

7/1/93-01345

**FINAL**

**ROUND ONE RI DRUM SAMPLING  
STRATEGY REPORT  
FOR SITES 1-9, 11, 12, 16-19 AND 21  
NAVAL WEAPONS STATION,  
YORKTOWN, VIRGINIA**

**CONTRACT NO. N62470-89-D-4814**

Prepared for:

Atlantic Division  
Naval Facilities Engineering Command  
Norfolk, Virginia

July 1993

Prepared by:

Baker Environmental, Inc.  
Coraopolis, Pennsylvania

Roy F. Weston, Inc.  
West Chester, Pennsylvania

W.O. No.: 06629-001-012-9999-00

## TABLE OF CONTENTS

<b><u>Section</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
<b>1.0</b>	<b>INTRODUCTION</b>	<b>1</b>
<b>2.0</b>	<b>DRUM INVENTORY DATA</b>	<b>1</b>
<b>3.0</b>	<b>SAMPLING RATIONALE</b>	<b>5</b>
	3.1 Drill Cuttings	5
	3.2 Monitoring Well Purge Water	6
	3.3 Sampling Equipment Decontamination Water	7
	3.4 Sampling Debris	7
<b>4.0</b>	<b>SAMPLING METHODS</b>	<b>8</b>
	4.1 Purge Water	8
	4.2 Drill Cuttings	8
	4.3 Decontamination Water	9
	4.4 QA/QC Samples	9
<b>5.0</b>	<b>SCHEDULE</b>	<b>12</b>
<b>6.0</b>	<b>HEALTH AND SAFETY</b>	<b>12</b>
<b>7.0</b>	<b>SAMPLE PACKAGING SHIPMENT OR TRANSPORT</b>	<b>14</b>

## LIST OF TABLES

<b><u>Section</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
2-1	Round One Remedial Investigation Sites	2
2-2	Round One RI Drum Inventory Data	4
4-1	Analytical Methods and Total Number of Samples	10
4-2	Summary of Sample Container Specifications, Preservatives, and Holding Times	11

## LIST OF FIGURES

<b><u>Figure No.</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
2-1	Location of Sites for Remedial Investigation at WPNSTA Yorktown	3
5-1	Drum Sampling Schedule WPNSTA Yorktown	13

## **1.0 INTRODUCTION**

A Round One Remedial Investigation (RI) was performed from April to October 1992 at the Naval Weapons Station, Yorktown, Virginia (WPNSTA Yorktown). This investigation was conducted by Roy F. Weston, Inc. (WESTON\*) under subcontract to Baker Environmental, Inc. (Baker) as part of the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program. The investigation included the installation of groundwater monitoring wells and the collection of environmental media samples. As a consequence of these field activities, four types of waste streams were generated:

- Drill cuttings from soil borings.
- Monitoring well purge water.
- Sampling equipment decontamination water.
- Sampling debris (discarded gloves, Tyvek® coveralls, etc.).

As they were generated, all of these wastes were placed in 55-gallon drums; these drums have not yet been removed from WPNSTA Yorktown. The purpose of this report is to develop a sampling strategy for this material, such that it can be technically characterized and managed in a cost effective manner. This report discusses the rationale for sampling and analysis of the drums, the sampling methods employed, and the quality assurance/quality control (QA/QC) procedures that will be followed.

