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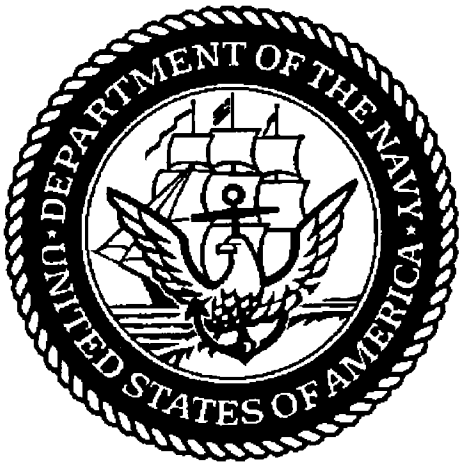
DRAFT SITE MANAGEMENT PLAN INSTALLATION RESTORATION PROGRAM 1995 TO 1996 ABL ROCKET CENTER WV

12/1/1996

NAVFAC MIDLANT

INSTALLATION RESTORATION PROGRAM
DRAFT SITE MANAGEMENT PLAN
1995-1996



ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Commander, Atlantic Division
Naval Facilities Engineering Command
Environmental Quality Division
Norfolk, Virginia

Commander
Naval Sea Systems Command
Naval Industrial Reserve Ordnance Plant
Rocket Center, West Virginia

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To Be Updated

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1.0 INTRODUCTION

This document represents the initial Site Management Plan (SMP) for Allegany Ballistics Laboratory (ABL), Mineral County, West Virginia. As part of the anticipated Federal Facilities Agreement (FFA), the SMP will be used as the management tool for planning, reviewing, and setting priorities for all remedial response activities to be conducted at the facility. The SMP will be updated annually to revise priorities of activities as additional information becomes available. This version of the SMP presents the rationale for the sequence of future investigations and remediations activities to be completed and the estimated schedule for completion of these activities, with detailed schedules and deadlines presented for Fiscal Years (FY) 1994 and 1995, as required by the FFA. The use of a SMP allows for annual adjustment in scheduled activities for reasons such as Federal budgetary constraints, changes in scope of investigation/remediation activities or other unanticipated events without the need to modify the FFA itself.

1.1 Facility Description

ABL is a 1,628 acre facility located in Mineral County, at Rocket Center, West Virginia. ABL consists of two separate facilities: Plant 1 (1,572 acres), owned by the Navy and operated by Hercules Aerospace Company of Hercules, Incorporated and Plant 2 (56 acres) owned and operated Hercules. The developed operations area of Plant 1 lies on approximately 400 acres in the northern portion of the facility within the nearly level floodplain of the North Branch Potomac River. The remaining undeveloped area consists of rugged, forested terrain. The 56-acre Hercules facility is adjacent to Plant 1. ABL is bounded on the north and west by the North Branch Potomac River, and east and south by mountainous terrain.

The land adjacent to ABL is primarily cropland and woodland. The land to the west of ABL, on the Maryland side of the North Branch Potomac River is cropland. Across the river, north of the facility, a small residential community and woodland exists. Northeast of the facility, the land is used for growing crops. To the east and south of the facility, the mountainous and wooded land serves as woodland or cropland.

The United States Department of the Navy acquired ownership and Hercules assumed management of the ABL facility in 1945. The facility has been used primarily for research, development, testing, and production of solid propellant rocket motors for the Department of Defense and the National Aeronautics and Space Administration.

1.2 Environmental Status and Previous Investigations

An Initial Assessment Study (IAS) at ABL was completed in January 1983. The IAS identified a total of 9 potentially contaminated sites (Sites 01-09). The study concluded three of the sites (Sites 06, 08, and 09) did not pose a threat to human health or the environment. The remaining six sites were recommended for further investigations.

In June 1984, three rounds of sampling and analysis were conducted at Sites 01-07. The Confirmation Study report, completed in 1986, recommended further study at Sites 01-07 and at a new site, contaminated groundwater in Potable Wells A and C (Site PWA or Site 10) which was identified during the study. The Confirmation Study was expanded into an Interim Remedial Investigation (IRI). The IRI Report, completed in October 1989, addressed Sites 01-07 and 10. The report recommended no further investigation at Site 04A and 06 because insignificant levels of contaminants were found at the sites, therefore these sites posed no threat to human health or environment. The report recommended further investigation at Sites 01-03, 04B, 05, 07, and 10. These sites proceeded into Remedial Investigation/Feasibility Study (RI/FS).

A Draft RI Report was completed in October 1992 for Sites 1, 2, 3, 5, 7 and 10. The Draft RI concluded that Volatile Organic Compounds (VOCs), particularly TCE, were the most widespread contaminants at the facility, and were detected in all media (soils, groundwater, surface water, and sediment) at Site 1. (Low levels ~~of~~ contamination were detected in the soils and groundwater at Sites 2 and 3. VOCs, primarily TCE, were detected in the soils and groundwater at Site 10. The RI also ~~detected~~ VOCs at Site 5 in the groundwater. In an effort to fill in data gaps from the draft RI, ~~and~~ second round of field work was performed at Sites 1,2, 3, 5, and 10 in 1994. The field effort was not completed at the time this document was published. Once the information is available it will be put into a later version of the SMP.

A (RCRA) Facilities Assessment (RFA) was conducted by U.S. EPA Region III as the first phase of the corrective action program to identify Solid Waste Management Units (SWMUs) and other areas of concern (AOCs). A Preliminary Review (PR) was conducted of all relevant EPA Region (III) files, including RCRA, CERCLA, TSCA, Air, and Water files. The PR, along with a Visual Site Investigation (VSI) conducted 2-4 February 1993, ~~were~~ was used to comply a phase II RFA.

In the phase II RFA, EPA identified 49 SWMUs and 12 AOCs. A RCRA Facility Investigation (RFI) and coordination of activities under corrective action authorities with the ongoing Remedial Investigation (RI) were suggested for four SWMUs (54, 55, 56, 57) not previously identified in RI/FS. An additional ten

what about the other 32 SWMUs + 2 AOCs?

SWMUs (16, 21, 23, 24E, 24V, 24FF, 24HH, 26, 27, 39, and 40) were identified as sites recommended for a RCRA Phase II confirmatory sampling. Ten AOCs (A,B,C,E,G,H,I,J,K,L) were also identified as sites suggested for a Phase II confirmatory sampling. Integrity testing was recommended for SWMUs 17,36 and 37 and AOC D.

ABL was proposed for the National Priorities List (NPL) on 23 June 1993 (update number 15) with an HRS score of 50.00 based on the groundwater pathway only. On 31 May 1994 ABL was added to the NPL.

1.3 Report Organization

The remainder of this report is divided into five sections. Section 2 contains a brief description of the sites identified as posing a potential threat to human health or environment. Section 3 contains a summary of the procedures to be followed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process that will be followed at ABL. Section 4 contains the system used to rank the sites utilizing a risk-based, worst-first model. Section 5 contains the schedules for the planned activities at the facility and assumptions made to come up with these schedules. Section 6 contains the references used in preparing this report.

may be a good spot for a table (table 2.2.?)

~~Activity~~

IRS	SWMU	AOC*	CURRENT PHASE OF INVEST.	RFA recommendations	Navy response

* AOC identification takes precedence over SWMU

Fix last. Doc

2.0 SITE DESCRIPTIONS

This section contains a breif descroption of each of the currect Installation Restoration Program (IRP) sites in addition to Solid Waste Management Units (SWMUs), and Areas of Concern (AOCs) identified by U.S. EPA (A.T. Kearny, 1993).

2.1 IRP Site Descriptions

This section describes the history of the disposal practices and summary at each of the IRP sites. The current status of each IR site is identified in Table 2.1

2.1.1 Site 1 Northern Riverside Waste Disposal Area

(change throughout)

Site 1 consists of several disposal sites including a burning ground for ordinance; three former disposal pits for spent solvents and waste acid disposal; a former storage pad for drums containing hazardous waste; a former landfill for incinerator ash; and a burning ground for inert substances. During the Initial Assessment Study (IAS), 2 soil samples were collected from two of the eight burning pads in the ordinance burning ground, 10 soil samples were collected in the vicinity of the drum storage pad, and 45 soil-gas samples were collected in Site 1.

The 10 samples collected at the drum storage pad were analyzed for methylene chloride, methyl ethyl ketone (MEK), and trichloroethylene (TCE) because more than 95 percent of the drums were determined to contain these compounds. Analysis of soil samples indicated that the soil contained these compounds at concentrations near or below the detection limits. However, the detection limit was not disclosed. Two of the 10 soil samples were analyzed for extraction procedure (EP) toxicity and the results were negative.

