



Naval Facilities Engineering Systems Command Mid-Atlantic
Norfolk, Virginia

Final

**Site Management Plan
Fiscal Years 2027–2031**

Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

July 2026



Naval Facilities Engineering Systems Command Mid-Atlantic
Norfolk, Virginia

Final

**Site Management Plan
Fiscal Years 2027–2031**

Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

July 2026

Prepared for NAVFAC Mid-Atlantic
by CH2M HILL, Inc.
Virginia Beach, Virginia
Contract N62470-21-D-0007
CTO N4008522F4497



Contents

Acronyms and Abbreviations.....	ix
1 Introduction.....	1-1
1.1 Purpose of the Site Management Plan.....	1-1
1.2 Format of the Site Management Plan	1-1
1.3 Facility Description	1-2
1.3.1 Facility Location and Physical Description	1-2
1.3.2 Facility History and Mission	1-2
1.3.3 Operations and Process Descriptions	1-3
1.4 Environmental Setting	1-3
1.4.1 Geology and Hydrogeology	1-3
1.4.2 Topography and Surface Water Hydrology	1-4
1.5 Environmental History	1-4
1.5.1 Environmental Restoration Program.....	1-4
1.5.2 Previous Investigations.....	1-5
1.5.3 Site Classifications	1-5
1.5.4 Preliminary Closeout Report	1-6
1.5.5 Team Partnering	1-6
2 Site Descriptions	2-1
2.1 Environmental Restoration Program Sites	2-1
2.1.1 Site 1 (OU1)—Camp Allen Landfill	2-2
2.1.2 Site 2 (OU2)—Naval Magazine Slag Pile	2-9
2.1.3 Site 3 (OU3)—Q-Area Drum Storage Yard	2-12
2.1.4 Site 6 (OU1 for Sediment and OU2 for Soil, Surface Water, and Groundwater)— Construction Debris Landfill	2-15
2.1.5 Site 20 (OU4)—Building LP-20	2-18
2.1.6 Site 22 (OU8)—Camp Allen Salvage Yard	2-22
2.1.7 Site 23 (OU10)—Building LP-20 Plating Shop	2-24
2.1.8 Site 18 (OU14)—Former Naval Magazine Waste Storage Area	2-26
2.1.9 Site 1—Camp Allen Landfill and Site 22 – Camp Allen Salvage Yard (OU15)	2-28
2.1.10 Site 3 (OU16)—Q-Area Drum Storage Yard	2-29
2.1.11 Site 18 (OU18)—Former Naval Magazine Waste Storage Area	2-32
2.1.12 SWMU 14 (OU19)—Q-50 Satellite Accumulation Area	2-34
2.1.13 Site 20 (OU20)—Building LP20	2-36
2.1.14 Site 24 (OU24)—W Area	2-39
2.1.15 Site 25 (OU25)—Building CEP 178 Fire Station and Piers.....	2-41
2.1.16 Site 26 (OU26)—CEP Area	2-43
2.1.17 Site 27 (OU27)—Building KBB Fire Truck Maintenance Shop	2-45
2.1.18 Site 28 (OU28)—LF Hangar Area, Building R43, and Building V49	2-47
2.1.19 Site 29 (OU29)—LP Hangar Area (LP27, LP33, and LP 34)	2-50
2.1.20 Site 30 (OU30)—Runway and Firefighting Training Area	2-52
2.1.21 Site 31 (OU31)—SP Hangar Area	2-54
2.1.22 Site 32 (OU32)—SP Spray Area.....	2-56
2.1.23 Site 33 (OU33)—Building BEN 154	2-57
2.2 Solid Waste Management Units	2-59
2.2.1 Solid Waste Management Unit 14 (OU13)—Q-50 Satellite Accumulation Area.....	2-59
2.2.2 SWMU 8—Firefighting School (OU17).....	2-61
2.3 Contaminants of Emerging Environmental Concern	2-63

2.3.1	Sites with PFAS	2-63
3	References	3-1

Appendixes

A	CERCLA Process Activities
B	Screening, Categorizing, and Prioritizing Sites at Naval Station Norfolk
C	Per- and Polyfluoroalkyl Substances Site Crosswalk Site Inspection to Remedial Investigation

Tables

1-1	Geologic and Hydrogeologic Units Present at NSN and NSA Hampton Roads
1-2	Status Summary of Environmental Restoration Sites
1-3	Status Summary of Solid Waste Management Units
1-4	Additional No Further Action Sites
1-5	Status Summary of Federal Facility Agreement Areas of Concern
1-6	NSN Partnering Team Consensus Statement Summary
2-1	Summary of Relevant Documents and Milestones for Site 1 (OU1)
2-2	Summary of Constituents of Concern at Site 1 (OU1)
2-3	Summary of Relevant Documents and Milestones for Site 2 (OU2)
2-4	Summary of Constituents of Concern at Site 2 (OU2)
2-5	Summary of Relevant Documents and Milestones for Site 3 (OU3)
2-6	Summary of Constituents of Concern at Site 3 (OU3)
2-7	Summary of Relevant Documents and Milestones for Site 6 (OU1 and OU2)
2-8	Summary of Constituents of Concern at Site 6 (OU1 and OU2)
2-9	Summary of Relevant Documents and Milestones for Site 20 (OU4)
2-10	Summary of Constituents of Concern at Site 20 (OU4)
2-11	Summary of Relevant Documents and Milestones for Site 22 (OU8)
2-12	Summary of Constituents of Concern at Site 22 (OU8)
2-13	Summary of Relevant Documents and Milestones for Site 23 (OU10)
2-14	Summary of Constituents of Concern at Site 23 (OU10)
2-15	Summary of Relevant Documents and Milestones for Site 18 (OU14)
2-16	Summary of Constituents of Concern at Site 18 (OU14)
2-17	Summary of Relevant Documents and Milestones for Site 1 and Site 22 (OU15)
2-18	Summary of Constituents of Concern at Site 1 and Site 22 (OU15)
2-19	Summary of Relevant Documents and Milestones for Site 3 (OU16)
2-20	Summary of Constituents of Concern at Site 3 (OU16)
2-21	Summary of Relevant Documents and Milestones for Site 18 (OU18)
2-22	Summary of Constituents of Concern at Site 18 (OU18)
2-23	Summary of Relevant Documents and Milestones for SWMU 14 – Q50 Area (OU19)
2-24	Summary of Constituents of Concern at SWMU 14 (OU19)
2-25	Summary of Relevant Documents and Milestones for Site 20 (OU20)
2-26	Summary of Constituents of Concern at Site 20 (OU20)
2-27	Summary of Relevant Documents and Milestones for Site 24 (OU24)
2-28	Summary of Constituents of Concern at Site 24 (OU24)
2-29	Summary of Relevant Documents and Milestones for Site 25 (OU25)
2-30	Summary of Constituents of Concern at Site 25 (OU25)
2-31	Summary of Relevant Documents and Milestones for Site 26 (OU26)
2-32	Summary of Constituents of Concern at Site 26 (OU26)
2-33	Summary of Relevant Documents and Milestones for Site 27 (OU27)
2-34	Summary of Constituents of Concern at Site 27 (OU27)

2-35	Summary of Relevant Documents and Milestones for Site 28 (OU28)
2-36	Summary of Constituents of Concern at Site 28 (OU28)
2-37	Summary of Relevant Documents and Milestones for Site 29 (OU29)
2-38	Summary of Constituents of Concern at Site 29 (OU29)
2-39	Summary of Relevant Documents and Milestones for Site 30 (OU30)
2-40	Summary of Constituents of Concern at Site 30 (OU30)
2-41	Summary of Relevant Documents and Milestones for Site 31 (OU31)
2-42	Summary of Constituents of Potential Concern at Site 31 (OU31)
2-43	Summary of Relevant Documents and Milestones for Site 32 (OU32)
2-44	Summary of Constituents of Potential Concern at Site 32 (OU32)
2-45	Summary of Relevant Documents and Milestones for Site 33 (OU33)
2-46	Summary of Constituents of Potential Concern at Site 33 (OU33)
2-47	Summary of Relevant Documents and Milestones for SWMU 14 (OU13)
2-48	Summary of Constituents of Concern at SWMU 14 (OU13)
2-49	Summary of Relevant Documents and Milestones for SWMU 8 (OU17)
2-50	Summary of Constituents of Concern at SWMU 8 (OU17)
2-51	Areas Identified as Potential PFAS Release Areas where Regulatory Concurrence Not Achieved

Figures

1-1	Site Locations and Current Clean-up Status
2-1	Site 1 (OU 1 and OU 15) – Camp Allen Landfill
2-2	Site 2 (OU 2) – Naval Magazine Slag Pile
2-3	Site 3 (OU3) – Q-Area Drum Storage Yard
2-4	Site 6 (OU 1 and OU 2) – Construction Debris Landfill
2-5	Site 20 (OU 4) – Building LP-20 Area
2-6	Site 22 (OU 8) – Camp Allen Salvage Yard
2-7	Site 23 (OU 10) – Building LP-20 Plating Shop
2-8	Site 18 (OU 14) – Former Naval Magazine Waste Storage Area
2-9	Site 3 (OU 3 and OU 16) – Q-Area Drum Storage Yard
2-10	Site 18 (OU 18) – Former Naval Magazine Waste Storage Area
2-11	SWMU 14 (OU19) – Q-50 Satellite Accumulation Area
2-12	Site 20 (OU 4 and OU 20) – Building LP-20
2-13	Site 24 (OU 24) – W Area
2-14	Site 25 (OU 25) – Building CEP 178 Fire Station and Piers
2-15	Site 26 (OU 26) – CEP Area
2-16	Site 27 (OU 27) – Building KBB Fire Truck Maintenance Shop
2-17	Site 28 (OU 28) – LF Hangar Area, Building R43, and Building V49
2-18	Site 29 (OU 29) – LP Hangar Area (LP27, LP33, and LP34)
2-19	Site 30 (OU 30) – Runway and Firefighting Training Area
2-20	Site 31 (OU 31) – SP Hangar Area
2-21	Site 32 (OU 32) – SP Spray Area
2-22	Site 33 (OU 33) – Building BEN154
2-23	SWMU 14 (OU13) – Q-50 Satellite Accumulation Area
2-24	SWMU 8 (OU 17) – Firefighting School

Schedules

- 2-1 Basewide Tasks FY 2027-2031 Schedule
- 2-2 Site 1 (OU1) FY 2027-2031 Schedule
- 2-3 Site 2 (OU2) FY 2027-2031 Schedule
- 2-4 Site 3 (OU3) FY 2027-2031 Schedule
- 2-5 Site 20 (OU4) FY 2027-2031 Schedule
- 2-6 Site 1 and Site 22 (OU15) FY 2027-2031 Schedule
- 2-7 Site 3 (OU16) FY 2027-2031 Schedule
- 2-8 Site 18 (OU18) FY 2027-2031 Schedule
- 2-9 SWMU 14 (OU19) FY 2027-2031 Schedule
- 2-10 Site 20 (OU20) FY 2027-2031 Schedule
- 2-11 Site 24 (OU24) FY 2027-2031 Schedule
- 2-12 Site 29 (OU29) FY 2027-2031 Schedule
- 2-13 Site 30 (OU30) FY 2027-2031 Schedule
- 2-14 Site 33 (OU33) FY 2027-2031 Schedule
- 2-15 SWMU 8 (OU17) FY 2027-2031 Schedule

Acronyms and Abbreviations

AFFF	aqueous film-forming foam
AM	Action Memorandum
AOC	area of concern
APU	air-purifying unit
AR	Administrative Record
AS	air sparge
AST	aboveground storage tank
CALF	Camp Allen Landfill
CASY	Camp Allen Salvage Yard
CD	construction debris
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CH2M	CH2M HILL, Inc.
COC	constituent of concern
COPC	chemical of potential concern
CSM	conceptual site model
DCA	dichloroethane
DCE	dichloroethene
DD	Decision Document
DFM	diesel fuel marine
DoD	U.S. Department of Defense
DPT	direct-push technology
DPVE	dual-phase vacuum extraction
EAI	Equilibrium Assessment Investigation
EE/CA	Engineering Evaluation/Cost Analysis
EPA	U.S. Environmental Protection Agency
EPT	Engineered Phytoremediation Technology
ERP	Environmental Restoration Program
FFA	Federal Facility Agreement
FFS	Fire Fighting School
FFTA	Firefighting Training Area
FS	Feasibility Study
FY	fiscal year
HHRA	human health risk assessment

IAS	Initial Assessment Study
IR	Installation Restoration
LTM	long-term monitoring
LUC	land use control
MCL	maximum contaminant level
N/A	not applicable
NAVFAC	Naval Facilities Engineering Systems Command
Navy	Department of the Navy
NFA	No Further Action
NPL	National Priorities List
NSA	Naval Support Activity
NSFO	Navy Special Fuel Oil
NSN	Naval Station Norfolk
NTCRA	non-time-critical removal action
OU	operable unit
OWS	oil/water separator
OWTP	oily wastewater treatment plant
OWWO	oily water and waste oil
PA	preliminary assessment
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
POL	petroleum, oil, and lubricants
PRAP	Proposed Remedial Action Plan
PRG	Preliminary Remediation Goal
RAB	Restoration Advisory Board
RAO	Remedial Action Optimization
RCRA	Resource Conservation and Recovery Act
RD	remedial design
RFA	Resource Conservation and Recovery Act facility assessment
RI	Remedial Investigation
ROD	Record of Decision
RRR	Relative Risk Ranking

SBGR	subgrade biogeochemical reactor
SI	Site Inspection
SMP	Site Management Plan
SVE	soil vapor extraction
SWMU	solid waste management unit
TCE	trichloroethene
TCRA	time-critical removal action
Team	Partnering Team
VC	vinyl chloride
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VI	vapor intrusion
VIMS	vapor intrusion mitigation system
VOC	volatile organic compound
yd ³	cubic yard(s)

Introduction

This Site Management Plan (SMP) was prepared by CH2M HILL, Inc. (CH2M), a wholly owned subsidiary of Jacobs, under Naval Facilities Engineering Systems Command (NAVFAC) Atlantic's Comprehensive Long-term Environmental Action—Navy Program, Contract N62470-21-D-0007, Contract Task Order N4008522F4497 for submittal to NAVFAC Mid-Atlantic. This document presents the SMP for environmental restoration sites at Naval Station Norfolk (NSN) and Naval Support Activity (NSA) Hampton Roads, for Fiscal Years (FYs) 2027 through 2031. This SMP has been prepared for use by the Department of the Navy (Navy), U.S. Environmental Protection Agency (EPA) Region 3, and the Virginia Department of Environmental Quality (VDEQ).

1.1 Purpose of the Site Management Plan

The purpose of the SMP is to provide a management tool for the Navy, EPA, VDEQ, and activity personnel for use in planning, scheduling, and setting priorities for environmental remedial response activities conducted at NSN and NSA Hampton Roads. This SMP focuses on upcoming activities planned for FY 2027 and identifies any additional activities that are planned through FY 2031. NSN, which at the time included the area occupied by NSA Hampton Roads, was proposed for inclusion on the National Priorities List (NPL) in the *Federal Register*, Volume 16, Number 117, on June 17, 1996, and was added to the NPL on April 1, 1997. NSN was included under the "Federal Facilities" section of the NPL, in which federal agencies are considered responsible for conducting the majority of the response actions at facilities under their jurisdiction. A Federal Facility Agreement (FFA) between EPA Region 3 and NSN was finalized in February 1999 (EPA and Navy 1999). Because NSN has a final FFA in place, EPA's role at NSN and NSA Hampton Roads sites is less extensive than at NPL sites that do not have FFAs. However, EPA continues to function in an oversight role for the management and cleanup of the Environmental Restoration Program (ERP) sites and solid waste management units (SWMUs) at NSN and NSA Hampton Roads. No Munitions Response Program sites have been identified at NSN or NSA Hampton Roads.

This SMP presents the rationale for the sequence of environmental investigations and remedial response activities to be completed for each site and the estimated schedule for completion of these activities. Detailed activity schedules are provided for FY 2027, and prospective activities are provided for years through FY 2031.

1.2 Format of the Site Management Plan

This SMP consists of three sections:

- **Section 1—Introduction**, describes the SMP's scope and purpose, provides a description and history of NSN and NSA Hampton Roads, summarizes the environmental setting and previous environmental investigations conducted at NSN and NSA Hampton Roads, provides the FFA site classifications and supporting rationale for these classifications, and briefly describes the Team Partnering process.
- **Section 2—Site Descriptions**, provides specific information regarding each of the active ERP sites. Site-specific information includes physical characteristics of the site, a description of past activities conducted at the site, and known contaminants in each site medium. A site map is provided for each site. Scheduling assumptions are provided for basewide tasks and Sites 1 (OU1 and 15), 2 (OU2), 3 (OU3 and 16), 20 (OU4 and 20), 18 (OU14 and 18), 24 (OU24), 29 (OU29), 30 (OU30), 33 (OU33), SWMU 14 (OU13 and 19), and SWMU 8 (OU17).
- **Section 3—References**, provides a list of documents used in preparing this plan.

1.3 Facility Description

1.3.1 Facility Location and Physical Description

NSN

NSN, the largest naval base in the United States, is situated on 4,631 acres of land (A.T. Kearney 1992) in the northwestern portion of the City of Norfolk, Virginia. The location of environmental sites currently undergoing investigations and/or remediation at NSN is shown on **Figure 1-1**. NSN is bounded on the north by Willoughby Bay, on the west by the confluence of the Elizabeth and James Rivers, on the east by the City of Norfolk, and on the south by NSA Hampton Roads and the City of Norfolk. A portion of NSN's eastern boundary is also formed by Mason Creek. NSN includes approximately 4,000 buildings, 20 piers, and an airfield. The western portion of NSN is a developed waterfront area containing the piers and facilities for loading, unloading, and servicing naval vessels. Land use in the surrounding area is commercial, industrial, and residential. The waterfront area south of NSN provides shipping facilities and a network of rail lines. Residential and recreational areas border NSN at the southern, eastern, and northeastern boundaries.

NSA Hampton Roads

NSA Hampton Roads is located along the southern border of NSN and encompasses just under 800 acres. The location of environmental sites currently undergoing investigations and remediation at NSA Hampton Roads is shown on **Figure 1-1**. NSA Hampton Roads is bordered to the north and east by NSN, to the south by the city of Norfolk, and to the west by the City of Norfolk and the Supply Depot Annex.

1.3.2 Facility History and Mission

NSN

NSN began operations in 1917, when the Navy acquired 474 acres of land to develop a naval base to support World War I activities. Bulkheads were built along the coast to extend available land, and after extensive dredge-and-fill operations, the total amount of land under Navy control was 792 acres. An additional 143 acres of land were acquired in 1918 and officially commissioned as Naval Air Station Norfolk. Improvements to the piers and expansion of supply and material-handling facilities were also completed from 1936 through 1941.

During World War II, major construction projects included a power plant, numerous runways and hangars, a tank farm, several barracks, and housing complexes. During this time, the area of NSN expanded to more than 2,100 acres. After World War II, NSN continued to acquire land through various types of land transfers and dredge-and-fill operations conducted in areas of Mason Creek, the Bousch Creek Basins, and Willoughby Bay (**Figure 1-1**).

During its history, NSN has expanded to become the world's largest naval installation, with 105 ships home-ported in Norfolk. The Base currently has 20 piers handling approximately 3,100 ship movements annually.

The mission of NSN is to support the operational readiness of the United States Atlantic Fleet, providing facilities and services to enable mission accomplishment.

NSA Hampton Roads

The area of NSA Hampton Roads was acquired by the U.S. Department of Defense (DoD) in 1941 and was used as part of NSN until NSA Hampton Roads was officially established in 1977. In 1999, NSA Hampton Roads was re-designated a major command (CNIC n.d.), however, the area now known as NSA Hampton Roads was included in the FFA as it was part of NSN at the time of the agreement.

The mission of NSA Hampton Roads is to enable robust command and control for Navy, Marine Corps, Coast Guard, NATO and interagency units; provide premier training and operational facilities and ranges to sustain generation activities; support warfighters with world-class medical, family support and recreational facilities and

services; and enhance relationships with community partners in Norfolk, Portsmouth, Chesapeake, and North Carolina (CNIC n.d.).

1.3.3 Operations and Process Descriptions

NSN

NSN operates in various capacities to provide support to vessels, aircraft, and other activities. NSN houses many tenants, each performing different operations involving the servicing and maintenance of vessels and aircraft.

The service and maintenance of ships includes utilities hook-up, onboard maintenance, and coordination of ship movements in the harbor. Additional functions include loading, unloading, and handling of fuels and oils used aboard the vessels. Ship and aircraft repair operations consist of paint-stripping, patching, parts cleaning, repainting, engine overhauls, sandblasting, and metal-plating processes.

NSA Hampton Roads

NSA Hampton Roads seats more than 6,000 personnel and includes facilities for fleet headquarters administrative and communication operations as well as the U.S. Fleet Forces Command; Joint Staff Hampton Roads; U.S. Marine Corps Forces Command; Naval Submarine Forces, Atlantic; and Naval Reserves Forces Command (CNIC n.d.)

1.4 Environmental Setting

1.4.1 Geology and Hydrogeology

NSN and NSA Hampton Roads are in the outer Atlantic Coastal Plain Physiographic Province, which is characterized by low elevations and gently sloping relief. The installations are underlain by more than 2,000 feet of gently dipping sandy sediment, ranging in age from Recent to Lower Cretaceous. As a result of the dredge-and-fill activities used to expand the installations, the soils here are a distribution of naturally occurring material and dredge-and-fill material. The native soils are composed of unconsolidated fine sands and silts of low to moderate permeability. The composition of the dredge-fill sediments varies from site to site, but it is generally composed of sand, silt, and gravel. Some concrete, stone, and miscellaneous debris were also used as fill material (CH2M 1997). Further detail about the geology in the area is presented in **Table 1-1**.

Table 1-1. Geologic and Hydrogeologic Units Present at NSN and NSA Hampton Roads

Geologic Period	Geologic Epoch	Geologic Unit	Hydrogeologic Unit	Geologic Description (Smith and Harlow 2002; Powars 2000)
Quaternary	Pleistocene	Tabb Formation	Columbia aquifer	Tabb Formation (Lynnhaven Member) - gray, pebbly and cobbly, fine to coarse sand, grading upward into clayey and silty fine sand and sandy silt.
Tertiary (Neogene)	Pliocene	Chowan River Formation	Yorktown confining unit	Chowan River Formation - interbedded, silty, fine sand, clayey silt, and bioclastic sand.
		Yorktown Formation	Yorktown-Eastover aquifer	Yorktown Formation - bluish-gray, greenish-gray, and dark greenish-gray, very fine to coarse sand, in part glauconitic and phosphatic, commonly very shelly and interbedded with gray and blue-gray sandy and silty clay.
	Miocene	Eastover Formation		Eastover Formation - dark-gray to bluish-gray to greenish-gray, muddy fine sand interbedded with finer and coarser-grained beds.
		St. Marys Formation	St. Marys confining unit	St. Marys Formation - muddy, very fine sand and sandy clay and silt containing scattered shells, abundant iron sulfide, and finely disseminated organic material.

The conceptual hydrogeologic framework of the shallow aquifer system at NSN and NSA Hampton Roads consists of the Columbia aquifer, the Yorktown confining unit, and the Yorktown-Eastover aquifer. These units are separated from deeper units by the relatively thick and continuous St. Marys confining unit (**Table 1-1**; Smith and Harlow 2002).

The Columbia aquifer consists of the Pleistocene Lynnhaven Member of the Tabb Formation. The Columbia aquifer is unconfined, and the water table depth is usually less than 8 feet below ground surface. The Yorktown confining unit is defined as a series of coalescing clay layers at or near the top of the Yorktown Formation. The Yorktown confining unit is not a single continuous layer, but a series of very fine sandy to silty clay units of various colors near the top of the Yorktown Formation (Powars 2000). The Yorktown confining unit varies in thickness and in composition, but on a regional scale is a leaky confining unit. The Yorktown-Eastover aquifer is defined as the predominantly sandy deposits of the Yorktown Formation and the upper part of the Eastover Formation above the confining clays of the St. Marys Formation. The St. Marys confining unit is defined predominantly by clays of the St. Marys Formation, but in places also includes clays of the overlying Eastover Formation.

Groundwater flow in the Columbia aquifer generally follows the topography and flows toward nearby surface water bodies. Groundwater in the Columbia aquifer at NSN predominantly flows toward the Elizabeth River and Willoughby Bay. Groundwater in the Columbia aquifer at NSA Hampton Roads predominantly flows toward Bousch Creek in the vicinity of Site 1 or toward the Elizabeth River in the vicinity of Site 33. Tidal fluctuations in the nearby rivers (Elizabeth River, Lafayette River, James River) may have an impact on groundwater levels in the unconfined aquifer. Groundwater flow in the Yorktown-Eastover aquifer is anticipated to flow to the northeast toward the confluence of the Elizabeth River and James River (McFarland and Bruce 2006).

1.4.2 Topography and Surface Water Hydrology

Elevations at the installations range from sea level at the northern and western boundaries of NSN to approximately 15 feet above sea level in central portions of NSN and NSA Hampton Roads.

Four major surface water features surround the greater Norfolk area, including the James River, Elizabeth River, Willoughby Bay, and Chesapeake Bay, all of which are tidally influenced in this area.

Most surface water at NSN flows to either Mason Creek or the remnants of Bousch Creek. Most surface water at NSA Hampton Roads flows toward Bousch Creek. The main channel of Bousch Creek was filled during the development of NSN and replaced by a network of drainage ditches and underground culverts. Because of the proximity of tidal waters and the low relief of the land, both Mason Creek and the remnant tributaries of Bousch Creek are tidally influenced throughout NSN and NSA Hampton Roads. Both creeks discharge to Willoughby Bay, and ultimately, to the Chesapeake Bay. In addition, some surface water runoff from NSN discharges directly to the Elizabeth River.

1.5 Environmental History

1.5.1 Environmental Restoration Program

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, initially referred to as the Installation Restoration (IR) Program and now known as the ERP, 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. The ERP continues to be conducted in accordance with applicable federal and state environmental regulations and requirements.

In 1976, Congress passed the Resource Conservation and Recovery Act (RCRA) 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 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or Superfund, was passed to investigate and

remediate areas resulting from past hazardous waste management practices. This program is administered by EPA or state agencies.

The DoD's ERP was reissued in 1981, with additional responsibilities and authorities specified in CERCLA delegated to the Secretary of Defense. The Navy subsequently restructured the ERP to match the terminology and structure of the EPA CERCLA program. The CERCLA process is further discussed in **Appendix A**.

Because NSN is on the NPL, Navy and EPA approval of all Records of Decision (RODs) with state concurrence is required. Prior to delisting, No Further Action (NFA) RODs will be signed to formally document site closeout through the CERCLA process (after the environmental cleanup activities are complete).

Team partnering was introduced to NSN in October 1996 to streamline the cleanup of former disposal sites by using consensus-based site management strategies during the CERCLA process. The Partnering Team (Team) consists of NAVFAC Mid-Atlantic, EPA Region 3, VDEQ, CH2M, and other Navy contractors as warranted. The Team has streamlined the site investigation and remediation process to reduce costs and expedite cleanup and closure of ERP sites. **Appendix B** discusses how the Team applied the CERCLA process (**Appendix A**) for sites identified at NSN.

Recently, regional tribes have expressed interest in becoming involved with the ERP at NSN, and other Federal Facilities, in response to EPA Tribal outreach in accordance with Executive Order 13175, Consultation and Coordination with Indian Tribes. The Navy is in the process of developing procedures to engage Tribal communities interested in the ERP at various naval installations in the region, including NSN.

1.5.2 Previous Investigations

The following basewide investigations were completed through the ERP:

- Initial Assessment Study (IAS) (ESE 1983)
- Installation Restoration Program Remedial Investigation (RI) Interim Report (Malcolm Pirnie 1988)
- RCRA Facility Assessment (RFA) (A.T. Kearney 1992)
- Aerial Photographic Site Analysis (EPA 1994)
- Relative Risk Ranking (RRR) System Data Collection Sampling and Analysis Report Phase I (RRR Phase I) (Baker 1996a)
- RRR System Data Collection Sampling and Analysis Report Phase II (Baker 1996e)
- Preliminary Assessment Per- and Polyfluoroalkyl Substances (CH2M 2022a)
- Per- and Polyfluoroalkyl Substances Site Inspection (CH2M 2023a)

1.5.3 Site Classifications

Environmental Restoration Program Sites

The purpose of the 1983 IAS was to identify and assess sites posing a potential threat to human health or the environment because of contamination from past hazardous materials handling and operations. Eighteen potentially contaminated sites (Sites 1 through 18) were identified based on information obtained from historical records, photographs, site inspections, and personnel interviews. Each of the 18 sites was evaluated for the past history of potential releases, potential migration pathways, and pollutant receptors. Sampling and analysis activities were not performed as part of the IAS. The IAS concluded that 6 of the 18 sites posed sufficient threats to human health or the environment to warrant further evaluation in a Confirmation Study (ESE 1983). Several of the IAS sites were re-designated under the RFA. Subsequent to the IAS, the Navy added five more sites to the IR Program (Sites 19 through 23) identified through historical information. Furthermore, and as discussed herein, 10 new sites (Site 24 through Site 33) were added to the IR Program following finalization of the Per- and Polyfluoroalkyl Substances (PFAS) Site Inspection (SI) (CH2M 2023a). The status of IAS sites, RFA designations, and

PFAS sites are summarized in **Table 1-2**. The ERP sites at NSN that are being investigated or currently undergoing remediation are described in more detail in **Section 2**, and the locations of these sites are shown on **Figure 1-1**.

Solid Waste Management Units

In March 1992, an RFA was completed for NSN (A.T. Kearney, Inc. 1992). This study was a basewide inventory of existing SWMUs and other areas of concern (AOCs). A total of 274 SWMUs and 10 AOCs were tentatively identified in this study. The September 1994 EPA Photographic Interpretation Center study of aerial photography identified 37 potential waste disposal areas. Of the sites identified by the RFA and EPA Photographic Interpretation Center study, 148 were identified as potentially contaminated. The RRR Phase I Report provided sampling results for 45 of the 148 identified sites (Baker 1996a). Of the sites sampled as part of the RRR Phase I Report, the Navy identified 25 for additional evaluation and possible investigation.

The current status of all SWMUs that have been investigated is summarized in **Table 1-3**. SWMU 8 and SWMU 14, which are further discussed in **Section 2**, are the only SWMUs currently undergoing investigation/remediation.

No Further Action Sites

The remaining 148 sites previously identified were individually evaluated during the NFA negotiations between the Navy and EPA. The Team determined that NFA is required for the 105 sites, as detailed in **Table 1-4**.

Federal Facility Agreement Areas of Concern

The FFA, signed by EPA on February 18, 1999, listed eight AOCs as sites under evaluation to determine whether the sites should proceed to the screening process and be investigated as Site Screening Areas, or whether the information under review supports an NFA determination (EPA and Navy 1999). Descriptions of the NFA determination for each of the eight AOCs are presented in **Table 1-5**.

1.5.4 Preliminary Closeout Report

A Preliminary Closeout Report summarizing the investigations and remedies at each site was signed by EPA in September 2010 (Navy 2010b). The Report documented construction completion for EPA and changed NSN's classification on the NPL.

1.5.5 Team Partnering

In October 1996, NAVFAC Mid-Atlantic convened the environmental Partnering Team consisting of representatives from the Navy, EPA, VDEQ, and Navy contractors. In addition, the Team created the Restoration Advisory Board (RAB) in 1994 to keep members of the community informed of Base ERP activities. The RAB met regularly during the course of ERP investigations at NSN and NSA Hampton Roads but dissolved in 2011 shortly after construction complete status was achieved in 2010. Additional information on the RAB can be found in the *Community Involvement Plan* (CH2M 2021a). As mentioned in **Section 1.5.1**, regional tribes have expressed interest in becoming involved with the ERP at NSN, and the Navy is in the process of developing policies and procedures to engage those tribal communities.

The Team is implementing an approach to site remediation referred to as “streamlined oversight.” The implementation of the streamlined oversight process has promoted a higher degree of communication, understanding, and cooperation among all of the involved groups. The scheduling is discussed in **Section 2**. The scheduling does not account for how the streamlined oversight process may affect schedules and potentially affect the sequence of tasks as the Team evaluates project progress on an accelerated basis and expedites the decision-making process. The goal of the streamlined oversight process is to increase the efficiency of the regulatory review processes of implementation, decision-making, reporting, and other environmental regulatory documentation, and to achieve significant savings of time and funding. Team decisions are documented through consensus statements and partnering meeting minutes; a summary of Team consensus statements is presented in **Table 1-6**.

Table 1-2. Status Summary of Environmental Restoration Sites
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	OU/RFA Designations	PA or IAS	SI or CS	EE/CA	Work Plans	RI	FS	PRAP	Closeout Report	ROD/DD	RD	RA Construction Phase	RA Ops Phase	Comments
PFAS Investigation														
Site 1 – Camp Allen Landfill and Site 22 – Camp Allen Salvage Yard	OU15	2022												In 2014, groundwater at Site 1 was sampled for PFAS. Because of groundwater detections, Site 1 was identified as a PFAS release area and recommended for further investigation. Site 22 was identified as a PFAS release area and recommended further investigation with Site 1. Work planning for the RI at Site 1/22 (OU15) began in 2023 and fieldwork is estimated to begin in 2026.
Site 3 – Q-Area Drum Storage Yard	OU16	2022	2023											Site 3 (OU16) consists of Site 3, the Q-Area Drum Storage Yard, Piers 11, 12, and 14, and Bunker Hill and Maryland Avenue. In 2022, an SI was performed at Site 3 and Bunker Hill and Maryland Avenue to determine if PFAS were present in groundwater. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Piers 11, 12, and 14 were not evaluated during the SI. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.
Site 18- Former Naval Magazine Waste Storage Area	OU18	2022	2023											In 2022, an SI was performed at Site 18 (OU18) to determine if PFAS were present in groundwater. During the SI, PFAS were detected in groundwater, and an RI was recommended. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.
SWMU 14– Q50 Satellite Accumulation Area	OU19	2022	2023											SWMU 14 (OU19) consists of the Q-50 Area and Frac tanks. In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at the Q50 Area and Frac Tanks. During the SI, PFAS were detected in soil and groundwater above screening criteria and an RI was recommended. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.
Site 20 – Building LP20	OU20	2022	2023-											Site 20 (OU20) consists of Site 20, and Buildings LP21, LP24, V50, V70, and V147. In 2022, an SI was performed at Buildings V50, V70, and V147 to determine if PFAS were present in soil or groundwater. During the SI, PFAS were detected in groundwater at concentrations greater than screening criteria, and an RI was recommended. The SI recommended that Site 20 and Buildings LP21, LP24, V50, V70, and V147 be grouped during the RI. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.
Site 24 – W- Area PFAS	OU24	2022	2023											Site 24 consists of W-Fuel Farm (Pier Area A), Building W146, and Piers 9 and 10. In 2022, an SI was performed to determine if PFAS were present in soil and/or groundwater at the W-Fuel Farm (Pier Area A) and Building W146. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Piers 9 and 10 were not evaluated during the SI. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.
Site 25 - Building CEP 178 Fire Station and Piers	OU25	2022	2023											Site 25 consists of Building CEP 178 and Piers 4 and 6. In 2022, an SI was performed to determine if PFAS were present in soil and groundwater at Building CEP 178. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Piers 4 and 6 were not evaluated during the SI but were recommended to be grouped with Building CEP 178 Fire Station during the RI. Work planning for the RI is anticipated to begin after 20231.
Site 26 – CEP Area	OU26	2022	2023											Site 26 consists of the CEP Tank Farm Area, Pier Area C, and Pier 2. In 2022, an SI was performed to determine if PFAS were present in soil and/or groundwater at the CEP Tank Farm Area and Pier Area C. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Pier 2 was not evaluated during the SI. Work planning for the RI is anticipated to begin after 20231.
Site 27 – Building KBB Fire Truck Maintenance Shop	OU27	2022	2023											Site 27 consists of Building KBB Fire Truck Maintenance Shop. In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at Site 27. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Work planning for the RI is anticipated to begin after 2031.
Site 28 – LF Hangar Area, Building R43, and Building V49	OU28	2022	2023											Site 28 consists of LF Hangar 59, 60, and 34; Building R43; and Building V49. In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at LF Hangar 59, 60, and 34; Building R43; and Building V49. During the SI, PFAS were detected in soil and/or groundwater above screening criteria and an RI was recommended. Work planning for the RI is anticipated to begin after 2031.
Site 29 – LP Hangar Area (LP27, LP33, and LP34)	OU29	2022	2023											Site 29 consists of LP Hangar 27, 33, and 34. In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at LP Hangar 27, 33, and 34. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Work planning for the RI began in 2024 and fieldwork is anticipated to begin in 2026.

Table 1-2. Status Summary of Environmental Restoration Sites
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	OU/RFA Designations	PA or IAS	SI or CS	EE/CA	Work Plans	RI	FS	PRAP	Closeout Report	ROD/DD	RD	RA Construction Phase	RA Ops Phase	Comments
Site 30 –Runway and Firefighting Training Area	OU30	2022	2023											Site 30 consists of the Firefighting Training Area, which includes Building LP166 and LP35, and Chambers Field Runway. In 2022, an SI was performed to determine if PFAS were present in soil, groundwater, sediment, and/or surface water at the Firefighting Training Area and Chambers Field Runway. During the SI, PFAS were detected in soil, groundwater, sediment, and/or surface water above screening criteria and an RI was recommended. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.
Site 31 – SP Hangar Area	OU31	2022	2023											Site 31 consists of SP35 and SP40. In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at SP35 and SP40. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Work planning for the RI is anticipated to begin after 2031.
Site 32 – SP Spray Area	OU32	2022	2023											Site 32 consists of the SP Spray Area. In 2022, a SI was performed to determine if PFAS were present in soil or groundwater at the SP Spray Area. During the SI, PFAS were detected in groundwater above screening criteria and an RI was recommended. Work planning for the RI is anticipated to begin after 2031.
Site 33 – Building BEN 154	OU33	2022	2023											Site 33 consists of Building BEN 154. In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at Building BEN 154. During the SI, PFAS were detected in soil and groundwater above screening criteria and an RI was recommended. Work planning for the RI began in 2024 and fieldwork is estimated to begin in 2026.

Table 1-2. Status Summary of Environmental Restoration Sites
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	OU/RFA Designations	PA or IAS	SI or CS	EE/CA	Work Plans	RI	FS	PRAP	Closeout Report	ROD/DD	RD	RA Construction Phase	RA Ops Phase	Comments
Remedy in Place (Ongoing O&M and LTM)														
Site 1 – Camp Allen Landfill	OU01	1983	1988		1991	1994	1994	1995		1995, 2010	1996, 2005	1997		Removal action (soil) completed January 1995 at Site 1 Area B. Construction of groundwater pump-and-treat and DPVE systems completed (DPVE system operation ceased in 2008). LTM to evaluate system effectiveness was initiated in 1999. Performed volatile organic compound groundwater plume delineation for Area B in January 2008. Remedy reaffirmed September 2010. Area B VI investigation of Building MCA-600 was completed in January 2014. Reconstruction of the new Camp Allen Elementary School was completed in 2019. The school is located near Area B and was constructed with a vapor mitigation system. The most recent round of LTM sampling was completed in 2025. The next round of LTM sampling is scheduled for 2027. Additionally, as a part of ongoing LTM at Site 1, all monitoring wells were re-surveyed in 2024 to support re-calibration of the groundwater flow model, which began in 2025 and is expected to be completed in 2026. Further evaluation of the groundwater extraction system is expected to begin in 2026 to determine if optimization of the existing extraction well network is feasible. ARAO Investigation was initiated in 2020. The RAO field investigation, including the soil-groundwater equilibrium assessment at potential soil sources areas in Area A, and Area B and the 2017 Time Critical Removal Action area, was completed in 2023. The RAO Report is expected to be finalized in 2026. An EE/CA will be completed to evaluate potential remedial alternatives for optimizing the Site 1 remedy to reduce remediation timeframes and/or life-cycle costs at Area A and Area B. The EE/CA is expected to begin in 2026. A RAO Phase II Investigation will be completed to evaluate the nature and extent of impacts to soil, groundwater, surface water and sediment at the 2017 TCRA area, refine the extent of impacts in groundwater at Area B, and confirm the presence of a clean water lens in the vicinity of the Liberty Military Housing area. Work planning for the RAO Phase II Investigation is expected to be finalized in 2026 and fieldwork is expected to begin in 2027. A VI investigation at the Camp Allen Elementary School was completed in 2025. The results of the evaluation will be documented in a technical memorandum expected to be finalized in 2026. Further evaluation of the VI pathway with LTM groundwater data will begin in 2026 and is expected to be finalized in 2027. The VI evaluation is expected to result in a recommendation to update the existing remedy to include an additional LUC for the VI pathway. Prior to modifying the LUC RD, a Memorandum-to-File will be completed to document the minor remedy update. While updating the LUC RD to include a new LUC objective, the LUC boundary will be expanded to include the estimated extent of COCs identified during the RAO investigation. A feasibility evaluation for the construction of a new interchange for Interstate 564, north of Site 1, was completed in 2022 and was followed by additional investigation efforts in 2024 to evaluate the potential for adverse environmental impacts from added loading by the proposed interchange. VOC and PFAS data from the 2024 investigation led VDOT to conclude that construction of the new interchange would unlikely result in increased concentrations of VOCs or PFAS in groundwater. The roadway design is expected to be drafted and provided to Navy, EPA, and VDEQ for comment. The RI for PFAS at Site 1 is being tracked with OU15 as part of the combined Site 1/Site 22.

Table 1-2. Status Summary of Environmental Restoration Sites
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	OU/RFA Designations	PA or IAS	SI or CS	EE/CA	Work Plans	RI	FS	PRAP	Closeout Report	ROD/DD	RD	RA Construction Phase	RA Ops Phase	Comments
Site 2 – Naval Magazine Slag Pile - All Media	OU02	1983	1988		1996, 1998	1998	1998	1999		2000	1999, 2005	1999		Sediments removed in December 1999. Annual post-closure monitoring conducted from 2000 to 2004. Following 2004, groundwater sampling conducted once every 5 years. Remedial Action Completion Report completed May 2007. LTM sampling was completed in 2021 in support of the Fifth Five-Year Review. The next LTM sampling event is scheduled for 2026 in support of the Sixth Five-Year Review. As a result of the data evaluation in the Fifth Five-Year Review (CH2M 2024b), in order to ensure long-term protectiveness, the residential risk exposure was evaluated in 2025. The data evaluation indicated that additional data are needed to evaluate potential risk to a residential receptor. A data gap investigation is planned to address the need for additional data and work planning for the data gap investigation is expected to begin in 2027 and will be followed by a field investigation.
Site 3 – Q-Area Drum Storage Yard	OU03	1983	1988		1991	1996	1996	1996		1996, 2010	1996, 2005	1998		Construction of AS/SVE system completed as site remedy. LTM to evaluate the effectiveness of treatment system was instituted in 1999. Remedy reaffirmed September 2010. AS/SVE systems turned off in July 2013 per Team decision. Remedial Process Optimization ongoing. LTM sampling was most recently completed in 2025. The next round of LTM sampling is scheduled for 2026. As a result of the data evaluation in the Fifth Five-Year Review (CH2M 2024b), the VI exposure pathway will be evaluated and documented in a technical memorandum. The VI evaluation is expected to result in a recommendation to update the existing remedy to include an additional LUC for the VI pathway. Prior to modifying the LUC RD, a Memorandum-to-File will be completed to document the minor remedy update. In addition, an ESD to modify the cleanup goals of existing COCs is expected to be completed in 2027. The RI for PFAS at Site 3 is being tracked with OU16.
Site 6 –CD Landfill	OU06	1983	1991		1993	1995	1995							Removal of contaminated sediments partially completed in fall 1997. Cap construction completed in December 1999. Post-closure monitoring initiated in January 2000. Groundwater Monitoring Plan in accordance with VSWMR corrective action finalized in April 2006. VSWMR permit was revoked by VDEQ in May 2013. LTM is completed once every 5 years to support each Five-Year Review. LTM sampling was completed in 2021 in support of the Fifth Five-Year Review. The next LTM sampling event is scheduled for 2026 in support of the Sixth Five-Year Review. Site inspections are completed quarterly to confirm that LUCs are being implemented.
Site 6, OU1 – Sediments	OU06							1996		1996	1996, 2005	1999		
Site 6, OU2 – Landfill Cap	OU07							1998		1998	1999, 2005	1999		
Site 18 – Former Naval Magazine Hazardous Waste Storage Area	OU14 RFA M-26	1983	2002, 2003	2008	2001, 2003, 2004, 2005					2010	2010	2008		NTCRA completed 2008 and 2010 (amendment injections for enhanced reductive dechlorination). ROD signed August 2010 documenting continued enhanced bioremediation with groundwater monitoring and LUCs as selected remedy. RD for LUCs finalized August 2010. Performance monitoring period was completed in April 2013. The most recent round of LTM sampling was completed in 2025. The next round of LTM sampling is scheduled for 2026. As a result of the data evaluation in the Fifth Five-Year Review (CH2M 2024b), the VI exposure pathway will be evaluated and documented in a technical memorandum, which is expected to be finalized in 2027.The RI for PFAS at Site 18 is being tracked with OU18.