## **2.0 DRUM INVENTORY DATA**

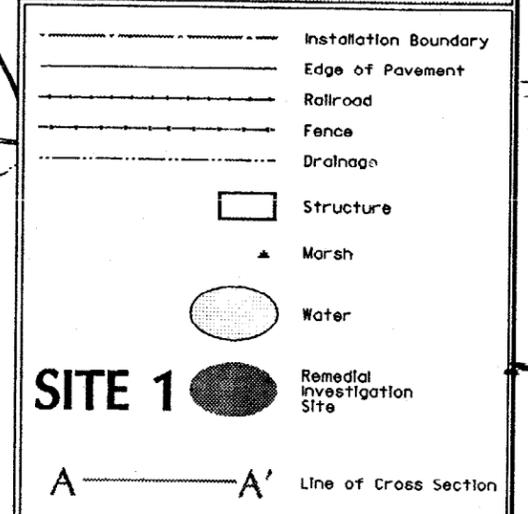
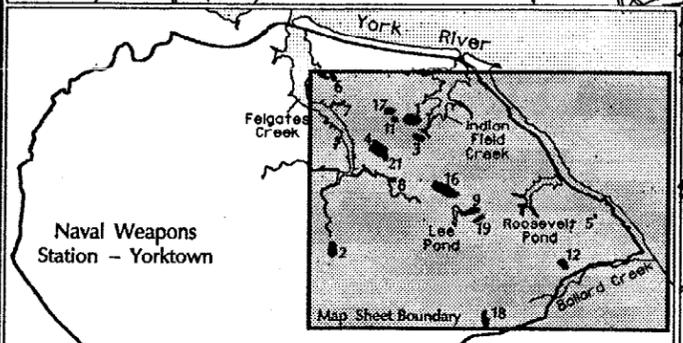
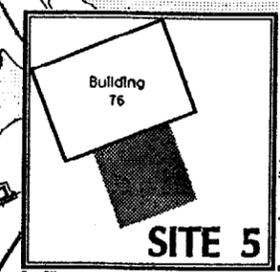
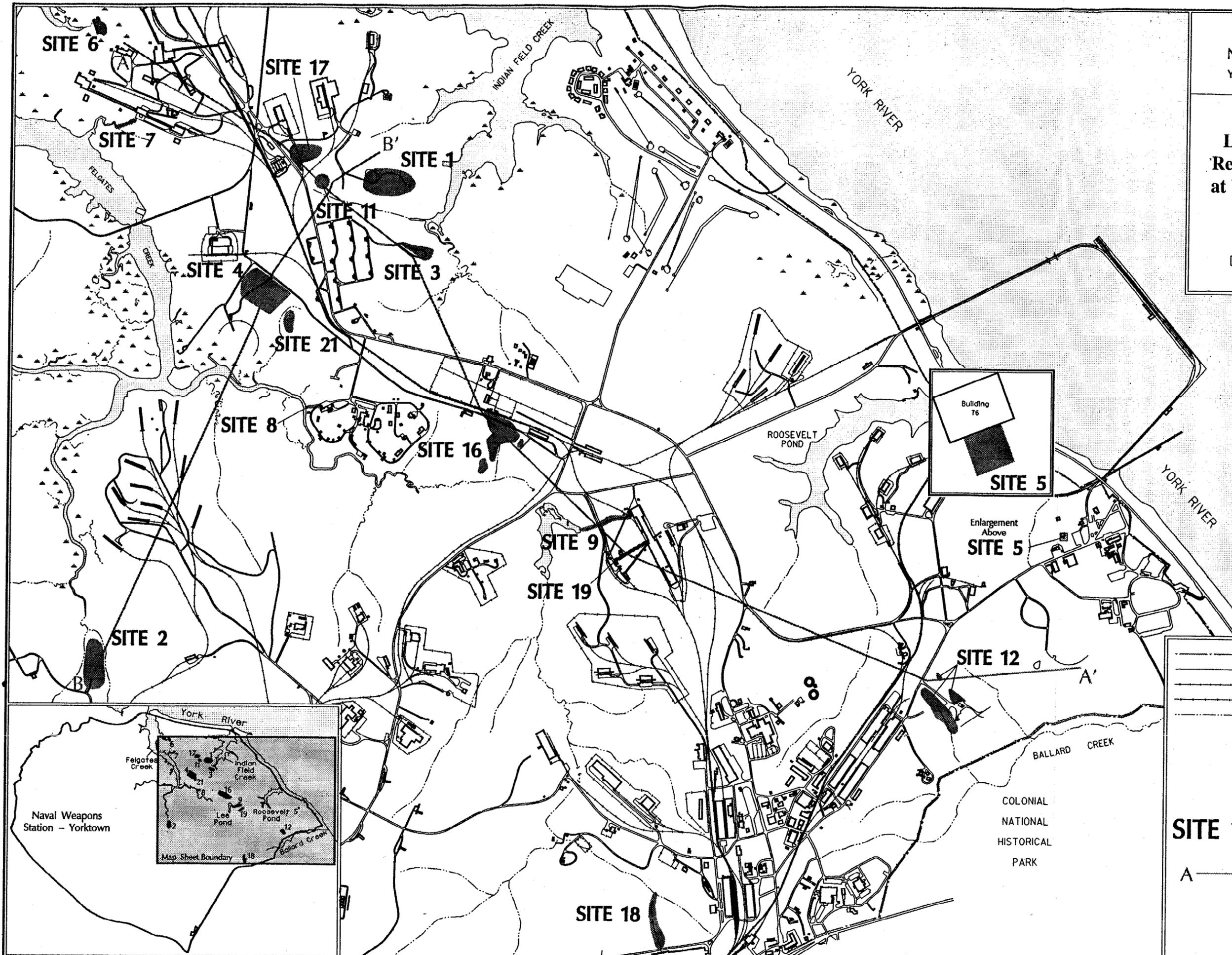
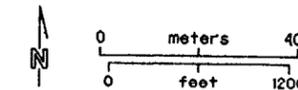
Table 2-1 lists the 16 sites involved in the Round One RI; the locations of these sites are shown on Figure 2-1. Table 2-2 contains the drum inventory data for the 14 sites where drums are located, which includes the decontamination area and background sites. Ninety-six drums consisting of soil drill cuttings are located at 12 sites. There are 60 drums with aqueous material at 11 sites. Site 16 contains 34 drums of water and 15 drums of sampling debris collected during the field program. The 34 drums of water at Site 16 contain purge water from all wells sampled at Sites 4 and 16, as well as decontamination water resulting from sampling activities at all sites. As shown in the table, no drums are present at Sites 7 and 18. The wastes quantities produced at these two sites were less than at the other