All soil-gas samples (sites 1, 2, and 3) were collected using 3/4-inch steel probes with microporous tips. Probes were installed to depths ranging from 3 to 5 feet. Boring logs recorded during well installation indicate that a silty clay layer, averaging 15 feet in thickness, exists over the areas where soil-gas surveys were conducted. Because of the low permeability typical of silty clay soil and the shallow depth at which soil-gas samples were collected, the results of soil-gas sampling are likely representative of soil contamination and not of shallow groundwater contamination.

During the Interim RI, 45 soil-gas samples were collected at Site 1 and analyzed for TCE using a gas chromatograph (GC). No soil samples were collected. Analytical results indicate that significantly high concentration of TCE were detected along the northern fence. TCE was not detected in 15 of the 45

Table 2.1: IR Program Site Status

Site #	Site Name	IAS/PA	CS/SI*	RI/FS	RD	RA	Removal Action Interim RA	Long Term Monitoring	Comments
1	Northern Riverside Waste Disposal Area	Jan-83	Oct-89	present					
2	Previous Burning Ground (1942-1949)	Jan-83	Oct-89	present					
3	Previous Burning Ground (1950-1958)	Jan-83	Oct-89	present					
4A	Spent Photographic Developing Solutions Disposal Site	Jan-83	Oct-89(NFA)						
4B	Spent Photographic Developing Solutions Disposal Site	Jan-83	Oct-89(NFA)						
5	Inert Landfill	Jan-83	Oct-89	present					
6	Test Area Surface Water Impoundment	Jan-83	Oct-89(NFA)						
7	Beryllium Landfill	Jan-83	Oct-89	present			present		
8	Explosives Wastewater Sumps/Catch Basins	Jan-83							
9	Former Acid Disposal Pit	Jan-83(NFA)							
10(PWA)	Plant 1 and Production Wells	Jan-83(NFA)	Oct-89	present					

* - Includes Roy F. Weston Interim Remedial Investigations forABL

IAS - Initial Assessment Study
PA - Preliminary Assessment
CS- Confirmation Study
SI - Site Investigation
RI/FS - Remedial Investigation/Feasibility Study
RD - Remedial Design
RA - Remedial Action
NFA - No Further Action

samples. These 15 samples were collected along the southern fence and at the western end of Site 1. TCE detected in the soil-gas samples probably originated from solvents disposed of in the soil and from solvents staged in the drum storage pad.

Nine monitoring wells were installed at Site 1 for investigation of possible groundwater contamination. The well numbers begin with the number 1 indicating Site 1. Wells 1GW6 and 1GW7 were installed in the southern part of the plant, presumably to determine the background quality for the site. However, operational areas of the plant exist between these wells and the site. Therefore, it is unlikely that either of these wells properly represents background conditions for Site 1, as groundwater could have been contaminated by plant operations in the area.

Wells 1GW6 and 1GW7 were analyzed for all constituents and had nondetectable concentrations of contaminants except for methylene chloride, which was estimated at 3 to 7 µg/l, less than the detection limit of 10 µg/l. Well 1GW6 is screened only in the shallow bedrock, and could serve as a background well for Site 1 unless another source of contamination is located between the well and Site 1. Well 1GW7 is screened in both the upper part of the bedrock and the overlying weathered bedrock; therefore it composites groundwater from both units. If contaminants were ever detected in 1GW7, the source of contamination would be difficult to determine. As a result, 1GW7 cannot serve as a proper background well for either aquifer.

The highest levels of contamination and the widest variety of VOC contaminants have been detected in wells 1GW3 and 1GW9, which are located next to one another and screened across the alluvium-bedrock contact and in the bedrock, respectively. In addition, the soil-gas survey indicated that high levels of soil contamination may occur in the vicinity of these wells. Well 1GW3 is considered to cross the contact because, according to the Interim RI report, the surface casing in the well does not reach all the way to bedrock. The Interim RI report states that the groundwater could migrate downward from the alluvium into the bedrock.

Concentrations of TCE on the order of those detected in wells 1GW3 and 1GW9 (i.e., 130,000 µg/l and 110,000 µg/l, respectively) are approximately 10 percent of the solubility of TCE in water. Concentrations this high are often associated with the presence of dense nonaqueous-phase liquids (DNAPLs). DNAPLs could have been introduced into the subsurface during previous dumping of waste solvents into disposal pits at Site 1. Because DNAPLs are denser than groundwater, they flow under the force of gravity rather than in response to gradients of hydraulic head. DNAPLs would migrate into low areas in the top of the bedrock surface and down into fractures in the bedrock, perhaps contributing to the contamination detected in wells 1GW3 and 1GW9.

The concentrations of contaminants tend to decline from high levels found in wells 1GW3 and 1GW9 as the distance from the wells increases. A strict evaluation of the presence of contaminant plumes in the vicinity of Site 1 is hampered because the wells are screened in different units. It is not clear that the solvent-disposal pits have caused the contamination in all of the wells at Site 1; the site may contain other sources of contaminants.

An EM survey was conducted at Site 1 during the Interim RI. The objectives of the EM survey were to determine the real extent of a possible inorganic contaminant plume within the sand and gravel aquifer, and to define the topography of the underlying bedrock surface. The EM survey indicated that the saturated alluvium appears to generally thicken toward the east as the bedrock topographic surface lowers in elevation. The survey provided no evidence of an inorganic plume in the alluvial aquifer. However, an EM survey cannot definitively confirm he presence or absence of an in organic contaminant plume in the groundwater..

2.1.2 Site 2: Previous Burning Ground (1942-1949)

Site 2 consists of an inactive burning ground for ordnance material. The IAS indicates that the quantity of waste disposed of at the site could not be determined because relevant records were lacking. As part of the Interim RI, 21 soil-gas samples were collected in the vicinity of Site 2 and analyzed for TCE using a field GC. No soil samples were collected during the IAS or Interim RI. TCE was detected in 7 of the 21 samples tested; 4 contained TCE in concentrations less than 5 parts per billion (ppb), and the other 3 contained concentrations of 11, 17, and 31 ppb. All of the samples in which TCE was detected are located southwest and hydraulically upgradient of Site 2. No TCE was detected in soil-gas samples from the northern and southern boundary of Site 2.

Six monitoring wells were installed at Site 2 to assess possible groundwater contamination. The well numbers begin with number 2 indicating Site 2. Because the casing in Well 2GW1 reportedly does not reach the top of the bedrock, this well straddles the clay-alluvium contact, most of the water obtained from the well probably comes from the alluvium.

Although the location of Well 2GW3 would be expected to be upgradient of contaminant sources, it had some of the highest levels of VOC contamination at the site. The next highest levels were detected in Wells 2GW1 and 2GW2, both presumably downgradient wells. However, because no accurate water-level data are available for the wells, their designation as upgradient or downgradient cannot be confirmed at this time.

Omitted from the analytical data summary table in the Interim RI report, were values of 1,1,2-trichloro-1,2,2-trifluoroethane and 1,2-dichloro-1,1,2-trifluoroethane from Well 2GW1. These omissions suggest that down gradient contamination at Site 2 was limited to Well 2GW2. Contamination appears to have migrated from Site 2 over a broader front, and may have contaminated bedrock downgradient from the site, because the surface casing in Well 2GW1 does not reach the top of bedrock and its screen straddles the alluvium-bedrock contact.

2.1.3 Site 3: Previous Burning Ground (1950 to 1958)

Site 3 consists of an inactive burning ground for ordnance material. The IAS indicates that operations and activities a Site 3 were similar to those at sites 1 and 2. As with Site 2, quantities of wastes disposed of cannot be determined because pertinent records are lacking. During the Interim RI, 10 soil-gas samples were collected in the vicinity of Site 3. No soil samples were collected during the IAS or Interim RI. TCE was detected in only 3 of the 10 samples and all 3 samples contained less than 5 ppb of TCE.

To assess possible groundwater contamination, four monitoring wells were installed. The well numbers begin with the number 3 indicating Site 3. Wells 3GW2 and 3GW3 effectively monitor the alluvium, whereas Well 3GW4 is a deep bedrock well and the screen in Well 3GW1 straddles the alluvium-bedrock contact.

Although Well 3GW3 is apparently upgradient of the site, it is the nearest to the site, which perhaps explains the higher level of TCE contamination detected in one round of sampling. The omission from an Interim RI summary table of a concentration of TCE of 56 µg/l that was found in one round of sampling in Well 3GW2 suggests that there is no contamination downgradient. However, contamination appears to have migrated downgradient from this site. Other contaminants were below detection limits, except for some explosives detected in Well 3GW3, the well nearest to the site.

