



## Introduction

### Mission

St. Juliens Creek Annex (SJCA) began operations as a naval facility in 1849. The annex was one of the largest ammunition depots in the United States involving wartime transfer of ammunitions to various other naval facilities. Specific ordnance operations and processes conducted at SJCA included stockpiling explosives for use in projectiles, manufacturing mines, assembling small caliber guns and ammunition, storing torpedoes, filling shells, and testing ordnance. In 1975, all ordnance operations were transferred to the Yorktown Naval Weapons Station. SJCA has also provided non-ordnance services, including degreasing; operation of paint shops, machine shops, vehicle and locomotive maintenance shops, pest control shops, battery shops, print shops, electrical shops, boiler plants, wash racks, and potable water and salt water fire-protection systems; fire-fighter training; and storage of oil and chemicals.

The current primary mission of SJCA is to provide a radar-testing range and administrative and warehousing facilities for nearby Norfolk Naval Shipyard and other local naval activities. SJCA also provides light industrial shops and storage facilities for several tenant commands; including Defense Reutilization and Marketing Office storage; Space and Naval Warfare Systems Command; Fleet and Industrial Supply Center, Norfolk Integrated Logistics Support; and a cryogenics school. Over 700 personnel, including 5 military officers, 30 military enlisted (plus 26 students), 407 civil servants, and 308 contractors work within SJCA to support its mission.

### Size and Environmental Setting

SJCA occupies approximately 490 acres, including 407 acres of land, 14 acres of marsh, and 69 acres of surface water.

### Geographical Setting

SJCA is in the Atlantic Coastal Plain within the Tidewater Region of southeast Virginia (Figure 1). The Southern Branch of the Elizabeth River and St. Juliens Creek, which are part of a tidal estuary system in the Chesapeake Bay watershed, define the eastern and southern boundaries of SJCA, respectively. Blows Creek flows through the center of SJCA and drains into the Southern Branch of the Elizabeth River.

### Political Setting

SJCA is in the 4th congressional district of Virginia. The facility is within the independent City of Chesapeake and is bounded on the north by the City of Portsmouth.