**Table 2-1**

**Round One Remedial Investigation Sites**

<b>SITE</b>	<b>LOCATION</b>
Site 1	Dudley Road Landfill
Site 2	Turkey Road Landfill
Site 3	Group 16 Magazine Landfill
Site 4	Burning Pad Residue Landfill
Site 5	Surplus Transformer Storage Area
Site 6	Explosives-Contaminated Wastewater Impoundment
Site 7	Plant 3 Explosives-Contaminated Wastewater Discharge Area
Site 8	Naval Explosives Development Engineering Department (NEDED) Explosives-Contaminated Wastewater Discharge Area
Site 9	Plant 1 Explosives-Contaminated Wastewater Discharge Area
Site 11	Abandoned Explosives Burning Pits
Site 12	Barracks Road Landfill
Site 16	West Road Landfill
Site 17	Holm Road Landfill
Site 18	Building 476 Discharge Area
Site 19	Conveyor Belt Soils at Building 10
Site 21	Battery and Drum Disposal Area

**Figure 2-1**  
**Location of Sites for**  
**Remedial Investigation**  
**at WPNSTA Yorktown**



**Table 2-2**

**Round One RI Drum Inventory Data**

Site	Total Drums	Drum Contents		
		Soil	Water	Debris
1	12	8	4	0
2	1	0	1	0
3	13	11	2	0
5	3	3	0	0
6	5	4	1	0
8	1	1	0	0
9	2	2	0	0
11	5	4	1	0
12	20	18	2	0
16*	49	0	34	15
17	6	4	2	0
19	15	12	3	0
21	10	4	6	0
BKG	29	25	4	0
<b>TOTAL</b>	<b>171</b>	<b>96</b>	<b>60</b>	<b>15</b>

\* Site 16 contains the decontamination water drums generated for all sites, purge water generated from monitoring wells at Sites 4 and 16, and all disposed personnel protective equipment materials used during the entire field program.

sites because no monitoring wells were installed. The wastes produced at these two sites were combined with the drummed wastes at the other sites.