2.1.4 Site 5: Inert Landfill

The IAS indicates that Site 5 covers approximately 3 to 5 acres and its maximum height is 20 feet. The landfill is reported to have accepted wastes such as emptied drums previously containing methylene chloride, TCE, and acetone; fluorescent tubes; unknown laboratory and photographic chemicals; fiberglass and other resin-coated fibers; metal and plastic machining wastes; and construction and demolition debris. The landfill began operations in the 1960s. The IAS reports that soil samples were collected at the "toe" of the inert landfill in 1981 and analyzed for EPA-priority pollutants. No

contamination was detected. However, the number of samples and analytical results were not included in the IAS. The Interim RI included no soil or soil-gas sampling.

Three monitoring wells were installed around Site 5 to assess possible groundwater contamination. The well numbers begin with the number 5 indicating Site 5. TCE was detected at levels ranging from 15 µg/l to 18 µg/l; in downgradient Well 5GW2 in all three sampling rounds; at levels ranging from an estimated 3 µg/l to 5 µg/l in downgradient well 5GW3 in two of three sampling rounds; and at a concentration of 10 µg/l in upgradient Well 5GW1 in one of three sampling rounds.

2.1.5 Site 7: Beryllium Landfill

Site 7 is a small (10 feet by 15 feet by 6 feet deep) pit excavated in limestone bedrock. The site is reported to contain a maximum of 2 pounds of beryllium and 100 pounds of overage laboratory equipment. The pit was permitted by the West Virginia Department of Natural Resources (WVDNR) and was inspected by WVDNR in July 1979 and June 1980. Following inspection, the WVDNR ordered the excavation and removal of the material in the pit. However, no excavation has occurred.

The Interim RI involved excavating 3 test pits in Site 7 and collecting 4 soil samples from the walls of the test pits. Soil samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, cyanide, phenols, and EP toxicity. Beryllium was detected in two samples at 1.1 ppb and 2.3 ppb. The results of the EP toxicity were negative except for mercury. Mercury was detected at a maximum concentration of .18 milligrams per liter (mg/l). The maximum concentration for mercury under the toxicity characteristic leaching procedure (TCLP), which replaced EP toxicity standards, is .2 mg/l.

No contamination above EP toxicity regulatory levels were detected in soil collected from within the beryllium landfill. In addition, the landfill was constructed in the limestone bedrock and the floor and walls of the landfill consist of bedrock, not soil. For this reason the soil outside the landfill is probably not contaminated.

No wells were installed at Site 7, therefore no data on groundwater quality are available.

In June, 1994 the contants of this landfill were excavated, characterized, and disposed of off-site in an approved landfill.

2.1.6 Site PWA: Plant 1 and Production Wells

Plant 1 and Production Wells consist of production wells PWA and PWC located at Plant 1. Volatile organic compounds (VOCs) have been detected in both wells. Consequently, the wells are no longer used as a potable water source.

Neither the IAS nor the Interim RI include any soil or soil-gas sampling in the vicinity of Site PWA. In addition, information indicating previous operations or activities contributing to possible soil contamination was not provided. However, VOCs were detected in Wells PWA, PWC, PWA1, and PWA2.

The highest level of VOC contamination in production wells was detected in Well PWA. A lower level was detected in Well PWC, and a still lower level was detected in Well PW2. Samples from Wells PW1 and PW3 exhibited only low levels of methylene chloride. A value of 10 µg/l of tetrachloroethene reportedly detected in Well PW2 during the sampling round in between July and August of 1987 is incorrect; according to the laboratory analytical data reports, the value should have been reported as less than the detection limit of 5 µg/l.

Analytical data were obtained from monitoring wells in the bedrock and the alluvium- PWA1 and PWA2, respectively- near Well PWA during the sampling round in August 1987. The analytical results from the wells- PWA (the production well in the bedrock with an open interval of probably 150 feet), PWA1 (screened at a depth between 63 and 78 feet), and PWA2 (screened at a depth between 20 and 35 feet)- showed a decrease in the concentrationss of 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene, and tetrachloroethene and an increase in the concentration of TCE between wells PWA2, PWA1, and PWA.

Because the depth of the wells increases through this sequence, the analytical results suggest systematic variations in concentrations of the contaminants with depth. The explanation may not be that simple, however, because PWA1 (the bedrock monitoring well) is screened through a part of the open interval of PWA, and the long open interval in PWA composites groundwater over the entire interval, thus preventing any conclusions about the variation in concentrations with depth beyond comparing the results in wells PWA1 and PWA2.

Because 1,1,1-TCA was not detected in Well PWA in September 1980 or March 1986, but appeared abruptly in July 1987, suggests that 1,1,1-TCA is migrating downward from a surface source. TCE also may be derived from a surface source, but one that is older (TCE was detected in Well PWA as early as October 1984) and one whose surface concentration of contaminants has declined significantly.

It is unlikely that Site 1 is contributing to the VOC contamination in wells PWA and PWC. According to the results of the pumping test conducted during the Interim RI, the radius of influence of the wells when they are pumping may not reach Site 1. Therefore, dissolved contaminants beneath Site1 would not be drawn into the wells. If the natural direction of groundwater flow in both the alluvium and the bedrock is toward the north as described in the Interim RI report, then the production wells are hydraulically upgradient from Site 1 and contaminants would not migrate into the wells.

DNAPLs derived from Site 1 could be affecting the groundwater quality at Well PWA. Because DNAPLs move under the influence of gravity instead of prevailing hydraulic gradients, they may have migrated along the top of the bedrock surface and through bedrock fractures and other openings into the vacinity of the production wells. Alternatively, the contamination in the production wells may be coming from another source perhaps near the wells.

Most of the information on groundwater quality beneath Plant 1 comes from the sites discussed previously-sites 1,2,3, and PWA. The highest levels of contamination are typically detected in wells screened in the alluvium or the shallow bedrock. Most of this contamination is due to VOCs and some explosives and metals. Data on groundwater quality from deeper parts of the bedrock are limited because few wells are installed to these depths. All wells that are installed to these depths contain detectable levels of VOCs, especially Well 1GW9. Therefore, it can be concluded that the bedrock has been contaminated to some degree, although current information indicates that contamination levels are relatively low at most locations.

2.2 New IRP Site Descirption

This section lists new sites identified for incorparation into the IR Program. A RCRA Facility Assessment (RFA) performed by U.S. EPA Region III (A.T. Kearny, 1993) identified a number of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). The RFA identified a number of SWMUs and AOCs which were reccommended for further action which were not sites in the IR Program. Table 2.2 lists the SWMUs and AOCs identified by EPA along with EPA's recommended action at each area. In addition, the comments section of the table presents the Navy's position based on the knowledge of the site and actions completed under other regualtory programs.

2.2.1 Solid Waste Managment Units and Areas of Concern

Table 2.2: RCRA Facility Investigation Summary

SWMU Number	SWMU Name	EPA Action Recommended	Comments
1	Haz Waste Store Area I	No Further Action	Recommended Action Accepted
2	Haz Waste Store Area II	No Further Action	Recommended Action Accepted
3	Current Haz Waste Storage Area	No Further Action	Recommended Action Accepted
4	Former Burning Ground (Bldg. 361)	Include in IRP	Listed as IRP SIte 2
5	Former Burning Ground (Bldg. 362)	Include in IRP	Listed as IRP Site 3
6	Current Burning Ground	Continue operation in interim status	Recommended Action Accepted
7	"Inert" Burn Area	Include in IRP	Included in IRP Site 1
8	Acid Disposal Pits	Include in IRP	Included in IRP SIte 1
9	Inert Landfill	Include in IRP	Listed as IRP Site 5
10	Be Landfill	Include in IRP	Listed as IRP Site 7
11	Garbage Burn Area	Include in IRP	Included in IRP Site 1
12	Alodine Treatment Tank	No Further Action	Recommended Action Accepted
13	2014 Alodine Former Storage Area	No Further Action	Recommended Action Accepted
14	167 Alodine Former Storage Area	No Further Action	Recommended Action Accepted
15	2014 Current Alodine Accumulation Area	No Further Action	This SWMU is not on Navy property any action is Hercules responsibility
16	Plant 1 Sewage Treatment Plant	Sample soil for VOCs and metals	No Further Action Recommended
17	Plant 2 Sewage Treatment Plant	Integrity Test/ Soil Sample	No Further Action Recommended
18	181 Photo Developer Discharge Area	Include in IRP	Listed as IRP Site 4B
19	231 Photo Developer Discharge Area	Include in IRP	IRP Site 4A, No Further Action Recommended
20	Solvent Disposal Pit	Include in IRP Determine Exact Location	Included in IRP Site 1
21	Bldg 241 Catch Basin	Sampling is recommended	?
22	Incinerators	No Further Action	Recommended Action Accepted