Table 1-2. Status Summary of Environmental Restoration Sites
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	OU/RFA Designations	PA or IAS	SI or CS	EE/CA	Work Plans	RI	FS	PRAP	Closeout Report	ROD/DD	RD	RA Construction Phase	RA Ops Phase	Comments
Site 20 – Building LP20 Site	OU10 RFA M-9/M-10	1991	1991		1994	1995	1996	1996		1996, 2010	1997, 2005	1998		Construction of AS/SVE system to address total petroleum hydrocarbons and chlorinated solvents in groundwater completed as site remedy. Remedy enhancement (groundwater extraction) was constructed in 2010 (not currently operating because of excessive maintenance requirements). The AS/SVE system was shut down in 2013. Based on remedy evaluation and Remedial Process Optimization in 2016, a field investigation and bench-scale test for a SBGR was recommended. Construction of the SBGR was completed in 2024 and quarterly SBGR performance monitoring which began in 2024 was conducted for 1 year. In addition to the SBGR pilot test, enhanced in situ bioremediation injections were completed in 2023 and 1 year of performance monitoring was completed. Results from both pilot studies will be evaluated in a summary report, which is expected to be finalized in 2026. Following completion of these pilot studies and the RI for PFAS (refer to OU20) alternatives to address groundwater at Site 20 will be evaluated in a Feasibility Study. A VI investigation for the Site 20 buildings was initiated in 2019. The results of the investigation resulted in a Rapid Response Action of installing air purifying units to reduce the indoor air concentration of TCE in an office in LP26. Performance indoor air monitoring is conducted every 4 months in conjunction with the air purifying unit filter change outs. The next Performance Monitoring Report is expected to be finalized in 2026. The results of the VI investigation that began in 2019 were included in the Expanded VI Investigation report, which was on hold; however, recent agreement between the Navy and EPA on how to evaluate VI will allow the Expanded VI Report to be updated and finalized in 2026. The report will also evaluate the VI exposure pathway with groundwater data collected during LTM between 2022 and 2024. A Focused FS to address the VI pathway is expected to begin in 2027. The most recent round of LTM sampling was completed in 2025. The next round of LTM sampling is scheduled for 2026. The RI for PFAS at Site 20 is being tracked with OU20.
Site 22 – Camp Allen Salvage Yard	OU08 RFA C-14	1994	1994	1999, 2002	1996	1999	2002	2002		2004	2002, 2004	2002, 2009		An NTCRA was implemented at the site in 1998 to remove PCB-contaminated soils. An EE/CA was completed in January 2002 recommending that a soil cover be placed at the site. The cover was completed in summer 2002. Site inspections are completed quarterly to confirm that LUCs are being implemented. Site groundwater is monitored under Site 1. The RI for PFAS at Site 22 is being tracked with OU15 as part of the combined Site 1/Site 22.
Site 23 – Building LP20 Plating Shop	OU10 RFA M-29		2005	2006	2004			2008		2008	2009			Final EE/CA completed December 2006. Construction for the interim action was implemented in June 2007 to construct a concrete cover (new floor). Site inspections are completed quarterly to confirm that the LUCs are being implemented.
Response Complete/NFA														
Site 4 – P-71 Transformer Storage	RFA M-5	1983	1988 ^[a]		1991	1991	1991	1991		1991	1991	1992		Cleanup completed. Construction Summary Report completed February 1993. Groundwater monitoring completed in 1995.
Site 5 – Pesticide Disposal Site		1983	1988 ^[b] 1998 ^[c]	1998					2000			1999		Pesticide-contaminated soil removal action completed in November 1999, and the site was closed out.
Site 7 – Inert Chemical Landfill	RFA L-3	1983							2001					
Site 8 – Asbestos Landfill	RFA L-4	1983							2001					
Site 9 – Q-50 Area Landfill	RFA L-5	1983							2001					Site 9 was incorporated as part of the Q-50 Satellite Accumulation Area (SWMU 14) where an RI was completed in 2004 (Table 1-3).
Site 10 – Apollo Fuel Disposal Sites	RFA M-23	1983	2001		2001				2002					
Site 11 – Instrument Repair Shop Drains	RFA M-34	1983												IAS report indicates low-level radiological contamination remediated in 1982. FFA indicates remediation of the site was completed as part of the V-60/V90 demolition project at Site 19.
Site 12 – Alleged Mercury Disposal Site	RFA M-35	1983							2001					
Site 13 – Past Wastewater Outfalls	RFA TP 10/ M 45													Recommended for NFA in FFA (EPA and Navy 1999)

Table 1-2. Status Summary of Environmental Restoration Sites
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	OU/RFA Designations	PA or IAS	SI or CS	EE/CA	Work Plans	RI	FS	PRAP	Closeout Report	ROD/DD	RD	RA Construction Phase	RA Ops Phase	Comments
Site 14 – Oil Spill Piers 4, 5, and 7	RFA M 24													Recommended for NFA in FFA (EPA and Navy 1999)
Site 15 – Oil Spill Piers 20, 21, and 22														Recommended for NFA in FFA (EPA and Navy 1999)
Site 16 – Chemical Fire Building X-136		1983	2001		2001				2002					
Site 17 – Chemical Fire Building SDA-215	RFA C-25/AOC E	1983							2001					
Site 19 – Buildings V-60/V-90	RFA M-34	1988	1988		1989	1989	1989	1989		1989	1989	1991		Building demolition and site cleanup completed.
Site 21 – Building W-316	RFA M-9/10	1996	1996	1997	1996				1998					PCB-contaminated soil removal action completed in March 1998.

Source: U.S. Environmental Protection Agency (EPA) and Department of the Navy (Navy). 1999. *Federal Facilities Agreement, Naval Base Norfolk, Norfolk, Virginia*. May.

^[a] Refers to IAS, Sewells Point Naval Complex, Norfolk, Virginia (ESE 1983).

^[b] Refers to Installation Restoration Program Investigation - Interim Report (Malcolm Pirnie 1988).

^[c] CH2M SI completed February 1998.

- AS = air sparge

COC = constituent of concern

CS = Confirmation Study

DD = Decision Document

DPVE = dual-phase vacuum extraction

EE/CA = Engineering Evaluation/Cost Analysis

ESD = Explanation of Significant Difference

FS = Feasibility Study

LTM = long-term monitoring

LUC = land use control

NTCRA = non-time-critical removal action

O&M = operations and maintenance

Ops = Operations

PA = preliminary assessment
- PCB = polychlorinated biphenyl

PRAP = Proposed Remedial Action Plan

RA = remedial action

RAO = Remedial Action Optimization

RD = Remedial Design

SBGR = subgrade biogeochemical reactor

SVE = soil vapor extraction

TCE = trichloroethene

VDOT = Virginia Department of Transportation

VI = vapor intrusion

VOC = volatile organic compound

VSWMR = Virginia Solid Waste Management Regulations

Table 1-3. Status Summary of Solid Waste Management Units
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

SWMU		OU/RFA Designations	Phase I RRR ^[a]	Phase 2 RRR ^[b]	Work Plans	PA/SI	SI/SSI ^[c]	RI/FS	EE/CA	Closeout Report	ROD/DD	RD	RA Construction	Comments
PFAS Investigation														
8	Firefighting School	OU17				2022/2023								In 2022, an SI was performed to determine if PFAS were present in soil or groundwater at the Firefighting School. During the SI, PFAS were detected in soil and groundwater above screening criteria and an RI was recommended. Work planning for the RI began in 2023. The RI fieldwork began in 2026.
Remedy in Place (Ongoing O&M and LTM)														
14	Q-50 Satellite Accumulation Area	OU13 RFA C-17	1996	1996	1998	1998		2004, 2009	2008		2010	2010	2008	The Final Proposed Plan was submitted August 2009. RD for LUCs completed August 2010. Limited action Remedial Action Completion Report signed September 2010. Quarterly inspections completed to confirm LUCs are implemented.
Response Complete/NFA														
1	SP-2B Accumulation Area	RFA C-83	1996	1996			1996							NFA under CERCLA based on SI Report.
2	Building Z-309 Ash Hopper Storage Area	RFA M-13/ M-14	1996	1996						2000				
3	Building Z-309 Oil/Lubricant Storage Area	RFA AOC B	1996	1996						2000				
4	PWC Sandblast Area	RFA M-19/ M-20; EPIC WDA-1	1996	1996	1996	1996								Site removed from the CERCLA program because the facility remains active.
5	LF-61 Waste Holding Tank	RFA M-36	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
6	Building V-28 Waste Pit	RFA M-31	1996		1996, 2001	1996	1998, 1999			2002				
7	LF-18 Aircraft Ramp	EPIC WDA-3	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
8	Firefighting School	EPIC WDA-20	1996		1996	1996	1999			2001				
9	LP-200/MAC Terminal	EPIC WDA-28/29	1996		1998	1998	1999			2001				
10	LP-200/MAC Terminal/East	EPIC WDA-31/32/35	1996	1996	1998	1998	1999			2001				
11	Old Weapons Station Entrance	EPIC WDA-33/34	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
12	Disposal Area near Naval Magazine-37	OU09 EPIC WDA-36	1996	1996	1998	1998		2004			2005			
13	Disposal Area PWC Operations, near Naval Magazine-71	EPIC WDA-37	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
15	W-130 Accumulation Area	RFA C-27	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
16	Naval Magazine 37 Accumulation Area	OU09 RFA C-54	1996	1996	1998	1998		2004			2005			NFA.
17	Surface Disposal Area; Waste Generated from SP-10 Maintenance		1996	1996										NFA based on RRR report.

Table 1-3. Status Summary of Solid Waste Management Units
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

	SWMU	OU/RFA Designations	Phase I RRR ^[a]	Phase 2 RRR ^[b]	Work Plans	PA/SI	SI/SSI ^[c]	RI/FS	EE/CA	Closeout Report	ROD/DD	RD	RA Construction	Comments
18	Surface Disposal Area; Waste Generated from V-88 Lab		1996	1996										NFA based on RRR report.
19	Surface Disposal Area; Waste Generated from LF-53 Painting		1996	1996										NFA based on RRR report.
20	Surface Disposal Area; Waste Generated from Aircraft Maintenance, Former UST Site		1996	1996										NFA based on RRR report.
22	Surface Disposal Area; Waste Generated from Building LF-60 Helicopter Maintenance		1996	1996			1999							NFA based on RRR report.
24	Building LF-53 Trenches	RFA M-39	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
25	Q-82/78 Former PWC Parking Lot		1996	1996										NFA based on RRR report.
26	Old Mounds Northeast of Naval Magazine-140/141	EPIC WDA-21	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
27	Mason Creek Embankment	EPIC WDA-30	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
28	Probable Solid Waste Disposal South of CEP 201	EPIC WDA-11	1996		1998	1998				2000				
29	Solid Waste Disposal Area/ CD-3/CD-4	EPIC WDA-12	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
30	Sludge Fill Disposal Area/Marshy Area South of Runway	EPIC WDA-15/16/17	1996	1996										Recommended for NFA in FFA (EPA and Navy 1999). NFA based on RRR report.
31	Solid Waste Disposal; Area V-82		1996	1996										NFA based on RRR report.
32	Solid Waste Disposal Area CEP 160/161 Embankment	EPIC WDA-5	1996		1998	1998				2000				
33	Debris Piled at Seawell	EPIC WDA-6	1996		1998	1998				2000				
34	Solid Waste Disposal Area CEP 200	EPIC WDA-7	1996		1998	1998	1999			2000				
35	Solid Waste Disposal Area CEP 196/Resolute Embankment	EPIC WDA-8	1996		1998	1998	1999			2000				
36	Stormwater Drainage System	RFA M-44												NFA under CERCLA.
37	Q-82/78 Former PWC Parking Lot	EPIC WDA-2	1996	1996										NFA under CERCLA. Moved out of CERCLA in 1998 and into the UST program.
38	CD Area Behind Compost Yard	EPIC WDA-13		1996	1998	1998	2000			2001				
39	Open Dump and Disposal Area near Boundary of Camp Allen Landfill	EPIC WDA-18/19					2000			2001				
40	MCA-603 Pits	EPIC WDA-22			1998	1998				2000				
41	Disposal Area, CA-99 Golf Course	EPIC WDA-23			1998	1998	1999			2000				
42	CEP 201 Area	EPIC WDA-9	1996	1996	1998	1998	1999			2000				

Source: U.S. Environmental Protection Agency (EPA) and Department of the Navy (Navy). 1999. *Federal Facilities Agreement, Naval Base Norfolk, Norfolk, Virginia*. May.

^[a] Refers to *Initial Assessment Study, Sewells Point Naval Complex, Norfolk, Virginia* (ESE 1983).

^[b] Refers to *Installation Restoration Program Investigation - Interim Report* (Malcolm Pirnie 1988).

^[c] CH2M SI completed February 1998.

CD = construction debris

EPIC = Environmental Photographic Interpretation Center (EPA)

PWC = Public Works Center

SSI = Supplementary Site Investigation

UST = underground storage tank

WDA = waste disposal area

Table 1-4. Additional No Further Action Sites*Site Management Plan, Fiscal Years 2027–2031**Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia*

Site	Site Description	Reason for No Further Action
RFA AOC C	Building V-93-1	UST/AST; Removed
RFA AOC C	Building V-93-2	UST/AST; Removed
RFA AOC C	Building V-93-3	UST/AST; Removed
RFA AOC C	Building V-112-1	UST/AST; Removed
RFA AOC C	Building V-112-2	UST/AST; Removed
RFA AOC C	Building V-112-3	UST/AST; Removed
RFA AOC C	Building NM-71-A	UST/AST; Removed
RFA AOC C	Building NM-71-B	UST/AST; Removed
RFA AOC C	Building U-117	UST/AST; Removed
RFA AOC C	Building CA-501-1	UST/AST; Removed
RFA C-4	Building CA-483 (A) SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-5	Building CA-483 (B) SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-6	Building CA-483 (C) SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-7	Building CA-483 (D) SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-9	Building W-7 (Pier 7) SAA	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-18	Building Z-309 SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-26	Building CA-501 SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-27	Building W-130 SAA	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-33	Building V-88 SAA (SWMU 18)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-36	Building LF53 SAA (SWMU 19)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-61	Building LP20 SAA	Team site visit, review of existing documentation and review of operational procedures

Table 1-4. Additional No Further Action Sites*Site Management Plan, Fiscal Years 2027–2031**Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia*

Site	Site Description	Reason for No Further Action
RFA C-71	Building SP10 SSA (SWMU 17)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-79	LP Fuel Farm SAA	Team site visit, review of existing documentation and review of operational procedures
RFA C-80	Building LP100 SAA (SWMU 20)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-81	Building LF59 SAA	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA C-82	Building LF60 SAA (SWMU 22)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA M-18	Sanitary Sewers	Team site visit, review of existing documentation and review of operational procedures
RFA M-22	Sewage Waste Oil Barges	Team site visit, review of existing documentation and review of operational procedures
RFA M-36	Building LF61 Waste Tank Area (SWMU 5)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA M-39	Building LF53 Trenches (SWMU 24)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
RFA M-46	P-1 Pond	Team site visit, review of existing documentation and review of operational procedures
RFA R-3	LF68 Former Hazardous Waste Storage Area	Team site visit, review of existing documentation and review of operational procedures
RFA O-1	A-80 Building OWS	OWS; Managed under IWMP
RFA O-2	A-81 Building OWS	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-3	A-127 Building	OWS; Managed under IWMP
RFA O-4	A-Area	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-7	CEP-188 Building	OWS; Managed under IWMP
RFA O-8	LF38 Building	OWS; Demolition complete
RFA O-9	LF53 Building	OWS; Inactive due to BRAC closure of NSN tenants
RFA O-10	LF59 Building	OWS; Managed under IWMP

Table 1-4. Additional No Further Action Sites*Site Management Plan, Fiscal Years 2027–2031**Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia*

Site	Site Description	Reason for No Further Action
RFA O-11	LF60 Building	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-23	LP20 Building	OWS; Managed under IWMP
RFA O-24	LP22 Building	OWS; Demolition complete – 1998
RFA O-25	LP32 Building	OWS; Inactive due to BRAC closure of NSN tenants
RFA O-27	LP48 Building	OWS; Demolition complete – 1998
RFA O-30	LP78 Building	OWS; Demolition complete – 1997
RFA O-31	LP167 Area 1	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-32	LP167 Area 2	OWS; Managed under IWMP
RFA O-33	LP167 Area 3	OWS; Managed under IWMP
RFA O-34	LP167 Area 4	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-35	LP167 Area 5	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-36	LP167 Area 6	OWS; Managed under IWMP
RFA O-37	LP176 Building	OWS; Demolition complete – 1998
RFA O-43	SP38 Building	OWS; Managed under IWMP
RFA O-45	SP-296 Hangar	OWS; Managed under IWMP
RFA O-46	SP-313	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-50	V-15 Building	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-51	V-27 Area 1	OWS; Inactive due to BRAC closure of NSN tenants
RFA O-52	V-28 Area 2	OWS; Inactive due to BRAC closure of NSN tenants
RFA O-55	V-49 S Area 5	OWS; Managed under IWMP

Table 1-4. Additional No Further Action Sites*Site Management Plan, Fiscal Years 2027–2031**Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia*

Site	Site Description	Reason for No Further Action
RFA O-56	V-49 W Area 6	OWS; Managed under IWMP
RFA O-57	V-146 Building	OWS; Demolition complete – 1997
RFA O-59	W-6 Building	OWS; Managed under IWMP
RFA O-60	Firefighting School	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
RFA O-61	Firefighting School	OWS; Demolition complete – 1992
RFA O-62	Firefighting School	OWS; Demolition complete – 1992
RFA T-3	Wastewater Tank 3 Building CEP-200	UST/AST; Regulated under VDEQ
RFA T-10	W-7 Building	UST/AST; Regulated under VDEQ
RFA T-12	W-388 Building High Flashpoint Tank	UST/AST; Regulated under VDEQ
RFA T-13	W-388	OWS; Managed under IWMP
RFA T-14	A-81 Building	UST/AST; Removed
RFA T-15	A-81 Building Tank No.1	UST/AST; Removed
RFA T-16	A-81 Building Tank No.2	UST/AST; Removed
RFA T-17	Firefighting School	UST/AST; Removed
RFA T-20	CEP-188 Building	UST/AST; Removed
RFA T-21	V-49 Building	UST/AST; Removed
RFA T-22	U-132 Calibration Fluid	UST/AST; Removed
RFA T-23	U-132 Varsol	UST/AST; Removed
RFA T-24	U-132 Waste Oil	UST/AST; Removed
RFA T-26	NH-34 Building	UST/AST; Removed
RFA T-27	NH-35 Building	UST/AST; Removed
RFA T-28	NH-94-1W Building	UST/AST; Regulated under VDEQ
RFA T-29	NH-94-2W Building	UST/AST; Regulated under VDEQ

Table 1-4. Additional No Further Action Sites*Site Management Plan, Fiscal Years 2027–2031**Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia*

Site	Site Description	Reason for No Further Action
RFA T-30	MCE-225-4 Building	UST/AST; Removed
RFA T-31	MCE-57-1	OWS; Demolition Complete – 1997
RFA T-32	W-6-1	UST/AST; Removed
RFA T-33	W-6-2	UST/AST; Removed
RFA T-34	W-6-3	UST/AST; Removed
RFA T-35	W-6-4	UST/AST; Removed
RFA T-36	W-196 Building	UST/AST; Removed
RFA T-37	LAFB Building	UST/AST; Removed
RFA T-38	NM-59 Building	UST/AST; Removed
RFA TP-6	Firefighting School Wastewater Pit	OWS; Demolition complete – 1999
RFA W-4	Q-50	OWS; Documentation of integrity and functionality inspections on file with the EPA Region 3
EPIC WDA-3	Building LF-18 Aircraft Ramp (SWMU 7)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-4	Building V-82 Area (SWMU31)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-12	Building CD-2/CD-3	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-14	Building U-40	Team site visit, review of existing documentation and review of operational procedures
EPIC WDA-15/16/17	Marshy Area South of Runway (SWMU 30)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-21	Northeast of Building NH-140/141 (SWMU 26)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-24	Building LP-3	Team site visit, review of existing documentation and review of operational procedures
EPIC WDA-25	Building SP-367	Team site visit, review of existing documentation and review of operational procedures
EPIC WDA-26	Building SP-86	Team site visit, review of existing documentation and review of operational procedures

Table 1-4. Additional No Further Action Sites

Site Management Plan, Fiscal Years 2027–2031

Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site	Site Description	Reason for No Further Action
EPIC WDA-27	Building SP-85 Area	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-30	Mason Creek Embankment (SWMU 27)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-33/34	NM-43 Old Weapons Station Entrance (SWMU 11)	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data
EPIC WDA-37	Building NM-71	Team site visit, review of existing documentation and review of operational procedures, review of RRR analytical data

BRAC = Base Realignment and Closure

EPIC = Environmental Photographic Interpretation Center (EPA)

IWMP = Industrial Wastewater Management Plan

OWS = oil-water separator

SAA = Satellite Accumulation Areas

SSA = Site Screening Areas

WDA = waste disposal area

Table 1-5. Status Summary of Federal Facility Agreement Areas of Concern

Site Management Plan, Fiscal Years 2027–2031

Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

AOC Designation		Site Description	Evaluation Determination
AOC 1	Building Z-309 Area	SWMU 2; RFA M-13/14	In March 2000, Close-Out Report approved, NFA is required, and the land use will be unrestricted.
		SWMU 3; RFA AOC B	In March 2000, Close-Out Report approved, NFA is required, and the land use will be unrestricted.
AOC 2	MAC Area	SWMU 9; EPIC WDA-28/29	In October 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
		SWMU 10; EPIC WDA-31/32/35	In October 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
AOC 3	CEP 201 Area	SWMU 42; EPIC WDA-9/10	In March 2000, Close-Out Report approved, NFA is required, and the land use will be unrestricted.
	CEP Area	SWMU 28; EPIC WDA-11	In May 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
		SWMU 32; EPIC WDA-5	In May 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
		SWMU 33; EPIC WDA-6	In May 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
		SWMU 34; EPIC WDA-7	In May 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
		SWMU 35; EPIC WDA-8	In May 2000, Streamline Risk Assessment approved, NFA is required, and the land use will be unrestricted.
AOC 4	Q-50 PWC Accumulation Area	SWMU 14; RFA C-17	Refer to Table 1-3 for status.
AOC 5	CD Area Behind the Compost Yard	SWMU 38; EPIC WDA-13	In March 2001, Close-Out Report signed, NFA is required, and the land use will be unrestricted.
AOC 6	Open Dump and Disposal Area at Boundary of Camp Allen Landfill	SWMU 39; EPIC WDA-18/19	In March 2001, Close-Out Report signed, NFA is required, and the land use will be unrestricted.
AOC 7	MCA-603 Pits	SWMU 40; EPIC WDA-22	In March 2000, Close-Out Report approved, NFA is required, and the land use will be unrestricted.
AOC 8	CA-99 Golf Course Disposal Area	SWMU 41; EPIC WDA-23	In March 2000, Close-Out Report approved, NFA is required, and the land use will be unrestricted.

EPIC = Environmental Photographic Interpretation Center (EPA)

PWC = Public Works Center

WDA = waste disposal area

Table 1-6. NSN Partnering Team Consensus Statement Summary

Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Number	Date	Facility	Site	Topic	Consensus Statement
1	12/18/1997	NSN	Basewide	Human Health Risk	Since no groundwater classification(s) has been assigned to either the shallow or deep aquifer beneath NSN describing natural water quality conditions, the establishment of information regarding natural groundwater quality will be conducted on a site by site basis. This should include the evaluation of analytical results acquired for a set of appropriate and agreed-upon water quality parameters (e.g. total dissolved solids, pH, conductivity, nitrates, nitrites, alkalinity, acidity, chloride, sulfates, sulfides, biological oxygen demand, chemical oxygen, etc.).
2	9/26/2000	NSN	Basewide	Background	The Background Report will be finalized documenting the native, fill (Admiral's Row), and combined soil types and that these soil types will be taken into consideration.
3	9/26/2000	NSN	Basewide	Fieldwork	Complete the Draft-Final SWMU 12, 14, 16, 38, & 39 Work Plan and begin fieldwork (9/00).
4	11/18/2003	NSN	Site 23	Investigation	The Team agrees to prepare a letter referencing previous investigations that have occurred at Site 23 in lieu of a formal PA/SI.
5	11/19/2003	NSA HR	Site 22	Remedy	The NSN Tier I Partnering Team agrees to move forward with a revised PRAP and ROD addressing soil and sediment at the CASY. The preferred alternatives will be: • Soil: ICs and LUCs • Sediment: ICs and LUCs The NSN Tier I Partnering Team agrees to address groundwater at the CASY.
6	1/7/2004	NSN/NSA HR	Bousch Creek	Ecological Risk	The Team agrees that the Draft Bousch Creek ERA Report (through Step 3A) will be finalized by preparing a resolution to the response to comments Memorandum on the document. The ecological subgroup positions and Tier I resolutions will be incorporated in the next Bousch Creek ERA Report (through Step 7).
7	3/2/2004	NSA HR	Site 18	Investigation	The Team agrees to implement the Site 18 proposed alternative consisting of additional delineation of the VOCs in the groundwater and evaluation of analytical data to determine the path forward.
8	3/3/2004	NSN	Site 23	Investigation	The Team agrees with the recommendation (from 01/04/04 meeting) of a phased sampling approach for the investigation at Site 23 that begins with the collection of soil samples as the first phase of the investigation. The next phase of the investigation will be determined on the basis of the Phase I soil sampling results.
9	5/11/2004	NSN	Site 23	Site Walk	The Team agreed to postpone the site visit to Site 23 until the new VDEQ representative is available to attend.
10	7/1/2004	NSN	Site 3 - AOC 1	Remedy	The Team agreed to the recommendations of the close-out strategy to continue operation of AS system and revise the LTM to include only wells CMW-101 and CMW-103R. The Team will revisit the close-out strategy following 6 additional rounds of sampling to determine if the strategy is adequate prior to dismantling of the system. The monitoring wells that are no longer part of the LTM sampling will be left intact until the Team decides they are no longer needed.
11	4/28/2004	NSN/NSA HR	Bousch Creek	Ecological Risk	The Team agrees with the ecological subgroup proposed path forward for Bousch Creek (Camp Allen Area). The proposed path forward consists of (1) development of a draft Step 4 work plan including a site visit to joint scope sampling locations, (2) conduct additional studies (Steps 5 and 6), (3) generate a Step 7 ERA report incorporating new data, and (4) provide input to risk managers (Step 8).
12	4/28/2004	NSN	SWMU 12/ 16	Remedy	The Team agrees to the recommendation in the Draft SWMUs 12 & 16 RI for a NFA determination.
13	3/24/2005	NSN	SWMU 14	Remedy	The Team agreed to the following statements regarding the SWMU 14 presumptive remedy: • A proposed continuous asphalt parking lot will cover the unpaved areas of SWMU 14. • The proposed asphalt parking lot will tie-in to the revetment such that the impervious surface is contiguous to minimize erosion, exposure to soils, and infiltration into the site. • These two components will serve as the presumptive remedy for site soils and sediments underneath the revetment. • The groundwater and other remaining sediments will be evaluated separately.
14	11/17/2004	NSA HR	Site 1/ Site 22	Operable Units	The Team agrees that the Columbia aquifer at CALF and CASY can be considered one hydrogeologic unit. The Team agrees that the Yorktown aquifer at CALF and CASY can be considered one hydrogeologic unit.
15	3/30/2005	NSN	SWMU 14	Investigation	The Team agreed to further delineate the southern boundary of SWMU 14 near the lagoon. The delineation will consist of: • Conduct hand auger soil borings to determine southern boundary by differentiating SWMU 14 soils from dredge fill soils. • The details of study will be outlined in a technical memorandum. • The path forward will be determined by results of soil boring study.
16	3/31/2005	NSA HR	Site 18	Investigation	The Team agreed to the installation of three new monitoring wells at Site 18 (as detailed in the Site 18 presentation for March 31, 2005). The three new monitoring wells and existing wells MW03C, MW03S, and MW05S will be sampled and analyzed for TCL VOCs and natural attenuation parameters.
17	3/31/2005	NSN	Site 23	Remedy	The Team has agreed to an interim action for Site 23 soils in the form of a cap that will be documented in a EE/CA. In addition, LUCs for the Site 23 soils will be documented in a ROD for Site 23.
18	3/31/2005	NSA HR	Site 2	Five-Year Review	The Team agreed to collect one additional round of sediment samples (from locations SD-41, SD-45, and SD-46) at Site 2 one year prior to the next Five-Year Review.
19	9/14/2005	NSN	Site 3 - AOC 2	Remedy	The Team agreed to implement the proposed close-out strategy for Site 3, AOC 2 consisting of enhanced remediation proximal to CMW-202, followed by continued monitoring and ultimately the shut down and dismantling of the system (July 14, 2005 meeting presentation).
20	9/14/2005	NSN	Basewide	Optimization	The Team agrees that the flexibilities may be applied to the active sites regardless of the site's stage in the CERCLA process, where applicable as determined by the Team. The Team agrees that on an individual site basis, the groundwater flexibilities will be utilized through documentation by the Partnering Team of the risk management rationale. The Team will then discuss which specific issues warrant involvement of technical support personnel and how these support personnel will be engaged.

Table 1-6. NSN Partnering Team Consensus Statement Summary
Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Number	Date	Facility	Site	Topic	Consensus Statement
21	7/12/2006	NSA HR	Site 22	RD	The Team agrees to the language changes to the Site 22 RD as stated below: • The title of the document will be changed from “Final Remedial Design for Land Use Controls” to “Revised Final Remedial Design for Land Use Controls for Soil and Sediment”. • The statement in Section 2.0 – “Although the ROD for this site does not include the LUCs for groundwater, institutional controls for groundwater at the entire Camp Allen area are included in the PRAP and Decision Document for Camp Allen Landfill” will be removed from the document and replaced with the following statement – “As detailed in the PRAP and ROD for Site 22, the Navy intends to address groundwater in a separate document through the CERCLA process”.
22	9/27/2006	NSN/NSA HR	Bousch Creek	Ecological Risk	The Team agreed to finalize the Step 7 ERA for Bousch Creek based on the resolution of regulatory comments by the ecological subgroup.
23	9/27/2006	NSN	Site 23	Remedy	The Team agreed to finalize the Site 23 EE/CA based on the proposed language as follows to be added to the ARARs table. • 40 CFR 264.101(a) - Based on VDEQ letter of August 20, 2002, VDEQ has determined that the requirements of CERCLA are equivalently protective of requirements set forth in 40 CFR 264.101(a). Therefore, these requirements are not applicable, because they have been replaced by CERCLA equivalently protective standards. (ARAR Determination – TBC). • 40 CFR 265.111 (a) and (b) - Based on VDEQ letter of August 20, 2002, VDEQ has determined that the requirements of CERCLA are equivalently protective of requirements set forth in 40 CFR 265.111 (a) and (b). Therefore, these requirements are not applicable, because they have been replaced by CERCLA equivalently protective standards. (ARAR Determination - TBC). • 40 CFR 265.110 (d) - Based on VDEQ letter of August 20, 2002, VDEQ has determined that the requirements of CERCLA are equivalently protective of requirements set forth in 40 CFR265.110(d). Therefore, these requirements are not applicable, because they have been replaced by CERCLA equivalently protective standards. (ARAR Determination - TBC). The intent of the consensus statement is that the site will be administered under CERCLA, because CERCLA provides as equivalent a level of protection as RCRA.
24	11/11/2006	NSN/NSA HR	Bousch Creek		The Team agreed to the following to address the metals-contaminated sediment in Bousch Creek. • Removal of 2 feet of sediment (or to concrete) in metals-contaminated area immediately north of Site 1, with no associated confirmation sampling. • Placement of 1 foot of clean soil cover, with no associated sampling for monitoring purposes. • Erosion prevention of the cover through the installation of a barrier (pavers, blanket, or membrane, etc.), if allowed by the design. • LUCs to prevent potential future damage to cover. • One initial inspection of the barrier and cover integrity and follow on inspections as part of each Five-Year Review. An EE/CA and action memorandum will be used to document the sediment removal action. The Site 1 RD will be modified to include LUCs for the area of the cover in Bousch Creek.
25	3/6/2007	NSA HR	Site 1	Five-Year Review	The purpose of this consensus statement is to address comments received on the 2003 Five-Year Review and prepare for the 2008 Five-Year Review. This statement addresses metals in the groundwater at Site 1. The Team agrees that arsenic and manganese in Site 1 groundwater are COPCs, based on a review of the HHRA from the 1994 RI, and will be further evaluated to determine what, if any, appropriate action is necessary. Any subsequent action, if necessary, will be documented in an ESD.
26	3/6/2007	NSA HR	Site 1	Remedy	The purpose of this consensus statement is to address comments received on the 2003 Five-Year Review and prepare for the 2008 Five-Year Review. This statement addresses VOCs in the shallow aquifer groundwater at Site 1. The Team agrees that in the list of Site 1 COCs, from Table 9-2 in the Decision Document, the shallow aquifer PRGs will be changed to the MCLs. This action will be documented in an ESD.
27	5/1/2007	NSA HR	Site 18	Remedy	The Team will move forward with EE/CA including a baseline round of sampling at all site wells. The determination as to whether or not additional delineation is required east of MW10S will be based on baseline sampling and in consideration for site restrictions on well installation.
28	8/8/2007	NSA HR	Site 1	Investigation	The team agrees to move forward with the delineation in the vicinity of Site 1, Area B, MWs 3A & 11A to determine if injection is feasible (as described in the June 1, 2007 tech memo).
29	8/8/2007	NSN	Site 20	Investigation	The team agrees that groundwater associated with Site 23 has been and continues to be addressed as part of Site 20.
30	9/19/2007	NSN HR	Site 18	Remedy	The Team agrees to prepare a Final Site Investigation Report for Site 18 to summarize all of the investigation activities that will be utilized in the Site 18 EE/CA. This report will be distributed for informational purposes as the Final document and therefore review is not required.
31	11/14/2007	NSN	Site 1	Remedy	1) Based upon the information available to make the original decision that there is not a discernable plume of arsenic in groundwater at Site 1, the team agrees with this rationale and concurs that data does not indicate a discernable plume. To ensure the situation has not changed, the team agrees to conduct an additional round of arsenic sampling at select wells and reassess the data prior to the next five-year review 2) The team agrees there is no discernable manganese plume and that a) concentrations in Site 1 groundwater are within background (other NSN sites and regional concentrations) range; and b) the human nutrient analysis indicates manganese concentrations are within an acceptable risk range based upon adequate daily intake Therefore, it is believed that based on the Team consensus, the regulatory comments received during the Five Year Review report (October 2003) have been adequately addressed. However, EPA recommended that an additional round of sampling be conducted to determine if there has been a change in the plume.
32	11/15/2007	NSN	Site 3	Remedy	The team agrees to revise the Site 3 AOCs 1&2 clean up goals to be MCLs because MCLs are appropriate groundwater clean up goals than the previous risk-derived values.
33	11/15/2007	NSN	Basewide		The team agrees that it is acceptable to provide information/revisions to an approved work plan to the regulators in the form of an informational email or via conference call, depending upon issue (as long as the intent of the work plan is being met and in accordance with applicable regulations).

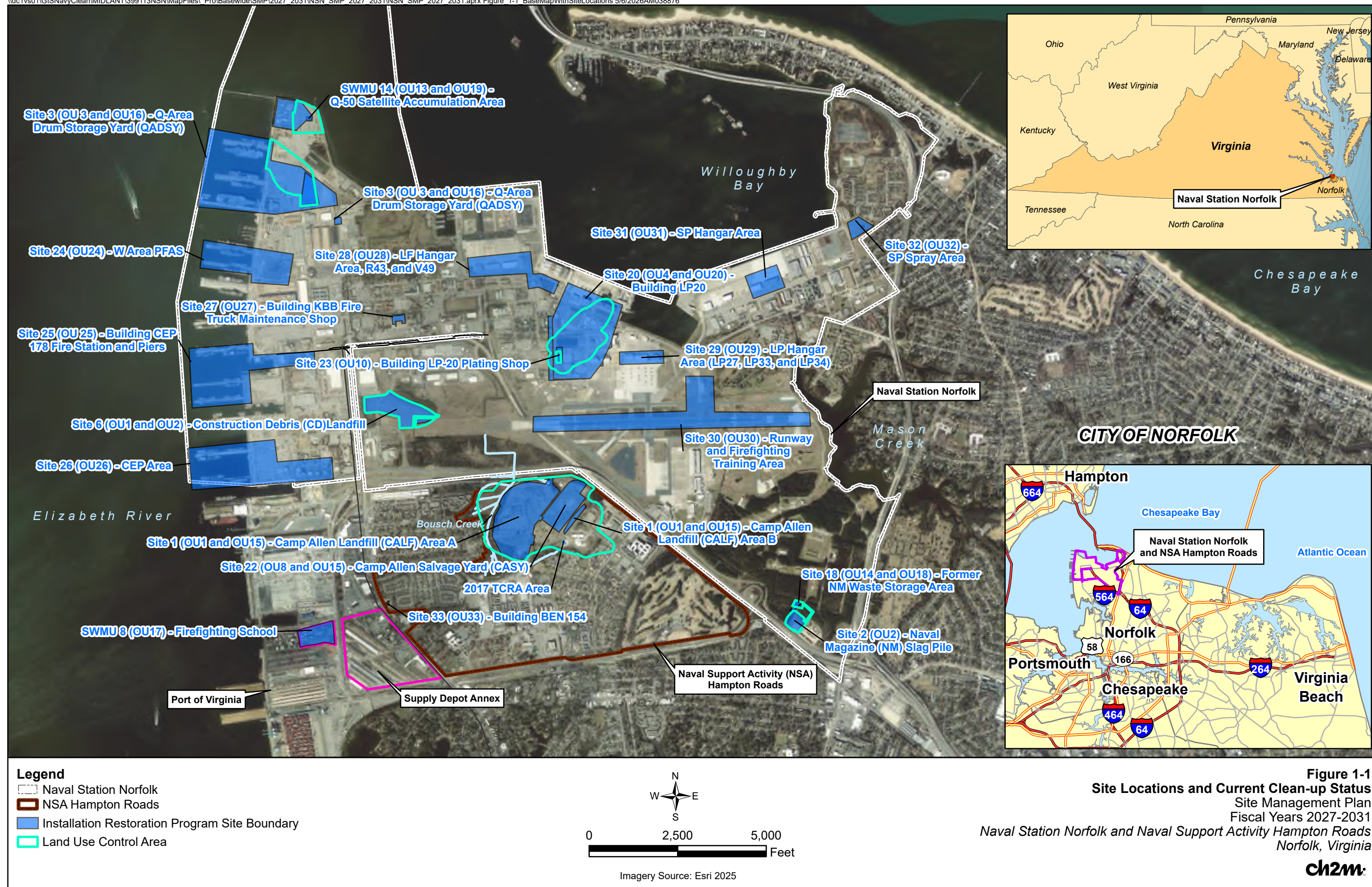
Table 1-6. NSN Partnering Team Consensus Statement Summary

Site Management Plan, Fiscal Years 2027–2031
Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Number	Date	Facility	Site	Topic	Consensus Statement
34	1/15/2008	NSN	Site 3 - AOC 1	Remedy	The team agrees that CMW-103R at AOC 1, Site 3 can be removed from the LTM following the ESD documentation for revision of the cleanup goals to MCLs. This changes is due to the concentrations over numerous monitoring events being at or below the MCLs.
35	5/21/2008	NSN	SWMU 14	Remedy	The Team agrees that the monitoring wells at SWMU 14 located within the footprint of construction activities can be abandoned based on the Team’s previous determinations (Rationale for “No-Treatment” Strategy for Groundwater at SWMU 14/Site 9, Q-50 Satellite Accumulation Area, Naval Station Norfolk , CH2M HILL, April 2008) that the water beneath SWMU 14 is not considered to be within an aquifer nor is there a preferential pathway for groundwater to discharge to Willoughby Bay and consequently long term monitoring is not required. Additionally, monitoring well abandonment will remove a man-made conduit to the water bearing zone enhancing the protectiveness of the cap.
36	10/21/2008	NSN	Site 20	Remedy	The team agrees that the groundwater clean up goals at Site 20 will be revised from the risk-based clean up goals to MCLs in order to address EPA’s previous (2003) Five Year Review comment. The revision will be documented in an NSD for Site 20.
37	10/21/2008	NSA HR	Site 1 - Area B	Remedy	The team agrees with the Navy’s recommendation for the Site 1 Area B shallow groundwater to shut down the shallow extraction system in the vicinity of B-MW3A & B-MW11A for 2-3 years in order to evaluate natural attenuation conditions. Groundwater will be conducted semiannually in accordance with an approved sampling plan.
38	5/5/2009	NSA HR	Site 1 - Area B	Remedy Optimization	As part of Camp Allen Landfill optimization measures in Area B, a single SAP will be developed to support DPT sampling in the vicinity of B-MW15A and B-MW35A to evaluate the lateral and vertical extent of VOC contamination in the vicinity of these wells and MNA sampling at B-MW3A/B-MW11A and, if appropriate, at B-MW15A/B-MW35A. The objective for evaluating shallow groundwater in these areas is to evaluate the CAL groundwater extraction and treatment system and provide for an optimization measure that no longer requires operation of the shallow portion of the system. An active treatment (such as localized in-situ injection) or monitoring for natural attenuation are the likely recommendations. Groundwater parameters will be collected in accordance with the recommendations made in the May 2008 Area B Tech Memo and the May 2009 Area B partnering presentation.
39	10/14/2009	NSN	Site 3 - AOC 1	Remedy	The team agrees that the low but persistent levels of vinyl chloride at Site 3 AOC 1 CMW01 warrant a pilot study that will be conducted employing an ORC® sock to be expeditiously implemented so the results can be evaluated in prior to the next LTM event in Feb 2010.
40	11/12/2009	NSN	Site 3 - AOC 1	Remedy - Revised Consensus	The team agrees that the low but persistent levels of vinyl chloride and the increase of TCE and cis-1,2- DCE at Site 3 AOC 1 CMW101 warrant a pilot study that will be conducted employing an HRC® sock to be expeditiously implemented so the results can be evaluated in prior to the next LTM event in Feb 2010. Once the HRC® has sufficiently reduced concentrations of TCE and cis-1,2-DCE, an ORC® sock may be inserted into the well to degrade vinyl chloride following the 2010 LTM event.
41	2/9/2011	NSN	Basewide	LTM	The Navy may delay the LTM sampling at Sites 1, 3, and 20 until an alternative plan is accepted by the VDEQ and EPA. The Navy will complete LTM at Sites 1, 3, and 20 within calendar year 2011. Additionally, the team agreed samples should be collected at Site 2 (total and dissolved metals) and include the Site 18 monitoring wells as noted in the basewide ROD.
42	1/10/2012	NSA HR	Site 1	Remedy	In accordance with the attached document, Site 1 CALF, Construction Considerations for Site Redevelopment of Area A at NSN, the site Project Managers who represent their respective agencies in the cleanup activities for CERCLA sites at NSN support the redevelopment of Environmental Restoration Site 1. This determination is based upon the addition of a minimum of 2 feet of soil being applied to the site as soil cover and any proposed buildings or structures within the site requiring review and approval. If dewatering or management of extracted groundwater is necessary during construction activities related to redevelopment, a groundwater management plan shall be prepared and submitted to the Navy, EPA, and VDEQ for review and approval. Extraction of groundwater, if necessary, will need to be conducted in a manner to prevent adverse impacts to the Site 1 CERCLA groundwater remedy (groundwater extraction and treatment).
43	10/17/2023	NSN	Site 3	LTM	1,4-dioxane groundwater sampling results have been below the PRG for eight rounds of sampling as documented in annual LTM reports. Consistent with the team agreement during the July 2020 LTM scoping session, the NSN Partnering Team agrees to removing 1,4-dioxane from the LTM sampling program at Site 3.

ARAR = Applicable or Relevant and Appropriate Requirement
CFR = Code of Federal Regulations
DCE = dichloroethene
DPT = direct-push technology
ERA = Environmental Risk Assessment
ESD = Explanation of Significant Difference
HHRA = Human Health Risk Assessment
HR = human resources

IC = Institutional controls
MCL = maximum containment level
MNA = monitored natural attenuation
MW = monitoring well
NSD = nonsignificant difference
PRG = Preliminary Remediation Goal
TCL = Target Compound List
SAP = Sampling and Analysis Plan



Site Descriptions

This section provides information regarding the active ERP sites (**Section 2.1**) and SWMUs (**Section 2.2**) at NSN and NSA Hampton Roads and the locations of the sites that are currently undergoing remediation or investigation are shown on **Figure 1-1**. This section also includes information on how contaminants of emerging environmental concern, including PFAS, are managed at NSN and NSA Hampton Roads (**Section 2.3**)

Basewide tasks, such as long-term monitoring (LTM), Five-Year Reviews, PAs, and SIs are reviewed in **Section 2.1** and **Section 2.2**, as applicable. The schedule of basewide tasks is depicted in **Schedule 2-1**. As determined appropriate by the Team, community engagement activities may be implemented in conjunction with tasks conducted in the ERP.

2.1 Environmental Restoration Program Sites

Sections 2.1.1 through **2.1.23** provide site-specific descriptions of ERP Sites 1, 2, 3, 6, 18, 20, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, and Site 1/22.¹ The following descriptions include a site summary, site description and history along with a table listing past activities, and a table listing the known constituents of concern (COCs) in each site medium. In addition, the current status of each site is briefly discussed.

¹ The PFAS Remedial Investigation at Site 1/ 22 is be tracked as a combined site.

2.1.1 Site 1 (OU1)—Camp Allen Landfill

Site 1 Summary

Status:	Remedy in place
Current IR Activities:	Remedy optimization and LTM
Media Investigated:	Soil, groundwater, surface water, sediment, subsurface vapor, indoor air
Removal and Remedial Actions:	Soil and debris removal action completed in 1995; groundwater extraction and treatment began in 1998; sediment removal of Bousch Creek was completed in 2008; soil and debris TCRA completed in 2017 in Camp Allen Elementary School parking lot; LUCs in place for groundwater
Media Closed:	N/A
Waste and Debris Present Onsite:	Buried debris present onsite

N/A = not applicable

TCRA = Time-Critical Removal Action

Site Description and History

The CALF site (**Figure 2-1**) includes three distinct areas: Area A, the 45-acre landfill, Area B, the 2-acre fire disposal area, and the 2017 TCRA area. CALF is located within the NSA Hampton Roads, as shown on **Figure 1-1**. The Area A landfill, which operated from the mid-1940s until approximately 1974, was used for the disposal of metal-plating and parts cleaning sludge, paint-stripping residue, various chlorinated organic solvents, overage chemicals, pesticides, asbestos, incinerator ash, fly and bottom ash from the Base power plant, and miscellaneous debris. Wastes from a fire at the Camp Allen Salvage Yard (CASY) (Site 22), including drums containing various chemicals, were buried in 1971 in trenches at Area B. The TCRA Area is in a parking lot area west of Camp Allen Elementary School. Impacted soil and discarded drums were identified during construction of the new Camp Allen Elementary School and subsequently removed in 2017.

The primary contaminants found in all media at the site are volatile organic compounds (VOCs). Areas of inorganic contamination in surface water and sediments in the surrounding drainage ditches and in the onsite pond were also identified. Groundwater contamination was found in both the Columbia aquifer (the shallow water table aquifer) and the Yorktown-Eastover aquifer (the deep groundwater aquifer) in Areas A and B. The presence of contamination in the deeper Yorktown-Eastover aquifer is thought to be the result of a discontinuous confining layer between the two aquifers beneath much of the CALF area.

Table 2-1 provides a list of relevant documents and past activities for Site 1.

Table 2-1. Summary of Relevant Documents and Milestones for Site 1 (OU1)

Document Title/ Milestone	Summary
RI and FS (Baker 1994) AR # 000597	The purpose of the RI was to determine the extent and degree of potential contamination associated with Areas A and B through investigation of subsurface and surface soil, sediment, surface water, groundwater, and air. Findings indicated that contamination from prior disposal practices at Areas A and B has affected the aforementioned media to various degrees. During the FS, remedial alternatives were developed to address VOC contaminants in subsurface soil and groundwater and inorganic contaminants in surface water and sediment in Areas A and B.
Soil and Debris Removal Action at Site 1 Area B (OHM 1995) AR # 000582	An NTCRA was implemented at Area B in May 1994 and completed in January 1995 to remove the primary source areas of contamination. Approximately 11,500 tons of waste were removed, and the final SI occurred February 16, 1995.

Table 2-1. Summary of Relevant Documents and Milestones for Site 1 (OU1)

Document Title/ Milestone	Summary
DD (Baker 1995a) AR # 000599	Signed in July 1995, the DD required localized treatment of soil and groundwater using DPVE system and a groundwater extraction and treatment system to remediate groundwater underlying Areas A, B, and CASY. Continuous operation of the groundwater extraction and treatment system began in November 1998 and includes extraction wells installed in Area A (for Yorktown aquifer groundwater in the western part of the area and for Columbia aquifer groundwater in the northern part of the area) and in Area B (for both Columbia and Yorktown aquifer groundwater). The DPVE system was installed and began operation in May 1998 to address a known hotspot in Area A. The extracted groundwater was pumped into a groundwater treatment system. Based on the evaluation of 2008 LTM data, the DPVE system was turned off (but maintained in an operable condition) in 2008 because there were no signs of contaminant migration in groundwater downgradient of the waste material.
Ecological Risk Assessment (CH2M 2006b) AR # 001594	Sediment in Bousch Creek that was considered to be associated with Site 1 was determined to potentially pose ecological risk.
2007 Area B Delineation Investigations (CH2M 2008e ^[a])	In 2007, additional soil and groundwater sampling were completed in the vicinity of Area B to delineate VOC contamination around monitoring wells B-MW3A and B-MW11A. Results indicated that natural attenuation appeared to be occurring at the site; however, the rate of degradation could not be estimated because of interference with the pump-and-treat system. As a result, it was recommended that pumping from extraction wells in this vicinity be discontinued for a period of 2 to 3 years while semiannual monitoring was completed to demonstrate whether natural attenuation is occurring (CH2M 2008e).
EE/CA and AM (CH2M 2007b) AR # 001594	In the EE/CA, the proposed NTCRA for Site 1 was evaluated. The supporting AM was approved as the DD for the NTCRA in October 2007, and construction activities were completed in 2008.
Construction Closeout Report (AGVIQ and CH2M 2008c ^[a])	A sediment removal action was completed to remove sediment within the upper reaches of Bousch Creek that posed an unacceptable ecological risk.
Proposed Plan and ROD (Navy 2010a) AR # 000268	The Proposed Plan and ROD reaffirmed remedial actions and LUCs for Areas A and B and CASY previously documented in the DD.
2012 Area B Delineation Investigations (CH2M 2012 ^[a])	Additional investigation of Area B was completed in 2012 to determine whether contamination in the area of B-MW16 was migrating toward Navy residential housing to the southwest. Groundwater results indicated that concentrations of chlorinated VOCs exceeded the MCL at multiple locations in the vicinity of the housing area. Additional investigation was recommended to delineate the full extent of contamination in groundwater.
LTM Reports (CH2M 2013a ^[a] , 2014a ^[a] , 2015, 2016 ^[a] , 2018, 2019a, 2020a) AR # 002752, 002726, 002913, 002881	The 2014 LTM Report identified PFAS in several monitoring wells. However, the extent of PFAS constituents has not been delineated, and the data have not been evaluated to determine whether the PFAS levels render them COCs. The 2018 LTM Report found COCs in groundwater above respective cleanup goals in Upper Columbia aquifer monitoring wells in Area B, Lower Columbia aquifer monitoring wells in Area A and B, and Yorktown aquifer monitoring wells in Area A and B. The report recommended additional investigation to refine the conceptual site model and to evaluate additional remedial options to expedite the reduction of COC concentrations to cleanup goals.
Time-Critical Removal Action (APTIM 2017 ^[a])	The Camp Allen Elementary School, which is located within the LUC area, was demolished and reconstructed in 2018 at the location shown on Figure 2-1 . A buried eight-gallon drum of oil containing PCBs was uncovered during reconstruction activities. As a result, a TCRA was completed in 2017 to prevent exposure to the assumed potential unacceptable risks to human health from exposure to site contaminated soil and/or buried drums/debris during continued school construction. The location of the TCRA is shown on Figure 2-1 .