### **3.0 SAMPLING RATIONALE**

Sampling requirements for the four types of waste noted above are described in the following subsections. To determine the need for analytical testing, the data from the Round One RI program was used in assessing the hazard potential of the drill cuttings and the monitoring well purge water. Groundwater data collected during the Round One RI field activities was compared against regulatory limits. The soil boring results were evaluated to determine the need for additional characterization of the drummed soil cuttings.

#### **3.1 DRILL CUTTINGS**

Drill cuttings were generated both at waste site and background locations. The Round One RI data for the soil boring samples were evaluated to determine which drums, if any, will be required to be sampled. The soil boring cuttings from the background locations are not contaminated based on analytical data from the environmental samples (i.e., results are substantially less than those obtained from contaminated sites), and therefore the drill cuttings will not be managed as a waste. No sampling or testing is required for these background soils and the cuttings may be removed from the drums (25 drums). As with any loose soil, provisions should be taken to prevent erosion of this material after it is removed from the drums.

Because contaminants were detected in the soils collected from waste site locations (Table 2-2), the cuttings from these sites will require testing to determine the appropriate disposal options. To make this determination, the materials will be tested for all hazardous waste characteristics. This includes ignitability, reactivity, corrosivity (IRC), and toxicity (via the Toxicity Characteristic Leachate Procedure [TCLP]).

If the results indicate that the soils are characteristically hazardous, they will be managed as a hazardous waste and labeled for off-site disposal by the government. If they are not considered to be characteristically hazardous, a determination of proper disposal of this material should be based on guidance from the Virginia Department of Environmental Quality.

### **3.2 MONITORING WELL PURGE WATER**

Water was collected from monitoring wells during well development (for newly installed wells) and sample prepurge activities. Based on the results obtained from the Round One RI groundwater sampling program, this water potentially contains low levels of contamination; as such, it cannot be discharged directly to a receiving stream. The purge water itself has not been analyzed; however, samples from all monitoring wells have been assessed and used to characterize the purge water (i.e., maximum groundwater concentrations measured during the field program were compared to TCLP). With the single exception of monitoring well 1GW12, no groundwater samples contained constituent concentrations that exceeded TCLP limits. In the case of 1GW12, it is uncertain whether the containerized water from this well exceeds TCLP limits, for two reasons: 1) standing water in the well (i.e., the water that was purged) would contain significantly lower volatile concentrations than the groundwater; and 2) water was purged by pumping, which would tend to reduce VOC concentrations. To confirm whether the purge water from monitoring well 1GW12 at Site 1 exceeds TCLP limits, it will be analyzed for TCLP VOCs. It is not necessary to analyze for any other constituents because the existing analytical data indicate that the projected maximum concentrations do not exceed regulatory limits.

All of the non-hazardous drummed purge water will be directed to an onsite carbon treatment unit which discharges to a commercial treatment facility that is permitted to receive industrial wastewaters. This will include the purge water from monitoring well 1GW12 at Site 1, if it is confirmed to be non-hazardous. If the purge water from monitoring well 1GW12 at Site 1 is shown to be hazardous, it will be managed as a hazardous waste.

### **3.3 SAMPLING EQUIPMENT DECONTAMINATION WATER**

Decontamination of sampling equipment was conducted at the decontamination area located near Site 16. As equipment was decontaminated, the resulting wash water flowed to a sump. Water from this sump was then pumped into a total of 31 drums. No attempt was made to segregate wash waters corresponding to specific sites into separate drums. None of the water in these drums has been previously characterized.

As shown on Table 2-2, there are a total of 34 drums of water at Site 16. In addition to the 31 drums of decontamination water, there are 3 drums containing purge water from Sites 4 and 16. As noted previously, the purge water does not require further characterization; the existing groundwater analytical data will suffice for this purpose.