Table 2.2: RCRA Facility Investigation Summary

SWMU Number	SWMU Name	EPA Action Recommended	Comments
23	Salvage Yard	Soil sampling recommended	O.K. (Hercules or Navy)
24	Satillite Accumulation Areas	Soil sampling recommended (4 Areas)	Not DERA eligibe, Hercules
25	Solvent Recovery Stills	No Further Action	Recommended Action Accepted
26	Septic Tank	Sampling soil in drainfield	
27	Drainage Ditch System	Soil sampling in ditch	No Further Action Recommended
28	Silver Recovery Units	No Further Action	Recommended Action Accepted
29	Dust Collectors and Baghouses	No Further Action	Recommended Action Accepted
30	Spray Booth Filters	No Further Action	Recommended Action Accepted
31	Laboratory Waste Areas	No Further Action	Recommended Action Accepted
32	PCB Rag Storage Area	No Further Action	Recommended Action Accepted
33	Dumpsters	No Further Action	Recommended Action Accepted
34	Oil/Water Separaters	No Further Action	Recommended Action Accepted
35	Paper Mulcher	No Further Action	Recommended Action Accepted
36	Oil Pit	Integrity test and sample	Hercules
37	Wastewater Sumps	Test/sample	Hercules
38	Parts Cleaners	No Further Action	Recommended Action Accepted
39	Weir	Soil Sample	No Further Action Recommened
40	Laboratory Exhaust Filter	Sample residue	Hercules
41	Automotive Maintenance Area Drain	Test integrity Sample soil	Hercules
42	Now AOC F		
43	Soil Pile Bldg.7 UST removal material	No Further Action	Recommended Action Accepted
44	Settling Basin	Test Water	Hercules
45	Air Stripper	No Further Action	Recommended Action Accepted
46	Now AOC G		
47	Now AOC H		
48	Now AOC I		
49	Now AOC J		
50	Now AOC K		

Table 2.2: RCRA Facility Investigation Summary

SWMU Number	SWMU Name	EPA Action Recommended	Comments
51	NOW AOC L		
52	Current Alodine Treatment Tank	No Further Action Define Tank Status	Recommended Action Accepted
53	Former PCB Storage Area	No Further Action	Recommended Action Accepted
54	Bldg.7 UST Removal Site	Conduct RFI	?
55	Bldg.2 UST Removal Site	Conduct RFI	Action taken under RCRA Subtitle I
56	Bldg.3 UST Removal Site	Conduct RFI	Action taken under RCRA Subtitle I
57	Bldg.300 UST Removal Site	Conduct RFI	?

Table 2.2: RCRA Facility Investigation Summary

AOC Letter	AOC Name	EPA Action Recommended	Comment
A	Underground Storage Tanks	Integrity test/ Soil sample	Action taken under RCRA Subtitle I
B	PCB Transformer Storage Area	Sample Soil	Recommended Action Accepted
C	Condensate Discharge Area	Sample Soil	No Further Action Recommended
D	Bldg 181 Pit	Sample Soil	Listed as IRP Site 4B
E	Bldg 344 Tank Dike Area	Comply with NCP	To be addresses by Hercules
F	Acid Neutralization Pit	Submit sampling results	To be adressed by Hercules
G	X Range Area	Sample Soil	Refer to DoD guidance
H	500 Test Area	Sample Soil	Refer to DoD guidance
I	IM Test and Pond Area	Sample Water and Sediment	Refer to DoD guidance
J	A and B Ranges	Sample Soil	Refer to DoD guidance
K	C Range	Sample Soil	Refer to DoD guidance
L	H Range	Sample Soil	Refer to DoD guidance

This section contains the SWUMs and AOCs that EPA recommended for a RCRA Facilitiy Investigation to be coordinated with the ongoing CERCLA activities. The Navy does not agree with all the conclusions presented for the SWMUs and AOCs in the following sections, but the information is presnted in the Draft Site Management Plan (DSMP) to provide a summary of EPA findings for the SWMS and AOCs for the users of the document. Once a final decision in made on which SWMUs and AOCs wil be included into the CERCLA process the DSMP will be updated accordingly

2.2.1.1 SWMU 54: Building No. 7 UST Removal Site

At the time of the Visual Site Investigation (VSI), the facility representatives identified this unit as a former location of six underground storage tanks which held gasoline and diesel. Each tank reportedly had a 3,000-gallon capacity and were utilized at the Automotive Maintenance facility. Subsequent to the VSI, the facility stated that the area is the location of seven underground storage tanks, which included two abandoned 550 gallon diesel, one 2,000 gallon and one 1,000 gallon gasoline (filled with sand in 1977), one 3,000 gallon diesel (in use), and two 3,000 gallon gasoline (in use) tanks. The tanks were removed as part of an on-going facility wide UST removal program. Prior to removal, the tanks were found to have been releasing to the surrounding soil.

Facility representatives have indicated that organic vapor analysis (OVA) readings were above detection limits during removal. The excavated soil was placed on plastic sheeting in an open area approximately 100 feet east of Building 7 at the Soil Pile (SWMU 43). The excavation pits filled with water from underground springs. The water had a total petroleum hydrocarbon content of less than 10 ug/L. The State of West Virginia has approved air stripping to be performed on the water using an Air Stripper (SWMU 45).

Core soil samples taken prior to removal showed BTEX contamination in the area. Water currently present in the excavation hole has been found to have a total petroleum hydrocarbon content of less than 10 ug/L.

CONCLUSIONS:

The past potential for release to air is moderate because the facility purged vapors from the units by venting them to the air. The current potential for release to air is low since the unit is no longer active. The potential for release to soil and groundwater is high due to the units' below grade locations, the high groundwater level in this portion of the facility, especially during periods of heavy rainfall, and the tanks' unknown integrity. In addition, the presence of petroleum hydrocarbons in the soil has been confirmed

through sampling and analysis performed in late 1991. The potential for release to surface water is low because of the below grade location of the unit. The potential for subsurface gas generation is high due to the units' below grade locations and the unknown integrity of the remaining units.

An RFI is suggested for this unit to assess the nature and extent of contamination at the unit.

2.2.1.2 SWMU 55: Building No. 2 UST Removal Site

This unit is a former location of two underground storage tanks located at Building 2 on the Plant 1 property. The tanks each had a capacity of 550 gallons and was used to store heating oil. The tanks had been active since approximately 1946 and were removed in 1991 as part of a facility-wide underground storage tank removal program. Soil sampling conducted in 1991 found petroleum hydrocarbons to be present. According to the facility, the contaminated soil was removed during tank removal and thermally treated to remove the petroleum contamination.

The former tanks had been documented to have released total petroleum hydrocarbons to the soil. Soil samples taken in the area of the storage tanks in late 1991 documented the presence of total petroleum hydrocarbons at concentrations as high as 2,380 mg/kg (prior to cleanup, according to the facility). In addition, 0.754 mg/kg anthracene, 1.84 mg/kg fluorene and 0.849 mg/kg phenanthrene were detected.

CONCLUSIONS:

The past potential for release to air is moderate because the facility purged vapors from the units by venting them to the air. The current potential for release to air is low since the unit is not active. There has been documented release of petroleum hydrocarbons to the soil. The potential for release to the groundwater is high since the units were located below grade and soil contamination has already been confirmed. The potential for release to surface water is low due to the unit's distance from any of the ditches in the facility's Drainage Ditch System (SWMU 27) and the river. The potential for subsurface gas generation is high due to the documented release to the soil and the below-grade location of the former tanks.

An RFI is suggested for this unit to assess the nature and extent of contamination at the unit. In lieu of an RFI, the facility should provide documentation which substantiates that the area has been remediated.

2.2.1.3 SWMU 56: Building No. 3 UST Removal Site

This unit is a former location of four underground storage tanks for No. 5 fuel oil located at Building 3 on the Plant 1 property. Three of the tanks had capacities of 8,000 gallons each. one tank had a capacity of 10,000 gallons. The tanks had been active since approximately 1966 and were removed in 1991 as part of a facility wide underground storage tank removal program. Soil sampling conducted in 1991 found petroleum hydrocarbons to be present in the soil. According to the facility, the contaminated soil was removed and thermally treated to remove the petroleum hydrocarbons.

