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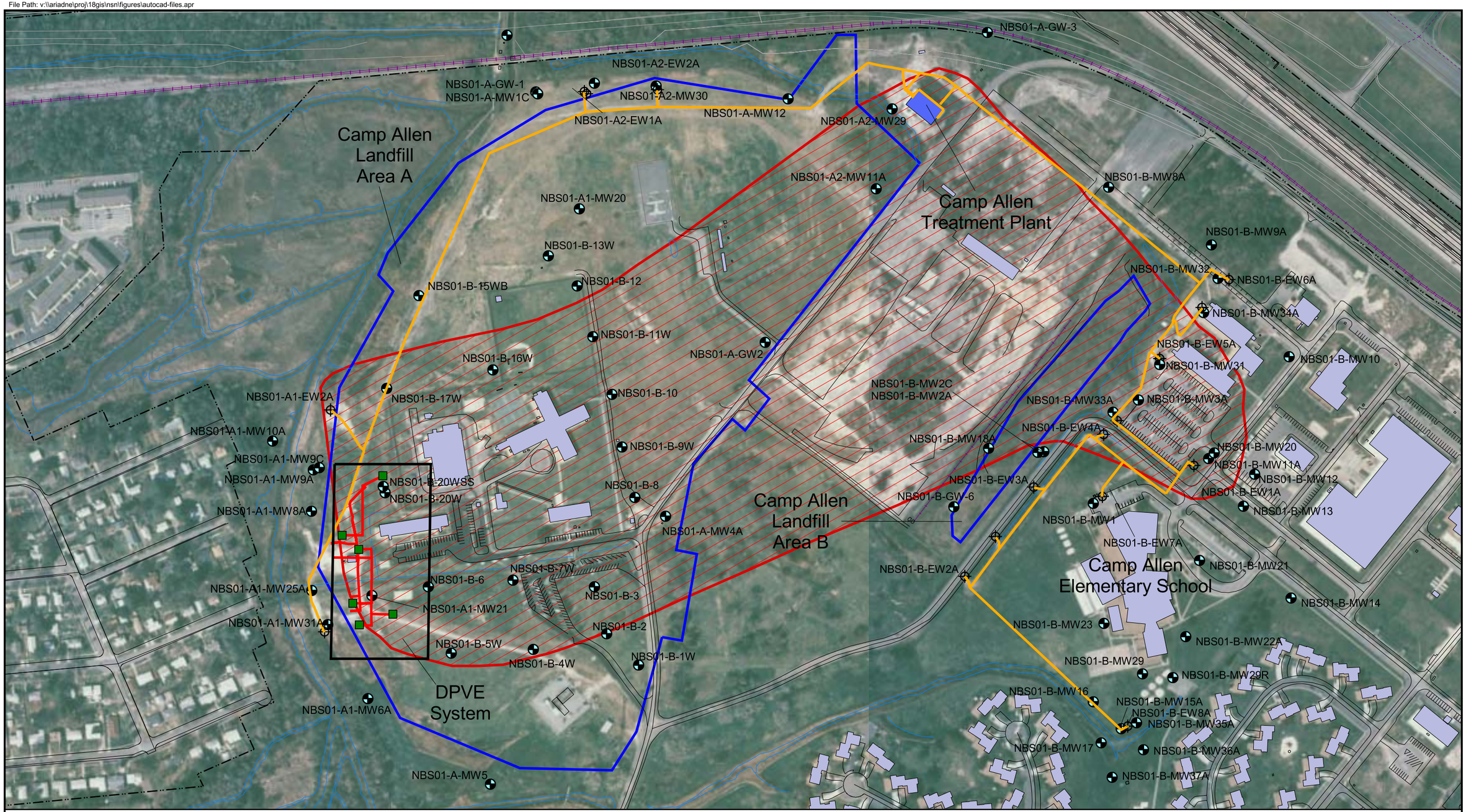

LEGEND

- Water Distribution Lines of Groundwater Extraction System
- Shallow Monitoring Well
- Shallow Extraction Well
- DPVE System
- DPVE Well
- Camp Allen Landfill Boundary
- Shallow Aquifer Groundwater Plume

N

0 300 600 Feet

Figure 2-1
Site Map - Shallow Aquifer Treatment System,
Monitoring Well Network, and Groundwater Plume
Site 1 - Camp Allen Landfill
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

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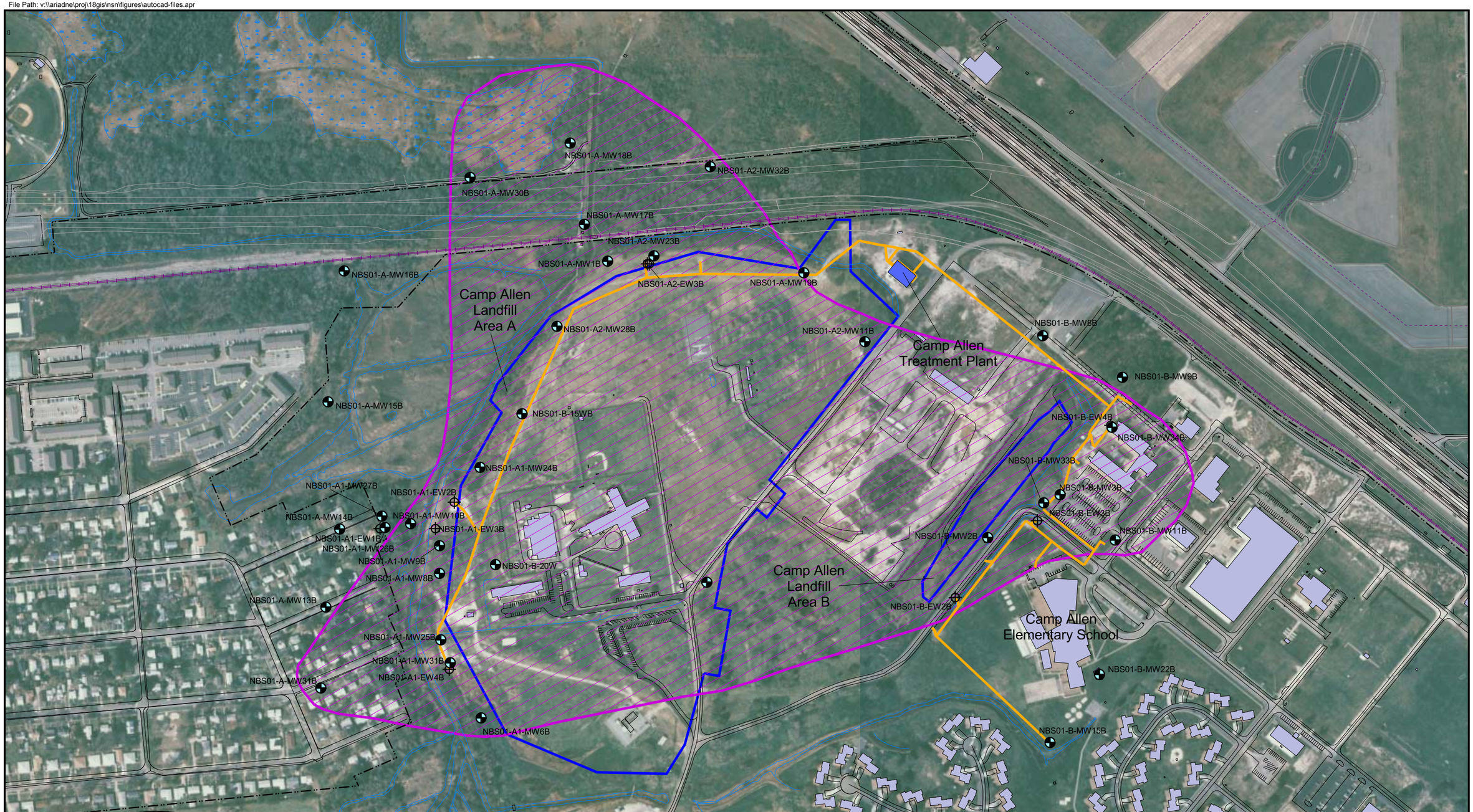