Regarding characterization of the decontamination water, it is not proposed to sample all 31 drums. Because this water was pumped into the drums from a sump, the decontamination water from different sites was already mixed prior to its being placed in the drums. Approximately 20 percent of the drums (7 drums) will be sampled in order to determine if the water is a hazardous waste. This number was selected to characterize the entire group of drums (which have a uniform composition) based on sample collection from representative drums. If it is not, it will be managed in the same manner as the purge water (off-site industrial wastewater treatment). If the water contains constituents exceeding the TCLP limits, it will be managed as a hazardous waste.

### **3.4 SAMPLING DEBRIS**

None of the sampling debris is grossly contaminated. It contains only minor quantities of environmental media (e.g., water or soil on gloves). This material (15 drums total) is a solid waste, and will be managed accordingly. It will be transported by the government to a sanitary landfill that is permitted to handle such material; no sampling is required.

## **4.0 SAMPLING METHODS**

The preceding section identified the samples/analyses that will be required for the four waste types. This section will describe the specific sampling procedures and the QA samples that are required.

### **4.1 PURGE WATER**

The purge water from monitoring well 1GW12 located at Site 1 will be sampled and analyzed for TCLP VOCs only. A glass straw or a COLIWASA will be used to collect the sample. The used sampling implement will then be disposed of in one of the drums containing sampling debris.

### **4.2 DRILL CUTTINGS**

The drill cuttings will be analyzed for all RCRA characteristics: TCLP plus IRC. At each of the nine sites at which drums containing soil cuttings are located, a composite sample will be collected to represent all of the drums. The composite will be used for all analyses except VOCs. This composite will be comprised of a grab samples from each drum at the site. A hand auger will be used to collect a sample (coring) through the entire depth from each drum. These corings will be placed into a clean stainless steel bowl, and thoroughly mixed with a stainless steel spatula. The composite sample will then be collected from this bowl. The unused portion of the composite will be returned to one of the soil cutting drums.

For the sample that will be analyzed for TCLP VOCs, a field composite will also be collected. However, this sample will not be mixed. Rather, all drums at a given site will be scanned with an organic vapor analyzer (OVA) as the drum lid is opened; results will be documented in the field. The composite sample will be comprised of grab samples (one foot below the surface) from the two drums with the highest OVA readings to conservatively characterize a drum grouping with minimal disturbance of the soils potentially containing VOCs.

The sampling and compositing implements will be decontaminated between sites, using the same procedures as were followed during the Round One RI. All decontamination water and sampling debris will be added to the appropriate drums at Site 16.

#### **4.3 DECONTAMINATION WATER**

The decontamination water will also be analyzed for TCLP and IRC. As discussed in Section 3, grab samples will be collected from a total of seven drums in order to produce a single composite sample (the drums will be chosen at random). This sample will not be used for VOC analysis. The drums will be sampled using either a glass straw or a COLIWASA sampler. The seven grab samples will be placed in a stainless steel bowl and thoroughly mixed. The composite sample will then be collected from this bowl. For the VOC analysis, a separate sample will be collected from each of the seven drums. These seven grab samples will then be shipped as separate samples and composited in the laboratory.

The unused portion of the composite sample will be returned to one of the drums; the sampling device will be placed in one of the drums containing sampling debris.

#### **4.4 QA/QC SAMPLES**

No trip blanks, field blanks, rinse blanks, or duplicate samples will be collected. The purpose of such samples is to identify possible false positive results. However, given the expense of these tests and the purpose of the sampling program (i.e., solely to support waste disposal activities), it is not warranted to collect such QA/QC samples. However, in order to ensure that a false negative result does not occur, matrix spikes will be collected (Reference: 57 FR 55114). A matrix spike will be run for each waste type. The total analytical requirements are summarized in Table 4-1.

The sampling containers and holding times are shown on Table 4-2.

**Table 4-1**

**Analytical Methods and Total Number of Samples**

Parameter	Analytical Method	Purge Water Samples	Decon Water Samples	Soil Samples	Matrix Spike	Total Analyses
TCLP Volatiles	SW1311/8240	1	1	9	3	14
TCLP Semi-Volatiles	SW1311/8270	---	1	9	2	12
TCLP Pesticides	SW1311/8080	---	1	9	2	12
TCLP Herbicides	SW1311/8150	---	1	9	2	12
TCLP* Metals	SW1311/6010	---	1	9	2	12
Ignitability	SW846-1010	1	1	9	---	11
pH**	SW846-9040/9045	1	1	9	---	11
Reactivity	SW846-Chapter 7	1	1	9	---	11

\* SW 1311/7470 for mercury.