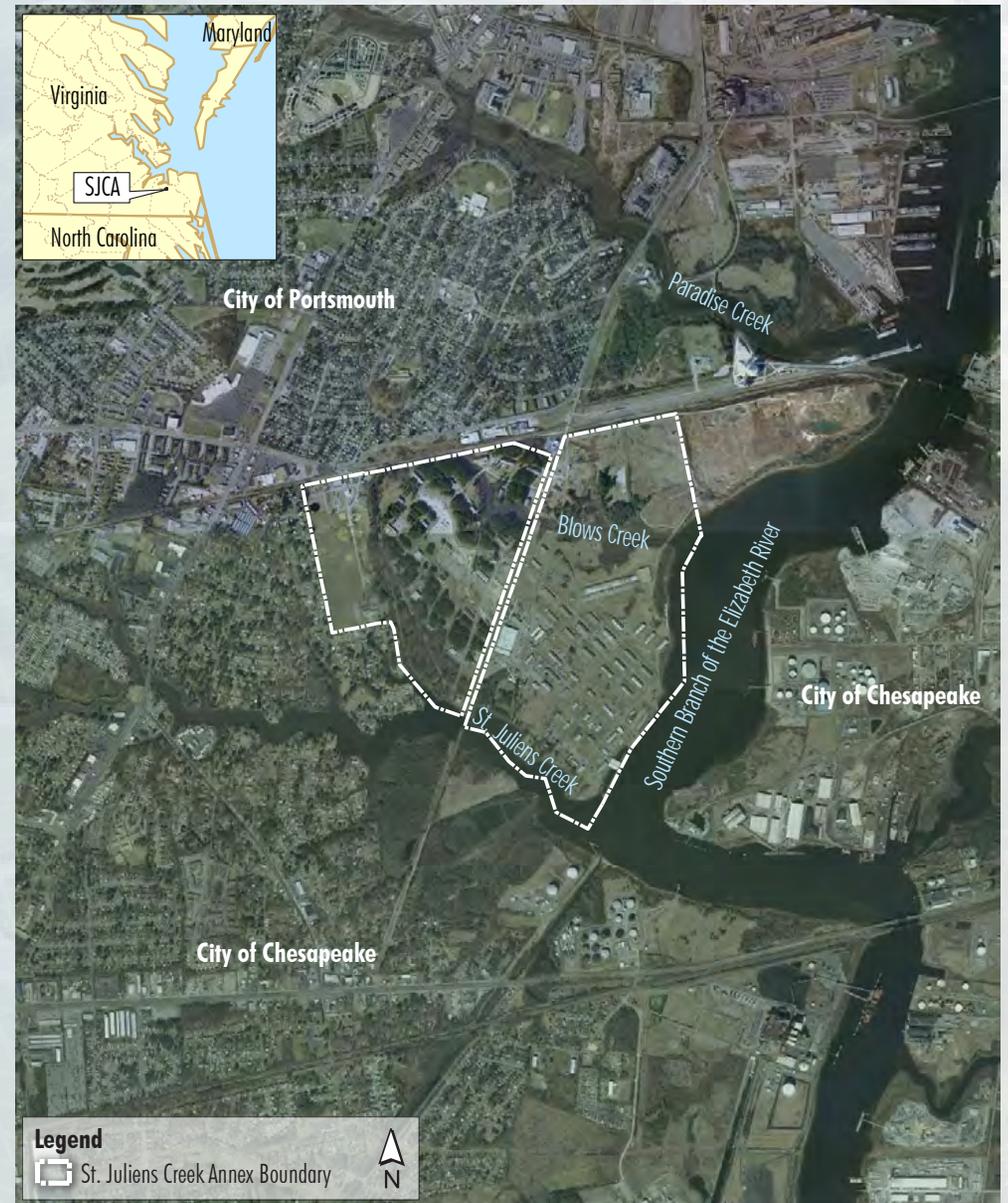


Figure 1 – St. Juliens Creek Annex Location

### Economic Setting

The City of Chesapeake is one of the largest 100 cities in the country. The unemployment rate has traditionally been below the national average. The largest portion of the workforce is employed in education/welfare, professional business services, and retail industries. Approximately 5 percent of the workforce is employed by the government.

### Community Setting

The land use immediately surrounding SJCA is primarily residential, with smaller areas of commercial, industrial, and public use. The Southern Branch of the Elizabeth River is home to a number of industries that use the water body for shipping. Both the Southern Branch of the Elizabeth River and St. Juliens Creek are used for boating and recreational fishing.

### Background

#### Program Summary

SJCA was added to the National Priorities List (NPL) in July 2000 as a result of former operations conducted at the base that resulted in environmental impacts. Fifty-nine potentially contaminated Installation Restoration (IR) and Munitions Response (MR) sites, solid waste management units (SWMUs), and areas of concern (AOCs) have been identified for evaluation based on the previous assessments and investigations (Figure 2). Four IR sites (Sites 2, 4, 5, and 21) and one MR site (Area UXO 1) are currently active in the Environmental Restoration (ER) Program. Fifty-four sites, SWMUs, and AOCs have been determined to require no further action under the ER Program following desktop audits, site inspections, and/or removal actions.

#### Challenges

The key challenge for the SJCA ER Program during this achievement period was development of closeout strategies for the remaining sites, which are the most complex because of the type and concentrations of contaminants, contaminated media, and physical site characteristics.

#### Organization, Staffing, and Management Approach

Following inclusion of SJCA on the NPL, the ER Program Partnering Team (Team) was chartered to streamline closure of ER sites by using consensus-based site management strategies following the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. The Team consists of representatives from Navy Facilities Engineering Command (NAVFAC), United States Environmental Protection Agency (USEPA), Virginia Department of Environmental Quality (VDEQ), and NAVFAC's contractor, CH2M HILL. The Team is supported by technical, contracting, and legal professionals and NAVFAC's Remedial Action (RA) contractors, Shaw Environmental Inc. and AGVIQ-CH2M HILL Joint Venture.



Figure 2 – Locations of ERP Sites, SWMUs, and AOCs



### Community Involvement Programs

A Restoration Advisory Board (RAB) was established for the SJCA ER Program in 1999 to educate the community about ER activities at SJCA and encourage community involvement in the decision-making process. The SJCA RAB is co-chaired by a NAVFAC representative and a community member. The RAB meets twice a year to keep the RAB members informed of ongoing activities. Members are notified of upcoming meetings by email and mail, and the meetings are advertised in the local newspaper.