LEGEND

- Water Distribution Lines of Groundwater Extraction System
- Deep Monitoring Well
- Deep Extraction Well
- Deep Aquifer Groundwater Plume
- Camp Allen Landfill Boundary

N

0 300 600 Feet

Figure 2-2
Site Map - Deep Aquifer Treatment System,
Monitoring Well Network, and Groundwater Plume
Site 1 - Camp Allen Landfill
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\five_year_review_sites.apr

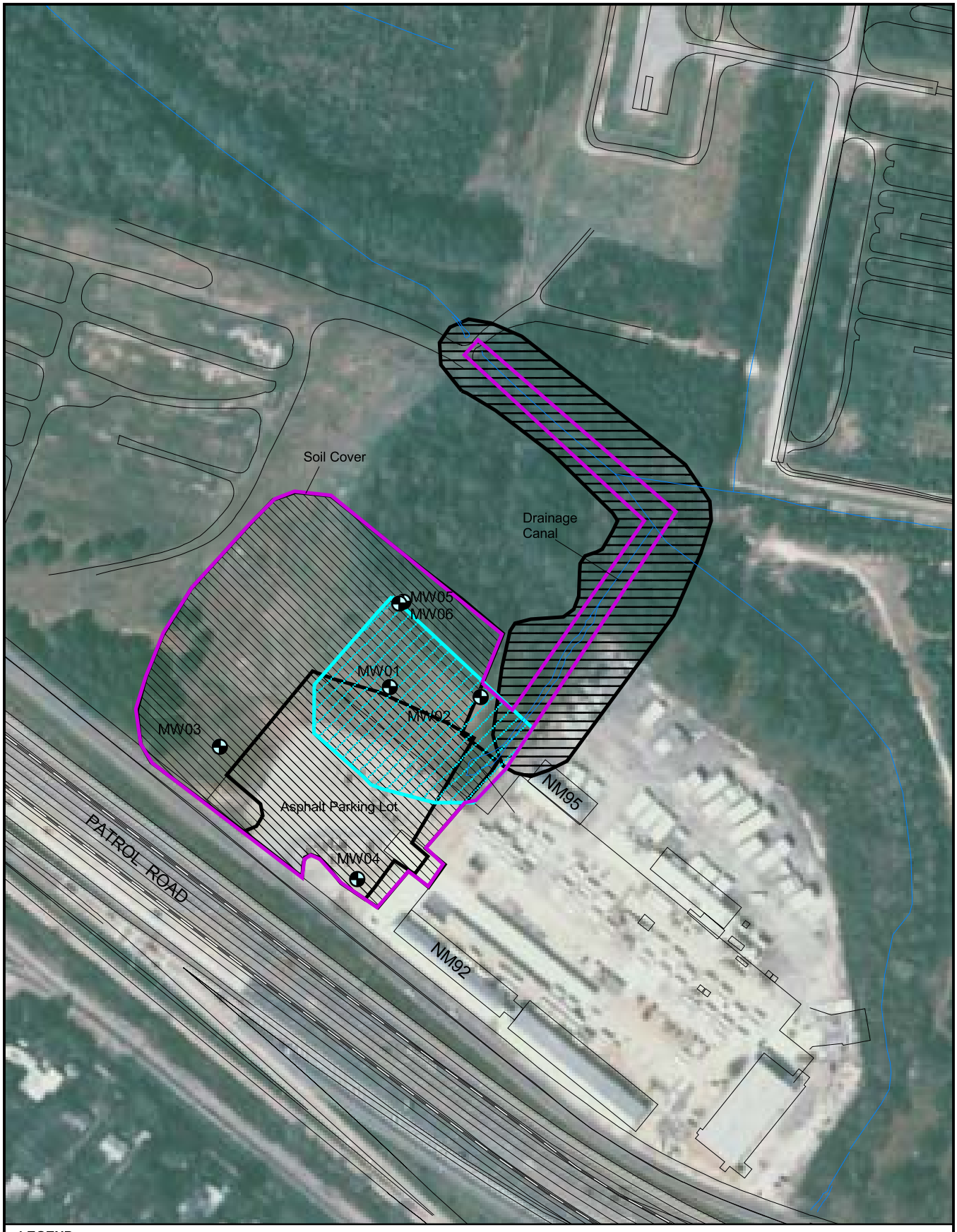
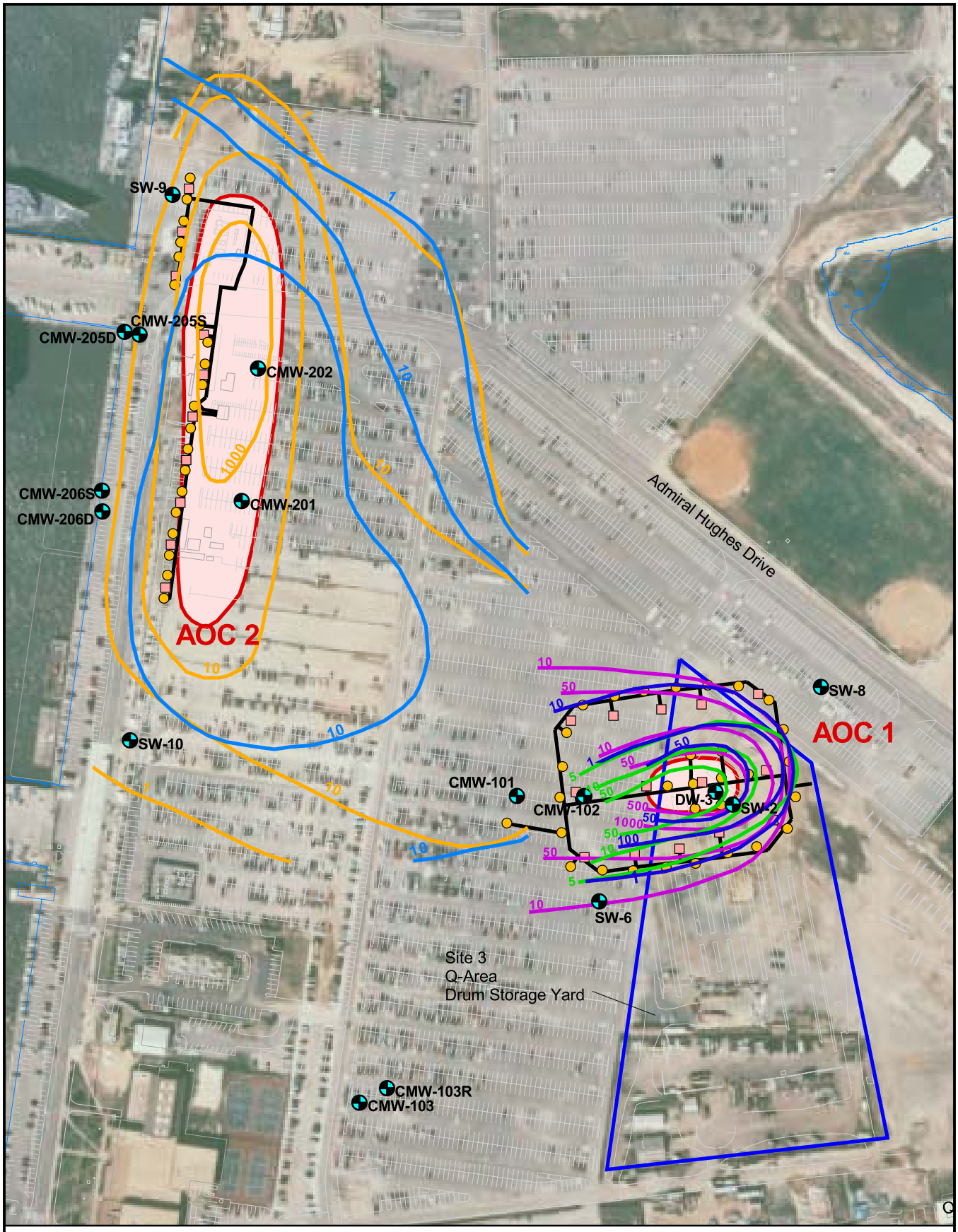