The former tanks had been documented to have released total petroleum hydrocarbons to the soil. Soil samples taken in the area of the storage tanks in late 1991 documented the presence of total petroleum hydrocarbons. According to the facility, the soil was removed until TPH levels were less than 50 ppm. Contaminated soil was thermally treated on site by Micon Engineering using a portable thermal treatment. Treated soil was then used as fill on site. Concentration levels were not available.

CONCLUSIONS:

The past potential for release to air is moderate because the facility purged vapors from the units by venting them to the air. The current potential for release to air is low since the unit is not active. There has been documented release of petroleum hydrocarbons to the soil. The potential for release to the groundwater is high since the units were located below grade and soil contamination has already been confirmed. The potential for release to surface water is high. The tanks located near Buildings 3 and 7 are all located within approximately 50 feet of one of the ditches in the facility's Drainage Ditch System (SWMU 27). An unknown quantity of oil reached the North Branch Potomac River following a spill of 100 gallons from one of the tanks at Building 3. The potential for subsurface gas generation is high due to the documented release to the soil and the below-grade location of the former tanks.

An RFI is suggested for this unit to assess the nature and extent of contamination at the unit. In lieu of an RFI, the facility should provide documentation which substantiates that the area has been romediated.

2.2.1.4 SWMU 57: Building No. 300 UST Removal Site

This unit is a former location of a 15,000 gallon underground storage tank located at Building 300 on the Plant 1 property. The tank had been active since approximately 1964 and was removed in 1991 as part of a facility wide underground storage tank removal program. Soil sampling conducted in 1991 found petroleum hydrocarbons to be present at levels less than 100 ppm of TPH.

The former tanks had been documented to have released total petroleum hydrocarbons to the soil. Soil samples taken in the area of the storage tanks in late 1991 documented the presence of total petroleum hydrocarbons at concentrations as high as 85 mg/kg.

CONCLUSIONS:

The past potential for release to air is moderate because the facility purged vapors from the units by venting them to the air. The current potential for release to air is low since the unit is not active. There has been documented release of petroleum hydrocarbons to the soil. The potential for release to the groundwater is low because of the topographical location of the unit. The potential for release to surface water is low because of the unit's distance from any of the ditches in the facility's Drainage Ditch System (SWNU 27) and the river. The potential for subsurface gas generation is high due to the documented release to the soil and the below-grade location of the former tanks.

An RFI is suggested for this unit to assess the nature and extent of contamination at the unit.

2.2.2 RCRA Phase II Confirmatory Sampling

This section contains the SWMUs and AOCs the EPA recommends for RCRA Phase II confirmatory sampling.

2.2.2.1 SWMU 16: Plant 1 Wastewater Treatment System

The facility constructed a wastewater treatment plant and collection system, at the Navy-owned property (Building 294), in 1962 to treat all of the facility's sanitary wastewater. The unit measures approximately 60 feet by 25 feet in area. The treatment plant utilizes a complete mix, extended aeration activated sludge process for biological treatment, including final settling, sludge return, and chlorination. The design capacity of the system is 100,000 gallons per day with a dry weather flow of 30,000 gallons per day. Effluent from the unit is discharged to a drainage ditch approximately 50 feet from the unit, which flows east to the North Branch Potomac River. According to facility officials, sludge from the sludge holding tank, or the settling tank was occasionally pumped directly to trucks from the local POTW and taken there.

EP toxicity tests have indicated that sludge generated at the plant was non-hazardous.

According to the facility, the plant handles primarily sanitary waste with some industrial wastes from photographic processing and several chemical laboratories on plant. Approximately 1,500 gallons per month of filtered wastewater, containing residual RDX of 100 mg/l or less, from RDX building/hopper cleaning operations is currently managed by the unit. According to the facility, this waste stream will be diverted to the UV treatment plant which was scheduled to begin operation sometime in 1993. Industrial wastewater from the Alodine process in Building 167 was pretreated on a batch basis at the Former Alodine Treatment Tank (SWMU 12) for chromium reduction and precipitation prior to being discharged to this unit.

Water from the Oil/Water Separators (SWMU 34) is discharged through rubber hoses to floor drains located within the boiler rooms. Some of these drains discharge to this unit. After silver is precipitated at the Silver Recovery Units (SWMU 28), the wastewater is discharged to this unit.

In 1984 the sanitary sewer system was separated from the combined sewer to limit storm water infiltration. The activated sludge tanks are located above the ground surface on a concrete structure and are open-topped.

A portion of the facility's stormwater sewer system was routed to the wastewater treatment plant in 1970. As of 1983, the pumping system in the largest lift station located in Building 293 had not been able to handle the total flow during peak wet weather flows due to the systems inability to handle the infiltration to the ground during heavy rain. The system frequently discharged sewage directly to the river as a result. Consequently there were low solids concentrations in the treatment system's aeration tanks, and no sludge had been disposed for at least ten years prior to 1983.

CONCLUSIONS:

The potential for release to air is low due to the low volatility of the waste managed by the unit. The past potential for release to soil and groundwater was high because of past overflown from the unit. Currently the potential for release to soil and groundwater is low because the sanitary sewer system is separated from the storm sewer system to prevent overflowing. The potential for release to surface water is high because of past overflows which eventually flowed to the river. The potential for subsurface gas generation is low due to the above ground location of the unit.

Soil samples should be collected in the area that received the overflow spill and analyzed for metals, organic and inorganic compounds.

2.2.2.2 SWMU 21: Building 241 Catch Basin

ABL operated an explosive test bunker for reactivity testing of propellants. The top of the structure was open allowing precipitation to enter. Water from precipitation and washdown procedures drained via gravity down a concrete ramp and through a metal pipe in a northerly direction to a metal catch basin which trapped any residual explosives. The catch basin consisted of a metal box-like structure measuring approximately one foot by two feet in area and one foot high. The bottom and sides consisted of a fine screen material which filtered the particulate residue and allowed water to pass through. The water was discharged down the steep slope of the mountain.

According to a 1983 IAS report, the bunker was used for conducting tests on quantities of explosives totaling less than 50 pounds. According to the facility, the unit was cleaned only a few times during its lifespan and wastes were presumably taken to the burning grounds.

This unit started operation during the 1960s. The unit ceased operation during the 1980s.
According to the facility, the unit managed water which may have contained residual explosive materials from testing operations in the Building 241 bunker. No estimate of the quantity of residue is available.

According to a 1983 IAS report, a sample of soil and detritus from the unit was analyzed and found to contain nitroglycerine (NG). No specific concentration levels were provided in the report. No other evidence of release was identified in the file material or observed during the VSI.

CONCLUSIONS:

The potential for release to air is low due to the nonvolatile nature of the waste managed by the unit and that fact the unit is not operational. The potential for release to soil and groundwater is high due to the detection of *NG* in soil samples collected from the unit. The potential for release to surface water is low due to the unit's distance from any drainage ditch or other surface water body. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the waste managed at the unit.

Since only one sample was collected in the early 1980s, it is suggested that soil samples should be collected in the vicinity of the unit and analyzed to determine if hazardous propellants or explosive constituents (specifically nitroglycerine) are present.

2.2.2.3 SWMU 23: Salvage Yard

This unit consists of an area measuring approximately 250 feet by 50 feet, and located immediately east of Building 270 in the northern portion of the Plant 1 property. It is also located approximately 50 feet north of the automotive test Building 224 and immediately south of the Acid Disposal Pits (SWMU 8) and the Solvent Disposal Pit (SWMU 20). The surface of the unit consists of exposed, compacted soil, and vegetated land. The entire area is enclosed by a chain link fence. At the time of the VSI, several hundred empty drums were being stored in the eastern portion of this unit. Large metal components and pieces of scrap metal were being stored at the western end of the area. Scrap metals are picked up from this unit by local scrap metal dealers.

According to the facility, this unit manages scrap metals including aluminum and copper. The facility also stores outdated equipment at the unit. Some of the equipment that has been stored at the yard over the years, such as compressors, has contained oil. All such equipment has been sampled for PCBS. If equipment was found to be PCB-contaminated it was removed from the area after the oil was drained and the unit flushed with solvent. The PCB-contaminated fluids (including solvents) generated from the draining and flushing operation were containerized and disposed off-site at an approved facility within one year. Equipment containing non-PCBcontaminated oil has been stored here.

The unit is also used to store empty drums. The bungs on all drums have been tightened. Drums are reused for waste accumulation and storage. Drums which are not reused are periodically picked up by a local salvage collector. The drums are deheaded and crushed before they are taken offsite.

At some time during the 1980s, according to the facility, this unit received spent automotive batteries.

No release controls are associated with this unit. A five-foot wide ditch from the facility's Drainage Ditch System (SWMU 27) runs in an easterly direction along the southern boundary of this unit.