Table 2-1. Summary of Relevant Documents and Milestones for Site 1 (OU1)

Document Title/ Milestone	Summary
Clean Water Lens Investigation	A vapor mitigation system was incorporated into the expansion of the school as a precautionary measure to prevent the potential for future VI from groundwater site-related VOC COCs. The VIMS includes an engineered barrier system as well as a passive subslab venting system constructed with the infrastructure to allow for easy conversion to an active, fan-driven system, if required.
Fourth Five-Year Review (CH2M 2019b) AR # 002748	The Fourth Five-Year Review confirmed that the remedy in place is protective in the short term; however, to ensure the remedy is protective in the long term, an RAO investigation was recommended to contain the COC plumes within the site and to remediate potential source areas to effectively reduce the COC concentrations within a reasonable timeframe.
Groundwater Flow Modeling and Capture Analysis (CH2M 2021c) AR # 002970	A three-dimensional numerical flow model has been developed to estimate hydraulic capture zones associated with onsite groundwater extraction wells in 2019. The hydraulic capture zones calculated by the groundwater flow models for both the Columbia and the Yorktown aquifers generally resemble those generated from the previous modeling efforts with slightly reduced combined capture zones for both aquifers, reflecting the slightly reduced total extraction rates as compared to 2018. A more robust model calibration effort is warranted after site wells are re-surveyed. The extraction system should be rehabilitated to restore pumping rates at the site and improve overall performance. As a part of the RAO, the groundwater extraction model should be used to determine whether increased flow rates of the extraction wells can effectively contain the groundwater contamination plumes.
LTM Report (CH2M 2024a ^[a])	The 2021 LTM Report found COCs in groundwater above respective cleanup goals in Columbia aquifer monitoring wells in Area A, Yorktown aquifer monitoring wells in Area A and B, Upper Columbia aquifer monitoring wells in Area B, and Lower Columbia aquifer monitoring wells in Area B. Though the extent of the groundwater plume in the Lower Columbia aquifer has not been fully defined near NBS01-B-MW51 in Area B, and the extent of COC concentrations in the Yorktown aquifer at Area B are not defined northeast and south of Area B, the extent of the plume is estimated to be within the expanded LUC boundary and the 2019 Groundwater Flow Model indicates the Yorktown aquifer extraction wells are likely containing the plume. While COC concentrations in groundwater remain above cleanup goals, the LUC portion of the remedy is functioning as intended and efforts are underway to optimize the remedy to expedite the time to achieve groundwater cleanup goals. Concentrations of 1,4-dioxane and the total toxic equivalency for dioxins/furans were less than the calculated risk-based preliminary remediation goal and MCL, respectively; therefore, they are not considered COCs for groundwater at this time. The report recommended delineating the extent of COCs in groundwater above cleanup goals in Area B Lower Columbia aquifer east of the Camp Allen Elementary School and continuing RAO efforts to evaluate ways to optimize the remedy.

Table 2-1. Summary of Relevant Documents and Milestones for Site 1 (OU1)

Document Title/ Milestone	Summary
Fifth Five-Year Review (CH2M 2024b) AR # 003172	The Fifth Five-Year Review concluded that the remedy at Site 1 is short-term protective of human health and the environment. The remedy is currently protective with the containment of the groundwater plumes and LUCs; however, to ensure the remedy is protective in the future, COCs to the east of the Camp Allen Elementary School will be further delineated and the remedy will be optimized to reduce COC concentrations more efficiently in groundwater and reduce remediation timeframes outside of the landfill waste boundary. In addition to the issues affecting the remedy protectiveness, the Five-Year Review identified the following information that impacts long-term site management: • Evaluation of the VI pathway is ongoing and will consider LTM groundwater data, DPT data collected during the RAO investigation, and subslab soil gas sampling results at Camp Allen Elementary School. • While expected to be in place, the construction of the VIMS has not been confirmed. • PFAS were detected in groundwater at Site 1 and further evaluation was recommended (Section 2.1.9). • Concentrations of dioxins/furans and 1,4-dioxane have been below screening criteria for two consecutive LTM events. If concentrations remain below project action limits for four consecutive LTM events, monitoring for these constituents is expected to be discontinued. • Monitoring well elevations used in the groundwater model were found to be inaccurate. New survey data will be collected for all monitoring wells and the groundwater model will be recalibrated. • VDOT is evaluating the feasibility of constructing an overpass through the footprint of Site 1. The Navy will coordinate with VDEQ and EPA to ensure any potential impacts to the remedy at Site 1 are mitigated.
Remedial Action Optimization Technology Assessment – Engineered Phytoremediation Technology (CH2M Geosyntec Consultants 2025) AR # 003281	The report evaluated whether site conditions at Site 1 were suitable for a pilot study using engineered phytoremediation technology (EPT) to help optimize the existing remedy at Site 1. The assessment considered available space for EPT installation and expansion, surrounding vegetation, equipment access, site characteristics (topography, lithology, hydrogeology, and groundwater chemistry), and applicable state and federal regulatory requirements. Results indicate that an EPT system could be an effective supplemental remedy because site conditions include relatively low contaminant concentrations, low groundwater flow rates, neutral pH, and no significant metal toxicity. However, potential challenges were identified, including installation risks due to loose soils and deeper target intervals (15–40 feet below ground surface), as well as uncertainty in hydraulic conductivity values that affect estimates of groundwater flow and EPT system sizing. To address these uncertainties and confirm feasibility, a data gap investigation was recommended, including a limited pilot test and aquifer (slug) testing to better define hydraulic conductivity and groundwater volumetric flux. Although the technology may have been suitable for the site, uncertainties in implementability and cost inflation resulted in the project being indefinitely delayed.

Table 2-1. Summary of Relevant Documents and Milestones for Site 1 (OU1)

Document Title/ Milestone	Summary
Remedial Action Optimization Report Site 1 – Camp Allen Landfill (CH2M 2025b) AR # TBD	The RAO report presents the activities and results of the RAO investigation and a supplemental EAI conducted at Site 1. The RAO investigation consisted of a geophysical survey, collection of soil and groundwater DPT data, and installation and sampling of new monitoring wells to characterize the sources and extent of site COCs at Area A and Area B and chemicals of interest (dioxins/furans at Area A and 1,4-dioxane at Area B). The investigation, which was conducted from July 2020 through August 2023, refined the extent and magnitude of COCs and chemicals of interest within the Columbia and Yorktown aquifers and found three areas of impacted soil (“hot spots”), including one at Area A, one at Area B, and one west of the school near the TCRA Area. Based on these findings, the Team decided to assess whether these soil hot spots represented an ongoing source of COCs to groundwater and to delineate these ongoing sources. To meet these objectives, an EAI was conducted at the three soil hot spots in July and August 2023. The EAI consisted of collecting co-located soil and groundwater samples at the three hot spots and in their immediate vicinity and conducting a soil-groundwater equilibrium assessment to assess leaching potential from soil to groundwater. In addition, the Team agreed to collect soil and groundwater samples within and near the 2017 TCRA excavation boundary to evaluate the extent of impacts remaining in soil and groundwater at the TCRA Area and to determine whether there are potentially unacceptable risks to human health from exposure to soil and groundwater. Because VOCs were detected in groundwater in the vicinity of residential neighborhoods south of Camp Allen Elementary School, the potential for a complete VI pathway was evaluated. The RAO report recommends an EE/CA for Area A and Area B to assess remedial alternatives for optimizing the Site 1 remedy to reduce remediation timeframes or life-cycle costs. In addition, the RAO report recommends additional investigation at the TCRA area to refine the extent of impacts and performance of a baseline human health risk assessment before evaluating remedial options for the source area identified during the RAO. Data collected to date do not indicate a complete VI pathway in the residential housing area.
LTM Report (CH2M 2026b ^[a])	The 2023 LTM report indicated that COC concentrations in groundwater in the Columbia and Yorktown-Eastover aquifer groundwater remain greater than cleanup goals. 1,4-dioxane concentrations in the Columbia aquifer at Areas A and B and Yorktown-Eastover aquifer at Area A were less than the PRG; however, the 1,4-dioxane concentrations in groundwater samples collected from the Yorktown-Eastover aquifer at Area B exceeded the PRG. The total toxicity equivalent concentration for dioxins/furans did not exceed the MCL used for 2,3,7,8-tetrachlorodibenzo-p-dioxin for the second consecutive sampling event at all monitoring wells. While the estimated extent of COCs in groundwater greater than cleanup goals was within the expanded LUC boundary, the extent of COCs in groundwater greater than cleanup goals in the Yorktown-Eastover aquifer at Area B are not defined and the existing Columbia aquifer monitoring well network at Area B does not reflect the nature of impacts identified during the RAO investigation. The report recommends continuing biennial LTM, the installation of monitoring wells in the upper and lower Columbia aquifer to refine the understanding of groundwater impacts at Area B, conducting a human health risk assessment to determine if 1, 4 dioxane should become a site COC for Area B, and collecting survey and water-level data at site monitoring wells to reduce uncertainties observed in water-level data and updating the groundwater flow and capture zone analysis. Upon completion of the groundwater flow model update, evaluation of whether additional monitoring wells are necessary in the Yorktown aquifer at Area B to verify the groundwater plume is within the expanded LUC boundary is recommended. Plume boundaries based on data collected during the 2023 LTM event are depicted on Figure 2-1 (CH2M 2026b).

^[a] This document is not uploaded to the AR.

AM = Action Memorandum

AR = Administrative Record

EAI = Equilibrium Assessment Investigation

EPT = Engineered Phytoremediation Technology

VIMS = vapor intrusion mitigation system

Site 1 (OU1) COCs

Identified COCs for each medium at Site 1 are summarized in **Table 2-2**.

Table 2-2. Summary of Constituents of Concern at Site 1 (OU1)

Medium	Potential Risk	COC
Groundwater	Human Health	1,2-DCA, PCE, TCE, cis-1,2-DCE, VC, benzene, ethylbenzene, toluene, xylene, 1,1,1-TCA
Soil	Human Health	Arsenic, cadmium, manganese
Surface Water	Ecological Risk	PCBs
Sediment	Ecological Risk	PCBs, arsenic, cadmium, metals
Indoor Air	None Identified	

DCA = dichloroethane

PCE = tetrachloroethene

TCA = trichloroethane

VC = vinyl chloride

Current and Future Activities

Following completion of the RAO investigation, an EE/CA will be completed to evaluate potential remedial alternatives for optimizing the Site 1 remedy to reduce remediation timeframes or lifecycles cost at Area A and Area B. The EE/CA is expected to begin in 2026. In addition, a RAO Phase II investigation will be completed to evaluate nature and extent of impacts on soil, groundwater, surface water, and sediment at the 2017 TCRA area refine the extent of impacts in groundwater at Area B and confirm the presence of a clean water lens in the vicinity of the Liberty Military Housing area. Work planning for the additional investigation began in 2025 and will be followed by fieldwork, risk assessment, reporting, and remedial alternatives analysis.

As a result of groundwater data collected during the RAO investigation, a reevaluation of the VI pathway at the Camp Allen Elementary School was completed in 2025. A technical memorandum summarizing the results of the VI evaluation is expected to be finalized in 2026.

Further evaluation of the VI pathway with LTM groundwater data will begin in 2026 and is expected to be finalized in 2027. The VI evaluation is expected to result in a recommendation to update the existing remedy to include an additional LUC for the VI pathway. Prior to modifying the LUC RD, a Memorandum-to-File will be completed to document the minor remedy update (2027) followed by a LUC RD Amendment (2028). While updating the LUC RD (2027/2028) to include a new LUC objective, the LUC boundary will be expanded to include the estimated extent of COCs identified during the RAO investigation.

As a part of the ongoing LTM at Site 1, all Site 1 monitoring wells were surveyed in 2024 to support recalibration of the existing groundwater flow model. The groundwater flow model recalibration and updated capture zone evaluation is expected to be finalized in 2026. Further evaluation of the groundwater extraction system is expected to begin in 2026 to determine if optimization of the existing extraction well network is feasible (**Schedule 2-2**). The results of the LTM sampling conducted in 2023 and 2024 will be included in LTM submittals expected to be finalized in 2026. The most recent round of LTM sampling was completed in 2025 and the results will be included in the 2025 LTM Data Submittal, expected to be finalized in 2027 (**Schedule 2-1**). The next LTM sampling event is scheduled for 2027 and will continue on a biennial basis (**Schedule 2-1**).

Site 1 is inspected quarterly to verify the effectiveness of the LUCs, and vegetation in the landfill footprint (Area A) is maintained semiannually. Operation and maintenance of the groundwater treatment plant at Site 1 is continuous and includes: cleaning of pump end, well screen and strainer baskets at extraction wells, extraction well pump replacement (as necessary), annual extraction well maintenance to enhance flow with chemical additives/ air jetting, quarterly cleaning of transfer pumps, and annual granular activated carbon change out.

Planning for the PFAS RI at Site 1 (as a grouping with Site 22) began in 2023, and will be followed by the field investigation expected to occur in 2026 or 2027. The details of the PFAS RI at Site 1/22 are discussed in **Section 2.1.9**.

In coordination with the Navy, VDOT is currently evaluating the feasibility of a new interchange on Interstate 564, north of Site 1; roads from the interchange would be constructed over Site 1 Area A and would connect Interstate 564 to Ingersol Avenue. The feasibility evaluation included a geotechnical investigation, which was completed in the summer of 2022, and was followed by additional investigation efforts to evaluate the presence of VOCs in subsurface soils beneath the road corridor in 2024. VOC data from the 2024 investigation will be evaluated by VDOT to determine if road construction efforts will impact the environment at Site 1 and the results will be shared with the Team. Similar to previous construction activities occurring at Site 1, the Navy will coordinate planned activities with the Team to ensure the protection of human health and the environment.

The next Five-Year Review for Site 1 is due to be finalized in 2029 (**Schedule 2-1**).

Schedule 2-2 presents the FY 2027 through FY 2031 schedule for Site 1.

2.1.2 Site 2 (OU2)—Naval Magazine Slag Pile

Site 2 Summary

Status:	Remedy in Place
Current IR Activities:	LTM
Media Investigated:	Groundwater, soil, surface water, sediment
Removal and Remedial Actions:	Sediment removal action completed in FY 1999 Asphalt and soil cover completed in FY 2000, LTM, LUCs
Media Closed:	Soil, surface water, sediment
Waste and Debris Present Onsite:	Buried debris present onsite

Site Description and History

The Naval Magazine Slag Pile (**Figure 2-2**) is a 1-acre disposal area for slag generated by an aluminum smelting operation during the 1950s and 1960s. The slag is a residual cindery material formed from the fusion of flux materials, such as limestone, with impurities from the aluminum ore and ash from the blast furnace fuel. In order to create a level surface upon which the slag could be deposited, fly ash and bottom ash (derived from coal burning operations elsewhere at NSN) was used as fill material at the site. During the smelting operation, the slag pile area was defined by a lack of vegetation around the site near the slag pile. The site surface has since been regraded and vegetation planted. Prior to remediation activities, the surface of the site consisted of a gravel parking lot and an open grassy field.

Table 2-3 provides a list of relevant documents and past activities for Site 2.

Table 2-3. Summary of Relevant Documents and Milestones for Site 2 (OU2)

Document Title/ Milestone	Summary
IAS (ESE 1983) AR # 000818	The potential for site contamination from metals, including chromium, cadmium, and zinc, was identified in the 1983 IAS.
RI (Malcolm Pirnie 1988) AR # 000102	Trace amounts of inorganics were detected in surface soil, surface water, and sediment samples taken during the 1988 RI. However, the samples were taken after site regrading and placement of gravel surfacing. Because these activities disturbed the surface soil, the analytical results may not be representative of potential subsurface contamination at the site.
RI and FS (CH2M 1998a, 1998c) AR # 001054, 001221, 001053, 000894	During the 1998 RI conducted at the site, it was concluded that the disposal activities had affected the groundwater and soil at the site, as well as sediment and surface water in the adjacent drainage channel. In correlation with the type of material disposed at the site, the primary contaminants consisted of metals, including arsenic, antimony, cadmium, chromium, copper, iron, lead, nickel, silver, and zinc. However, significant concentrations of organic chemicals (4,4'-dichlorodiphenyldichloroethene and TCE) were also detected. Sediment and surface soil sampling were conducted in February 1998 to delineate the contamination limits for a sediment removal action.
Proposed Remedial Action Design (CH2M 1999) AR # 000626	The final remedial design for the sediment removal program was submitted, and approximately 2,000 yd ³ of sediment were removed in November 1999.

Table 2-3. Summary of Relevant Documents and Milestones for Site 2 (OU2)

Document Title/ Milestone	Summary
ROD (CH2M 2000) AR # 000773	The final ROD was completed in December 2000. In February 2000, an asphalt and soil cover remedy were placed over the site. The ROD called for the collection of sediment, surface water, and groundwater samples for Target Analyte List metals analysis. The first five rounds of sampling were completed annually from 2000 to 2004. In 2004, statistical analysis results indicated that the concentrations of site risk drivers^[a] were decreasing in groundwater. In addition, the concentrations of site risk drivers in the surface water and sediment demonstrated little change since the remedial actions at the site. Therefore, based on the ROD, it was recommended that the LTM groundwater sampling be reduced to a frequency of once every 5 years, and sediment and surface water LTM sampling be discontinued.
LTM Reports (CH2M 2008f, 2014a ^[b] , 2018, 2024a ^[b]) AR # 002155, 002726	In preparation for the Second Five-Year Review (CH2M 2008d), sediment samples collected during the 2007 LTM event were analyzed for lead. The results indicated that concentrations were below the established cleanup goal, and no further sediment sampling was required following this event. Site 2 wells were sampled and analyzed for total and dissolved inorganics during the 2012 LTM event, and thallium and arsenic were detected at concentrations above their respective MCLs. The 2016 LTM event included the sampling of five Site 2 monitoring wells for total and dissolved metals. Although exit strategies for LTM at Site 2 were evaluated in 2018, the NSN Team decided to continue with the existing 5-year LTM plan because of contaminated soils remaining in place and the MCL exceedances for thallium and arsenic. The 2021 LTM sampling event consisted of a water-level survey and sampling of six Site 2 monitoring wells for total and dissolved metals. The 2021 LTM Report found metals concentrations consistent with historical results and concluded that the remedy is functioning as intended.
Five-Year Reviews (CH2M 2019b, 2024b) AR # 002748, 003172	The Fourth Five-Year Review confirmed that the remedy is protective of human health and the environment; however, as long as contaminated soils remain in place, groundwater monitoring will continue every 5 years to ensure the remedy is protective over the long term. The Fifth Five-Year Review confirmed that the remedy is protective of human health and the environment in the short-term; however, to ensure that the remedy is protective in the future, the Navy intends to evaluate residential exposure to soil and groundwater outside the soil and asphalt cover.
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Site 2 was not identified as a potential PFAS release area. The PA recommended no further investigation at Site 2; however, if additional information becomes available, Site 2 may be re-evaluated.

^[a] The ROD did not identify COCs. Total and dissolved metals are risk drivers at Site 2.

^[b] This document is not uploaded to the AR.

yd³ = cubic yard(s)

Site 2 (OU2) COCs

Identified COCs for each medium at Site 2 are summarized in **Table 2-4**.

Table 2-4. Summary of Constituents of Concern at Site 2 (OU2)

Medium	Potential Risk	COC
Groundwater	Human Health	Total and dissolved metals ^[a]
Soil	Human Health	Aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, nickel
Surface Water	Ecological	Aluminum, cadmium, copper, iron, lead, silver, zinc
Sediment	Ecological	Aluminum, silver, antimony, arsenic, barium, beryllium, cadmium, cobalt, copper, chromium, iron, lead, nickel, selenium, thallium, vanadium, zinc

^[a] The ROD did not identify COCs. Total and dissolved metals are risk drivers at Site 2.

Current and Future Activities

Quarterly site inspections are conducted to confirm that LUCs are being implemented. LTM of groundwater is conducted every 5 years to assess the trends in COC concentrations over time. The most recent LTM sampling was completed in 2021 in support of the Fifth Five-Year Review (CH2M 2024b). The next LTM monitoring event is scheduled to be completed in 2026.

As a result of the data evaluation in the Fifth Five-Year Review, and in order to ensure long-term protectiveness, the residential risk exposure pathway was evaluated in 2025. After further evaluation of the historical dataset, and Team discussion in December 2025, the Team agreed additional data were needed to evaluate potential risk to a residential receptor. A data gap investigation, including development of a Sampling and Analysis Plan, performance of fieldwork, and subsequent reporting, is expected to begin in 2027(**Schedule 2-3**).

The next Five-Year Review for Site 2 is due to be finalized in 2029 (**Schedule 2-1**).

Schedule 2-3 presents the FY 2027 through FY 2031 schedule for Site 2.

2.1.3 Site 3 (OU3)—Q-Area Drum Storage Yard

Site 3 Summary

Status:	Remedy in place
Current IR Activities:	LTM
Media Investigated:	Groundwater, soil
Removal and Remedial Actions:	Pre-NPL soil removal in 1987 AS/SVE discontinued in FY 2013
Media Closed:	N/A
Waste and Debris Present Onsite:	N/A

Site Description and History

The Q-Area Drum Storage Yard (**Figure 2-3**) was previously a compound that occupied approximately 5 acres in the northwestern corner of the NSN near the carrier piers. This area of NSN was created by dredging operations in the early 1950s as the Base expanded. The Q-Area Drum Storage Yard was an open earthen yard that was used from the 1950s until the late 1980s to store tens of thousands of drums. Most of the drums contained new petroleum products, various chlorinated organic solvents, paint thinners, and pesticides. Previous investigations showed dark stains on the soil and oil-saturated soil throughout the storage yard, indicating past spills. The northern portion of the yard, which was used to store leaking or damaged drums and hazardous materials, was particularly stained. To reflect the two distinct areas of higher concentrations of VOCs observed during historical field investigations, the site was subdivided into AOCs (AOC 1, which is approximately 7 acres across the southeastern corner of the site, and AOC 2, which occupies 2.5 acres) across the western extent of the site (**Figure 2-3**).

Table 2-5 provides a list of relevant documents and past activities for Site 3.

Table 2-5. Summary of Relevant Documents and Milestones for Site 3 (OU3)

Document Title/ Milestone	Summary
Pre-NPL Soil Removal	In 1986, Navy fire inspectors expressed concern with the oil-saturated soils at the northern end of the storage area. On the basis of a potential fire hazard, the top 6 inches of soil were excavated from an area of 4,240 square yards (totaling approximately 750 yd ³ of soil removed) in the northern section and disposed of offsite in 1987. Following the removal action, this area of the storage yard was paved. The removal action was documented in the subsequent RI (ESE 1996a).
RI and FS (ESE 1996a) AR # 001108	The RI/FS for this site revealed that the soil was contaminated with petroleum hydrocarbons, VOCs, and pesticides. In addition, VOC contamination was found in the groundwater beneath the site and outside the site boundary. The shallow groundwater beneath the hazardous materials area and the northern portion of the petroleum products area was affected the most. Some low VOC levels were also detected in the deep (Yorktown aquifer) wells, which may have resulted from the lack of a confining layer between the two aquifers (Columbia and Yorktown) in this area. The general extent of the groundwater plume was estimated to affect approximately 29 acres beneath the fleet parking area west of the site. The Q-Area Drum Storage Yard was subdivided into AOC 1 and AOC 2 to reflect that the yard contained two areas of high VOC concentrations.
DD (ESE 1996b) AR # 000934	The DD for the site was signed in November 1996 and called for remediation by AS/SVE. A pilot treatability study was performed prior to the system being constructed. Several monitoring wells were sampled for VOCs in 1998 to provide baseline water quality data before the remediation system was started. The remediation system began operation in August 1998.

Table 2-5. Summary of Relevant Documents and Milestones for Site 3 (OU3)

Document Title/ Milestone	Summary
AOC 1 Closeout Strategy Agreement	In July 2002, the Team agreed to a closeout strategy for AOC 1, including the accelerated remediation proximal to CMW-101 to address high concentrations of VC, followed by continued monitoring, and ultimately the shutdown and dismantling of the system. The accelerated remediation was accomplished by installation of a new AS well proximal to well CMW-101. The closeout strategy was implemented on April 4, 2003, when the new AS well began operation. Following the installation of the new AS well, concentrations of VC in well CMW-101 decreased to below the detection limit in February 2005. Subsequent monitoring events indicated relatively low VC concentrations that exceeded the cleanup goal (0.08 micrograms per liter), so the 2002 closeout strategy was suspended.
AOC 2 Closeout Strategy	A closeout strategy for AOC 2 was implemented in June 2006 with the installation of an additional AS well proximal to CMW-202 to treat TCE and VC. However, LTM data indicated that VOC concentrations continued to exceed the cleanup goals.
Proposed Plan and ROD (Navy 2010a) AR # 000268	The remedy selected by the 1996 DD (ESE 1996b) was reaffirmed by the Proposed Plan and ROD for Sites 1, 3, 18, and 20, which was signed in September 2010. The groundwater cleanup goals, based on the risk-based values presented in the DD (ESE 1996b) (based on the most likely exposure scenarios), continued to serve as the cleanup goals because the risk-based goals were more protective than the respective MCLs.
LTM Reports (CH2M 2014a ^[b] , 2015, 2018, 2019a, 2020a, 2021d, 2022b, 2024a ^[b] , 2026a ^[b] , 2026b ^[b] , 2026c ^[b]) AR # 002752, 002726, 002913, 002881, 002941, 002988	Annual LTM began in 2000 to evaluate and optimize the AS/SVE systems at AOC 1 and AOC 2 and optimize the groundwater monitoring program. In addition to the site COCs, groundwater samples were analyzed for 1,4-dioxane from 2013 through 2020, after which the Team agreed 1,4-dioxane could be removed from the sampling program because concentrations in groundwater samples had been less than the PRG for eight consecutive events (CH2M 2022b). Since the AS/SVE systems were pulsed off (2013), LTM through 2024 has indicated that concentrations of COCs remain in groundwater greater than their cleanup goals but concentrations are generally stable across the site and the RAO of minimizing the threat to potential human receptors (resident) from exposure to contaminated groundwater through the inhalation of VOCs in future buildings is being achieved through LUCs. Further administrative documentation is planned (e.g. Memo-To-File and LUC RD Amendment) to ensure risk to a future site worker is minimized.
(continued)	The 2023 LTM Report recommends reducing the frequency of LTM at Site 3 to once every 5 years in conjunction with the Five-Year Review and to revise the cleanup goals for carbon tetrachloride, chloroform, 1,1-DCE, and VC from their risk-based values to their Applicable or Relevant and Appropriate Requirements. Plume boundaries based on data collected during the 2024 LTM event are depicted on Figure 2-3 (CH2M 2026a).
Five-Year Reviews (CH2M 2019b, 2024b) AR # 002748, 003172	Based on Team discussion of the groundwater data collected in 2012, the systems at AOC 1 and AOC 2 were shut down in June 2013 while annual LTM continues to assess remedy effectiveness and identify opportunities for future optimization. The Fourth Five-Year Review concluded that the remedy implemented at Site 3 is protective of human health and the environment (CH2M 2019b). The following actions will continue at the site: (1) quarterly site inspections will be conducted to confirm implementation of the LUCs, and (2) LTM of groundwater will be conducted every year to assess the trends in COC concentrations. The Fifth Five-Year Review concluded that the selected remedy at Site 3 is protective (current and future) of human health and the environment. While the remedy was considered protective, the Fifth Five-Year Review identified the following information that impacts long-term site management: 1. Site 3 was identified as a potential PFAS release area and further evaluation in the form of an RI is planned (Section 2.1.10). 2. The cleanup goals identified in the ROD for select COCs are less than MCLs and should be modified to equal the MCLs. 3. The VI pathway should be evaluated.

^[a] Because of schedule delays, the 2019 LTM event was completed in February 2020, and the report was finalized in August 2021.

^[b] This document is not uploaded to the AR.

Site 3 (OU3) COCs

Identified COCs for each medium at Site 3 are summarized in **Table 2-6**.

Table 2-6. Summary of Constituents of Concern at Site 3 (OU3)

Medium	Potential Risk	COC
Groundwater	Human Health	1,1-DCE, PCE, TCE, VC, carbon tetrachloride, chloroform
Soil	Human Health	N/A

Current and Future Activities

The most recent round of LTM sampling was completed in 2025. The next LTM event is scheduled to be completed in 2026 after which sampling will be conducted every 5 years in conjunction with the Five-Year Review. Results from the 2023 and 2024 sampling events will be included in LTM submittals anticipated to be finalized in 2026 and the results from the 2025 sampling event will be included in an LTM data submittal expected to be finalized in 2027 (**Schedule 2-1**). Site inspections will be conducted quarterly at Site 3 to confirm that LUCs are being implemented.

Evaluation of the VI pathway with LTM groundwater data will begin in 2026 and is expected to be finalized in 2027 (**Schedule 2-4**). The VI evaluation is expected to result in a recommendation to update the existing remedy to include an additional LUC for the VI pathway. Prior to modifying the LUC RD, a Memorandum-to-File will be completed to document the minor remedy update (2027) followed by a LUC RD Amendment (2028).

An Explanation of Significant Difference will be completed to modify the cleanup goals of existing COCs and is anticipated to be completed in 2027 (**Schedule 2-4**). Planning for the PFAS RI at Site 3 began in 2024 and will be followed by a field investigation in 2026. The details of the PFAS RI at Site 3, which is being investigated as grouping with Piers 11, 12, and 14 and Bunker Hill and Maryland Avenue as OU16, are discussed in **Section 2.1.10**.

The next Five-Year Review for Site 3 is due to be finalized in 2029 (**Schedule 2-1**).

Schedule 2-4 presents the FY 2027 through FY 2031 schedule for Site 3.

2.1.4 Site 6 (OU1 for Sediment and OU2 for Soil, Surface Water, and Groundwater)—Construction Debris Landfill

Site 6 Summary

Status:	Remedy in place
Current IR Activities:	LTM
Media Investigated:	Groundwater, soil, surface water, sediment
Removal and Remedial Actions:	Sediment removal action, synthetic cap, LTM, LUCs
Media Closed:	N/A
Waste and Debris Present Onsite:	Buried debris present onsite

Site Description and History

The CD Landfill (**Figure 2-4**) occupies approximately 22 acres and is located just east of Hampton Boulevard and south of the Naval Exchange. The site incorporates two areas of landfilling operations: the easternmost (unpermitted) section and the western (permitted) section. The unpermitted portion of the landfill operated from 1974 to 1979, and was used for demolition debris and inert solid waste, fly ash, and incinerator residue.

In October 1979, NAVFAC received a permit from the Virginia Department of Health to use the landfill (western portion) for disposal of demolition debris and other non-putrescible wastes, excluding fly ash, incinerator residues, chemicals, and asbestos. Blasting grit used for sandblasting cadmium-plated aircraft parts was deposited at the landfill until 1981, when the blasting grit was tested and found to exceed the EPA extraction procedure toxicity limit for cadmium. The grit was classified as a hazardous waste, and onsite disposal of the material ceased. Landfilling operations continued in the western portion of the site until 1987. At the time the landfill permit was granted, a portion of the southeastern corner of the site was regraded to allow for runway expansion at the Naval Air Station. The design of the runway expansion specified that excess material was to be spread over the landfill and not removed from the site.

In 1993, Seabee Road was constructed over the site and opened to the public. Construction plans required only the addition of fill material; no cutting or grading into the existing landfill occurred. Most of the existing debris mounds situated in the north-central portion of the landfill were leveled and spread around the site to reduce the amount of standing water that accumulated after rain events.

Table 2-7 provides a list of relevant documents and past activities for Site 6.

Table 2-7. Summary of Relevant Documents and Milestones for Site 6 (OU1 and OU2)

Document Title/ Milestone	Summary
RI/Baseline Risk Assessment (Baker 1995b) AR # 000578	The RI was completed in three separate rounds of sampling. Soil, sediment, groundwater, and surface water samples were collected. The results of the RI/Baseline Risk Assessment were used to prepare the FS (Baker 1996b).
FS (Baker 1996b) AR # 001073	The FS was prepared in July 1996 to address contaminated media at the CD Landfill site. Potential risks associated with contaminants in the soil, sediments, groundwater, and surface water were identified, and these guided the development and evaluation of the media-specific remedial action alternatives. In addition to the FS, a separate geostatistical analysis was performed to evaluate and better define the areas of sediment contamination.

Table 2-7. Summary of Relevant Documents and Milestones for Site 6 (OU1 and OU2)

Document Title/ Milestone	Summary
DD (Baker 1996c) AR # 001074	A 1996 DD for the contaminated sediments (designated as OU1) at the CD Landfill outlined a removal action for sediments that exceeded the Effects Range–Median levels. Removal of heavy metal- and pesticide-contaminated sediments was partially completed in fall 1997 but was postponed during the winter because of inclement weather. When the OU2 (soil and groundwater) landfill cap was designed, the cap was extended to cover the remaining contaminated sediments so no further removal would be required. In June 1997, the Team agreed to an additional sampling event to characterize the fill material and determine closure requirements. A statistical sampling approach was developed to determine within a specified confidence interval whether the fill material would be classified as hazardous. All of the samples collected and analyzed during the June event were below the regulatory standards. Based on the statistical findings, the fill material at the CD Landfill was not considered a hazardous waste and it was agreed that the site would be closed under Virginia Solid Waste Management Regulations.
PRAP (Baker 1998a) AR # 001079	The PRAP identified the preferred alternative, a synthetic flexible liner-capping system with groundwater monitoring and institutional controls, for the CD Landfill.
ROD (Baker 1998b) AR # 001056	The final ROD was issued on September 28, 1998. The construction of the landfill cap was completed in December 1999.
Post-closure Monitoring Report (AGVIQ and CH2M 2004 ^[a])	As a requirement of Virginia Solid Waste Management Regulations (Part D of 9 Virginia Administrative Code 20-80-270), the CD Landfill was part of the NSN LTM program for the first 4 years of monitoring as discussed in the 2003 Post-closure Monitoring Report (AGVIQ and CH2M 2004) and in the 2004 First Determination Report for Site 6 (CH2M 2004a).
LTM Reports (CH2M 2006a ^[a] , 2018, 2024a) AR # 003204, 002726	Following the post-closure monitoring, LTM was initiated in 2005. The LTM network includes eight monitoring wells, which are sampled every 5 years for site COCs. If COCs are detected at concentrations exceeding the MCLs or risk-based alternate concentration limits, or if COC concentrations have increased, then the NSN Team will determine the appropriate action and modify the existing remedy if warranted. In May 2013, the VDEQ Landfill Permit was revoked and the NSN Team agreed that any subsequent oversight, including the LTM program, would be conducted under the CERCLA program by the NSN Team. The 2016 LTM event data showed that only one of the groundwater samples contained a COC (arsenic) at concentrations above the MCL (CH2M 2018). However, the arsenic concentration was lower than the concentration previously detected at the same location in 2007. In addition, there were no other exceedances of the MCLs. As a result, no modifications to the remedy or the LTM program were recommended. The 2021 LTM sampling event found concentrations consistent with historical results. While the concentrations of dissolved arsenic exceeded the MCL at one monitoring well, the concentrations were lower than the total arsenic concentration detected during the 2016 LTM event. The 2021 LTM Report concluded that the remedy is functioning as intended.
HHRA (CH2M 2013b ^[a])	An HHRA was conducted using the data collected from 2007 and 2011 to evaluate any changes in the contaminants driving risk in groundwater as established in the 1994 RI/HHRA, to determine whether contaminants detected in groundwater warranted further evaluation. The report concluded that potential contact with groundwater by future adult and child residents may result in reasonable maximum exposure and central tendency exposure noncarcinogenic hazards and carcinogenic risks above EPA's acceptable risk range. Groundwater elevations indicated groundwater flow to the east at the site.
Five-Year Reviews (CH2M 2019b, 2024b) AR # 002748, 003172	The Fourth Five-Year Review concluded that the remedy implemented at Site 6 is protective of human health and the environment. The following actions will continue at the site: (1) quarterly site inspections will be conducted to confirm implementation of the LUCs, and (2) LTM of groundwater will be conducted every 5 years to assess the trends in COC concentrations. The Fifth Five-Year Review concluded that the remedy at Site 6 is functioning as intended and is protective (current and future) of human health and the environment. While the remedy is protective, the Fifth Five-Year Review concluded that the approach for assessing the remedy should be refined before the next groundwater sampling event.

Table 2-7. Summary of Relevant Documents and Milestones for Site 6 (OU1 and OU2)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a ^[a]) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Site 6 was not identified as a potential PFAS release area. The PA recommended no further investigation at Site 6; however, if additional information becomes available, Site 6 may be re-evaluated.

^[a] This document is not uploaded to the AR.

Site 6 (OU1 and OU2) COCs

Identified COCs for each medium at Site 6 are summarized in **Table 2-8**.

Table 2-8. Summary of Constituents of Concern at Site 6 (OU1 and OU2)

Medium	Potential Risk	COC
Groundwater	Human Health	PCBs, arsenic, antimony, beryllium, chlorobenzene
Soil	Human Health	Arsenic, beryllium, lead, manganese, antimony, cadmium, chromium, copper, nickel, vanadium, zinc
Surface Water	Ecological	Dieldrin, 4,4-dichlorodiphenyldichloroethane, cobalt, copper, iron, manganese, nickel
Sediment	Ecological	Semivolatile organic compounds, 4,4-dichlorodiphenyltrichloroethane, PCBs, arsenic, cadmium, chromium, copper, lead, nickel, mercury, zinc

Current and Future Activities

The most recent LTM sampling event was completed in 2021 in support of the Fifth Five-Year Review (CH2M 2024b). The approach for assessing the remedy at Site 6 will be refined in the next Basewide LTM Sampling and Analysis Plan anticipated to be finalized in 2026 (**Schedule 2-1**). The next LTM monitoring event is scheduled to be completed in 2026 (**Schedule 2-1**). Site inspections will be conducted quarterly at Site 6 to confirm that LUCs are being implemented. Vegetation at Site 6 is maintained semiannually.

The next Five-Year Review for Site 6 is due to be finalized in FY 2029 (**Schedule 2-1**).

2.1.5 Site 20 (OU4)—Building LP-20

Site 20 Summary

Status:	Remedy in place
Current IR Activities:	RAO and LTM
Media Investigated:	Groundwater, soil, subslab vapor, indoor air
Removal and Remedial Actions:	AS/SVE
Media Closed:	N/A
Waste and Debris Present Onsite:	N/A

Site Description and History

Building LP-20 (**Figure 2-5**) is one of many large buildings northwest of the Naval Air Station main runway. Currently, the building houses the Public Works Center Transportation Department. In the past, a portion of the building was used for aircraft engine overhaul and maintenance. Previous activities at the building included painting, facilities for x-ray work, cleaning and blasting, and a metal-plating operation. Waste products generated from these activities were conveyed to the industrial wastewater treatment plant via underground piping. In addition, a large fuel storage area (Fuel Farm) is located south of the building. An underground pipeline extends from the Fuel Farm to Buildings LP-78 and LP-176, located east of the site. Between the 1940s and 1990s, numerous spills or releases of wastewater and petroleum have been documented. Significant releases were associated with damage to underground wastewater lines during construction activities and leakage of the underground petroleum pipeline.

Investigations at the site began in 1986 following a release of jet propulsion-5 fuel from the underground pipeline. Since 1986, numerous investigations have been conducted to evaluate the extent of releases from underground fuel pipelines, the industrial wastewater line, and various underground storage tanks at the site. These investigations determined that significant amounts of free product (petroleum) and chlorinated solvents were present.

Table 2-9 provides a list of relevant documents and past activities for Site 20.

Table 2-9. Summary of Relevant Documents and Milestones for Site 20 (OU4)

Document Title/ Milestone	Summary
RI and FS (Baker 1995c, 1996b) AR # 001304, 001218	The RI and FS summarizing the previous investigation data were completed in 1995 and 1996, respectively. The data generated during the RI indicated that VOCs were the primary COCs detected within groundwater in the area. Specifically, chlorinated VOCs were detected in the vicinity of Buildings LP-20 and LP-26. In addition, petroleum products were present within the groundwater east of Building LP-22 and south of Building LP-179. VC, 1,1- DCE, 1,2-DCE, 1,2-DCA, TCE, and benzene were detected in the shallow aquifer (Columbia). VC, 1,2-DCE, and TCE were also detected in the deep aquifer (Yorktown).
DD (Baker 1996d) AR # 001161	The DD (Baker 1996d) for Site 20 required that contamination at the site be treated to reduce the potential risk to human health and the environment. The goal of the remedial action was to treat the contaminant plume in the shallow aquifer using an AS/SVE system to prevent migration of the plume offsite and into the deep aquifer and to reduce the contaminant concentrations to established cleanup goal levels. In addition, aquifer use restrictions (for both the shallow and deep aquifer) were mandated to prevent the groundwater from being used for either a potable or non-potable (industrial water) source.
LTM Plan (CH2M 1998b ^[a])	The treatment system began operating on April 14, 1998. The shallow aquifer AS/SVE system consisted of 31 AS wells and 21 SVE wells. The system was placed throughout the center and downgradient extent of the contaminant plume in accessible areas. In addition, several monitoring wells were sampled for VOCs in February 1998 to provide baseline water quality data before the remediation system was started.

Table 2-9. Summary of Relevant Documents and Milestones for Site 20 (OU4)

Document Title/ Milestone	Summary
LTM Reports (CH2M 2001 ^[a] ; AGVIQ and CH2M 2005 ^[a] , 2007a ^[a] , 2007b ^[a] , 2008a ^[a] , 2011 ^[a] ; CH2M 2013a ^[a] , 2014a ^[a] , 2015, 2016 ^[a] , 2018, 2019a, 2020a, 2021d, 2022b, 2024a ^[a] , 2026a ^[a] , 2026b ^a , 2026c ^a) AR # 002752, 002726, 002913, 002881, 002941, 002988	The first round of LTM was performed in February 1999, after approximately 10 months of system operation, and annual LTM has continued since. Monitoring currently consists of annual sampling of shallow and deep monitoring wells to track the levels of contaminants at the site and determine whether these constituents are migrating offsite or into the deep aquifer. Based on LTM data through 2013, the AS/SVE system was turned off (but maintained in an operable condition) in 2013, and LTM continued. During LTM in 2014, PFAS and 1,4-dioxane were analyzed in select groundwater samples. PFAS were detected at greater than screening criteria, but further evaluation or investigation was deferred to the RI (Section 2.1.13). The concentration of 1,4-dioxane exceeded the EPA Tap Water Regional Screening Level and was subsequently added to the list of analytes monitored during LTM. LTM through 2024 indicated that concentrations of COCs and 1,4-dioxane remain in groundwater greater than their cleanup goals. While concentrations are not decreasing, exposure to contaminated groundwater is prevented via LUCs. The Columbia and Yorktown-Eastover aquifer plume boundaries, based on data collected during the 2024 LTM event, are depicted on Figure 2-5 (CH2M 2026c).
PRAP and ROD (Navy 2010a) AR # 000268	The remedy selected by the DD was reaffirmed in the PRAP and ROD for Sites 1, 3, 18, and 20 (ROD signed September 2010). The groundwater cleanup goals were revised from the risk-based values presented in the 1996 DD (Baker 1996d) (based upon the most likely exposure scenarios) to the federal MCLs.
Remedy Optimization	Following recommendations from the Remedial Process Optimization Team, a groundwater extraction system was installed at the site to supplement the existing AS/SVE system. The enhanced system (groundwater extraction and AS/SVE systems) began operation in August 2010. The groundwater that was extracted contained high concentrations of VOCs, successfully reducing the mass of VOCs remaining in groundwater at Site 20. However, high iron concentrations in groundwater caused scaling in the air stripper, which had to be taken offline to perform maintenance. In addition, the extraction system captured residual petroleum, oil, and lubricants from an adjacent site, which clogged the filter bags. Because of the operational issues requiring significant maintenance activities, the extraction system ceased operation in 2011.
Five-Year Reviews (CH2M 2019b, 2024b) AR # 002748, 003172	The Fourth Five-Year Review concluded that the remedy at Site 20 is currently protective of human health and the environment in the short term. Exposure pathways that could pose an unacceptable risk are being controlled through LUCs. In order for the remedy to be protective over the long term, the following actions need to be undertaken: (1) conduct a VI investigation to assess whether the vapors from the underlying COC plumes pose an unacceptable risk to human health, (2) complete the installation of a pilot-scale SBGR and conduct 1 year of performance monitoring to assess whether the SBGR can reduce the COC concentrations to meet the remedial action objectives, and (3) evaluate SBGR effectiveness in treating the 1,4-dioxane and consider potential modifications necessary for full-scale deployment. In addition, conduct an expanded PA/SI to further characterize the nature and extent of PFAS constituents onsite. The Fifth Five-Year Review concluded that the remedy at Site 20 is short-term protective of human health and the environment. The remedy is currently protective with LUCs; however, to ensure the remedy is protective in the future, the Navy intends to evaluate additional groundwater treatment technologies and continue to assess the VI pathway. In addition to the issues affecting the remedy protectiveness, the Five-Year Review identified the following information that impacts long-term site management: • Data collected during the SVE system evaluation are being evaluated to determine the effectiveness of the SVE to reduce soil gas concentrations at Buildings LP-20 and LP-26. • PFAS were detected in groundwater at Site 20 and further evaluation was recommended.
Vapor Intrusion Investigation (CH2M 2020b ^[a])	The VI investigation was completed in 2019 and identified elevated levels of VOCs within the indoor air at Office 120 inside Building LP-26. As a result, two APUs have been installed, and air monitoring has been ongoing to keep indoor air concentrations of TCE below acceptable risk-based guidelines.