Figure 2-3
Site Map
Site 2- NM Slag Pile
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\five_year_review_sites.apr



LEGEND

- Air Sparge Wells
- Soil Vapor Extraction Wells
- Piping for AS/SVE Systems
- Site Boundary
- AOC Boundary
- Monitoring Wells

AOC 1 Isoconcentration Lines
- VOC
- TCE
- PCE

AOC 2 Isoconcentration Lines
- TCE35
- TCE25

N

0 125 250 Feet

Figure 2-4
Site Map
Site 3 - Q-Area Drum Storage Yard
AOC 1 and AOC 2
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\five_year_review_sites.apr

LEGEND

- Monitoring Wells
- Areas of Sediment Removal
- Soil Cap - Remedial System Caps/Covers
- CD Landfill Boundary

N

0 200 400 Feet

Figure 2-5
Site Map
Site 6 - CD Landfill
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\146383.apr

LEGEND

Site Boundary

Monitoring Wells

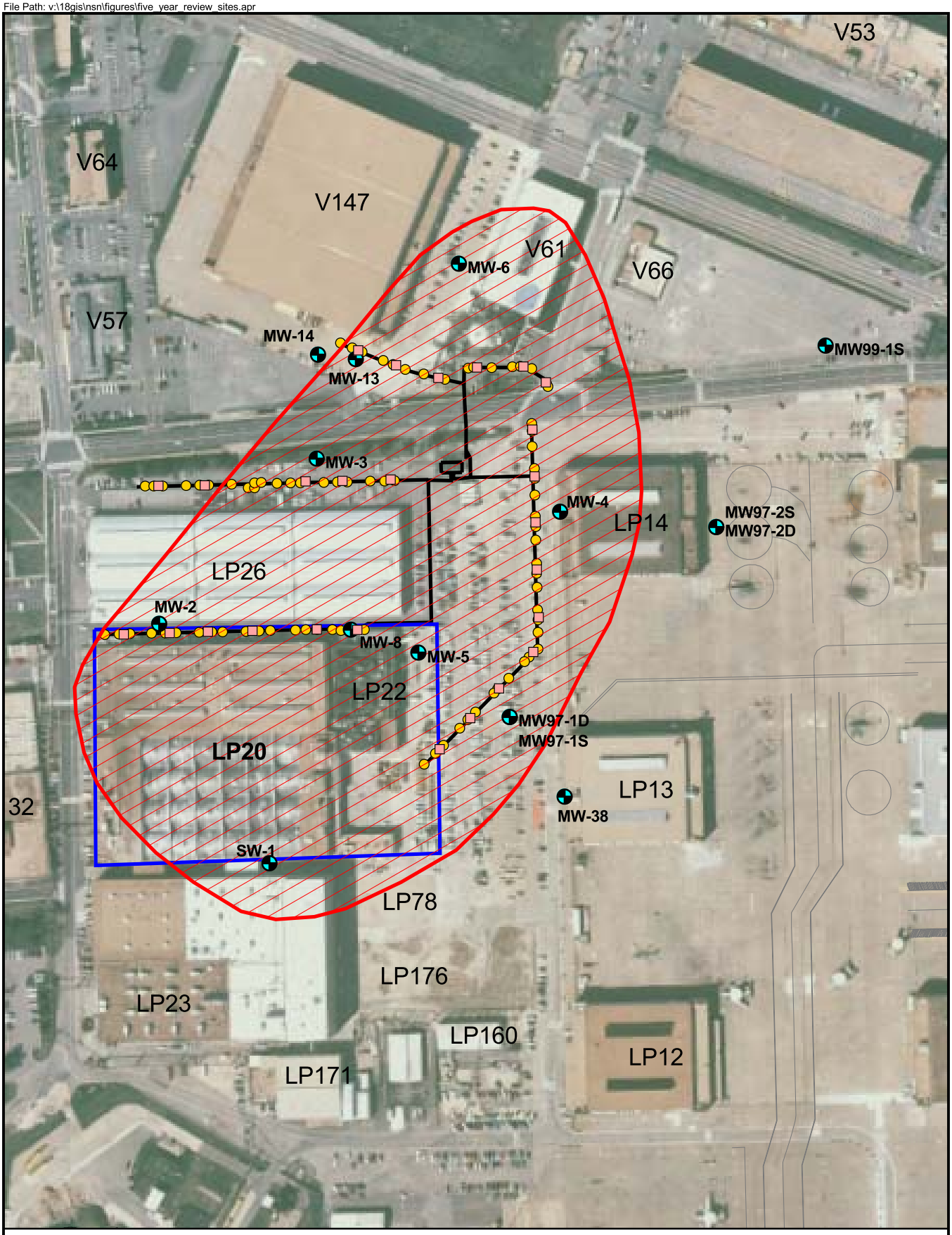
N

0 50 100 Feet

Figure 2-6
Site Map
Site 18 - Former NM Hazardous Waste Storage Area
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\five_year_review_sites.apr



LEGEND

- Air Sparge Wells
- Monitoring Wells
- Soil Vapor Extraction Wells
- Piping for AS/SVE Systems
- Site Boundary
- Estimated Plume