\*\* Analysis required for samples with liquid present.

**Table 4-2**

**Summary of Sample Container Specifications,  
Preservatives and Holding Times**

<b>FOR SOLIDS</b>				
<b>ANALYTE</b>	<b>CONTAINER</b>	<b>VOLUME</b>	<b>PRESERVATIVE</b>	<b>HOLDING TIMES</b>
TCLP Volatiles	Glass	8 oz	Cool, 4°C	14 Days
TCLP Semi-Volatiles TCLP Pesticides TCLP Herbicides	Glass	8 oz	Cool, 4°C	Seven days until extraction, 40 days after extraction
TCLP Metals	Plastic or Glass	8 oz	Cool, 4°C	180 days (except Hg which is 28 days)
Ignitability/pH/Reactivity	Amber Glass	4 oz	Cool, 4°C	NA

<b>FOR LIQUIDS</b>				
<b>ANALYTE</b>	<b>CONTAINER</b>	<b>VOLUME</b>	<b>PRESERVATIVE</b>	<b>HOLDING TIMES</b>
TCLP Volatiles	Septum Vial	40 ml (In Duplicate)	Cool, 4°C HCl to pH <2*	14 Days
TCLP Semi-Volatiles TCLP Pesticides TCLP Herbicides	Glass	1 liter	Cool, 4°C	Seven days until extraction, 40 days after extraction
TCLP Metals	Plastic	1 liter	Cool, 4°C pH <2 with 6N HNO <sub>3</sub> *	180 days (except Hg which is 28 days)
Ignitability/pH/Reactivity	Amber Glass	1 liter	Cool, 4°C	NA

Note: \*Preservative will be placed in bottle prior to leaving the lab.

All pertinent information will be recorded by field personnel in a field logbook. This will include the drums that make up each sample. Samples will be labeled with the following information: sample identification number, preservative, holding time, date/time collected, analysis required, and initials of person collecting the sample. Upon completion of sampling, a Chain-of-Custody Record will be completed and will remain with the samples when they are shipped to the laboratory. The drums will also be labeled with the sample date and corresponding sample ID.

The sample identification number will consist of the site number followed by the sample matrix, a hyphen, and then the sample number, where the sample matrix is identified as:

- "SS" for soil samples.
- "DW" for decontamination water.
- "PW" for purge water.

