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Final

**Record of Decision
Site 3: Waste Disposal Area C
St. Juliens Creek Annex
Chesapeake, Virginia**



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

FEBRUARY 2006

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Acronyms and Abbreviations

AOC	Area of Concern
BERA	Baseline Ecological Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
EE/CA	Engineering Estimate and Cost Analysis
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
FFA	Federal Facilities Agreement
HHRA	Human Health Risk Assessment
IAS	Initial Assessment Study
IRP	Installation Restoration Program
JV I	AGVIQ-CH2M HILL Joint Venture I
MCL	Maximum Contaminant Level
NACIP	Naval Assessment and Control of Installation Pollutants
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	no further action
NPL	National Priorities List
NTCRA	non-time-critical removal action
PA	Preliminary Assessment
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PRAP	Proposed Remedial Action Plan
RAB	Restoration Advisory Board
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment

RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
RRR	Relative Risk Ranking
SARA	Superfund Amendments and Reauthorization Act
SJCA	St. Juliens Creek Annex
SMP	Site Management Plan
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
UTL	upper tolerance limit
UXO	unexploded ordnance
VDEQ	Virginia Department of Environmental Quality

Declaration

1.1 Site Name and Location

Site 3, Waste Disposal Area C
St. Juliens Creek Annex
Chesapeake, Virginia
EPA ID: VA5170000181

1.2 Statement of Basis and Purpose

This Record of Decision (ROD) presents the Selected Remedy at Site 3, Waste Disposal Area C, at St. Juliens Creek Annex (SJCA), Chesapeake, Virginia. The determination has been made in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record file for the site.

The United States Department of the Navy (Navy) is the lead agency and provides funding for site cleanups at SJCA. The Navy and United States Environmental Protection Agency (EPA) Region III issue this ROD jointly. The Commonwealth of Virginia, Virginia Department of Environmental Quality (VDEQ), concurs with the Selected Remedy. The lead agency has determined that no action is necessary to protect public health or welfare or the environment.

1.3 Description of the Selected Remedy

Site 3 is one of several Installation Restoration Program (IRP) sites under CERCLA at SJCA. The annual Site Management Plan (SMP) for SJCA includes the schedule for remedial actions that will be conducted at IRP sites at SJCA.

The Selected Remedy for Site 3 is no further action (NFA). Removal actions were conducted at Site 3 from 2002 through 2003, which eliminated potentially unacceptable risk associated with waste, soil, and upland drainage ditch sediment/soil at the site. Pre-confirmation sampling was conducted prior to the removal actions to define the necessary extent of removal in order to eliminate unacceptable risks to human health and the environment. The results support the NFA remedial alternative.

1.4 Statutory Determinations

The removal actions previously conducted at Site 3 have eliminated the need to conduct further remedial action. Additionally, because this remedy will not result in hazardous

substances, pollutants, or contaminants remaining on-site above levels that restrict unlimited use and unrestricted exposure, a five-year review will not be required. The NFA Remedy satisfies the statutory requirements of CERCLA Section 121 and the regulatory requirements of the NCP.

1.5 Authorizing Signatures



S. D. BAILEY
CAPT, USN
Chief of Staff

19 OCT 2005

Date



ABRAHAM FERDAS, Director
Hazardous Site Cleanup Division
EPA (Region III)

2/6/06

Date

Decision Summary

2.1 Site Name, Location, and History

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 in southeastern Virginia (Figure 2-1). The facility covers approximately 490 acres and includes administrative buildings, wharf areas on the Southern Branch of the Elizabeth River, a central heating plant, numerous nonoperational industrial facilities, and miscellaneous structures. SJCA was placed on the National Priorities List (NPL) in August 2000 (VA5170000181).

Site 3 covers approximately 2.1 acres in the northeast portion of SJCA (Figure 2-2). In earlier documents, Site 3 was referred to as "Dump C" and the aerial extent was initially reported to be 10 acres. Review of historical aerial photographs indicated that before 1940, the site and much of the adjacent area was used for placement of dredge spoil material. The Site 3 disposal area was originally a mudflat where refuse was dumped, burned, and the ash was used to reclaim the low-lying area. Refuse disposal operations began in 1940 and continued until 1970, before the implementation of the Resource Conservation and Recovery Act (RCRA). Burned refuse was extinguished daily using water from a fire hose. Salvageable materials were removed from the site daily, and every 2 weeks the site was bulldozed for compaction and leveling.

