedules were developed by the SJCA IR Partnering Team (consisting of representatives of the Navy, VDEQ, and USEPA) and are based on several factors:

- The Partnering Team's relative ranking of the sites with regard to the potential risks that they may pose to human health and the environment (i.e., address high risk sites first).
- Department of Defense (DoD) Program Goals (DPGs) of having remedies in place at all "high" priority sites by FY 2005.
- Goals set by the Partnering Team to meet requirements of USEPA, VDEQ, LANTDIV, SJCA, and the public.

The SMP is a working document that is updated yearly to maintain up-to-date documentation and a summary of environmental actions at SJCA. This SMP updates and supercedes the FY 2003 through 2008 SMP prepared by CH2M HILL in January 2003 (CH2M HILL, 2003a).

1.2 SMP Report Organization

This SMP consists of six sections. This section establishes the purpose of the SMP. Section 2 presents a brief history of environmental activities at the base and describes each of the sites at SJCA that are currently included, or are being addressed under CERCLA, and will be identified in the FFA. Section 3 presents the proposed scope of work at each site where activities will be conducted during FY 2004. Section 4 presents 5-year schedules for environmental investigation and remediation activities at those sites where activities are currently planned for FY 2004 through 2009. Section 5 summarizes planned and potential remedial and removal actions for SJCA. References are provided in Section 6.

Site Background

The SJCA facility is situated at the confluence of St. Juliens Creek and the Southern Branch of the Elizabeth River in the City of Chesapeake, located in southeastern Virginia (Figure 2-1). The facility covers approximately 490 acres.

The facility is bordered to the north by the Norfolk and Western Railroad, the City of Portsmouth, and residential areas; to the west by residential areas; to the south by St. Juliens Creek; and to the east by the Southern Branch of the Elizabeth River (Figure 2-1). Most of the surrounding areas are developed and include residences, schools, recreational area, and shipping facilities for several large industries. The Norfolk Naval Shipyard is located approximately 1.5 miles to the north.

St. Juliens Creek Annex began operations as a naval ammunition facility in 1849. In the past, operations at SJCA have included general ordnance operations involving wartime transfer of ammunitions to various other U.S. Naval facilities throughout the United States and abroad. In addition, the Annex has been involved in specific ordnance operations and processes including those involving black powder operations, smokeless powder operations, projectile loading operations, mine loading, tracer mixing, testing operations, and decontamination operations. Decontamination was performed in, around, and under ordnance handling facilities at SJCA in 1977, after ordnance operations had ceased (NEESA, 1981).

St. Juliens Creek Annex has also been involved in non-ordnance operations, including degreasing operations, paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plant operations, wash rack operations, potable water, salt water fire protection systems, and fire training operations. Many of these operations have been discontinued, such as locomotive maintenance and printing.

Activity at SJCA has decreased in recent years. The current primary mission of SJCA is to provide a radar testing range and various administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local Naval activities. St. Juliens Creek Annex also provides administrative offices, light industrial shops, storage facilities, Defense Reutilization and Marketing Office (DRMO) storage, Space and Naval Warfare Systems Command (SPAWAR), Shore Intermediate Maintenance Activity (SIMA), a radar testing facility, and a cryogenics school for various naval commands.

Materials stored at SJCA have included oil, ordnance materials, non-ordnance chemicals, and disaster preparedness chemicals. Various parts of the facility are currently used to store small amounts of waste before transfer to accumulation points.

2.1 Environmental History

In 1975, the DoD began a program to assess past hazardous and toxic materials storage and disposal activities at military installations. The goals of this program, now known as the

Installation Restoration Program (IRP), were to identify environmental contamination resulting from past hazardous materials management practices, to assess the impacts of the contamination on public health and the environment, and to provide corrective measures as required to mitigate adverse impacts to public health and the environment.

In 1976, the Resource Conservation and Recovery Act (RCRA) was passed by Congress to address potentially adverse human health and environmental impacts of hazardous waste management and disposal practices. RCRA was legislated to manage the present and future disposal of hazardous wastes. In 1980, the CERCLA, or “Superfund,” was passed to investigate and remediate areas contaminated from past hazardous waste management practices.

In 1981, the DoD’s IRP was re-issued, with additional responsibilities and authorities specified in CERCLA delegated to the Secretary of Defense. The Navy subsequently restructured the IRP to match the terminology and structure of the USEPA CERCLA Program. The current IRP is consistent with CERCLA and applicable state environmental laws.

St. Juliens Creek Annex was listed on the USEPA National Priorities List (NPL) in August 2000. The Navy acts as the lead agency, in partnership with the USEPA and VDEQ to address environmental investigations at the facility through the IRP. The Navy is currently preparing an FFA for use among the Navy, the USEPA, and the VDEQ. Under the FFA, all past and future work at IR Sites, solid waste management units (SWMUs), and Areas of Concern (AOCs) will be reviewed and a course of action for future work requirements at each site will be developed. The FFA will include specific requirements for the preparation and contents of the SMP.

The following sections provide an overview of the CERCLA process and a summary of the major studies completed to date at SJCA. Table 2-1 lists studies, investigations, and actions completed to date at each site.

2.1.1 CERCLA Process

The objectives of the CERCLA process are to evaluate the nature and extent of contamination at a site, and to identify, develop, and implement appropriate remedial actions in order to protect human health and the environment. The major elements of the CERCLA process are:

- Preliminary Assessment/Site Investigation (PA/SI),
- Remedial Investigation/ Feasibility Study (RI/FS),
- Proposed Remedial Action Plan (PRAP) and Record of Decision (ROD),
- Remedial Design and Remedial Action (RD/RA),
- Operation and Maintenance,
- Post-Remedial Action Monitoring and Reporting, and
- Final Site Close-out.

The documents prepared for the program are maintained in information repositories for review by the public. Public meetings are held semi-annually to inform the public of the IRP progress. A formal public comment period and a public meeting (if required) generally occurs at the remedy selection step (PRAP and ROD). Public comments received are

addressed as part of the responsiveness summary in the ROD. Subsequent to the public comment period, RD/RA activities are initiated.

At times, some sites warrant preliminary or interim investigations, studies, or removal/remedial actions. If it is unclear as to whether a site should be included in the CERCLA RI/FS process, a Preliminary Assessment (PA), Site Screening Process (SSP), or Site Investigation (SI) is sometimes conducted to make a general determination if activities at the site have impacted environmental media.

Removal actions are implemented to clean up or remove hazardous substances from the environment at a specific site in order to mitigate the spread of contamination. Removal actions may be implemented at any time during the CERCLA process.

Removal actions are classified as either time-critical or non-time-critical. Actions taken immediately to mitigate an imminent threat to human health or the environment, such as the removal of corroded or leaking drums containing harmful material, are classified as time-critical removal actions. Removal actions that may be delayed for 6 months or more without significant additional harm to human health or the environment are classified as non-time-critical removal actions (NTCRAs).

For NTCRAs, an Engineering Evaluation/Cost Analysis (EE/CA) is prepared to assess removal action alternatives. An EE/CA focuses only on the substances to be removed rather than on all contaminated substances at the site. It is possible for a removal action to become the final remedial action if the risk assessment results indicate that no further remedial action is required in order to protect human health and the environment.

Interim remedial actions are implemented to provide temporary mitigation of human health risks or to mitigate the spread of contamination in the environment. Similar to removal actions, they may be implemented at any time during the process. Examples of interim remedial actions include installing a pump-and-treat system for product recovery from the groundwater or installing a fence to prevent direct contact with hazardous materials.

For interim remedial actions, a focused FS is prepared rather than the more extensive FS. As with the removal action, an interim remedial action may become the final remedial action if the results of the risk assessment indicate that no further remedial action is required in order to protect human health and the environment.

Treatability studies are performed to assist in the evaluation of a potentially promising remedial technology. The primary objectives of treatability testing are to:

- Provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the FS;
- Support the remedial design of a selected remedial alternative.

Treatability studies may be conducted at any time during the process. The need for a treatability study generally is identified during the RI/FS.

Treatability studies may be classified as either bench-scale (laboratory study) or pilot-scale (field studies). For technologies that are well-developed and tested, bench-scale studies are often sufficient to evaluate performance. For innovative technologies, pilot tests may be required to obtain the desired information. Pilot tests simulate the physical and chemical

parameters of the full-scale process, and are designed to bridge the gap between bench-scale and full-scale operations.

2.1.2 Initial Assessment Study (IAS)

In 1981, the Navy conducted the IAS as part of the Naval Assessment and Control of Installation Pollutants (NACIP) Program (NEESA, 1981). The purpose of the IAS was to identify and assess sites that posed a potential threat to human health or the environment because of contamination from past handling of and operations involving hazardous materials.

Results of this study revealed that low level concentrations of ordnance materials exist in the eastern and southern portions of SJCA. The decontamination process of buildings, equipment, magazines, and burning grounds was conducted in 1977 and lowered the ordnance concentrations. However, visual inspections and analytical tests performed after decontamination indicated that low concentrations of ordnance still exist in some buildings (NEESA, 1981). Residues were also suspected from garbage burning at the Burning Grounds (Site 5), garbage burning near the swamp between Buildings 257 and 130 (Site 2), pesticide and herbicide rinsewater disposal at Cross Street and Mine Road (Site 8), and ordnance wastewaters and rinsewaters to the sediments of Blows Creek. However, the sites identified were determined not to pose a threat to human health and the environment, and no confirmation study was recommended.

2.1.3 Preliminary Assessment (PA)

In 1983, NUS Corporation, Superfund Division (NUS), conducted a PA at seven sites at the facility. These sites comprised:

- Cross and Mine (SWMU 9 [renamed Site 8]);
- Building 249 (SWMU 13);
- Dump A (SWMU 1 [renamed Site 1]);
- Dump B (SWMU 2 [renamed Site 2]);
- Dump B Incinerator (SWMU #3 [included with Site 2]);
- Dump C (SWMU 5 [renamed Site 3]); and
- Dump D (SWMU 6 [renamed Site 4]).

Ambient air at each site was monitored for volatile organic compounds (VOCs) and radiation with an organic vapor meter and radiation meter, respectively. No readings above background were encountered and NUS did not observe significant signs of contamination at the sites. However, the PA report mentioned that various locations on the facility were contaminated with low level residues of pesticide and herbicide materials. A confirmation study was not proposed (A.T. Kearney, 1989).

2.1.4 Phase II RCRA Facility Assessment (RFA)

In 1989, A.T. Kearney, Inc. and K.W. Brown and Associates, Inc. prepared a Phase II RFA. The RFA included a preliminary review of all available relevant documents and a visual site inspection (VSI) that identified 34 SWMUs and 12 AOCs (AOCs A through L). No sampling was conducted during the RFA (A.T. Kearney, 1989).

Fifteen SWMUs (SWMUs 4, 9, 13, 14, 15, 16, 17, 19, 20, 23, 25, 27, 32, 33, and 41) and eight AOCs (AOCs B, C, D, E, G, H, I, and J) were recommended for further action. Detailed subsurface investigations, such as RCRA Facility Investigations (RFIs), were recommended at 10 the SWMUs (SWMUs 1, 2, 3, 4, 5, 6, 8, 24, 30, and 32) and AOC L.

2.1.5 Relative Risk Ranking (RRR) System Data Collection Report

In April 1996, CH2M HILL submitted a RRR System Data Collection Report for SJCA to the Department of the Navy. The report contained results from soil, sediment, and groundwater sampling conducted at 21 Sites (Sites 1 through 21) at the Annex. The goal of the sampling effort was to gather data for the Navy to determine which sites may require further investigation and to prioritize those sites where further investigation was needed (CH2M HILL, 1996).

The RRR System uses three components to assign a relative risk to each site. The three components are Chemical Hazard Factor (CHF), Migration Pathway Factor (MPF) and Receptor Factor (RF) (CH2M HILL, 1996). No background or quality control (QC) samples were collected during the RRR data collection and the data was not validated, as these data were used for screening purposes only.

2.1.6 Environmental Photographic Interpretation Center (EPIC) Study and Regulatory Review

In 1995, USEPA conducted a review of historical aerial photographs of Annexes of the Norfolk Naval Shipyard, including SJCA (USEPA, 1995). Potential waste disposal activities were identified at SJCA.

In June 1999, USEPA, VDEQ, and Navy jointly reviewed the EPIC and historical aerial photography of SJCA and identified twelve potential AOCs for investigation. In November 1999, a work-in progress/site visit with representatives of the Navy, CDM Federal, VDEQ, and the biological technical assistance group (BTAG) was conducted to evaluate the 12 “EPIC AOC” locations (EPIC AOCs 1 through 12). A review of the current and past conditions of each of the 12 “EPIC AOC” locations was also conducted using the EPIC photographs to determine if sampling was warranted at any of the locations. Further desktop review and site visits were conducted by the SJCA Partnering Team in 2001 and EPIC AOCs 2 through 12 were recommended for no further action (NFA).

2.1.7 Hazard Ranking System (HRS)

In 1999, Tetra Tech was assigned by the USEPA to prepare an HRS sampling plan for St. Juliens Creek Annex. The purpose of the plan was to identify additional sampling locations and sample analysis necessary to complete the HRS evaluation of SJCA (Tetra Tech, 1999). Twelve potential sources that may have released contaminants were identified. Twenty-one sediment samples were collected from Blows Creek, the Southern Branch of the Elizabeth River, and St. Juliens Creek in February 1999 and analyzed for Target Analyte List (TAL) and Target Compound List (TCL) constituents.

Samples SD-1 through SD-8 were collected in the Southern Branch of the Elizabeth River in close proximity to Sites 4, 19, and 20. SD-9 through SD-14 were collected in St. Juliens Creek near Site 2 and SD-15 through SD-21 were collected in Blows Creek. The data was presented in the *Hazard Ranking System Documentation Record for St. Juliens Creek Annex* (Tetra Tech,

2000). The HRS document identified sample locations SD-2, SD-3, SD-4, SD-5, SDSD-11, SD-12, SD-13, SD-14, SD-20, and SD-21 as containing inorganic concentrations that met the criteria for observed releases. SD-3, SD-5, SD-13, SD-14, SD-18, and SD-21 also had concentrations of organic compounds that met the criteria for observed releases.

2.1.8 Technical Memorandum Findings of Expanded Site Inspection of Site 17 (Building 278/279)

In 2001, four surface soil samples were collected and analyzed as part of an Expanded Site Investigation to determine if Site 17 required further investigation (CH2M HILL, 2001a). Polycyclic aromatic hydrocarbons (PAHs) and metals were present above background concentrations and human health and ecological screening values. The SI concluded that Site 17 may pose a risk to human health and the environment. It was recommended that an additional investigation be conducted to define the vertical and horizontal extent of contaminants and better define any potential risk at Site 17. Further, based upon their proximity to one another, the report recommended incorporating investigation activities of Site 17 with Site 2.

2.1.9 Background Investigation Report

A soil background study was conducted in 2001 (CH2M HILL, 2001b). The objective of the investigation was to establish background concentrations of metals, pesticides, and PAHs in surface and subsurface soil for use in comparison to IRP Site data to better identify site-related constituents of concern. Background levels are due to naturally occurring (those chemicals expected at a site in the absence of human influence) or anthropogenic (chemicals that are present in the environment due to man-made, non-site related sources) sources.

2.1.10 Site Screening Assessment (SSA) Report

An SSA was finalized in April 2002 and covered eight Sites (Sites 1, 8, 10, 11, 18, 19, 20, and 21) and EPIC AOCs 1 through 12 (CH2M HILL, 2002a). The sites were originally identified during the RFA (A.T. Kearney, 1989) and the EPIC AOCs were identified during the joint USEPA, VDEQ, and Navy review of historical facility aerial photographs (EPIC Study) in June 1999.

The SSA recommended further investigation at four Sites (Sites 1, 8, 19, and 21) and EPIC AOC 1 to determine if a release had occurred and if an RI was warranted for the sites (CH2M HILL, 2002a). The Navy, in partnership with the USEPA and VDEQ, determined NFA was required for Sites 10, 11, 18, and 20 and EPIC AOCs 2 through 12.

An addendum to the SSA was submitted in January 2003 regarding a further investigation conducted at Site 1 (Waste Disposal Area A) in September 2002. The addendum documented closeout for Site 1.

2.1.11 Engineering Evaluation/Cost Analysis (EE/CA) for Sites 3 and 6

An EE/CA for a NTCRA for soil and sediment was completed in June 2002 for Sites 3 and 6 at SJCA (CH2M HILL, 2002b). The EE/CA was prepared in response to RI findings. The objective of the EE/CA was to design the removal of waste and mitigate potential risks posed by the presence of physical and chemical wastes at Sites 3 and 6. The EE/CA evaluated several different options for meeting these objectives. The selected action includes

excavation (including unexploded ordnance [UXO] screening and removal) of visible burnt/stained soil and debris, as well as material posing a potential risk to human health and the environment, characterization (including UXO screening and removal), and non-hazardous disposal of waste and debris in a local landfill. The EE/CA calculated that approximately 9,204 yd³ of waste, soil, and sediment were recommended for removal from Sites 3 and 6. Following complete removal of waste and contaminated media posing a potential risk, the land comprising Sites 3 and 6 will have unrestricted land-use (CH2M HILL, 2002b).

An Action Memorandum was completed in August 2002 as the Decision Document for the EE/CA and documents approval for the selected removal action for Sites 3 and 6. This selected removal action was developed in accordance with CERCLA as amended, and is consistent with the National Contingency Plan (NCP). The Naval Facilities Engineering Command, in cooperation with the USEPA and VDEQ, recommended approval of the proposed removal action.

2.1.12 Site 6 Closeout Report and Site 3 Removal Summary

In March 2003, following the NTCRA activities at Sites 3 and 6 conducted in August and September 2002, a Closeout Report for Site 6 and Removal Summary for Site 3 was completed. The report documents closeout of Site 6 and presents a summary of the removal activities conducted at Site 3.

At Site 3, Phase I of the removal activity included approximately 3,300 yd³ of waste and soil removed in August 2002. The remainder of the Site 3 removal (Phase II) is scheduled to begin in October 2003. Following the completion of the Phase II removal action, all Phase I and Phase II confirmation sample data will be evaluated for mitigation of risk and site closure.

Based upon the complete removal of waste/soil at Site 6, approximately 180 yd³, it was recommended that Site 6 be closed with NFA and a no action PRAP and ROD be prepared for Site 6 (CH2M HILL, 2003b).

2.1.13 Remedial Investigation (RI) for Sites 3, 4, 5, and 6

An RI for Sites 3, 4, 5, and 6 was completed in March 2003 and included human health and ecological risk assessments (CH2M HILL, 2003c). Surface and subsurface soil, shallow (Columbia Aquifer) and deep (Yorktown Aquifer) groundwater, sediment, and surface water samples were collected and analyzed to characterize the nature and extent of contaminants and potential human health and ecological risks posed by contaminants at each site.

The RI concluded that potential remedial alternatives include removal and/or soil cover to address potential risk from exposure to soil at Sites 3, 4, 5, and 6 and upland ditch sediment at Sites 3 and 4. The RI also recommended that the SJCA Partnering Team consider additional soil sampling at Sites 3 and 5 in support of further characterization of the nature and extent of contamination and evaluation of remedial alternatives.

Mitigation of risk through remedial actions for soil and upland ditch sediment would eliminate concern for continued transport of potential contaminants Blows Creek. Further evaluation of the potential for adverse effects from historical contributions to aquatic life in

Blows Creek sediment was recommended and scheduled for Summer 2003 under the *Final Work Plan for Baseline Ecological Risk Assessment (Step 4), Blows Creek Sites 3, 4, and 5*, submitted in August 2003 (CH2M HILL, 2003e).

Groundwater samples collected from the shallow monitoring wells at Site 5 indicated isolated detections of metals at concentrations above Maximum Contaminant Level (MCLs). In addition, an isolated detection of RDX was found in a sample collected from a deep monitoring well. Because these results were isolated and inconsistent between the three rounds of sampling, the Partnering Team concluded that an additional round of groundwater samples was necessary to confirm the RI results before proceeding with a more complete assessment of remedial needs for groundwater associated with Site 5.

2.1.14 Remedial Investigation (RI) Report for Site 2

A Draft RI for Site 2 was completed in September 2003 and included human health and ecological risk assessments (CH2M HILL, 2003f). Surface and subsurface soil, shallow (Columbia Aquifer) and deep (Yorktown Aquifer) groundwater, sediment, and surface water samples were collected and analyzed to characterize the nature and extent of contaminants and potential human health and ecological risks posed by contaminants at Site 2.

The RI concluded that potential remedial alternatives include removal and/or soil cover to address potential risk from exposure to soil. Mitigation of risk through remedial actions for soil will also eliminate concern for continued transport of potential contaminants to the inlet. Risks identified to human health and ecological receptors from exposure to sediment may also warrant remedial action. The SJCA Partnering Team will consider various alternatives which may include removal of impacted sediment in the inlet. The potential remedial actions may also include improving the quality of existing wetland areas adjacent to the inlet through the removal of phragmites and replacement with higher quality wetland species.