Table 2-9. Summary of Relevant Documents and Milestones for Site 20 (OU4)

Document Title/ Milestone	Summary
Draft Expanded Vapor Intrusion Investigation Report (CH2M 2021b)	The Expanded VI investigations resulted in the following recommendations: - No further response is warranted for the VI pathway at Buildings U-111, U-132, V-61, and V-147 because the multiple lines of evidence evaluation and HHRA results did not identify current or future risks related to VI. - The VI pathway warrants consideration during evaluation of the overall site remedy as part of the CERCLA process for Buildings LP-20, LP-22, LP-24, and LP-26 based on potential risks above the risk target range of 1×10^{-6} to 1×10^{-4} to future industrial and residential receptors.
Performance Monitoring of APUs Report Site 20, Building LP-26, Office 120 (CH2M 2022d ^[a] , 2023b, 2024c, 2024d, 2026d)	The indoor air monitoring at Office 120 within Building LP-26 is conducted to evaluate the effectiveness of two APUs deployed to reduce the concentration of TCE in indoor air. From August 2020 to July 2022, monthly indoor air samples were collected and data indicated that the APUs are effective in maintaining indoor air concentrations of TCE in Office 120 below the agreed-upon target levels with a carbon changeout frequency of approximately 4 months. Beginning August 2023, the sampling frequency was reduced to every four months. The carbon changeout frequency continues to be triannual (every 4 months). As performance monitoring continues, the most recently reported data was from the period of August 2024 to July 2025. Data indicate the APUs continue to operate as intended and are effectively maintaining TCE concentrations measured in indoor air less than the agreed-upon target levels with the triannual carbon changeout frequency. While APUs continue to maintain TCE concentrations in indoor air less than the target level, intermittent power interruptions were observed during the reporting period. Increased inspections were recommended to determine if outages were anomalous in addition to continued APU operation, maintenance and triannual carbon changeout, building surveys, and monitoring of indoor air.
Remedy Optimization – Soil Vapor Extraction Evaluation Study (CH2M 2025a)	The AS/SVE system was installed at Site 20 in 1998 and operated through 2013 when the system was shut down because of ongoing performance, maintenance, and operational issues. Because of ongoing data collection and review at Site 20, the Navy began evaluating options for long-term mitigation to address potential future VI risks at Buildings LP-20 and LP-26, including restarting the SVE system and evaluating its effectiveness. The scope of work included soil, soil vapor, and indoor air sampling and collecting direct measurements of radon and differential pressure to assess overall influence of the SVE on VI potential at Buildings LP-20 and LP-26. The results of the evaluation indicated that the SVE system does not effectively mitigate VI, based on frequent water entrainment into the SVE knockout tank and no discernable trends in the analytical or direct measurement data. In addition, analytical data indicated the presence of a residual soil source. There was no influence of the SVE system observed in the soil source area and was, therefore, determined to not effectively reduce source concentrations. Because of the evaluation, the SVE system was turned off and remains in long-term operations and maintenance status, with no plans to modify or optimize the system. A Focused Feasibility Study was recommended to evaluate alternative mitigation technologies to address the VI pathway at Site 20.

^[a] This document is not uploaded to the AR.

APU = air-purifying unit

Site 20 (OU4) COCs

Identified COCs for each medium at Site 20 are summarized in **Table 2-10**.

Table 2-10. Summary of Constituents of Concern at Site 20 (OU4)

Medium	Potential Risk	COC
Groundwater	Human Health	1,2-DCA, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, benzene, TCE, VC
Soil	Human Health	Arsenic, beryllium, benzo(a)pyrene

Current and Future Activities

To expedite the reduction of COC concentrations in groundwater, two pilot tests were completed at Site 20 to evaluate effectiveness of a SBGR and enhanced in situ bioremediation. The SBGR installation was completed in 2024, and quarterly SBGR performance monitoring was conducted for 1 year starting in 2024. The enhanced in situ bioremediation pilot study, consisting of substrate injections into existing AS wells was completed in 2024. This pilot study also included 1 year of performance monitoring. Results of the SBGR and enhanced in situ bioremediation pilot studies will be documented in a summary report expected to be finalized in 2026. Following completion of these pilot studies and the RI for PFAS (**Section 2.1.13**), alternatives to address groundwater at Site 20 will be evaluated in an FS, proposed to the public in a Proposed Plan, and documented in an amendment to the ROD (**Schedule 2-5**). Air purifying units continue to operate in Office 120 at LP-26 to reduce TCE concentrations in indoor air. Indoor air is monitored every 4 months to verify the concentration of TCE measured in indoor air remains below target levels agreed to by the Team. The next Performance Monitoring Report, which will summarize August 2025 through July 2026 indoor air data, is expected to be finalized in 2027. Monitoring, filter changeout, and reporting are expected to continue indefinitely until the TCE source beneath LP26 is addressed.

The most recent LTM sampling event was completed in 2025 and will continue to be conducted annually (**Schedule 2-1**). Results from the 2023 and 2024 sampling events will be included in LTM submittals expected to be finalized in 2026 and the results from the 2025 sampling event will be included in an LTM data submittal expected to be finalized in 2027 (**Schedule 2-1**).

The Navy and EPA have resolved discrepancies that were delaying the finalization of the Expanded VI report. The Expanded VI Report is expected to be finalized by 2027. In addition to evaluating VI data collected in 2019, the Expanded VI report will evaluate VI from groundwater with LTM data. Following finalization of the Expanded VI report, a Focused FS to address the VI pathway will be completed (2028).

Planning for the PFAS RI at Site 20 (OU20) began in 2024 and will be followed by a field investigation in 2026. The PFAS investigation includes other PFAS release areas in the vicinity of Site 20 (OU4). The details of the PFAS RI at Site 20 (OU20) are discussed in **Section 2.1.13**.

The next Five-Year Review for Site 20 is due to be finalized in 2029 (**Schedule 2-1**).

Schedule 2-5 presents the FY 2027 through FY 2031 schedule for Site 20.

2.1.6 Site 22 (OU8)—Camp Allen Salvage Yard

Site 22 Summary

Status:	Remedy in place
Current IR Activities:	LTM
Media Investigated:	Groundwater, soil, surface water, sediment
Removal and Remedial Actions:	Soil removal action, soil cover, and LUCs
Media Closed:	Soil, sediment
Waste and Debris Present Onsite:	Buried debris present onsite

Site Description and History

The CASY (**Figure 2-6**) operated from the 1940s until 1995, salvaging and processing scrap materials generated at NSN. The CASY is between Area A and Area B of the CALF site (Site 1). The CASY activities included storage and management of waste oils, used chemicals, and scrap industrial and commercial equipment. Metal smelting, various recycling activities, and miscellaneous burning also occurred at the CASY. In addition, the facility was used to store acids, paint thinners, solvents, pesticides, and transformers. A PCB spill occurred at the CASY in 1989 when a transformer was damaged by a forklift. The Public Works Center responded to the spill and conducted a preliminary cleanup at that time. When operations ceased in 1995, the buildings, incinerators, and rail lines were demolished.

Table 2-11 provides a list of relevant documents and past activities for Site 22.

Table 2-11. Summary of Relevant Documents and Milestones for Site 22 (OU8)

Document Title/ Milestone	Summary
ROD (Baker 2004) AR # 001233	A removal action of PCB-contaminated soils began in August 1998. Additional delineation of site contaminants in 2001 identified six metals hotspots throughout the site (Baker 2004). As an interim measure, the Navy began removal of the hotspot soils in conjunction with the ongoing PCB removal action. The removal continued through 2001, with the ultimate excavation of more than 16,000 yd³ of material. The removal action achieved the soil PCB cleanup goals; however, the additional soil analytical data indicated that the areal extent of metal contamination was more widespread than previously estimated. It was estimated that approximately 29,000 yd³ of soil remained at the site, with concentrations exceeding the cleanup goals for metals. Based on the more comprehensive confirmation sampling and anticipated future land use of the site, the RAOs for the site were re-evaluated. The Navy determined that the placement of a soil cover was more cost-effective than removal of the metals-contaminated soils, and Team agreement on this approach was obtained in March 2002. The soil cover and the cover for the sediments in the pond were completed in June 2004. The final ROD addressing the soil and sediment at the site, encompassing the overall soil and sediment cleanup strategy for the site, was signed by EPA in September 2004 (Baker 2004). The ROD identifies the risks to human health and ecological receptors exposed to soil and sediment, establishes the RAOs, and defines the LUCs for the CASY.
Remedial Action Completion Report (CH2M and Baker 2009 ^[a])	In accordance with the closeout procedures for NPL sites, a Remedial Action Completion Report for Site 22 was signed by the Navy in January 2009. Quarterly site inspections continue to be completed to assess the enforcement of the LUCs. Because of the proximity of Site 22 to Site 1, groundwater is being managed and addressed as a single unit.
LTM Reports (CH2M 2020a) AR # 002881	The 2018 LTM Report indicates that the groundwater directly downgradient from Site 1 Area B and Site 22 has exhibited increases of COC concentrations for the last few years, indicating that either of these areas may be a source of the detected COCs.

Table 2-11. Summary of Relevant Documents and Milestones for Site 22 (OU8)

Document Title/ Milestone	Summary
Five-Year Reviews (CH2M 2019b, 2024b)	The Fourth Five-Year Review concluded that the remedy in place for Site 22 is currently protective of human health and the environment in the short term because of the potential presence of PFAS.
AR # 002748, 003172	The Fifth Five-Year Review concluded that the remedy at Site 22 is protective of human health and the environment (current and future).

^[a] This document is not uploaded to the AR.

Site 22 (OU8) COCs

Identified COCs for each medium at Site 22 are summarized in **Table 2-12**.

Table 2-12. Summary of Constituents of Concern at Site 22 (OU8)

Medium	Potential Risk	COC
Groundwater	N/A ^[a]	N/A ^[a]
Soil	Human Health	Arsenic, antimony, iron, lead, PCBs
Sediment	Ecological	Pesticides, PCBs, metals

^[a] Groundwater at Site 22 is currently managed as one unit with groundwater at Site 1.

Current and Future Activities

Because of the proximity of Site 22 to Site 1, groundwater is managed and addressed with Site 1 (**Section 2.1.1**). Site inspections will be conducted quarterly at Site 22 to confirm that LUCs are being implemented.

The next Five-Year Review for Site 22 is due to be finalized in 2029 (**Schedule 2-1**).

Planning for the PFAS RI at Site 22 (as a grouping with Site 1) began in 2023 and will be followed by the field investigation in 2026. The details of the PFAS RI at Site 1/22 (OU15) are discussed in **Section 2.1.9**.

2.1.7 Site 23 (OU10)—Building LP-20 Plating Shop

Site 23 Summary

Status:	Remedy in place
Current IR Activities:	LTM
Media Investigated:	Groundwater, soil, subslab vapor, indoor air
Removal and Remedial Actions:	Soil removal action, concrete cover, and LUCs
Media Closed:	Soil
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 23, the former Plating Shop, is on the western side of Building LP-20 (**Figure 2-7**). The Plating Shop, which is not currently in use, occupied approximately 9,500 square feet of building space. The Plating Shop contained seven process pits that extended beneath the concrete slab floor and were used for cleaning, stripping, and plating engine parts. The concrete floor of the shop and the pits were lined with corrosion-resistant brick tiles. Underground pipes carried rinse water from the metal-plating activities at Building LP-20 to the industrial wastewater treatment plant. In May 2005, the NSN Team agreed to conduct an interim removal action to address the site soils (fill the plating pits, cap the pits, and install impermeable sealant over the cap). The Team also agreed that the groundwater beneath Site 23 was being treated as part of Site 20.

Table 2-13 provides a list of relevant documents and past activities for Site 23.

Table 2-13. Summary of Relevant Documents and Milestones for Site 23 (OU10)

Document Title/ Milestone	Summary
EE/CA (CH2M 2006c) AR # 001646	A final EE/CA was submitted in December 2006, summarizing the soil removal action (a new concrete floor to serve as a cover). The construction activities associated with the interim action were initiated in June of 2006.
Completion Report Site 23, Building LP-20 Plating Shop (Shaw 2008) AR # 002131	Between June and November 2007, a removal action consisting of removing all debris and brick tiling within the Plating Shop, filling the plating pits with flow-able fill, and covering the Plating Shop floor with a concrete pad and impermeable sealant was completed. In addition, concrete pads within adjacent blower rooms #1 and #2 were removed to grade, pressure washed, and replaced with concrete slab.
PRAP and ROD (CH2M 2008g; Navy 2008 ^[a]) AR # 002133	In September 2008, a Proposed Plan for Site 23 presented LUCs to effectively limit site access and protect against human exposure to unacceptable risk in the soil at the site. The ROD for Site 23 was finalized in September 2008, implementing LUCs as the remedy. The remedial design was finalized in July 2009 to implement LUCs and maintenance actions, including periodic inspections and reporting to ensure residential development, or any other development inconsistent with the specific RAOs and selected remedy, would not be allowed on the site and that the concrete cover would be properly maintained until contaminant levels diminished so as to allow unrestricted use and unlimited exposure. Quarterly site inspections are conducted to verify the implementation of the LUCs. Groundwater associated with Site 23 and Site 20 is considered one hydrogeologic unit and is currently being remediated as part of Site 20.
Five-Year Reviews (CH2M 2019b, 2024b) AR # 002748, 003172	The Fourth Five-Year Review concluded that the remedy at Site 23 is protective of human health and the environment in the short term because of the potential presence of PFAS. The Fifth Five-Year Review concluded that the remedy at Site 23 is protective of human health (current and future) and the environment.
VI Investigation (CH2M 2020b ^[a])	Because of the presence of elevated VOC concentrations in the groundwater beneath Site 23, a VI investigation was completed in January 2019 and during summer 2019 as discussed in Section 2.1.5 .

Table 2-13. Summary of Relevant Documents and Milestones for Site 23 (OU10)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a ^[a]) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Site 23 was not identified as a potential PFAS release area. The PA recommended no further investigation at Site 23; however, if additional information becomes available, Site 23 may be re-evaluated (groundwater beneath Site 23 will be evaluated as part of Site 20).

^[a] This document is not uploaded to the AR.

Site 23 (OU10) COCs

Identified COCs for each medium at Site 23 are summarized in **Table 2-14**.

Table 2-14. Summary of Constituents of Concern at Site 23 (OU10)

Medium	Potential Risk	COC
Groundwater	N/A ^[a]	
Soil	Human Health	Semivolatile organic compounds, arsenic, cadmium, chromium, lead, nickel

^[a] Groundwater at Site 23 is currently managed as one unit with groundwater at Site 20.

Current and Future Activities

Groundwater associated with Site 23 and Site 20 is considered one unit and is managed and addressed with Site 20 (**Section 2.1.5**). Site inspections will be conducted quarterly at Site 23 to confirm that LUCs are being implemented.

The next Five-Year Review for Site 23 is due to be finalized in 2029 (**Schedule 2-1**).

2.1.8 Site 18 (OU14)—Former Naval Magazine Waste Storage Area

Site 18 Summary

Status:	Remedy in place
Current IR Activities:	LTM
Media Investigated:	Groundwater, soil, surface water, sediment
Removal and Remedial Actions:	Emulsified oil/zero-valent iron injections
Media Closed:	Soil, sediment
Waste and Debris Present Onsite:	Buried debris present onsite

Site Description and History

The former Naval Magazine Waste Storage Area (**Figure 2-8**) is located in the southeastern corner of NSN and was used from 1975 to 1979 to store drums of hazardous waste, consisting of waste oil, metal-plating solutions and sludges, chlorinated organic acids (including TCE and 1,1,1-trichloroethane), and paint-stripping solutions. Spillage of waste oil and hazardous wastes occurred in this area. A pit was excavated, and an existing drainage ditch was widened and lengthened to channel waste oil and contaminated runoff into an unlined pit. Oil and contaminated water were periodically pumped from the pit and transported to a wastewater treatment plant.

Table 2-15 provides a list of relevant documents and past activities for Site 18.

Table 2-15. Summary of Relevant Documents and Milestones for Site 18 (OU14)

Document Title/ Milestone	Summary
SI Report (CH2M 2002) AR # 000938	Additional investigation was recommended for soil to delineate the extent of VOC impacts, evaluate current site conditions, and perform an HHRA. Additional investigation was recommended for surface water and sediment in the creek north of the site to evaluate the groundwater to surface water/ sediment pathway. Additional groundwater sampling was recommended to evaluate migration of contaminants to the Yorktown-Eastover aquifer and evaluate natural attenuation of contaminants in groundwater.
Expanded SI (CH2M 2004b) AR # 001159	The Final Expanded SI Report for Site 18 concluded that soil and sediment were no longer to be considered media of concern, and investigations were focused on VOCs in groundwater. Based on the analytical data and a preliminary monitored natural attenuation evaluation, it was determined that there was evidence of biodegradation of TCE at Site 18.
EE/CA Memorandum (CH2M 2008a, 2008c) AR # 001765, 001782	An EE/CA was finalized in March 2008, detailing an interim groundwater remedial action focused on a VOC hotspot. In April 2008, an AM recommended the implementation of enhanced reductive dechlorination to mitigate the potential human health risk. An interim remedial action of amendment injections in the area of the MW03 cluster, and extending to MW10, was completed in July 2008 (Figure 2-8) in accordance with the work plan (AGVIQ and CH2M 2008b).
Performance Monitoring Report (AGVIQ and CH2M 2009) AR # 000038	Quarterly performance monitoring of VOCs in groundwater was initiated in October 2008 and was completed July 2009. A Performance Monitoring Report documenting the effectiveness of the NTCRA was completed in December 2009. The report recommended an additional amendment injection to encourage further reduction of VOCs in groundwater.
AM Addendum (CH2M 2010a) AR # 000176	In May 2010, an additional DPT injection (Figure 2-8) was implemented in accordance with an Addendum to the 2008 AM. Performance monitoring was conducted through March 2013 to evaluate the effectiveness of the injection. Groundwater monitoring demonstrated that the VOCs in groundwater were reduced by more than 90 percent.
ROD (Navy 2010a) AR # 000268	Site 18 is included in the NSN ROD for Sites 1, 3, 18, and 20, which was signed in September 2010. The selected remedy documented by the ROD was continued enhanced bioremediation with groundwater monitoring and LUCs. It was anticipated that additional injections may be necessary if cleanup goals were not met in a reasonable timeframe, in accordance with the ROD.

Table 2-15. Summary of Relevant Documents and Milestones for Site 18 (OU14)

Document Title/ Milestone	Summary
Five-Year Reviews (CH2M 2019b, 2024b), AR # 002748, 003172	The Fourth Five-Year Review concluded that the remedy in place at Site 18 is currently protective of human health and the environment in the short term due to the potential presence of PFAS. The Fifth Five-Year Review concluded that the remedy at Site 18 is protective of human health (current and future) and the environment. While the remedy was considered protective, the Fifth Five-Year Review identified the following information that impacts long-term site management: 1. Site 18 was identified as a potential PFAS release area and further evaluation in the form of a site inspection is planned (Section 2.1.11). 2. The VI pathway should be evaluated.
LTM Report (CH2M 2021d, 2022b, 2024a ^[a] , 2026a ^[a] , 2026b ^[a] , 2026c ^[a]), AR # 002941, 002988	Groundwater LTM at the site was initiated in 2014. Initially planned at 5-year intervals, the sampling frequency was changed to annual in 2016 after COCs were detected at concentrations exceeding their respective cleanup levels. Between 2014 and 2019, LTM for groundwater COCs was performed annually at six monitoring wells. Before the 2020 LTM event, the number of sampled monitoring wells was reduced to two (NBS18-MW03S and NBS18-MW10S) because the COC concentrations at the other monitoring wells met their respective cleanup goals. From 2020 through 2024, COC concentrations have fluctuated greater than and less than cleanup goals for TCE (5 micrograms per liter [µg/L]) or vinyl chloride (2 µg/L) at each monitoring well that was sampled. During this time frame, TCE concentrations have fluctuated between non-detect and 5.67 µg/L at NBS18-MW10S while vinyl chloride concentrations at NBS18-MW03S have ranged from non-detect to 5.37 µg/L. The plume boundary based on data collected during the 20224 LTM event is depicted on Figure 2-8 (CH2M 2026a).

^[a] This document is not uploaded to the AR.

Site 18 (OU14) COCs

Identified COCs for each medium at Site 18 are summarized in **Table 2-16**.

Table 2-16. Summary of Constituents of Concern at Site 18 (OU14)

Medium	Potential Risk	COC
Groundwater	Human Health	cis-1,2-DCE, 1,1-DCE, TCE, VC

Current and Future Activities

The most recent round of LTM sampling was completed in 2025. The next LTM event is scheduled to be completed in 2026 and will continue on an annual basis until cleanup goals are achieved (**Schedule 2-1**). Results from the 2023 and 2024 sampling events will be included in LTM submittals anticipated to be finalized in 2026 and the results from the 2025 sampling event will be included in an LTM data submittal expected to be finalized in 2027 (**Schedule 2-1**). Evaluation of the VI pathway with LTM groundwater data will begin in 2026 and is expected to be finalized in 2027 (**Schedule 2-1**). Site inspections will be conducted quarterly at Site 18 to confirm that LUCs are being implemented.

Planning for the PFAS RI at Site 18 (OU18) began 2024 and will be followed by a field investigation in 2026. The details of the PFAS RI at Site 18 (OU18) are discussed in **Section 2.1.11**.

The next Five-Year Review for Site 18 is due to be finalized in 2029 (**Schedule 2-1**).

2.1.9 Site 1—Camp Allen Landfill and Site 22 – Camp Allen Salvage Yard (OU15)

Site 1 and Site 22 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	Buried debris present onsite

Site Description and History

Refer to **Sections 2.1.1** and **2.1.6** for the Site Description and History of Site 1 and Site 22, respectively.

In 2014, 18 monitoring wells, sampled as part of the Site 1 LTM groundwater sampling event, were analyzed for PFAS because of recommendation in the Third Five-Year Review. PFAS exceeded screening criteria at 15 of the monitoring wells that were sampled. During the PA (refer to **Table 2-17**), Site 1 and Site 22 were evaluated separately but grouped because of their geography. Following completion of the Basewide Site Inspection, the Site 1 and Site 22 grouping was designated OU15 for PFAS investigations and actions (refer to **Appendix C**).

Table 2-17 provides a list of relevant PFAS documents and past activities for Site 1 and Site 22.

Table 2-17. Summary of Relevant Documents and Milestones for Site 1 and Site 22 (OU15)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Site 1 and Site 22 were identified as potential PFAS release areas, and because the objective of a SI had been completed during the 2014 groundwater sampling event, further evaluation of Sites 1 and 22 was recommended as a group.

Site 1 and Site 22 (OU15) Chemicals of Potential Concern

Chemicals of potential concern (COPCs) for each medium at Site 1 and Site 22 are summarized in **Table 2-18**.

Table 2-18. Summary of Constituents of Concern at Site 1 and Site 22 (OU15)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors because of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 1/22 began in 2023 and will be followed by a field investigation starting in 2026. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2029), and ROD (2031).

Schedule 2-6 presents the FY 2027 through FY 2031 schedule for Site 1 and Site 22.

2.1.10 Site 3 (OU16)—Q-Area Drum Storage Yard

OU16 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 3, in the northwestern corner of NSN along the Elizabeth River, has been expanded to include the – following PFAS investigation areas: the Q-Area Drum Storage Yard, Piers 11, Pier 12, and Pier 14 and Bunker Hill and Maryland Avenue. During the SI (refer to **Table 2-19**), Site 3 – Q-Area Drum Storage Yard and Bunker Hill and Maryland Avenue were evaluated as separate AOCs. Following completion of the SI, Site 3 – Q-Area Drum Storage Yard, Piers 11, 12, and 14, and Bunker Hill and Maryland Avenue were grouped because of their proximity and designated OU16 for PFAS investigations and actions (refer to **Appendix C**).

- Site 3 – Q-Area Drum Storage Yard** – the Q-Area Drum Storage Yard was a 5-acre open earthen yard used from the 1950s until 1991 (**Figure 2-9**). Types of drummed materials historically stored in this area include petroleum, oil lubricants, various solvents, paint thinners, pesticides, formaldehyde, and acids. Former installation personnel indicated that excess and unpermitted materials from ships would be disposed of at this location before inspections. As detailed in **Section 2.1.3**, site characterization and remediation has occurred at Site 3 to address VOCs in site media. Site 3 is currently a parking lot with grassy areas.
- Pier 11** – consists of the pier, the associated sanitary sewer system, and an oily water and waste oil (OWWO) system (**Figure 2-9**). Pier 11 was built in 2008. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island oily wastewater treatment plant (OWTP), where it is treated. OWWO and bilge water are transferred at this location. Four releases of aqueous film-forming foam (AFFF) have been reported to have occurred in the area. On February 20, 2016, 3 gallons of AFFF were released into the Elizabeth River from an AFFF system aboard a ship docked at the pier; the exact source of the release is unknown. On November 1, 2010, an unknown amount of AFFF was released into the Elizabeth River from piping aboard a docked ship at the pier. On March 8, 2018, a small, unknown amount of AFFF was discharged because of a ventilation turbine failure within the USS Gerald R. Ford while it was docked at Pier 11. On August 22, 2019, 15 gallons of AFFF were released from the USS Whidbey Island, which was docked at Pier 11, into the Elizabeth River because of mechanical failure during AFFF maintenance.
- Pier 12** – located north of Pier 11, consists of the pier, the associated sanitary sewer system, and an OWWO system (**Figure 2-9**). Pier 12 was built in 1959 and rebuilt in 1984. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. OWWO and bilge water are transferred at this location. Two AFFF releases have been reported to have occurred from ships docked at Pier 12. On September 5, 2006, 25 gallons of AFFF were released from a docked ship's fire-suppression system into the Elizabeth River. On June 6, 2019, approximately 10 gallons of AFFF were released into the Elizabeth River by a ship docked in the area.
- Pier 14** – located at the northernmost pier, consists of the pier, the associated sanitary sewer system, and an OWWO system (**Figure 2-9**). Pier 14 was built in 1959. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. OWWO and bilge water are transferred at this location. Three AFFF releases have been reported to have occurred in the area. The largest of these releases occurred on August 4, 2010, when

800 gallons were released from a tank on the USS George W. Bush by unknown means. On June 21, 2005, a 300-gallon release of AFFF was reported because of accidental activation from a vessel because of operator error. On September 22, 2007, equipment failure on a vessel reportedly caused an 80-gallon release of AFFF into the Elizabeth River.

- **Bunker Hill and Maryland Avenue** – an intersection located in the northwestern portion of NSN (**Figure 2-9**). On February 23, 2006, a 5-gallon bucket of AFFF fell off a truck at this intersection because of operator error. It is probable that the bucket spilled or broke open when it fell from the truck.

Table 2-19 provides a list of relevant PFAS documents and past activities for Site 3.

Table 2-19. Summary of Relevant Documents and Milestones for Site 3 (OU16)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Site 3 was identified as a potential PFAS release area based on historical disposal practices known to have occurred at the site and detections of PFOA and PFOS above screening criteria in a composite purge water sample collected for waste characterization and disposal purposes. The PA recommended further evaluation of Site 3 during the Basewide PFAS SI. Piers 11, 12, and 14 were identified as PFAS release areas because of documented releases of AFFF; however, the PA recommended further evaluation following the completion of the SI. The intersection of Bunker Hill and Maryland Avenue was identified as a PFAS release area based on the previous release of AFFF. The PA recommended further evaluation of Bunker Hill and Maryland Avenue during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS are present groundwater at Site 3. PFAS were detected in groundwater above screening criteria, and an RI was recommended. Piers 11, 12, and 14 were not evaluated during the SI but were recommended to be grouped with the Q-Area Drum Storage Yard during the RI. The 2022 Basewide PFAS SI was completed to determine whether PFAS are present groundwater at Bunker Hill and Maryland Avenue. PFAS were detected in groundwater above screening criteria, and an RI was recommended.

PFOA = perfluorooctanoic acid

PFOS = perfluorooctanesulfonic acid

Site 3 (OU16) Chemicals of Potential Concern

COPCs for each medium at Site 3 are summarized in **Table 2-20**.

Table 2-20. Summary of Constituents of Concern at Site 3 (OU16)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors because of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 3 began in 2024 and will be followed by a field investigation beginning in 2026. The initial RI sampling activities will not include sediment or surface water sampling in the Elizabeth River. Sampling in the Elizabeth River is deferred until the upland investigation at Site 3 refines the conceptual site model (CSM) and potential impacts via secondary migration pathways are better understood. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2029), and ROD (2031).

Schedule 2-7 presents the FY 2027 through FY 2031 schedule for OU16.

2.1.11 Site 18 (OU18)—Former Naval Magazine Waste Storage Area

Site 18 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	Buried debris present onsite

Site Description and History

Site 18, in the southeastern portion of NSN (**Figure 2-10**), consists of Site 18 – Former Naval Magazine Waste Storage Area. Refer to **Section 2.1.8** for a description of Site 18 and its history. Site 18 was evaluated in a group or AOC during the SI. Each AOC has been assigned a site number and name, and the correlation from SI AOC to RI Site is depicted in **Appendix C**. While a documented release of PFAS-containing materials does not exist, PFAS were detected in purge water generated during annual groundwater monitoring conducted at Site 18, and the concentration of PFAS in the sample exceeded screening criteria. Following completion of the SI (refer to **Table 2-21**), Site 18 was designated OU18 for PFAS investigations and actions (refer to **Appendix C**).

Table 2-21 provides a list of relevant PFAS documents and past activities for Site 18.

Table 2-21. Summary of Relevant Documents and Milestones for Site 18 (OU18)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Site 18 was identified as a PFAS release area based on detections of PFAS above screening criteria in a composite purge water sample collected for waste characterization and disposal purposes. While the PA did not identify evidence of AFFF or other PFAS-containing materials being used, released, or transferred at this location during document review and site visits, an unlined pit was present at the site during years of disposal operations and used to contain disposed liquids and sludge. The PA recommended further evaluation of Site 18 during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS were present in groundwater at Site 18. Groundwater samples were collected from six existing monitoring wells throughout Site 18, and PFAS were detected in groundwater above screening criteria and an RI was recommended.

Site 18 (OU18) Chemicals of Potential Concern

COPCs for each medium at Site 18 are summarized in **Table 2-22**.

Table 2-22. Summary of Constituents of Concern at Site 18 (OU18)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors because of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 18 began in 2024 and will be followed by a field investigation beginning in 2026. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2030), and ROD (2031).

Schedule 2-8 presents the FY 2027 through FY 2031 schedule for Site 18.

2.1.12 SWMU 14 (OU19)—Q-50 Satellite Accumulation Area

SWMU 14 – Q50 Area Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	Removed

Site Description and History

The SWMU 14 Q-50 Satellite Accumulation Area in the northwest corner of NSN (**Figure 2-11**) was expanded to include three PFAS release areas: Buildings Q50 and Q50D and the Frac Tanks Area. During the SI (refer to **Table 2-23**), Building Q50 and Q50D and the Frac Tank Area were evaluated separately. Following completion of the SI, Building Q50, Building Q50D, and the Frac Tanks were grouped because of their proximity and designated OU19 for PFAS investigations and actions (refer to **Appendix C**).

- **Building Q50** – Building Q50 is the Oil Response Facility and was constructed in 1987. The primary purpose of this building is to collect oily waste from spill response, tank cleanout, and other activities from throughout the region. Waste collected is drained into a collection system that ultimately leads to Craney Island. OWWO from both ship and shore sources is also stored in tanks within Building Q50 for later shipment to Defense Logistics Agency Disposition Services (formerly Defense Reutilization and Marketing Office) for disposal.
- **Building Q50D** – Building Q50D is the Oil Recovery Operations Building and was constructed in 1981. It is southwest of Building Q50 and contains 13 aboveground storage tanks (ASTs) that contain oily waste, waste fuel, or various petroleum products that were vacuumed from ships; 55-gallon drums; underground storage tanks; waste fuel or oil ASTs; and OWSs from Naval facilities within the region. The tanks can contain about 11,000 gallons and are moved as needed, though they typically are either kept in the yard at Building Q50D or along the fence in the northwest corner of the parking lot closest to Q50D. Tank 9 and Tank 13, which are in the eastern portion of the building, have been documented to contain AFFF. An OWS that can hold approximately 5,000 gallons is also in proximity to this building. OWWO from both ship and shore sources is also stored in tanks within Building Q50D.
- **Frac Tanks** – According to Base personnel, this area contained three frac tanks in 2019. The frac tanks were stored on the northern portion of the asphalt parking lot. These tanks were used to store OWWO and have previously been used to hold AFFF mixed with water from hangar suppression system releases. Vacuum trucks, which were used to clean up AFFF releases, pumped the recovered AFFF into the frac tanks, often overfilling them and releasing AFFF into the surrounding area because it is difficult to determine how much foam is in the tank.

Table 2-23 provides a list of relevant PFAS documents and past activities for SWMU 14 – Q50 Area.

Table 2-23. Summary of Relevant Documents and Milestones for SWMU 14 – Q50 Area (OU19)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. The Q50 Area (Building Q50 and Q50D) and Frac Tanks were identified as potential and confirmed PFAS release areas, respectively, because of potential or confirmed releases of AFFF at each area. The PA recommended further evaluation of the Q50 Area and Frac Tanks during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS are present in soil or groundwater at the Q50 Area and Frac Tanks. PFAS were detected in soil and groundwater above screening criteria and an RI was recommended. The SI Report recommended that the Q50 Area and Frac Tanks be grouped during the RI.

SWMU 14 (OU19) - Chemicals of Potential Concern

COPCs for each medium at SWMU 14 (OU19) are summarized in **Table 2-24**.

Table 2-24. Summary of Constituents of Concern at SWMU 14 (OU19)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors because of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at SWMU 14 Q-50 Satellite Accumulation Area began in 2024 and will be followed by a field investigation beginning in 2026. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2030), and ROD (2031).

Schedule 2-9 presents the FY 2027 through FY 2031 schedule for SWMU 14 – Q-50 Satellite Accumulation Area.

2.1.13 Site 20 (OU20)—Building LP20

Site 20 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 20, in the central portion of NSN, has been expanded to include the following PFAS investigation areas: Building LP21, Building LP 24, Building V52, Building V70, and Building V147. During the SI (refer to **Table 2-25**), Building V52, V70, and V147 were evaluated separately. Site 20 (OU4) and Buildings LP21 and LP24 were not evaluated during the SI. Following completion of the SI, Site 20 (OU4) and Buildings LP21, LP24, V52, V70, and V147 were grouped because of their proximity and designated OU20 for PFAS investigations and actions (refer to **Appendix C**).

- **Site 20** – Refer to **Section 2.1.5** for a description of Site 20 (OU4) and its history. In 2014, 16 monitoring wells, sampled as part of the Site 20 LTM groundwater sampling event, were analyzed for PFAS because of a recommendation in the Third Five-Year Review. One or more PFAS exceeded screening criteria in 12 of the monitoring wells that were sampled. In addition, purge water generated during an annual groundwater sampling was analyzed for PFAS, and concentrations exceeded screening criteria.
- **Building LP21** – Located just east of Fourth Avenue near Chambers Field Runway, operates as the VAW Maintenance Hangar (**Figure 2-12**). It was built in 2003 at the same location of former Building LP13. It has an automatic AFFF fire-suppression system and concrete floor with drainage trenches. Multiple AFFF spills have been recorded at Building LP21, as follows:
 - On September 5, 2006, 30 gallons of AFFF were released because of a defective valve within the fire-suppression system. AFFF was spilled on the ground and reportedly cleaned up. While the location of the release is unknown, because the release was reported to VDEQ, the release likely migrated outside of the building.
 - On July 23, 2008, 100 gallons of AFFF were released because of “suspect lightning” that activated the fire-suppression system. The spill was diverted to an OWS, which was subsequently pumped to remove the AFFF. While the location of the release is unknown, because the release was reported to VDEQ, the release likely migrated outside of the building.
 - On September 8, 2009, 1,100 gallons of AFFF were released and contained within the hangar. The cause was not confirmed but speculated to be mechanical failure of the fire-suppression system. A vacuum truck pumped out AFFF from the drainage trenches within the hangar and AFFF holding tanks. While the location of the release is unknown, because the release was reported to VDEQ, the release likely migrated outside the building.
 - On July 12, 2010, an unknown amount of AFFF was released because of an activation of the fire-suppression system. The release was diverted to the AFFF holding tank; however, on July 13, 2010, the holding tank overflowed and discharged into a nearby storm drain. Cleanup was reportedly not possible, and the tank was evacuated to prevent further release.
 - On August 21, 2015, 100 gallons of AFFF were released, and the receiving waterway was Willoughby Bay. The cause was not confirmed but speculated to be caused by a “power surge.”

- On August 28, 2016, an estimated 50 to 100 gallons of AFFF were released because of a small fire caused by maintenance operating on the air conditioning system. The small fire activated the fire-suppression system, and the release was contained to the hangar area and ultimately contained within the AFFF holding tank. A vacuum truck was also used during cleanup.
- On January 24, 2018, 15 gallons of AFFF were released because of an accidental activation as a NAVFAC technician was attempting to “bring the AFFF system offline.” The release was contained within the holding tank.
- On September 4, 2018, 0.1 gallon of AFFF was released because of an accidental activation of the fire-suppression system. The system was speculated to be faulty. The release was contained within the holding tank.
- On September 14, 2018, 50 gallons of AFFF were released because of an accidental activation of the fire-suppression system. The system was speculated to be faulty. The release was contained within the holding tank.
- **LP24** – Building LP24, constructed in 1986, operates as a hazardous waste storage facility that handles waste before shipment (**Figure 2-12**). It has formerly contained many different shops, such as aircraft component electroplating (including vapor degreasing, masking, rinsing, chromium stripping, chromium plating, nickel stripping, nickel plating process, cadmium plating, aluminum anodizing, and corrosion prevention operations) and welding. While PFAS have been known to be used as a wetting agent in plating baths to help with hexavalent chromium mist suppression, there is no evidence PFAS-containing wetting agents were used at Building LP24. It has been documented to store AFFF and rinse water from Building LP168 operations in 18,000-gallon frac tanks before disposal. During the 2019 site visit, it was determined that approximately 8,000 gallons of AFFF were being stored for later transport and disposal off-Base. According to interviews during the PA, some spills from the changeout of the AFFF storage tank have occurred outside of building LP24. P25s used for firefighting on ships may also be stored in Building LP24.
- **Building V52** – Building V52 is to the north of Aircraft Tow Way in the northern portion of NSN (**Figure 2-12**). It formerly operated as a warehouse but was demolished following a fire in 2011. The area is now grass covered and surrounded by parking lots. On January 27, 2011, the former building caught fire because of “hot work” that was conducted near cardboard that was accidentally ignited. NAVFAC Fire and Emergency Services confirmed that the fire was extinguished with AFFF; however, the exact amount of AFFF used was not confirmed. Runoff generated from firefighting activities caused potential pollutant materials to enter Willoughby Bay.
- **Building V70** – Building V70 is north of Aircraft Tow Way and along the northern terminus of NSN (**Figure 2-12**). Building V70 is a hangar constructed in 2009 and is north of Aircraft Tow Way and less than 1,000 feet south of Willoughby Bay. On August 10, 2013, approximately 50 gallons of AFFF solution were released at Building V70 when the fire-suppression system was inadvertently activated.
- **Building V147** – Building V147 is to the south of Aircraft Tow Way in the northern portion of NSN (**Figure 2-12**). It was constructed in 1971, is currently used as the Fleet Readiness Center Aircraft Department hangar and is primarily used to repair aircraft. This hangar contains an AFFF fire-suppression system, an AFFF reclamation locker with containment gear and a spill kit, and a 90-day Hazardous Waste Accumulation Area outside the west side of the building. The AFFF sprinkler and valve room contains a 2,000-gallon AFFF concentrate tank with two foam pumps. The AFFF discharges from eight trench drains that are in the central area of the hangar. One potential and one confirmed PFAS release has been reported at this building. The potential PFAS release was documented in the 1995 Environmental Baseline Survey. The spill occurred because of a break in the industrial wastewater lines between V147 and Building V61. Approximately 10,000 gallons of industrial wastewater were released on the southeastern side of Building V147; approximately 6,850 gallons were recovered, and the remaining 3,150 gallons saturated the soil. The saturated soil was excavated and stored onsite. Approximately 100 gallons of AFFF were released from the fire-suppression system within Building V147; however, the cleanup method was not recorded within the spill log.

Table 2-25 provides a list of relevant PFAS documents and past activities for Site 20.

Table 2-25. Summary of Relevant Documents and Milestones for Site 20 (OU20)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. The LP Industrial Area, which includes Site 20, Building LP21, and Building LP24, was identified as a PFAS release area based on detections of PFAS in groundwater above screening criteria and documented releases of AFFF at LP21 and LP24. The PA recommended further evaluation of the LP Industrial Area in the form of an RI. Buildings V52, V70, and V147 were identified as PFAS release areas based on documented releases of AFFF. The PA recommended further evaluation of these areas during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS are present in soil or groundwater at Building V52, V70, and V147. During the SI, PFAS were detected in groundwater at concentrations greater than screening criteria, and an RI was recommended. The SI recommended that Site 20 and Buildings LP21, LP24, V52, V70, and V147 be grouped during the RI.

Site 20 (OU20) Chemicals of Potential Concern

COPCs for each medium at Site 20 are summarized in **Table 2-26**.

Table 2-26. Summary of Constituents of Concern at Site 20 (OU20)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors because of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 20 began in 2024 and will be followed by a field investigation beginning in 2026. The initial RI sampling activities will not include sediment or surface water sampling in Willoughby Bay. Sampling in Willoughby Bay is deferred until the upland investigation at Site 20 refines the CSM and potential impacts via secondary migration pathways are better understood. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2030), and ROD (2031).

Schedule 2-10 presents the FY 2027 through FY 2031 schedule for OU20.

2.1.14 Site 24 (OU24)—W Area

Site 24 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 24 W – Area consists of the W-Fuel Farm, Building W146, Pier 9, and Pier 10.

- W-Fuel Farm** – The W-Fuel Farm is co-located with Pier Area A, which is a petroleum, oil, and lubricants (POL) site (**Figure 2-13**). The fuel farm originally consisted of six large capacity ASTs and several lesser capacity ASTs, connected by a network of aboveground and belowground piping that extended to the fuel piers and across the Base. The date of construction is unknown, but the tanks are visible in aerial photography as early as 1954. It is also unknown what was stored in the ASTs, however, jet propellant 5 (JP-5), diesel fuel marine (DFM), and Navy Special Fuel Oil (NSFO) are typically encountered in this area. No fire-suppression system was observed at the W-Fuel Farm during the site visit, though the site was not accessible. The presence of a fire-suppression system in this area was also not mentioned during the interviews with Base personnel. The W-Fuel Farm was undergoing active remediation until 2001 at which point an impermeable soil cap was installed. The ASTs and associated piping were demolished between 2008 and 2009 and were subsequently investigated to delineate the presence of POL. Three areas that contained impacted soil were identified during investigations; and excavation of these areas occurred in 2009 and 2010; however, not all petroleum compounds were addressed by this project. Three additional areas were excavated in 2020 and stabilization was completed in 2021.
- Building W146** - Building W146 is the former Fire Station #1, built in 1942, but is not currently in use and is scheduled to be demolished. Historically, AFFF (3 percent) has been stored at Building W146. According to interviews, fire trucks were washed at the wash bays of the fire stations. A wash rack may also have existed at this building.
- Pier 9** - Pier 9 consists of the pier, the associated sanitary sewer system, and an OWWO system. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. OWWO and bilge water are transferred at this location. Three releases of AFFF have been reported to have occurred in the area. The first occurred on January 10, 2005, when a reported 4 gallons were accidentally released into the Elizabeth River from a fire-suppression system from the USS Battan docked at the pier. The second occurred on February 20, 2016, when a reported 3 to 5 gallons of AFFF were observed in the water next to Pier 9 from an unknown source. The third release occurred on December 12, 2018, when an estimated 1 gallon overflowed from an AFFF concentrate tank because it was accidentally connected to the wrong line.
- Pier 10** - Pier 10, built in 1931, consists of the pier, the associated sanitary sewer system, and an OWWO system. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. OWWO and bilge water are transferred at this location. Three releases of AFFF have been reported to have occurred in the area. The first release occurred on March 28, 2006, when a reported 40 gallons of residual AFFF were released to the Elizabeth River as a result of removal of the nozzle while maintenance was performed. The second release occurred on March 19, 2014, when a reported 75 gallons of AFFF were released to the Elizabeth River from

accidental activation of a ship's fire-suppression system. The third release occurred on August 22, 2019, when 25 gallons of AFFF were released from an accidental activation of a ship's fire-suppression system.

Table 2-27 provides a list of relevant PFAS documents and past activities for Site 24.

Table 2-27. Summary of Relevant Documents and Milestones for Site 24 (OU24)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. The W-Fuel Farm and Building W146 were identified as a potential PFAS release areas and recommended for further evaluation during the Basewide PFAS SI. Piers 9 and 10 were identified as PFAS release areas because of documented releases of AFFF; however, the PA recommended further evaluation following the completion of the SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at the W-Fuel Farm and Building W146. During the SI, PFAS were detected in groundwater above screening criteria at each release area, and an RI was recommended. Piers 9 and 10 were not evaluated during the SI but were recommended to be grouped with the W-Fuel Farm and Building W146 during the RI.

AFFF = aqueous film-forming foam

Site 24 (OU24) Chemicals of Potential Concern

COPCs for each medium at Site 24 are summarized in **Table 2-28**.

Table 2-28. Summary of Constituents of Concern at Site 24 (OU24)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 24 began in 2024 and will be followed by a field investigation beginning in 2026. The initial RI sampling activities will not include sediment or surface water sampling in the Elizabeth River. Sampling in the Elizabeth River is deferred until the upland investigation at Site 24 refines the CSM and potential impacts via secondary migration pathways are better understood. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2029), and ROD (2031).

Schedule 2-11 presents the FY 2027 through FY 2031 schedule for Site 24.

2.1.15 Site 25 (OU25)—Building CEP 178 Fire Station and Piers

Site 25 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 25 is located in the southwestern portion of NSN and consists of Building CEP 178 Fire Station, Pier 4, and Pier 6.

- Building CEP 178 Fire Station** - An active fire station located to the west of Virginia Avenue and to the south of Admiral Taussig Boulevard in the western portion of NSN (**Figure 2-14**). According to NSN records Building CEP178 was constructed in 2011. Based on historical aerial images, prior to the construction of Building CEP178, the area appeared to be used for parking. Fire trucks on the installation are reportedly washed at this station on concrete surfaces, with rinse water entering an OWS. According to personnel interviews in 2019, an unknown quantity of AFFF is stored at this fire station and on the fire trucks housed here.
- Pier 4** - Pier 4 is located on the western terminus of Escort Avenue and NSN (**Figure 2-14**) and consists of the pier and an OWWO system. It was built in 1979. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. AFFF was used to extinguish a fire on Pier 4 that spread to the USS La Salle on April 21, 1983, as observed in historical images. No information about mitigation or cleanup methods were reported. In addition, on April 26, 2007, approximately 200 gallons of bilge water were released from a ship docked at this pier as a result of an equipment malfunction. On October 12, 2012, approximately 1 gallon of AFFF was released from a deck drain that drained overboard from a vessel into the Elizabeth River.
- Pier 6** - Pier 6 is located on the southern terminus of Decatur Avenue and NSN (**Figure 2-14**) and consists of the pier, the associated sanitary sewer system, and an OWWO system. It was built in 1979. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. On December 22, 2011, 200 gallons of AFFF were released from the USS Truxton, which was docked at the pier, into the Elizabeth River.

Table 2-29 provides a list of relevant PFAS documents and past activities for Site 25.

Table 2-29. Summary of Relevant Documents and Milestones for Site 25 (OU25)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Building CEP 178 Fire Station was identified as a potential PFAS release area based on the use as a fire station during the timeframe for AFFF use and the potential for an AFFF releases from washing fire trucks or during refilling of AFFF tanks on fire trucks. The PA recommended further evaluation of Building CEP 178 Fire Station during the Basewide PFAS SI. Piers 4 and 6 were identified as PFAS release areas because of documented releases of AFFF; however, the PA recommended further evaluation following completion of the SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at Building CEP 178 Fire Station. PFAS were detected in groundwater above screening criteria and an RI was recommended. Piers 4 and 6 were not evaluated during the SI but were recommended to be grouped with Building CEP 178 Fire Station during the RI.

Site 25 (OU25) Chemicals of Potential Concern

COPCs for each medium at Site 25 are summarized in **Table 2-30**.