No evidence of release was identified in the file material or observed during the VSI.

However, according to the facility, several automotive batteries were found to be leaking in 1990. The batteries were emptied into containers and removed, and soil was tested for pH using pH paper. When no contamination was found, no further action was taken, according to facility officials. No sampling or excavation of soil was conducted, according to the facility.

CONCLUSIONS:

The potential for release to air water is low due to the solid and non-volatile nature of the wastes being managed at this unit. The potential for release to soil and groundwater is high due to the reported release of automotive battery acid to the soil at this unit. The potential for release to surface water is moderate due to the reported release of automotive battery acid to the soil at this unit and the unit's proximity to a drainage ditch. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the wastes managed at the unit.

Soil samples should be collected from around the areas where spent automotive batteries and empty drums were accumulated and analyzed to determine if any metals are present.

2.2.2.4 SWMU 24: Satellite Accumulation Areas

ABL uses several areas throughout the facility property to accumulate waste materials before they are transferred to the Current Hazardous Waste Storage Area (SWMU 3).

The facility operates waste oil accumulation areas at Buildings 7, 215, 219, 815, 8204, and 8501. These units are used to collect waste oil from automotive maintenance and repair operations,, and the Oil/Water Separators (SWMU 34) at the facility's boiler rooms.

ABL also maintains accumulation areas at Buildings 2, 3, 4, 8, 9A, 16, 35, 37, 105, 145, 167, 257, 262, 289, 821, 2002, and 2014. A description of the units at Buildings 7, 219, 8204, and 8501, recommended for further sampling, is presented in Table 2.1. All accumulated wastes, unless otherwise noted are taken to the Current Hazardous Waste Storage Area (SWMU 3) prior to being transported off-site to a regulated TSDF.

As of 1983, approximately 2,400 gallons of waste oil was generated at the facility annually. This consisted of waste vehicle oil, machine cutting oil, hydraulic fluid, and petroleum-based degreasing solvents. According to the IAS report, prior to 1973, the facility probably generated half of this amount annually, and during the 1940s and 1950s, the facility probably generated even less waste oil. Waste managed at each unit is presented in Table 2.1.

CONCLUSIONS:

The potential for release to air is low because all accumulated wastes are kept in sealed drums or smaller containers. The potential for release to soil and groundwater is low at all accumulation areas except the units at Buildings 153, 821, 7, and 8204 (SWMUs 24V, 24FF, 24HH, and 24E). All units are located on

paved asphalt surfaces or concrete pads. Many of the units are also located in fully enclosed structures. The unit at Building 153 (SWMU 24V) exhibited staining on the north and west sides of the concrete pad. The unit at Building 8204 (SWMU 24FF) exhibited staining on the paved asphalt surface near surrounding soil. Heavy staining was observed on the outdoor concrete pad at Building 8501 (SWMU 24HH) and staining was observed on the pad outside Building 7 (SWMU 24E). The potential for release to soil and groundwater at these four units is moderate due to the units' outdoor location and the observed staining. The potential for release to surface water is low at all units due to their distances from any surface water body or drainage ditch. The potential for subsurface gas generation is low due to the above ground, enclosed location of the units.

Soil samples should be collected from around the units at Buildings 7, 153, 8204 and 8501 (SWMUs 24E, 24V, 24FF, and 24HH), and analyzed to determine if any petroleum hydrocarbons are present. No further action is suggested at this time for the remaining units.

Table 2.3

SWMU 24 - Satellite Accumulation Area

Unit #	*Location (Bldg. #)*	*Description*	*Period of Operation*	*Waste Managed*	*Release Controls*	*History of Release*
24E	7	55-Gallon drum on paved asphalt approximately 10 feet south of Building 7 automotive garage	1940s-present	Waste oil from automotive repair and maintenance shop	Located on asphalt	Staining approximately 15 drum ring impressions in an area which extends approximately 15 feet east of garage area
24V	153	7'x7' concrete pad 6" high; no beams or dikes; surrounded by sand and gravel; 20' east of Building 145; six 55-gallon drums of waste oil and seven 25-gallon empty drums	1940s-present	Waste oil from equipment located on Plant 1 property	Located on concrete pad without berms or dikes	Staining on north and west sides of pad observed
24FF	8204	5'x5' area at corner of paved asphalt parking area for accumulating 55-gallon drums of waste oil from Plant 2	1960s-present	Waste oil from equipment located on Plant 2 property; 1 drum oil being stored at time of VSI	Paved asphalt area; no berms or dikes	Staining on paved asphalt area observed
24HH	8501	5'x10' area of concrete pad with 2 cinder block walls and metal roof, immediately north of Building 8501; two 55-gallon drums and three 5-gallon drums	Prior to 1970 to present	Waste oil from boilers	Concrete pad under metal roof with 2 concrete walls	Heavy staining on entire 20'x10' concrete pad observed

2.2.2.5 SWMU 26: Septic Tank

According to the facility, only one of the seventeen septic tanks which ABL operated received industrial wastewater. The other sixteen received only sanitary wastewater. Facility representatives do not know from which buildings and processes it received waste or the exact location of this unit, but indicated that it was located near the Soil Pile (SWMU 43). The unit has not been excavated, and according to a map provided by the facility is located approximately 50 feet west of Building 369. According to the IAS report, this unit is equipped with a drain field, and effective pollutant removal may not have been achieved in the septic tanks drain fields because of the high groundwater table in the Plant 1 property area. According to the report, these systems may have discharged inadequately treated sewage to the shallow groundwater and surface water. However, according to the facility, the IAS is in error since Kelly Springfield drawing PGXA10 12/l/42 indicates a 611 V.C.T. (1000 feet) followed by 1000 feet of open field tile discharging to the river.

This unit started operation during the 1940s. This unit ceased operation during the mid-1960s. According to facility officials, this unit managed industrial wastewater in addition to sanitary wastewater. Industrial wastewater was generated from photographic processes and laboratory glassware washing. Industrial wastewater potentially contained solvents, including acetone, and photographic solutions.

According to the IAS report, effective pollutant removal may not have been achieved in the septic tank drain field because of the high groundwater table at the facility property. The unit may have discharged inadequately treated sewage to the shallow groundwater and surface water.

CONCLUSIONS:

The potential for release to air is low due to the unit's below grade location. The potential for release to soil and groundwater is high due to the unit's below grade location, the high groundwater level in this portion of the facility, especially during periods of heavy rainfall, the unknown quantities of industrial waste which it received during its operation, and its unknown integrity. The potential for release to surface water is moderate because of the high water table situation that can lead to discharges of wastewater to the Drainage Ditch System (SWMU 27), which eventually discharges to the river. The potential for subsurface gas generation is unknown due to the unknown quantities of industrial waste which it received during its operation, and its unknown integrity.

Soil samples from the drainfield should be collected from around the unit and analyzed to determine if any VOCS, inorganics, propellant and explosive constituents, and heavy metals are present. In addition, the integrity of the unit should be assessed. If the integrity is impaired, then soil samples should be collected from deeper locations around the unit and analyzed for the same constituents.

2.2.2.6 SWMU 27: Drainage Ditch System

A system of open earthen drainage ditches, catch basins, and culverts throughout the facility property serves as a stormwater drainage system. The ditches are approximately four feet deep and five feet wide. one stormwater ditch (Outfall 011) is lined with riprap. Several others have riprap lining at the point of discharge only. The ditches drain toward the northern end of the Plant 1 property and discharge through 16 outfalls to the North Branch Potomac River.

Prior to the installation of the Plant 1 Wastewater Treatment System (SWMU 16) in 1962 and the Plant 2 Wastewater Treatment System (SWMU 17) in 1967, some of ABL's septic tanks discharged to this unit. According to the IAS report, the septic tanks which discharged to this unit would have only provided minimal pollutant removal.

During periods of heavy rainfall, standing water is generated in many low-lying areas of the property. In addition, the groundwater level rises to within a few feet of the surface.

This unit started operation during the 1940s and is still in operation today.

This unit manages stormwater runoff from the developed property area. The unit receives washdown from some of the process buildings (e.g. Building 181). The unit also receives discharge from the Settling Basin (SWMU 44).

No release controls are associated with this unit. The unit discharges through a series of outfalls directly to the North Branch Potomac River.

Analysis of soil samples taken in October 1984 from the drainage ditch at Building 181 indicated the concentration of silver contamination between 8,512 mg/kg and 12,800 mg/kg. BETEX contamination was found in the water in the Settling Basin (SWMU 44) which eventually discharges to the ditch.