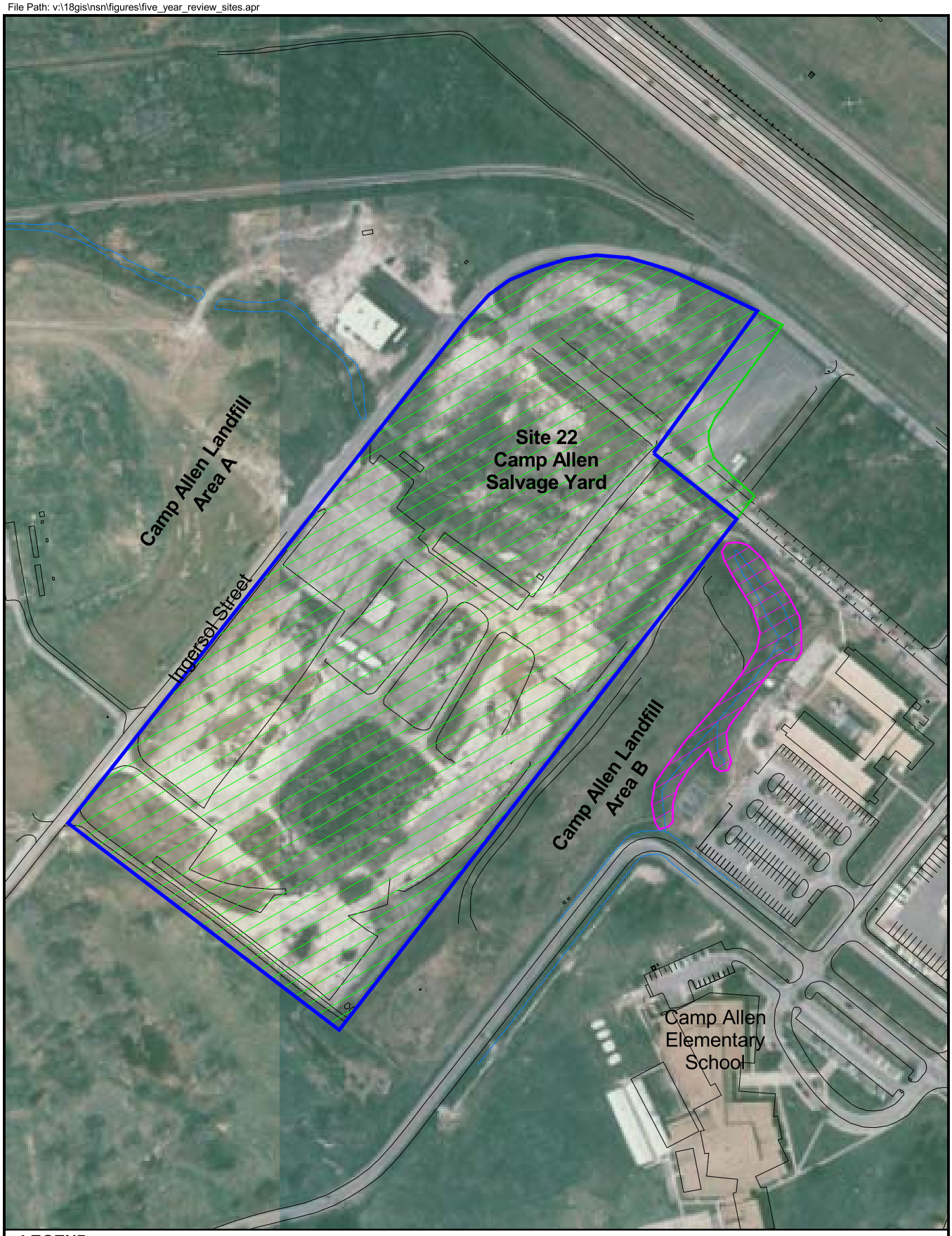
N

0 130 260 Feet

Figure 2-7
Site Map
Site 20 - LP-20 Site
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\five_year_review_sites.apr



LEGEND

Covers

Soil

Sediment

Camp Allen Salvage Yard / Fenceline

N

0 130 260 Feet

Figure 2-8
Site Map
Site 22 - Camp Allen Salvage Yard
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\five_year_review_sites.apr

LEGEND

Site Boundary

N

0 65 130 Feet

Figure 2-9
Site Map
Site 23 - Building LP-20 Plating Shop
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

File Path: v:\18gis\nsn\figures\153013.apr

LEGEND

- Monitoring Wells
- Estimated Extent of Site 9 Landfill

N

0 100 200 Feet

Figure 2-10
Site Map
Q-50 Satellite Accumulation Area
Naval Station Norfolk
Norfolk, Virginia

CH2MHILL

SECTION 3

Screening, Categorizing, and Prioritizing Sites at Naval Station Norfolk

3.1 Federal Facilities Agreement

On February 18, 1999, the EPA Region III and the Department of the Navy entered into a FFA for Naval Station Norfolk. One of the objectives of the FFA is to define a Site Screening Process (SSP) that is intended to provide a simplified investigative method whereby identified SSAs and AOCs can be evaluated to determine whether Remedial Investigations are required for these areas.

3.1.1 Determining Site Screening Areas

If the EPA or Navy determines that an area on the Naval Station, which has not been previously identified as a SSA, poses a threat to public health or the environment, the other party shall be notified. The parties will then have forty-five (45) days from the notification to discuss the site conditions and determine if the site shall be addressed under the FFA as a SSA.

3.1.2 Establishing a Site Screening Area

Any site that is established as a 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 shall include in the next Draft Amended Site Management Plan a proposed time schedule for the submittal of a SSP Work Plan. This schedule shall be approved in accordance with Section XI of the FFA.

3.1.3 Site Screening Process

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

1. Upon conclusion of a SSP, the Navy shall submit to the EPA a draft SSP Report which shall provide the basis for a determination that either: a) a RI/FS be performed on the area addressed by the SSP or, b) 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 sixty (60) days of receipt of the final SSP Report, the EPA and the Navy will determine if the SSA(s) will require a RI/FS.

3. For those SSAs which the EPA and Navy agree do not warrant an RI/FS, the Navy shall 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 a RI/FS, OUs will be established. A schedule for the submission of the RI/FS Work Plan(s) is to be developed and incorporated into the next update of the SMP.

3.1.4 Areas of Concern

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

1. A document evaluation will be undertaken to review existing documentation and assessing 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.

3. For those AOCs that will not proceed to the SSP, the Navy shall prepare, with EPA assistance, a brief AOC Closeout Document. The EPA shall provide a response to the Navy within thirty (30) days of receipt of the supporting documentation.

4. Those AOCs, which 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.

3.2 Site Screening Process Tools

Although the FFA provides an outline of the SSP for closing out SSA, 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 utilized at NSN.

3.2.1 Relative Risk Ranking

The DoD developed a relative risk framework to evaluate the potential risk posed by a site in relation to other sites. The relative risk evaluation of NSN 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.”

This version of the SMP does not update the prior ranking of the sites at NSN. The decision to defer the re-ranking of sites is based on the fact that the sites discussed in this 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 below.

The primary factors considered in the relative risk methodology are human health and ecological risks associated with 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 (CHFs) 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 impact human health and the environment. This analysis will be performed by qualitative analysis of the CHFs, 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*.

3.2.2 Aerial Photo Analysis

The September 1994 an EPA Photographic Interpretation Center (EPIC) study of aerial photography identified 37 potential Waste Disposal Area (WDAs) at NSN. 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.

3.2.3 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 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 (IDW) wastes 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 due to: 1) the data cannot be reproduced as is the case with well data, and 2) metals data may not be representative due to 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.

3.2.4 Steamlined 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 a SSA for further investigation. Conversely, the slight exceedances above the risk-based criteria did not justify a full-scale risk assessment for these sites. Therefore, a streamlined risk assessment process has been applied to these sites, which is described below.

Concentrations of detected chemicals were compared to the following current EPA screening and regulatory screening criteria for each sample matrix: risk-based concentrations (RBCs) for residential and industrial soil, EPA tap water RBCs and MCLs for groundwater, and the EPA Region III Biological Technical Assistance Group (BTAG) screening values for surface water and sediment. The 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 contaminants exceeding the comparison criteria were calculated using the detected concentrations from all samples collected during the RRR 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.

SECTION 4

CERCLA Process Activities

As previously discussed in Section 1, NSN was listed on the EPA CERCLA NPL on April 1, 1997. The Base is being investigated through the IRP. Because the Navy structured the IRP to be consistent with the terminology and structure of the CERCLA Program, the placement of NSN on the CERCLA NPL has had a limited effect on the cleanup processes that were already established. The CERCLA cleanup process is described below. The IRP at NSN is being implemented in accordance with applicable federal and state environmental regulations and requirements.

The FFA developed for NSN by EPA Region III and the Navy will assist the Navy to meet the provisions of CERCLA, RCRA, 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 section.

4.1 CERCLA Process

4.1.1 CERCLA RI/FS Process

The CERCLA RI/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—Remedial Investigation
- RA—Risk Assessment
- FS—Feasibility Study
- PRAP—Proposed Remedial Action Plan
- ROD—Record of Decision or Decision Document

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

The RI, RA, 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, remedial design/remedial action activities are initiated. In accordance with CERCLA, remedial action is required to begin within 15 months of the Final ROD.