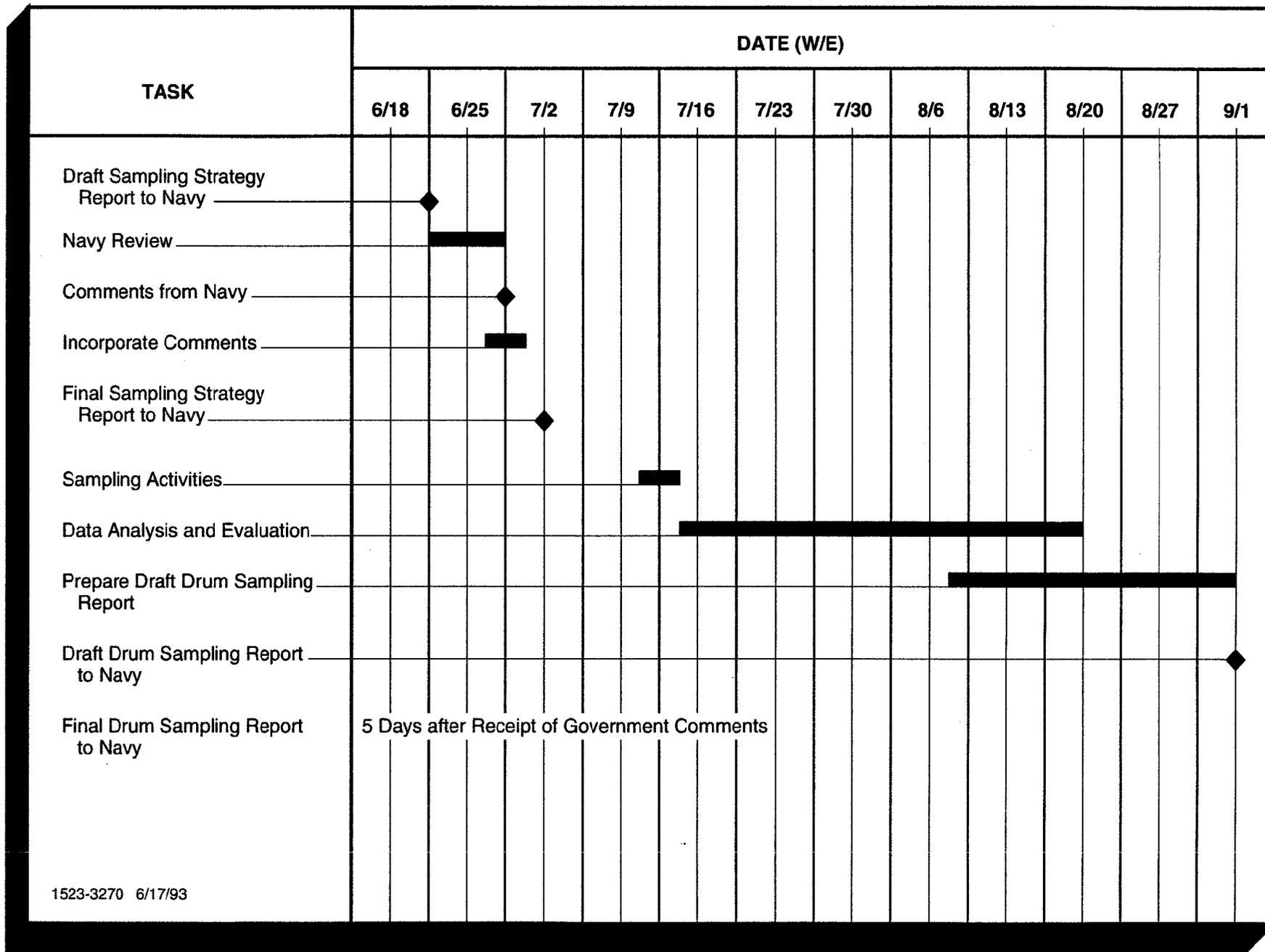
For example, at Site 11 the composite, regular soil sample would be labeled as 11SS-01 using the previously identified method.

## **5.0 SCHEDULE**

Figure 5-1 provides the schedule for the activities comprising the drum sampling program. These tasks include the field sampling effort, the data analysis and evaluation, and the preparation and submittal of the drum sampling report.

## **6.0 HEALTH AND SAFETY**

Personnel who will be performing the drum sampling are required to follow the existing Health and Safety Plan which was prepared for the RI. The use of protective clothing (Tyvek® suits, rubber gloves) and equipment (safety goggles) is required to minimize exposure to possible hazardous material. This sampling debris is not expected to be grossly contaminated, and as such will be managed as a solid waste along with the sampling debris from the RI activities.



1523-3270 6/17/93



FIGURE 5-1 DRUM SAMPLING SCHEDULE  
WPNSTA YORKTOWN

It will be transported by the government to a sanitary landfill that is permitted to handle such material.

## **7.0 SAMPLE PACKAGING SHIPMENT OR TRANSPORT**

Samples collected from drums are considered to be hazardous materials and are to be packaged and transported according to WESTON Corporate Guidelines.

If the samples are shipped by air to a laboratory, the samples will be packaged in accordance with WESTON Corporate Guidelines and International Air Transport Association (IATA) standards as detailed in the most current edition of IATA Dangerous Goods Regulations for hazardous materials shipments.