Based on the results of the Site 2 RI and data gaps identified, an Expanded RI was recommended to include shallow monitoring well installation and sampling to further define the nature and extent of shallow groundwater contamination, stormwater and surface water sampling to assess the source of VOC contamination in inlet surface water, and sediment sampling in St. Juliens Creek to evaluate potential impacts from the Site 2 inlet.

2.1.15 Feasibility Study (FS) for Site 4

A Draft FS for Site was completed in July 2003 to evaluate potential remedial options to mitigate the risk posed by Site 4 (CH2M HILL, 2003d). Four alternatives were considered; no further action, soil cover, RCRA Subtitle D cap, and excavation and offsite disposal of landfill material.

Based on the comparative analysis, a soil cover was selected as the remedial alternative for Site 4. This alternative was selected based on its protection of human health and the environment, its compliance with Virginia applicable or relevant and appropriate requirements (ARARs), its short- and long-term effectiveness, and its relatively easy implementability.

2.2 Descriptions of Sites, SWMUs, and AOCs

The following sections provide site-specific information for each of the Sites, SWMUs, and AOCs identified at SJCA. Sites that were identified and have since been determined to require NFA are also included. The status of each site is presented in Table 2-2. Locations of each Site, SWMU, and AOC are shown in Figure 2-2. This figure also identifies which Sites, SWMUs, and AOCs require further investigation under CERCLA. Table 2-3 provides a summary of pertinent building and related area information for several SWMUs and AOCs.

2.2.1 Descriptions of Sites

The following IRP Sites were identified for further investigation under the CERCLA SSA/SI/RI/FS process.

2.2.1.1 Site 1—Waste Disposal Area A

Site 1 consists of a one-acre area former waste disposal area located east of Cradock Street, west of a set of railroad tracks, and north of Building 146. The extent of waste disposal is unknown and the site boundaries are approximate. In earlier documents, Site 1 was referred to as Dump A or SWMU 1.

The waste disposal area was used from 1921 to 1924 primarily for the disposal of trash and garbage as reported in the RFA (A.T. Kearney, 1989). Pesticides, acids and bases were also reportedly disposed of at the site. It was reported that trash was burned at the site and the ashes used to fill the marsh area adjacent to Blows Creek. The estimated volume of disposed material prior to being burned was 30,000 cubic yards (yd³).

During the IAS (NEESA, 1981), no evidence of environmental contamination was noted. In 1983, NUS conducted a PA, which indicated that neither VOCs nor radiation was present in the air at Site 1. In the 1989 RFA, Site 1 was recommended for an RFI due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to high potential for release to surface water via runoff and groundwater discharge due to the proximity to Blows Creek. During the 1996 RRR data collection study, two surface soil and two groundwater samples were collected and analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), inorganics, and nitramines (CH2M HILL, 1996). DDT, DDE, and several PAHs were detected in soil and nitrobenzene was detected in the groundwater.

As part of the HRS Scoring Field Investigation conducted in 2000, surface water and sediment samples were collected from Blows Creek in the vicinity of the waste disposal area (Tetra Tech, 2000). The downstream sample collected closest to Site 1 was described as “black sand” while other samples both upstream and downstream of the site had components of silt and organic material. Since both fine-grained material and organic material have a greater tendency to adsorb contaminants, the dominance of sand in the downstream sample was considered to bias the sample toward lower concentrations of contaminants. Furthermore, the samples were collected during rising (incoming) tide, which could have prevented representative samples from being collected. Based on the evaluation of this data, it was determined that there appeared to be data gaps that should be addressed.

In February 2001, during investigations to support a SSA, four surface water and four sediment samples were collected from Blows Creek, north of Site 1, to address the data gaps identified during the HRS field investigation. The RRR and HRS results were used with the February 2001 results to conduct a human health risk screening (HHRS) and ecological risk screening (ERS) as part of the SSA (CH2M HILL, 2002a). Human health and ecological risk screens determined that groundwater, sediment, and soil at Site 1 are not media of concern. The HHRS, however, did recommend further evaluation of surface water to determine if inorganics in surface water were site-related or related to background or reference conditions in Blows Creek. No further evaluation was found to be necessary based on the ERS. It was also recommended that trenching activities be conducted to determine the limits of the waste disposal area and character of the waste.

In September 2002, three test pits were excavated at Site 1 and no evidence of waste was encountered. Consensus for NFA at Site 1 was reached by the SJCA Partnering Team based on RRR data and the test pit results and an addendum to the SSA was submitted in January 2003 that documented the closeout of Site 1.

2.2.1.2 Site 2—Waste Disposal Area B

Site 2 is a former waste disposal area located at the corner of St. Juliens Drive and Craddock Street in the southwestern portion of the facility. In earlier documents, Site 2 was referred to as Dump B, Landfill B, and SWMUs 2, 3, and 4. The waste disposal area began operating in 1921. Initially, refuse was burned onsite and was used to fill an adjacent swampy area. Mixed municipal wastes, organics, inorganics, solvents, and waste ordnance may have been disposed at Site 2. The total volume of waste prior to burning is reported to have been approximately 35,185 yd³ and it is estimated that half of this waste was disposed of prior to 1942. In 1942, an incinerator was installed and replaced the open burning practices. The waste disposal area was closed sometime after 1947 (A.T. Kearney, 1989).

Site 2 also contains abrasive blast media (ABM) from ship overhaul and repair operations and the dates of ABM disposal are not known. In 1989, the VSI during the RFA indicated that the site was used for storage of heavy equipment and machinery, including storage of tools, tires, and machinery in sheds and trailers.

In the center of Site 2 is a water body surrounded by brush, trees, and grass that is directly connected to St. Juliens Creek. This inlet is tidally influenced and drains surface water from adjoining land into the creek. The Site 2 topography is generally level, sloping towards the inlet and St. Juliens Creek. Groundwater flow mimics the topography and flows towards the inlet and creek. Construction debris (concrete and brick), as well as ABM, is visible at the site. Site 2 is bounded to the north by a parking lot and CERCLA Site 17 (former Building 278/279); to the east by a grass-covered field where Building 130 once stood; to the west by a stormwater drainage ditch and Craddock Street; and to the south by St. Juliens Road and St. Juliens Creek.

Drainage ditches are located along Craddock Street. The 2 to 3 feet (ft) deep grassed drainage ditches originate north of Site 2, may contain standing water, and drain Craddock Street during high rainfall periods. The portions of the drainage ditch adjacent to the SIMA building flow through an underground stormwater pipe under the parking lot and through the northernmost culvert to the inlet. The drainage ditches south of the SIMA building enter the inlet through a culvert on the west side of the inlet. An underground storm drainage

system also exists that originates approximately 1,000 ft northeast of the Site 2 area and outlets to the northernmost culvert to the inlet. Surface runoff from an adjacent parking lot to the northwest of the inlet also drains directly into the inlet.

During the 1981 IAS, a drum of Pen-Strip-G (penetone) was identified in the washrack at Building 249, just north of Site 2. The IAS states that penetone was used for vehicle and equipment cleaning in the washrack and the wastewater drained to the sanitary sewer, but prior to 1976 the effluent drained to the swampy area (Site 2 inlet), which drained into St. Juliens Creek. In 1983, NUS conducted a PA and ambient air samples were monitored for VOCs and radiation; no readings above background were encountered at Site 2.

During the 1989 RFA, stained soil associated with leaking heavy equipment stored onsite, ash, and ABM were observed on the ground surface at Site 2. An RFI was recommended at Site 2 due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to high potential for release to surface water via runoff and groundwater discharge due to the proximity to St. Juliens Creek. Additionally, soil sampling for metals was recommended in the areas of blast grit to determine if hazardous constituents were associated with the material.

During the RRR data collection study in 1996, two surface soil and two groundwater samples were collected at Site 2 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines (CH2M HILL, 1996). The soil samples were found to contain pesticides/PCBs and inorganics. The groundwater samples contained 2,4,6-trinitrotoluene, 1,3,5-trinitrobenzene, acetone, and several inorganics.

RI field activities were completed at Site 2 in 2001. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, waste delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, and surface water samples.

Based on the results of a waste delineation trenching activity conducted in 2001, historical aerial photograph reviews, and Tier I SJCA Partnering Team discussions it was determined that Site 2 was not operated as a cut and fill landfill. Therefore, Site 2 was reclassified as a waste disposal area. In addition, the Site 2 boundary was adjusted to reflect the extent of waste.

The Draft RI/HHRA/ERA report, completed in September 2003, concluded that potential remedial alternatives include removal and/or soil cover to address potential risk from exposure to soil. Mitigation of risk through remedial actions for soil will also eliminate concern for continued transport of potential contaminants to the inlet. Risks identified to human health and ecological receptors from exposure to sediment may also warrant remedial action. The SJCA Partnering Team will consider various alternatives which may include removal of impacted sediment in the inlet. The potential remedial actions may also include improving the quality of existing wetland areas adjacent to the inlet through the removal of phragmites and replacement with higher quality wetland species.

Based on the results of the Site 2 RI and data gaps identified, an Expanded RI was recommended to include shallow monitoring well installation and sampling to further define the nature and extent of shallow groundwater contamination, stormwater and surface water sampling to assess the source of VOC contamination in inlet surface water,

and sediment sampling in St. Juliens Creek to evaluate potential impacts from the Site 2 inlet. The Expanded RI activities are scheduled to take place in Fall 2003.

2.2.1.3 Site 3—Waste Disposal Area C

Site 3 is a former waste disposal area that covers approximately 2.1 acres in the northeastern corner of the Annex and is accessible by way of a patrol road. Review of historical aerial photographs, interpreted by EPIC, indicate that prior to use as a disposal area, the site and much of the adjacent area had been used for placement of dredge spoil material (USEPA, 1995) which reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. Site 3 was reported to consist of about 10 acres. In earlier documents, Site 3 was referred to as Dump C, Waste Disposal Pits, Landfill C, SWMU 5, or SWMU 30.

Site 3 was originally a mudflat where refuse was allowed to burn; the ash was then used to fill the area. Operations began in 1940 and continued until 1970. Refuse disposed of at Site 3 may have included solvents, acids, bases, and mixed municipal waste, in addition to trichloroethylene waste oil and oil sludges. Prior to burning, the total volume of waste disposed of was estimated to be 27,778 yd³. Salvageable materials were removed from the site each day and once every two weeks the site was bulldozed for compaction and leveling (NEESA, 1981). After 1970, the area was graded level and covered with grass (CDM, 1999b).

Two pits at Site 3 were reportedly used for disposal of oil and oily sludge, as well as for periodic burning. The locations of the waste disposal pit and waste disposal area were outlined based on historical aerial photographs taken in 1958, 1961, 1964 and 1970 and interpreted by USEPA (USEPA, 1995). As identified in the photographs, the disposal pits were located along the north side of the dirt road that crosses the site diagonally. USEPA also interpreted ground scarring along the road to be possible waste disposal areas (CDM, 1999b).

In 1983, NUS conducted a PA and ambient air samples were monitored for VOCs and radiation; no readings above background were encountered at Site 3. During the 1989 RFA, Site 3 was recommended for an RFI due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to high potential for release to surface water via runoff and groundwater discharge due to the proximity to Blows Creek.

During the RRR data collection study in 1996, two surface soil and three groundwater samples were collected at Site 3 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines (CH2M HILL, 1996). The soil samples were found to contain several SVOCs, pesticides/PCBs, and inorganics. The groundwater samples contained SVOCs, nitramines, and inorganics.

According to former employees, interviewed in December 2001, Site 3 was used for disposing of materials from buildings, including Buildings 89 and 190. The area was said to be used during the 1977 building decontamination at SJCA where materials from the buildings were lined up aside the gravel road.

An RI/HHRA/ERA Report was completed for Site 3 in 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, water delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, surface water samples. Debris and burnt/stained soil were visually identified within 30 inches of the ground surface at Site 3.

The debris area was confined along the access road, which transects Site 3, with the majority of debris located on the north side of the road. Burnt or stained soil was limited to the north side of the gravel access road (CH2M HILL, 2003c).

Based on an interview conducted on December 18, 2001 with former SJCA employees and intrusive investigations conducted as part of the 2001 RI, the extent of waste at Site 3 was determined to be substantially smaller than previously reported and not an established landfill. Therefore, the SJCA Partnering Team reclassified the site as a waste disposal area (CH2M HILL, 2003c). In addition, the Site 3 boundary was adjusted to reflect the extent of waste.

The RI concluded that potential remedial alternatives include removal and/or soil cover to address potential risk from exposure to soil and upland ditch sediment at Site 3. The RI also recommended that the SJCA Partnering Team consider additional soil sampling at Sites 3 in support of further characterization of the nature and extent of contamination and evaluation of remedial alternatives. Mitigation of risk through remedial actions for soil and upland ditch sediment would eliminate concern for continued transport of potential contaminants Blows Creek. Further evaluation of the potential for adverse effects from historical contributions to aquatic life in Blows Creek sediment was recommended in the RI and scheduled for Summer 2003 under the *Final Work Plan for Baseline Ecological Risk Assessment (Step 4), Blows Creek Sites 3, 4, and 5*, submitted in August 2003.

Arsenic and manganese were identified as human health risk drivers in the deeper Yorktown Aquifer in the RI. However, arsenic was only detected in one unfiltered sample collected from the upgradient well during the most recent sampling event and the concentration was below the MCL and the manganese concentrations were below the USEPA Region III tap water risk-based concentration (RBC). Therefore, the Navy, USEPA, and VDEQ agreed risk management of groundwater was warranted with NFA.

An EE/CA was prepared in June 2002 and Phase I of the proposed NTCRA was conducted at Site 3 in the last quarter of FY 2002. The NTCRA included excavation of visible burnt/stained soil and debris, as well as surrounding material posing a potential risk to human health and the environment, characterization (including UXO screening and removal), and non-hazardous disposal of waste and debris in a local landfill. The extent of the area removed included 3,300 yd³ of waste and soil.

A Supplemental Remedial Investigation (SRI) of soil was conducted in February 2003 to clearly define the extent of the Phase II NTCRA. As a result, the extent of surface soil removal was increased 10 ft. radially around SS19 with an additional confirmation sample required after removal in the vicinity of SS19. These samples will serve as final confirmatory samples following completion of the Phase II NTCRA and the results will be presented in a Closeout Report for Site 3. The Phase II NTCRA is planned for FY 2003 to remove the remaining waste, soil, and sediment at Site 3. Following complete removal of waste and media posing a potential risk, the land compromising Site 3 will have unrestricted use.

2.2.1.4 Site 4—Landfill D

The Site 4 landfill covers an estimated 10 acres and is located approximately 500 ft south of Site 3. The site is located on dredge fill material which reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. The areal extent of Site 4 was previously reported to be about 5 acres, however, a review of historical aerial photographs

and site reconnaissance conducted during the RI in 2001 indicated that the extent of Site 4 was greater than previously reported, extending west from the original site boundary. In earlier documents, Site 4 was referred to as Dump D or SWMU 6 and included SWMU 7 and AOC L.

In 1970, a sanitary landfill was started at Site 4. The IAS stated that the landfill operation continued until 1976 and consisted of a series of unlined trenches filled with trash and wet garbage and the disposal of inert material. A historical aerial photograph from 1961 indicated a trench, well before the reported start date of 1970. The IAS indicated that the first trench was approximately 1,00 ft long and was located parallel to and 500 ft north of Blows Creek. As the trenches were filled, parallel trenches were dug and covered with soil from subsequent trenches. The total number of trenches at Site 4 is not known.

The RFA indicated that the use of Dump D was discontinued in 1981. The wastes disposed of at Site 4 were estimated at 1,500,000 yd³ and included trash, wet garbage, construction materials, solvents, pesticides, acids, bases, PCBs, and out-dated civil defense stores. According to personnel at the Base Public Works Center (PWC), the PCBs most likely came from ballast containers for fluorescent light fixtures. It is not known whether or not these ballast containers were sealed units. Drums of unknown materials were stored on the surface and buried at Site 4 and several tanks with undetermined wastes were also once stored in the area. During the 1989 RFA, Site 4 was recommended for an RFI due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to high potential for release to surface water via runoff and groundwater discharge due to the proximity to Blows Creek.

In 1983, NUS conducted a PA and ambient air samples were monitored for VOCs and radiation; no readings above background were encountered at Site 4. During the RRR data collection study in 1996, two surface soil and three groundwater samples were collected at Site 4 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines (CH2M HILL, 1996). The soil samples were found to contain several PAHs, pesticides/PCBs, and inorganics. Acetone and several inorganics were detected in the groundwater samples.

Along the eastern boundary of Site 4, a drainage ditch diverts stormwater run-on from the site into Blows Creek. An east-west trending drainage ditch is also present along the northern site boundary of Site 4. This ditch appears to receive only surface water run-off from the site's northern portion as well as run-off from adjacent northern areas, which eventually discharge into the wetlands on the site's western side.

An RI/HHRA/ERA Report was completed for Site 4 in 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, and surface water samples (CH2M HILL, 2003c).

The RI concluded that potential remedial alternatives include removal and/or soil cover to address potential risk from exposure to soil and upland ditch sediment at Site 4. Elevated mercury concentrations (greater than 6 mg/kg) were detected in the Site 4 drainage sediments adjacent to Blows Creek. Mitigation of risk through remedial actions for soil and upland ditch sediment would eliminate concern for continued transport of potential contaminants Blows Creek. Further evaluation of the potential for adverse effects from

historical contributions to aquatic life in Blows Creek sediment was recommended in the RI and scheduled for Summer 2003 under the *Final Work Plan for Baseline Ecological Risk Assessment (Step 4), Blows Creek Sites 3, 4, and 5*, submitted in August 2003.

The results of sampling conducted to date at Site 4 have not indicated the presence of hazardous materials. Although trenching and landfilling may have continued after 1976 (RCRA), it is believed that only municipal wastes and inert material were disposed of. In addition, no sampling to date has indicated the presence of hazardous waste.

A Draft FS for Site 4 was submitted in July 2003 (CH2M HILL, 2003d). Remedial alternatives, including no action, soil cover, RCRA Subtitle D Cap, and excavation and offsite disposal were evaluated to minimize contact of human and ecological receptors with landfill contents, reduce infiltration and leaching of contaminants from the landfill to the groundwater, and prevent surface water run-on and control surface water run-off and erosion. Based on the comparative analysis conducted as part of the FS, soil cover was selected as the recommended remedial alternative for Site 4.

2.2.1.5 Site 5—Burning Grounds

Site 5 consists of approximately 3 acres located east of Craddock Street in the northern portion of the facility. The site is located on dredge fill material which reportedly originated from Blows Creek and the Southern Branch of the Elizabeth River. In earlier documents, Site 5 was also referred to as SWMU 8.

The site currently consists of an open field with the southwestern portion overgrown with phragmites. A significant portion of the south-central area of the site is covered with a layer of gravel.

According to the IAS, the Burning Grounds operations began in the 1930s when waste ordnance materials; including black powder (mixture of charcoal, nitrate, and sulfur), smokeless powder (nitrocellulose), Explosive D (ammonium picrate), and Composition A-3 (contains RDX and wax); were disposed of by open burning on three main pads. The RFA stated that tetryl, trinitrotoluene (TNT), fuzes, solvents, paint sludge, pesticides, and various types of refuse were also disposed of. In the 1970's, reports stated that the Burning Grounds spontaneously caught fire several times. The amount of ordnance disposed of varied from year to year and there is insufficient information to calculate the waste volume. In 1974, 427 short tons of ordnance items were disposed of. In 1980, during the IAS, visual examination revealed ordnance residue, such as old cartridges and spacers, as well as non-ordnance residue, such as broken glass. During the VSI in 1988, a faint odor of a hydrocarbon-type compound was detected upon close inspection of the soil (A.T. Kearney, 1989). The 1989 RFA recommended an RFI be conducted at Site 5 due to the high potential for release to soil due to the unlined nature of the waste disposal area and the moderate to high potential for release to surface water via runoff and groundwater discharge due to the proximity to Blows Creek.

The surface of the Burning Grounds was decontaminated in mid-1977. The decontamination included equipment form buildings that were filled with oil and straw and ignited at the Burning Grounds. Afterwards, the ground surface was covered with oil and straw and burned, the top 6 inches of soil was diced, and the ground surface was covered with oil and straw and burned again. However, a former Navy employee who worked at the Burning Grounds was interviewed and stated that no oil was burned with the straw (CDM, 1999a).

After the decontamination was completed, the Naval Ammunition Production Engineering Center (NAPEC) collected samples for chemical analyses and certified decontamination, however, the level of decontamination was not specified.

During the RRR data collection study in 1996, four surface soil and four groundwater samples were collected at Site 5 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines (CH2M HILL, 1996). The soil samples were found to contain several SVOCs, pesticides/PCBs, and inorganics. Three SVOCs and several inorganics were detected in the groundwater samples.