Table 2-30. Summary of Constituents of Concern at Site 25 (OU25)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 25 is expected to begin after 2031. After the RI field investigation, an RI Report, FS, Proposed Plan, and ROD will be completed.

A site schedule will be developed after the project is funded.

2.1.16 Site 26 (OU26)—CEP Area

Site 26 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 26 is located in the southwestern portion of NSN adjacent to the Elizabeth River and consists of the CEP Tank Farm Area, Pier Area C, and Pier 2.

- **CEP Tank Farm Area** – The CEP Tank Farm Area is located to the north of Second Street in the southwest portion of NSN (**Figure 2-15**). Two ASTs (CEP3 and CEP11) within the area boundary have been identified as potential PFAS release areas. CEP3 and CEP11 are currently used to store OWWO from operations on the piers and from OWSs throughout NSN and the Fire Fighting School (FFS). Assigned connection valves to each tank are located to the north and northeast of the ASTs.
 - Tank CEP3 - CEP3 was built in 1944 and has also been used as a bilge water collection tank; however, exact dates of bilge water storage are unknown.
 - Tank CEP11 - CEP11 was built in 1977 and has a capacity of 675,000 gallons. The OWWO piping consists of 10-inch ductile iron forcemain pipes that connect CEP11 to Building CEP10, a pump house.

Sludge from the OWSs at the FFS are sent to CEP3 and CEP11. On June 4, 2012, 1 gallon of OWWO was spilled from the pipeline to CEP11 because of a small hole in the pipeline. The spill entered the storm drain, which subsequently led to the Elizabeth River. Two-hundred gallons of OWWO were spilled from CEP3 on October 15, 2013; the cause of the spill and method of containment is unknown. On December 14, 2014, OWWO system operators noticed evidence of a leak within the forcemain piping between CEP11 and Building CEP10. Operators observed movement and apparent soil disruption beneath the high-density polyethylene secondary containment berm liner around CEP11 while the pump house was active. The exact location of the berm liner disturbance was between the discharge valve of CEP11 and the inlet valve of CEP10. A temporary bypass was installed and connected to CEP10 to remedy the forcemain piping. Liquid with an oily sheen (assumed to be OWWO) was observed underneath the liner, and this oily liquid was also observed to be trickling into a stormwater catch basin from underneath the liner. On January 5, 2015, a vacuum truck removed 25 gallons of the OWWO product that collected within the stormwater catch basin inside the berm and 125 gallons of standing water with an oily sheen on the liner surface.

- **Pier Area C** - Pier Area C is adjacent to Piers 1 and 2 and is south of Pier Areas B and D in the western terminus of NSN (**Figure 2-15**). Pier Area C is located within a fuel distribution network associated with the W-Fuel Farm. Pier Area C includes ship-loading facilities along the Elizabeth River that are used for maintenance, loading and unloading, and storage of the Naval surface and subsurface vessels. The impact of POLs in Pier Area C was first identified in 1980. Further investigation determined that a broad area was impacted by POL releases. Three POLs of concern are typically encountered at these sites: JP-5, DFM, and NSFO. A corrective action for the free product that was observed in the groundwater at Pier Area C began in 1996 and consisted of 14 recovery wells and five product skimming pumps.

- **Pier 2** - Pier 2 is located west of Third Street (**Figure 2-15**) and consists of the pier, the associated sanitary sewer system, and an OWWO system. It was built in 2001. Bilge water that is produced from vessels at this pier is transferred to a barge along the pier. The barge then transports the bilge water to the Craney Island OWTP, where it is treated. Painting operations using powder-coating processes or manual rollers were documented to occur at this pier. On October 24, 2012, 200 gallons of AFFF were released from the USS Bainbridge, which was docked at the pier. On January 10, 2013, 15 gallons of AFFF were released from the USS Bainbridge, which was docked at the pier, into the Elizabeth River. On May 1, 2020, 2 gallons of AFFF were released from the USS Laboon, which was docked at the pier, into the Elizabeth River. The cleanup method for these spills was not noted in the spill log.

Table 2-31 provides a list of relevant PFAS documents and past activities for Site 26.

Table 2-31. Summary of Relevant Documents and Milestones for Site 26 (OU26)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. As a result of documented releases of material potentially containing PFAS at the CEP Tank Farm Area and detections of PFAS in groundwater greater than screening criteria at Pier Area C, the CEP Tank Farm Area, and Pier Area C were identified as potential PFAS release areas. The PA recommended further evaluation of each area during the Basewide PFAS SI. Pier 2 was identified as a PFAS release area because of documented releases of AFFF; however, the PA recommended further evaluation following the completion of the SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS are present in soil and/or groundwater at the CEP Tank Farm Area and Pier Area C. PFAS were detected in groundwater above screening criteria and an RI was recommended. Pier 2 was not evaluated during the SI but was recommended to be grouped with the CEP Tank Farm Area and Pier Area C during the RI.

Site 26 (OU26) Chemicals of Potential Concern

COPCs for each medium at Site 26 are summarized in **Table 2-32**.

Table 2-32. Summary of Constituents of Concern at Site 26 (OU26)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 26 is expected to begin after 2031. After the RI field investigation, an RI Report, FS, Proposed Plan, and ROD will be completed.

A site schedule will be developed after the project is funded.

2.1.17 Site 27 (OU27)—Building KBB Fire Truck Maintenance Shop

Site 27 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 27, consisting of the Building KBB Fire Truck Maintenance Shop, and is located off of Piersey Street. Building KBB was built in 1940 and currently operates as a housing and training facility at NSN (**Figure 2-16**). The western portion of the building includes a fire truck maintenance shop. Historically, an unknown amount of AFFF (3 percent) has been stored at Building KBB. According to onsite personnel during the site visit, AFFF is temporarily stored here while maintenance is performed on fire trucks (if the fire trucks have AFFF stored within tanks). Fire trucks are also supplied with AFFF at this building. Firefighting training activities and equipment testing also has historically occurred at the concrete pad that is directly south of the building, which contains an OWS. A wash rack is located to the south of the building and adjacent to the concrete pad.

Table 2-33 provides a list of relevant PFAS documents and past activities for Site 27.

Table 2-33. Summary of Relevant Documents and Milestones for Site 27 (OU27)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Building KBB Fire Truck Maintenance Shop was identified as a potential PFAS release area based on the operation of the building as a fire truck maintenance shop during the timeframe for AFFF use and the potential for an AFFF release from washing fire trucks and the transfer of AFFF from tanks on fire trucks. In addition, firefighting training and equipment testing also occurred at Building KBB; it is possible that AFFF was used during testing or training. The PA recommended further evaluation of Building KBB Fire Truck Maintenance Shop during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS are present in soil or groundwater at Building KBB Fire Truck Maintenance Shop. PFAS were detected in groundwater above screening criteria and an RI was recommended.

Site 27 (OU27) Chemicals of Potential Concern

COPCs for each medium at Site 27 are summarized in **Table 2-34**.

Table 2-34. Summary of Constituents of Concern at Site 27 (OU27)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 27 is expected to begin after 2031. After the RI field investigation, an RI Report, FS, Proposed Plan, and ROD will be completed.

A site schedule will be developed after the project is funded.

2.1.18 Site 28 (OU28)—LF Hangar Area, Building R43, and Building V49

Site 28 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 28 is located in the northern portion of NSN and consists of the LF Hangars 59, 60, and 34, Building R43, and Building V49.

- Building LF59** – located to the north of CV Tow Way in the northern portion of NSN (**Figure 2-17**). It was constructed in 1988 and is a hangar that supports and maintains helicopter squadrons. It includes office spaces in the southern portion of the building. The hangar is located in the northern portion of the building and has concrete floors with drainage trenches and an AFFF fire-suppression system. The AFFF suppression system consists of a four-zone system with overhead sprinklers and oscillating nozzles. A bladder concentrate tank is located in the mechanical room. Aircraft washing is performed outside the hangar, with wash water entering an OWS. A diverter valve is used to direct wash water to the sanitary sewer and stormwater to the stormwater utility network. On October 29, 2011, approximately 150 gallons of AFFF were accidentally released onto the surrounding tarmac from the fire-suppression system. While the majority of the release was contained within the drainage trenches, some of the AFFF drained outside of the hangar onto the tarmac, entered the storm system, and eventually discharged to Willoughby Bay. A letter was sent to Hampton Roads Sanitation District, which reported that 9 to 12 gallons of AFFF concentrate was released from LF59 through the trench drains, OWS, and R-4 lift station and subsequently to sanitary sewer.
- Building LF60** - located to the north of CV Tow Way in the northern portion of NSN and immediately west of Building LF59 (**Figure 2-17**). It is a hangar built in 1976 and is responsible for supporting and maintaining helicopter squadrons. The building has concrete floors and drainage trenches within the floor that discharge AFFF when activated. Two ASTs containing AFFF are located on the eastern side of the building. These tanks are located in the mechanical room and regular testing is not reported to be performed. On May 1, 2006, approximately 200 gallons of AFFF solution was released from the pressure valve. The associated cleanup activities were not provided. An unspecified river was reported to be the receiving waterway. On June 13, 2008, approximately 150 gallons of AFFF were released due to operator error. The associated cleanup activities were not provided. This release reportedly discharged to a nearby storm drain that subsequently discharges to Willoughby Bay. While the location of the release is unknown because the release was reported to VDEQ, the release was likely outside. On May 10, 2012, approximately 10 gallons of AFFF were released from the fire-suppression system. This was reportedly cleaned up with a fire hose, but no further details were provided. On May 1, 2014, approximately 300 gallons of AFFF were released from the fire-suppression system. This release was cleaned by washing down the area, although there is no reported recovery of the AFFF. On May 5, 2015, approximately 1 gallon of AFFF was released from the system. This release was reportedly cleaned by an absorbent.
- Building LF34** - located north of CV Tow Way in the northern portion of NSN (**Figure 2-17**). It was constructed in 1966 and currently operates as a paint shop facility for aircraft. A flammable and hazardous material storage exists on the eastern side of the building and is generally used to contain aerosol and enamel paints, oils, and degreasers. Although the fire-suppression system was determined to be water-based in the 2019 site visit, on January 18, 2006, an AFFF release of approximately 50 gallons was reported to the VDEQ as a result

of a faulty sprinkler system. While the location of the release is unknown because the release was reported to VDEQ, the release was likely outside. Cleanup activities are unknown.

- **Building R43** - Fire Station #2 is located to the northwest of the intersection of Aircraft Tow Way and Gilbert Street in the northern portion of NSN (**Figure 2-17**). Building R43 was built in 1943 and operates as one of the crash crew fire stations. Approximately 2,500 to 2,800 gallons of AFFF have been stored in drums within the fire station. Storage of AFFF at this fire station was also documented in the 2005 Emergency Planning and Community Right to Know Act Report. Site personnel also indicated during the 2019 site visit that the footprint of the former (now demolished) AFFF storage room, which was located on the eastern side of the building, had been used as a burn area for training. Site personnel also noted that fire trucks are washed in the concrete driveway outside of the bays on the southern side of building, which contains a spill diversion valve and stormwater drain.
- **Building V49** - located to the east of Aircraft Tow Way in the northern portion of NSN (**Figure 2-17**). Building V49 formerly operated as an auto vehicle shop. The date of construction is unknown; however, based on aerial photographs Building V49 was constructed as early as 1954 and the building was demolished between 1994 and 2001. A grassy area southwest of Building V49 was reportedly used to test firefighting equipment. In addition, based on aerial imagery, it appears that equipment was also stored in the area southwest of Building V49. The former location of Building V49 is now a grassy area.

Table 2-35 provides a list of relevant PFAS documents and past activities for Site 28.

Table 2-35. Summary of Relevant Documents and Milestones for Site 28 (OU28)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Building LF59, LF60, LF34, R43, and V49 were identified as potential or confirmed PFAS release areas. As a result of potential and confirmed releases of PFAS at each area, the PA recommended further evaluation of these areas during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS are present soil and/or groundwater at the LF Hangar Area (LF59, LF60, and LF34), Building R43, and Building V49. PFAS were detected in soil and/or groundwater greater than screening criteria and an RI was recommended. In addition, the SI Report recommended that LF59, LF60, and LF34 be grouped with Building R43 and V49 during the RI. After the SI Report, these areas were grouped as Site 28 for the RI.

Site 28 (OU28) Chemicals of Potential Concern

COPCs for each medium at Site 28 are summarized in **Table 2-36**.

Table 2-36. Summary of Constituents of Concern at Site 28 (OU28)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 28 is expected to begin after 2031. After the RI field investigation, an RI Report, FS, Proposed Plan, and ROD will be completed.

A site schedule will be developed after the project is funded.

2.1.19 Site 29 (OU29)—LP Hangar Area (LP27, LP33, and LP 34)

Site 29 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 29 is located in the central portion of NSN and consists of LP Hangars 27, 33, and 34.

- **Building LP27** – located east of Building LP34, south of Bellinger Boulevard, operates as the E2C A/C Maintenance Hangar (**Figure 2-18**). It was constructed in 2003. It contains an automatic AFFF fire-suppression system and concrete floors with trench drains. On October 7, 2005, 1,000 gallons of AFFF were released in Building LP27 as a result of “smoke from a barbecue grill” that activated the fire-suppression system. While the location of the release is unknown because the release was reported to VDEQ, the release was likely outside. On October 22, 2009, approximately 700 gallons of AFFF were released in Building LP27 as a result of a malfunctioning valve within the fire-suppression system. The spill was reported to have been released to the sewer system and cleaned with a vacuum truck where possible. The following day, VDEQ received a report of AFFF being observed in a stormwater manhole and concluded that it was due to the release at Building LP27. Due to the presence of AFFF in a stormwater manhole, it is likely that AFFF was released outside the building and was not contained within the sewer system.
- **Building LP33** - is the VAW Maintenance Hangar and was constructed in 1992 (**Figure 2-18**). It is currently used for maintenance of aircraft in the carrier airborne early warning squadron. Based on interviews, this hangar currently has an automatic AFFF fire-suppression system. Approximately 9,000 pounds of AFFF were reportedly stored here and AFFF was released when a contractor was changing a bladder tank and AFFF was sprayed into the parking lot and entered the creek. The estimated volume of this release is unknown.
- **Building LP34** - currently operates as an aircraft maintenance hangar (**Figure 2-18**). It was built in 1994. It has an automatic AFFF fire-suppression system, a 9,000-gallon AST that contains AFFF, and a concrete floor with trench drains. A lift station with two pumps and an aircraft maintenance OWS (NSN-LP34-OWS-01) are also present in the vicinity of this building. In aerial photography, planes are parked south of the building while passenger vehicles are parked in the parking lot north of the building.

Table 2-37 provides a list of relevant PFAS documents and past activities for Site 29.

Table 2-37. Summary of Relevant Documents and Milestones for Site 29 (OU29)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. LP Hangars 27, 33, and 34 were identified as PFAS release areas as a result of documented releases of AFFF. The PA recommended further evaluation of each release area during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR# 003157	The 2022 Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at LP Hangars 27, 33, and 34. PFAS were detected in groundwater above screening criteria and an RI was recommended. In addition, the SI recommended that the releases areas were further grouped and evaluated together in the RI.

Site 29 (OU29) Chemicals of Potential Concern

COPCs for each medium at Site 29 are summarized in **Table 2-38**.

Table 2-38. Summary of Constituents of Concern at Site 29 (OU29)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 29 began in 2024 and will be followed by a field investigation in 2026. The initial RI sampling activities will not include sediment or surface water sampling in Willoughby Bay. Sampling in Willoughby Bay is deferred until the upland investigation at Site 29 refines the CSM and potential impacts via secondary migration pathways are better understood. The PFAS RI Report is expected to be finalized in 2027 and will be followed by an FS (2028), Proposed Plan (2029), and ROD (2030).

Schedule 2-12 presents the FY 2027 through FY 2031 schedule for Site 29.

2.1.20 Site 30 (OU30)—Runway and Firefighting Training Area

Site 30 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 30, located in the central-eastern portion of NSN consists of the Firefighting Training Area (FFTA), Buildings LP166 and LP35, and Chambers Field Runway (**Figure 2-19**).

- **Building LP35** – Building LP35 was built in 1993 and is located just northwest of LP166. Building LP35 is a wash rack that is primarily used for washing airfield vehicles that carry AFFF in addition to other airfield materials and equipment; minor airfield truck maintenance is also conducted at LP35.
- **Building LP166** - Building LP166 currently operates as Fire Station #3. LP166 was built and opened between 1967 and 1970. It is one of the crash crew fire stations, and has stored approximately 2,500 to 2,800 gallons of AFFF in 55-gallon drums within the building at one time. There is also an AST that contains 3 percent concentrate AFFF and is located to the northeast, outside of the building. Fire trucks (NSN trucks as well as trucks from other installations) refill trucks with AFFF in this area.
- **FFTA** - Fire training historically occurred at the aircraft mockup to the north of LP166. Historically and currently, fire trucks have been washed to the south of LP166. There is a spill diversion valve in the south parking lot that receives rinse water. According to personnel, fire trucks can also be washed inside Building LP166, and rinse water is captured in a floor drain that leads to an OWS. Trucks are seen parking immediately west of Building LP166 in aerial imagery. Building LP166 currently stores approximately 2,500 to 2,800 gallons of AFFF in 55-gallon drums within the building. There is also an AST that contains 3 percent concentrate AFFF and is located to the northeast, outside of the building. Historically and currently, fire trucks are washed to the south of LP166. There is an OWS in the south parking lot that receives rinse water. It is also a fueling site for fire trucks; a 1,000-gallon diesel AST is located to the south of LP166. Installation personnel and firefighters reported that firefighting training occurred in the vicinity of LP166 where AFFF was used during training exercises.
- **Chambers Field Runway** - Chambers Field Runway, also known as Runway 28, is located to the south of the FFTA and Building LP166 Area (**Figure 2-19**). This area also includes the associated landing strip and taxiways and is approximately 1.5 miles long. AFFF has historically been applied to the runway on at least one occasion during a wheels-up landing to reduce sparking. There have been incidents where AFFF may have been used, but not confirmed, which are detailed as follows:
 - On March 21, 1966, a Canadair CL-44 was completing a cargo flight from Indianapolis to Chambers Field. The copilot was in command on final approach to Runway 10 and the airplane improperly touched down with its left main gear and nose gear first. At impact, the left wing was torn off. Out of control, the airplane crashed inverted and burst into flames. It is unknown if AFFF was used to extinguish this fire.
 - At an unknown date in 1974, an aircraft was landing and experienced shearing of the landing gear. The crash crew extinguished the small flash fire that precipitated from the shearing.

There are also incidents with documented foam use, which are detailed as follows:

- On March 6, 1970, a hydraulic brake line broke during the landing of an aircraft. The fluid ignited and caused major damage to the port side of the aircraft. The crash crew spread a blanket of foam on the runway to help avoid sparking.
- On January 31, 1972, a flaming aircraft was rolling to a stop and a crash crew was reported to have used foam to extinguish the fire.
- In January 1973, an aircraft crash-landed on the runway as a result of engine failure and subsequent combustion. The aircraft was reportedly in flames as it rolled down the runway, and crash crews were “spraying foam on the aircraft as it was rolling to a stop”.

Table 2-39 provides a list of relevant PFAS documents and past activities for Site 30.

Table 2-39. Summary of Relevant Documents and Milestones for Site 30 (OU30)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. The Firefighting Training Area, Building LP166, Building LP35, and Chambers Field Runway were identified as PFAS release areas as a result of documented releases of AFFF. The PA recommended further evaluation of these areas during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR # 003157	The Basewide PFAS SI was completed to determine whether PFAS were present in soil, groundwater, surface water and/or sediment at the FFTA, Building LP166, Building LP35, and Chambers Field Runway. During the SI, PFAS were detected in soil, groundwater, surface water, and sediment above screening criteria and an RI was recommended. In addition, the SI Report recommended that LP35, LP166, and the FFTA be grouped with Chambers Field Runway during the RI. After the SI Report, these areas were grouped as Site 30 for the RI.

Site 30 (OU30) Chemicals of Potential Concern

COPCs for each medium at Site 30 are summarized in **Table 2-40**.

Table 2-40. Summary of Constituents of Concern at Site 30 (OU30)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 30 began in 2024 and will be followed by a field investigation in 2026. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2028), Proposed Plan (2029), and ROD (2031).

Schedule 2-13 presents the FY 2027 through FY 2031 schedule for Site 30.

2.1.21 Site 31 (OU31)—SP Hangar Area

Site 31 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 31 is located to the north of A Street in the northeast portion of NSN and consists of Buildings SP35 and SP40 (Figure 2-20).

- Building SP35** – Building SP35 was constructed in 2003 and operates as a maintenance hangar, also referred to as the HC-2/HCS-4 Hangar. The building contains an automatic AFFF fire-suppression system and a 9,000-gallon AST containing AFFF (3 percent). On February 25, 2004, approximately 55 gallons of AFFF were released from a sprinkler system at an unknown hangar within the SP Hangar Area and migrated to A Street. On February 2, 2007, 150 gallons of AFFF were released from the AFFF system in Building SP35 as a result of a leak. An unspecified river was reported to be the receiving waterway. Further details, such as the specific location of the release and cleanup activities, were not documented. While the location of the release is unknown because the release was reported to VDEQ, the release likely migrated outside the building. On October 27, 2014, 100 gallons of AFFF were released from the AFFF system in Building SP35 as a result of accidental activation by a mechanic. The release was contained in the building, and the area was hosed off to remove the AFFF. Further details, such as the specific location of the spill or where the rinse water was diverted to, were not documented.
- Building SP40** – Building SP40 was constructed in 2009 after the demolition of Former Building SP31. Building SP40 operates as a maintenance hangar, also referred to as the new MH-60/HSC Hangar. It contains an automatic AFFF fire-suppression system and a 9,000-gallon AST of AFFF (3 percent). On December 28, 2009, 100 gallons of AFFF were released from the AFFF system in SP40 as a result of accidental, manual activation during a fire drill. AFFF spilled within the hangar was diverted to the holding tank through the drainage trenches. Brooms and squeegees were used to divert residual AFFF away from the storm drains and inside of the hangar. On February 19, 2013, 1,100 gallons were released from the fire-suppression system in SP40 as a result of a NAVFAC transportation driver attempting to open hangar doors and accidentally activating the fire-suppression system instead. It was subsequently cleaned up with a vacuum truck; however, some spilled into storm drains. AFFF overflowed to the surrounding area outside the hangar during the February 2013 release.

Table 2-41 provides a list of relevant PFAS documents and past activities for Site 31.

Table 2-41. Summary of Relevant Documents and Milestones for Site 31 (OU31)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Building SP35 and Building SP40 were identified as PFAS release areas as a result of documented releases of AFFF. The PA recommended further evaluation of these areas during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR # 003157	The Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at Building SP35 and Building SP40. During the SI, PFAS were detected groundwater at concentrations greater than screening criteria and an RI was recommended. The SI Report recommended that SP35 and SP40 be grouped during the RI.

Site 31 (OU31) Chemicals of Potential Concern

COPCs for each medium at Site 31 are summarized in **Table 2-42**.

Table 2-42. Summary of Constituents of Potential Concern at Site 31 (OU31)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 31 is expected to begin after 2031. After the RI field investigation, an RI Report, FS, Proposed Plan, and ROD will be completed.

A site schedule will be developed after the project is funded.

2.1.22 Site 32 (OU32)—SP Spray Area

Site 32 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 32 is located north of Rippard Avenue in the northeast corner of NSN and consists of the SP Spray Area (**Figure 2-21**). The area was formerly the location of the SP Fuel Farm, but is currently a grassy, undeveloped area. Based on interviews with current firefighters stationed at NSN, the area has been used for firefighting spray-testing.

Table 2-43 provides a list of relevant PFAS documents and past activities for Site 32.

Table 2-43. Summary of Relevant Documents and Milestones for Site 32 (OU32)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. The SP Spray Area was identified as a potential PFAS release area as a result of the historical firefighting spray-test activities. The PA recommended further evaluation of the SP Spray Area during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR # 003157	The Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at the SP Spray Area. During the SI, PFAS were detected in groundwater above screening criteria and a RI was recommended.

Site 32 (OU32) Chemicals of Potential Concern

COPCs for each medium at Site 33 are summarized in **Table 2-44**.

Table 2-44. Summary of Constituents of Potential Concern at Site 32 (OU32)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 32 is expected to begin after 2031. After the RI field investigation, an RI Report, FS, Proposed Plan, and ROD will be completed.

A site schedule will be developed after the project is funded.

2.1.23 Site 33 (OU33)—Building BEN 154

Site 33 Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

Site 33 is located on Hampton Boulevard, adjacent to Norfolk Pointe military housing on NSA Hampton Roads and consists of Building BEN154, the current Navy Region Mid-Atlantic Fire and Emergency Services Fire Station #4 (**Figure 2-22**). Building BEN154 was opened sometime between 1983 and 1985. AFFF has historically been stored at Building BEN154. According to Base personnel, AFFF is stored at the station in the manufacturer's containers, but the trucks do not have foam tanks. In addition, Base personnel indicated that AFFF equipment testing may have occurred at BEN154 in the past.

Table 2-45 provides a list of relevant PFAS documents and past activities for Site 33.

Table 2-45. Summary of Relevant Documents and Milestones for Site 33 (OU33)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Building BEN154 was identified as a potential PFAS release area because AFFF could have been released during equipment testing or spills while transferring AFFF from the original containers. The PA recommended further evaluation during the Basewide PFAS SI.
Basewide PFAS SI (CH2M 2023a) AR # 003157	The Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at Building BEN154. During the SI, PFAS were detected in soil and groundwater at concentrations greater than screening criteria and an RI was recommended.

Site 33 (OU33) Chemicals of Potential Concern

COPCs for each medium at Site 33 are summarized in **Table 2-46**.

Table 2-46. Summary of Constituents of Potential Concern at Site 33 (OU33)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at Site 33 began in 2024 and will be followed by a field investigation in 2026. The PFAS RI Report is expected to be finalized in 2027 and will be followed by an FS (2028), Proposed Plan (2029), and ROD (20310).

Schedule 2-14 presents the FY 2027 through FY 2031 schedule for Site 33.

2.2 Solid Waste Management Units

SWMU 14 and SWMU 8 are the only SWMUs at NSN that are active. All other SWMUs have been closed out and require no action. The following description includes a summary, site description and history along with a table describing past activities at SWMU 14 and SWMU 8, and a table listing the known COCs or COPCs in each site medium. In addition, the current status of SWMU 14 and 8 is briefly discussed.

2.2.1 Solid Waste Management Unit 14 (OU13)—Q-50 Satellite Accumulation Area

SWMU 14 Summary

Status:	LTM
Current IR Activities:	LUC inspections
Media Investigated:	Groundwater, soil, surface water, sediment
Removal and Remedial Actions:	Asphalt cover and LUCs
Media Closed:	Soil, surface water, sediment
Waste and Debris Present Onsite:	Removed

Site Description and History

The Q-50 Satellite Accumulation Area (SWMU 14) (**Figure 2-23**) is in the northwestern corner of NSN. SWMU 14 consisted of a concrete storage pad surrounded by a grass-covered field. The pad served as a 90-day hazardous waste accumulation area where wastes generated by various operations were processed (sampled, identified, labeled, and packaged) before being shipped for eventual disposal. The original concrete pad for the accumulation area has since been removed.

Table 2-47 provides a list of relevant documents and past activities for SWMU 14.

Table 2-47. Summary of Relevant Documents and Milestones for SWMU 14 (OU13)

Document Title/ Milestone	Summary
RI (CH2M 2004c) AR # 001222	The 2004 RI concluded that there are no unacceptable human health risks at the site under the land use; however, unacceptable risks associated with surface soil, subsurface soil, and groundwater are present in most future scenarios. In addition, there were no unacceptable risks to ecological receptors at the site's terrestrial portion; however, unacceptable ecological risks for sediment and groundwater discharging to surface water are present at the site.
Technical Memorandum Trident Probe Survey Results (CH2M 2007a) AR # 001643	The results of the Trident probe study indicated that there were no strong areas of groundwater discharge from SWMU 14 to the James River or Willoughby Bay and that there is significant attenuation in the discharge zones. Based on the results of the Trident Probe survey and Ecological Risk Assessment (CH2M 2004c), the technical memorandum recommended NFA for ecological receptors.
EE/CA and ROD (CH2M 2008b) AR # 001767	In March 2008, an EE/CA was prepared for an NTCRA at SWMU 14. The objective of the NTCRA was to mitigate potential unacceptable human health risk from exposure to contaminated surface soil, subsurface soil, and subsurface debris at SWMU 14 by constructing an asphalt cover. The supporting AM was signed April 8, 2008. Construction activities, consisting of construction of the asphalt cover (parking lot) and bioretention areas and removal of CD as encountered, were initiated in early June 2008 and completed in January 2009.
Focused FS (CH2M 2009) AR # 000002	The Focused FS was finalized in July 2009. The FS was completed to evaluate remedial action alternatives to address remaining COCs in soil and groundwater.

Table 2-47. Summary of Relevant Documents and Milestones for SWMU 14 (OU13)

Document Title/ Milestone	Summary
PRAP and ROD (CH2M 2010b) AR # 000248	The Proposed Plan was completed in September 2009, recommending LUCs to prevent exposure to soil by human receptors by maintaining the asphalt cover. The ROD was signed in August 2010 to document LUCs as the selected remedy. As documented in the ROD, potential risks associated with groundwater were deemed acceptable, and no action for groundwater was required; however, the LUC objectives for SWMU 14 prohibit the withdrawal of groundwater.
Five-Year Reviews (CH2M 2019b, 2024b) AR # 002748, 003172	The Fourth Five-Year Review Report concluded that the remedy at SWMU 14 is protective of human health and the environment. The Fifth Five-Year Review Report concluded that the remedy at SWMU 14 is protective of human health (current and future) and the environment.

SWMU 14 (OU13) COCs

Identified COCs for each medium at SWMU 14 are summarized in **Table 2-48**.

Table 2-48. Summary of Constituents of Concern at SWMU 14 (OU13)

Medium	Potential Risk	COC
Groundwater	None Identified	
Soil	Human Health	Iron, thallium, vanadium, antimony, benzo(a)pyrene
Surface Water	N/A	N/A
Sediment	N/A	N/A
Indoor Air	N/A	N/A

Current and Future Activities

Quarterly site inspections at SWMU 14 will be conducted to ensure LUCs are maintained. If the quarterly inspections identify any breaches in the asphalt surface or soil cover, the information will be presented to the NSN Team to discuss whether any mitigation measures are needed to maintain protectiveness.

The next Five-Year Review for SWMU 14 is due to be finalized in 2029 (**Schedule 2-1**).

2.2.2 SWMU 8—Firefighting School (OU17)

SWMU 8 – Summary

Status:	RI
Current IR Activities:	RI
Media to be Investigated:	Soil, groundwater, surface water, and sediment
Removal and Remedial Actions:	None
Media Closed:	None
Waste and Debris Present Onsite:	N/A

Site Description and History

The FFS is a noncontiguous area of NSA Hampton Roads that supports firefighting training for Navy personnel. The FFS, also known as the Farrier Fire Fighting School, is a 12.3-acre facility located west of Hampton Boulevard between Baker Road and 6th Street (**Figure 2-24**) and has been in operation since 1963. It is located within the Norfolk International Freight Terminals, which is a secure area.

SWMU 8 is within the footprint of the FFS. In 1989, environmental investigations were initiated with a site assessment of the old FFS Facility that was located within SWMU 8A. This investigation identified a firefighting structure, firefighting training mockup, and two firefighting pits and concluded that POL was present in surface soils, subsurface soils, groundwater, and concrete and brick structures at the facility, and site remediation was necessary. Following the site assessment, approximately 25,000 tons of soil were excavated and treated via onsite thermal treatment between January and April 1992. Following remediation, new firefighting training facilities were constructed east of and adjacent to the old facility and a new firefighting facility was constructed on the western half of the parcel. During this construction, three concrete structures (the engine room, the boiler room, and the focsle), a concrete hangar deck, several brick control room buildings, and three concrete pits were also removed. On aerial imagery dated from 1991 to 1994, three large pits and accompanying site staining were located along the southern boundary of SWMU 8. It is likely that these are firefighting training pits because the FFS has documented use of firefighting pits throughout its history. The location of these pits is a parking lot south of Building SDA310. SWMU 8 was closed in 2001 on the basis of an RRR Study that indicated that the site did not pose an unacceptable risk to human health or the environment.

FFS operations have used AFFF historically and occasional overflows of AFFF have been documented. Firefighting activities, fire pits, and metal structures that simulate shipboard and aircraft conditions, as well as water and other chemical and organic fire extinguishing agents have historically been and currently are used and stored at the FFS. AFFF was often discharged indoors and then disposed of in an outdoor concrete pit. Standard training would consist of igniting fires within concrete pits and/or rings with fuel oil, and subsequently extinguishing the fires. The resulting water and oil would flow to storm drains. The use of AFFF for training at the FFS was reportedly prohibited in the 1990s; however, no records confirming this have been identified.

Table 2-49 provides a list of relevant PFAS documents and past activities for SWMU 8 – Firefighting School.

Table 2-49. Summary of Relevant Documents and Milestones for SWMU 8 (OU17)

Document Title/ Milestone	Summary
Basewide PFAS PA (CH2M 2022a) AR # 003087	The 2022 Basewide PFAS PA was completed to identify and catalog all potential or confirmed PFAS release areas and identify areas requiring further PFAS investigation. Firefighting training activities have occurred at Building SDA339, SDA342, SDA346, SDA310, and firefighting pits, as well as unknown locations. FFS operations have used AFFF historically and occasional overflows of AFFF have been documented. AFFF was often discharged indoors and then disposed of in an outdoor concrete pit. As a result of these historical activities, the FFS was identified as a PFAS release area and the PA recommended further evaluation of the FFS during the Basewide PFAS SI.

Table 2-49. Summary of Relevant Documents and Milestones for SWMU 8 (OU17)

Document Title/ Milestone	Summary
Basewide PFAS SI (CH2M 2023a) AR# 003157	The Basewide PFAS SI was completed to determine whether PFAS were present in soil or groundwater at the FFS. During the SI, PFAS were detected in soil and groundwater above screening criteria, and an RI was recommended.

SWMU 8 (OU17) Chemicals of Potential Concern

COPCs for each medium at SWMU 8 are summarized in **Table 2-50**.

Table 2-50. Summary of Constituents of Concern at SWMU 8 (OU17)

Medium	Potential Risk	COPC
Groundwater	Human Health	PFAS
Soil	Human Health/Ecological Risk	PFAS
Surface Water	Human Health/Ecological Risk	PFAS
Sediment	Human Health/Ecological Risk	PFAS

Note: The potential risk to human or ecological receptors as a result of exposure to PFAS have not yet been evaluated but will be evaluated during the RI if a complete exposure pathway exists.

Current and Future Activities

Work planning for the RI at SWMU 8 began in 2023 and will be followed by a field investigation beginning in 2026. The PFAS RI Report is expected to be finalized in 2028 and will be followed by an FS (2029), Proposed Plan (2030), and ROD (2031).

Schedule 2-15 presents the FY 2027 through FY 2031 schedule for SWMU 8.

2.3 Contaminants of Emerging Environmental Concern

Contaminants of Emerging Environmental Concern are a “chemical or material that is characterized by perceived or real threat to human health or the environment with no published health standard or an evolving standard” and the DoD has established *DoD Instruction 4715.18: Emerging Chemicals of Environmental Concern*, which establishes the policy for the identification, assessment and risk management of contaminants of emerging environmental concern that have the potential to impact the DoD (DoD 2019). Contaminants of emerging environmental concern have been evaluated at NSN during the Five-Year Review Process and incorporated into the ERP as appropriate (e.g., 1,4-dioxane, perchlorate, dioxins and furans, PFAS). PFAS were identified as contaminants of emerging environmental concern and this section provides information regarding investigations associated with the assessment of PFAS at NSN.

2.3.1 Sites with PFAS

The Basewide PFAS PA includes comprehensive review of historical documents to identify potential PFAS release areas in addition to the sites previously identified. The report was finalized in FY 2022. The PA (CH2M 2022a) identified 41 potential or confirmed release areas for further evaluation. Each area that was recommended for further evaluation was either evaluated during the SI (CH2M 2023a) or investigation activities were deferred to the RI phase. As a result of the data collected during the SI, or decision to defer investigation, each area identified in the PA as a potential or confirmed release area was recommended for further investigation in an RI. The SI recommended release areas were evaluated in groups, or AOCs. Each AOC has been assigned a site number and name and the correlation from SI AOC to RI Site is depicted in **Appendix C**. Each site moving to the RI phase will be addressed and evaluated as described in **Appendix A**. Consistent with the CERCLA process, if an understanding of site conditions change or new site information is obtained which alters the CSM (such as a release of another chemical to the environment), additional chemical analyses (beyond PFAS) may be considered during the investigation process.

Regulatory concurrence was not achieved on 134 areas, listed in **Table 2-51**, where the PA recommended no additional investigation at this time. Additional documentation of the non-concurrence items is captured in the PA and in comments and Response to Comments (CH2M 2022c) on the draft PA.

Table 2-51. Areas Identified as Potential PFAS Release Areas where Regulatory Concurrence Not Achieved

Facility	Area
Naval Station Norfolk	Building CEP171
Naval Station Norfolk	Pit To Craney, Q50 Area
Naval Station Norfolk	Building CEP200 and Building CEP209
Naval Station Norfolk	Building X218
Naval Station Norfolk	Building W174
Naval Station Norfolk	Pier 1
Naval Station Norfolk	Pier 3
Naval Station Norfolk	Pier 5
Naval Station Norfolk	Pier 5T
Naval Station Norfolk	Pier 7
Naval Station Norfolk	Pier 8
Naval Station Norfolk	1975 USS Independence Explosion. ¹
Naval Station Norfolk	1976 Elmer Montgomery Fire ¹
Naval Station Norfolk	1979 USS Comte de Grasse Fire ¹
Naval Station Norfolk	Site 16 – Building X136

Table 2-51. Areas Identified as Potential PFAS Release Areas where Regulatory Concurrence Not Achieved

Facility	Area
Naval Station Norfolk	Lift and Pump Stations
Naval Station Norfolk	OWSs
Naval Station Norfolk	Building Z309
Naval Station Norfolk	SWMU 14 (OU13)– Q50 Satellite Accumulation Area
Naval Station Norfolk	Building A81
Naval Station Norfolk	Building A123
Naval Station Norfolk	Building CEP166
Naval Station Norfolk	Building CEP201
Naval Station Norfolk	Building W135
Naval Station Norfolk	Building W313
Naval Station Norfolk	Building X137
Naval Station Norfolk	Building X275
Naval Station Norfolk	Building X374
Naval Station Norfolk	Building W143
Naval Station Norfolk	Building Z93
Naval Station Norfolk	Building Z105
Naval Station Norfolk	Building Z140
Naval Station Norfolk	Z200 Area
Naval Station Norfolk	Building Z398
Naval Station Norfolk	Building W5
Naval Station Norfolk	Building A127
Naval Station Norfolk	SWMU 15 – Hazardous Waste Accumulation Area
Naval Station Norfolk	Building W131
Naval Station Norfolk	Building W7
Naval Station Norfolk	Pier Area B and Pier Area D
Naval Station Norfolk	Pier 8 Storm Drain Area
Naval Station Norfolk	Oil/Water Separators (NSN-KBB-OWS-02)
Naval Station Norfolk	Site 6 – CD Landfill
Naval Station Norfolk	SWMU 30 – Sludge Fill Disposal Area
Naval Station Norfolk	SWMU 38 – CD Area Behind Compost Yard
Naval Station Norfolk	Building IAA
Naval Station Norfolk	Building J50
Naval Station Norfolk	Building KCC
Naval Station Norfolk	Building KQ
Naval Station Norfolk	Building M52
Naval Station Norfolk	Building M113
Naval Station Norfolk	Building N19

Table 2-51. Areas Identified as Potential PFAS Release Areas where Regulatory Concurrence Not Achieved

Facility	Area
Naval Station Norfolk	N26B
Naval Station Norfolk	Building P76
Naval Station Norfolk	Building P72
Naval Station Norfolk	Building MB28
Naval Station Norfolk	Building P71
Naval Station Norfolk	Building P1
Naval Station Norfolk	Building CD2
Naval Station Norfolk	Building CD30
Naval Station Norfolk	Building O28
Naval Station Norfolk	Building U120
Naval Station Norfolk	Building U128
Naval Station Norfolk	Building U113
Naval Station Norfolk	Site 5 – Pesticide Disposal Site
Naval Station Norfolk	Building V109
Naval Station Norfolk	Building V136
Naval Station Norfolk	Building LF18, WDA 3 Area
Naval Station Norfolk	Building V71, Site 19 Area
Naval Station Norfolk	OWSs
Naval Station Norfolk	Building LF38, SWMU 5 Area
Naval Station Norfolk	Building LF50, SWMU 5 Area
Naval Station Norfolk	Building LF53, SWMU 5 Area
Naval Station Norfolk	Building R60
Naval Station Norfolk	Building V58
Naval Station Norfolk	Building V88
Naval Station Norfolk	Building V143
Naval Station Norfolk	Building V146
Naval Station Norfolk	Building V4, Building V28 Area
Naval Station Norfolk	Building V28
Naval Station Norfolk	SWMU 6 – Building V28 Waste Pit
Naval Station Norfolk	Aircraft Bone Yard
Naval Station Norfolk	Building LF69
Naval Station Norfolk	LF64
Naval Station Norfolk	Buildings R61 and R62
Naval Station Norfolk	Building R63
Naval Station Norfolk	Building LP2
Naval Station Norfolk	Building LP4
Naval Station Norfolk	Building LP12, Former LP12 Area

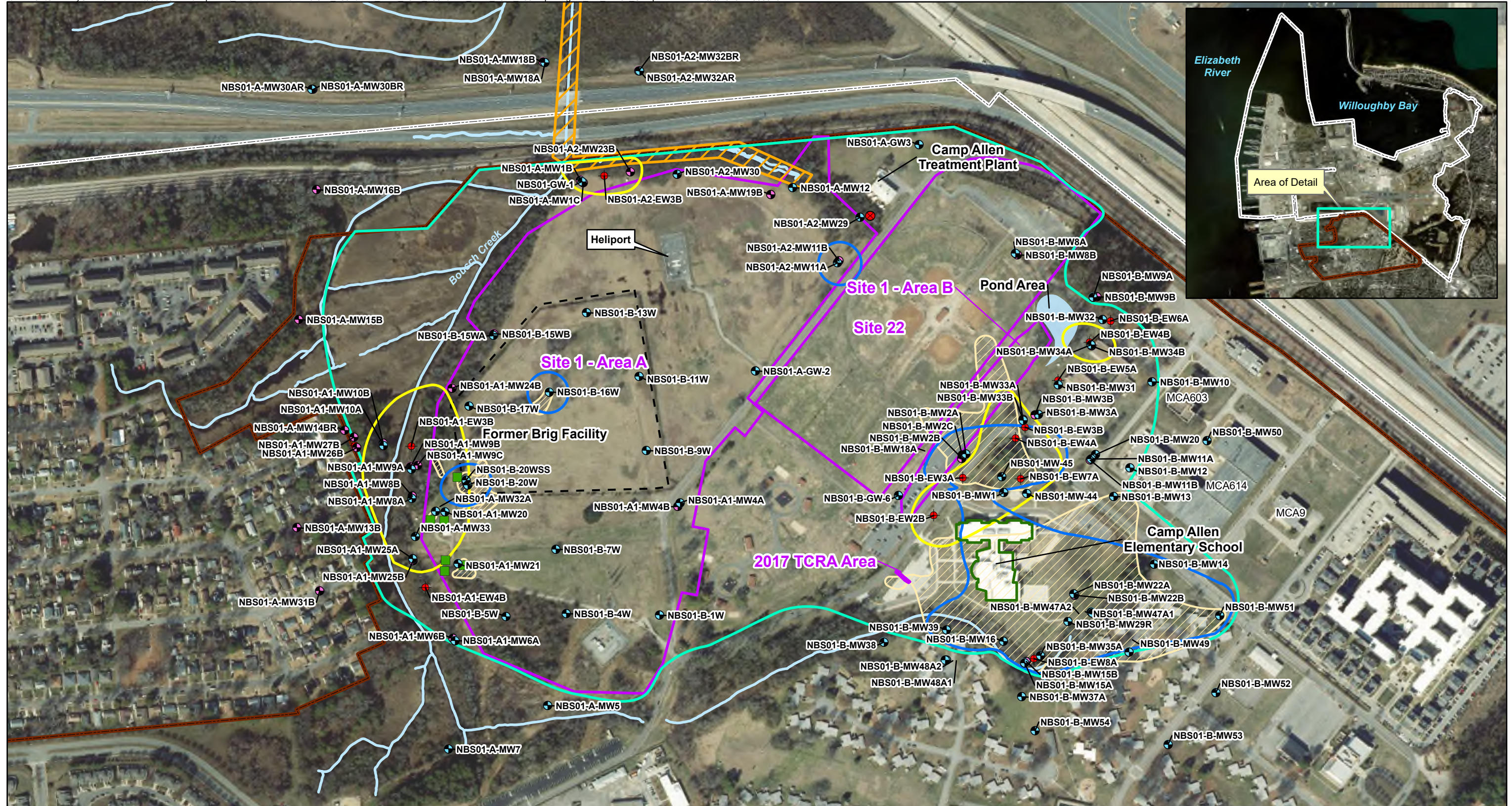
Table 2-51. Areas Identified as Potential PFAS Release Areas where Regulatory Concurrence Not Achieved

Facility	Area
Naval Station Norfolk	LP123, Former LP12 Area
Naval Station Norfolk	Building LP167, LP167 Area
Naval Station Norfolk	Building LP205A, LP167 Area
Naval Station Norfolk	Building LP3, LP Hangar Area
Naval Station Norfolk	LP 48, LP Hangar Area
Naval Station Norfolk	LP Fuel Farm
Naval Station Norfolk	Building LP45, LP Fuel Farm Area
Naval Station Norfolk	Lift Stations
Naval Station Norfolk	OWSs
Naval Station Norfolk	Building SP31
Naval Station Norfolk	Building SP36
Naval Station Norfolk	Buildings SP356 and SP363
Naval Station Norfolk	Building SP381
Naval Station Norfolk	Building SP65
Naval Station Norfolk	Building SP300
Naval Station Norfolk	Lift and Pump Stations
Naval Station Norfolk	OWSs (SP35-OWS-01 and -02)
Naval Station Norfolk	SWMU 1– SP2B Hazardous Waste Accumulation Area
Naval Station Norfolk	Building SP10
Naval Station Norfolk	Building SP38
Naval Station Norfolk	Building SP85
Naval Station Norfolk	Building SP123
Naval Station Norfolk	Building SP233
Naval Station Norfolk	Building SP237
Naval Station Norfolk	Building SP234
Naval Station Norfolk	Building SP383
Naval Station Norfolk	SP13
Naval Station Norfolk	Building SP41
Naval Station Norfolk	SP285
Naval Station Norfolk	SP296
Naval Station Norfolk	Lift and Pump Stations
Naval Station Norfolk	SWMU 27 – Mason Creek Embankment
Naval Station Norfolk	Building NM95
Naval Station Norfolk	Building NM92
Naval Station Norfolk	Building NM110
Naval Station Norfolk	Building NM111
NSA Hampton Roads	Building MC604

Table 2-51. Areas Identified as Potential PFAS Release Areas where Regulatory Concurrence Not Achieved

Facility	Area
NSA Hampton Roads	Lift and Pump Stations (8)
NSA Hampton Roads	OWSs (3)
NSA Hampton Roads	Building CA484
NSA Hampton Roads	SWMU 39A – Open Dump/Disposal NH3 Area
NSA Hampton Roads	Building NH34
Supply Depot Annex	Building SDA204
Supply Depot Annex	Site 17 – Chemical Fire Building SDA215

WDA = waste disposal area



Legend

- DPVE Well
- Columbia Aquifer Monitoring Well
- Yorktown-Eastover Aquifer Monitoring Well
- Extraction Well
- Treatment Plant Discharge Point
- Surface Water Features

- Bousch Creek Sediment Removal Action (2008)
- Land Use Control Area
- Former Brig Facility
- Site Boundary
- Naval Station Norfolk
- NSA Hampton Roads

2023 LTM COC Plume Extent Greater than Cleanup Goals:

- Estimated extent of COCs in groundwater greater than cleanup goals in the Columbia aquifer
- Estimated extent of COCs in groundwater greater than cleanup goals in the Yorktown-Eastover aquifer.