4.1.2 Removal Action Process

Removal actions are implemented to cleanup 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.

For non-time-critical removal actions, an 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 in order to protect human health and the environment.

A non-time-critical soil removal action was completed at Area B of the Camp Allen Landfill in 1994; however, this 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 northwest corner of the site to allow construction of a parking lot. In addition, a soil removal action was completed in the NM 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 PCB-contaminated soil and a removal action was completed at the SP-2B Accumulation Area that involved the removal of lead-contaminated soil. Non-time critical removal actions have been completed for pesticide-contaminated soil at the Pesticide Disposal site, metals and PCB-contaminated soil at the CASY, lead-contaminated sediment at the NM Slag Pile, and metals and pesticide-contaminated sediment at CD Landfill.

4.1.3 Remedial Action Process

Remedial actions may be considered interim remedial actions (IRA) or final remedial actions. Interim remedial actions are implemented to provide temporary mitigation of human health risks or to mitigate the spread of contamination in the environment. Similar to removal actions, they may be implemented at any time during the RI/FS process. An IRA is implemented to attain applicable or relevant and appropriate requirements (ARARs) to the extent required by CERCLA or the National Contingency Plan (NCP). It is also consistent with and contributes to the efficient performance of a final remedial action taken at an area or OU. Examples of interim remedial actions 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 interim remedial actions, a focused feasibility study (FFS) 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 interim remedial action.

Following the more extensive FS process, a preliminary/conceptual remedial design, a pre-final remedial design, and then a final remedial design 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, the Camp Allen Landfill, the LP-20 site and the Q-Area Drum Storage Area. A groundwater extraction and treatment system and DPVE system became operational at the Camp Allen Landfill in July 1997. An AS/SVE system to address chlorinated solvents in the groundwater at LP-20 started operations on April 14, 1998. An air sparge/SVE system to address TPH and chlorinated solvents in the groundwater started operations at the Q-Area Drum Storage Area 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 all three sites.

4.1.4 Treatability Studies

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

- To provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the FS, and/or
- To support the remedial design 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 Camp Allen Landfill Site to evaluate air stripping and DPVE technologies. Additionally, SVE and air sparging pilot-scale treatability studies were completed at the Q-Area Drum Storage Area and LP-20 site.

4.2 FFA CERCLA Integration Process

4.2.1 AOC Evaluation

Sites identified as 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 as SSAs and which AOCs will require no further action and can be closed out. For those AOCs requiring no further action, an AOC closeout document will be prepared.

4.2.2 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, a SSP work plan will be prepared outlining the activities necessary to determine if there have been releases of hazardous substances, pollutants, contaminants, hazardous waste, or other hazardous constituents to the environment. After investigation activities have been performed, a SSP report will be prepared. The report provides the basis for a determination that either (1) a RI/FS be performed at the SSA or (2) 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.

SECTION 5

Site Management Plan Schedules

This section presents project-specific schedules for projects that are or potentially will be active in FY 2006 and FY 2007. In addition, tentative site schedule projections are provided from FY 2008 through FY 2011. Project-specific schedules for active projects will be updated periodically in the SMP. Potentially active projects for years FY 2006 through FY 2007, for which project-specific schedules have been developed, are summarized in Table 5-1 and Figure 5-1. Tentative projections from FY 2008 through FY 2011 are also provided in Figure 5-2.

5.1 Team Partnering at Naval Station Norfolk

In October 1996, NAVFAC-Mid-Atlantic convened an environmental partnership among the Navy, EPA, VDEQ, and Navy subcontractors. In addition, the partnership created the RAB to keep members of the community informed of Base IR activities. The partnership 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 assumptions presented below represent an ideal flow of work for sites that are addressed through the conventional cleanup approach. These assumptions do not account for how the streamlined oversight process may affect schedules and potentially affect the sequence of tasks, as the partnership 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. To date, the streamlined oversight process is estimated to have saved over $4.0 million in remediation costs and 24 months in cleanup schedules in comparison to conventional cleanup approaches.

5.2 Scheduling Assumptions

Assumptions regarding duration of field investigations, laboratory analyses, data validation, document preparation, document review, and remedial design/remedial action are discussed below.

5.2.1 Field Investigation and Laboratory Analysis/ Validation

The time required for RI field investigations depends on the size and complexity of the site and the overall scope of the field investigation (i.e., types of field investigation activities, number of sampling rounds, etc.). Generally, field investigations require from 2 to 6 months to complete.

A 30-day turnaround time was assumed for laboratory analysis. Twenty-eight days is the standard turnaround time for Naval Facilities Engineering Support Center (NFESC)-approved laboratories under the current Navy CLEAN Contract. A 14-day duration was assumed for validation of laboratory data.

5.2.2 Document Preparation and Document Review

The time required for document preparation under the RI/FS process (see Section 4.1) has been estimated based on prior experience in preparing the various types of documents. A summary of the estimated times required for development of the various types of documents typically prepared during the RI/FS process is presented in Table 5-2. The durations presented in Table 5-2 represent the time required to prepare the initial draft document and do not include time required for review and subsequent revisions of the document.

The time required for document review generally will vary according to the length and complexity of the document, as well as the availability of resources on the part of the reviewing agency. In accordance with the FFA, unless mutually agreed upon by the project management team, all draft primary documents will be subject to a 60-day review and comment period. Exceptions to the time periods required for review and comment on draft documents are identified in the FFA. Prefinal remedial designs will be subject to a 45-day review and comment period and final remedial designs will be subject to a 14-day review and comment period. In the event that significant changes are made to the design between the prefinal and final designs, the EPA may extend the review period by another 14 days. As discussed in the FFA, in some cases the review and comment period on draft remedial designs and remedial action work plans may need to be expedited for the Navy to satisfy CERCLA requirements.

The following corresponding document review periods were assumed for the purposes of this SMP:

- Working Draft: 30-day review by NAVFAC-Mid-Atlantic
- Draft Document: 60-day review by Regulatory Agencies
- Working Draft Final Document: 15-day review by NAVFAC-Mid-Atlantic
- Draft Final Document: 60-day review by Regulatory Agencies

In many cases, the Navy may choose to have concurrent review periods for draft final documents. In those cases, no separate NAVFAC-Mid-Atlantic review would be required for a working draft final document.

For this SMP, it was assumed that 30 days would be required by the consultant to incorporate NAVFAC-Mid-Atlantic and regulatory agency comments on the draft document and to prepare and submit the draft final document. Also, it was assumed that 15 days would be required by the consultant to incorporate NAVFAC-Mid-Atlantic and regulatory comments on the draft final document and to prepare and submit the final document.

5.2.3 Data Gap Analysis and Supplemental Investigations

The schedules in this SMP reflect the fact that once the results of an investigation have been evaluated and draft (or draft final) reports have been submitted, it is common for data gaps to be identified that will need to be filled before risk management decisions can be made and remedial or removal alternatives can be defined. In fact, it is rare that all pertinent questions for risk assessment and the nature and extent of contamination are answered in a single phase of investigation. In past SMPs, the schedules for RI/FS projects did not account for multiple phases of investigation and were, therefore, unrealistically short. For the purposes of this SMP, it is assumed that data gap analyses and supplemental investigations will be performed following the review of both the draft and draft final reports.