Interviews with former employees were conducted in December 2001 and indicated that asbestos piping was buried to a depth of 10 ft below ground surface (bgs) and other material disposed of including tables and metal from all portions of the base. Several buildings were located to the southwest of Site 5, including a 40 mm breakdown building and a restroom. Building 272 is still in existence and was used for inspections and storing pyrotechnics.

An RI, HHRA, and ERA Report was completed for Site 5 in 2003. The RI field investigation activities included geophysical investigations, installation of monitoring wells, water-level monitoring, waste delineation, and the collection and analysis of surface and subsurface soil samples, groundwater samples, sediment samples, surface water samples (CH2M HILL, 2003c). Because Site 6 is in proximity to Site 5, RI investigation activities and the HHRA and ERA combined results from Sites 5 and 6.

Based on the waste delineation investigation conducted as part of the 2001 RI, the extent of the Site 5 boundaries were adjusted to the north to reflect the extent of waste encountered. From a comparison of historical aerial photographs and waste delineation results, it is likely that material was burnt on the south side of the site and the burnt soil and debris were spread to the north and east of the Burning Grounds (CH2M HILL, 2003c).

The RI concluded that potential remedial alternatives include removal and/or soil cover to address potential risk from exposure to soil. However, the RI recommended that the SJCA Partnering Team consider additional soil sampling at Site 5 in support of further characterization of the nature and extent of contamination and evaluation of remedial alternatives. Mitigation of risk through remedial actions for soil will also eliminate concern for continued transport of potential contaminants Blows Creek.

Further evaluation of the potential for adverse effects from historical contributions to aquatic life in Blows Creek sediment was also recommended and is scheduled for Summer 2003 under the *Final Work Plan for Baseline Ecological Risk Assessment (Step 4), Blows Creek Sites 3, 4, and 5*, submitted in August 2003.

Groundwater samples collected from the shallow monitoring wells at Site 5 indicated isolated detections of metals at concentrations above MCLs. In addition, an isolated detection of RDX was found in a sample collected from a deep monitoring well. Because these results were isolated and inconsistent between the three rounds of sampling, the Partnering Team concluded that an additional round of groundwater samples was necessary to confirm the RI results before proceeding with a more complete assessment of remedial needs for groundwater associated with Site 5.

2.2.1.6 Site 6—Small Arms Unit

Site 6 was operated as part of the ordnance disposal operations at the Annex and has also been referred to as the Caged Pit and SWMU 24. It was located in the northeastern portion of SJCA, west of Site 5. According to the 1981 IAS report, an unknown volume of small items, such as igniters and fuzes, were burned in the unit. Interviews with former employees conducted in December 2001 indicated that a conveyor belt dropped small munitions, hand flares, and cartridge activated devices (CAD) into the container and material was inerted by soaking in water or burning. The conveyor dropped materials into the container, estimated to be 8-ft wide by 20-ft long by 12-ft high.

No date of operation of the pit was found in historical records. The IAS also reported that the unit had been filled in “during recent years” (NEESA, 1981). A review of historical aerial photographs indicated that activities associated with Site 6 may have begun around 1949 and continued through the early 1980s.

During the RRR data collection study in 1996, one surface soil sample was collected at Site 6 and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines (CH2M HILL, 1996). The soil sample was found to contain several SVOCs, pesticides, and inorganics.

Due to its proximity to Site 5, Site 6 was investigated with Site 5 during the RI activities in 2001. RI field investigation activities at Site 6 included a geophysical survey and the collection and analysis of surface and subsurface soil samples. Geophysical investigations indicated potential buried remains of this container. In 2001, test pits were excavated at Site 6 to confirm the presence/absence of debris. No visual signs of waste or stained/burned soil were observed at Site 6. Pieces of concrete discovered may have been the remains of the pit (CH2M HILL, 2003c).

The highest concentrations of compounds detected in soil occurred at Site 5; therefore, the identified risks would be biased high as applied to Site 6 soil. To achieve closure of Site 6, the SJCA Partnering Team agreed to conduct a complete removal of waste and soil to eliminate potential risk to human health and ecological receptors at Site 6 (CH2M HILL, 2003c).

An EE/CA was prepared in June 2002 in response to the potential risks associated with soil exposure. A removal action was conducted at Site 6 in the last quarter of FY 2002 and included excavation of remnants of the Small Arms Unit, as well as surrounding material posing a potential risk to human health and the environment. A Closeout Report documenting the closure of Site 6 under CERCLA was submitted in FY 2003. The final NFA PRAP and ROD were submitted in July 2003 and the ROD is pending signature.

2.2.1.7 Site 7—Old Storage Yard

Site 7 consists of a previously fenced, outdoor grassy area used to store a variety of material including anchors, chain, and equipment. The initial start date for the site is unknown, however, the site was active when the RFA was conducted in 1989 when 5-gallon containers of hydraulic fluid, lubricating oil, lead paint, and open drums of sandblast grit were observed. There was also evidence that oil had leaked or was drained onto the soil from some of the equipment being stored at the site. The RFA recommended that surface soil sampling be conducted in areas of observed staining to determine if hazardous constituents were released. In earlier documents, Site 7 was referred to Old Storage Yard # 1 or SWMU 17.

Two soil samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics during the 1996 RRR data collection study. Only bis(2-ethylhexyl)phthalate and methylene chloride were detected in the samples. In July 2001, the SJCA Partnering Team recommended NFA for the site under CERCLA following removal of the equipment/material stored at the site. The surface debris identified at the site was removed in September 2002 and the site was closed for NFA.

2.2.1.8 Site 8—Cross and Mine

Site 8 is located near the intersection of Cross Street and Mine Road, adjacent to, and north of, Building 212 and across the street from Building M-1. From the 1950s to mid-1960s, the site was used for disposal of rinse water from mobile insecticide and herbicide spray trucks. It is estimated that 675,000 gallons of rinse water were discharged directly to the ground and allowed to infiltrate into the soil. Although the 1981 IAS report (NEESA, 1981) stated that the area was “devoid of vegetation,” the 1989 RFA noted that the area was covered with grass (A.T. Kearney, 1989). The RFA recommended soil sampling in the areas devoid of vegetation to determine if hazardous constituents were released. In earlier documents, Site 8 was referred to as SWMU 9.

The site was included in the 1983 PA conducted by NUS. No VOCs were detected in air and no radiation was detected above background at Site 8. During the 1996 RRR data collection study, four surface soil samples and one groundwater sample were collected and analyzed for pesticides and PCBs. Pesticides detected in one or more soil samples included DDT, DDD, DDE, and endrin. No pesticides or PCBs were detected in groundwater. The RRR results were used to conduct HHRS and ERS as part of the SSA (CH2M HILL, 2002a). No unacceptable risks were found to exist. However, concerns remained regarding the historical record of 675,000 gallons of pesticide rinse water discharged to the ground remained and the site was recommended for further study (CH2M HILL, 2002a). An SSA was conducted at Site 8 in August 2003 and the results will be reported in the second quarter of FY 2004.

2.2.1.9 Site 9—Building 249

Several activities were conducted at Building 249, including a pesticide control, repair, and maintenance shop (SWMU 13), a washrack (SWMU 25), and an oil/water separator (SWMU 23).

The IAS study in 1981 indicated that Building 249 was used for storing the Annex's supply of pesticides, including Abate, rodent baits, Bromacil, Carbaryl, Chlordane, Dalapon, Diazinon, Diquat, Gardona, Malathion, Naled, Tandex, and other combinations of chemicals that were mixed at the shop. The 1989 RFA indicated that the start-up of the unit was in the mid-1960s and any waste management activities were discontinued in 1976. In 1989, Building 249 was a repair and maintenance shop that contained heavy equipment, vehicles needing repair, tools, and operational areas (e.g., solvent baths) normally found in automotive garages. The RFA recommended that management practices be considered to control waste runoff to the adjacent storm sewers (A.T. Kearney, 1989).

The washrack was located at the east end of Building 249 and was a single concrete wash pad which was divided into two separate stalls (A.T. Kearney, 1989). One stall was rebuilt in approximately 1981 and the other was constructed in 1986. Each stall measured approximately 15-ft by 40-ft and was surrounded by 6-inch to 8-inch concrete berms. One

stall was used to remove grease and the other was used to rinse non-greasy items. The unit was located outdoors and was not covered (A.T. Kearney, 1989).

From the mid-1960s to 1976, the wash pad was used for cleaning pesticides and herbicides out of mobile spray tanks. Wastes managed included solvent wastewater from rinsing various types of equipment. Prior to 1976, the wash pad waste discharged toward the southern end of the wash pad and into a storm drain which discharged to a swampy area that discharged to St. Juliens Creek. In 1976, the discharge stream was redirected to a sanitary sewer. In 1989, during the RFA, the discharge was being directed to an oil/water separator. During the VSI, oily sludge was observed on the soil beyond the secondary containment of the pad (A.T. Kearney, 1989). The RFA recommended surface soil sampling in the areas where waste sludge or visual evidence of a release existed.

The oil/water separator (SWMU 23) at Building 249 was located adjacent to the washrack. The separator was a subgrade, concrete, open-top tank with a metal grating cover. Rinsate and washdown material from the wash pad were collected in the separator. The RFA states that SJCA personnel reportedly pumped sludge from the bottom of the separator into a vacuum truck on a periodic basis. The sludge was transported offsite for final disposal. Excess water was directed to a Publicly Operated Treatment Works (POTW) conduit via a level control outlet. It is not known when the oil/water separator was installed. During the VSI, no evidence of release from the separator was noted. However, integrity testing was suggested to determine the condition of below-grade units (A.T. Kearney, 1989).

During the PA conducted in 1983, no VOCs or radiation were measured above background levels in air at the site. During the 1996 RRR data collection study, three groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. Several VOCs and inorganics were detected in groundwater.

Site 9 was remediated during a removal action conducted as part of the SIMA facility construction (Building 1556) and the SJCA Partnering Team reached consensus for NFA at Site 9 based on the removal action.

2.2.1.10 Site 10—Waste Disposal at Railroad Tracks and Swale beneath Building 13

Site 10 was a waste disposal area (SWMU 14) located in the vicinity of Building 13. According to the RFA report, the site was the reported disposal location for wastes generated during hardware cleaning operations, which occurred from pre-1940 to the mid-1970s. Wastes handled at this location included Alodine (a caustic detergent), methyl ethyl ketone, and acetone. It was also reported that liquid wastes were poured on the railroad tracks. The RFA indicated that Building 13 was a well-maintained machine shop and no evidence of a release was observed. However, the RFA recommended soil sampling in suspect areas to determine if hazardous constituents were released.

As part of the RRR study (CH2M HILL, 1996), two groundwater and two surface soil samples were collected and analyzed for VOCs, SVOCs, and inorganics. In addition to a variety of inorganics, PAHs and methylene chloride were detected in the soil; however concentrations were below the quantitation limit of the analytical instruments. The groundwater contained low levels of trichloroethene.

In addition, the USEPA, VDEQ, and Navy proposed that SWMU 31 (the swale beneath Building 13) should be addressed as part of Site 10. SWMU 31 was identified in the RFA as a

swale that ran under Building 13 and eventually drained into St. Juliens Creek. Rinsate generated from the washing of smokeless powder cans that were washed in Buildings 13 and 47 was emptied into the swale (NEESA, 1981). During the VSI for the RFA, neither the swale area nor any evidence of contamination such as staining or stressed vegetation were found and NFA was recommended.

During SJCA Partnering Meetings and site visits conducted in November 1999 and February 2000, it was observed that the former swale located between Buildings 13 and 199/278 (Sites 10 and 17, respectively) was paved. The former swale would have traversed Site 17 and Site 2, currently under RI/FS investigation. Historical photographs indicate that this area has been paved since 1949. During December 2001 interviews with former employees, activities reported included blasting and cleaning of aluminum tanks and a blast grit machine had a pit approximately 10-ft long by 18-ft wide by 8-ft high. The pit had a steel bottom and appeared to be unsupported, suggesting additional space beneath.

Site 10 was included in the SSA finalized in 2002 (CH2M Hill, 2002a). Human health and ecological risk screens and background data were used to determine that groundwater and surface soil at Site 10 do not pose a concern to human health and do not warrant further evaluation. During a site visit in July 2001, the SJCA Partnering Team reached consensus for NFA, as documented in the SSA dated November 2002.

2.2.1.11 Site 11—Waste Disposal at Building 53 (formerly Building 266)

Site 11 is located at Building 53 (formerly referred to as Building 266 or SWMU 15), which was the facility electrical shop located in the industrial area east of Craddock. In the IAS report (NEESA, 1981) it was stated that station electricians used 5 gallons of trichloroethene per month. Most of the solvent evaporated, but the remainder was disposed on the railroad track bed adjacent to Building 53.

By 1989, at the time of the RFA site visit (A.T. Kearney, 1989), the building had been converted to a recreation room. No evidence of waste disposal around the building was found. However, the RFA recommended soil sampling in suspect areas to determine if hazardous constituents were released.

As part of the RRR study (CH2M HILL, 1996), one surface soil sample and one groundwater sample were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. Surface soil contained DDT, DDE, dieldrin, endrin, and aroclor-1260. Several PAHs were also detected at concentrations below the instrument quantitation limit and methylene chloride and trichloroethene were both detected (below the quantitation limit) at a concentration of approximately 6 ppb. The groundwater sample contained several metals and VOCs, including 1,2-dichloroethene (total) (100 ppb), methylene chloride (11 ppb), and trichloroethene (46 ppb) (CH2M HILL, 1996).

Site 11 was included in the SSA (CH2M HILL, 2002a). No surface soil human health risks were found. Groundwater VOC results, however, were above the MCLs. No additional ecological evaluation was recommended in the SSA. Due to its proximity to Site 21, where trichloroethene was also detected in a site groundwater sample, VOCs in Site 11 groundwater will be addressed under further investigation of groundwater at Site 21. During a site visit in July 2001, the SJCA Partnering Team reached consensus for NFA, as documented in the SSA dated November 2002.

2.2.1.12 Site 12—Sand Blast Area Building 323

Site 12 is located at Building 323 where sand blasting operations were conducted. It is not known when sand blasting operations began at Site 12. Wastes consisted of waste blast grit and particulates removed from the items being blasted (e.g., paint, metal). In earlier documents, Site 12 was referred to as SWMU 16.

The building consisted of bare floors and a metal shed which was covered, divided into two stalls, and open at two ends. No release controls were in place at the unit during the 1989 RFA, although there was a roof and several walls to help confine particulate waste as it was generated. During the RFA, it was stated that additional barriers were being planned for installation in the future to prevent particulate waste grit from escaping the building. Sand blast waste was observed in the past on the ground surrounding Building 323 (A.T. Kearney, 1989). The RFA recommended soil sampling in stained areas to determine if hazardous constituents had been released and management to effectively contain the sand blast grit.

Site 12 was remediated during a removal action conducted as part of the SIMA facility construction (Building 1556) and the SJCA Partnering Team reached consensus for NFA at Site 12 based on the removal action.

2.2.1.13 Site 13—Waste Generation Area

Site 13 was a fenced concrete pad used to store waste liquids (e.g., battery acid, lacquer thinner, antifreeze, and lube oils) prior to being sent to the waste accumulation area. The pad measured approximately 20-ft by 20-ft and was surrounded by a 6-ft high chain-link fence. Entrance into the area was controlled by a locked gate. The concrete pad was surrounded by sand bags forming a berm. It is not known when waste storage operations began at Site 13 (A.T. Kearney, 1989). In earlier documents, Site 13 was referred to as SWMU 20.

Waste liquids were contained in closed, 55-gallon barrels. After the barrels were filled, they were relocated to the facility waste accumulation area within 72 hours of filling. During the VSI, oily stains were observed on concrete pad and, to a lesser degree, on the soil in areas surrounding the pad (A.T. Kearney, 1989). The RFA recommended soil sampling in stained areas to determine if hazardous constituents had been released. In addition, actions were suggested to control the source of staining and continue compliance with the State of Virginia regulatory requirements.

Site 13 was remediated during a removal action conducted as part of the SIMA facility construction (Building 1556) and the SJCA Partnering Team reached consensus for NFA at Site 13 based on the removal action.

2.2.1.14 Site 14—Washrack Building 266

Site 14 was a washrack reportedly located at Building 266, referred to in earlier documents as SWMU 25. The area was remediated during a removal action conducted as part of the SIMA facility construction (Building 1556) and the SJCA Partnering Team reached consensus for NFA at Site 14 based on the removal action.

2.2.1.15 Site 15—Fire Training Area

Site 15 is the fire training area located at Building 271, referred to in earlier documents as SWMU 27. Site 15 consists of two adjacent celled areas which are used to train personnel to fight fires. One of the celled areas consists of a burning site where wooden pallets are soaked with diesel, ignited, and extinguished with water. The other burning site is a buried stainless steel pit measuring approximately 4-ft wide by 4-ft long by 3-ft deep. The pit is filled with diesel fuel which is ignited and extinguished using carbon dioxide. It is not known when waste storage operations began at Site 15 (A.T. Kearney, 1989).

Wastes managed at this site include wooden pallets and diesel fuel. No controls structures, other than the stainless steel pit, were in place during the 1989 RFA, to control releases to the environment. During the VSI, blackened and stained soil was observed and ashes from the burning of the pallets were piled along the fence-line behind the fire training area. The soil where the diesel fuel was stored also was found to be stained (A.T. Kearney, 1989). The RFA recommended soil sampling in the ignition areas to determine if hazardous constituents had been released. In addition, management practices were recommended to prevent continued releases.

Site 15 will be investigated under the Navy's Underground Storage Tank (UST) program. Therefore, consensus for NFA under CERCLA for Site 15 was reached by the SJCA Partnering Team in July 2002.

2.2.1.16 Site 16—Defense Reutilization and Marketing Office (DRMO) Storage/Salvage Yard

Site 16 (formerly SWMU 28) consists of the area surrounding Buildings 400, 168, and 173, particularly around the railroad tracks which are currently inactive at the DRMO. Waste, including scrap stainless steel, was observed at the site during the RFA and there was no evidence of hazardous materials being managed at the site. The RFA recommended that affected soil areas be sampled to determine if hazardous constituents were released and areas of releases be addressed to prevent further releases.

During the RRR data collection study, soil and groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. In addition to several metals, the following organic contaminants were detected in soil: DDD, DDT, alpha chlordane, aroclor-1254, dieldrin, endrin, endrin aldehyde, gamma chlordane, di-n-butylphthalate, di-n-octylphthalate, bis(2-ethylhexyl)phthalate, and several PAHs. Groundwater samples from the site contained acetone and methylene chloride.

Consensus for NFA under CERCLA for Site 16 was reached by the SJCA Partnering Team in July 2002 since the DRMO is currently managed under RCRA.

2.2.1.17 Site 17—Storage Pad at Building 279

Site 17 is located within the industrial area of the Base, east of Craddock Street, and consists of a concrete storage pad located just outside Building 279. The storage pad was used to store two 55-gallon drums of PD-860, a commercial product used as a degreaser. Stains on the ground near the pad, as well as indications of poor management (e.g., overflowing catch bucket under drum spigot) were noted during the RFA site visit (A.T. Kearney, 1989). The RFA recommended NFA for Site 17, referred to in earlier documents as AOC A.

Soil and groundwater samples were collected during the RRR data collection study and analyzed for VOCs, SVOCs, and inorganics. In addition to inorganic constituents, the following organic constituents were detected in site soils: DDD, DDE, DDT, alpha-chlordane, aroclor-1254, dieldrin, endrin, gamma-chlordane, bis(2-ethylhexyl)phthalate, and several PAHs. No organic constituents were detected in the groundwater sample.

Four surface soil samples were collected and analyzed as part of an Expanded Site Investigation conducted in 2001 (CH2M HILL, 2001a). Several PAHs and metals were present above background concentrations and human health and ecological screening values. The site inspection concluded that Site 17 may pose a risk to human health and the environment. It was recommended that an additional investigation be conducted to define the vertical and horizontal extent of contaminants and better define any potential risk at Site 17 (CH2M HILL, 2001a).

The roof and walls of Building 278/279 were demolished in early 2003, the flooring and concrete pilings are still in place awaiting final removal. Based upon the proximity to Site 2, the SJCA Partnering Team agreed in February 2003 that further action related to Site 17 will be addressed under Site 2, based on their proximity to each other.

2.2.1.18 Site 18—Building 47

Site 18 is located adjacent to the south wall of Building 47 where an air compressor and blasting grit were observed during the RFA site visit. The air compressor and blasting grit were referred to AOCs B and C, respectively. Oily stains were observed on the soil below the compressor. Small amounts (less than five gallons) of black blasting grit had been poured on the soil along the south end of Building 47 (A.T. Kearney, 1989). Although Building 47 housed two sand blasting booths, personnel working in that building reported that they did not use black blasting grit in their machines. Therefore, the source of the material identified as grit during the RFA site visit is unknown. The RFA recommended alternative management practices to ensure that continuing releases do not occur in the future. In addition, it was recommended that the air compressor releases be referred to the Spill Prevention Control and Countermeasure (SPCC) plan of the facility RCRA B Permit Application

As part of the RRR study (CH2M HILL, 1996), one surface soil sample was collected at Site 18 and analyzed for VOCs, SVOCs, and inorganics. Inorganics as well as several SVOCs (mostly PAHs), and two VOCs (methylene chloride and trichloroethene, both at a concentration of approximately 4 ppb) were detected. A human health and ecological risk screening were conducted on these RRR data as part of the SSA (CH2M HILL, 2002a). No human health risk was identified and no further ecological evaluation was recommended. In addition, during the July 2001 SJCA Partnering Team site visit, no blast grit was observed in several hand auger borings. During a site visit in July 2001, the SJCA Partnering Team reached consensus for NFA for the blasting grit, as documented in the SSA dated November 2002. The SJCA Partnering Team reached consensus for NFA for the air compressor in July 2002.