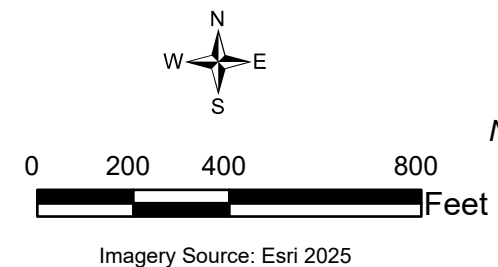
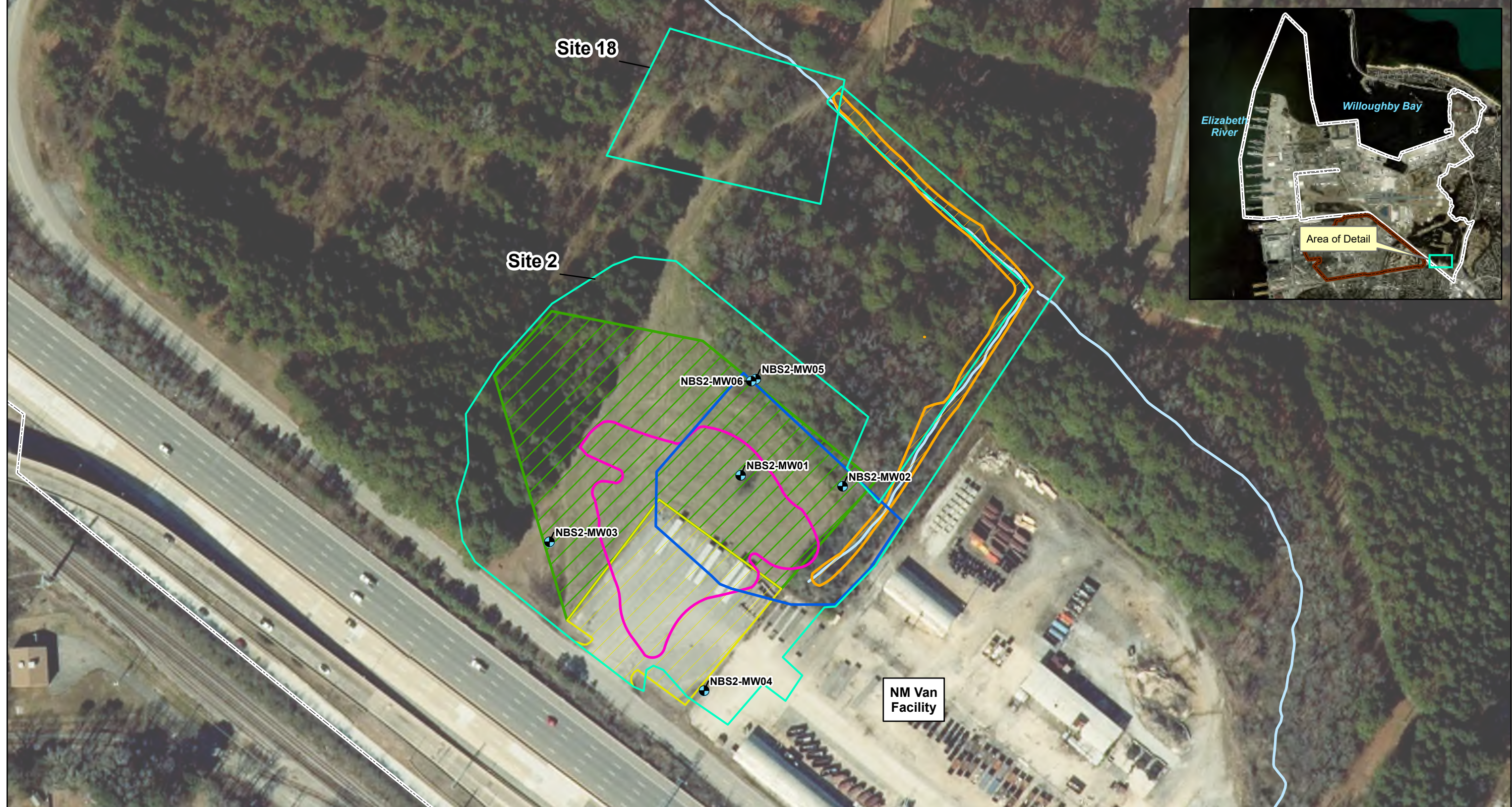


Figure 2-1
Site 1 (OU 1 and OU 15) - Camp Allen Landfill
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



- Legend**
- Monitoring Well
 - Surface Water Feature
 - Approximate Location of Slag Pile
 - Area of Sediment Removal
 - Area of Soil Cover
 - Areal Extent of Geophysical Anomaly
 - Area of Asphalt Cover
 - Land Use Control Area
 - Naval Station Norfolk
 - NSA Hampton Roads

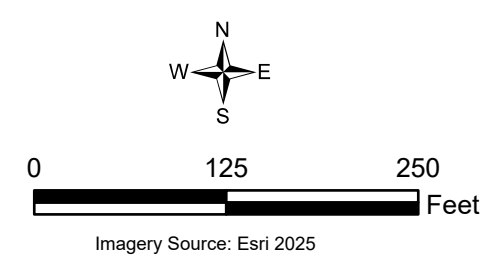


Figure 2-2
Site 2 (OU 2) - Naval Magazine Slag Pile
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

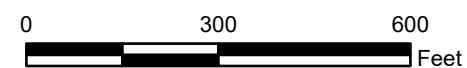


Legend

- Monitoring Well
- Air Sparge Well (AS)
- Piping for AS System
- Land Use Control Area
- AOC Boundary
- Naval Station Norfolk
- NSA Hampton Roads

2024 LTM Data COC Plume Extent Greater than Cleanup Goals (Dashed Where Inferred):

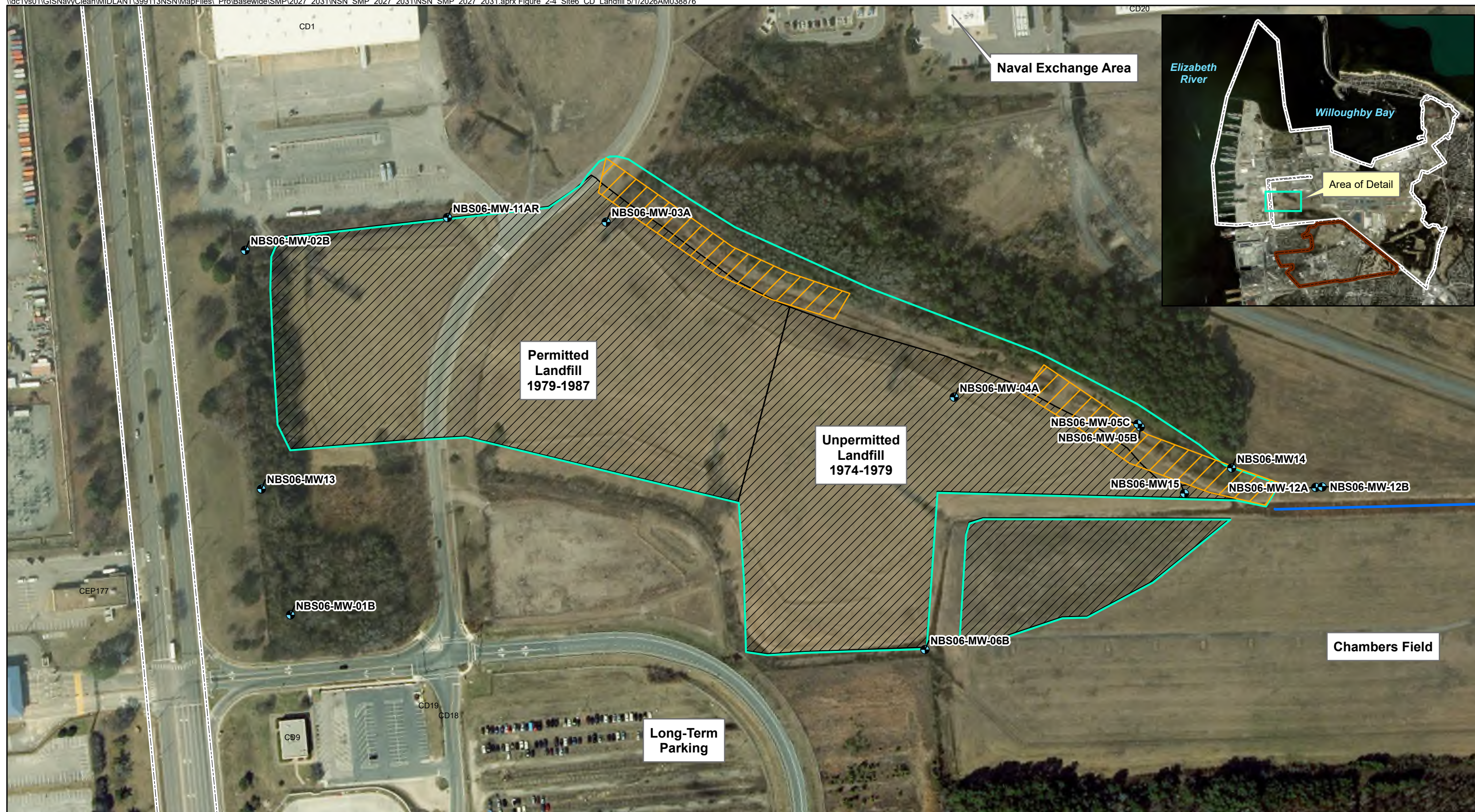
- 1,1-DCE greater than 0.38 µg/L
- TCE greater than 5 µg/L
- VC greater than 0.08 µg/L



Imagery Source: Esri 2025

Figure 2-3
Site 3 (OU3) - Q-Area Drum Storage Yard
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia





- Legend**
- Monitoring Well
 - Tributary to Bousch Creek
 - Areas of Sediment Removal
 - Land Use Control Area
 - Engineered Landfill Cover
 - Naval Station Norfolk
 - NSA Hampton Roads

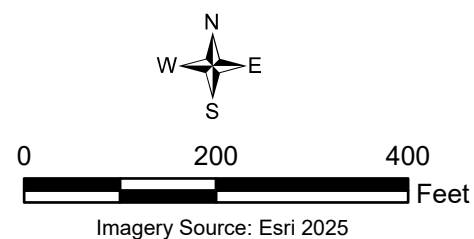
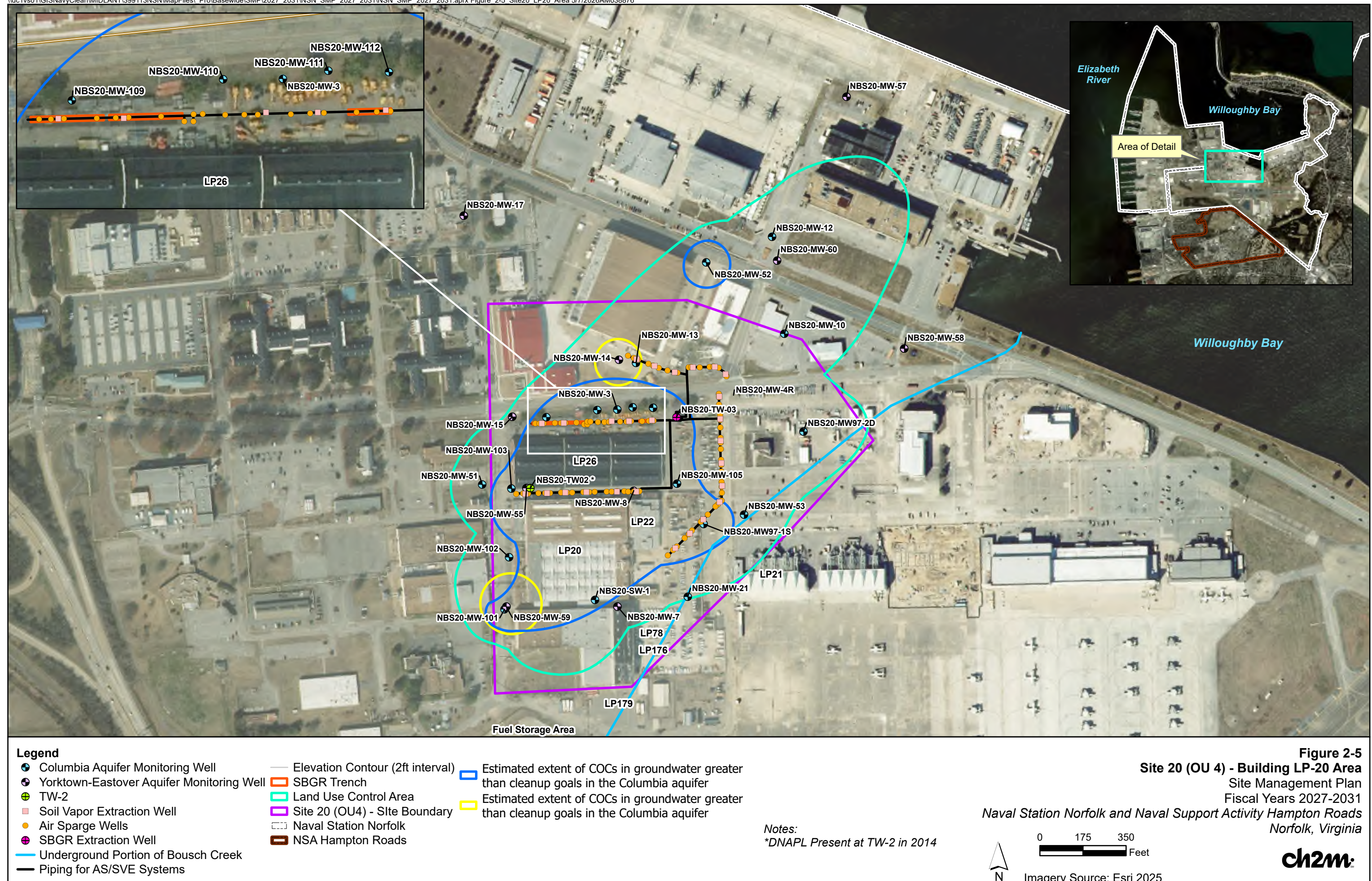


Figure 2-4
Site 6 (OU 1 and OU 2) - Construction Debris Landfill
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia





- Legend**
- Small Sign
 - Large Sign
 - Surface Water Features
 - Site 1 Boundary
 - Sediment Cover Installed in 2003
 - Soil Cover Installed in 2002
 - Former Area
 - Land Use Control Area
 - PCB Contaminated Soil Removed in 1998
 - PCB/Metals Contaminated Soil Removed in 2001
 - Metals 'Hot Spot' Soil Removed (0-4 Foot) in 2001
 - Metals 'Hot Spot' Soil Removed (0-1.5 Foot) in 2001

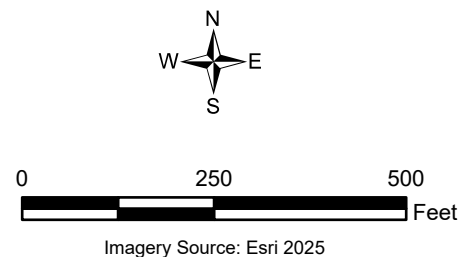
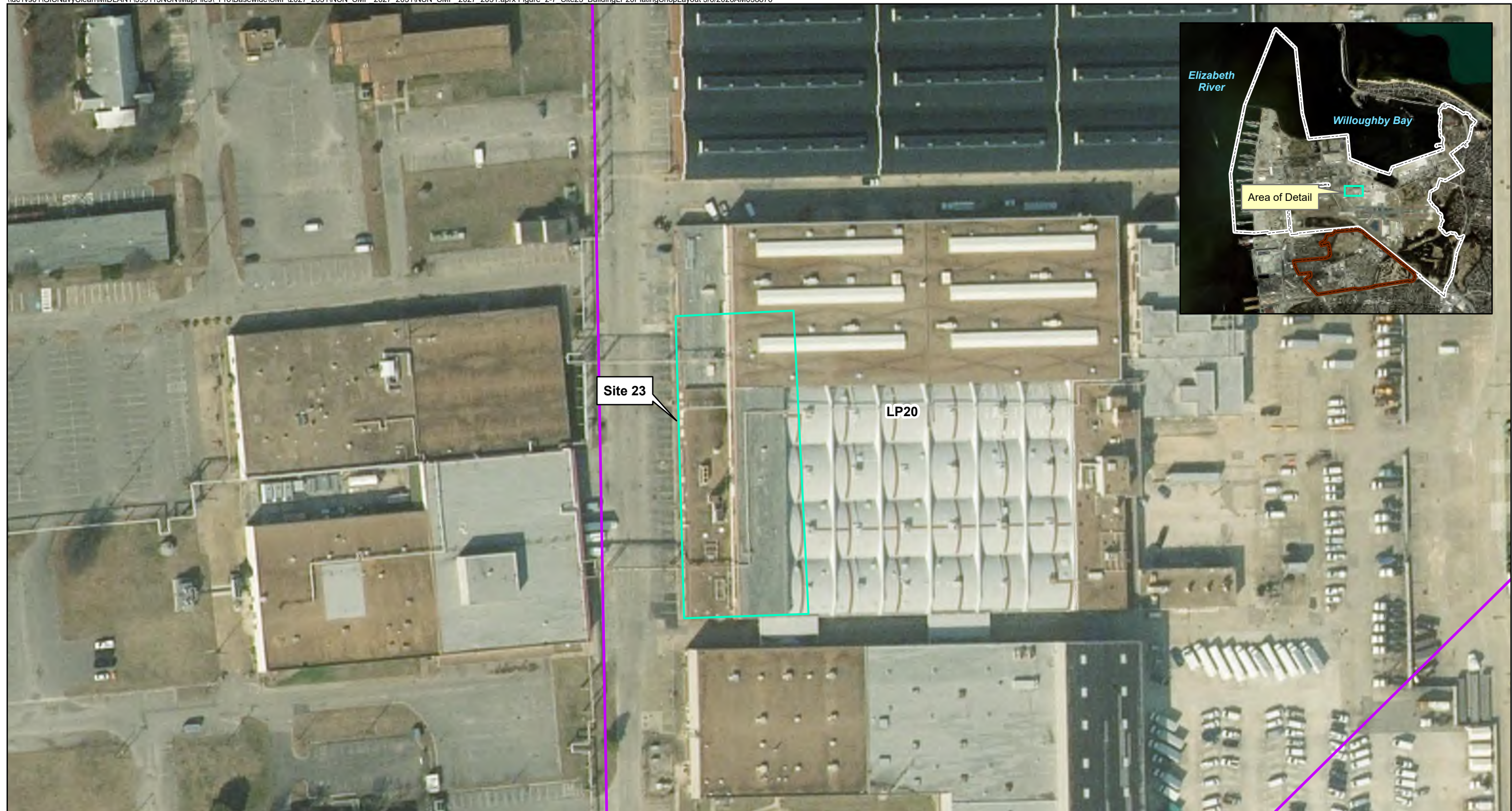


Figure 2-6
Site 22 (OU 8) - Camp Allen Salvage Yard
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



Legend
Cyan rectangle: Land Use Control Area
Purple line: Site 20 (OU4) - Site Boundary

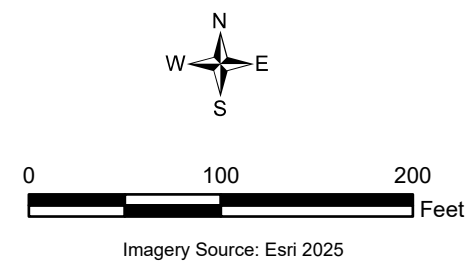
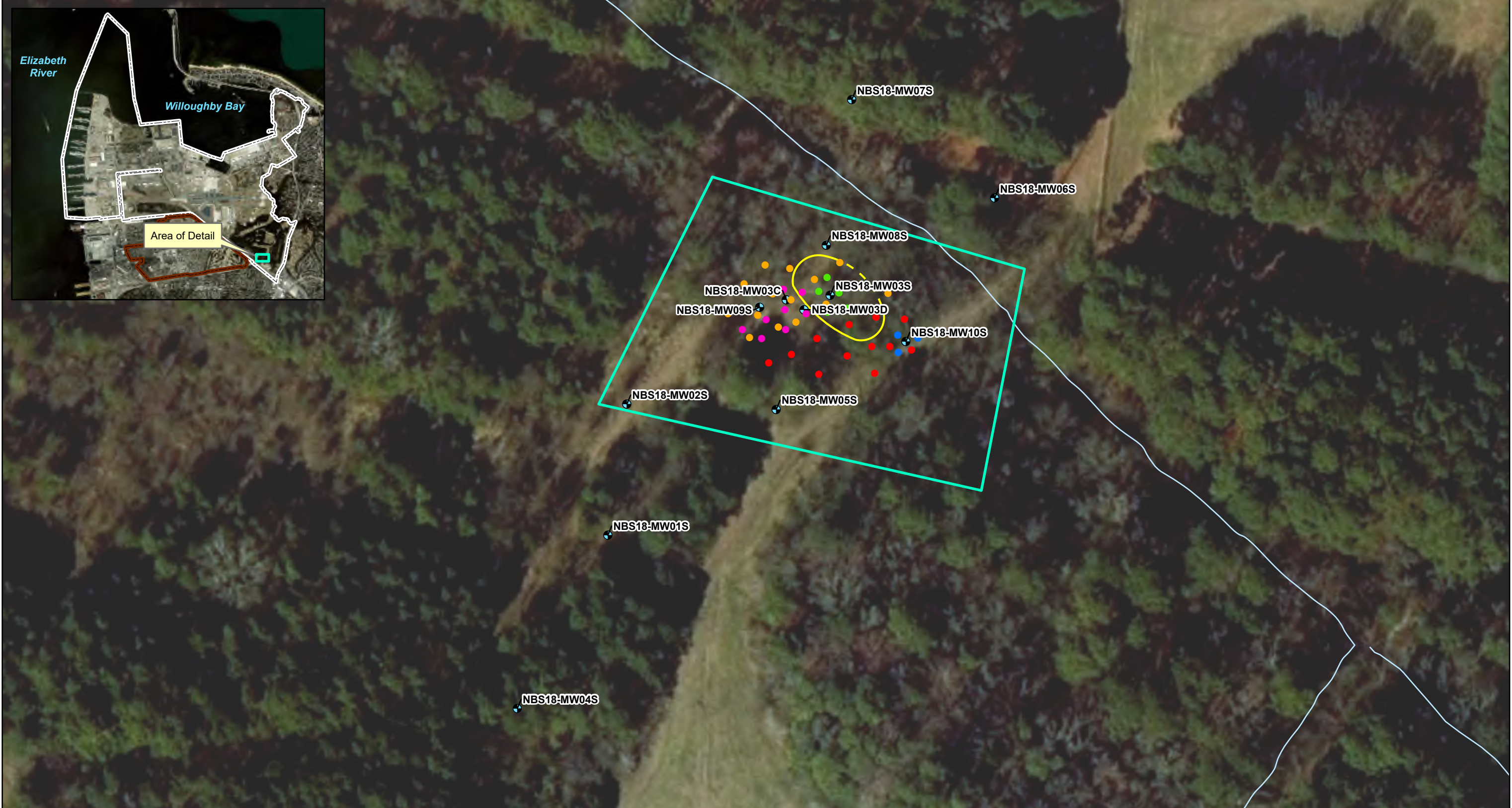


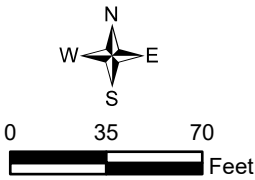
Figure 2-7
Site 23 (OU 10) - Building LP-20 Plating Shop
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



Legend

- Monitoring Well
- 2008 Injection Location (6 to 16 feet below ground surface)
- 2008 Injection Location (12 to 22 feet below ground surface)
- 2010 Supplemental Injection Location (16 to 22 feet below ground surface)
- 2010 Supplemental Injection Location (3 to 13 feet below ground surface)
- 2010 Supplemental Injection Location (7 to 14 feet below ground surface)

- Surface Water Features
- Land Use Control Area
- 2024 LTM Data COC Plume Extent Above Cleanup Goals (Dashed Where Inferred):
- Vinyl Chloride greater than 2 µg/L

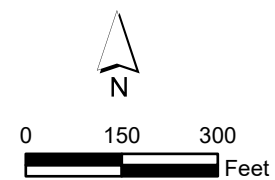


Imagery Source: Esri 2025

Figure 2-8
Site 18 (OU 14) - Former Naval Magazine
Waste Storage Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia
ch2m



- Legend**
- Monitoring Well Location
 - PFAS Release Area
 - Site 3 (OU 16) - Site Boundary
 - Site 3 (OU3) - Land Use Control Area
 - Wetland
 - Installation Boundary

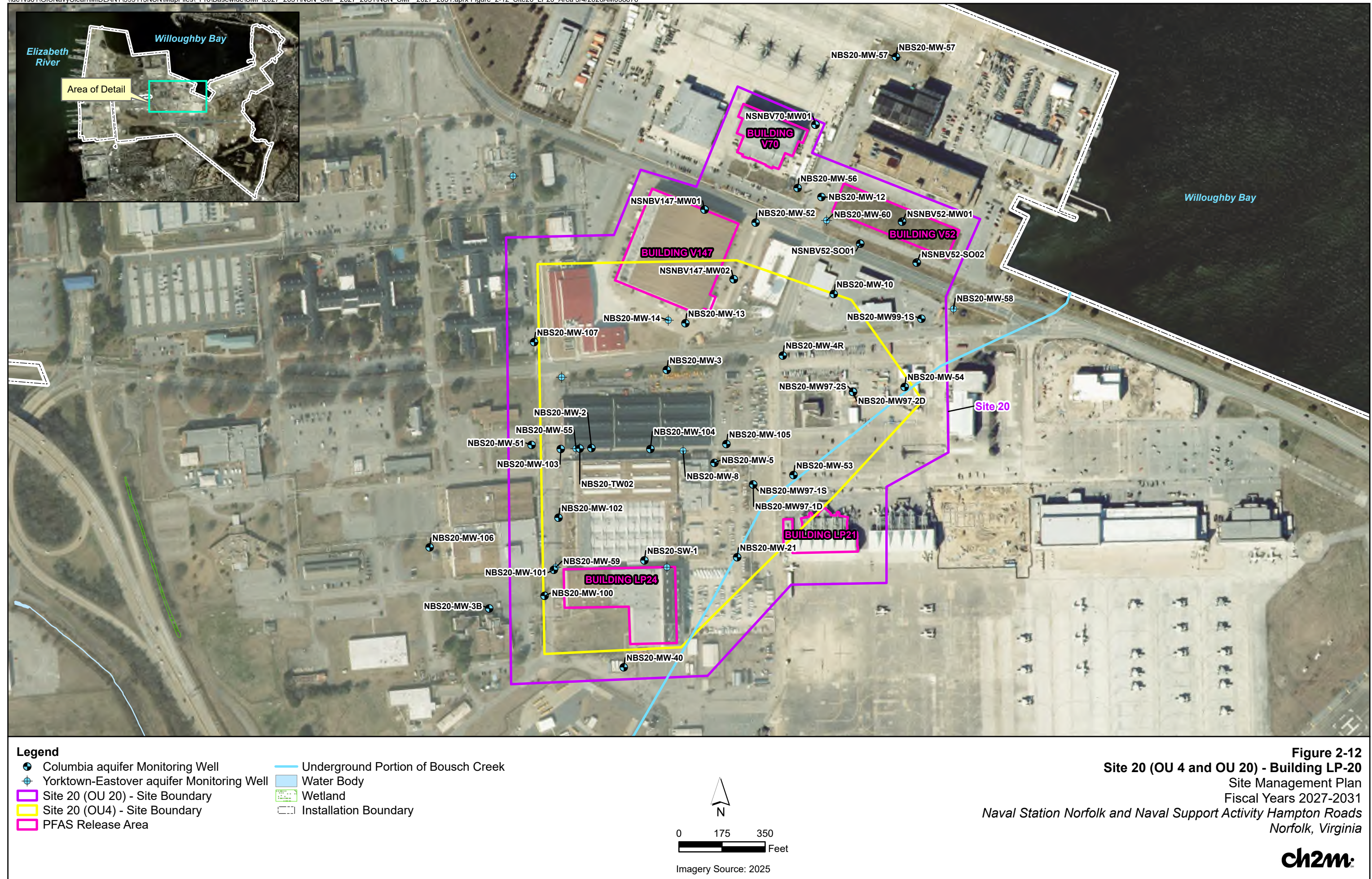


Imagery Source: Esri 2025

Figure 2-9
Site 3 (OU 3 and OU 16) - Q-Area Drum Storage Yard
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

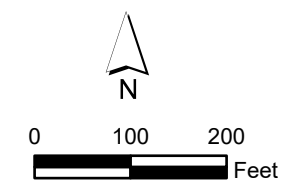








- Legend**
- Monitoring Well
 - PFAS Release Area
 - Site 24 (OU24) - Site Boundary
 - 2020 Excavation Areas
 - Installation Boundary



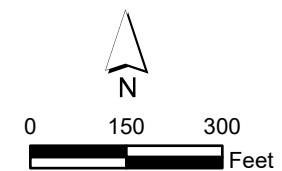
Imagery Source: Esri 2025

Figure 2-13
Site 24 (OU 24) - W Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia





- Legend**
- Monitoring Wells
 - Site 26 (OU26) - Site Boundary
 - PFAS Release Area
 - Installation Boundary

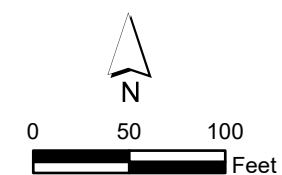


Imagery Source: Esri 2025

Figure 2-15
Site 26 (OU 26) - CEP Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



- Legend**
- Monitoring Wells
 - Site 27 (OU27) - Site Boundary
 - Installation Boundary



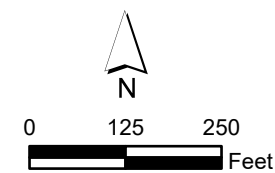
Imagery Source: Esri 2025

Figure 2-16
Site 27 (OU 27) - Building KBB Fire Truck Maintenance Shop
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

ch2m

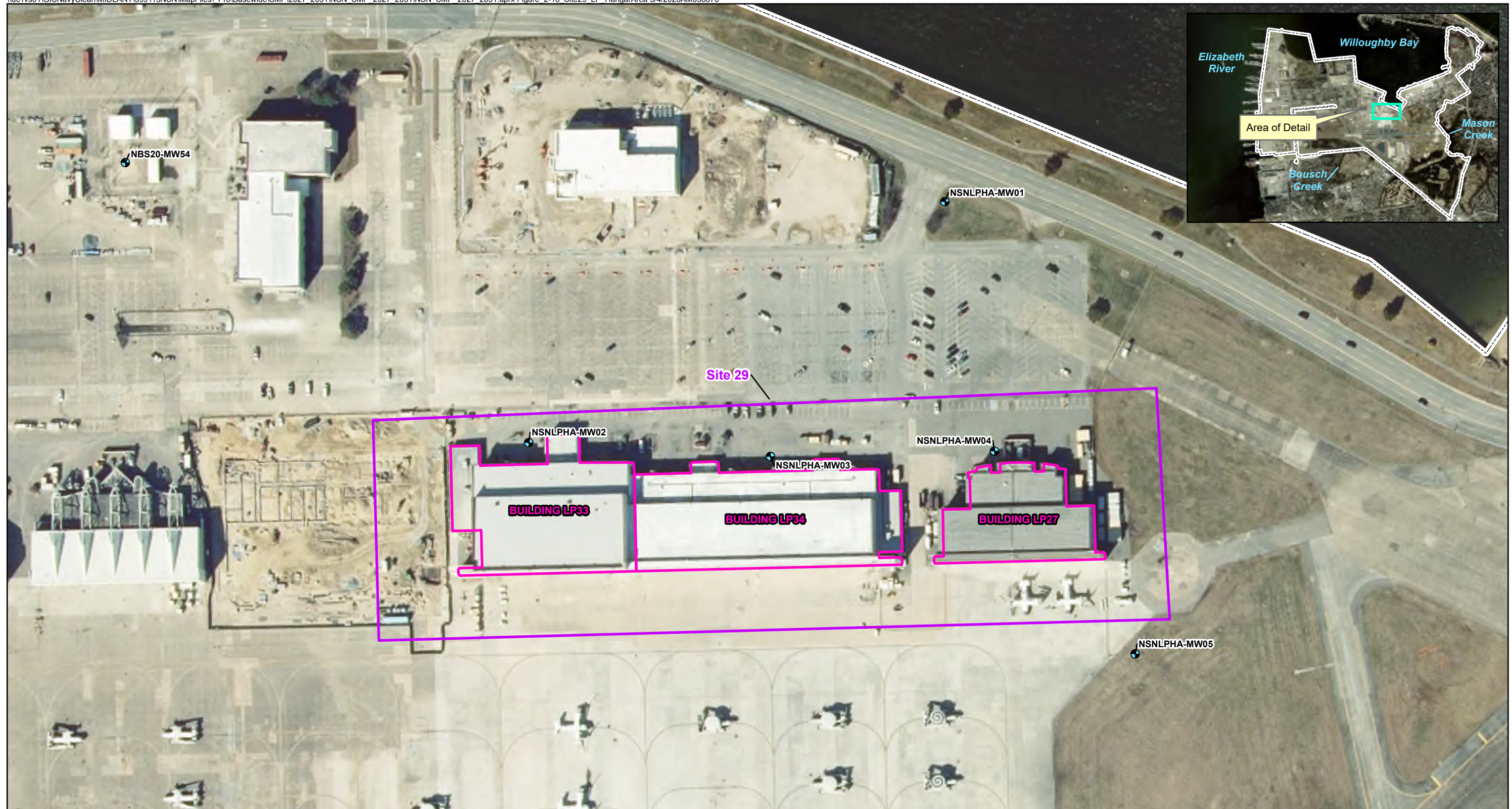


- Legend**
- Monitoring Wells
 - Site 28 (OU28) - Site Boundary
 - PFAS Release Area
 - Installation Boundary



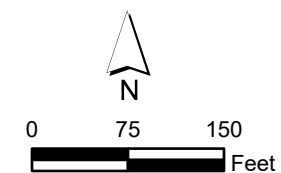
Imagery Source: Esri 2025

Figure 2-17
Site 28 (OU 28) - LF Hangar Area, Building R43, and Building V49
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



Legend

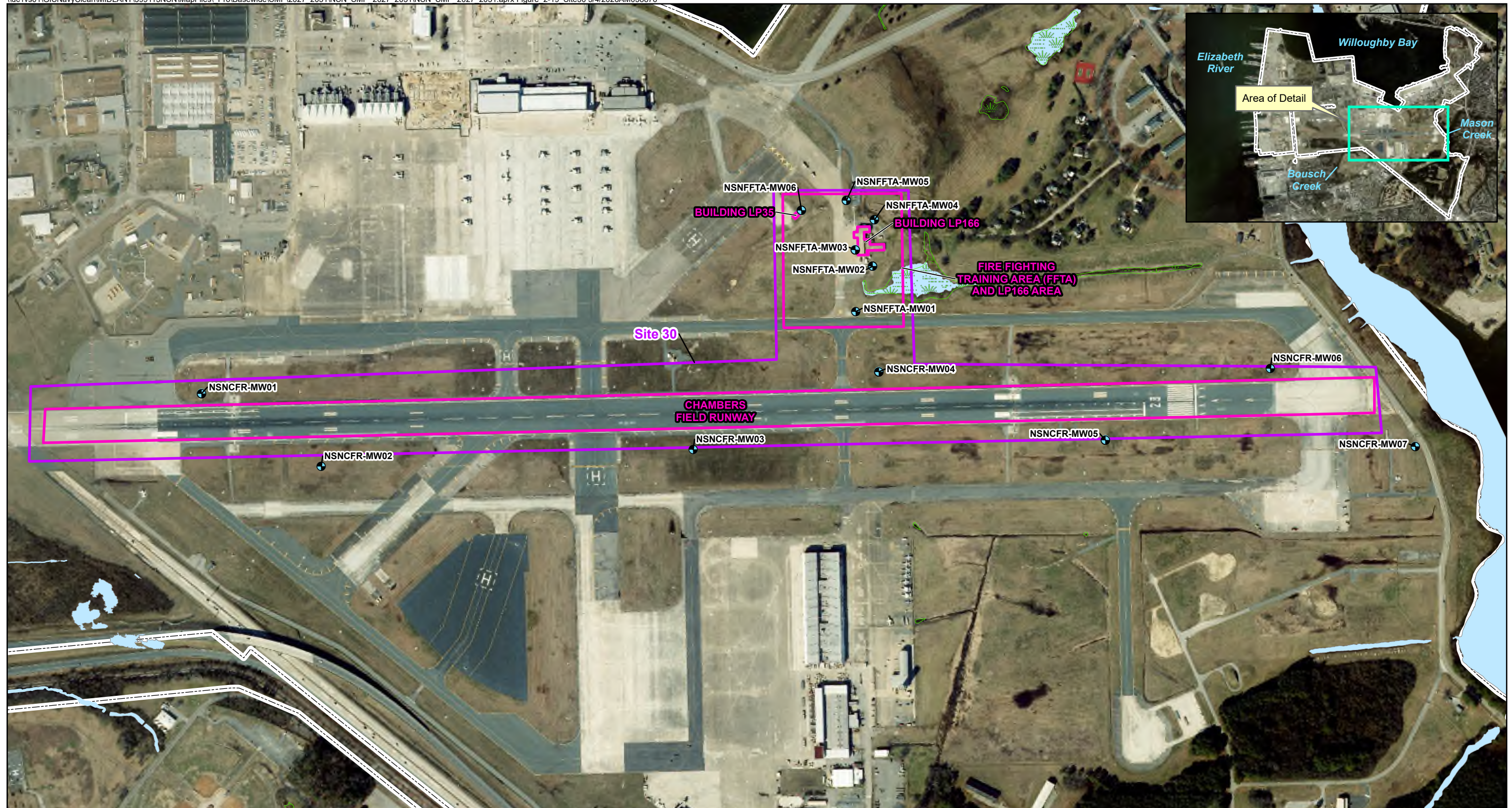
- Monitoring Wells
- Site 29 (OU29) - Site Boundary
- PFAS Release Area
- Installation Boundary



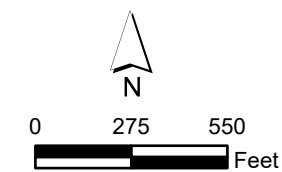
Imagery Source: Esri 2025

Figure 2-18
Site 29 (OU 29) - LP Hangar Area (LP27, LP33, and LP34)
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

ch2m



- Legend**
- Monitoring Wells
 - Site 30 (OU 30) - Site Boundary
 - PFAS Release Area
 - Water Body
 - Wetland
 - Installation Boundary

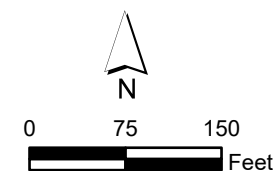


Imagery Source: Esri 2025

Figure 2-19
Site 30 (OU 30) - Runway and Firefighting Training Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



- Legend**
- Monitoring Well Location
 - Site 31 (OU31) - Site Boundary
 - PFAS Release Area
 - Installation Boundary



Imagery Source: Esri 2025

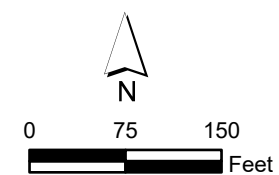
Figure 2-20
Site 31 (OU 31) - SP Hangar Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

ch2m



Legend

- Monitoring Well Location
- Site 32 (OU32) - Site Boundary
- Installation Boundary



Imagery Source: Esri 2025

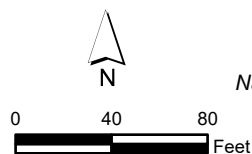
Figure 2-21
Site 32 (OU 32) - SP Spray Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

ch2m



Legend

- Monitoring Wells
- Site 33 (OU33) - Site Boundary
- Naval Station Norfolk
- NSA Hampton Roads



Imagery Source: Esri 2025

Figure 2-22
Site 33 (OU 33) - Building BEN154
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia

ch2m:



- Legend**
- Asphalt Cover
 - Bioretention Areas
 - Historical Location of Original Satellite Accumulation Area Concrete Pad
 - Land Use Control Area

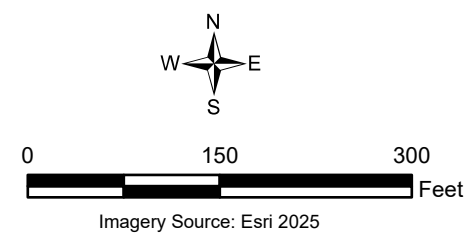
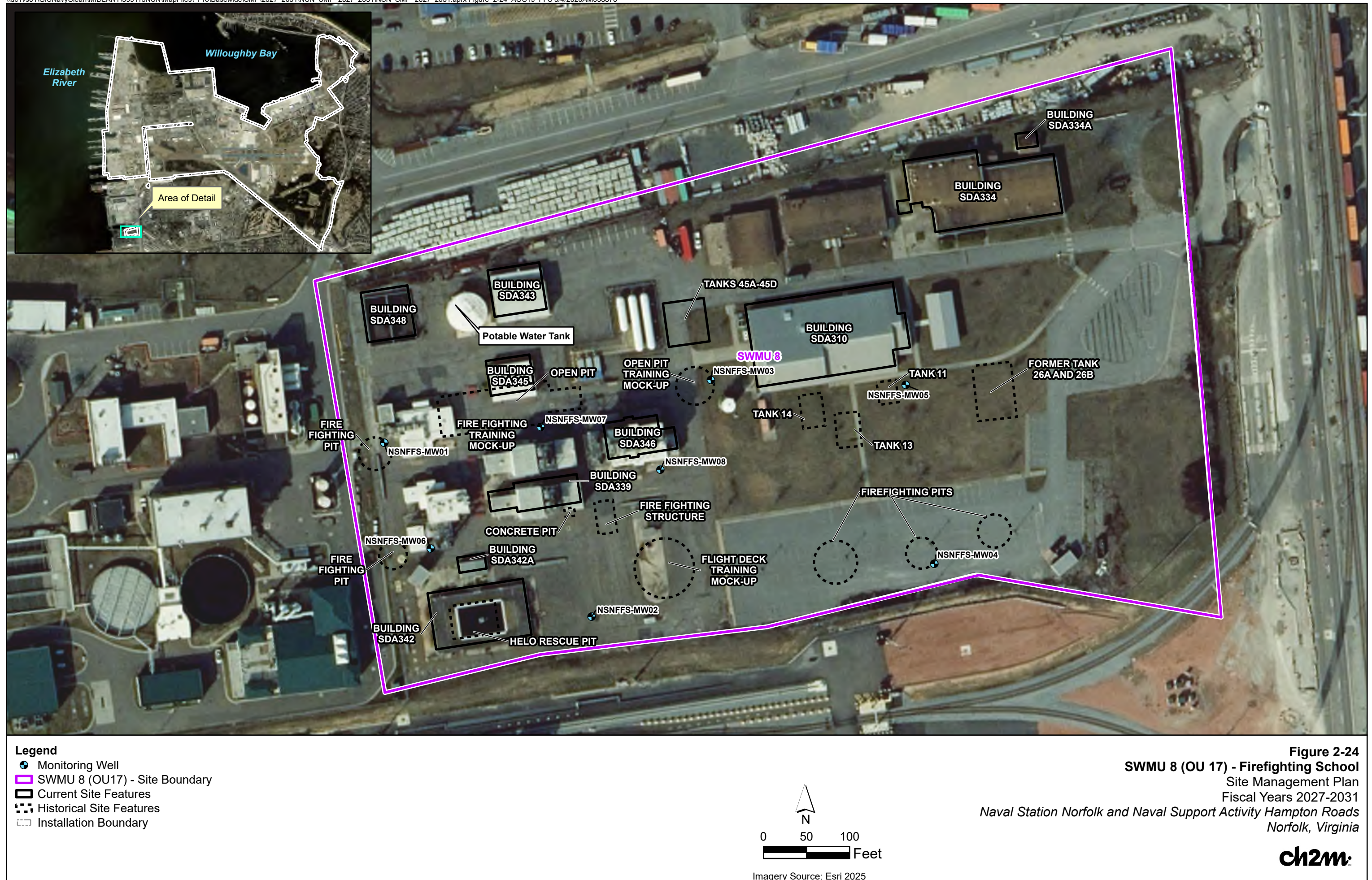


Figure 2-23
SWMU 14 (OU13) - Q-50 Satellite Accumulation Area
Site Management Plan
Fiscal Years 2027-2031
Naval Station Norfolk and Naval Support Activity Hampton Roads
Norfolk, Virginia



Schedule 2-1
Basewide Tasks FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish
1	Site Management Plan FY 2027-2031	183 days	Sun 3/15/26	Sun 9/13/26
2	Development and Submittal of Pre-Draft SMP to Navy	60 days	Sun 3/15/26	Wed 5/13/26
3	Navy Review of Pre-Draft SMP and Comment Resolution	32 days	Thu 5/14/26	Sun 6/14/26
4	Regulatory Review of Draft SMP and Comment Resolution	60 days	Mon 6/15/26	Thu 8/13/26
5	Regulatory Review of Draft Final SMP and Comment Resolution	31 days	Fri 8/14/26	Sun 9/13/26
6	Development and Submittal of Final SMP	15 days	Mon 9/14/26	Mon 9/28/26
7	2023 LTM Fieldwork	837 days	Fri 5/31/24	Mon 9/14/26
8	2023 LTM Report (Sites 1, 3, 18, and 20)	837 days	Fri 5/31/24	Mon 9/14/26
9	Development and Submittal of Pre-Draft 2023 LTM Report to Navy	290 days	Fri 5/31/24	Sun 3/16/25
10	Navy Review of Pre-Draft 2023 LTM Report and Comment Resolution	395 days	Mon 3/17/25	Wed 4/15/26
11	Regulatory Review of Draft 2023 LTM Report and Comment Resolution	91 days	Thu 4/16/26	Wed 7/15/26
12	Regulatory Review of Draft Final 2023 LTM Report and Comment Resolution	45 days	Thu 7/16/26	Sat 8/29/26
13	Development and Submittal of Final 2023 LTM Report	16 days	Sun 8/30/26	Mon 9/14/26
14	2024 LTM Fieldwork	456 days	Mon 6/16/25	Mon 9/14/26
15	2024 LTM Report (Sites 3, 18, and 20)	456 days	Mon 6/16/25	Mon 9/14/26
16	Development and Submittal of Pre-Draft 2024 LTM Report to Navy	273 days	Mon 6/16/25	Sun 3/15/26
17	Navy Review of Pre-Draft 2024 LTM Report and Comment Resolution	31 days	Mon 3/16/26	Wed 4/15/26
18	Regulatory Review of Draft 2024 LTM Report and Comment Resolution	91 days	Thu 4/16/26	Wed 7/15/26
19	Regulatory Review of Draft Final 2024 LTM Report and Comment Resolution	45 days	Thu 7/16/26	Sat 8/29/26
20	Development and Submittal of Final 2024 LTM Report	16 days	Sun 8/30/26	Mon 9/14/26
21	Vapor Intrusion Pathway Evaluation	285 days	Thu 4/30/26	Mon 2/8/27
22	Development and Submittal of Pre-Draft VI Pathway Evaluation to Navy	60 days	Thu 4/30/26	Sun 6/28/26
23	Navy Review of Pre-Draft VI Pathway Evaluation and Comment Resolution	60 days	Mon 6/29/26	Thu 8/27/26
24	Regulatory Review of Draft VI Pathway Evaluation and Comment Resolution	90 days	Fri 8/28/26	Wed 11/25/26
25	Regulatory Review of Draft Final VI Pathway Evaluation and Comment Resolution	45 days	Thu 11/26/26	Sat 1/9/27
26	Development and Submittal of Final VI Pathway Evaluation	15 days	Sun 1/10/27	Sun 1/24/27
27	2025 LTM Fieldwork	468 days	Mon 5/4/26	Sat 8/14/27
28	2025 LTM Report (Sites 1, 3, 18, and 20)	348 days	Tue 9/1/26	Sat 8/14/27
29	Development and Submittal of Pre-Draft 2025 LTM Report to Navy	70 days	Mon 5/4/26	Sun 7/12/26
30	Navy Review of Pre-Draft 2025 LTM Report and Comment Resolution	60 days	Mon 7/13/26	Thu 9/10/26
31	Regulatory Review of Draft 2025 LTM Report and Comment Resolution	91 days	Fri 9/11/26	Thu 12/10/26
32	Regulatory Review of Draft Final 2025 LTM Report and Comment Resolution	45 days	Fri 12/11/26	Sun 1/24/27
33	Development and Submittal of Final 2025 LTM Report	16 days	Mon 1/25/27	Tue 2/9/27
34	2026 LTM SAP Update	261 days	Thu 1/15/26	Fri 10/2/26
35	Development and Submittal of Pre-Draft 2026 LTM SAP to Navy	135 days	Thu 1/15/26	Fri 5/29/26
36	Navy Review of Pre-Draft 2026 LTM SAP and Comment Resolution	60 days	Sat 5/30/26	Tue 7/28/26
37	Regulatory Review of Draft 2026 LTM SAP and Comment Resolution	90 days	Wed 7/29/26	Mon 10/26/26
38	Regulatory Review of Draft Final 2026 LTM SAP and Comment Resolution	45 days	Tue 10/27/26	Thu 12/10/26
39	Development and Submittal of Final 2026 LTM SAP	16 days	Fri 12/11/26	Sat 12/26/26
40	2026 LTM Fieldwork	345 days	Mon 5/31/27	Tue 5/9/28
41	2026 LTM Report (Sites 2, 3, 6, 18, and 20)	345 days	Mon 5/31/27	Tue 5/9/28
42	Development and Submittal of Pre-Draft 2026 LTM Report to Navy	120 days	Mon 5/31/27	Mon 9/27/27
43	Navy Review of Pre-Draft 2026 LTM Report and Comment Resolution	60 days	Tue 9/28/27	Fri 11/26/27
44	Regulatory Review of Draft 2026 LTM Report and Comment Resolution	90 days	Sat 11/27/27	Thu 2/24/28
45	Regulatory Review of Draft Final 2026 LTM Report and Comment Resolution	60 days	Fri 2/25/28	Mon 4/24/28
46	Development and Submittal of Final 2026 LTM Report	15 days	Tue 4/25/28	Tue 5/9/28