Refuse dumped at Site 3 reportedly included solvents, acids, bases, and mixed municipal waste. The total volume of waste disposed of was estimated to be approximately 750,000 cubic feet (27,800 cubic yards) before burning. Two pits at Site 3 were reportedly used for the disposal of oil and oily sludge and for periodic burning. The disposal pits were located along the north side of the access road that diagonally crosses the site. After 1970, the area was graded level and covered with grass.

Findings of a waste delineation investigation and interviews with former SJCA employees, conducted in 2001, revealed that the extent of waste at Site 3 was smaller than reported (note: descriptions of investigations and documentation of these findings are discussed in Section 2.2). The waste found was confined along the gravel road transecting the site and the majority of debris was located on the north side of the gravel road.

2.2 Investigation History

The following subsections provide summaries of the previous investigations conducted at Site 3. No enforcement activities have been recorded to date at Site 3.

Initial Assessment Study (NACIP, 1981)

An Initial Assessment Study (IAS) was conducted at SJCA to qualitatively identify and assess sites that posed a potential threat to human health or the environment as a result of contamination from past handling of (and operations involving) hazardous materials. The

IAS determined that Dump C (Site 3), did not pose a threat to human health and the environment, and no confirmation study was recommended.

Preliminary Assessment (NUS Corp., 1983)

During the Preliminary Assessment (PA) conducted at SJCA, air samples were monitored for volatile organics and radiation. No readings above background were encountered at Site 3.

Phase II RCRA Facility Assessment (A.T. Kearney, Inc., 1989)

A RCRA Facility Assessment (RFA) was completed to identify Solid Waste Management Units (SWMUs) and other Areas of Concern (AOCs) at SJCA and to evaluate their potential for releases of hazardous wastes or constituents to the environment. The RFA included a preliminary review of all available relevant documents and a visual site inspection of 34 SWMUs and AOCs, including Dump C (Site 3). Dump C (Site 3) was recommended for a RCRA Facility Investigation (RFI) due to the high potential for releases to site media (soil, groundwater, and surface water).

Relative Risk Ranking System Data Collection Report (CH2M HILL, 1996)

A Relative Risk Ranking (RRR) System Data Collection Report was prepared to gather data for the Navy to perform assessments of the sites at SJCA in order to rank and prioritize them based on level of risk. The report contained results from sampling at 21 sites, including Site 3, where data had not been previously available.

Two surface soil and three groundwater samples were collected from Site 3. Several pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) were detected in the surface soil samples. Explosives, semivolatile organic compounds (SVOCs), and inorganics were detected in the groundwater samples. The analytical results were not validated.

Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (CH2M HILL, 1997 through 2003)

A Remedial Investigation/Human Health Risk Assessment/Ecological Risk Assessment (RI/HHRA/ERA) Report was finalized in March 2003 to define the nature and extent of soil, groundwater, sediment, and surface water contamination; to evaluate the geologic and hydrogeologic systems at the site to further understand contaminant distribution and potential migration pathways; and to determine if Site 3 poses unacceptable risks to human health and the environment.

Waste debris and burnt/stained soils were visually identified within 30 inches of the ground surface at Site 3. In soils, elevated chemical concentrations (primarily inorganics, PAHs, and dioxins), reflective of potential impacts from Site 3 activities, were identified within the waste area and site drainages. One surface soil hot spot (SS15) was present outside the limits of waste.

Potential human health risk drivers for soil (surface and subsurface soil combined) were arsenic and iron. Dioxins were detected in several subsurface soil samples collected from within the waste but no unacceptable human health risks were identified. The ecological risk

drivers found in surface soil above background upper tolerance limits (UTLs) were the inorganics antimony, chromium, copper, iron, lead, vanadium, and zinc; several pesticides; and PAHs. The PAHs and pesticides were identified as risk drivers based on only one elevated location within the waste area. Primary fate and contaminant migration pathways at Site 3 include surface runoff and erosion of soil to the drainage ditches and infiltration and leaching of precipitation through the vadose zone from soil to the groundwater system.

No human health risk drivers were identified for the shallow (Columbia Aquifer) groundwater and risks identified in the deep (Yorktown Aquifer) groundwater were determined to be acceptable (see Section 2.7 for greater detail).