2.2.1.19 Site 19—Wharf Area Building 190

Building 190 was located near Building M-5, south of the mouth of Blows Creek. The 1981 IAS identified Building 190 to have handled loose ordnance materials and as heavily used

for loading explosives into ammunition. From the 1940s to the 1970s, Explosive D and Composition A-3 were used at Building 190.

According to the IAS, in mid-1977 all ordnance-handling buildings were decontaminated by flushing with chemical solutions and water. Prior to decontamination, NAPEC visually inspected the facilities and collected samples for chemical analysis to develop appropriate decontamination procedures for each building. At the conclusion of the decontamination process, NAPEC visually reinspected each building, collected samples for chemical analysis, and certified that the facilities were decontaminated. However, the level of decontamination was not specified and residues of ordnance may remain (NEEAA, 1981).

The RFA reported that various ordnance items were disposed of in the area between Building M-5 and Building 190 during past ordnance management activities (A. T. Kearney, 1989). Site 19 was referred to as AOC H. During the RFA, the area was noted to contain a variety of construction rubble and facility personnel reported no knowledge of residual contamination from ordnance management operations. The RFA recommended that a determination be made as to whether residual ordnance exists and the collection of soil samples to determine possible residual contamination.

During the RRR data collection study, surface soil and groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, inorganics, and nitramines. No nitramines were detected in the surface soil samples. Organic constituents that were detected in surface soil included DDD, DDE, DDT, alpha chlordane, aroclor-1254, dieldrin, endrin, and several PAHs. Organic constituents detected in the groundwater sample included acetone and methylene chloride. Several inorganics were detected in both the surface soil and groundwater samples.

The RRR analytical results were used to conduct a HHRS and ERS as part of the SSA (CH2M HILL, 2002a). The SSA concluded that groundwater should be further evaluated to confirm the presence of arsenic and methylene chloride at concentrations that may pose a human health risk. Surface soil may pose a concern to human health and was also recommended for further evaluation. No further evaluation of potential ecological effects was necessary based on results of the ERS (CH2M HILL, 2002a).

Building 190 was demolished sometime after 2000. Additional concerns with Site 19 exist related to two concrete drainage culverts and a weir based on interviews with former employees and a site visit, both conducted in 2001. The concrete drainage culverts and the weir lead from former Buildings 190 and 240 through a fence towards the Southern Branch of the Elizabeth River (CH2M HILL, 2002a).

An SI was conducted at Site 19 in August 2003 and the results will be reported in the second quarter of FY 2004.

2.2.1.20 Site 20—Wharf Area Sediments

Site 20 is located adjacent to the former wharf in the Southern Branch of the Elizabeth River. The IAS (NEESA, 1981) concluded that it was likely that ordnance had been dropped into the sediments adjacent to the former wharf during loading and unloading operations. According to the IAS document, Explosive Ordnance Disposal (EOD) Team divers identified some metal and thick silt deposits in the area of the old pier. The 1989 RFA

recommended that a determination be made as to whether residual ordnance exists and the collection of benthic sediment samples to determine possible residual contamination.

During the RRR data collection study (CH2M HILL, 1996), an underwater reconnaissance and a magnetometer survey, in which EOD divers searched the sediments, were performed in that area. The magnetometer survey identified approximately 68 buried “contacts” surrounding the former wharf pilings. Many individual “contacts” were identified in random locations between the pilings. The most significant concentration of “contacts” was along the center west side of the pilings, between the pilings and the river bank. No visual confirmation of “contacts” was made during the RRR data collection study. It is important to note that “contacts” might indicate any type of buried metal object, and does not necessarily indicate the presence of buried ordnance.

Four sediment samples were collected during the RRR study and were analyzed for VOCs, SVOCs, pesticides, PCBs, inorganics, and nitramines. One nitramine, 1,2-dinitrobenzene, was detected in one sediment sample. Metals, one pesticide, several PAHs, bis(2-ethylhexyl)phthalate, and one VOC (methylene chloride) were detected in sediment.

The RRR data were used to conduct a human health and ecological risk screening as part of the SSA in 2002. Site 20 sediment was not found to pose a potential concern to human health. The ERS concluded the potential for adverse effects to benthic organisms is likely minimal and does not warrant further evaluation. However, due to the potential for buried ordnance, under the Navy’s Range Program, signs were posted at Site 20 in FY 2003 to prohibit intrusive activities. Additionally, the Navy will place a warning notice for potential UXO at Site 20 in LANTDIV Real Estate Documents. The U.S. Army Corps of Engineers will also be notified of the potential for UXO at Site 20. During the July 2001 site visit, the SJCA Partnering Team reached consensus for NFA under CERCLA based on the actions taken under the Navy’s Range Program.

2.2.1.21 Site 21—Soil Staining at Building 187

Building 187 was a locomotive shed used for locomotive maintenance. The IAS stated that the area around the locomotive shed was saturated with oil (NEESA, 1981).

During the 1996 RRR data collection study, surface soil and groundwater samples were collected and analyzed for VOCs, SVOCs, pesticides/PCBs, and inorganics. Pesticides (DDT, DDD, and DDE), aroclor-1260, benzo(g,h,i)perylene, fluoranthene, and inorganics were detected in surface soil samples. In addition to several inorganic constituents (including cyanide), groundwater contained one SVOC and eight VOCs (including 1,1-dichloroethane, 1,2-dichloroethene (total), 1,2-dichloropropane, acetone, carbon tetrachloride, chloroform, methylene chloride, and trichloroethene).

The RRR analytical results were used to conduct a HHRS and ERS as part of the SSA (CH2M HILL, 2002a). Based on the HHRS and groundwater exceedances of the MCL, the SSA recommended that Site 21 groundwater be further evaluated. No further action was recommended for surface soil or for evaluating potential ecological effects (CH2M HILL, 2002a). Future investigations of groundwater at Site 21 will include groundwater at Site 11 due to the proximity of the two sites. Further investigation of the groundwater at Sites 11 and 21 is planned for FY 2003.

During a July 2001 site visit by the SJCA Partnering Team, Building 187 was vacant. A concrete maintenance pit for servicing railcars, approximately 40-ft long by 4-ft wide, was located near the east side of Building 187. The floor of the building was concrete and noted to be in good condition. The tracks from the former rail lines entered the building. No drains were noted in Building 187; however floor drains were present in the adjoining Building 248. Building 187 was demolished in 2003 and the pit was fractured and backfilled.

An SI was conducted at Site 21 in August 2003 and the results will be reported in the second quarter of FY 2004.

2.2.2 Descriptions of SWMUs

The SWMUs described in this section were identified during the 1989 RFA and have not been identified as IRP Sites. Several of the SWMUs were recommended for NFA under CERCLA but may require investigation under the RCRA program.

2.2.2.1 SWMU 10—Hazardous Waste Container Storage Building 154Y

SWMU 10 is located in Building 154Y and is a greater-than-90-day waste storage bunker. SWMU 10 consists of a concrete bunker covered with soil on all sides except the entrance. According to the RFA, the floor of the bunker was treated with a waterproof epoxy coating and air vents extend through the roof of the bunker (A.T. Kearney, 1989). The inside of the unit was comprised of designated areas for flammable and Other Regulated Materials (ORM) waste types. Thirty-six drums, situated atop wooden pallets, were observed inside the unit during the RFA.

The bunker began operating as a waste storage area in August 1981. Wastes managed at SWMU 10 included both characteristic (e.g., D001, D002, and D003) and listed hazardous waste (e.g., F001, F002, F003, and F005). At the time of the RFA in 1989, the bunker was operating under an interim status and a drainage ditch extended across the front of the bunker.

During a RCRA Compliance Evaluation Inspection conducted in June 1986, the majority of drums at the SWMU were either badly corroded or bulging. The contents of some of the drums had leaked on or were spilled on the ground. In addition, inspection reports indicated the drums inside the unit were in unsatisfactory condition during April and May 1987 inspections. During the VSI in 1989, no evidence of a release of hazardous waste was observed either inside or outside of the unit.

The RFA recommended NFA for this SWMU other than continued compliance under RCRA. The SJCA Partnering Team reached consensus for NFA under CERCLA in July 2002, as SWMU 10 was managed under RCRA.

2.2.2.2 SWMU 11—Hazardous Waste Container Storage Building 163Y

SWMU 11 is located in Building 163Y and is a greater-than-90-day waste storage bunker. SWMU 11 consists of a concrete bunker covered with soil on all sides except the side with the entrance. According to the RFA, the floor of the bunker was treated with a waterproof epoxy coating and was sloped to drain into troughs. Air vents extend through the roof of the bunker. The front of the bunker previously had a railroad spur extending to the entrance of the unit. At the time of the RFA in 1989, a drainage ditch extended across the front of the bunker (A.T. Kearney, 1989).

The bunker began operating as a waste storage area in August 1981. Designated areas within the interior of the bunker were used for storing alkali, acid, flammable, and other regulated material waste types. Twelve drums, all located on wooden pallets, were observed inside the building during the RFA. Wastes managed at SWMU 11 included characteristic waste (e.g., D001, D002, and D003), listed hazardous waste (e.g., F001, F002, F003, and F005) and large quantities of unknown waste. PCBs, mercuric nitrate, and trichloroethene were also managed at this unit (A.T. Kearney, 1989).

At the time of the RFA in 1989, the bunker was operating under an interim status and a drainage ditch extended across the front of the bunker. During the VSI, the drainage troughs inside Building 163Y appeared to be open to the outside of the bunker. Absorbent material emitting an organic odor was observed outside the bunker entrance at the time of the VSI in 1989; however, no staining was observed on soil surrounding the unit (A.T. Kearney, 1989).

The RFA recommended NFA for this SWMU other than continued compliance under RCRA. The SJCA Partnering Team reached consensus for NFA under CERCLA, as SWMU 11 is managed under the Virginia Hazardous Waste Management Regulations.

2.2.2.3 SWMU 12—PCB Storage Building 198

SWMU 12 is a warehouse located in Building 198. Warehousing operations at Building 198 began in March 1976. The warehouse stored Kepone for the USEPA until the fall of 1978. During the RFA in 1989, the building was storing PCB transformers and PCB oil. At the time of the RFA, this fully enclosed, locked building contained four 55-gallon barrels and three transformers situated on wooden pallets. The floor of the building is concrete treated with epoxy. No environmental releases were evident during the VSI in 1989.

The RFA recommended NFA for this SWMU other than continued compliance under Toxic Substances Control Act (TSCA). The SJCA Partnering Team reached consensus for NFA under CERCLA, as SWMU 12 is managed under the TSCA.

2.2.2.4 SWMU 18—Old Storage Yard # 2

SWMU 18 is located south of Building 154Y and consists of an asphalt pad measuring approximately 100-ft by 400-ft. The area is used to store scrap metal and various types of metal equipment. Two old metal tanks with holding capacities of more than 1,000 gallons were observed during the 1989 RFA. The source of the tanks is not known but it appeared that they could have been boilers removed from a ship. It is not known when waste storage operations began at this unit. No releases were evident during the VSI conducted in 1989 (A.T. Kearney, 1989).

The RFA recommended NFA for this SWMU. Due to the low potential for releases to surrounding environmental media, the SJCA Partnering Team reached consensus for NFA under CERCLA, as the SMU is managed under RCRA.

2.2.2.5 SWMU 19—Old Storage Yard # 3

SWMU 19 is located adjacent to IR Site 15 located at Building 271. This SWMU consists of a fenced concrete pad which appeared to be the foundation of a building previously located at the site. This unit is located outdoors and measures approximately 40-ft by 500-ft. The pad is partially surrounded by a concrete berm less than 6 inches high. In the center of the pad is a

small metal building measuring approximately 20-ft by 40-ft. The area is used to store scrap metal, obsolete equipment, and piping. It is not known when waste storage operations began at this unit. No releases were evident during the VSI conducted in 1989 (A.T. Kearney, 1989).

The RFA recommended site management practices be implemented at this SWMU. The SJCA Partnering Team site visit in November 2002 did not identify concerns with the storage yard and consensus for NFA under CERCLA was reached.

2.2.2.6 SWMU 21—Hazardous Waste Accumulation Area (SIMA # 2)

SWMU 21 is located east of Building 47 and consists of a concrete pad measuring approximately 20-ft by 40-ft. The pad is surrounded by a concrete berm less than 6 inches high and sand bags. The area is enclosed by a 8-ft high chain-link fence and a locking gate. It is not known when this SWMU began operating (A.T. Kearney, 1989).

SWMU 21 receives waste from Site 14. Waste stored at this SWMU include old batteries, waste lacquer thinner, lube, and oils. At the time of the RFA in 1989, there were approximately 13 batteries and two 55-gallon drums of waste lube oil located in the building. Waste material is stored at this SWMU before being transported to a RCRA interim status storage facility (A.T. Kearney, 1989).

The RFA recommended NFA for this SWMU. A SJCA Partnering Team site visit in November 2002 did not identify concerns with the SWMU and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 21.

2.2.2.7 SWMU 22—Repair Shop Satellite Storage Area Northeast of Building 40

SWMU 22 is a repair shop satellite area located northeast of Building 40. The SWMU is an outdoor concrete pad approximately 15-ft by 35-ft and is surrounded by sand bags on two sides and a concrete curb on the other two sides (A.T. Kearney, 1989).

The pad was used in the past for the storage of hazardous waste for a period less than 90 days. According to the facility and the RFA, this SWMU began storing waste as early as 1985 and operated for approximately 2 years. In 1989 during the VSI, the unit was inactive and no waste was observed. Oily stains were noted on the concrete pad, but no soil staining was evident during the VSI (A.T. Kearney, 1989).

The RFA recommended NFA for this SWMU. A SJCA Partnering Team site visit in November 2002 did not identify concerns with the SWMU and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 22.

2.2.2.8 SWMU 26—Scrap Metal Storage in Railroad Cars Near Building 176

SWMU 26 consists of four open-topped railroad storage cars containing scrap metal. The cars were located on an active railroad spur near Building 176. It is not known when waste storage in the railroad cars began (A.T. Kearney, 1989).

The VSI reported that the types of waste included stainless steel scrap metal destined for DRMO. No environmental releases from this unit were evident during the VSI (A.T. Kearney, 1989).

The RFA recommended NFA for this SWMU. The SJCA Partnering Team reached consensus for NFA under CERCLA, as SWMU 26 is managed under RCRA.

2.2.2.9 SWMU 29—Dumpsters (throughout the Facility)

SWMU 29 consists of dumpsters located throughout the SJCA facility. Certain dumpsters have closed tops. The RFA reported that each dumpster is emptied on a regular schedule by a contractor for offsite disposal. According to the RFA, wastes handled in these dumpsters include burnable waste (e.g., refuse), salvageable waste (e.g., metal), non-burnable, non-salvageable waste (e.g., sand), and asbestos waste (A.T. Kearney, 1989).

No release to the environment was observed during the 1989 VSI other than the dumpster identified at IR Site 7 (formerly SWMU 17) (A.T. Kearney, 1989).

The RFA recommended NFA for this SWMU. The SJCA Partnering Team reached consensus for NFA under CERCLA, as SWMU 29 is managed under RCRA.

2.2.2.10 SWMU 32—Overland Drainage Ditches

SWMU 32 consists of overland drainage ditches located throughout the SJCA facility. A series of overland drainage ditches were used to transport process wastewater and runoff from process areas to receiving waters. Process waste is now collected and managed at waste generation points and is no longer transported via the ditches (A.T. Kearney, 1989).

Ditches in the vicinity of Site 4 were inspected during the 1989 VSI. There was no evidence of waste transport in these ditches and no evidence of environmental releases. However, the RFA recommended identification of the exact boundaries of the drainage ditch system and to sample all points where there is either visible evidence of a release or that past releases occurred (A.T. Kearney, 1989).

The SJCA Partnering Team reached consensus for NFA under CERCLA, as drainage ditches associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will identify the exact boundaries of the drainage ditch and samples will be collected at all locations where there is either visible evidence of release or suspicion that past releases may have occurred.

2.2.2.11 SWMU 33—Sewer Drainage System

SWMU 33 consists of the underground sewer drainage system used for both sanitary sewage and storm water runoff. Past waste management practices were to wash unspecified waste into floor drains. Ultimately, this waste would enter either the sanitary or storm water sewer system. Waste was generated from fuze drill-out operations, ammunition breakdown operations, steam-out operations, degreasing operations, and boiler plant operations (A.T. Kearney, 1989).

During the 1989 VSI, it was noted that the oil/water separator (Site 9), which collects rinsate from the wash pad at Building 249 (also part of Site 9), is tied to the sanitary sewer. It was also noted that unspecified spilled liquids in operational areas may enter the drain system. The RFA recommended that the integrity of the subsurface system be determined and based on the results, soil sampling may be warranted to determine if hazardous constituents have been released (A.T. Kearney, 1989).

The SJCA Partnering Team reached consensus for NFA under CERCLA, as the sewer drainage system associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will include evaluating the integrity of the subsurface system and may include soil sampling to determine if hazardous constituents have been released.

2.2.2.12 SWMU 34—Operational Waste Accumulation Areas

SWMU 34 consists of various waste accumulation areas located throughout SJCA. The areas are located in enclosed buildings with concrete floors. According to the RFA, a typical operational waste accumulation area is a “two-day” storage area located within a portion of the building designated as the waste accumulation area and identified as a painted floor area. Typical waste accumulation areas contained a single, closed, 55-gallon drum and a closed, 5-gallon can (A.T. Kearney, 1989).

The waste managed at each unit is specific to the operation being conducted in each building. Wastes are expected to include various waste oils and solvents. No environmental releases were observed as part of the VSI in 1989. (A.T. Kearney, 1989). The RFA recommended NFA for this SWMU.

The SJCA Partnering Team reached consensus for NFA under CERCLA, as SWMU 34 is managed under RCRA.

2.2.3 Descriptions of AOCs

The AOCs described in this section were identified either during the RFA in 1989, an EPIC Study and review conducted in 1999, or during the December 2001 interview with former employees. An SSA was also conducted in 2001 to identify if each AOC requires additional investigation, removal action, or NFA.

2.2.3.1 AOC D—Stormwater Outfalls

AOC D consists of 35 storm water outfalls identified at SJCA during the RFA. None of the outfalls are connected to sanitary sewers. The outfalls are listed as an AOC based on past releases from waste management areas located near storm water drains, lines and outfall structures. During the VSI in 1989, no evidence of a waste release was noted (A.T. Kearney, 1989).

The RFA recommended sampling at the various outfalls to determine whether there has been a release of hazardous constituents to sediments. In addition, alternative management practices (e.g. control of runoff quality entering the sewer system) are suggested to ensure that continuing releases do not occur (A.T. Kearney, 1989).

The SJCA Partnering Team reached consensus for NFA under CERCLA, as the storm water outfalls will be investigated under CERCLA on a site-specific basis. Site-specific investigations may include sampling various outfalls to determine whether there has been a release of hazardous constituents.

2.2.3.2 AOC E—Temporary Pump Storage

AOC E is located at Building 104 and is used to temporarily store generators, pumps, and heavy equipment. During the RFA, a VSI was conducted and noted that lubricating oil had

leaked from one of the pumps onto the bare ground. The leaking pump was removed and placed on the concrete foundation of Building 104 (A.T. Kearney, 1989). The RFA recommended secondary containment to ensure that continuing releases do not occur.

AOC E was remediated during a removal action conducted as part of the SIMA facility construction. Therefore, the SJCA Partnering Team reached consensus for NFA for AOC E based on the removal action.

2.2.3.3 AOC F—Underground Storage Tanks

AOC F consists of nine USTs identified during the RFA. The tanks are constructed from steel, concrete, and fiberglass, and are located at Buildings 113, 201 (two tanks), 263, 266, 271, and 283 (three tanks). The capacity of the tanks ranges from 250 to 8,000 gallons. The tanks are approximately 25 to 45 years old (A.T. Kearney, 1989).

According to the RFA, several tanks were reportedly out of service but still in place; others were being used for storage of refined fuels (diesel and gasoline) (A.T. Kearney, 1989). The RFA recommended that the integrity of the tanks be verified and managed under the UST program.

The SJCA Partnering Team reached consensus for NFA under CERCLA in July 2002, as AOC F is managed under the Navy's UST Program.