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

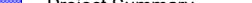
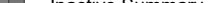
Schedule 2-1
Basewide Tasks FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish	2027													2028													2029													2030													2031												
					S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S				
47	Sixth Five-Year Review	642 days	Fri 4/30/27	Tue 1/30/29																																																																	
48	Development and Submittal of Pre-Draft Sixth FYR to Navy	180 days	Fri 4/30/27	Tue 10/26/27																																																																	
49	Navy Review of Pre-Draft Sixth FYR and Comment Resolution	90 days	Fri 10/29/27	Wed 1/26/28																																																																	
50	Regulatory Review of Draft Sixth FYR and Comment Resolution	240 days	Thu 1/27/28	Fri 9/22/28																																																																	
51	Regulatory Review of Draft Final Sixth FYR and Comment Resolution	90 days	Sat 9/23/28	Thu 12/21/28																																																																	
52	Development and Submittal of Final Sixth FYR for CO Signature	39 days	Fri 12/22/28	Mon 1/29/29																																																																	
53	Sixth FYR Signed	1 day	Tue 1/30/29	Tue 1/30/29																																																																	
54	Community Involvement Plan	360 days	Tue 12/30/25	Thu 12/24/26																																																																	
55	Development and Submittal of CIP to Navy	150 days	Tue 12/30/25	Thu 5/28/26																																																																	
56	Navy Review of Pre-Draft CIP and Comment Resolution	60 days	Fri 5/29/26	Mon 7/27/26																																																																	
57	Regulatory Review of Draft CIP and Comment Resolution	90 days	Tue 7/28/26	Sun 10/25/26																																																																	
58	Regulatory Review of Draft Final CIP and Comment Resolution	45 days	Mon 10/26/26	Wed 12/9/26																																																																	
59	Development and Submittal of Final CIP	15 days	Thu 12/10/26	Thu 12/24/26																																																																	

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-2
Site 1 (OU1) FY 2027-2031 Schedule

[illegible]

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-2
Site 1 (OU1) FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish	2027												2028												2029												2030												2031											
					J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S								
46	Vapor Intrusion Pathway Evaluation	285 days	Thu 4/30/26	Mon 2/8/27																																																												
47	Development and Submittal of Pre-Draft VI Pathway Evaluation to Navy	60 days	Thu 4/30/26	Sun 6/28/26																																																												
48	Navy Review of Pre-Draft VI Pathway Evaluation and Comment Resolution	60 days	Mon 6/29/26	Thu 8/27/26																																																												
49	Regulatory Review of Draft VI Pathway Evaluation and Comment Resolution	90 days	Fri 8/28/26	Wed 11/25/26																																																												
50	Regulatory Review of Draft Final VI Pathway Evaluation and Comment Resolution	45 days	Thu 11/26/26	Sat 1/9/27																																																												
51	Development and Submittal of Final VI Pathway Evaluation	15 days	Sun 1/10/27	Sun 1/24/27																																																												
52	Memo To File	155 days	Sun 1/10/27	Sun 6/13/27																																																												
53	Development and Submittal of Pre-Draft Memo To File to Navy	20 days	Sun 1/10/27	Fri 1/29/27																																																												
54	Navy Review of Pre-Draft Memo To File and Comment Resolution	30 days	Sat 1/30/27	Sun 2/28/27																																																												
55	Regulatory Review of Draft Memo To File and Comment Resolution	60 days	Mon 3/1/27	Thu 4/29/27																																																												
56	Regulatory Review of Draft Final Memo to File and Comment Resolution	30 days	Fri 4/30/27	Sat 5/29/27																																																												
57	Development and Submittal of Final Memo to File	15 days	Sun 5/30/27	Sun 6/13/27																																																												
58	LUC RD Amendment	314 days	Thu 12/10/26	Tue 10/19/27																																																												
59	Development and Submittal of Pre-Draft LUC RD Amendment to Navy	90 days	Fri 4/30/27	Wed 7/28/27																																																												
60	Navy Review of Pre-Draft LUC RD Amendment and Comment Resolution	60 days	Thu 7/29/27	Sun 9/26/27																																																												
61	Regulatory Review of Draft LUC RD Amendment and Comment Resolution	90 days	Mon 9/27/27	Sat 12/25/27																																																												
62	Regulatory Review of Draft Final LUC RD Amendment and Comment Resolution	30 days	Sun 12/26/27	Mon 1/24/28																																																												
63	Development and Submittal of Final LUC RD Amendment Report	14 days	Tue 1/25/28	Mon 2/7/28																																																												
64	Comprehensive Monitoring Well Survey (Area A & B)	473 days	Fri 6/27/25	Mon 10/12/26																																																												
65	Groundwater Flow Fate & Transport Model	473 days	Fri 6/27/25	Mon 10/12/26																																																												
66	Development and Submittal of Pre-Draft Groundwater Flow Fate & Transport Model to Navy	200 days	Fri 6/27/25	Mon 1/12/26																																																												
67	Navy Review of Pre-Draft Groundwater Flow Fate & Transport Model and Comment Resolution	108 days	Tue 1/13/26	Thu 4/30/26																																																												
68	Regulatory Review of Draft Groundwater Flow Fate & Transport Model and Comment Resolution	90 days	Fri 5/1/26	Wed 7/29/26																																																												
69	Regulatory Review of Draft Final Groundwater Flow Fate & Transport Model and Comment Resolution	60 days	Thu 7/30/26	Sun 9/27/26																																																												
70	Development and Submittal of Final Groundwater Flow Fate & Transport Model	15 days	Mon 9/28/26	Mon 10/12/26																																																												
71	Groundwater Treatment System Optimization	315 days	Tue 9/8/26	Mon 7/19/27																																																												
72	Development and Submittal of Pre-Draft Groundwater Treatment System Optimization to Navy	90 days	Fri 5/29/26	Wed 8/26/26																																																												
73	Navy Review of Pre-Draft Groundwater Treatment System Optimization and Comment Resolution	60 days	Tue 9/8/26	Fri 11/6/26																																																												
74	Regulatory Review of Draft Groundwater Treatment System Optimization and Comment Resolution	90 days	Sat 11/7/26	Thu 2/4/27																																																												
75	Regulatory Review of Draft Final Groundwater Treatment System Optimization and Comment Resolution	45 days	Fri 2/5/27	Sun 3/21/27																																																												
76	Development and Submittal of Final Groundwater Treatment System Optimization	15 days	Mon 3/22/27	Mon 4/5/27																																																												

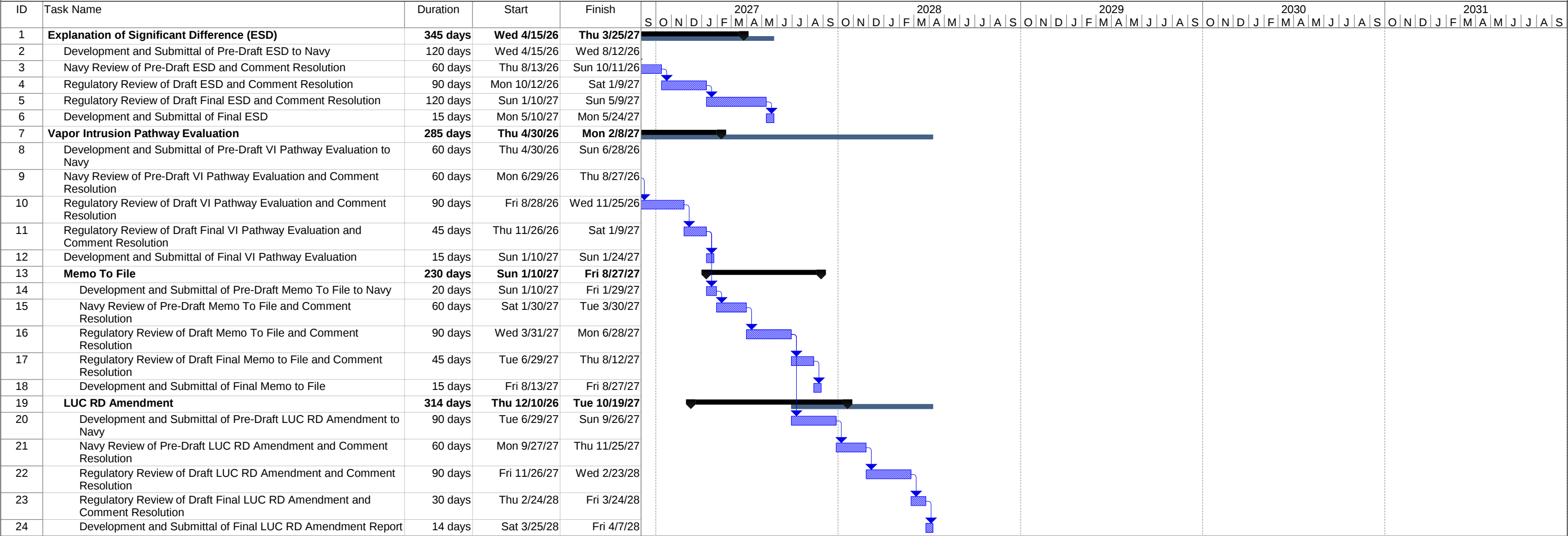
Task	Project Summary	Inactive Summary	Manual Summary	External Milestone
Split	External Tasks	Manual Task	Start-only	Progress
Milestone	External Milestone	Duration-only	Finish-only	Deadline
Summary	Inactive Milestone	Manual Summary Rollup	External Tasks	

Schedule 2-3
Site 2 (OU2) FY 2027-2031 Schedule

[illegible]

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-4
Site 3 (OU3) FY 2027-2031 Schedule



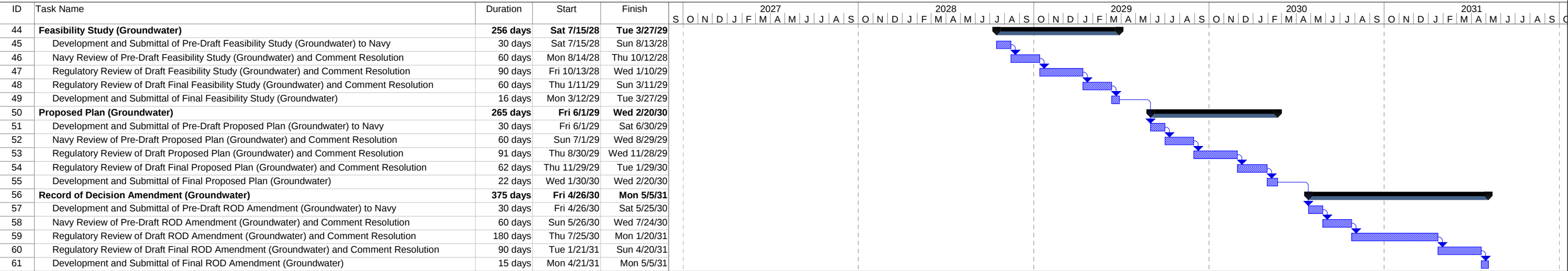
Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

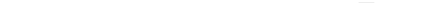
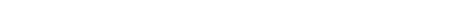
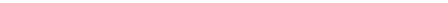
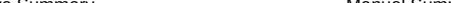
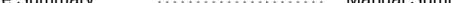
Schedule 2-5
Site 20 (OU4) FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
1	Air Purifying Unit Performance Monitoring Report (August 2025 - July 2026)	262 days?	Fri 8/29/25	Sun 5/17/26																																																	
2	Development and Submittal of Pre-Draft Air Purifying Unit Performance Monitoring Report (August 2025 - July 2026) to Navy	60 days	Fri 8/28/26	Mon 10/26/26																																																	
3	Navy Review of Pre-Draft Air Purifying Unit Performance Monitoring Report (August 2025 - July 2026) and Comment Resolution	60 days	Tue 10/27/26	Fri 12/25/26																																																	
4	Regulatory Review of Draft Air Purifying Unit Performance Monitoring Report (August 2025 - July 2026) and Comment Resolution	90 days	Sat 12/26/26	Thu 3/25/27																																																	
5	Regulatory Review of Draft Final Air Purifying Unit Performance Monitoring Report (August 2025 - July 2026) and Comment Resolution	45 days	Fri 3/26/27	Sun 5/9/27																																																	
6	Development and Submittal of Final Air Purifying Unit Performance Monitoring Report (August 2025 - July 2026)	15 days	Mon 5/10/27	Mon 5/24/27																																																	
7	Vapor Intrusion Remedy Update	2193 days	Thu 4/24/25	Fri 4/25/31																																																	
8	Expanded Vapor Intrusion Report	316 days	Thu 4/24/25	Thu 3/5/26																																																	
9	Development and Submittal of Revised Draft Final Expanded Vapor Intrusion Report to Navy	90 days	Mon 5/4/26	Sat 8/1/26																																																	
10	Navy Review of Revised Draft Final Expanded Vapor Intrusion Report and Comment Resolution	60 days	Sun 8/2/26	Wed 9/30/26																																																	
11	Regulatory Review of Revised Draft Final Expanded Vapor Intrusion Report and Comment Resolution	90 days	Thu 10/1/26	Tue 12/29/26																																																	
12	Regulatory Review of Revised Draft Final V2 Expanded Vapor Intrusion Report and Comment Resolution	45 days	Wed 12/30/26	Fri 2/12/27																																																	
13	Development and Submittal of Final Expanded Vapor Intrusion Report	10 days	Sat 2/13/27	Mon 2/22/27																																																	
14	Focused Feasibility Study (Vapor Intrusion Only)	410 days	Wed 6/30/27	Sat 8/12/28																																																	
15	Development and Submittal of Pre-Draft Focused Feasibility Study (VI Only) to Navy	180 days	Wed 6/30/27	Sun 12/26/27																																																	
16	Navy Review of Pre-Draft Focused Feasibility Study (VI Only) and Comment Resolution	60 days	Mon 12/27/27	Thu 2/24/28																																																	
17	Regulatory Review of Draft Focused Feasibility Study (VI Only) and Comment Resolution	91 days	Fri 2/25/28	Thu 5/25/28																																																	
18	Regulatory Review of Draft Final Focused Feasibility Study (VI Only) and Comment Resolution	62 days	Fri 5/26/28	Wed 7/26/28																																																	
19	Development and Submittal of Final Focused Feasibility Study (VI Only)	17 days	Thu 7/27/28	Sat 8/12/28																																																	
20	Proposed Plan (Vapor Intrusion Only)	258 days	Tue 10/10/28	Sun 6/24/29																																																	
21	Development and Submittal of Pre-Draft Proposed Plan (VI Only) to Navy	30 days	Tue 10/10/28	Wed 11/8/28																																																	
22	Navy Review of Pre-Draft Proposed Plan (VI Only) and Comment Resolution	60 days	Thu 11/9/28	Sun 1/7/29																																																	
23	Regulatory Review of Draft Proposed Plan (VI Only) and Comment Resolution	91 days	Mon 1/8/29	Sun 4/8/29																																																	
24	Regulatory Review of Draft Final Proposed Plan (VI Only) and Comment Resolution	60 days	Mon 4/9/29	Thu 6/7/29																																																	
25	Development and Submittal of Final Proposed Plan (VI Only)	17 days	Fri 6/8/29	Sun 6/24/29																																																	
26	Record of Decision Amendment (Vapor Intrusion Only)	391 days	Thu 8/30/29	Tue 9/24/30																																																	
27	Development and Submittal of Pre-Draft ROD Amendment (VI Only) to Navy	30 days	Thu 8/30/29	Fri 9/28/29																																																	
28	Navy Review of Pre-Draft ROD Amendment (VI Only) and Comment Resolution	70 days	Sat 9/29/29	Fri 12/7/29																																																	
29	Regulatory Review of Draft ROD Amendment (VI Only) and Comment Resolution	185 days	Sat 12/8/29	Mon 6/10/30																																																	
30	Regulatory Review of Draft Final ROD Amendment (VI Only) and Comment Resolution	91 days	Tue 6/11/30	Mon 9/9/30																																																	
31	Development and Submittal of Final ROD Amendment (VI Only)	15 days	Tue 9/10/30	Tue 9/24/30																																																	
32	Land Use Control Remedial Design Amendment	350 days	Sat 5/11/30	Fri 4/25/31																																																	
33	Development and Submittal of Pre-Draft LUC RD Amendment to Navy	120 days	Sat 5/11/30	Sat 9/7/30																																																	
34	Navy Review of Pre-Draft LUC RD Amendment and Comment Resolution	60 days	Sun 9/8/30	Wed 11/6/30																																																	
35	Regulatory Review of Draft LUC RD Amendment and Comment Resolution	91 days	Thu 11/7/30	Wed 2/5/31																																																	
36	Regulatory Review of Draft Final LUC RD Amendment and Comment Resolution	62 days	Thu 2/6/31	Tue 4/8/31																																																	
37	Development and Submittal of Final LUC RD Amendment	17 days	Wed 4/9/31	Fri 4/25/31																																																	
38	Pilot Study Summary Report	255 days	Sun 3/1/26	Tue 11/10/26																																																	
39	Development and Submittal of Pre-Draft SBGR Performance Monitoring Report to Navy	90 days	Sun 3/1/26	Fri 5/29/26																																																	
40	Navy Review of Pre-Draft SBGR Performance Monitoring Report and Comment Resolution	60 days	Sat 5/30/26	Tue 7/28/26																																																	
41	Regulatory Review of Draft SBGR Performance Monitoring Report and Comment Resolution	90 days	Wed 7/29/26	Mon 10/26/26																																																	
42	Regulatory Review of Draft Final SBGR Performance Monitoring Report and Comment Resolution	45 days	Tue 10/27/26	Thu 12/10/26																																																	
43	Development and Submittal of Final SBGR Performance Monitoring Report	15 days	Fri 12/11/26	Fri 12/25/26																																																	

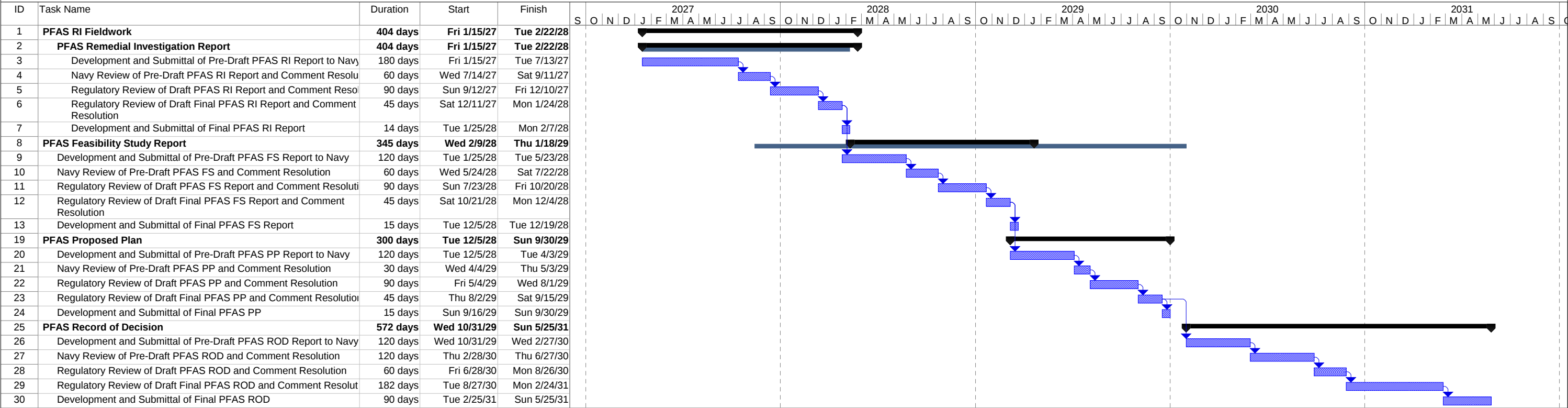
Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-5
Site 20 (OU4) FY 2027-2031 Schedule



Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-6
Site 1 & 22 (OU15) FY 2027-2031 Schedule



Task

Split

Milestone

Summary

Project Summary

External Tasks

External Milestone

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Progress

Deadline

Schedule 2-7
Site 3 (OU16) FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish	2027												2028												2029												2030												2031												
					S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
1	PFAS Remedial Investigation SAP	686 days	Wed 10/2/24	Tue 8/18/26																																																													
2	Development and Submittal of Pre-Draft PFAS RI SAP to Navy	300 days	Wed 10/2/24	Mon 7/28/25																																																													
3	Navy Review of Pre-Draft PFAS RI SAP and Comment Resolution	220 days	Tue 7/29/25	Thu 3/5/26																																																													
4	Regulatory Review of Draft PFAS RI SAP and Comment Resolution	91 days	Fri 3/6/26	Thu 6/4/26																																																													
5	Regulatory Review of Draft Final PFAS RI SAP and Comment Resolution	60 days	Fri 6/5/26	Mon 8/3/26																																																													
6	Development and Submittal of Final PFAS RI SAP	15 days	Tue 8/4/26	Tue 8/18/26																																																													
7	PFAS Remedial Investigation Fieldwork	981 days	Fri 6/20/25	Fri 2/25/28																																																													
8	PFAS Remedial Investigation Report	406 days	Sat 1/16/27	Fri 2/25/28																																																													
9	Development and Submittal of PFAS RI Report to Navy	180 days	Fri 6/20/25	Tue 12/16/25																																																													
10	Navy Review of Pre-Draft PFAS RI Report and Comment Resolution	60 days	Wed 12/17/25	Sat 2/14/26																																																													
11	Regulatory Review of Draft PFAS RI Report and Comment Resolution	91 days	Sat 1/16/27	Fri 4/16/27																																																													
12	Regulatory Review of Draft Final PFAS RI Report and Comment Resolution	45 days	Sat 4/17/27	Mon 5/31/27																																																													
13	Development and Submittal of Final PFAS RI Report	15 days	Tue 6/1/27	Tue 6/15/27																																																													
14	PFAS Feasibility Study Report	345 days	Tue 6/1/27	Wed 5/10/28																																																													
15	Development and Submittal of PFAS Feasibility Study Report to Navy	135 days	Tue 6/1/27	Wed 10/13/27																																																													
16	Navy Review of Pre-Draft PFAS Feasibility Study Report and Comment Resolution	60 days	Thu 10/14/27	Sun 12/12/27																																																													
17	Regulatory Review of Draft PFAS Feasibility Study Report and Comment Resolution	90 days	Mon 12/13/27	Sat 3/11/28																																																													
18	Regulatory Review of Draft Final PFAS Feasibility Study Report and Comment Resolution	45 days	Sun 3/12/28	Tue 4/25/28																																																													
19	Development and Submittal of Final PFAS Feasibility Study Report	15 days	Wed 4/26/28	Wed 5/10/28																																																													
20	PFAS Proposed Plan	356 days	Wed 4/26/28	Mon 4/16/29																																																													
21	Development and Submittal of Pre-Draft PFAS Proposed Plan to Navy	145 days	Wed 4/26/28	Sun 9/17/28																																																													
22	Navy Review of Pre-Draft PFAS Proposed Plan and Comment Resolution	60 days	Mon 9/18/28	Thu 11/16/28																																																													
23	Regulatory Review of Draft PFAS Proposed Plan and Comment Resolution	91 days	Fri 11/17/28	Thu 2/15/29																																																													
24	Regulatory Review of Draft Final PFAS Proposed Plan and Comment Resolution	45 days	Fri 2/16/29	Sun 4/1/29																																																													
25	Development and Submittal of Final PFAS Proposed Plan	15 days	Mon 4/2/29	Mon 4/16/29																																																													
26	PFAS Record of Decision	465 days	Mon 4/2/29	Wed 7/10/30																																																													
27	Development and Submittal of Pre-Draft PFAS Record of Decision to Navy	180 days	Mon 4/2/29	Fri 9/28/29																																																													
28	Navy Review of Pre-Draft PFAS ROD and Comment Resolution	60 days	Sat 9/29/29	Tue 11/27/29																																																													
29	Regulatory Review of Draft PFAS ROD and Comment Resolution	150 days	Wed 11/28/29	Fri 4/26/30																																																													
30	Regulatory Review of Draft Final PFAS ROD and Comment Resolution	60 days	Sat 4/27/30	Tue 6/25/30																																																													
31	Development and Submittal of Final PFAS ROD	15 days	Wed 6/26/30	Wed 7/10/30																																																													

Task	Project Summary	Inactive Summary	Manual Summary	External Milestone
Split	External Tasks	Manual Task	Start-only	Progress
Milestone	External Milestone	Duration-only	Finish-only	Deadline
Summary	Inactive Milestone	Manual Summary Rollup	External Tasks	

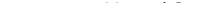
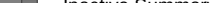
Schedule 2-8 Site 18 (OU18) FY 2027-2031 Schedule									
--	--	--	--	--	--	--	--	--	--

ID	Task Name	Duration	Start	Finish	2027												2028												2029												2030												2031											
					S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S											
1	PFAS Remedial Investigation SAP	756 days	Mon 9/2/24	Sun 9/27/26																																																												
2	Development and Submittal of Pre-Draft PFAS RI SAP to Navy	372 days	Mon 9/2/24	Mon 9/8/25																																																												
3	Navy Review of Pre-Draft PFAS RI SAP and Comment Resolution	218 days	Tue 9/9/25	Tue 4/14/26																																																												
4	Regulatory Review of Draft PFAS RI SAP and Comment Resolution	91 days	Wed 4/15/26	Tue 7/14/26																																																												
5	Regulatory Review of Draft Final PFAS RI SAP and Comment Resolution	60 days	Wed 7/15/26	Sat 9/12/26																																																												
6	Development and Submittal of Final PFAS RI SAP	15 days	Sun 9/13/26	Sun 9/27/26																																																												
7	PFAS Remedial Investigation Fieldwork	1089 days	Thu 6/12/25	Sun 6/4/28																																																												
8	PFAS Remedial Investigation Report	406 days	Mon 4/26/27	Sun 6/4/28																																																												
9	Development and Submittal of PFAS RI Report to Navy	180 days	Thu 6/12/25	Mon 12/8/25																																																												
10	Navy Review of Pre-Draft PFAS RI Report and Comment Resolution	60 days	Tue 12/9/25	Fri 2/6/26																																																												
11	Regulatory Review of Draft PFAS RI Report and Comment Resolution	91 days	Sat 2/7/26	Fri 5/8/26																																																												
12	Regulatory Review of Draft Final PFAS RI Report and Comment Resolution	60 days	Sat 5/9/26	Tue 7/7/26																																																												
13	Development and Submittal of Final PFAS RI Report	15 days	Wed 7/8/26	Wed 7/22/26																																																												
14	PFAS Feasibility Study Report	345 days	Wed 7/8/26	Thu 6/17/27																																																												
15	Development and Submittal of PFAS Feasibility Study Report to Navy	120 days	Wed 7/8/26	Wed 11/4/26																																																												
16	Navy Review of Pre-Draft PFAS Feasibility Study Report and Comment Resolution	60 days	Thu 11/5/26	Sun 1/3/27																																																												
17	Regulatory Review of Draft PFAS Feasibility Study Report and Comment Resolution	90 days	Mon 1/4/27	Sat 4/3/27																																																												
18	Regulatory Review of Draft Final PFAS Feasibility Study Report and Comment Resolution	60 days	Sun 4/4/27	Wed 6/2/27																																																												
19	Development and Submittal of Final PFAS Feasibility Study Report	15 days	Thu 6/3/27	Thu 6/17/27																																																												
20	PFAS Proposed Plan	361 days	Thu 6/3/27	Sun 5/28/28																																																												
21	Development and Submittal of Pre-Draft PFAS Proposed Plan to Navy	135 days	Thu 6/3/27	Fri 10/15/27																																																												
22	Navy Review of Pre-Draft PFAS Proposed Plan and Comment Resolution	60 days	Sat 10/16/27	Tue 12/14/27																																																												
23	Regulatory Review of Draft PFAS Proposed Plan and Comment Resolution	91 days	Wed 12/15/27	Tue 3/14/28																																																												
24	Regulatory Review of Draft Final PFAS Proposed Plan and Comment Resolution	60 days	Wed 3/15/28	Sat 5/13/28																																																												
25	Development and Submittal of Final PFAS Proposed Plan	15 days	Sun 5/14/28	Sun 5/28/28																																																												
26	PFAS Record of Decision	465 days	Sun 5/14/28	Tue 8/21/29																																																												
27	Development and Submittal of Pre-Draft PFAS Record of Decision to Navy	150 days	Sun 5/14/28	Tue 10/10/28																																																												
28	Navy Review of Pre-Draft PFAS ROD and Comment Resolution	60 days	Wed 10/11/28	Sat 12/9/28																																																												
29	Regulatory Review of Draft PFAS ROD and Comment Resolution	180 days	Sun 12/10/28	Thu 6/7/29																																																												
30	Regulatory Review of Draft Final PFAS ROD and Comment Resolution	60 days	Fri 6/8/29	Mon 8/6/29																																																												
31	Development and Submittal of Final PFAS ROD	15 days	Tue 8/7/29	Tue 8/21/29																																																												

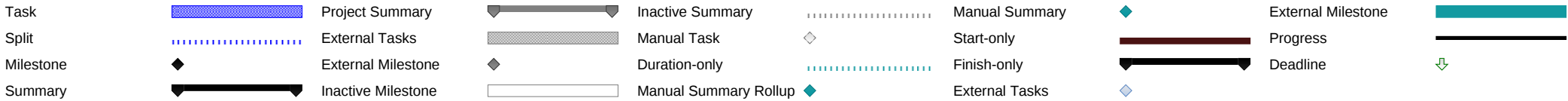
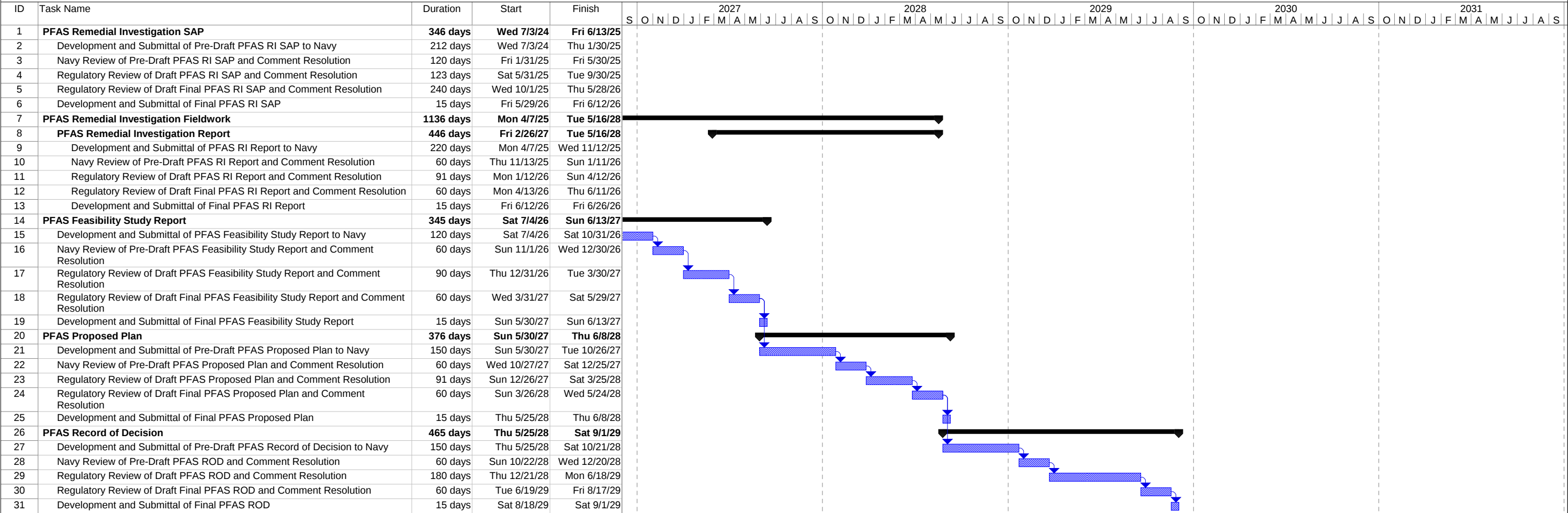
Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-9
SWMU 14 (OU19) FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish	2027												2028												2029												2030												2031											
					S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S											
1	PFAS Remedial Investigation SAP	685 days	Thu 10/3/24	Tue 8/18/26																																																												
2	Development and Submittal of Pre-Draft PFAS RI SAP to Navy	300 days	Thu 10/3/24	Tue 7/29/25																																																												
3	Navy Review of Pre-Draft PFAS RI SAP and Comment Resolution	220 days	Wed 7/30/25	Fri 3/6/26																																																												
4	Regulatory Review of Draft PFAS RI SAP and Comment Resolution	90 days	Sat 3/7/26	Thu 6/4/26																																																												
5	Regulatory Review of Draft Final PFAS RI SAP and Comment Resolution	60 days	Fri 6/5/26	Mon 8/3/26																																																												
6	Development and Submittal of Final PFAS RI SAP	15 days	Tue 8/4/26	Tue 8/18/26																																																												
7	PFAS Remedial Investigation Fieldwork	979 days	Sun 6/22/25	Fri 2/25/28																																																												
8	PFAS Remedial Investigation Report	406 days	Sat 1/16/27	Fri 2/25/28																																																												
9	Development and Submittal of PFAS RI Report to Navy	180 days	Sun 6/22/25	Thu 12/18/25																																																												
10	Navy Review of Pre-Draft PFAS RI Report and Comment Resolution	60 days	Fri 12/19/25	Mon 2/16/26																																																												
11	Regulatory Review of Draft PFAS RI Report and Comment Resolution	91 days	Tue 2/17/26	Mon 5/18/26																																																												
12	Regulatory Review of Draft Final PFAS RI Report and Comment Resolution	60 days	Tue 5/19/26	Fri 7/17/26																																																												
13	Development and Submittal of Final PFAS RI Report	15 days	Sat 7/18/26	Sat 8/1/26																																																												
14	PFAS Feasibility Study Report	365 days	Sat 7/18/26	Sat 7/17/27																																																												
15	Development and Submittal of PFAS Feasibility Study Report to Navy	140 days	Sat 7/18/26	Fri 12/4/26																																																												
16	Navy Review of Pre-Draft PFAS Feasibility Study Report and Comment Resolution	60 days	Sat 12/5/26	Tue 2/2/27																																																												
17	Regulatory Review of Draft PFAS Feasibility Study Report and Comment Resolution	90 days	Wed 2/3/27	Mon 5/3/27																																																												
18	Regulatory Review of Draft Final PFAS Feasibility Study Report and Comment Resolution	60 days	Tue 5/4/27	Fri 7/2/27																																																												
19	Development and Submittal of Final PFAS Feasibility Study Report	15 days	Sat 7/3/27	Sat 7/17/27																																																												
20	PFAS Proposed Plan	376 days	Sat 7/3/27	Wed 7/12/28																																																												
21	Development and Submittal of Pre-Draft PFAS Proposed Plan to Navy	150 days	Sat 7/3/27	Mon 11/29/27																																																												
22	Navy Review of Pre-Draft PFAS Proposed Plan and Comment Resolution	60 days	Tue 11/30/27	Fri 1/28/28																																																												
23	Regulatory Review of Draft PFAS Proposed Plan and Comment Resolution	91 days	Sat 1/29/28	Fri 4/28/28																																																												
24	Regulatory Review of Draft Final PFAS Proposed Plan and Comment Resolution	60 days	Sat 4/29/28	Tue 6/27/28																																																												
25	Development and Submittal of Final PFAS Proposed Plan	15 days	Wed 6/28/28	Wed 7/12/28																																																												
26	PFAS Record of Decision	445 days	Wed 6/28/28	Sat 9/15/29																																																												
27	Development and Submittal of Pre-Draft PFAS Record of Decision to Navy	100 days	Wed 6/28/28	Thu 10/5/28																																																												
28	Navy Review of Pre-Draft PFAS ROD and Comment Resolution	60 days	Fri 10/6/28	Mon 12/4/28																																																												
29	Regulatory Review of Draft PFAS ROD and Comment Resolution	180 days	Tue 12/5/28	Sat 6/2/29																																																												
30	Regulatory Review of Draft Final PFAS ROD and Comment Resolution	90 days	Sun 6/3/29	Fri 8/31/29																																																												
31	Development and Submittal of Final PFAS ROD	15 days	Sat 9/1/29	Sat 9/15/29																																																												

Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-10
Site 20 OU20 FY 2027-2031 Schedule

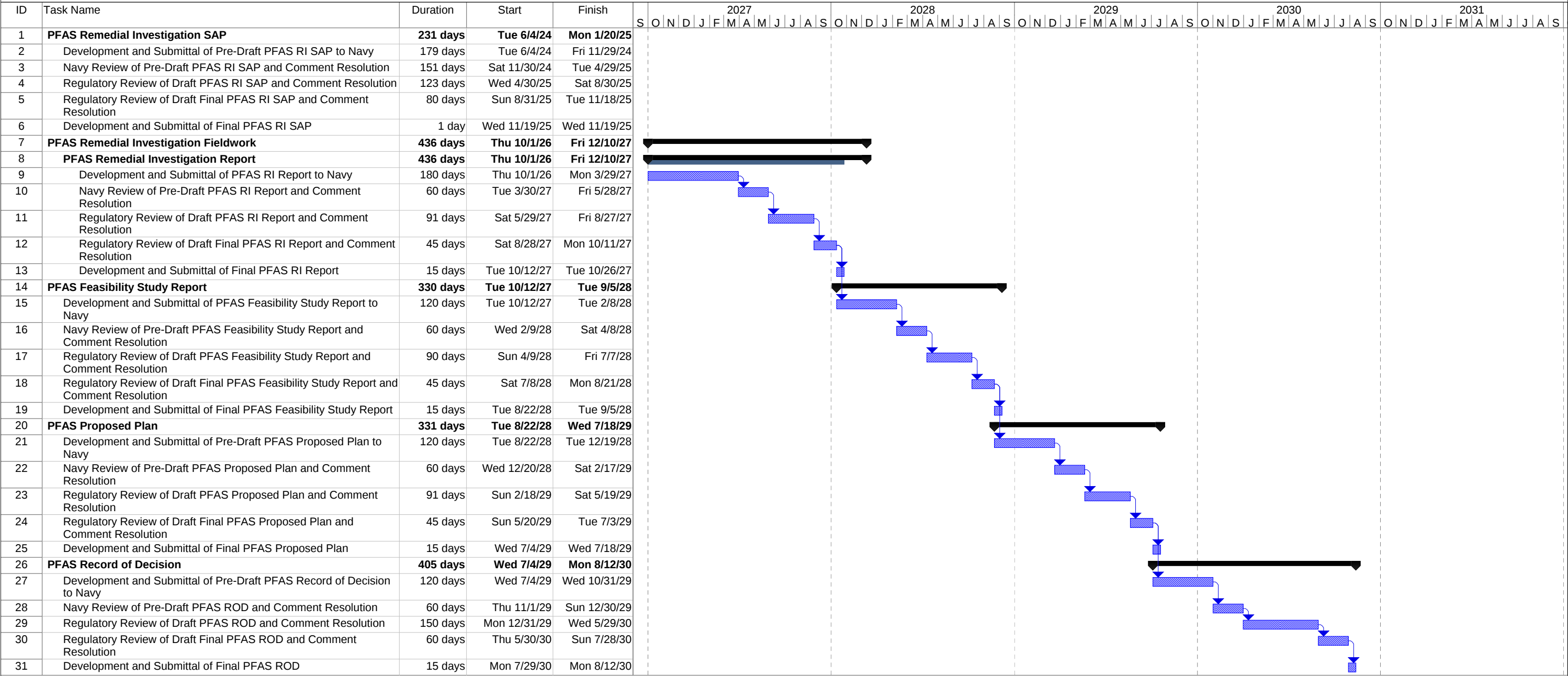


Schedule 2-11 Site 24 (OU24) FY 2027-2031 Schedule	
---	--

ID	Task Name	Duration	Start	Finish	2027												2028												2029												2030												2031											
					S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S											
1	PFAS Remedial Investigation SAP	685 days	Thu 10/3/24	Tue 8/18/26																																																												
2	Development and Submittal of Pre-Draft PFAS RI SAP to Navy	299 days	Thu 10/3/24	Mon 7/28/25																																																												
3	Navy Review of Pre-Draft PFAS RI SAP and Comment Resolution	220 days	Tue 7/29/25	Thu 3/5/26																																																												
4	Regulatory Review of Draft PFAS RI SAP and Comment Resolution	91 days	Fri 3/6/26	Thu 6/4/26																																																												
5	Regulatory Review of Draft Final PFAS RI SAP and Comment Resolution	60 days	Fri 6/5/26	Mon 8/3/26																																																												
6	Development and Submittal of Final PFAS RI SAP	15 days	Tue 8/4/26	Tue 8/18/26																																																												
7	PFAS Remedial Investigation Fieldwork	979 days	Sun 6/22/25	Fri 2/25/28																																																												
8	PFAS Remedial Investigation Report	406 days	Sat 1/16/27	Fri 2/25/28																																																												
9	Development and Submittal of PFAS RI Report to Navy	180 days	Sun 6/22/25	Thu 12/18/25																																																												
10	Navy Review of Pre-Draft PFAS RI Report and Comment Resolution	60 days	Fri 12/19/25	Mon 2/16/26																																																												
11	Regulatory Review of Draft PFAS RI Report and Comment Resolution	91 days	Tue 2/17/26	Mon 5/18/26																																																												
12	Regulatory Review of Draft Final PFAS RI Report and Comment Resolution	45 days	Tue 5/19/26	Thu 7/2/26																																																												
13	Development and Submittal of Final PFAS RI Report	15 days	Thu 7/16/26	Thu 7/30/26																																																												
14	PFAS Feasibility Study Report	350 days	Fri 7/3/26	Thu 6/17/27																																																												
15	Development and Submittal of PFAS Feasibility Study Report to Navy	140 days	Fri 7/3/26	Thu 11/19/26																																																												
16	Navy Review of Pre-Draft PFAS Feasibility Study Report and Comment Resolution	60 days	Fri 11/20/26	Mon 1/18/27																																																												
17	Regulatory Review of Draft PFAS Feasibility Study Report and Comment Resolution	90 days	Tue 1/19/27	Sun 4/18/27																																																												
18	Regulatory Review of Draft Final PFAS Feasibility Study Report and Comment Resolution	45 days	Mon 4/19/27	Wed 6/2/27																																																												
19	Development and Submittal of Final PFAS Feasibility Study Report	15 days	Thu 6/3/27	Thu 6/17/27																																																												
20	PFAS Proposed Plan	361 days	Thu 6/3/27	Sun 5/28/28																																																												
21	Development and Submittal of Pre-Draft PFAS Proposed Plan to Navy	150 days	Thu 6/3/27	Sat 10/30/27																																																												
22	Navy Review of Pre-Draft PFAS Proposed Plan and Comment Resolution	60 days	Sun 10/31/27	Wed 12/29/27																																																												
23	Regulatory Review of Draft PFAS Proposed Plan and Comment Resolution	91 days	Thu 12/30/27	Wed 3/29/28																																																												
24	Regulatory Review of Draft Final PFAS Proposed Plan and Comment Resolution	45 days	Thu 3/30/28	Sat 5/13/28																																																												
25	Development and Submittal of Final PFAS Proposed Plan	15 days	Sun 5/14/28	Sun 5/28/28																																																												
26	PFAS Record of Decision	445 days	Sun 5/14/28	Wed 8/1/29																																																												
27	Development and Submittal of Pre-Draft PFAS Record of Decision to Navy	100 days	Sun 5/14/28	Mon 8/21/28																																																												
28	Navy Review of Pre-Draft PFAS ROD and Comment Resolution	60 days	Tue 8/22/28	Fri 10/20/28																																																												
29	Regulatory Review of Draft PFAS ROD and Comment Resolution	180 days	Sat 10/21/28	Wed 4/18/29																																																												
30	Regulatory Review of Draft Final PFAS ROD and Comment Resolution	90 days	Thu 4/19/29	Tue 7/17/29																																																												
31	Development and Submittal of Final PFAS ROD	15 days	Wed 7/18/29	Wed 8/1/29																																																												