The upland drainage ditches constructed near the site to control runoff are comprised of the same soil type as the site soils (dredge fill), remain dry through the majority of the year, are vegetated with grass, and contain no viable ecological habitat. Therefore, background UTLs established for dredge fill soils were used to identify site-related releases. The inorganics antimony, arsenic, and iron were identified as human health risk drivers and several inorganics and pesticides were identified as ecological risk drivers in upland drainage ditch sediment/soil. Because surface water is transient at Site 3 and the upland drainage ditches provide minimal ecological habitat, there were no significant risks to the environment identified from direct exposure to surface water.

Further evaluation of the potential for adverse effects to aquatic life in Blows Creek sediment was recommended based on the chemical concentrations of inorganics and pesticides in upland drainage ditch sediment/soil. A separate Baseline Ecological Risk Assessment (BERA) for Blows Creek is currently being conducted to identify potential risk associated with possible historical contributions to Blows Creek from upland Navy IRP sites, including Site 3.

The RI/HHRA/ERA recommended a removal action for Site 3, including waste, soil, and upland drainage ditch sediment/soil, to mitigate risks and eliminate concern for continued transport of potential contaminants to Blows Creek via the site-related drainage ditches.

Engineering Evaluation/Cost Analysis and Action Memorandum (CH2M HILL, 2002)

Based on the findings of the RI/HHRA/ERA, an Engineering Evaluation/Cost Analysis (EE/CA) was conducted to identify and analyze remedies or removal actions to mitigate potential risk at Site 3. Three alternatives were identified, evaluated, and ranked. Based on a comparative analyses of the alternatives, the selected non-time-critical removal action (NTCRA) involved excavation, disposal characterization (including unexploded ordnance [UXO] oversight), and disposal of waste, soil, and upland drainage ditch sediment/soil from Site 3. The volume of the material and soil to be removed was estimated to be 9,204 cubic yards and confirmatory samples were to be collected from the remaining soils at the sides and bottom of the excavated areas to verify that cleanup goals were met.

As required by Section 300.415(n) of the NCP, a public notice of availability of the Draft EE/CA was issued on April 26, 2002 and was made available to the public for comment from May 1 to May 30, 2002. No comments were received from the public during the comment period. Therefore, the Navy signed an Action Memorandum on August 5, 2002 to implement the NTCRA as specified in the EE/CA.

Removal Actions (OHM/SHAW, 2002 and AGVIQ-CH2M HILL Joint Venture I, 2004)

The NTCRA activities at Site 3 were conducted in two phases. Phase I was conducted by the Navy's Remedial Action Construction (RAC) Contractor OHM/SHAW from August 2002 through September 2002. CH2M HILL performed confirmatory sampling and provided guidance on the extent of the Phase I removal. During Phase I, approximately 3,300 cubic yards of waste and soil were removed from the northern portion of Site 3. The limits of excavation (Figure 2-3) were determined based on achieving soil field screening results below background UTLs for dredge fill soil followed by off-site laboratory confirmation analyses.

In February 2003, CH2M HILL conducted a waste delineation investigation to delineate the remaining waste, soil, and upland drainage ditch sediment/soil requiring excavation at Site 3 by obtaining confirmation samples. Subsequently, the Phase II removal was conducted by AGVIQ-CH2M HILL Joint Venture I (JV I) from October 2003 through March 2004. Approximately 9,497 cubic yards of waste, soil, and upland drainage ditch sediment/soil were removed based on the confirmatory sample results. Only ornamental shells were found during the removal, no live ordnance was encountered.

The Confirmation Closeout Report, completed in August 2004, summarizes the confirmation sample results from the NTCRAs conducted at Site 3. The confirmation sample results show that the average concentrations for all compounds of potential concern were below background UTLs for dredge fill soil, and the central-tendency population-to-population comparisons indicated no statistical difference between site and background data. Therefore, the potential risk to human and ecological receptors posed by Site 3 has been mitigated by the removal actions conducted. Based upon the complete removal of waste, soil (including the area of the former disposal pits), and upland drainage ditch sediment/soil that posed a potential risk at Site 3, the SJCA Project Management Team (Navy, EPA, VDEQ) reached consensus for closure and no further action for Site 3.

2.3 Community Participation

The SJCA Restoration Advisory Board (RAB) was formed in 1999. RAB meetings are routinely held to provide an information exchange among community members, the EPA, the Commonwealth of Virginia, and the Navy. These meetings are open to the public to provide opportunity for public comment and input on all remedies considered and the assumptions used, including the assumptions about reasonably anticipated future land use and potential beneficial uses of groundwater. A community relations program is also being conducted through the IRP process and public input is considered a key element in the decision-making process.