2.2.3.4 AOC G—Former Process Buildings

AOC G consists of former process buildings located throughout SJCA identified during the RFA. The former process buildings include structures where various processes and operations were performed; some of which were suspected to have generated hazardous constituents. Some of the structures included under AOC G no longer exist and some structures still exist but are no longer conducting process operations. A comprehensive list of existing and non-existing former process buildings is not available. It is also not known whether buildings were cleaned or decontaminated prior to being torn down or the type of waste management practices that were implemented at the buildings (A.T. Kearney, 1989).

The RFA recommended that the facility initiate a program to identify all former process buildings and areas and determine if residual contamination exists, including the type and amount of waste generated. If a potential hazardous release is identified, verification or characterization sampling was recommended.

The SJCA Partnering Team reached consensus for NFA under CERCLA, however, as new information becomes available on the locations and processes conducted at former process buildings, the SJCA Partnering Team will determine if new AOCs should be added. Any former process buildings identified for further evaluation will be evaluated on a site-specific basis.

2.2.3.5 AOC J—Former Ammunition Manufacturing Areas

AOC J consists of former areas used for manufacturing ammunition identified during the RFA. Buildings in which ammunition is believed to have been handled include Buildings 12, 13, 14, 18, 29 (which has been torn down, and was formerly adjacent to the east end of M-2), 32, 32A, 33 (these three buildings were located between Buildings 17, 38, and 39), 39, 41, 43, 46, 47, 89, 180, 184, 185, 188, 190, 193, 222 (Victory Building located between Site 5 and

Blows Creek), 240 through 246, 256, 267, M-3, M-4, M-5, and M-5 Annex (A.T. Kearney, 1989). According to the IAS, different sizes and types of ammunition were loaded with black powder, smokeless powders, Explosive D, TNT, Composition A-3, and tetryl in these areas since 1898 (NEESA, 1989). It is not known whether these areas were cleaned or decontaminated prior to being decommissioned as ammunition manufacturing areas (A.T. Kearney, 1989).

The RFA recommended that the facility initiate a program to identify all former ammunition areas, including the type and amount of waste generated. If a potential hazardous release is identified, verification or characterization sampling was recommended.

The SJCA Partnering Team reached consensus for NFA under CERCLA, however, as new information becomes available on the manufacturing areas, the SJCA Partnering Team will determine if new AOCs should be added. Any former ammunition manufacturing areas identified for further evaluation will be evaluated on a site-specific basis.

2.2.3.6 AOC K—Former Sewage Treatment Plant

AOC K consists of the former sewage treatment plant identified during the RFA. The plant has been identified as a small sewage treatment plant located onsite in an undefined proximity to Building 318 (A.T. Kearney, 1989). No other information was available during the RFA on the description and operation of the plant. The treatment plant began operating in 1942 and discontinued operations in 1947. The waste handled at this unit reportedly included treated wastewater from the onsite barracks. Inspection of the area where this plant was thought to be located did not reveal any evidence of prior existence of the plant. U.S. Navy documentation indicates that discharge of an unspecified waste to an unnamed receptor did occur at the plant (A.T. Kearney, 1989).

The RFA recommended NFA for this AOC however, the SJCA Partnering Team agreed that AOC K will require further review. An SSA was conducted at AOC K in August 2003 and the results will be reported in the second quarter of FY 2004.

2.2.3.7 EPIC AOC 1—E Street and Marsh Road Ground Scarring

EPIC AOC 1 is located in the northernmost area of SJCA, near the intersection of E Street and Marsh Road. AOC 1 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. In the EPIC study interpretation of the 1937 aerial photograph, this AOC was identified as a possible waste disposal area. Ground scarring, both north and south of Marsh Road, was apparent in the photograph. The area north of Marsh Road was approximately 200-ft by 150-ft, and the area south of Marsh Road was approximately 125-ft by 80-ft. By 1949, the date of the subsequent EPIC photograph, the area had been developed and Buildings 181 and 182 were constructed north of and over part of the scarring. The observation of marine shell fragments in the soil during a site visit in November 1999 indicated that the area had possibly been filled with dredge material.

An electromagnetic geophysical survey and surface soil and subsurface soil sample collection were conducted in 2001 as part of the SSA. Seven of the eight anomalies observed during the EM geophysical survey were attributed to utilities or other underground features. In addition to inorganics, three pesticides (DDD, DDE, and DDT), 19 SVOCs (including 17 PAHs), and one VOC (methylene chloride) were detected in surface soil

samples. Five pesticides, one PCB (aroclor-1260), 17 SVOCs (mostly PAHs), and two VOCs (acetone and methylene chloride) were measured in subsurface soil samples.

The results of the 2001 SSA investigation were used to conduct a HHRS and ERS (CH2M HILL, 2002a). Based on the HHRS, the SSA recommended further evaluation of surface soil. Additional consideration for ecological impacts to Blows Creek from PAHs was also recommended. The SJCA Partnering Team agreed that additional desktop review of the site information was necessary to assess the status of EPIC AOC 1 (CH2M HILL, 2002a).

An SI, including a desktop review, of AOC 1 was conducted in August 2003. The findings will be reported in the second quarter of FY 2004.

2.2.3.8 EPIC AOC 2—Piers in Front of Building 83

EPIC AOC 2 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. A review of the 1974 EPIC photograph showed storage of materials, possibly ordnance, in rows approximately 150 ft long in the fenced area immediately adjacent to the pier. Storage of items in this manner was not evident in photographs after 1976. In 1977, all SJCA ordnance operations/processes were moved to the Naval Weapons Station Yorktown. Additionally, releases have not been reported for this EPIC AOC and no sampling has been conducted.

The site was further evaluated in November 1999, during a work-in-progress meeting that was held and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Based on a review of current and past conditions and the location of EPIC AOC 2, it was determined that sampling was not warranted.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was conducted and the site was reevaluated in the SSA. Based upon the available information and site visit, it was the consensus of the SJCA Partnering Team that EPIC AOC 2 does not pose a threat to human health or the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.9 EPIC AOC 3—Ground Scarring at Building M-5

EPIC AOC 3 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. USEPA identified ground scarring east of Building M-5 on the April 1949 aerial photograph. The area of scarring was roughly circular and approximately 70 ft in diameter.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Upon review of current and past conditions and location of this EPIC AOC through additional evaluation of aerial photographs, it was confirmed that the ground scarring was fill material. Review of subsequent aerial photographs indicated that the SJCA facility was extended into this area east of Building M-5. This was evident in the 1937 photograph, which showed an extension of the facility to the east of Building M-5. The partnering team concluded that sampling was not warranted for this site.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was conducted and the site was

reevaluated in the SSA. Based upon the available information and site visit, the SJCA Partnering Team reached consensus that EPIC AOC 3 does not pose a threat to human health or the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.10 EPIC AOC 4—Parking Area South of Building M-1

EPIC AOC 4 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. Soil staining and possible storage tanks were identified in a parking area located south of Building M-1 during the EPIC Study and by USEPA in a May 1958 aerial photograph.

The site was further evaluated in November 1999, during a work-in-progress meeting that was held and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA and BTAG. The SJCA Partnering Team concluded that sampling was not warranted for this site.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL reevaluated the site as part of the SSA. Based upon the available information and site visit, it was the consensus of the partnering team that EPIC AOC 4 does not pose a threat to human health or the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.11 EPIC AOC 5—Possible Soil Staining Between Buildings 87 and 88

EPIC AOC 5 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. USEPA identified areas of possible dark staining between Buildings 87 and 88 (located in the central part of the industrial area of the Annex) in a 1964 photograph.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Areas of standing water were observed during the site visit. During the November 1999 site visit, it was noted that grading of the area did not achieve proper drainage. Based on additional review of aerial photographs and evaluation of past and present site conditions, the areas appeared to be ponded water. Therefore, sampling is not warranted.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and site was reevaluated in the SSA. During the July 2001 site visit the area was mixed grass and gravel. No standing water was observed and there were no indications of current or historical contamination in the area. Based upon the available information and site visit, it was the consensus of the SJCA Partnering Team that EPIC AOC 5 does not pose a risk to human health or the environment and NFA is required, as documented in the SSA dated November 2002.

2.2.3.12 EPIC AOC 6—Ground Scarring East of Site 2

EPIC AOC 6 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. This site, located to the west of Cradock Street across from IRP Site 2, was identified as a possible ground scarring and waste disposal area from the 1964 aerial photograph. A review of a

March 1963 photograph showed no activity at this location. However, aerial photographs from May 1970 and onwards, showed the presence of a high voltage transmission tower in the disturbed area shown in the 1964 photograph.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Based on additional review of aerial photographs and evaluation of past and present site conditions, it was determined that sampling was not warranted for this EPIC AOC in 2001.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and the site was evaluated as part of the SSA. Based upon the available information and site visit, it was the consensus of the SJCA Partnering Team that EPIC AOC 6 does not pose a threat to human health or the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.13 EPIC AOC 7—City of Portsmouth Outgrant Area

EPIC AOC 7 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. This area is located just off of Victory Avenue and outside the main gate of the Annex in the City of Portsmouth outgrant area. It was identified during the EPIC Study from the 1974 aerial photograph as a storage area. In the 1985 photograph, rows of mounded material were observed. This material was thought to be truckloads of soil staged for filling of the area. By 1986, there was evidence of scarring and ground disturbance as well as mounded material, indicating that filling activities had begun.

The site was further evaluated in November 1999, during a work-in-progress meeting that was held and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, and BTAG. Upon further review of aerial photographs and evaluation of current and past site conditions, it was determined that sampling was not warranted for this EPIC AOC.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and the site was evaluated in the SSA. Based upon the available information and site visit, it was the consensus of the SJCA Partnering Team that EPIC AOC 7 does not pose a threat to human health or the environment and NFA is required, as documented in the SSA dated November 2002.

2.2.3.14 EPIC AOC 8—Possible Waste Disposal/Bulk Storage Area

EPIC AOC 8 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. This site is located northeast of and adjacent to Building 176. EPIC AOC 8 was identified in the EPIC study interpretation of the 1974 aerial photograph as a possible bulk storage area or waste disposal area. The area is flat and currently is covered with grass. It is approximately 300-ft long by 60-ft wide. No activity has been identified at this location in either earlier or later photographs.

In November 1999, a work-in-progress meeting was held and a site visit was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA and BTAG. Through a

review of current and past conditions and the location of this EPIC AOC, it was determined that sampling was warranted.

During the SSA in 2001, CDM collected surface soil samples from 0 to 6 inches bgs and subsurface soil samples from 1 to 3 ft bgs from three co-located locations and analyzed the samples for VOCs, SVOCs, pesticides/PCBs, metals, explosives, and low concentrations PAHs. An electromagnetic survey was conducted to delineate the site boundary, locate possible waste such as buried drums and metallic debris, and characterize the soil profile above the water table. Three anomalies were identified during the survey. One anomaly appeared to be caused by above-ground features (existing fence and metal structures) whereas two anomalies were due to small buried man-made objects.

The sampling results were used during to conduct a HHRS and ERS. No human health concerns were found for exposure to surface soil and subsurface soil and no further evaluation of ecological effects was recommended. On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and the team evaluated the site. Based upon the available information and site visit, the SJCA Partnering Team reached consensus that EPIC AOC 8 does not pose a threat to human health and the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.15 EPIC AOC 9—Ground Scarring South of Building 75

EPIC AOC 9 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. Aerial photography from February 1976 showed ground scarring under the steam line next to the railroad tracks. This area is relatively small, approximately 40-ft by 40-ft, and is located about 75 ft southwest of Building 75. This EPIC AOC was also identified in previous 1970s and early 1980s photographs.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Upon further review of aerial photographs and evaluation of current and past site conditions, the “ground scarring” appeared to be due to steam from the overhead steam lines. It was determined that sampling was not warranted for this EPIC AOC.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and the site was evaluated as part of the SSA. Based upon the available information and site visit, the SJCA Partnering Team reached consensus that EPIC AOC 9 does not pose a threat to human health and the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.16 EPIC AOC 10—Ground Scarring in Wharf Area

EPIC AOC 10 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. USEPA identified this area as “ground scarring” from a June 1986 aerial photograph. It is located in the area of the Wharf, south of the east corner of Building M-5. Photographs from 1974 indicated that this area was the former location of Buildings 244, 245, and 256. The scarring was probably the result of demolition of these buildings between 1974 and 1986.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Upon further review of aerial photographs and evaluation of current and past site conditions, it was determined that sampling was not warranted for this EPIC AOC.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and the site was evaluated in the SSA. Based upon the available information and site visit, the SJCA Partnering Team reached consensus that EPIC AOC 8 does not pose a threat to human health and the environment and requires NFA, as documented in the SSA dated November 2002.

2.2.3.17 EPIC AOC 11—Open Storage Area Northeast of Building 55

EPIC AOC 11 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. From 1985 and 1986 aerial photographs, this area was identified as an area of open storage of drums and material at Building 55 between the railroad tracks and the road. There is no evidence of storage in this area in previous or subsequent photographs.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and BTAG. Upon further review of aerial photographs and evaluation of current and past site conditions, it was determined that sampling was not warranted for this EPIC AOC.

On July 11, 2001, a partnering meeting/site visit with representatives from the Navy, USEPA, VDEQ, CDM Federal, and CH2M HILL was held and the team evaluated the site. In the SSA, based upon the available information and site visit, it was the consensus of the SJCA Partnering Team that EPIC AOC 11 does not pose a risk to human health and the environment. Review of aerial photographs from before 1985 and after 1986 showed no evidence of this area being used to store drums and other materials. Therefore, consensus was reached for NFA at EPIC AOC 11, as documented in the SSA dated November 2002.

2.2.3.18 EPIC AOC 12—Sandy Flat

EPIC AOC 12 was identified for investigation during the joint USEPA, VDEQ, and Navy review of historical aerial photographs (EPIC Study) of the facility in June 1999. This site is located north of Buildings M-1 and M-5, directly adjacent to Blows Creek. It is a sandy, flat area next to the railroad tracks and it is approximately 240-ft long by 70-ft wide. In a 1937 aerial photograph, the area appeared as a marsh. By 1949, the area was devoid of vegetation. In the 1961 and 1964 photographs, a dark mounded material was noted in the area. None of the photographs showed storage or waste disposal activities. The area is still not vegetated with sandy soil at the surface.

The site was further evaluated in November 1999, during a work-in-progress meeting and a site visit that was conducted with representatives of the Navy, CDM Federal, VDEQ, USEPA, and the BTAG. During the site visit, marine shell fragments were observed in the soil, which indicates that the area had been filled during development of the area. Due to the lack of vegetation in the area for extended periods of time, this EPIC AOC was proposed for additional investigation in 2001.

During the SSA in 2001, CDM collected surface soil samples from 0 to 6 inches bgs and subsurface soil samples from 1 to 3 ft bgs from the three co-located locations and analyzed the samples for VOCs, SVOCs, pesticides/PCBs, metals, explosives, and low concentrations PAHs. An electromagnetic survey was also conducted to delineate the site boundary, locate possible waste such as buried drums and metallic debris, and characterize the soil profile above the water table. Four anomalies were identified during the survey. It was determined that one anomaly was probably due to partially buried concrete blocks, two anomalies were most likely caused by buried man-made objects, and one anomaly appeared to be due to the adjacent railroad tracks.

The sampling results were used to conduct a HHRS and ERS. The HHRS concluded that contact with EPIC AOC 12 surface and subsurface soil was not expected to be a human health concern. In addition, no significant potential ecological effects were identified. Therefore, the SJCA Partnering Team consensus for EPIC AOC 12 was for NFA, as documented in the SSA dated November 2002.

2.2.3.19 AOC 13—PCP Dip Tanks

AOC 13 was identified for further evaluation during the December 2001 interview with former employees. AOC 13 is located in an open bay of Building M-3. Two pentachlorophenol (PCP) dip tanks were located on the western wall of the open bay. Conveyor belts extended through the bay wall into the tanks. No known releases have occurred at this site. It was reported that the PCP dip tanks were in operation for a period less than 2 years during the Korean War from 1951 to 1953.

During a site visit in December 2001 conducted by the SJCA Partnering Team, no evidence of staining on the concrete floor or other signs of releases were observed. However, no information was available on the location of drying operations.

The SJCA Partnering Team agreed that AOC 13 required further review. An SSA was conducted at AOC 13 in August 2003 and the results will be reported in the second quarter of FY 2004.

2.2.3.20 AOC 14—Building 89

AOC 13 was identified for further evaluation during the December 2001 interview with former employees. AOC 14 is located at the former Building 89 location. The 1981 IAS identified Building 190 to have handled loose ordnance materials and as heavily used for loading explosives into ammunition. From the 1920s to the 1970s, Explosive D was used at Building 89 and from the 1940s to the 1970s, tetryl was also used.

According to the IAS, in mid-1977 all ordnance-handling buildings were decontaminated by flushing with chemical solutions and water. Prior to decontamination, NAPEC visually inspected the facilities and collected samples for chemical analysis to develop appropriate decontamination procedures for each building. At the conclusion of the decontamination process, NAPEC visually reinspected each building, collected samples for chemical analysis, and certified that the facilities were decontaminated. However, the level of decontamination was not specified and residues of ordnance may remain (NEEAA, 1981). In July 1978, representatives of the Ordnance Environmental Support Office (OESO) and NAPEC reinspected Building 89 for Explosive D contamination and indicated that levels less than 10

parts per million (ppm) still remained in portions of the building. Further decontamination was required before the building could be used for non-ordnance operations.

During the December 2001 interview, the former employees indicated that the building was used for 8-inch and 16-inch shell loading of Explosive D only. The building had 4 ft walls and a large mound of soil facing the Southern Branch of the Elizabeth River for blast protection and there was an underground storage area to the northwest of Building 89. Building 89 was demolished sometime after 1999 and there is no evidence that drainage lines were present within the building. No known releases have occurred at this site and no contaminant releases were identified during building demolition activities. The site is currently covered with grass.

The SJCA Partnering Team agreed that AOC 14 required further review. An SSA was conducted at AOC 14 in August 2003 and the results will be reported in the second quarter of FY 2004.

TABLE 2-1

Summary of Environmental Studies, Investigations, and Actions Completed for IR Sites
St. Juliens Creek Annex, Chesapeake Virginia

Site Number	Site Name	IAS ¹	PA ²	RFA ³	RRR	SSA	RI/FS Work Plans	RI	EE/CA	FS	NTCRA	Close out Report	PRAP	ROD
1	Waste Disposal Area A	1981	1983	1989	1996	2003 ⁴								
2	Waste Disposal Area B	1981	1983	1989	1996		1997							
3	Waste Disposal Area C	1981	1983	1989	1996		1997	2003	2002		2002			
4	Landfill D	1981	1983	1989	1996		1997	2003						
5	Burning Grounds	1981		1989	1996		1997	2003						
6	Small Arms Unit	1981		1989	1996		1997	2003	2002		2002	2003	2003	2003
7	Old Storage Yard	1981		1989	1996									
8	Cross and Mine Site	1981	1983	1989	1996	2002								
9	Building 249	1981	1983	1989										
10	Haz. Waste Disposal at Rail Road	1981		1989	1996	2002								
11	Haz. Waste Disposal at Bldg. 266	1981		1989	1996	2002								
12	Sand Blast Area Building 323			1989										
13	Waste Generation Area			1989										
14	Washrack Building 266	1981		1989										
15	Fire Training Area	1981		1989	1996									
16	DRMO Storage/Salvage Yard	1981		1989	1996									
17	Storage Pad at Building 279	1981		1989	1996									
18	Building 47	1981		1989	1996	2002								
19	Wharf Area Bldg.M-5	1981		1989	1996	2002								
20	Wharf Area Sediments	1981		1989	1996	2002								

TABLE 2-1

Summary of Environmental Studies, Investigations, and Actions Completed for IR Sites
St. Juliens Creek Annex, Chesapeake Virginia

21	Soil Staining at Bldg. 187	1981	1989	1996	2002
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Shading indicates those Sites where No Further Action is required or where No Further Action is recommended in the Final SSA (CH2M HILL, 2001).

¹IAS conducted by the Navy in 1981.

²PA conducted by NUS in 1983.

³RFA conducted by A.T. Kearney in 1989.

⁴Addendum to the SSA was completed in 2003.