The steps required for each phase of data gap analysis and supplemental investigations are:

1. Draft Document Review by NAVFAC-Mid-Atlantic /agencies complete (as previously shown)
2. Data Gap Analysis: 15 days
3. Work Plan for Supplemental Investigations: 15 days
4. NAVFAC-Mid-Atlantic /Agency Review of Supplemental Work Plan: 30 days
5. Mobilize for Field Investigation: 15 days
6. Supplemental Field Investigation (depends upon size of field effort): 15 to 30 days
7. Laboratory Analysis: 30 days
8. Data Validation: 15 days
9. Data Evaluation: 10 days
10. Prepare Draft Final Report (as previously shown)

Steps 2 to 9 above, are estimated to require approximately 6 months to complete and are often left out when project schedules are established. Following the draft final document review, it is common for additional data gaps to be identified. This results in steps 2 to 9 above being repeated and another 6 months elapsing before the final report can be prepared. The inclusion of data gap analysis and supplemental investigations after both the draft report and the draft final report are estimated to extend project schedules by about a year in comparison to an "ideal" RI/FS where no data gaps are identified after the first phase of investigation is completed.

Through team partnering, the data gap and supplemental investigation phases of a project can be significantly shortened through several steps:

- Environmental data are summarized and presented to the partnering team in tables and graphical form as soon as the data are available.
- As a team, the data are reviewed, data gaps are identified, and additional investigations (if necessary) are scoped during meetings. Although the team develops the scope of additional work based on a consensus, it is understood that additional data gaps may be identified once new results are in.
- The final document deliverable is not prepared and submitted until there is consensus that all significant data gaps have been filled.

5.2.4 Remedial Design/ Remedial Action

The time required for remedial design/remedial action (RD/RA) depends on the type and complexity of the proposed remedial action. For example, the remedial design of a groundwater pump-and-treat system generally is much more complex than the remedial design for a soil removal/offsite disposal remedial action. For example, the groundwater pump-and-treat remedial design process may require up to one year, whereas the soil removal/off-site disposal remedial design may require less than three months. In addition, the groundwater pump-and-treat system may operate for a long time (10 to 20 years for remedial action), whereas the soil removal/off-site disposal remedial action may be completed in less than one year. Therefore, schedules for RD/RA activities are only provided for projects where the type of remedial action to be performed is known. The remaining sites are only scheduled up through the ROD phase of the RI/FS process.

5.3 IRP Site Project Schedules

Project-specific schedules for IRP projects that are or potentially will be active in FY 2006 and FY 2007 are presented in Figure 5-1. In addition, tentative site projections are provided for FY 2008 through FY 2011 in Figure 5-2.

The basic strategy used during development of the IRP project schedules was to overlap the RI/FS and RD/RA activities to the maximum extent practicable. By overlapping activities, the overall project schedules are compressed without compromising the interdependencies of the various tasks and documents in the RI/FS process. The amount of overlap of tasks was based on the degree of dependency between the various tasks and documents. Key dependencies and related assumptions are outlined below.

- Remedial Investigation (RI): Preparation of the draft RI was assumed to start once all of the analytical data have been received, but prior to data validation. Certain RI tasks can begin before the data are validated; however, in order to prevent duplication of effort, this overlap was assumed to be only two weeks.
- Feasibility Study (FS): Preparation of the draft FS was assumed to begin approximately four months following the start of the RI. Many FS tasks are dependent on the nature and extent of contamination, which is generally defined in the RI report.
- Proposed Remedial Action Plan (PRAP): Preparation of the draft PRAP was assumed to start following receipt of agency comments of the draft final FS, because selection of the proposed remedial action(s) in the PRAP is contingent upon agency approval of the recommended alternative.
- Record of Decision (ROD) or Decision Document (DD): Preparation of the draft ROD was assumed to begin following receipt of agency comments on the draft final PRAP. Since public comments received during the public comment period must be responded to in the ROD, preparation of the final ROD would not begin until closure of the public comment period.

TABLE 5-1
Active Projects for FY2006 and FY2007
(October 2005-September 2007)
Naval Station Norfolk

Active Projects for FY 2006 and 2007	Estimated Milestone
Site 1, Site 3, Site 20-Continue meetings for LTM/O&M subgroup to optimize the system and reduce O&M costs as well as accelerating remediation.	FY2006 and FY2007
Site 3-AOC 1- Evaluate the effectiveness of accelerated remediation at AOC 1, and determine the next step for the area based on the Close-Out Strategy.	3rd Quarter FY2006
Site 3-AOC 2- Evaluate the effectiveness of accelerated remediation at AOC 2, and determine the next step for the area based on the Close-Out Strategy.	4th Quarter FY2006
Site 1, Site 3, Site 20- Complete annual LTM report for Camp Allen Landfill, Q Area, and LP-20.	1st Quarter FY2006 and 1st Quarter FY2007
Site 2 – Complete LTM groundwater sampling	3rd Quarter FY2007
Site 2- Complete sediment sampling	3rd Quarter FY2007
Site 6- Submit 5th year post-closure monitoring reports for CD Landfill.	2nd Quarter FY2006 & FY2007
Site 18- Complete Draft Final Supplemental ESI Report.	2nd Quarter FY2006
Site 23 – Complete Final EE/CA.	1st Quarter FY2006
SWMU 14- Complete Draft Step 4 Work Plan.	4th Quarter FY2006
Bousch Creek- Complete Final Step 7 Ecological Risk Assessment Report for the Upper Reaches	2nd Quarter FY2006
Final Long-Term Monitoring Plans.	2nd Quarter FY2006
Update Site Management Plan in accordance with FFA.	1st Quarter FY2006 and FY FY2007

TABLE 5-2
Document Preparation Durations
Naval Station Norfolk

Document	Duration (Months) [1]
AOC Close-Out Document	1
SSP Work Plan	1
SSP Report	1-2
Preliminary Assessment/Site Inspection	2
Engineering Evaluation/Cost Analysis	1-2
RI/FS Work Plans	2
Remedial Investigation Report	3-4
Supplemental Investigation Work Plans	2
Supplemental Investigation Report	3-4
Feasibility Study	3-4
Proposed Plan	2
Record of Decision	2
Preliminary/Conceptual Remedial Design	2
Pre-Final Remedial Design	2
Final Design	1-2
Treatability Study Work Plan	2
Treatability Study Report	1-2
Removal Action Work Plan	2
Removal Action Completion Report	1-2

[1] Durations represent estimated time required to complete Draft Documents.