### Agreements, Plans, and Associated Documents

The SJCA ER Program has multiple agreements and plans to guide management of the CERCLA program. Below is a list of key agreements and plans.

Agreement/Plan	Purpose	Date of Latest Version
Federal Facility Agreement	Establish how NAVFAC, USEPA, and VDEQ will work together to achieve cleanup at SJCA	July 2004
Community Involvement Plan	Establish how NAVFAC will provide for community involvement in the decision-making process for ER sites at SJCA	February 2010
Five-Year Review	Evaluate the implementation and performance of remedies to determine whether they remain protective of human health and the environment	May 2010
Site Management Plan	Present the planned activities for the next 5 fiscal years, and project long-term progress at the facility	August 2012

The following milestone documents were completed during the achievement period to address human health or environmental risks.

Action Document	Number Completed During Achievement Period
Land Use Control Remedial Design	2
Remedial Action Remedial Design	1
Record of Decision	2
Remedial or Removal Action Work Plan	3
Construction Completion Report	2

### Initiatives

The key initiatives for the SJCA ER Program during this achievement period were to:

- Plan and implement actions to address remaining human health and environmental risks at IR sites
- Conduct an Expanded Site Inspection (ESI) to gain additional information for the MR Program site to initiate site closeout without advancing to a Remedial Investigation
- Increase community involvement
- Include evaluation of green remediation approaches

### Summary of Accomplishments

#### Accelerated Environmental Cleanup

Initiated the RA for IR Site 2 in May 2012: After identification of a data gap requiring additional investigation, the Remedial Design (RD) was split into two phases based on remedy sequence and schedule. This allowed for initiation of RA-Construction approximately 1 year earlier than if the RD had been kept as one deliverable.

Completed the non-time-critical removal action (NTCRA) at IR Site 5: The NTCRA at IR Site 5, initiated in 2007 but delayed due to encounters of munitions and explosives of concern, was completed in August 2012 and addressed the remaining site risks (see Reducing Risks to Human Health and the Environment). Development of a no-further-action Proposed Plan and Record of Decision has been initiated and site closeout is scheduled for 2013.

Achieved Remedy in Place for IR Site 21 in February 2012: Achievement of this milestone was possible due to selection of an interim remedy for shallow groundwater and initiation of the RA prior to completing evaluation of vapor intrusion at the site. Streamlining the ER process accelerated cleanup at the site by over a year and resulted in a significant reduction in chlorinated volatile organic compound concentrations in groundwater (see Reducing Risk to Human Health and the Environment). The vapor intrusion investigation and evaluation was completed during remedy implementation, and no additional RA was required, which made the interim remedy the final remedy.

#### Innovative Technology Demonstration/Validation and Implementation

Underwater MR site investigation: MR Area UXO 1 comprises current and former wharf areas along the shoreline of the Southern Branch of the Elizabeth River. A Site Inspection (SI), including a geophysical investigation, conducted in 2010 identified metallic debris within the sediment of both wharf areas. The presence of metallic debris indicated that munitions could potentially be present within the site; therefore, an ESI was scoped to visually inspect metallic debris from select locations. A common practice is to use a clam shell dredge to recover material from the river bottom; however, this approach would result in a significant disturbance of the river bed and generation of large quantities of investigation-derived waste (IDW). Use of an innovative approach, electromagnetic recovery to recover only metallic debris, minimized environmental impacts, resulted in cost savings associated



Area UXO 1 Expanded SI Activities

with a shortened field schedule, and reduced IDW generation compared with standard approaches (see Green Remediation). The investigation approach was incorporated into a presentation for a Navy environmental conference in September 2012, and lessons learned are being applied to investigation planning at similar underwater sites.

RA-Operation Explosive Gas Monitoring: A component of the IR Site 21 RA (enhanced reductive dechlorination) can generate explosive gases as temporary byproducts of the remediation process, presenting a potential safety hazard for the active industrial area at the site. The acute nature of the hazard of explosive gases required a different monitoring strategy than what had been developed for the potential inhalation risk of the site contaminants of concern. The approach to monitor the potential explosive hazard, which included evaluation of both occupied and unoccupied buildings and collection of real-time gas measurements, was developed and is now being used as an example at other Navy sites.