1981—Calendar Year Activity Completed

EE/CA—Engineering Evaluation/Cost Analysis

FS—Feasibility Study

IAS—Initial Assessment Study

PA—Preliminary Assessment

PRAP—Proposed Remedial Action Plan

NTCRA—Non-Time-Critical Removal Action

RD—Remedial Design

RFA—RCRA Facility Assessment

RI—Remedial Investigation

ROD—Record of Decision or Decision Document

RRR—Relative Risk Ranking

SSA—Site Screening Assessment

**Table 2-2
Current Status of Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
Sites					
Site 1	Waste Disposal Area A	Dump A, RFA - SWMU 1	NFA	Consensus for NFA by Navy, VDEQ, and USEPA in November 2002 based on RRR data and September 2002 test pit information.	Consensus for NFA as documented in an Addendum to the SSA in January 2003.
Site 2	Waste Disposal Area B	Dump B, RFA - SWMU 2	RI in progress	Draft RI and Draft Expanded RI WP submitted September 2003	
Site 2	Waste Disposal Area B Incinerator	Dump B Incinerator, RFA - SWMU 3	RI in progress	Included with Site 2, Draft RI and Draft Expanded RI WP submitted September 2003	
Site 2	Blast Grit at Waste Disposal Area B	Blast Grit Dump B, RFA - SWMU 4	RI in progress	Included with Site 2, Draft RI and Draft Expanded RI WP submitted September 2003	
Site 3	Waste Disposal Area C	Dump C, RFA - SWMU 5	RI complete, Removal Action in progress	Final RI submitted March 2003, Final EECA completed August 2002, Phase I Removal completed September 2002, Phase II Removal Action scheduled for 2003 to be followed by a Close-Out Report	
Site 3	Waste Disposal Pits at Waste Disposal Area C	Waste Disposal Pits Dump C, RFA - SWMU 30	RI complete, Removal Action in progress	Final RI submitted March 2003, Final EECA completed August 2002, Phase I Removal completed September 2002, Phase II Removal Action scheduled for 2003 to be followed by a Close-Out Report	
Site 4	Landfill D	Dump D, RFA - SWMU 6	RI complete, FS in progress	Final RI submitted March 2003, Draft FS submitted July 2003	
Site 4	Old Tanks at Dump D	RFA - AOC L	RI complete, FS in progress	Final RI submitted March 2003, Draft FS submitted July 2003	
Site 4	Dumpster Storage at Landfill D	Dumpster storage at Dump D, RFA - SWMU 7	Recommended for NFA in the RFA	RFA - Dumpsters no longer present.	Site 4 is currently being investigated under CERCLA.
Site 5	Burning Grounds	RFA - SWMU 8	Expanded RI in progress	Final RI submitted March 2003, Draft Expanded RI WP submitted September 2003	
Site 6	Small Items Pit	Caged Pit, RFA - SWMU 24	ROD submitted July 2003, awaiting signature	Final RI submitted March 2003, Final EECA completed August 2002, Removal Action completed September 2002 followed by a Close-Out Report in March 2003, and Final PRAP and ROD submitted July 2003	
Site 7	Old Storage Yard	Old Storage Yard #1, RFA - SWMU 17	NFA	Consensus for NFA in July 2001 by Navy, VDEQ, and USEPA pending debris removal. Debris at the site was removed in 4th Quarter 2002. A construction removal document was produced in 2nd Quarter 2003.	July 2001 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
Site 8	Cross and Mine	RFA - SWMU 9	SSA/Further Evaluation	An SSA was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	
Site 9	Pest. Control Bldg. 249	PA - SWMU 13	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.
Site 9	Oil Water Separator at Bldg. 249	RFA - SWMU 23	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.

**Table 2-2
Current Status of Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
Site 9	Washrack Bldg. 249	RFA - SWMU 25	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.
Site 10	Waste Disposal at Railroad Tracks	Hazardous Waste Disposal Area at Bldg. 13 (Railroad Tracks), RFA - SWMU 14	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
Site 10	Swale beneath Bldg. 13	RFA - SWMU 31	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
Site 11	Waste Disposal at Building 53 (formerly referenced to Bldg. 266)	RFA - SWMU 15	NFA	Consensus by Navy, VDEQ, and USEPA for NFA during a site visit in July 2001 for Site 11 and groundwater underlying site will be covered under Site 21 further study.	Consensus for NFA as documented in the November 2002 SSA.
Site 12	Sand Blast Area Bldg. 323	RFA - SWMU 16	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.
Site 13	Waste Generation Area	RFA - SWMU 20	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.
Site 14	Washrack Bldg. 266	None	NFA	Removed/remediated during construction of SIMA facility.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.
Site 15	Fire Training Area	Fire Training Area at Bldg. 271, RFA - SWMU 27	NFA	Will be investigated under the Navy's Underground Storage Tank (UST) program and therefore, NFA under CERCLA consensus by Navy, VDEQ, and USEPA in July 2002.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
Site 16	DRMO Storage/Salvage Yard	RFA - SWMU 28	NFA	While active, the DRMO does not fall under CERCLA and therefore, NFA under CERCLA consensus by Navy, VDEQ, and USEPA in July 2002. Regional inspections are conducted for stormwater management.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.

**Table 2-2
Current Status of Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
Site 17	Storage Pad at Building 279	Satellite storage at Bldg. 279; RFA - AOC A	NFA	The roof and walls of Building 278/279 were demolished in early 2003, the flooring and concrete pilings are still in place awaiting final removal. Based upon the proximity to Site 2, consensus in February 2003 by Navy, VDEQ, and USEPA that further action related to Site 17 will be addressed under Site 2.	February 2003 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
Site 18	Blasting Grit at Building 47	RFA - AOC C	NFA	During the July 2001 SJCA Partnering Team site visit, no blast grit was observed in several hand auger borings therefore, consensus for NFA was reached by Navy, VDEQ, and USEPA.	Consensus for NFA as documented in the November 2002 SSA.
Site 18	Air Compressor at Bldg. 47	RFA - AOC B	NFA	NFA consensus by Navy, VDEQ, and USEPA in July 2002. Regional inspections are conducted for stormwater management.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
Site 19	Wharf Area Building M-5	Residual Ordnance at Bldg. M-5 & 190 RFA - AOC H	SSA/Further Evaluation	An SI was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	
Site 20	Wharf Area Sediments	Residual Ordnance at wharf area RFA - AOC I	NFA	Navy Range Program will manage the site. Due to the potential for buried ordnance, signs were posted in FY 2003 to prohibit intrusive activities, the Navy will place a warning notice in LANTDIV Real Estate Documents, and notify the U.S. Army Corps of Engineers of the potential for UXO. During the July 2001 site visit, the Navy, VDEQ and USEPA reached consensus for NFA under CERCLA.	Consensus for NFA as documented in the November 2002 SSA.
Site 21	Soil Staining at Building 187	None	SSA/Further Evaluation	An SI was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	
SWMUs					
SWMU 10	Hazardous Waste Container Storage Bldg. 254Y	None	NFA	Recommended for NFA in the RFA as SWMU 10 was assigned to RCRA Program as a >90 day storage bunker. Consensus by Navy, VDEQ, and USEPA for NFA under CERCLA in July 2002, as SWMU 10 was managed under RCRA.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
SWMU 11	Hazardous Waste Container Storage Bldg. 163Y	None	NFA	Recommended for NFA in the RFA as SWMU 11 was assigned to RCRA Program as a >90 day storage bunker. Consensus by Navy, VDEQ, and USEPA for NFA under CERCLA in July 2002, as SWMU 11 is managed under the Virginia Hazardous Waste Management Regulations.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
SWMU 12	PCB Storage Bldg. 198	None	NFA	Recommended for NFA in the RFA. SWMU 12 is a current storage facility managed under TSCA therefore, consensus by Navy, VDEQ, and USEPA for NFA under CERCLA in July 2002.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
SWMU 18	Old Storage Yard # 2	None	NFA	Recommended for NFA in the RFA. Currently in operation and Regional inspections are conducted for stormwater management. Consensus by Navy, VDEQ, and USEPA for NFA under CERCLA.	Official documentation to be contained in FFA upon finalization.
SWMU 19	Old Storage Yard # 3	None	NFA	RFA recommended action for better management practice. A site visit was performed in November 2002 by Navy, VDEQ, and USEPA to confirm status and consensus for NFA under CERCLA was reached.	Official documentation to be contained in FFA upon finalization.

**Table 2-2
Current Status of Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
SWMU 21	Hazardous Waste Accumulation Area (SIMA # 2)	None	NFA	The RFA recommended NFA for this SWMU. A site visit was performed in November 2002 by Navy, VDEQ, and USEPA to confirm status and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 21.	Closure letter submitted to VDEQ and documentation to be contained in FFA upon finalization.
SWMU 22	Repair Shop Satellite Storage Area NE of Bldg. 40	None	NFA	The RFA recommended NFA for this SWMU. A site visit was performed in November 2002 by Navy, VDEQ, and USEPA to confirm status and consensus for NFA under CERCLA was reached. The Navy submitted a closure notification letter to VDEQ for SWMU 22.	Closure letter submitted to VDEQ and documentation to be contained in FFA upon finalization.
SWMU 26	Scrap Metal Storage in Railroad Cars near Bldg. 176	None	NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and USEPA, as the SWMU is managed under RCRA.	Official documentation to be contained in FFA upon finalization.
SWMU 29	Dumpsters (throughout the facility)	None	NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and USEPA, as the SWMU is managed under RCRA.	Official documentation to be contained in FFA upon finalization.
SWMU 32	Overland Drainage Ditches	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, as drainage ditches associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will identify the exact boundaries of the drainage ditch and samples will be collected at all locations where there is either visible evidence of release or suspicion that past releases may have occurred.	Official documentation to be contained in FFA upon finalization.
SWMU 33	Sewer Drainage System	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, as the sewer drainage system associated with individual sites, AOCs, or SWMUs will be investigated on a site-specific basis. Site-specific investigations will include evaluating the integrity of the subsurface system and may include soil sampling to determine if hazardous constituents have been released.	Official documentation to be contained in FFA upon finalization.
SWMU 34	Operational Waste Accumulation Areas	None	NFA	Based on a site visit in November 2002, NFA consensus was reached by Navy, VDEQ, and USEPA, as the SWMU is managed under RCRA.	Official documentation to be contained in FFA upon finalization.
AOCs					
AOC D	Storm Water Outfalls	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, as the storm water outfalls will be investigated under CERCLA on a site-specific basis. Site-specific investigations may include sampling various outfalls to determine whether there has been a release of hazardous constituents.	Official documentation to be contained in FFA upon finalization.
AOC E	Temporary Pump Storage	None	NFA	AOC E was remediated during a removal action conducted as part of the SIMA facility construction. Therefore, the SJCA Partnering Team reached consensus for NFA for AOC E based on the removal action.	Closed out during the construction of the SIMA building. Official documentation to be contained in FFA upon finalization.

**Table 2-2
Current Status of Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
AOC F	Underground Storage Tanks	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA in July 2002, as AOC F is managed under the Navy's UST Program.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
AOC G	Former Process Buildings	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA in July 2002 however, as new information becomes available on the locations and processes conducted at former process buildings, the SJCA Partnering Team will determine if new AOCs should be added. Any former process buildings identified for further evaluation will be evaluated on a site-specific basis.	July 2002 Tier I Partnering Meeting Minutes. Official documentation to be contained in FFA upon finalization.
AOC J	Former Ammunition Manufacturing Areas	None	NFA	Navy, VDEQ, and USEPA reached consensus for NFA under CERCLA, however, as new information becomes available on the manufacturing areas, the SJCA Partnering Team will determine if new AOCs should be added. Any former ammunition manufacturing areas identified for further evaluation will be evaluated on a site-specific basis.	Official documentation to be contained in FFA upon finalization.
AOC K	Former Sewage Treatment Plant	None	SSA/Further Evaluation	An SSA was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	
EPIC AOC 1	E Street and Marsh Road Ground Scarring	AOC 1	SSA/Further Evaluation	An SI was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	
EPIC AOC 2	Piers in front of Building 83	AOC 2	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 3	Ground Scarring at Building M5	AOC 3	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 4	Parking Area South of Building M1	AOC 4	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 5	Possible Soil Staining Between Buildings 87 and 88	AOC 5	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 6	Ground Scarring East of Site 2	AOC 6	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 7	City of Portsmouth Outgrant Area	AOC 7	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 8	Possible Waste Disposal/Bulk Storage Area	AOC 8	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 9	Ground Scarring Southwest of Building 74	AOC 9	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.

**Table 2-2
Current Status of Sites, SWMUs, and AOCs
St. Juliens Creek Annex
Chesapeake, Virginia**

Current Site/ SWMU/ AOC ID	Description	Other Identifications	Current Status	Comments	Documentation of Closure
EPIC AOC 10	Ground Scarring in Wharf Area	AOC 10	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 11	Open Storage Area Northeast of Building 55	AOC 11	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
EPIC AOC 12	Sandy Flat	AOC 12	NFA	NFA consensus by Navy, VDEQ, and USEPA during a site visit in July 2001.	Consensus for NFA as documented in the November 2002 SSA.
AOC 13	PCP Dip Tank	AOC 13	SSA/Further Evaluation	An SSA was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	
AOC 14	Building 89	AOC 14	SSA/Further Evaluation	An SSA was conducted in August 2003 and the results will be reported in the second quarter of FY 2004.	

Note: Shading indicates those Sites/SWMUs/AOCs that require No Further Action (NFA)

Table 2-3
AOC and SWMU Buildings and Area Related Activities Summary

RFA No.	Additional AOC/SWMU Description	Current Status	Previous Action	Additional Action
AOC D SWMU 32 SWMU 33	Outfalls 1, 2, 3, 4 Water Pollution Outfalls Map, July 8, 1971		Rinsate and drainage from various buildings have discharged to surface water bodies via Overland Drainage Ditches (SWMU #32), Sewer Drainage System (SWMU #33), and Stormwater Outfall(s) (AOC D). The contamination migration from these buildings will be addressed as one operable unit (OU #1).	Additional information required to determine further action. Review interview information and Navy documentation of facility permit record (NWSY & NNSY) and review facility utility drawing/maps to determine probable migration routes and additional action. While OU #1 is not proposed for the SSA field investigation, the SSA report provides additional information and recommends additional investigation requirements. NFA outfalls will be investigated relative to a site-specific CERCLA release.
AOC G	Building 6	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 6 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 6 was decontaminated in the 1970's, it has been used as administration space by PWC. The Navy plans no further action (NFA) for Building 6.
AOC G	Building 7	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 7 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 7 was decontaminated in the 1970's, it has been used as storage space by NWASP. The Navy plans no further action (NFA) for Building 7.
AOC G	Building 8	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 8 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 8 was decontaminated in the 1970's, it has been used as administration space by NIF. The Navy plans no further action (NFA) for Building 8.
AOC G	Building 10	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Building 10 was not identified as requiring decontamination by the Naval Ammunition Production Engineering Center (NAPEC) in the assessment of St. Juliens Creek Annex. Based on review of documents, the Navy concludes that Building 10 was decontaminated and converted to administrative use prior to the NAPEC assessment.	Since Building 10 was decontaminated in the 1970's, it has been used as administration space by FTSC/LANT. The Navy plans no further action (NFA) for Building 10.
AOC G	Buildings 11, 62, & 63 (Inert Storage Warehouse)	Building 62 has been demolished. All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 16, 17, 38, & 40 (Smokeless Powder Storage)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 18 Fuze and Primer Renovation and Black Powder Filling	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building 18 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 18 was decontaminated in the 1970's, it has been used by the Fleet Training Command (FTC) as a Cryogenics School. The Navy plans no further action (NFA) for Building 18.
AOC G	Buildings 24, 28, 141, & 251 (Bulk Black Powder Storage)	Building 141 has been demolished. All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 29	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 29.
AOC G	Building 32	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 32.
AOC G	Building 32A	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 32A.
AOC G	Building 33	DEMOLISHED (after W.W.II)	Demolished after W.W.II.	The Navy plans no further action (NFA) for Building 33.
AOC G	Building 39 20 mm & 40 mm Breakdown Plant	Located in the Historic District	Decontamination of Building 39 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 7 was decontaminated in the 1970's, it has been used for storage. It is currently vacant and planned for demolition in FY-02. The Navy plans no further action (NFA) for Building 39.

Table 2-3
AOC and SWMU Buildings and Area Related Activities Summary

RFA No.	Additional AOC/SWMU Description	Current Status	Previous Action	Additional Action
AOC G	Building 41 20 mm & 40 mm Renovation Building	DEMOLISHED (1991)	Decontamination of Building 41 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 41 was decontaminated in the 1970's, it was used as a shipping and receiving facility for FTSC/LANT. Navy plans no further action (NFA) for Building 41.
AOC G	Building 44 Explosive Loading into railroad tank cars (1930s)	DEMOLISHED (1982-1985)*	Decontamination of Building 44 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance.	No reports of disposal or spills are documented at this location; however, these reports indicate that excess materials from ordnance processing were cleaned up and disposed of at the Burning Grounds (Site 5). Building 44 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 44.
AOC G	Building 46 Medium Caliber Cartridge Renovation and Assembly	Demolition Planned unknown date	Decontamination of Building 46 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 46 was decontaminated in the 1970's, it has been used as a machine shop with some administrative space. It is currently vacant and planned for demolition. The Navy plans no further action (NFA) for Building 46.
AOC G	Buildings 55, 56, & 57 (Inert and Explosive Loaded Item Storage facilities as Category 2 for building decontamination)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings. Buildings 55 and 56 are located in the historic district.
AOC G	Buildings 59, 60, 61, 64, 65, 66, 67, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, & 84 (Explosive Loaded Items and Smokeless Powder Storage Magazines)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 86, 87, & 88 (Explosive Item Storage- no exposed explosives)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 161 & 162 (Bulk Hi-Explosives Support Buildings)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Buildings 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, & 198 (Hi-Explosive Item Storage and Smokeless Powder Storage)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 185 Bag Loading operations/Ammunition Breakdown	DEMOLISHED (1985-1990)*	Decontamination of Building 185 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	After building 185 was decontaminated in the 1970s, it was used for OCFS administration spaces prior to demolition between 1985-1990. The Navy plans no further action (NFA) for Building 185.
AOC G	Building 193	DEMOLISHED (after 1990)*	Decontamination of Building 193 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance.	Building 193 was demolished after 1990. The Navy plans no further action (NFA) for Building 193.
AOC G	Building 218, 219, & 220 (Black Powder Quilting Support Buildings)	All tenet commands are scheduled for relocation by FY-07. If not currently demolished, structure will be identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) developed building decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	The Navy plans no further action (NFA) for these buildings.
AOC G	Building 227 Ordnance (hardware) degreasing	DEMOLISHED (1982-1985)*	Spent solvents from this operation, ordnance (cartridge) degreasing at Buildings 227 & 190 were reportedly disposed of at the Burning Grounds (Site 5)	Site 5 is under investigation (RI); contamination from this source will be identified and addressed in future actions taken at Site 5. Building 227 was demolished between 1982-1985; The Navy plans no further action (NFA) for Building 227.
AOC G	Building 240	DEMOLISHED (1998)	Decontamination of Building 240 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 240 was demolished in 1998. The Navy plans no further action (NFA) for Building 240.
AOC G	Building 241	DEMOLISHED (after 1990)*	Decontamination of Building 241 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 241 was demolished after 1990. The Navy plans no further action (NFA) for Building 241.