FIGURE 5-1
Project-Specific Schedules
FY 2006 and FY 2007
Naval Station Norfolk

Site Description	Oct 05	Nov 05	Dec 05	Jan 06	Feb 06	Mar 06	Apr 06	May 06	Jun 06	Jul 06	Aug 06	Sep 06
Site 1- Camp Allen Landfill	Draft LTM Plan	Draft 2005 Annual Long-Term Monitoring Report Draft LTM Plan Review	Draft LTM Report Review/ Draft LTM Plan Review	Draft LTM Report Review/ Final LTM Plan	Final 2005 Annual Long-Term Monitoring Report	LTM Groundwater Sampling, Water Level Measurements	Laboratory Analysis	Data Validation				Water Level Measurements
Site 2- NM Slag Pile												
Site 3- Q Area Drum Storage Yard	Data Validation/ Draft LTM Plan	Draft 2005 Annual Long-Term Monitoring Report Draft LTM Plan Review	Draft LTM Report Review/ Draft LTM Plan Review	Draft LTM Report Review/ Final LTM Plan	Final 2005 Annual Long-Term Monitoring Report/ LTM Groundwater Sampling	Laboratory Analysis	Data Validation				LTM Groundwater Sampling	Laboratory Analysis
Site 6- CD Landfill	Draft LTM Plan	LTM Groundwater Sampling/ Draft LTM Plan Review	Laboratory Analysis/ Draft LTM Plan Review	Data Validation/ Final LTM Plan	02/28-2005 Annual Post-Closure Report				LTM Groundwater Sampling	Laboratory Analysis	Data Validation	
Site 18	Conduct Additional Groundwater Investigation	Laboratory Analysis	Data Validation		Draft Final Supplemental ESI Report	Draft Final Supplemental ESI Report review	Draft Final Supplemental ESI Report review		Final Supplemental ESI Report			
Site 20- LP 20 Site Long Term Monitoring	Draft LTM Plan	Draft 2005 Annual Long-Term Monitoring Report Draft LTM Plan Review	Draft LTM Report Review/ Draft LTM Plan Review	Draft LTM Report Review/ Final LTM Plan	Final 2005 Annual Long-Term Monitoring Report/ LTM Groundwater Sampling	Laboratory Analysis	Data Validation					
Site 22- Camp Allen Salvage Yard												
Site 23 - LP-20 Plating Shop	Final ESI Report/ Draft EE/CA Report	Draft EE/CA review	Draft EE/CA review	Draft Final EE/CA	Draft EE/CA review	Draft EE/CA review	Final EE/CA					
SWMU 12 Disposal Area near NM 37 and SWMU 16 Accumulation near NM-37	ROD Signature											
SWMU 14 Q-50 Accumulation Area	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project	Shoreline Restoration Project		Draft Step 4 ERA Work Plan	Draft Work Plan review
Bousch Creek - Upper Reaches	Draft Step 7 ERA review	Draft Step 7 ERA review	Draft Final Step 7 ERA Report	Draft Final Step 7 ERA review	Draft Final Step 7 ERA review	Final Step 7 ERA Report						
Bousch Creek - Lower Reaches			Evaluation of Sources									
Basewide	Draft FY 2006 SMP review	Draft FY 2006 SMP review	Final FY 2006 SMP									Draft FY 2007 SMP
	Black- Field Work	BLUE- Navy/Regulatory Review		RED- Deliverable	GREEN- Work in progress							

FIGURE 5-1
Project-Specific Schedules
FY 2006 and FY 2007
Naval Station Norfolk

Site Description	Oct 06	Nov 06	Dec 06	Jan 07	Feb 07	Mar 07	Apr 07	May 07	Jun 07	Jul 07	Aug 06	Sep 07
Site 1- Camp Allen Landfill		Draft 2006 Annual Long-Term Monitoring Report	Draft LTM Report Review	Draft LTM Report Review	Final 2006 Annual Long-Term Monitoring Report	LTM Groundwater Sampling, Water Level Measurements	Laboratory Analysis	Data Validation				Water Level Measurements
Site 2- NM Slag Pile									Sediment Sampling			
Site 3- Q Area Drum Storage Yard	Data Validation	Draft 2006 Annual Long-Term Monitoring Report	Draft LTM Report Review	Draft LTM Report Review	Final 2006 Annual Long-Term Monitoring Report/ LTM Groundwater Sampling	Laboratory Analysis	Data Validation				LTM Groundwater Sampling	Laboratory Analysis
Site 6- CD Landfill		LTM Groundwater Sampling	Laboratory Analysis	Data Validation	02/28-2005 Annual Post-Closure Report				LTM Groundwater Sampling	Laboratory Analysis	Data Validation	
Site 18												
Site 20- LP 20 Site Long Term Monitoring		Draft 2006 Annual Long-Term Monitoring Report	Draft LTM Report Review	Draft LTM Report Review	Final 2006 Annual Long-Term Monitoring Report/ LTM Groundwater Sampling	Laboratory Analysis	Data Validation					
Site 22- Camp Allen Salvage Yard												
Site 23 - LP-20 Plating Shop												
SWMU 12 Disposal Area near NM 37 and SWMU 16 Accumulation near NM-37												
SWMU 14 Q-50 Accumulation Area	Draft Work Plan review	Draft Final Step 4 ERA Work Plan	Draft Work Plan review	Draft Work Plan review	Final Step 4 ERA Work Plan		Step 4 ERA sampling	Laboratory Analysis	Data Validation		Draft Step 4 ERA Report	Draft Step 4 ERA review
Bousch Creek - Upper Reaches												
Bousch Creek - Lower Reaches												
Basewide	Draft FY 2007 SMP review	Draft FY 2007 SMP review	Final FY 2007 SMP									Draft FY 2007 SMP
	Black- Field Work	BLUE- Navy/Regulatory Review		RED- Deliverable	GREEN- Work in progress							

FIGURE 5-2
Project Projected Schedules
FY 2008 through FY 2011
Naval Station Norfolk

Site Description	FY 2008				FY 2009				FY 2010				FY 2011			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Site 1- Camp Allen Landfill		LTM sampling		2008 LTM Report		LTM sampling		2009 LTM Report		LTM sampling		2010 LTM Report		LTM sampling		2010 LTM Report
Site 2- NM Slag Pile							LTM groundwater sampling									
Site 3- Q Area Drum Storage Yard		LTM sampling		2008 LTM Report/ LTM sampling		LTM sampling		2009 LTM Report/ LTM sampling		LTM sampling		2010 LTM Report/ LTM sampling		LTM sampling		2010 LTM Report/ LTM sampling
Site 6- CD Landfill	LTM sampling	2007 Post-Closure Report	LTM sampling		LTM sampling	2008 Post-Closure Report	LTM sampling		LTM Sampling	2005 Post-Closure Report	LTM sampling		LTM Sampling	2005 Post-Closure Report	LTM sampling	
Site 18																
Site 20- LP 20 Site Long Term Monitoring		LTM sampling		2008 LTM Report		LTM sampling		2009 LTM Report		LTM sampling		2010 LTM Report		LTM sampling		2011 LTM Report
Site 22- Camp Allen Salvage Yard																
Site 23 - LP-20 Plating Shop																
SWMU 12 Disposal Area near NM 37 and SWMU 16 Accumulation near NM-37																
SWMU 14 Q-50 Accumulation Area	Draft Final Step 7 ERA Report	Final Step 7 ERA Report		Draft FS	Draft Final FS	Final FS		Remedial Action								
Bousch Creek-Upper Reaches																
Bousch Creek-Lower Reaches																
Basewide	FY 2008 SMP				FY 2009 SMP				FY 2010 SMP				FY 2011 SMP			
Five-Year Review			Draft Five-Year Review Report	Final Five-Year Review Report												

SECTION 6

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Solid Waste Interpretive Guidance Statement (SWIGS) - Management of Dredged Material

Solid Waste Interpretive Guidance Statement (SWIGS)

MANAGEMENT OF DREDGED MATERIAL

The purpose of this guidance document is to clarify the waste management standards governing characterization and disposal of dredged material and to clarify the role and responsibilities of the waste program in regards to management of dredged material.

For the purposes of this guidance, A**dredged materials**≅ are bottom sediments, vegetation, or other materials that have been dredged or excavated from the waters of the Commonwealth of Virginia. Dredged materials consist primarily of natural bottom sediments (i.e., silt, sand, gravel, rock) and natural bottom vegetation. Dredged materials can consist of solid waste and other materials which may may be found commingled with the natural bottom sediments and vegetation. Dredged material may be contaminated by municipal, commercial, or industrial wastes or by runoff from terrestrial sources.

For the purposes of this guidance, dredged natural bottom sediment and bottom vegetation that is **not contaminated with waste constituents** is considered **soil** and is therefore conditionally exempt from the requirements for management as a solid waste (see VSWMR ∋2.4.D.5).

For the purposes of this guidance, A**other bottom material**≅ are items, such as brush, stumps, debris, pilings, etc., that may normally be found at the bottom of a surface water body but have not been discarded or otherwise placed there in a manner which constitutes disposal.