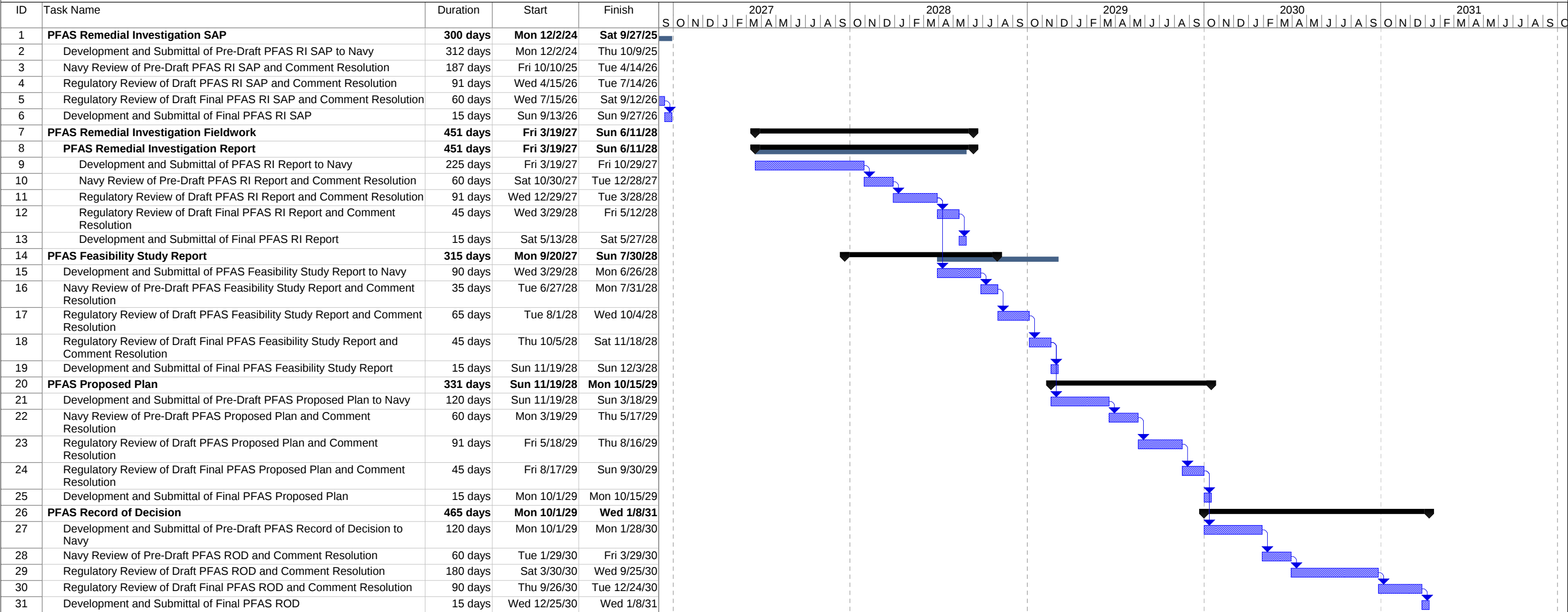
Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-12
Site 29 (OU29) FY 2027-2031 Schedule



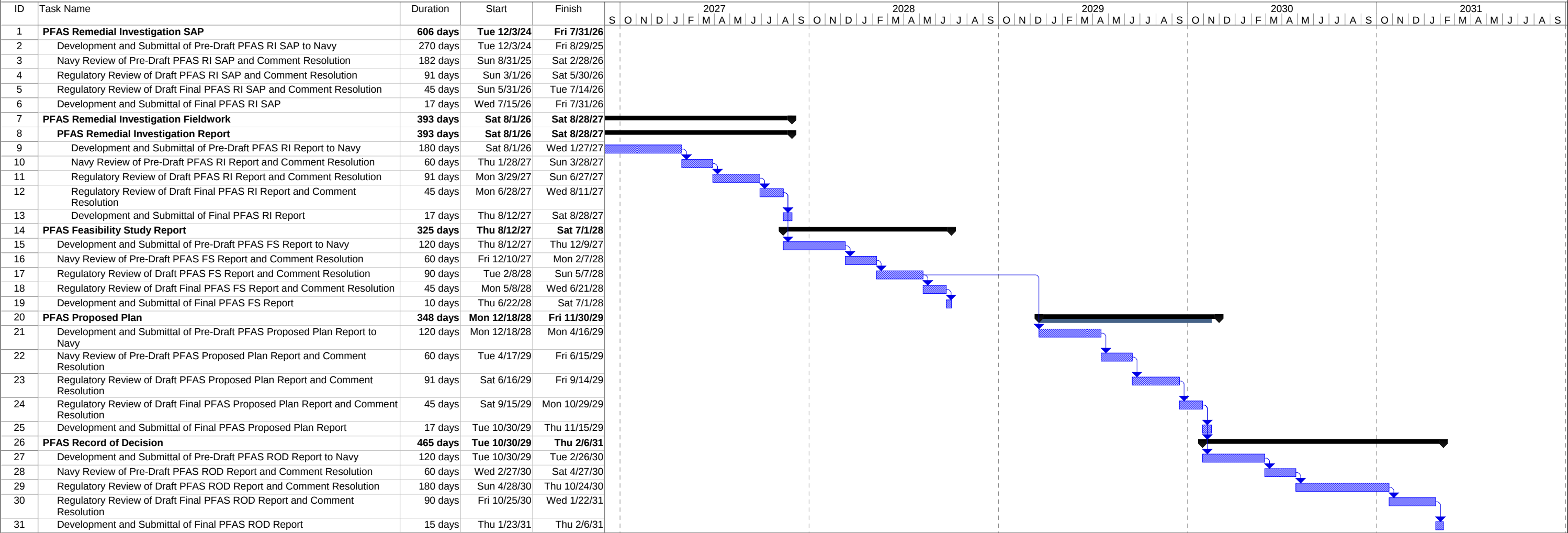
Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-13
Site 30 (OU30) FY 2027-2031 Schedule



Task		Project Summary		Inactive Summary		Manual Summary		External Milestone	
Split		External Tasks		Manual Task		Start-only		Progress	
Milestone		External Milestone		Duration-only		Finish-only		Deadline	
Summary		Inactive Milestone		Manual Summary Rollup		External Tasks			

Schedule 2-14 Site 33 (OU33) FY 2027-2031 Schedule	
---	--



Task	Project Summary	Inactive Summary	Manual Summary	External Milestone
Split	External Tasks	Manual Task	Start-only	Progress
Milestone	External Milestone	Duration-only	Finish-only	Deadline
Summary	Inactive Milestone	Manual Summary Rollup	External Tasks	

Schedule 2-15
SWMU 8 (OU17) FY 2027-2031 Schedule

ID	Task Name	Duration	Start	Finish	2027												2028												2029												2030												2031											
					S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S											
1	PFAS Remedial Investigation SAP	560 days	Wed 1/31/24	Tue 8/12/25																																																												
2	Development and Submittal of Pre-Draft PFAS RI SAP to Navy	120 days	Wed 1/31/24	Wed 5/29/24																																																												
3	Navy Review of Pre-Draft PFAS RI SAP and Comment Resolution	125 days	Thu 5/30/24	Tue 10/1/24																																																												
4	Regulatory Review of Draft PFAS RI SAP and Comment Resolution	240 days	Wed 10/2/24	Thu 5/29/25																																																												
5	Regulatory Review of Draft Final PFAS RI SAP and Comment Resolution	60 days	Fri 5/30/25	Mon 7/28/25																																																												
6	Development and Submittal of Final PFAS RI SAP	15 days	Tue 7/29/25	Tue 8/12/25																																																												
7	PFAS Remedial Investigation Fieldwork	351 days	Wed 5/6/26	Wed 4/21/27																																																												
8	PFAS Remedial Investigation Report	391 days	Thu 4/22/27	Tue 5/16/28																																																												
9	Development and Submittal of PFAS RI Report to Navy	180 days	Thu 4/22/27	Mon 10/18/27																																																												
10	Navy Review of Pre-Draft PFAS RI Report and Comment Resolution	60 days	Tue 10/19/27	Fri 12/17/27																																																												
11	Regulatory Review of Draft PFAS RI Report and Comment Resolution	91 days	Sat 12/18/27	Fri 3/17/28																																																												
12	Regulatory Review of Draft Final PFAS RI Report and Comment Resolution	45 days	Sat 3/18/28	Mon 5/1/28																																																												
13	Development and Submittal of Final PFAS RI Report	15 days	Tue 5/2/28	Tue 5/16/28																																																												
14	PFAS Feasibility Study Report	360 days	Tue 5/2/28	Thu 4/26/29																																																												
15	Development and Submittal of PFAS Feasibility Study Report to Navy	150 days	Tue 5/2/28	Thu 9/28/28																																																												
16	Navy Review of Pre-Draft PFAS Feasibility Study Report and Comment Resolution	60 days	Fri 9/29/28	Mon 11/27/28																																																												
17	Regulatory Review of Draft PFAS Feasibility Study Report and Comment Resolution	90 days	Tue 11/28/28	Sun 2/25/29																																																												
18	Regulatory Review of Draft Final PFAS Feasibility Study Report and Comment Resolution	45 days	Mon 2/26/29	Wed 4/11/29																																																												
19	Development and Submittal of Final PFAS Feasibility Study Report	15 days	Thu 4/12/29	Thu 4/26/29																																																												
20	PFAS Proposed Plan	331 days	Thu 4/12/29	Fri 3/8/30																																																												
21	Development and Submittal of Pre-Draft PFAS Proposed Plan to Navy	120 days	Thu 4/12/29	Thu 8/9/29																																																												
22	Navy Review of Pre-Draft PFAS Proposed Plan and Comment Resolution	60 days	Fri 8/10/29	Mon 10/8/29																																																												
23	Regulatory Review of Draft PFAS Proposed Plan and Comment Resolution	91 days	Tue 10/9/29	Mon 1/7/30																																																												
24	Regulatory Review of Draft Final PFAS Proposed Plan and Comment Resolution	45 days	Tue 1/8/30	Thu 2/21/30																																																												
25	Development and Submittal of Final PFAS Proposed Plan	15 days	Fri 2/22/30	Fri 3/8/30																																																												
26	PFAS Record of Decision	495 days	Fri 2/22/30	Tue 7/1/31																																																												
27	Development and Submittal of Pre-Draft PFAS Record of Decision to Navy	150 days	Fri 2/22/30	Sun 7/21/30																																																												
28	Navy Review of Pre-Draft PFAS ROD and Comment Resolution	60 days	Mon 7/22/30	Thu 9/19/30																																																												
29	Regulatory Review of Draft PFAS ROD and Comment Resolution	180 days	Fri 9/20/30	Tue 3/18/31																																																												
30	Regulatory Review of Draft Final PFAS ROD and Comment Resolution	90 days	Wed 3/19/31	Mon 6/16/31																																																												
31	Development and Submittal of Final PFAS ROD	15 days	Tue 6/17/31	Tue 7/1/31																																																												

Task	Project Summary	Inactive Summary	Manual Summary	External Milestone
Split	External Tasks	Manual Task	Start-only	Progress
Milestone	External Milestone	Duration-only	Finish-only	Deadline
Summary	Inactive Milestone	Manual Summary Rollup	External Tasks	

References

- AGVIQ Environmental Services (AGVIQ) and CH2M HILL, Inc. (CH2M). 2004. *Annual Post-Closure Monitoring Report (VDEQ Solid Waste Permit 286), Naval Station Norfolk, Norfolk, Virginia*. February.
- AGVIQ and CH2M. 2005. *2004 Annual Long-Term Monitoring Report for Four Sites, Naval Station Norfolk, Norfolk, Virginia*. November.
- AGVIQ and CH2M. 2007a. *2005 Annual Long-Term Monitoring Report for Three Sites, Naval Station Norfolk, Norfolk, Virginia*. January.
- AGVIQ and CH2M. 2007b. *2006 Annual Long-Term Monitoring Report for Three Sites, Naval Station Norfolk, Norfolk, Virginia*. July.
- AGVIQ and CH2M. 2008a. *2007 Annual Long-Term Monitoring Report for Four Sites, Naval Station Norfolk, Norfolk, Virginia*. May.
- AGVIQ and CH2M. 2008b. *Non-Time-Critical Removal Action Work Plan, Site 18, Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. June.
- AGVIQ and CH2M. 2008c. *Construction Closeout Report Upper Reaches of Bousch Creek (Site 1, Camp Allen Landfill) Naval Station Norfolk, Norfolk, Virginia*. September.
- AGVIQ and CH2M. 2009. *Post-Injection Sampling Summary at Site 18, Naval Station Norfolk, Norfolk, Virginia*. December.
- AGVIQ and CH2M. 2011. *2010 Annual Long-Term Monitoring Report, Camp Allen Landfill (Site 1), Naval Magazine Slag Pile (Site 2), and Q Area Drum Storage Yard (Site 3), Naval Station Norfolk, Norfolk, Virginia*. December.
- APTIM. 2017. *Construction Completion Technical Memorandum, Time Critical Removal Action Area Adjacent to Site 1, Camp Allen Landfill, Naval Support Activity Hampton Roads, Norfolk, Virginia*. June.
- A.T. Kearney, Inc. 1992. *Phase II RCRA Facility Assessment of the Norfolk Naval Base-Sewells Point*. Revised Final.
- Baker Environmental, Inc. (Baker). 1994. *Camp Allen Landfill Remedial Investigation/Feasibility Study Report, Naval Base Norfolk, Norfolk, Virginia*. November.
- Baker. 1995a. *Decision Document, Camp Allen Landfill, Naval Base, Norfolk, Virginia*. July.
- Baker. 1995b. *Remedial Investigation and Baseline Risk Assessment—CD Landfill, Naval Base Norfolk, Norfolk, Virginia*. December.
- Baker. 1995c. *Remedial Investigation Report and Baseline Risk Assessment—Building LP-20 Site Naval Base, Norfolk, Virginia*. December.
- Baker. 1996a. *Relative Risk Ranking System Data Collection Sampling and Analysis Report Phase I, Naval Base Norfolk, Norfolk, Virginia*. January.
- Baker. 1996b. *Feasibility Study—Building LP-20 Site, Naval Base Norfolk, Norfolk, Virginia*. September.
- Baker. 1996c. *Decision Document—CD Landfill Site OU1 Sediments, Naval Base Norfolk, Norfolk, Virginia*. October.
- Baker. 1996d. *Decision Document—Building LP-20 Site, Naval Base Norfolk, Norfolk, Virginia*. November.
- Baker. 1996e. *Relative Risk Ranking System Data Collection Sampling and Analysis Report Phase II, Naval Base Norfolk, Norfolk, Virginia*. Draft. December.
- Baker. 1998a. *Proposed Remedial Action Plan Operable Unit No. 2 CD Landfill, Naval Base Norfolk, Norfolk, Virginia*. June.
- Baker. 1998b. *Record of Decision-OU2 CD Landfill Site, Naval Base Norfolk, Norfolk, Virginia*. September.

- Baker. 2004. *Record of Decision Site 22; Camp Allen Salvage Yard Site 22 Naval Station Norfolk, Norfolk, Virginia*. September.
- CH2M HILL, Inc. (CH2M). 1997. *Master Work Plan Naval Base, Norfolk, Norfolk, Virginia*. Final. October.
- CH2M. 1998a. *Remedial Investigation Site 2, NM Slag Pile, Norfolk Naval Base, Norfolk, Virginia*. August.
- CH2M. 1998b. “LP-20 Site Long-Term Monitoring Plan,” module to the *Long-Term Monitoring Plans for Four Sites at Naval Base Norfolk, Norfolk, Virginia*. August.
- CH2M. 1998c. *Feasibility Study Site 2, NM Slag Pile, Norfolk Naval Base, Norfolk, Virginia*. September.
- CH2M. 1999. *Proposed Remedial Action Design Site 2, NM Slag Pile Naval Station Norfolk, Norfolk, Virginia*. September.
- CH2M. 2000. *Record of Decision NM Slag Pile Naval Station Norfolk, Norfolk, Virginia*. October.
- CH2M. 2001. *Annual Long-Term Monitoring Report for Three Sites, Naval Station Norfolk, Norfolk, Virginia*. Final. October.
- CH2M. 2002. *Site Investigation Report Site 18, Former NM Hazardous Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. November.
- CH2M. 2004a. *First Determination Report for Site 6, CD Landfill (VDEQ Solid Waste Permit 286), Naval Station Norfolk, Norfolk, Virginia*. March.
- CH2M. 2004b. *Expanded Site Investigation Report Site 18 Former NM Hazardous Waste Storage Area Naval Station Norfolk, Norfolk, Virginia*. July.
- CH2M. 2004c. *Remedial Investigation, Human Health Risk Assessment, Ecological Risk Assessment for SWMU 14, Q-50 Satellite Accumulation Area, Naval Station Norfolk, Norfolk, Virginia*. August.
- CH2M. 2006a. *2005 Annual Long-Term Monitoring Report for Three Sites, Naval Station Norfolk, Norfolk, Virginia*. January.
- CH2M. 2006b. *Ecological Risk Assessment (ERA) Step 7 Report, Upper Reaches of Bousch Creek, Camp Allen Landfill (Site 1), Naval Station Norfolk, Norfolk, Virginia*. November.
- CH2M. 2006c. *Engineering Evaluation/Cost Analysis (EE/CA), Site 23 – Building LP-20 Plating Shop, Naval Station Norfolk, Norfolk, Virginia*. December.
- CH2M. 2007a. *Technical Memorandum: Trident Probe Survey Results and Data Evaluation, SWMU 14, (Q-50 Satellite Accumulation Area), Naval Station Norfolk, Norfolk, Virginia*. Final. April.
- CH2M. 2007b. *Engineering Evaluation/Cost Analysis for Upper Reaches of Bousch Creek, Naval Station Norfolk, Norfolk, Virginia*. August.
- CH2M. 2008a. *Engineering Evaluation/Cost Analysis, Site 18, Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. March.
- CH2M. 2008b. *Engineering Evaluation/Cost Analysis, SWMU 14, Q-50 Satellite Accumulation Area, Naval Station Norfolk, Norfolk, Virginia*. March.
- CH2M. 2008c. *Action Memorandum for Site 18 (Former Naval Magazine Waste Storage Area), Naval Station Norfolk, Norfolk, Virginia*. April.
- CH2M. 2008d. *2007 Annual Long-Term Monitoring Report for Four Sites, Naval Station Norfolk, Norfolk, Virginia*. May.
- CH2M. 2008e. *VOC Groundwater Plume Delineation Results and Recommendations, Monitoring Wells B-MW3A and B-MW11A, Camp Allen Landfill, Naval Station Norfolk*. Draft. May.
- CH2M. 2008f. *Five-Year Review Report Naval Station Norfolk, Norfolk, Virginia*. October.

- CH2M. 2008g. *Proposed Plan, Site 23 Building LP-20 Plating Shop, Naval Station Norfolk, Norfolk, Virginia*. August.
- CH2M. 2009. *Focused Feasibility Study for SWMU 14, Naval Station Norfolk, Norfolk, Virginia*. July.
- CH2M. 2010a. *Removal Action Addendum at Site 18 Former Naval Magazine Waste Storage Area, Naval Station Norfolk, Norfolk, Virginia*. April.
- CH2M. 2010b. *Record of Decision SWMU 14: Q-50 Satellite Accumulation Area Naval Station Norfolk, Virginia*. August.
- CH2M. 2012. *Site 1, Camp Allen Landfill, Area B Migration Evaluation Technical Memorandum, Naval Station Norfolk, Norfolk, Virginia*. Draft. December.
- CH2M. 2013a. *Annual Long-Term Groundwater Monitoring Report 2011, Camp Allen Landfill (Site 1), Q-Area Storage Yard (Site 3), and LP-20 Site (Site 20)*. January.
- CH2M. 2013b. *Site 6 CD Landfill Human Health Risk Assessment and Piezometer Installation Summary, Naval Station Norfolk, Norfolk, Virginia*. April.
- CH2M. 2014a. *Annual Long-term Groundwater Monitoring Report 2012 Camp Allen Landfill (Site 1), Naval Magazine Slag Pile (Site 2), Q-Area Storage Yard (Site 3), and LP-20 Site (Site 20) Naval Station Norfolk, Virginia*. July.
- CH2M. 2015. *Summary of Long-term Groundwater Monitoring Technical Memorandum 2014 Camp Allen Landfill (Site 1), Q-Area Storage Yard (Site 3), Naval Magazine Storage Area (Site 18) and LP-20 Site (Site 20), Naval Station Norfolk, Virginia*. July.
- CH2M. 2016. *Sampling and Analysis Plan, Long-term Monitoring Plan for Groundwater Sites 1, 2, 3, 6, 18, and 20, Naval Station Norfolk, Norfolk, Virginia*. May.
- CH2M. 2018. *2015-2016 Long-term Monitoring Groundwater Report for Camp Allen Landfill (Site 1), Q-Area Drum Storage Yard (Site 3), Former Naval Magazine Storage Area (Site 18), and LP-20 (Site 20)*. April.
- CH2M. 2019a. *2017 Long-term Monitoring Groundwater Report for Camp Allen Landfill (Site 1), Q-Area Drum Storage Yard (Site 3), Former Naval Magazine Storage Area (Site 18), and LP-20 (Site 20)*. January.
- CH2M. 2019b. *Fourth Five-Year Review Report Naval Station Norfolk, Norfolk, Virginia*. February.
- CH2M. 2020a. *2018 Long-term Monitoring Groundwater Report for Camp Allen Landfill (Site 1), Q-Area Drum Storage Yard (Site 3), Former Naval Magazine Storage Area (Site 18), and LP-20 (Site 20)*.
- CH2M. 2020b. *Technical Memorandum, Response Activities, Office 120, Building LP-26, Site 20, Naval Station Norfolk, Norfolk, Virginia*. September.
- CH2M. 2021a. *Community Involvement Plan, Naval Station Norfolk, Norfolk, Virginia*. December.
- CH2M. 2021b. *Expanded Vapor Intrusion Investigation Report Site 20, Naval Station Norfolk, Norfolk, VA*. Draft. April.
- CH2M. 2021c. *Technical Memorandum, 2019 Groundwater Flow Modeling and Capture Zone Analysis Site 1, Camp Allen Landfill, Naval Station Norfolk, Norfolk, VA*. August.
- CH2M. 2021d. *2019 Long-Term Monitoring Groundwater Report, Q-Area Drum Storage Yard (Site 3), Former Naval Magazine Storage Area (Site 18), and Building LP-20 (Site 20), Naval Station Norfolk, Norfolk, VA*. August.
- CH2M. 2022a. *Preliminary Assessment, Per- and Polyfluoroalkyl Substances, Naval Station Norfolk, Naval Support Activity Hampton Roads, and Associated Federal Facility Agreement Areas, Norfolk, Virginia*. December.
- CH2M. 2022b. *2020 Long-Term Monitoring Groundwater Report, Q-Area Drum Storage Yard (Site 3), Former Naval Magazine Storage Area (Site 18), and Building LP-20 (Site 20), Naval Station Norfolk, Norfolk, VA*. July.

CH2M. 2022c. *Responses to Comments, Draft Preliminary Assessment for Per- and Polyfluoroalkyl Substances, Norfolk Naval Station, Naval Support Activity Hampton Roads, and Associated Federal Facility Agreement Areas, Norfolk, Virginia.* September.

CH2M. 2022d. *Performance Monitoring of Air Purifying Units Report, Site 20, Building LP26, Office 120, August 2020 to July 2021, Naval Station Norfolk, Norfolk, Virginia.* December.

CH2M. 2023a. *Per- and Polyfluoroalkyl Substances Site Inspection, Naval Station Norfolk, Naval Support Activity Hampton Roads, and Associated Federal Facility Agreement Areas, Norfolk, Virginia.* December.

CH2M. 2023b. *Performance Monitoring of Air Purifying Units Report, Site 20, Building LP26, Office 120, August 2021 to July 2022, Naval Station Norfolk, Norfolk, Virginia.* August.

CH2M. 2024a. *2021 Long-Term Monitoring Groundwater Report, Camp Allen Landfill (Site 1), Naval Magazine Slag Pile (Site 2), Q-Area Drum Storage Yard (Site 3), Construction Debris Landfill (Site 6), Former Naval Magazine Waste Storage Area (Site 18), and Building LP-20 (Site 20), Naval Station Norfolk, Norfolk, Virginia.* April.

CH2M. 2024b. *Fifth Five-Year Review, Naval Station Norfolk, Virginia.* Final. January.

CH2M. 2024c. *Performance Monitoring of Air Purifying Units Report, Site 20, Building LP26, Office 120, August 2022 to July 2023, Naval Station Norfolk, Norfolk, Virginia.* Final. November.

CH2M. 2024d. *Performance Monitoring of Air Purifying Units Report, Site 20, Building LP26, Office 120, August 2023 to July 2024, Naval Station Norfolk, Norfolk, Virginia.* Final. December.

CH2M. 2025a. *Technical Memorandum, Remedy Optimization - Soil Vapor Extraction Evaluation Study, Site 20, Naval Station Norfolk, Norfolk, Virginia.* Final. January.

CH2M. 2025b. *Remedial Action Optimization Report Site 1 – Camp Allen Landfill Naval Station Norfolk, Norfolk, Virginia.* Draft. July.

CH2M. 2026a. *2022 Long-Term Monitoring Groundwater Report, Q-Area Drum Storage Yard (Site 3), Former Naval Magazine Storage Area (Site 18), and Building LP-20 (Site 20), Naval Station Norfolk, Norfolk, VA.* Final. March.

CH2M. 2026b. *2023 Long-Term Monitoring Groundwater Report, Camp Allen Landfill (Site 1), Naval Magazine Slag Pile (Site 2), Q-Area Drum Storage Yard (Site 3), Construction Debris Landfill (Site 6), Former Naval Magazine Waste Storage Area (Site 18), and Building LP-20 (Site 20), Naval Station Norfolk, Norfolk, Virginia.* Draft. April.

CH2M. 2026c. *2024 Long-Term Monitoring Groundwater Report, Camp Allen Landfill (Site 1), Naval Magazine Slag Pile (Site 2), Q-Area Drum Storage Yard (Site 3), Construction Debris Landfill (Site 6), Former Naval Magazine Waste Storage Area (Site 18), and Building LP-20 (Site 20), Naval Station Norfolk, Norfolk, Virginia.* Draft. April.

CH2M. 2026d. *Performance Monitoring of Air Purifying Units Report, Site 20, Building LP26, Office 120, August 2024 to July 2025, Naval Station Norfolk, Norfolk, Virginia.* Final. April.

CH2M and Baker Environmental, Inc. (Baker). 2009. *Remedial Action Completion Report Site 22. Camp Allen Storage Yard, Naval Station Norfolk, Norfolk, Virginia.* January.

CH2M and Geosyntec Consultants. 2025. *Final Technical Memorandum Remedial Action Optimization Technology Assessment – Engineered Phytoremediation Technology Naval Station Norfolk (NSN) Site 1 – Camp Allen Landfill Naval Station Norfolk, Norfolk, Virginia.* June.

Commander, Navy Installations Command (CNIC). n.d. Naval Support Activity Hampton Roads. https://www.cnic.navy.mil/regions/cnrma/installations/nsa_hampton_roads.html.

Department of the Navy (Navy). 2008. *Record of Decision, Site 23: Building LP-20 Plating Shop, Naval Station Norfolk, Norfolk, Virginia.* September.

Navy. 2010a. *Sites 1, 3, 18, and 20 Record of Decision, Norfolk Station Norfolk, Norfolk, Virginia.* September.

- Navy. 2010b. *Preliminary Closeout Report NPL Site (CERCLIS ID: VA6170061463) Naval Station Norfolk (Sewells Point), Norfolk Virginia*. September.
- Environmental Science & Engineering, Inc. (ESE). 1983. *Initial Assessment Study, Sewells Point Naval Complex, Norfolk, Virginia*. February.
- ESE. 1996a. *Remedial Investigation/Feasibility Study Q-Area Drum Storage Yard Norfolk Naval Base, Norfolk, Virginia*. Revised Draft Final. May.
- ESE. 1996b. *Decision Document for Q-Area Drum Storage Yard, Norfolk Naval Base, Norfolk, Virginia*. November.
- Malcolm Pirnie, Inc. (Malcolm Pirnie). 1988. *Installation Restoration Program Remedial Investigation-Interim Report*. March.
- McFarland, Randolph E. and T. Scott Bruce. 2006. *The Virginia Coastal Plain Hydrogeologic Framework*. United States Geological Survey.
- OHM. 1995. *Final Report for the Soil and Debris Removal Action at Camp Allen Landfill Area B*. March.
- Powars, David S. 2000. *The Effects of the Chesapeake Bay Impact Crater on the Geologic Framework and The Correlation of Hydrogeologic Units of Southeastern Virginia, South of the James River*. U.S. Geological Survey Professional Paper 1622. U.S. Department of the Interior, U.S. Geological Survey, and Hampton Roads Planning District Commission.
- Shaw Environmental, Inc. 2008. *Completion Report, Site 23 – Building LP-20 Plating Shop Naval Station Norfolk, Norfolk, VA*. February.
- Smith, Barry S. and George E. Harlow, Jr. 2002. *Conceptual Hydrogeologic Framework of the Shallow Aquifer System at Virginia Beach, Virginia*. *Water Resources Investigations Report 01-4262*. U.S. Department of the Interior, U.S. Geological Survey, and City of Virginia Beach, Department of Public Utilities.
- U.S. Department of Defense (DoD). 2019. *DoD Instruction 4715.18: Emerging Chemicals of Environmental Concern*. September.
- U.S. Environmental Protection Agency (EPA). 1994. *EPA Aerial Photographic Site Analysis, Norfolk Naval Base, Norfolk, Virginia*. September.
- EPA and Department of the Navy (Navy). 1999. *Federal Facilities Agreement, Naval Base Norfolk, Norfolk Virginia*. May.

Appendix A

CERCLA Process Activities

CERCLA Process Activities

As discussed in Section 1 of the Site Management Plan, Naval Station Norfolk (NSN), which at the time included Naval Support Activity (NSA) Hampton Roads, was listed on the U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List on April 1, 1997. Environmental restoration sites at each Installation are being investigated through the Environmental Restoration Program (ERP). Because the Department of the Navy (Navy) structured the ERP to be consistent with the terminology and structure of the CERCLA program, the placement of NSN on the CERCLA National Priorities List has had a limited effect on the cleanup processes that were already established. The CERCLA cleanup process is described in this attachment. The ERP at NSN and NSA Hampton Roads is being implemented in accordance with applicable federal and state environmental regulations and requirements.

The Federal Facility Agreement (FFA) developed for NSN by EPA Region 3 and the Navy will assist the Navy in meeting the provisions of CERCLA, Resource Conservation and Recovery Act, and applicable state law. The FFA will establish a procedural framework and provide detailed guidance on all phases of the remedial process, from investigation through remedial action. The FFA also incorporates the effects of team partnering on the remediation process. The modified remedial process, incorporating the provisions of the FFA, is discussed in this attachment.

CERCLA Process

CERCLA Remedial Investigation/Feasibility Study Process

The CERCLA Remedial Investigation (RI)/Feasibility Study (FS) process refers to the process of site investigation and remedial action that is used for CERCLA sites.

The objectives of the CERCLA RI/FS 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 RI/FS process includes the following major elements:

- RI
- Risk Assessment
- FS
- Proposed Remedial Action Plan (PRAP)
- Record of Decision (ROD) or Decision Document

These steps ultimately lead to either implementation of a remedial design (RD)/remedial action or the decision to take no action at the site. Where No Further Action (NFA) is required at a site, a no-action ROD would be signed and the site removed from the program.

The RI, risk assessment, FS, and PRAP documents are maintained in information repositories for review by the public. A formal public comment period and a public meeting (if required) generally follow the issuance of the final PRAP. Public comments received on the final PRAP are addressed as part of the responsiveness summary in the ROD. Subsequent to completion of the ROD, RD/remedial action activities are initiated. In accordance with CERCLA, remedial action is required to begin within 15 months of the final ROD.

Removal Action Process

Removal actions are implemented to clean up or remove hazardous substances from the environment at a site in order to mitigate the spread of contamination. Removal actions may be implemented at any time during the RI/FS 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, 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 and Cost Analysis (EE/CA) is prepared rather than the more extensive FS. 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 to protect human health and the environment.

An NTCRA was completed at Area B of the Camp Allen Landfill (CALF) in 1994; however, the NTCRA was not considered a final remedy for the site. A soil removal action also was completed in the Q-Area that involved the removal of 750 cubic yards of petroleum-contaminated soil from the northwestern corner of the site to allow construction of a parking lot. In addition, a soil removal action was completed in the Naval Magazine Area (Taussig Can Area) in 1979 with the approval of the Commonwealth of Virginia.

A soil removal action was completed at the Building W-316 site that involved the removal of polychlorinated biphenyl-contaminated soil, and a removal action was completed at the SP-2B Accumulation Area that involved the removal of lead-contaminated soil. NTCRAs have been completed for pesticide-contaminated soil at the Pesticide Disposal Site, metals and polychlorinated biphenyl-contaminated soil at the Camp Allen Salvage Yard, lead-contaminated sediment at the Naval Magazine Slag Pile, and metals and pesticide-contaminated sediment at the Construction Debris Landfill.

NTCRAs were completed at four sites in 2007 and 2008. These sites (along with the Site Management Plan section where details are provided) are the following:

- Upper Reaches of Bousch Creek (as associated with Site 1) – Section 2.1.1
- Site 23 – Section 2.1.7
- Site 18 – Section 2.1.8
- SWMU 14 – Section 2.2.1

Remedial Action Process

Remedial actions may be considered interim remedial actions (IRAs) or final remedial actions. IRAs are implemented to provide temporary mitigation of human health risks or to mitigate the spread of contamination in the environment. Similar to removal actions, remedial actions may be implemented at any time during the RI/FS process. An IRA is implemented to attain applicable or relevant and appropriate requirements to the extent required by CERCLA or the National Contingency Plan. It is also consistent with and contributes to the efficient performance of a final remedial action taken at an area or operable unit (OU). Examples of IRAs include installation of a pump-and-treat system for product recovery from the groundwater or installation of a fence to prevent direct contact with hazardous materials.

For IRAs, a Focused FS is prepared rather than the more extensive FS. As with the removal action, an IRA may 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. In this case, a no-action ROD would be signed and the site removed from the program upon completion of the IRA.

Following the more extensive FS process, a preliminary/conceptual RD, a pre-final RD, and then a final RD are developed for final remedial action at an area or OU. After completion of the remedial action at each area or OU, a Remedial Action Completion Report will be prepared. If necessary, a Long-term Monitoring Plan and an Operation and Maintenance Plan will also be prepared for each remedial action site.

Remedial actions have been constructed at three sites at NSN: Site 1 - CALF, Site 20 – Building LP-20 Area, and Site 3 - Q-Area Drum Storage Yard. A groundwater extraction and treatment system and dual-phase vapor extraction system became operational at CALF in July 1997. An air sparge/soil vapor extraction (AS/SVE) system to address chlorinated solvents in the groundwater at the Building LP-20 Area started operations on April 14, 1998. An AS/SVE system to address total petroleum hydrocarbons and chlorinated solvents in the groundwater started operations at the Q-Area Drum Storage Yard in AOC 2 and AOC 1 on August 18, 1998 and August 20, 1998, respectively. Baseline monitoring, supplemental testing, and long-term monitoring are currently performed at each site.

Treatability Studies

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

- To provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the FS
- To support the RD of a selected alternative

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

Treatability studies may be classified as either bench-scale (laboratory study) or pilot-scale (field studies). Bench-scale studies are often sufficient to evaluate performance for technologies that are well developed and tested. For more 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.

Pilot-scale treatability studies had been conducted at the CALF site to evaluate air stripping and dual-phase vapor extraction technologies. Additionally, SVE and AS pilot-scale treatability studies were completed at the Q-Area Drum Storage Yard and Building LP20 Area.

Federal Facility Agreement CERCLA Integration Process

Area of Concern Evaluation

Sites identified as areas of concern (AOCs) in the FFA will undergo a document evaluation. This document evaluation will involve a thorough review of existing or easily obtainable documentation and information on the identified sites. If the Navy and EPA agree, the evaluation could include obtaining discrete samples from the AOC without the development of a work plan. If both parties do not agree, the AOC evaluation process will continue without the performance of sampling.

The document evaluation will also involve assessing information concerning the handling of hazardous wastes at each AOC, the actions taken at each AOC, or actions that will be occurring under other regulatory programs at each AOC. Based on the AOC evaluation, a decision will be made by the management team regarding which AOCs will proceed to the Site Screening Process (SSP) as Site Screening Areas (SSAs) and which AOCs will require NFA and can be closed out. For those AOCs requiring NFA, an AOC closeout document will be prepared.

Site Screening Process

The SSP refers to the process described in the FFA that will be used to identify whether SSAs should proceed into the RI/FS process under CERCLA. SSAs are those areas that may pose a threat to public health, welfare, or the environment. SSAs can be identified by either the Navy or EPA. Upon identification of an SSA, an SSP Work Plan will be prepared outlining the activities necessary to determine whether there have been releases of hazardous substances, pollutants, contaminants, hazardous waste, or other hazardous constituents to the environment. After investigation activities have been performed, an SSP report will be prepared. The report provides the basis for a determination of one of the following:

- An RI/FS will be performed at the SSA.
- The area does not pose a threat to public health, welfare, or the environment and, therefore, should be removed from further study.

For SSAs that do not warrant an RI/FS under CERCLA, a brief Decision Document will be prepared and signed by all project managers on the management team. Historically, the NSN Partnering Team has utilized consensus agreements to close out SSP sites.

Appendix B
Screening, Categorizing, and
Prioritizing Sites at Naval Station Norfolk

Screening, Categorizing, and Prioritizing Sites at Naval Station Norfolk

Federal Facility Agreement

On February 18, 1999, the U.S. Environmental Protection Agency (EPA) Region 3 and the Department of the Navy (Navy) entered into a Federal Facility Agreement (FFA) for Naval Station Norfolk (NSN), which at the time included Naval Support Activity (NSA) Hampton Roads. One of the objectives of the FFA is to define a site screening process (SSP) intended to provide a simplified investigative method to identify site screening areas (SSAs) and areas of concern (AOCs) for evaluation and determine whether Remedial Investigations (RIs) are required for these areas.

Determining Site Screening Areas

If the EPA or Navy determines that an area on NSN or NSA Hampton Roads, which has not been previously identified as an SSA, poses a threat to public health or the environment, the other party will be notified. The parties will then have 45 days from the notification to discuss the site conditions and determine whether the site will be addressed under the FFA as an SSA.

Establishing a Site Screening Area

Any site that is established as an SSA will be added to the list in Appendix B of the FFA as an additional SSA. This may lead to an investigation and possible remediation in accordance with the requirements of the FFA. For any new SSAs, the Navy will include a proposed time schedule for the submittal of an SSP Work Plan in the next draft Amended Site Management Plan (SMP). This schedule will be approved in accordance with Section XI of the FFA.

Site Screening Process

The Navy will submit to the EPA an SSP Work Plan, which outlines the activities necessary to determine whether there has been a release of hazardous constituents to the environment. The scope of work will be mutually agreed to by the EPA and the Navy. The SSP Work Plan will also include a schedule for the submittal of the SSP Report, which will be incorporated into the SMP. The SSP will also include the following:

1. Upon conclusion of an SSP, the Navy will submit to the EPA a draft SSP Report, which will provide the basis for determining one of the following:
 - RI/Feasibility Study (FS) will be performed on the area addressed by the SSP.
 - The area does not pose a threat to the environment, and therefore, the area should be removed from further study under the FFA.
2. Within 60 days of receipt of the final SSP Report, the EPA and the Navy will determine whether the SSA will require an RI/FS.
3. For those SSAs that the EPA and Navy agree do not warrant an RI/FS, the Navy will prepare a Decision Document that reflects that agreement. The agreement is to be signed by all the project managers.
4. For those SSAs that are to proceed with an RI/FS, operable units will be established. A schedule for the submission of the RI/FS Work Plans will be developed and incorporated into the next update of the SMP.

Areas of Concern

For those areas that have been identified as AOCs, the Navy and EPA will go through a screening process as follows:

1. A document evaluation will be undertaken to review existing documentation and assess information concerning the handling of hazardous waste at each AOC. The evaluation could also include (if agreed to by both EPA and the Navy) discrete sampling without developing a work plan.
2. Based on the document evaluation, the project managers will decide which AOCs will proceed to the SSP as SSAs and which AOCs will require No Further Action (NFA).
3. For those AOCs that will not proceed to the SSP, the Navy will prepare, with EPA assistance, a brief AOC closeout document. EPA will provide a response to the Navy within 30 days of receipt of the supporting documentation.
4. Those AOCs that are not agreed upon by EPA and the Navy to be closed out will proceed to the SSP. These sites will have schedules established for submittal of SSP Work Plans. The schedules will be incorporated into the SMP.

Site Screening Process Tools

Although the FFA provides an outline of the SSP for closing out SSAs, the FFA does not provide a detailed process for site screening. As a result, the Tier I Partnering Team has developed several tools for rapidly screening a site to determine whether the site will require a full RI/FS or if it can be removed from further study. The following section describes the screening tools used at NSN and NSA Hampton Roads.

Relative Risk Ranking

The Department of Defense developed a relative risk framework to evaluate the potential risk posed by a site in relation to other sites. The relative risk evaluation of sites will be performed to give each of the sites a relative risk designation. Relative risk is a management tool that uses actual media concentrations, potential exposure, and potential migration to indicate which sites may pose a risk to human health and the environment. Based on the relative risk results, the Navy can focus available resources for study and remediation on the sites ranked “high.”

The current version of the SMP does not update the prior ranking of the sites at NSN or NSA Hampton Roads. The decision to defer the re-ranking of sites is based on the fact that the sites discussed in the SMP are either undergoing remediation, are in an active site characterization phase, or have been closed out based on a determination of no significant risk to human health or the environment. It is anticipated that the sites undergoing site characterization will be re-ranked in a future update of the SMP. The framework for future ranking is provided in the following paragraphs.

The primary factors considered in the relative risk methodology are human health and ecological risks associated with receptor exposure to constituents at the site. The site ranking is based on the best information available at the time the report is submitted. The relative risk model is both quantitative and qualitative in nature.

To initially categorize the sites, contaminant hazard factors (CHF) for human health and ecological risk are calculated based on available chemical data at the time the ranking is performed for each site. The CHF values are determined by dividing the maximum detected concentration of particular compounds in the environmental media (groundwater, soil, surface water, and sediment) by the appropriate corresponding screening value. To perform this analysis, the most up-to-date version of the relative risk ranking model should be used.

For the quantitative screening analysis, human health risk will be evaluated assuming that the groundwater is used as drinking water (both ingestion and inhalation exposure scenarios will be included in the drinking water determination). To be conservative, soil ingestion will be assumed under a residential use scenario. Ecological risk will be determined for the aquatic environment only (surface water and sediment) because benchmark values for terrestrial ecological risk are not readily available.

Once the quantitative assessment is complete, a qualitative assessment addressing potential exposure pathways and potential contaminant transport will be performed. This analysis will be conducted to ensure that sites where human or ecological exposure to the contaminated media exists and the potential for contaminant migration is significant will be ranked higher than sites with less potential to affect human health and the environment. This analysis will be performed by qualitative analysis of the CHF, receptor factors (exposure potential), and migration pathway factors (contaminant transport potential), as described in the following sections.

A detailed description of the procedures and equations used to complete the relative risk ranking of the sites at NSN is included in the *1999-2000 Site Management Plan, Naval Station Norfolk* (CH2M 1999).

Aerial Photo Analysis

The September 1994 study by EPA Photographic Interpretation Center of aerial photography identified 37 potential waste disposal areas across NSN and NSA Hampton Roads (EPA 1994). This study provided a useful tool for identifying potential SSAs for further investigation by ascertaining such potential indicators of contamination as disturbed areas, ponded liquids, excavated areas, fill areas, stressed vegetation, and discolored soils.

However, a more detailed review of additional aerial photos and field verification can also provide supporting documentation for removing sites from further study. Examples of this photographic documentation include demonstrating that the disturbed areas are associated with new building construction activities, confirming that ponded areas are attributed to natural drainage patterns, and illustrating from historical photos that disturbed areas occurred over a short period of time.

Geoprobe Sampling

The use of direct-push soil and groundwater sampling techniques, such as the Geoprobe, can provide a rapid, cost-effective alternative to traditional sampling techniques. These direct-push techniques offer the following advantages over traditional sampling methods: the need for the installation of permanent wells may be reduced or eliminated, the generation of investigation-derived waste is minimized, the effort to achieve decontamination is reduced, the mobility is much easier than with drilling equipment, and the collection of samples can be conducted much more rapidly.

Although the Geoprobe data generally provide representative soil analytical data, the groundwater data can be used only on a qualitative basis for risk assessments (RAs) for the following reasons:

- The data cannot be reproduced as is the case with well data.
- Metals data may not be representative because of the high turbidity of the samples.

However, the data generated from the Geoprobe investigations can be used to provide a conservative assessment of the nature and extent of soil and groundwater contamination at a particular site. Confirmation data may be required with the installation of monitoring wells; however, the number of wells will likely be significantly reduced.

Streamlined Risk Assessments

Several sites were identified where the available data indicated that the sites seemed to pose minimal risk to human health or the environment. However, a quantitative risk evaluation was warranted before a determination could be made on whether the sites could be closed as NFA sites, or classified as SSAs for further investigation. Conversely, the slight exceedances above the risk-based criteria did not justify a full-scale RA for these sites. Therefore, a streamlined RA process has been applied to these sites, which is described as follows:

- Concentrations of detected chemicals were compared to the following current EPA screening and regulatory screening criteria for each sample matrix: risk-based concentrations for residential and industrial soil, EPA tap water risk-based concentrations and maximum contaminant levels for groundwater, and the EPA Region 3 Biological Technical Assistance Group screening values for surface water and sediment. The solid waste

management units (SWMUs) were initially categorized based on the comparison to screening and regulatory criteria (comparison criteria).

- In addition, the maximum, minimum, arithmetic mean, and median concentrations for the contaminant concentrations exceeding the comparison criteria were calculated using the detected concentrations from all samples collected during the Relative Risk Ranking Study and the SWMU Supplemental Investigation. Although these values were not used in determining the recommendations for each SWMU, this evaluation was performed to identify the detected range for contaminants exceeding the comparison criteria.

References

CH2M HILL, Inc. (CH2M). 1999. 1999-2000 Site Management Plan, Naval Base Norfolk, Norfolk, Virginia. Draft Final. January.

U.S. Environmental Protection Agency (EPA). 1994. *EPA Aerial Photographic Site Analysis, Norfolk Naval Base, Norfolk, Virginia*. September.

Appendix C
Per- and Polyfluoroalkyl Substances
Site Crosswalk Site Inspection to
Remedial Investigation

Appendix C. Per- and Polyfluoroalkyl Substances Site Crosswalk Site Inspection to Remedial Investigation

Site Management Plan, Fiscal Years 2027–2031

Naval Station Norfolk and Naval Support Activity Hampton Roads, Norfolk, Virginia

Site Inspection AOC		Remedial Investigation Site		
AOC Number	Site Name	Site/SWMU Number	Operable Unit	Site/SWMU Name
1	Q50 Area and Frac Tanks	SWMU 14	19	Q-50 Satellite Accumulation Area
2	Site 3 - Q-Area Drum Storage Yard, Piers 11, 12, and 14	3	16	Q-Area Drum Storage Yard
3	Bunker Hill and Maryland Avenue	3	16	Q-Area Drum Storage Yard
4	W-Fuel Farm (Pier Area A), Building W146, Piers 9 and 10	24	24	W Area PFAS
5	Building CEP178, Piers 4 and 6	25	25	Building CEP178 Fire Station and Piers
6	Pier Area C and Pier 2	26	26	CEP Area
7	CEP Tank Farm Area	26	26	CEP Area
8	Building KBB	27	27	Building KBB Fire Truck Maintenance Shop
9	Buildings LF34, LF59, and LF60	28	28	LF Hangar Area, R43, and V49
10	Buildings R43 and V49	28	28	LF Hangar Area, R43, and V49
11	Buildings V147, V52, V70, and Site 20 - Building LP20 Area	20	20	Building LP20
12	LP Hangar Area	29	29	LP Hangar Area (LP27, LP33, and LP34)
13	Firefighting Training Area and LP166 Area	30	30	Runway and Firefighting Training Area
14	Chambers Field Runway	30	30	Runway and Firefighting Training Area
15	SP Hangar Area	31	31	SP Hangar Area
16	SP Spray Area	32	32	SP Spray Area
17	Site 18 - Former Naval Magazine Waste Storage Area	18	18	Former NM Waste Storage Area
18	Building BEN154	33	33	Building BEN154
19	Firefighting School	SWMU 8	17	Firefighting School (site reopened)
N/A	Site 1 - Camp Allen Landfill	1	15	Camp Allen Landfill
N/A	Site 22 - Camp Allen Salvage Yard	22	15	Camp Allen Salvage Yard

AOC = area of concern

N/A = not applicable

SWMU = solid waste management unit