Partnerships Addressing Environmental Restoration Issues between DoD and other Entities

**SJCA ER Program Partnering Team Mission Statement**

Using principles of partnering and the CERCLA process, the St. Juliens Creek Annex Team shall seek to protect human health and the environment. The sites will be addressed, and ultimately de-listed, through innovative, streamlined, consensus-based strategies in a cost-effective, proactive manner.

St. Js Rocks!

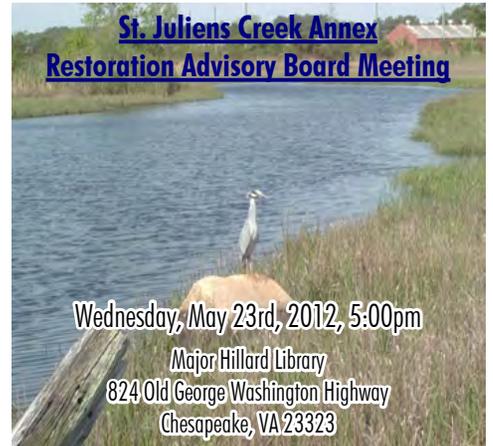
NAVFAC partners with USEPA and VDEQ to form the SJCA ER Program Partnering Team. The Team developed guidelines for implementing the SJCA ER Program during chartering, and meets approximately every 2 months to set schedules with interim milestones and develop site strategies using consensus-based decision-making.

NAVFAC has continued to involve the community in the SJCA ER Program. The community co-chair has been involved with the RAB since it began in 1999. NAVFAC initiated actions to increase awareness and interest in the RAB, including sending fact sheets about the SJCA ER Program to neighboring civic leagues and staffing an informational booth at a community festival. Presumably as a result of NAVFAC's actions, the average meeting attendance during this accomplishment period was more than twice what it was during the previous 2 years. Attendees included members of the community, representatives of the Cities of Chesapeake and Portsmouth, a Virginia senator, and representatives of the Elizabeth River Project and Portsmouth Public Works Department. In addition to community involvement in RAB meetings, the SJCA ER Program has interacted with the community through an SJCA ER Program public website, an information repository housed at a local library, a Community Involvement Plan, public document presentation meetings, and site tours. NAVFAC has received positive feedback during recent RAB meetings about the community participation process and environmental cleanup progress.



**NAVFAC Mid-Atlantic  
 Cordially Invites You to Our**

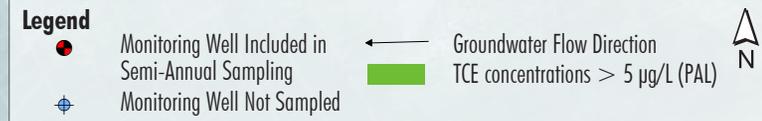
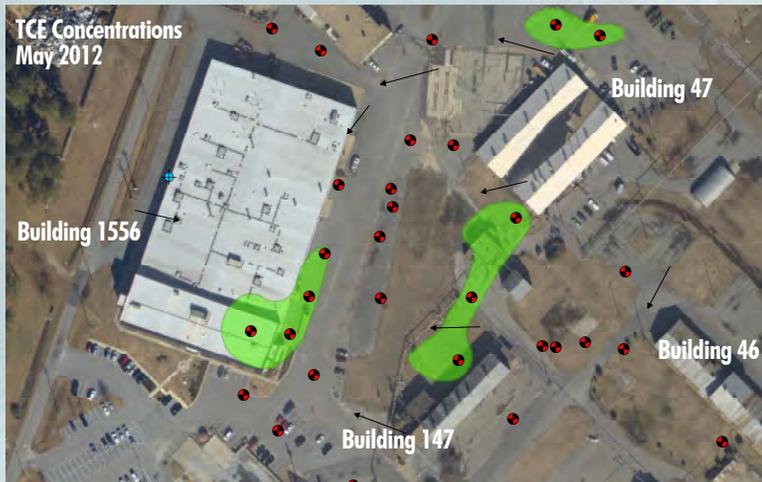
**St. Juliens Creek Annex  
 Restoration Advisory Board Meeting**



Wednesday, May 23rd, 2012, 5:00pm  
 Major Hillard Library  
 824 Old George Washington Highway  
 Chesapeake, VA 23323

The SJCA Restoration Advisory Board (RAB) was formed in 1999 and consists of community members and representatives of the Navy, Virginia Department of Environmental Quality (VDEQ), and United States Environmental Protection Agency (USEPA). RAB meetings are held semiannually and are open to the public to provide an opportunity for comment and input on the Environmental Restoration Program (ERP). Please join us and provide public input on the current environmental cleanup activities for SJCA.