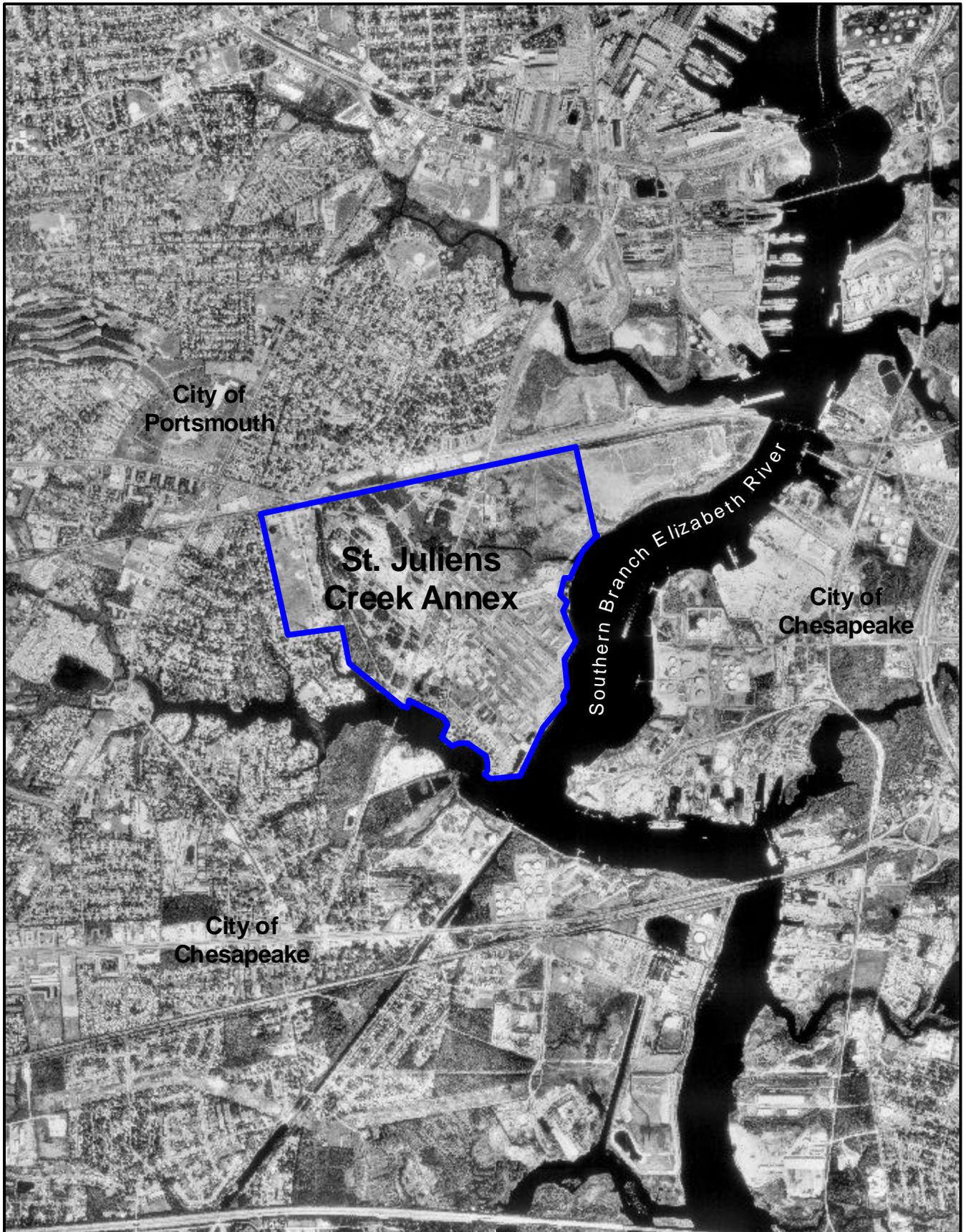
Table 2-3
AOC and SWMU Buildings and Area Related Activities Summary

RFA No.	Additional AOC/SWMU Description	Current Status	Previous Action	Additional Action
AOC G	Building 242	DEMOLISHED (after 1990)*	Decontamination of Building 242 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 242 was demolished since 1990. The Navy plans no further action (NFA) for Building 242.
AOC G	Building 243	DEMOLISHED (after 1990)*	Decontamination of Building 243 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 243 was demolished since 1990. The Navy plans no further action (NFA) for Building 243.
AOC G	Building 244	DEMOLISHED (1982-1985)*	Decontamination of Building 244 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 244 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 244.
AOC G	Building 245	DEMOLISHED (1982-1985)*	Decontamination of Building 245 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 245 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 245.
AOC G	Building 246	DEMOLISHED (1982-1985)*	Decontamination of Building 246 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 246 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 246.
AOC G	Building 256	DEMOLISHED (1986-1990)*	Decontamination of Building 256 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 256 was demolished between 1986-1990. The Navy plans no further action (NFA) for Building 256.
AOC G	Building 267	DEMOLISHED (1982-1985)*	Decontamination of Building 267 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 267 was demolished between 1982-1985. The Navy plans no further action (NFA) for Building 267.
AOC G	Building 272 Pyrotechnics Renovation Plant	DEMOLISHED (1991)	Building 272 was not identified as requiring decontamination by the Naval Ammunition Production Engineering Center (NAPEC) in the assessment of St. Juliens Creek Annex.	Building 272 is within the area being investigated as part of the Burning Grounds (Site 5) which is under investigation (RI); contamination from this source will be identified and addressed in the future actions taken at Site 5. The Navy plans no further action (NFA) for Building 272.
AOC G	Building 277 Q.E. Lab	no data	Decontamination of X-ray test cells in Building 277 and support magazine, Building 358; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 277 was decontaminated in the 1970s, it has been used as a communication center. The Navy plans no further action (NFA) for Building 277.
AOC G	Building 358	DEMOLISHED	Decontamination of X-ray test cells in Building 277 and support magazine, Building 358; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 358 was decontaminated in the 1970s, it has been used as a transmitter building. The Navy plans no further action (NFA) for Building 358.
AOC I	Wharf Area Ordnance Dumping	Closed under SSA Investigation	Area examined/searched by EOD divers in the 1970s. Pier area is certified as decontaminated at the single "X" level. Additional action is required if area transferred to non-DOD entities.	AOC I was under investigation as IRP Site 20, NFA close out in the SSA.
AOC J	Building 12	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) assessment of Building 12 determined that decontamination of this building was not required.	The Navy plans no further action (NFA) for Building 12
AOC J	Building 14	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Naval Ammunition Production Engineering Center (NAPEC) assessment of Building 14 determined that decontamination of this building was not required.	The Navy plans no further action (NFA) for Building 14.
AOC J	Building 43	DEMOLISHED (after 1990)*	Decontamination of Building 43 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 43 was demolished since 1990. The Navy plans no further action (NFA) for Building 43.

Table 2-3
AOC and SWMU Buildings and Area Related Activities Summary

RFA No.	Additional AOC/SWMU Description	Current Status	Previous Action	Additional Action
AOC J	Building 89 (1908-1970s)	DEMOLISHED (1991) Further Action Conducted in FY-03.	Decontamination of Building 89 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 89 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition in FY-00. The Navy plans further action for Building 89.
AOC J	Building 184 Primer Renovation Facility	DEMOLISHED (1985-1986)*	Decontamination of Building 184 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building 184 was demolished between 1985-1986. The Navy plans no further action (NFA) for Building 184.
AOC J	Building 188 (1940s-1970) Pyrotechnic loading	DEMOLISHED	Decontamination of Building 188 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building 188 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition in FY-00. The Navy plans no further action (NFA) for Building 188.
AOC J	Building 190 (1940s-1970s) Medium Caliber Loading/Renovation Plant/Degreasing	DEMOLISHED (1991) Further Action Conducted in FY-03.	Decontamination of Building 190 (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination. Spent solvents from this operation, ordnance (cartridge) degreasing, at Building 190 (and 227 were reportedly disposed of at the Burning Grounds (Site 5).	Since Building 190 was decontaminated in the 1970s, it has been used for storage. It was demolished in 2001. The Navy plans no further action (NFA) for Building 190. Site 19 is under investigation (SI); contamination from this source will be identified and addressed in future actions taken at Site 19.
AOC J	Building 222 Ammunition Steam Out	DEMOLISHED (after W.W.II)	Building 222 (Victory Building) demolished after W.W.II. The former location is directly adjacent to Site 5 and the berm running along the mid-section of Blows Creek.	Residual contamination from Building 222 will be investigated as part of the RI underway for Site 5. Contamination from this source will be identified and addressed in future actions. The Navy plans no further action (NFA) for Building 222.
AOC J	Building M-3 Mark VI mine loading facility/ Steam out	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building M-3 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building M-3 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition, although the demolition has not been programmed for a specific FY. The Navy plans no further action (NFA) for Building M-3.
AOC J	Building M-4 Mark VI mine loading facility/ Steam out	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building M-4 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building M-4 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition, although the demolition has not been programmed for a specific FY. The Navy plans no further action (NFA) for Building M-3.
AOC J	Building M-5 Mark VI mine loading facility/ Steam out	All tenet commands are scheduled for relocation by FY-07. Structure identified for future demolition.	Decontamination of Building M-5 occurred in the mid 1970s; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Since Building M-5 was decontaminated in the 1970s, it has been used for storage. It is currently vacant and planned for demolition, although the demolition has not been programmed for a specific FY. The Navy plans no further action (NFA) for Building M-3.
AOC J	Building M-5 Annex Medium Caliber Projectile Washout Plant	DEMOLISHED (1982-1985)*	Decontamination of Building M-5 Annex (including surrounding area and under building) and process equipment; Naval Ammunition Production Engineering Center (NAPEC) developed decontamination procedures, provided implementation oversight, and conducted inspection upon completion to determine compliance and effectiveness of decontamination.	Building M-5 Annex was demolished between 1982 and 1985. The Navy plans no further action (NFA) for Building M-5 Annex.
AOC K	Former Waste Water Treatment Plant	Building 318 Demolished Further Action Conducted in FY-03.	Small sewage treatment plant (Building 318) treated wastewater from the barracks from 1942 to 1947. The barracks were demolished in 1947, and use of the plant was discontinued.	Available information pertaining to this location and recommendations for further investigation at AOC K are included in the Site Screening Assessment report.
SWMU 11	Building 163 NBC Agents Storage area	Under RCRA Closure	Building 163 is a magazine bunker and has been used for storage of non-ordnance materials. Currently, Building 163 is under RCRA Closure for hazardous waste storage >90 days. This VDEQ enforcement is with the Norfolk Naval Shipyard.	The Navy plans no further action (NFA) for Building 163.
SWMU 31	Drainage Swales (along Building 13) Ammunition Degreasing Building 47	Demolition Planned date unknown	The drainage swale identified as SWMU # 31 has been filled and paved since the 1940s; the recipient water body (tidal marsh) is the low lying area of Landfill B.	Landfill B (Site 2) is under investigation (RI); contamination from this source will be identified and addressed in future actions taken at Site 2. The Navy plans no further action (NFA) for SWMU #13.
N/A	Septic Drainage Field-Southeast of Building 269	DEMOLISHED (after 1990)*	Septic tank and tile filed associated with Building 269 (constructed as a latrine). Per a Sanitary Facilities Survey of SJCA in 1963, this was the only active septic tank and tile field at SJCA. No reported or known releases of hazardous materials have occurred at this location.	The Navy plans no further action (NFA) for this location.
N/A	Septic Drainage Field-Southeast of Building 305	no data	Septic tank and tile filed associated with Building 305 (constructed as a gatehouse with latrine facilities). Per a Sanitary Facilities Survey of SJCA in 1963, Building 305 latrine facilities discharge to the sanitary sewer. No reported or known releases of hazardous materials have occurred at this location.	The Navy plans no further action (NFA) for this location.

* Based on Review of EPIC Study of Photography



LEGEND

 St. Juliens Creek Annex



0 2000 4000 Feet



Figure 2-1
Location of St. Juliens Creek Annex
St. Juliens Creek Annex
Chesapeake, Virginia

Proposed Activities for FY 2004

This section summarizes ongoing and planned IR/CERCLA activities at each site. The discussion focuses on activities that are proposed for FY 2004 but also includes currently funded activities that may expand beyond September 2004.

Additional activities may be identified during, or as a result of, the execution of ongoing and proposed IRP efforts. The scope of proposed activities is presented on a site-by-site basis. Section 3.1 discusses multi-site and basewide activities and Section 3.2 describes site-specific characterization, remediation and long-term monitoring, and maintenance activities.

The schedule for all activities discussed below depends on the availability of funding.

3.1 Multi-site and Basewide Activities for FY 2004

3.1.1 Preparation of the Federal Facilities Agreement

The listing of SJCA on the NPL requires that the Navy, VDEQ, and USEPA enter into an Inter-Agency written agreement, an FFA, that will lay out how and when CERCLA-related activities will be conducted at the base. As part of this process, the FFA identifies each specific area (Site, SWMU, and/or AOC) on the base that will be addressed under the FFA, and categorizes them as to how they will fit into the CERCLA process. The FFA also addresses sites under Findings of Fact that require NFA under CERCLA. The Draft FFA for SJCA will be submitted in FY 2004. Legal reviews by the Navy, USEPA, and VDEQ and finalization of the FFA are also scheduled to be completed during FY 2004.

3.1.2 Preparation of the SMP Update for FY 2005 through 2010

The SMP will be updated for SJCA for FY 2005 through 2010 in FY 2004. The SMP will meet the requirements of the FFA under the CERCLA. The SMP will be used as a management tool by the SJCA Partnering Team and their respective organizations (LANTDIV, SJCA, USEPA, and VDEQ) in the planning and scheduling of environmental remedial response activities to be conducted at SJCA. The SMP is a working document that is updated yearly to maintain up-to-date documentation and a summary of environmental actions at SJCA.

3.1.3 Blows Creek Watershed Baseline Ecological Risk Assessment

This proposed activity involves preparation of a BERA for the Blows Creek Watershed to evaluate potential releases from CERCLA sites located on Blows Creek. The assessment includes Steps 5 and 6 of the eight-step ERA process for Sites 3, 4, and 5 and the Blows Creek watershed at SJCA. Site 19 and EPIC AOC 1 will also be evaluated because they are located along Blows Creek and have the potential to affect the watershed.

In addition to an evaluation of risks, the BERA will include analysis and interpretation of bioassay outcomes, comparison of chemical concentrations detected in Blows Creek to those

present in potential offsite source areas (Southern Branch of the Elizabeth River), and an analysis of chemical fate and transport. The BERA will also provide characterization of potential risks and a consideration of management options.

The Blows Creek BERA Work Plan was finalized in August 2003 and the field investigation will be conducted in September 2003. During FY 2004, the findings of the BERA investigation will be included in a BERA report.

3.1.4 Basewide Background Groundwater Investigation

In October 2001, a Background Study was conducted at SJCA to evaluate background levels for soil and groundwater. Due to the limited number of groundwater monitoring wells, the groundwater data was inconclusive. Therefore, six additional shallow monitoring wells will be installed and an additional round of groundwater data will be collected from the existing and newly installed shallow monitoring wells.

The data collected and evaluated in this study will be used to help determine a statistically valid set of background concentrations for groundwater. The background data set (once completed) will be applied to each site during the risk assessment phases (human health and ecological) to help determine if the compounds found at each site (and the risks associated with them) are site-related or are indicative of natural or anthropogenic background conditions. The results of this sampling event will be included as an addendum to the Final Background Study.

In FY 2003, the Background Investigation Work Plan will be finalized. The field investigation was conducted in August 2003. During FY 2004, the findings of the background investigation will be included as a Final Addendum to the Final Background Investigation Report for SJCA.

3.1.5 St. Juliens Creek Annex Enterprise System

The SJCA Enterprise System website will be designed and online in FY 2003. The website will be created to track, manage, and maintain IRP activities. The website will include a web calendar, provide a means for online document reviews, an administrative record and document management system, and a project management page that will include historical and contract task order (CTO) related information. The website will be updated and maintained in FY 2004 to reflect current activities.

3.1.6 Watershed Contamination Source Document (WCSD)

In February 2002, the Department of the Navy issued guidance requiring that a WCSD must be prepared detailing potential Navy and non-Navy sources that may have contaminated sediment in the water bodies adjacent to Navy property. SJCA will require a WCSD due to potential releases from non-Navy sources to sediments surrounding the facility.

The preparation of a WCSD technical memorandum for SJCA is scheduled for FY 2004. The WCSD will identify potential contamination sources, releases, transport mechanism, exposure routes, and receptors and will include a pictorial conceptual site model from both Navy and non-Navy sources.

3.2 Site Characterization Activities for 2004

3.2.1 Site 2—Waste Disposal Area B

The Draft RI/ERA/HHRA report for Site 2 was submitted for regulatory review in September 2003. The RI will be finalized in FY 2004. In addition, an Expanded RI of sediment, groundwater, and surface water are planned for FY 2004. The findings will be presented in an Expanded RI Report and an FS will be initiated to address any potential risks identified in the RI/ERA/HHRA in FY 2004.

3.2.2 Site 4—Landfill D

The RI/ERA/HHRA report for Site 4 was finalized in FY 2003 and a Draft FS was submitted to address potential exposures to risks identified in the RI. Potential human health risks were associated with metal concentrations in soil and sediment at localized areas within Site 4. During the FS, remedial alternatives including no action, soil cover, RCRA Subtitle D Cap, and excavation and offsite disposal were evaluated to minimize contact of human and ecological receptors with landfill contents, reduce infiltration and leaching of contaminants from the landfill to the groundwater, and prevent surface water run-on and control surface water run-off and erosion. Based on the comparative analysis conducted as part of the FS, soil cover was selected as the recommended remedial alternative for Site 4. An RD, PRAP, and ROD will be initiated for Site 4 in FY 2004.

3.2.3 Site 5—Burning Grounds

The RI/ERA/HHRA report for Site 5 was finalized in FY 2003. Analytical results from Site 5 identified potential human health risks associated with metals in soil and drainage sediment. Further investigation of surface soil and groundwater are planned for FY 2003. The findings will be presented in an Expanded RI Report in FY 2004.

3.2.4 Site 8—Cross and Mine

Further investigation of Site 8 was conducted in August 2003 under the SSA phase. The SSA evaluation included groundwater sampling. An SSA evaluation report will be submitted for regulatory review in FY 2004.

3.2.5 Site 19—Wharf Area Building 190

Further investigation of Site 19 was conducted in August 2003. The SI included surface soil, subsurface soil, and sediment sampling. Further evaluation of the concrete drainage culverts leading from this area of the facility was also initiated. An SI report documenting the findings will be submitted for regulatory review in FY 2004.

3.2.6 Site 21—Soil Staining at Building 187

Further investigation of Site 21 (including Site 11) was conducted in August 2003. The SI consisted of a groundwater investigation by Membrane Interface Probe and monitoring well installation and sampling. An SI report documenting the findings will be submitted for regulatory review in FY 2004.

3.2.7 EPIC AOC 1—E Street and Marsh Road Ground Scarring

Further investigation of EPIC AOC 1 was conducted in August 2003. The SI included surface soil sampling. Further desktop review, including aerial photo reviews and investigation of the impact to Blows Creek was also conducted. An SI report documenting the findings will be submitted for regulatory review in FY 2004.

3.2.8 AOC 13—PCP Dip Tank

An investigation of AOC 13 was conducted in August 2003 under the SSA phase. The SSA evaluation included surface and subsurface soil sampling. An SSA evaluation report will be submitted for regulatory review in FY 2004.

3.2.9 AOC 14—Building 89

An investigation of AOC 13 was conducted in August 2003 under the SSA phase. The SSA evaluation will include soil sampling. An SSA evaluation report will be submitted for regulatory review in FY 2004.

3.2.10 AOC K—Former Sewage Treatment Plant

An investigation of AOC K was conducted in August 2003 under the SSA phase. The SSA evaluation will include surface and subsurface soil sampling. An SSA evaluation report will be submitted for regulatory review in FY 2004.

Planned and Proposed Remedial Actions and Removal Actions

Remedial Actions (RAs) are conducted to prevent a potential release of contaminants and/or further migration of contaminants. Removal actions are taken to prevent immediate and substantial harm to human health. Examples include the removal of drums or tanks, or removal of contaminated soils.

Planned and proposed remedial and removal actions that have been conducted or identified at SJCA sites are presented below, listed according to site. With the exception of removal actions associated with facility construction projects, no historic remedial actions under CERCLA have taken place at any SJCA IR Sites or AOCs. A removal action at Site 6 and a partial removal action at Site 3 was completed in September 2003. The Navy will continue to identify possible remedial and removal actions as investigation activities proceed.

4.1 Site 3—Waste Disposal Area C

Phase I of a NTCRA was implemented at Site 3 in the last quarter of FY 2002 to remove visible burnt/stained soil and debris, as well as surrounding material posing a potential risk to human health and the environment. The extent of the area removed included 3,300 yd³ of waste and soil. The Phase II NTCRA is planned for FY 2003 to remove the remaining waste, soil, and sediment at Site 3. Following complete removal of waste and media posing a potential risk, an NFA PRAP and ROD will be submitted and the land comprising Site 3 will have unrestricted use.

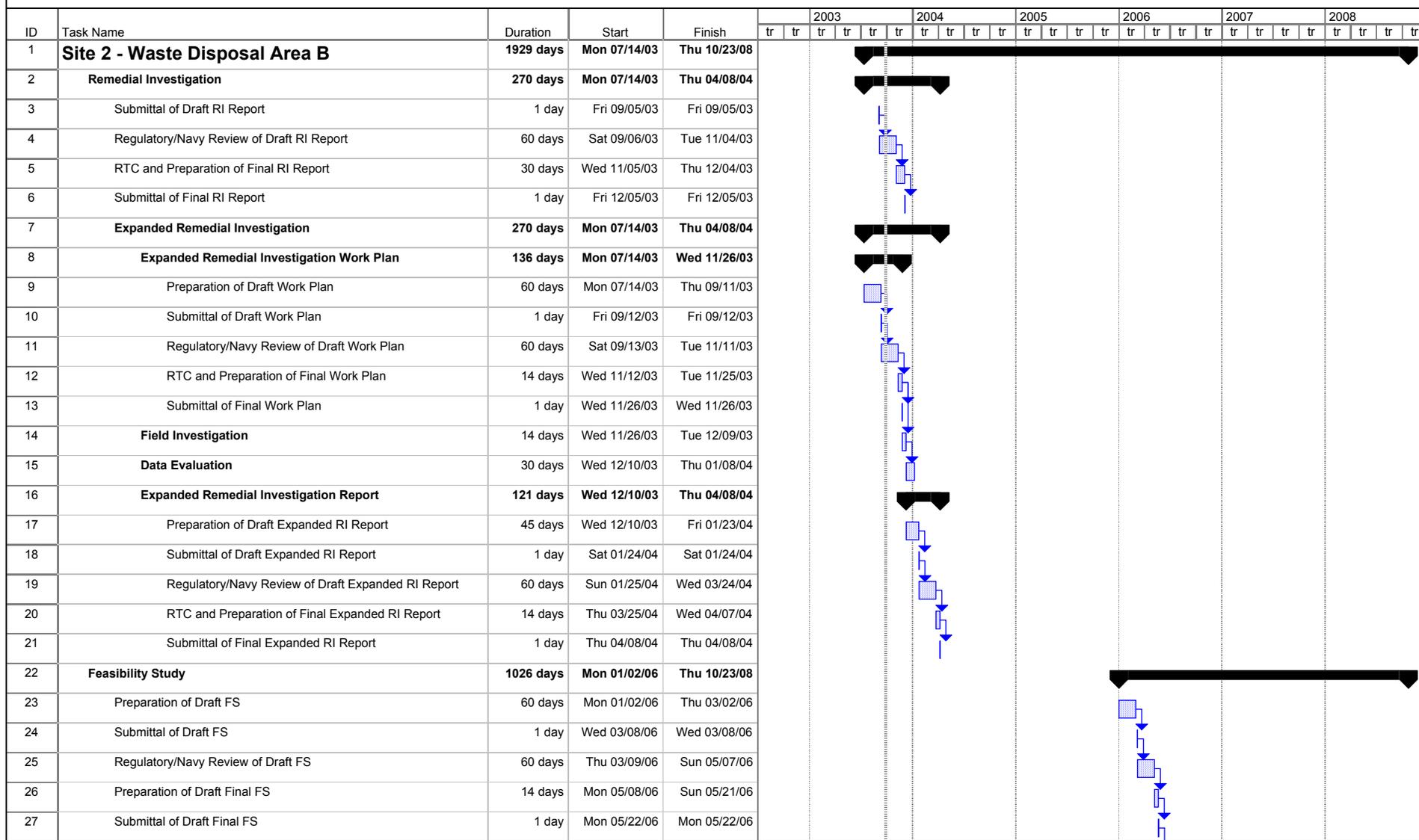
SECTION 5

Site Management Schedules

This section presents the project schedules for basewide activities and each site discussed in Section 3 and for sites which will begin study, investigation, or remedial activities in FY 2004 through 2009 (October 1, 2003 through September 30, 2009). These schedules are adjusted annually in the SMP, as future site activities are further defined and various administrative issues, including funding, are addressed. The project schedules may change depending on funding availability.