CONCLUSIONS:

The potential for release to air is low due to the diluted and non-volatile nature of any wastes potentially managed by this unit. The potential for release to soil and groundwater is high due to the units' ground surface location and the high groundwater level at the facility. In addition, the groundwater level rises to within a few feet of the surface during periods of heavy rainfall. Soil samples at the drainage ditch near Building 181 have confirmed contamination of soil by silver. The drainage ditch near the Bottling Basin (SWMU 44) receives discharges potentially contaminate with BTEX. The potential for release to surface water is high because the unit discharges directly to the North Branch Potomac River through 16 outfalls and because past release history. The Underground Storage Tanks (AOC A) located near Buildings 3 and 7 are all located within approximately 50 feet of one of the ditches. The potential for subsurface gas generation is low due to the above ground location of the units.

Soil samples should be collected from the base of the drainage ditch at points located closest to the Building 7 tanks excavation area. Samples should also be collected from the base of the drainage ditch at points located closest to the Settling Basin (SWMU 44) discharge point. Samples should be analyzed to determine if VOCs and total petroleum hydrocarbons are present.

Soil samples should also be collected from the start of the drainage ditch which exists closest to Building 181 and analyzed for vocs, inorganics, and heavy metals. In addition, a few random samples should be collected at locations close to all the outfall points.

2.2.2.7 SWMU 39: Weir

This unit, in operation since 1988, consists of a concrete skimmer located along one of the trenches which is part of the facility's Drainage Ditch System (SWMU 27). The unit is approximately ten feet wide and fifteen feet long. The unit has a concrete base and a Vnotch. It was constructed as a contingency measure to control any releases of oil which might occur at the boiler facility at Building 344 located approximately three hundred feet west of the unit along the ditch.

The unit was constructed to manage fuel oil use at the boiler facility at Building 344.

This unit serves as a release control device for any oil spills which may occur at Building 344. The unit is built with an oil/water skimmer to contain oil within the western portion of the drainage ditch.

According to the facility, a release of oil occurred at Building 344 upstream from the unit in May 1989. However, information provided by the facility states that no report was found regarding this spill. No evidence of release was observed during the VSI.

CONCLUSIONS:

The potential for release to air is low due to the low volatility of the waste managed. The potential for release to soil and groundwater is moderate. Although the unit has a concrete structure and is located above ground at the drainage ditch, it is exposed to the surrounding soil and a release to the drainage ditch occurred in 1989. The potential for release to surface water is moderate because any release of oil to the drainage ditch from Building 344, such as the one which occurred in 1989, would be contained in the ditch to the west of the unit and would be prevented from discharging to the river. The potential for subsurface gas generation is low due to the above ground location of the unit.

Soil samples should be collected from around the unit, specifically immediately upstream of the unit, and analyzed to determine if any petroleum hydrocarbons are present.

2.2.2.8 SWMU 40: Laboratory Exhaust Filter

This unit consists of a disposable filter mechanism located along the outside southern wall of the Strand Bomb Testing Laboratory at Building 12. Exhaust from test operations conducted in the westernmost testing room of the building is discharged through the unit. The unit is located approximately 18 inches above the ground surface. The unit is cleaned with acetone before being disposed.

This unit potentially started operation during the 1960s, but may have started operation as early as the 1940s, and is currently operational.

According to the facility, this unit manages explosives, propellant, and combustion products. The facility uses NG, HMX, RDX, and AP in such products.

No release controls are associated with this unit.

During the VSI, a black ash residue was observed on the ground and wall surface beneath the unit. The majority of the surrounding ground surface is covered with concrete. A one-foot wide area of gravel covered ground is located approximately eighteen inches west of the unit.

CONCLUSIONS:

The potential for release to air is high based on the observed discoloration of concrete surfaces surrounding the vent. The potential for release to soil and groundwater is moderate because the unit discharges ashen residue to the surrounding area which is nearly completely covered with concrete and may leach to soil through the nearby gravel and cracks and joints in the concrete. The potential for release to surface water is low due to the unit's distance from any drainage ditch or other surface water body. The potential for subsurface gas generation is low due to the above ground location of the unit.

Sampling of the residue found in the vicinity of the filter is suggested to determine the constituents of the particulate releases to the air from this unit.

2.2.2.9 AOC A: Underground Storage Tanks

This area consists of several underground storage tanks located on the Plant 1 property.

A 1,000-gallon underground storage tank located adjacent to Building 100 was used to store hoptane. The chemical was used for experimental purposes from 1972 to 1973. A distillation procedure removed water which was used to desentize nitrocellulose (NC). The water removed was replaced with heptane without allowing the material to dry and become sensitive. The final water removed from the material was discharged onto the ground outside the building. When the operation was discontinued the haptane was removed form the tank and ABL declared it closed in 1977. The tank was excavated in October 1991. According to the facility sampling was conducted and no contamination was found.

Three 10,000-gallon underground tanks located at Building 224 have been used since the late 1970s to store gasoline and diesel fuel oil. These tanks are currently still underground, although no longer active. According to the facility, these tanks will be replaced after the new tanks near Building 7 become operational.

A 5,000-gallon underground tank located near Building 504 was used to store No. 5 fuel oil between 1966 and 1991. This tank was excavated in 1991.

No evidence of release was identified in the file material or observed during the VSI. All of these tanks began operating in the 1960s and 1970s.

CONCLUSIONS:

The past potential for release to air is moderate because the facility purged vapors from the units by venting them to the air. The current potential for release from these units is low because the units are no longer active. The potential for release to the soil and groundwater is unknown at the USTs formerly located at Buildings 100 and 504 since the integrity of the tanks prior to removal is unknown. The potential for release to the soil and groundwater from the USTs at Building 224 is unknown since the integrity to the units are unknown. The potential for release to surface water is low due to the unit's distance from any of the ditches in the facility's Drainage Ditch System (SWMU 27) and the river. The potential for subsurface gas generation is unknown since the integrity of the tanks could not be determined.

RCRA Phase II soil sampling is suggested for these areas. The sampling will determine whether contamination is present at the location of the former tanks at Buildings 100 and 504. Samples should be analyzed for petroleum hydrocarbons constituents and heptane. If sampling activities have already taken place at any of these areas, the results should be submitted to EPA prior to conducting additional sampling activities.

Integrity testing is suggested for the three underground storage tanks (USTS) at Building 224. If any of the tanks fail integrity testing, soil samples should be collected to determine whether a release has occurred. Samples should be analyzed for petroleum hydrocarbons constituents.

2.2.2.10 AOC B: PCB Transformers Storage Area

This unit consists of a concrete pad measuring approximately 20 feet by 30 feet in area. It is located immediately east of Building 157 on the Plant 1 property. The unit is not enclosed by any walls or containment structures, or covered by a roof. The unit served as a staging area for transformers which were designated for reuse at the facility. Approximately 44 transformers, containing 7,491 kg of PCB-containing fluid were stored here as of 1983, according to the IAS report. According to the facility, at the time not all equipment had been tested. All items were assumed to be PCB containing. Transformers were stored on wooden pallets. According to the facility, all transformers were removed from the area in 1991 and 1992.

No evidence of release was identified in the file material or observed during the VSI. According to the facility, no leaks were detected from transformers which contained PCB oil. Minor leaks of non-PCB oil consisted of a few milliliters and typically accumulated on the pallets.

CONCLUSIONS:

The potential for release to air is low due to the contained and non-volatile nature of the material being stored at the unit. The potential for release to soil and groundwater is moderate. Transformers were stored on pallets on an open concrete surface. The concrete surface contains several unsealed, exposed joints where two or more slabs of concrete were set. The pad is not equipped with any form of containment. In addition, the unit managed approximately 7,500 kg of PCB-containing oil, according to the IAS report. The potential for release to surface water is low due to the unit's distance from any stormwater ditch or the river. The potential for subsurface gas generation is low due to the above ground location of the unit.

Soil samples should be collected from the joint areas in the concrete pad and in the area around the unit to determine if PCBs are present.

2.2.2.11 AOC C: Condensate Discharge Area

This unit consists of an earthen area located immediately east of Building 105. The unit is partially vegetated and measures approximately four feet by five feet in area. A one-inch diameter pipe extending from the lower level of the building discharges a warm liquid to the unit, leaving a reddish-brown residual color. According to the facility, the reddish-brown color is due to the high iron content of the plant water supply.

No evidence of release was identified in the file material. During the VSI, a reddish-brown colored condensate discharge to this unit was observed. The soil and surrounding vegetation were discolored reddish-brown.

CONCLUSIONS:

The potential for release to air is not known at this time because of the unknown volatility of the waste constituents. The potential for release to soil and groundwater is high due to the liquid nature of the waste being managed at this unit and the earthen, land-based location of the unit. The potential for release to

surface water is low due to the unit's distance from any drainage ditch or surface water body. The potential for subsurface gas generation is low due to the above ground location of the unit.