In accordance with Sections 113 and 117 of CERCLA, the Navy provided a public comment period from November 13 through December 27, 2004, for the Proposed Remedial Action Plan (PRAP) for Site 3. A public meeting to present the PRAP for Site 3 was held on December 7, 2004, at the Major Hillard Library. Public notice of the meeting and availability of documents was placed in *The Virginian Pilot* newspaper on November 5, 2004.

The PRAP and previous investigation reports for Site 3 are available to the public in the Administrative Record and the information repository maintained at:

Major Hillard Library
824 Old George Washington Hwy. N
Chesapeake, Virginia 23323
(757) 382-3600

2.4 Scope and Role of Response Actions

Site 3 is one of several IRP sites being addressed under CERCLA at SJCA. Site 3 does not include or directly impact any other sites at SJCA. The Navy is the lead agency and provides funding for site cleanups at SJCA. EPA is the lead regulatory agency and VDEQ is the support regulatory agency. A Federal Facilities Agreement (FFA) was negotiated between the Navy, the EPA, and the VDEQ in July 2004. Under the FFA, all past and future work at IRP sites were reviewed and a course of action for future work at each site was developed. As required by the FFA, a list of all IRP sites and the schedule for future remedial actions at SJCA can be found in the current version of the SMP, which is located in the Administrative Record.

2.5 Site Characteristics

Site 3 covers an estimated 2.1 acres and is an open grass-covered area east of Cradock Street in the facility's northern portion (Figure 2-3). The site's topography is relatively flat with a land surface elevation of approximately 10 to 15 feet above mean sea level. The site is bordered to the north by the Norfolk and Western Railroad, to the south by IRP Site 4 (Landfill D), to the west by IRP Site 5 (Burning Grounds), and to the east by a former industrial waste pond. Buildings 458 and 1459, located east of the site, are the radar tower and control building used during radar testing operations.

Along the north, east, and west sides of Site 3, drainage ditches divert stormwater from the site southward to Blows Creek. Groundwater at the site ranges seasonally between 2 and 8 feet below ground surface and flows toward nearby surficial water bodies (i.e., Blows Creek to the south and the Southern Branch of the Elizabeth River to the southeast).

There are no surface or subsurface features (i.e., tanks, structures) or areas of archaeological or historical importance at Site 3.

Waste, soil, and upland drainage sediment/soil were removed from Site 3 from 2002 through 2004 and replaced with clean fill to mitigate the potential human health and ecological risks identified in previous investigations. Therefore, the details of the conceptual site model, sampling strategy, and chemicals of concern (COCs) are not relevant and are not included in this ROD.

2.6 Current and Potential Future Site and Resource Uses

Site 3 is occasionally used as part the base's radar testing operations. The grass is regularly mowed and the adjacent patrol road is accessible and occasionally utilized as an exercise path by base personnel. There is currently no planned future land use at Site 3 and the surrounding area, but industrial or commercial use is anticipated. Future residential

development of the site is unlikely; however, residential scenarios were evaluated in the Site 3 baseline HHRA to be conservative.

Groundwater from beneath Site 3 or downgradient of Site 3 is not currently used. The City of Chesapeake supplies water to SJCA and surrounding communities. Private deep wells (Yorktown Aquifer) exist locally, at least 1.5 miles upgradient of SJCA within the cities of Chesapeake and Portsmouth, that are permitted for irrigation only. Although the deep groundwater is not used as a potable water supply in the vicinity, if the site is developed for future residential use, it is possible that deep groundwater could be used as a potable water supply.

There are no surface water bodies within the boundaries of Site 3. However, the Southern Branch of the Elizabeth River is located to the southeast and Blows Creek is located to the south of Site 3. The nearby surface water is not used for swimming as it is shallow and the base is secured; however, future trespassers may potentially wade in these areas and contact both surface water and sediment.

2.7 Summary of Site Risks

A detailed discussion of risk identified at Site 3 prior to the NTCRAs can be found in the RI/HHRA/ERA (CH2M HILL, March 2003) and, subsequent to the NTCRAs, in the Confirmation Closeout Report (CH2M HILL, August 2004). The following subsections summarize the human health and ecological risks identified, including results from the NTCRAs and risk management decisions, by media at Site 3.