The project schedule for basewide and site-specific activities is presented in Figure 5-1. The review and comment periods were based on general FFA guidelines and flow charts depicting the process are included as Figures 5-2 through 5-4. The schedule derived from these guidelines assume informal dispute resolution. The Draft FFA for SJCA will be submitted pending agreement of model language between USEPA and the Navy.

**Figure 5-1
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2004 through 2009
Site Management Plan**



Date: Fri 09/26/03

Task		Summary		*Rolled Up Milestone		External Milestone	
Split		Project Summary		*Rolled Up Progress			
Progress		*Rolled Up Task		External Tasks			
Milestone		*Rolled Up Split		External Milestone			

Note: The review and submittal dates are based on the FFA Process Flow Charts or dates previously agreed upon and assume informal dispute resolution of Draft Final documents within a reasonable number of days.

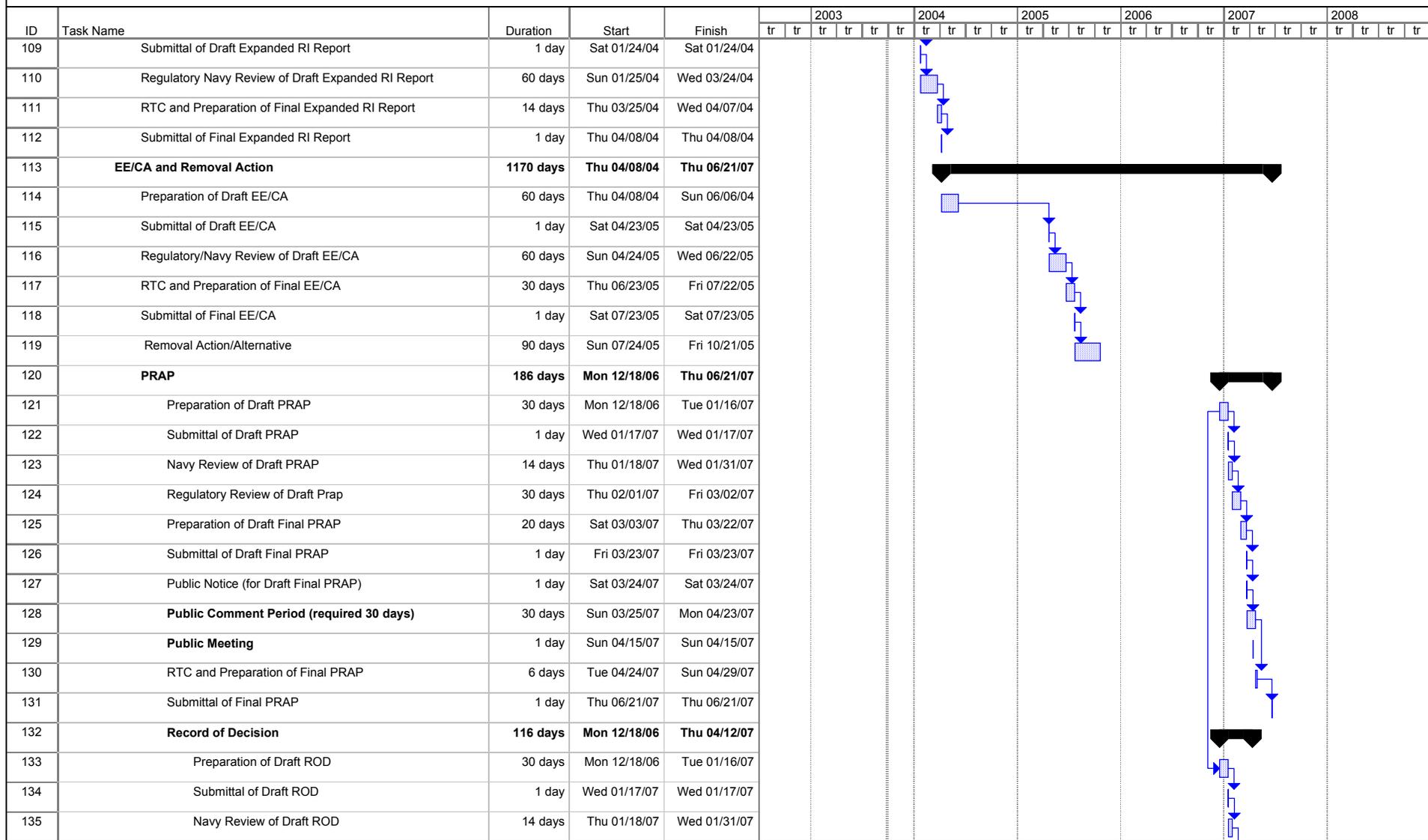
**Figure 5-1
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2004 through 2009
Site Management Plan**

ID	Task Name	Duration	Start	Finish	2003		2004		2005		2006		2007		2008	
					tr	tr										
55	Public Meeting	1 day	Mon 07/12/04	Mon 07/12/04												
56	RTC and Preparation of Final PRAP	6 days	Tue 07/27/04	Sun 08/01/04												
57	Submittal of Final PRAP	1 day	Tue 08/03/04	Tue 08/03/04												
58	Record of Decision	116 days	Mon 03/22/04	Thu 07/15/04												
59	Preparation of Draft ROD	30 days	Mon 03/22/04	Tue 04/20/04												
60	Submittal of Draft ROD	1 day	Wed 04/21/04	Wed 04/21/04												
61	Navy Review of Draft ROD	14 days	Thu 04/22/04	Wed 05/05/04												
62	Regulatory/Navy Review of Draft ROD	30 days	Thu 05/06/04	Fri 06/04/04												
63	RTC and Preparation of Final ROD	40 days	Sat 06/05/04	Wed 07/14/04												
64	Submittal of Final ROD	1 day	Thu 07/15/04	Thu 07/15/04												
65	Site 4 - Landfill C	462 days	Sat 05/10/03	Fri 08/13/04												
66	Feasibility Study	462 days	Sat 05/10/03	Fri 08/13/04												
67	Preparation of Draft FS	60 days	Sat 05/10/03	Tue 07/08/03												
68	Submittal of Draft FS	1 day	Wed 07/09/03	Wed 07/09/03												
69	Navy Review of Draft FS	60 days	Thu 07/10/03	Sun 09/07/03												
70	Preparation of Draft Final FS	20 days	Mon 09/08/03	Sat 09/27/03												
71	Submittal of Draft Final FS	1 day	Sun 09/28/03	Sun 09/28/03												
72	Regulatory/Navy Review of Draft Final FS	30 days	Mon 09/29/03	Tue 10/28/03												
73	RTC and Preparation of Final FS	30 days	Wed 10/29/03	Thu 11/27/03												
74	Submittal of Final FS	1 day	Fri 11/28/03	Fri 11/28/03												
75	Remedial Design	260 days	Fri 11/28/03	Fri 08/13/04												
76	Remedial Design and Review	120 days	Fri 11/28/03	Fri 03/26/04												
77	Final Remedial Design	90 days	Sat 03/27/04	Thu 06/24/04												
78	PRAP	135 days	Thu 04/01/04	Fri 08/13/04												
79	Preparation of Draft PRAP	30 days	Thu 04/01/04	Fri 04/30/04												
80	Submittal of Draft PRAP	1 day	Sat 05/01/04	Sat 05/01/04												
81	Navy Review of Draft PRAP	14 days	Sun 05/02/04	Sat 05/15/04												

Date: Fri 09/26/03	Task		Summary		*Rolled Up Milestone		External Milestone	
	Split		Project Summary		*Rolled Up Progress			
	Progress		*Rolled Up Task		External Tasks			
	Milestone		*Rolled Up Split		External Milestone			

Note: The review and submittal dates are based on the FFA Process Flow Charts or dates previously agreed upon and assume informal dispute resolution of Draft Final documents within a reasonable number of days. Page 3 of 8

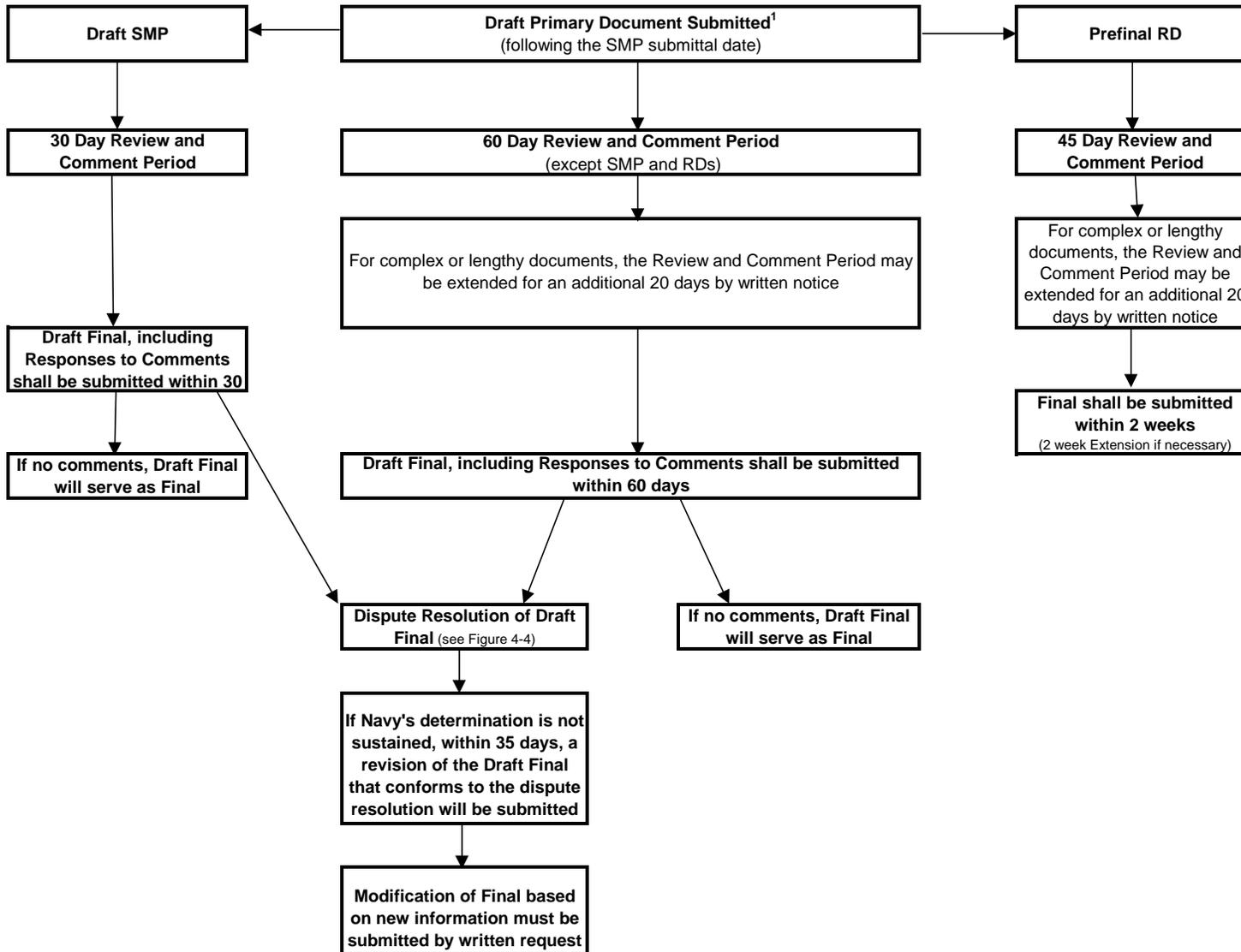
**Figure 5-1
St Juliens Creek Annex Schedule of IR Activities for Fiscal Years 2004 through 2009
Site Management Plan**



Date: Fri 09/26/03	Task		Summary		*Rolled Up Milestone		External Milestone	
	Split		Project Summary		*Rolled Up Progress			
	Progress		*Rolled Up Task		External Tasks			
	Milestone		*Rolled Up Split		External Milestone			

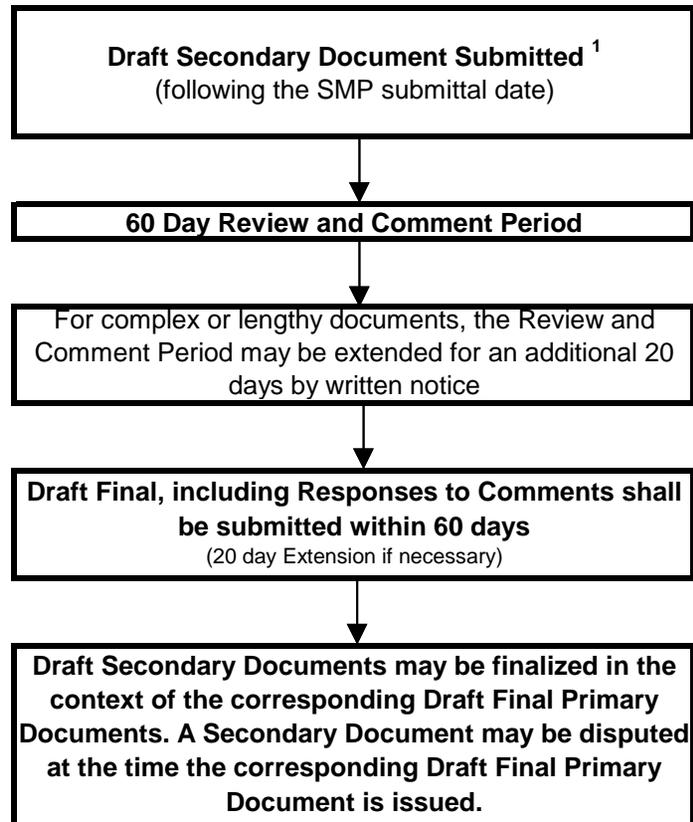
Note: The review and submittal dates are based on the FFA Process Flow Charts or dates previously agreed upon and assume informal dispute resolution of Draft Final documents within a reasonable number of days. Page 5 of 8

**Figure 5-2
Primary Document Submittal Flow Chart
FFA Process
St. Juliens Creek Annex
Chesapeake, Virginia**



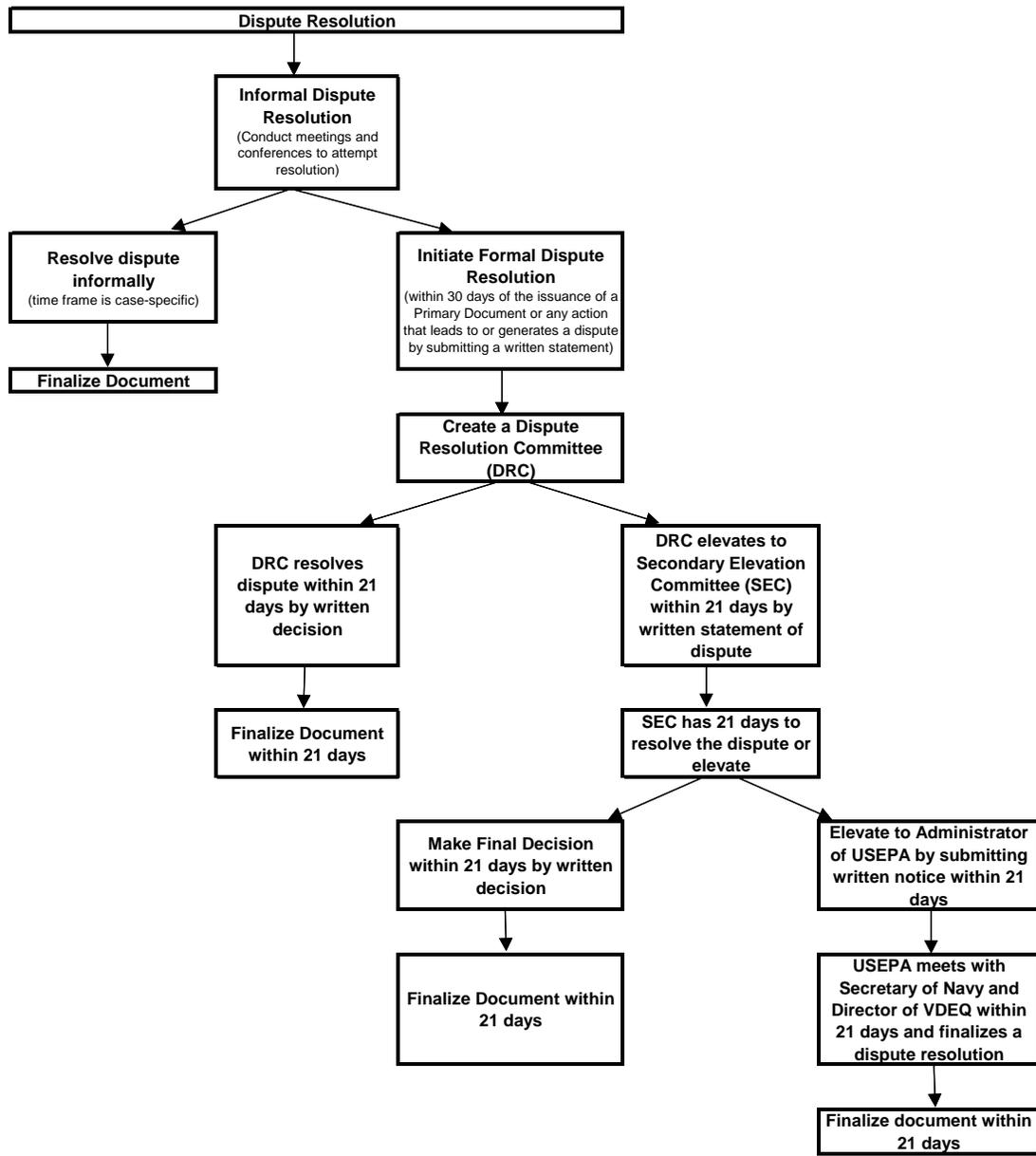
¹SJCA Primary Documents Include: Remedial Investigation (RI)/Feasibility Study (FS)/Focused Feasibility Study (FFS) Work Plans, RI Reports, FS and FFS Reports, Proposed Remedial Action Plans (PRAPs), Records of Decision (RODs), Final Remedial Designs (RDs), Remedial Action Work Plans, Remedial Action Completion Reports (RACRs), and Site Management Plans (SMPs)

**Figure 5-3
Secondary Document Submittal Flow Chart
FFA Process
St. Juliens Creek Annex
Chesapeake, Virginia**



¹SJCA Secondary Documents Include: Health and Safety Plans (HSPs), Non-Time-Critical Removal Action (NTCRA) Plans, Pilot/Treatability Study Work Plans and Reports, Engineering Evaluation/Cost Analysis (EE/CA) Reports, Well Closure Methods and Procedures, Preliminary/Conceptual Designs or equivalents, Prefinal Remedial Designs (RDs), Periodic Reviews/5-Year Review Assessment Reports, Removal Action Memorandums, Preliminary Closeout Reports (PCORs)/Final Closeout Reports (FCORs)

Figure 5-4
Dispute Resolution Flow Chart
FFA Process
St. Juliens Creek Annex
Chesapeake, Virginia



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