For the purposes of this guidance, A**contaminated sediment**≅ refers to natural bottom sediments and natural bottom vegetation that are contaminated, above normal background levels, with waste constituents. Contaminated sediment does not include industrial wastewater discharges regulated under CWA ∋ 402.

The management of dredged material is currently regulated by the United States Army Corps of Engineers, the Virginia Marine Resources Commission, and the State Water Control Board (i.e. DEQ Water Division). In many cases, when dredged material is properly managed in accordance with the standards of those other agencies or boards, regulation of the dredged material under the Virginia Waste Management Act (AVWMA≅) imposes unnecessary and duplicative regulatory burdens upon persons engaged in dredging activities.

Dredged material is not excluded from regulation as a solid waste, however the Virginia Waste Management Board is authorized by Va. Code ∋10.1-1402(9) to:

> *Consult and coordinate with the heads of appropriate state and federal agencies, independent regulatory agencies and other governmental instrumentalities for the purpose of achieving maximum effectiveness and enforcement of this chapter while imposing the least burden of duplicative requirements on those persons subject to the provisions of this chapter*.

To determine when management of bottom sediments and other bottom material contaminated with waste constituents is appropriate and not duplicative under the VWMA, it is important to know the source of the contamination. The major question to answer is whether the contamination resulted from non-point source discharges or unknown releases, or from point source discharges subject to regulation under the Clean Water Act (ACWA≅), as amended.

Solid Waste Interpretive Guidance Statement (SWIGS)

Note: Disposal of any dredged material into state waters (i.e., Aoverboard disposal≅) including wetlands, can be considered a point source discharge of wastewater subject to regulation under CWA ээ 401, 402, and 404 and is therefore considered to be excluded from definition as a solid waste (see 40 CFR 261.4 (a) (2)). This activity should be allowed without involvement from the Waste Division provided the disposal is properly done in accordance with the standards of those sections of the Clean Water Act.

40 CFR 261.4 (a) (2) (Identification and Listing of Hazardous Waste), specifically exempts industrial wastewater discharges (AIWD≅) that are point source discharges subject to regulation under CWA э 402. These IWDs are excluded from definition as a solid waste. This authority, under CWA э 402, pertains to the addition of any pollutants to waters of the United States from any discernible, confined, and discrete conveyance, except discharges of dredged and fill material regulated under CWA э 401 and CWA э 404. The intent of the industrial wastewater exclusion is to avoid potentially duplicative regulation, under RCRA and the CWA, of point source discharges. Thus, once wastewater flows from an NPDES discharge point into waters of the United States, that wastewater is exempt from RCRA regulation. This is true even if the discharge could be regulated under CWA э 402, but is not. A point source discharge of wastewater without an NPDES permit would be a violation of the CWA, and could be subject to enforcement action under the CWA.

Conversely, if there is evidence to demonstrate that solid waste or hazardous wastes have been released into surface water in a manner that does not trigger CWA э 402 (i.e., illegal dumping, a spill, or other non-point source discharge), this constitutes disposal under RCRA and would be subject to the appropriate regulatory controls under the VWMA. For example, bottom sediment or other bottom material which are contaminated by a listed hazardous waste that was Adumped≅into the water is considered a listed hazardous waste and would be subject to regulation under the Virginia Hazardous Waste Management Regulations (VR 672-10-1) ("VHWMR"). And for example, rail road ties, brush, and wood debris that were discarded by being bulldozed into the water would be considered a solid waste subject to regulation under the Virginia Solid Waste Management Regulations (VR 672-20-10) (AVSWMR≅).

Contaminated sediment and other bottom material that are determined **not** to be a **listed hazardous waste** subject to regulation under the VHWMR, as describe in the paragraph above, (such as bottom sediment or other bottom material that are contaminated with hazardous waste constituents from unknown sources, etc.), are not considered wastes as long as the contaminated sediment or other bottom material is not actively managed or removed from the water.

When contaminated sediments or other bottom material are actively managed and removed through dredging, the removed bottom sediments, bottom vegetation, or other bottom material, (i.e., Acontaminated dredged material≅), may meet the definition of a solid waste, as set forth in Va. Code э 10.1-1400 and in VSWMR Part III, by either being discarded or by being applied to the land in a manner constituting disposal. The dredged material may also be considered a hazardous waste under Part III of the VHWMR by possessing a hazardous waste characteristic (see VHWMR ээ 3.6 - 3.9).

Contaminated dredged material that is considered a solid waste, is subject to the hazardous waste determination requirements of the VHWMR. Under VHWMR э 6.1, a person who generates a solid waste shall determine if that waste is a hazardous waste using the prescribed methods (see VHWMR э 6.1). The determination may be made by either testing the waste according to accepted testing methods, or by applying knowledge of the hazard characteristics of the waste in light of the materials or the processes used.

Testing of the material, for hazardous waste determination purposes, may be done either *in situ* or after removal. However, until it has been determined that the dredged material is **not** a hazardous waste, it is recommended that the generator manage the contaminated dredged material in accordance with the requirements of VHWMR э6.4.E. In particular, in order to avoid the unintentional creation of an unpermitted hazardous waste management unit, until characterized the contaminated dredged material should be managed in tanks and/or containers, and should not be placed in waste piles, in surface impoundments, or onto the land.

Since dredged material is currently regulated by the United States Army Corps of Engineers, the Virginia Marine Resources Commission, and the State Water Control Board, **the Waste Division will allow non-hazardous waste, contaminated dredged sediment to be disposed on-land in locations other than a permitted solid waste management facility (SWMF)**, provided the contaminated dredged sediment is properly managed in accordance with the regulatory programs of those agencies or boards, and

provided further that no open dump, hazard, or public nuisance is created (see Va. Code §§ 10.1-1402(21), -1408.1.G.-H). Additionally, **prior to on-land disposal, the contaminated dredged sediment shall be evaluated for any potential risks which may be associated with its disposal at the proposed location. If the contaminated dredged sediment contains constituents not normally found in the environment (i.e. PCBs, creosote, TPH, etc.) and health risk standards are available for those constituents, then, to evaluate the potential risks, a formal risk assessment should be performed (i.e., evaluation by REAMS model), or the values for the waste contaminants in the sediment can be compared to accepted health based standards. Contaminated dredged sediment can be disposed on-land in locations other than a permitted SWMF depending on the degree of risk associated with its disposal and provided the sediment does not require special handling for disposal.**

Contaminated dredged material other than natural bottom sediment and vegetation (i.e., wood pilings, metal, garbage, debris) and contaminated dredged sediment that requires special handling or poses unacceptable risks for uncontrolled on-land disposal, shall be disposed only in a permitted solid waste management facility, or otherwise recycled, reused, or managed in accordance with the VSWMR.

It is recommended that the Waste and Water staff within the regional offices establish waste constituent levels that would be appropriate for allowing land disposal of non-hazardous waste contaminated dredged material in locations other than permitted SWMFs. When contaminated dredged material is considered for approval for Aupland disposal≅ by the regional office Awater≅ staff (i.e., before approval or a permit which allows this activity is actually given), information regarding the waste constituents and the proposed on-land disposal sites should be forwarded to the regional office Awaste≅ staff for evaluation and feedback. If the conditions for disposal of the dredged material in on-land locations other than a permitted SWMF, as outlined in this guidance, are met, the waste staff should acknowledge that Aon-land≅disposal of the material at the proposed location would not pose an unacceptable risk or otherwise be considered a solid waste subject to regulation under the VWMA in accordance with this guidance.

Note: The intent here is to eliminate duplicative submittal of information by the permittee. By having all waste and water concerns addressed initially during the permitting process under Water Program, persons engaged in dredging operations will not have to get separate approval from the Waste Program for on-land disposal of the waste.