2.7.1 Soil and Upland Drainage Sediment/Soil

Based on the risks identified in the RI/HHRA/ERA from exposure to inorganics, PAHs, and pesticides in soil and upland drainage sediment/soil, the final removal area included the waste area, the area surrounding sample locations where human health and ecological risk drivers were identified, an isolated soil hotspot, and the upland drainage ditch sediment/soil. Confirmation samples collected as part of the removal actions at Site 3 show that, with the exception of isolated locations, the removal activities reduced average site concentrations to below cleanup levels (background UTLs for dredge fill soil) in soil and upland drainage sediment/soil. Additionally, the central-tendency population-to-population comparisons indicated no statistical difference between site and background data. Therefore, the potential human health and ecological risk posed by Site 3 has been mitigated by the NTCRAs and no remedial action is necessary to ensure protection of human health and the environment.

2.7.2 Shallow Groundwater

Individual bis(2-ethylhexyl)phthalate and thallium concentrations exceeded the Maximum Contaminant Level (MCL) in shallow groundwater. However, bis(2-ethylhexyl)phthalate is a known potential lab contaminant that likely reflects artifacts of the analytical process, was only detected above the MCL in 1997 at one monitoring well, and was not detected in the subsequent monitoring events; and thallium was only detected at one monitoring well at a concentration below the background UTL and was not detected in the duplicate sample. Based on the discussion above, the shallow groundwater meets the MCLs in the latest round

of sampling collected from Site 3 in 1999. It was determined that previous MCL exceedances in shallow groundwater were anomalous and inaccurate. Therefore, the SJCA Project Management Team (Navy, EPA, VDEQ) determined that no further investigation of Site 3 shallow groundwater was warranted.

Human health risks were evaluated for a construction worker scenario based on dermal contact and incidental ingestion only, and the results were below EPA's acceptable risk ranges (1×10^{-4} to 1×10^{-6} for carcinogens and Hazard Index of 1 for noncarcinogens). Potential ecological risks from shallow groundwater discharge to the adjacent site drainages were estimated indirectly through the evaluation of surface water and sediment. Although potential COCs were identified in shallow groundwater, elevated concentrations of these chemicals were also detected in site soils. Based on the proximity of soil and the drainages to one another, it is likely that surface soils represent the primary source of chemicals to the site drainages and this pathway was mitigated by the removal of waste, soil, and upland drainage sediment/soil at Site 3. Thus, groundwater does not appear to be a significant transport route from the site to the drainages.

2.7.3 Deep Groundwater

In the area of SJCA, the deep groundwater is not used as a potable water supply. Although future residential development of the site is improbable, deep groundwater was evaluated under the future residential scenario. Potential noncarcinogenic hazards (based on ingestion of arsenic, manganese, and thallium) and carcinogenic hazards (based on contact with arsenic) were identified to current and future adult and child residents who use the deep groundwater beneath Site 3 as a potable water supply. However, the estimated arsenic concentration was below the MCL, manganese concentrations were low and below the tap water risk-based concentration (RBC), and thallium was only detected in a 1997 sample collected from the upgradient monitoring well at an estimated concentration only slightly above the MCL and was not detected in the subsequent monitoring events.

Based on the discussion above, the deep groundwater meets the MCLs in the latest round of sampling, collected in 1999. Therefore, the SJCA Project Management Team (Navy, EPA, VDEQ) determined the deep groundwater risks identified at Site 3 to be acceptable for all pathways and receptors.

2.7.4 Upland Drainage Surface Water

There were no human health or ecological risks identified from exposure to surface water.

2.8 Documentation of Significant Changes

The PRAP for Site 3 identified NFA as the preferred alternative. No members of the public attended the public meeting for the Site 3 PRAP and no comments were received during the public comment period. Therefore, no significant changes were made to the preferred remedial action alternative identified in the PRAP.

SECTION 3

Responsiveness Summary

The participants in the Public Meeting, held on December 7, 2004, included representatives of the Navy and EPA. No members of the public attended the public meeting for the Site 3 PRAP and no comments were received during the public comment period.

SECTION 4

References

A.T. Kearney, Inc, March 1989. *Phase II RCRA Facility Assessment of the St. Juliens Creek Annex Facility*. Chesapeake, Virginia.