Please R.S.V.P. by May 11 to  
 Walt Bell, NAVFAC Remedial Project Manager, at 757-445-6638



### Reducing Risk to Human Health and the Environment

IR Site 21 Groundwater Contaminants: The RA-Construction phase at Site 21 was conducted from November 2010 through September 2011, and RA-Operation phase groundwater monitoring results indicate significant contaminant reduction. Concentrations of the primary site contaminant, trichloroethene, are now below the cleanup goal at 21 of the 30 monitoring wells (Figure 3). Concentrations of all contaminants of concern are below the cleanup goals at 10 of the 30 monitoring wells.

IR Site 5 Waste and Impacted Soil: A NTCRA was completed at IR Site 5 in July 2012 to address potential risks to human health and the environment from exposure to waste and impacted soil. The following items were removed for disposal or destruction:

- Approximately 32,960 tons of soil and cultural debris
- Approximately 13 tons of munitions debris



Site 5 Removal Action Activities

Figure 3 – Reduction in TCE concentrations in Site 21 Groundwater

- Approximately 5,200 pounds of asbestos-containing material
- Approximately 45 tons of scrap metal
- Eight munitions and explosives of concern/material potentially presenting an explosion hazard

As a result of the NTCRA, no further action is proposed for Site 5, and 23 acres will be returned to the facility for use without land restrictions following signature of the no-further-action Record of Decision, which is currently being developed.

### Green Remediation

IR Site 2 RA Life-cycle Assessment: The selected RA includes soil cover installation, which will eliminate a tidal wetland in the center of the site, creation of a mitigation wetland at former IR Site 19 to offset the loss of the Site 2 wetland, and creation of an enhanced extended detention basin (EEDB) to offset loss of the drainage capacity through the wetland. A life-cycle assessment was conducted using SimaPro to compare the environmental footprints of options for the IR Site 2 cover component of the RD. The results indicated that use of onsite borrow materials and building foundation as fill material would be optimal as it would reduce environmental burdens that would have been introduced from importing all of the fill material from offsite and transporting the building foundation material offsite for disposal. Opportunities to reuse and recycle site materials have been identified during the RA. During preparation of the site for installation of the soil cover, excavation for the EEDB creation, and excavation for the mitigation wetland, the following materials have been recycled or reused:

- 480 yd<sup>3</sup> of timber (recycled offsite)
- 16 tons of metal (recycled)
- 3 transformers (collected for onsite re-use)
- 14,500 yd<sup>3</sup> of fill material (stockpiled for reuse in the soil cover at IR Site 2)



Site 2 Remedial Action Activities

- 950 yd<sup>3</sup> of topsoil (stockpiled for reuse at the EEDB)
- 925 yd<sup>3</sup> of concrete debris (stockpiled for reuse as subgrade at IR Site 2)
- 1,875 yd<sup>3</sup> of wood chips (stockpiled for reuse at IR Site 2 and the mitigation wetland)

IR Site 21 RA Life-cycle Assessment: SiteWise™ was used during the RA-Construction phase to confirm that a proposed emulsified vegetable oil reformulation would be an appropriate change given NAVFAC's sustainability policy.

MR Area UXO 1 SI Innovative Approach: Use of an electromagnet instead of a clam shell dredge to recover magnetic debris significantly reduced environmental impacts and the amount of IDW generated. Use of the electromagnet reduced disturbance of sediment compared with use of a clam shell dredge, resulting in minimal increases in suspended solids in the water column. The approach also resulted in generation of no sediment IDW, compared with an estimated 1,200 cubic yards expected from use of a clam shell dredge for a similar investigation.