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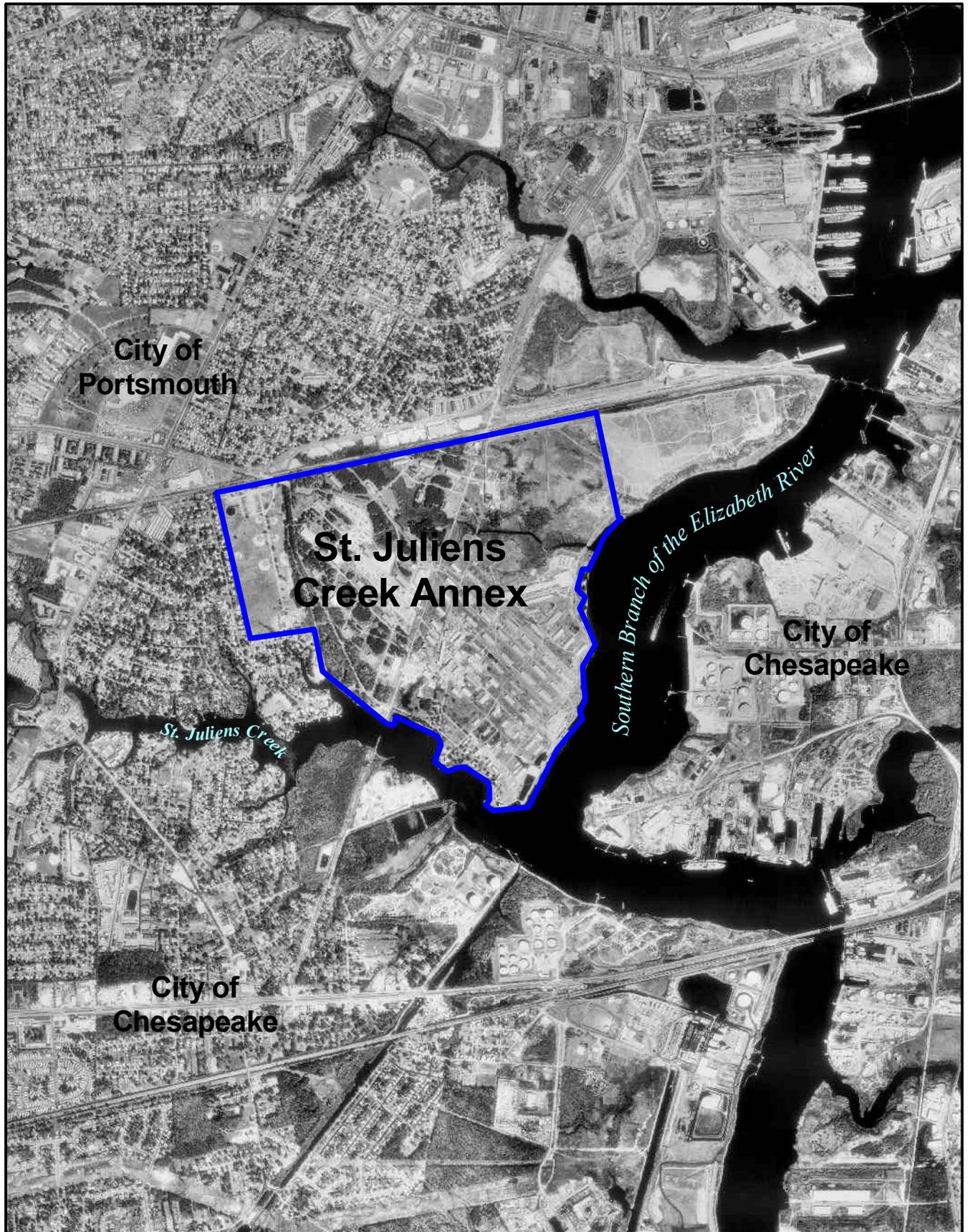
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EPA, July 1999. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*. USEPA 540-R-98-031, OSWER 9200.1-23P, PB98-963241.

Navy Engineering and Environmental Support Activity, August 1981. *Navy Assessment and Control of Installation Pollutants: Initial Assessment Study of St. Juliens Creek Annex*. Norfolk Naval Shipyard. Portsmouth, Virginia.

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LEGEND

 St. Juliens Creek Annex



0 1000 2000 3000 Feet



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



LEGEND

-  Site Boundaries
-  Activity Boundary
-  Railroad
-  Former Industrial Waste Pond

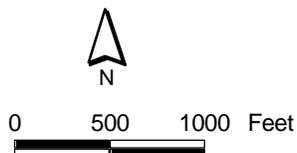
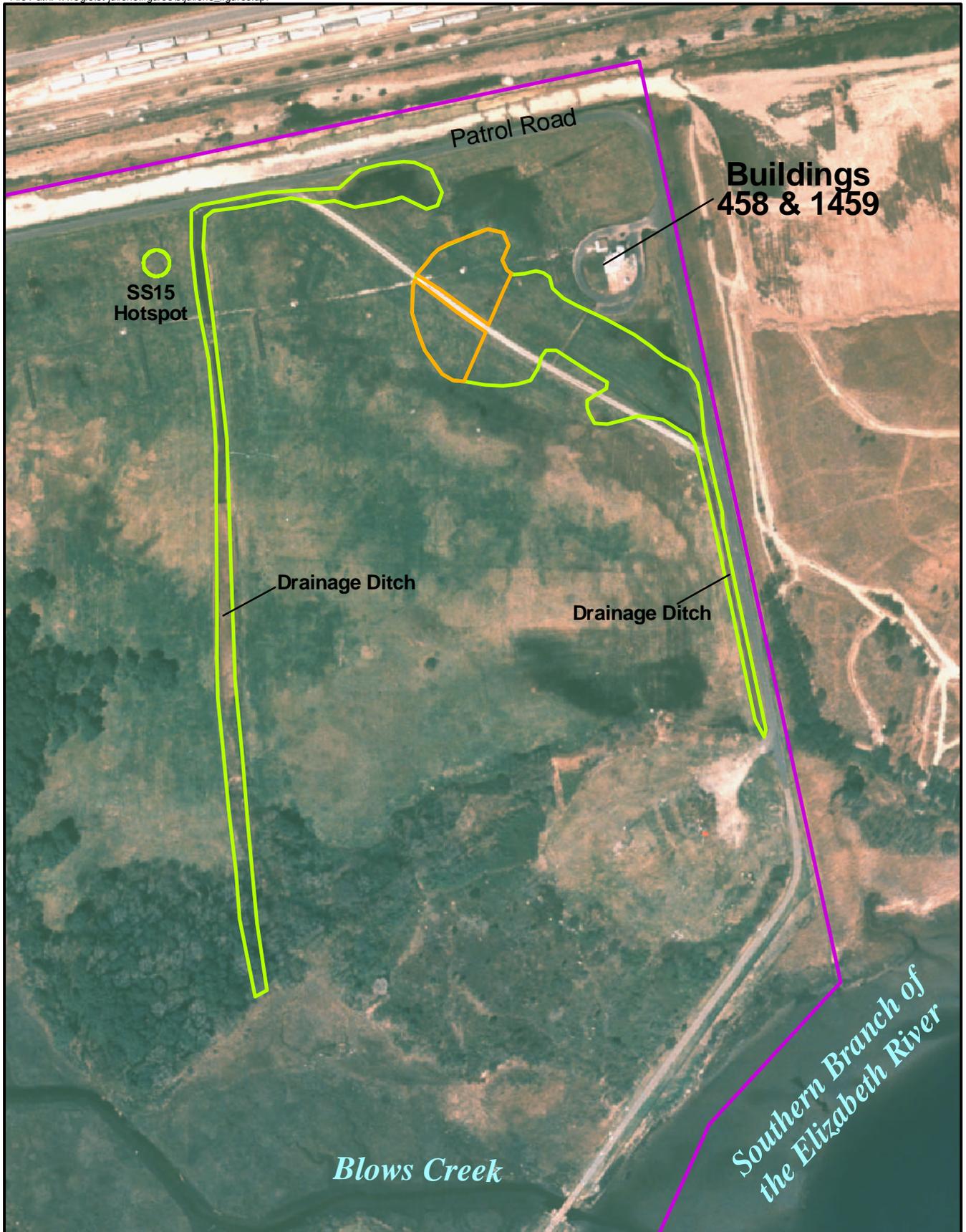


Figure 2-2
Location of Site 3
St. Juliens Creek Annex
Chesapeake, Virginia



LEGEND

-  Extent of Phase I Removal (2002)
-  Extent of Phase II Removal (2003)
-  Activity Boundary

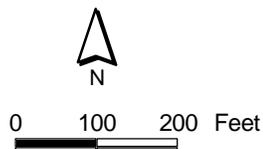


Figure 2-3
Extent of Site 3 Removal
St. Juliens Creek Annex
Chesapeake, Virginia