Soil samples should be collected from around the unit and analyzed to determine if any petroleum hydrocarbons, VOCS, acetone, inorganics, and heavy metals are present.

2.2.2.12 AOC E: Above Ground Storage Tanks Spills Area

On February 11, 1993, EPA Region III staff conducted a Spill Prevention Containment and Countermeasure (SPCC) inspection at the facility. According to EPA representatives, an oil spill was noted at the above ground tank farm, approximately 100 feet west of Building 344. No further details regarding this spill were provided.

During the VSI, standing water was observed in the tank farm containment area which facility officials stated was from condensate discharge accumulation.

The tank farm is located within a concrete bermed area. The berm extends four feet above the interior grade, with three feet submerged, and surrounds an area measuring approximately 50 feet by 30 feet.

At the time of the VSI, the insulation covering the tanks was observed to be bulging and cracking.

CONCLUSIONS:

The potential for release to air is unknown because the quantity of material released is unknown. The potential for release to soil and groundwater is unknown because an unknown amount of fuel oil discharged directly to the exposed ground surface at the unit. The potential for release to surface water is low because the tank farm is completely contained by a concrete berm system. The potential for subsurface gas generation is unknown because the quantity of material released is unknown.

It is suggested that ABL comply with EPA and WVDEP in conducting a contamination sampling and monitoring program.

2.2.2.13 AOC G: X Range Area

The facility operates (since 1944) a static test firing range for the rocket motors and igniters that are produced onsite. The unit is located in the far southeastern corner of the developed Plant 1 property. The unit occupies an area measuring approximately 700 feet by 500 feet. It includes four firing bays and one ballastic centrifuge, which allow captured functioning of the test motors and igniters. The bays open out toward the hillside to the south and east. According to a 1983 IAS report, test firing facilities have existed at the location of this unit since 1944. During the 1940s, the unit was used for the development and testing of propellant for the bazooka.

The easternmost bay and range is now used for small-scale test firing of quarter-pound motors. During the late 1950s and early 1960s, this area was used for large-scale testing. Simulated altitude firing was conducted using rocket motor exhaust through a venturi to maintain an atmospheric pressure simulating that altitude.

The remaining three bays and centrifuge are used for testing rocket motors ranging in size up to five tons.

The bays consist of three concrete walls, concrete floors, and rollback roofs. They measure approximately 20 feet long, 20 feet wide and 25 feet high.

The unit manages explosives residuals which are generated as a result of the rocket motor and igniter testing procedures. Composite propellant contains AP and aluminum as the primary ingredients. Double base propellant contains NG or other nitrate esters, NC, and RDX and HMX as the primary ingredients. According to the facility, small amounts of lead compounds are also used in double base propellants.

Over the years, continual firing has lead to an erosion of the hillside, and residues from fired materials may have reached the soil, according to the facility. Occasionally, rocket motors being tested explode or break loose. Burning propellant and motor parts are discharged onto the hillside, generating small fires.

CONCLUSIONS:

The potential for release to air is moderate due to the propensity of the materials being tested to vent to the atmosphere. The potential for release to soil and groundwater is moderate due to the large area of exposed ground surface at this unit which may have received residual propellant constituents during test firing procedures. The potential for release to surface water is low due to the unit's distance from any drainage ditch or other surface water body. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the waste managed at the unit.

Soil samples should be collected in the vicinity of the test firing bays at Buildings 77, 193, 194, 242 and analyzed to determine if any hazardous propellant or explosive constituents are present.

2.2.2.14 AOC H: Rocket motor Test Area

The unit is located approximately 500 feet south of the Sensitivity Test Areas and Pond (AOC I). This unit consists of a sensitivity testing area (operating since the early 1960s) where .50caliber shots are fired at anchored rocket motors. Motors are also tested for flammability by placing them in bonfires to see how they would react to fire and extreme heat. At the highest point and southernmost end of this unit, the facility conducts sensitivity and genetration testing of rocket motors by firing .50-caliber artillery into them. The unit consists of a cleared area surrounded by a wooded area. The flammability tests are conducted on two concrete pads measuring approximately three feet by three feet in area each or a concrete pad measuring approximately two feet by ten feet. The sensitivity test operations are conducted in a semicircular corrugated metal enclosure built into the hillside. The floor of the structure is earthen.

The unit manages explosives residuals which are generated as a result of the rocket motor testing procedures. The propellants and explosives in these motors include HMX and TNT.

No release controls are associated with this unit. Residues can be washed by stormwater runoff through a swale to the Sensitivity Test Area Pond. Water from the pond flows to the North Branch Potomac River through a series of swales and creeks.

According to a 1983 IAS report, pellets of smokeless powder were occasionally found on the ground surface at the unit in the past. The report stated that HMX and TNT explosives residues were detected at the milligram-per-gram levels in a soil sample collected at the unit. Ash deposits from burning operations were observed at this unit during the VSI.

CONCLUSIONS:

The potential for release to air is low due to the nonvolatile nature of the waste managed by the unit. The potential for release to soil is high because rocket motor testing operations are conducted on small concrete pad at the ground surface. According to a 1983 IAS report, pellets of smokeless powder were occasionally found on the ground surface at the unit in the past. The report stated that HMX and TNT explosives residues were detected at the milligram-per-gram levels in a soil sample collected at the unit. Ash deposits from burning operations were observed at this unit during the VSI. The potential for release

to surface water is moderate because explosives residuals can be transported by stormwater runoff via the pond and a series of swales and creeks to the North Branch Potomac River. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the waste managed at the unit.

Soil samples should be collected from around the concrete pads and tunnel, and analyzed to determine if any explosives residuals are present.

2.2.2.15 AOC I: Sensitivity Test Areas and Pond

A sensitivity testing area is located approximately 100 feet west of the pond on the hillside. Since 1989, .50-caliber rounds of ammunition have been fired at rocket motors. In addition, flammability testing is conducted at this unit. An incentive sensitivity test area was located on the hillside immediately northeast of the pond from the late 1970s to mid-1980s.

This unit includes a pond which serves as a catch basin for runoff from the sensitivity test area located outside of the developed area of the facility. The unit consists of a two-to-three acre man made pond located approximately 500 feet north of and downhill from the F Range sensitivity test area. The unit is located adjacent to Building 103. According to facility officials, the pond was built as a source for fire control water for the sensitivity testing areas and the nearby magazine areas. Water from the pond eventually flows to the North Branch Potomac River.

The unit manages explosives residuals transported by stormwater runoff from the sensitivity testing areas. According to Exhibit 5, Reference 142, one area it receives runoff from is the sensitivity testing area where .50-caliber shots are fired at anchored rocket motors. Motors are also flammability tested. These operations have been conducted since 1989. The propellants and explosives in these motors include HMX and TNT.

No release controls are associated with this unit. Water from the unit flows to the North Branch Potomac River through a series of swales and creeks. During the VSI, the facility officials indicated that runoff from the sensitivity test area does not flow to the pond.

The pond area was sampled as part of the IR study in 1984. RDX was confirmed in the surface water. Several other explosive constituents were found in a sediment sample but were not confirmed since there was only one sample. No other release was identified in the file material or observed during the VSI.

CONCLUSIONS:

The potential for release to air is low due to the nonvolatile nature of the waste managed by the unit. The potential for release to soil and groundwater is moderate due to the possibility that runoff from the sensitivity test area may have flowed to the pond which could percolate to soil and ground water. The potential for release to surface water is high because the unit discharges stormwater runoff through a series of swales and creeks to the North Branch Potomac River. In addition, RDX and other explosives were detected in the surface water of the pond. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the waste managed at the unit.

Confirmatory sampling of the 1984 IR study for surface water should be conducted at the pond. In addition, sediment should be sampled and analyzed for PEP constituents.

2.2.2.16 AOC J: A and B Ranges

These two ranges were located at Building 3 in the southwestern portion of the Plant 1 property. The ranges were operational between the 1940s and 1960s. The unit included two subscale rocket motor static test firing ranges which were used prior to the construction of the X Range Area (AOC G). The unit consists of two concrete firing bays on the south side of Building 3 and an open land area to the south of the bays measuring approximately 300 feet by 300 feet in area. The range area is completely vegetated now.

These ranges received propellant residue as a result of rocket motor test firing operations. According to the facility, the quantities of propellant tested at the these ranges is unknown.

No release controls are associated with this unit. The firing bays, where the rocket motors were test fired were enclosed units with concrete bases.

The range areas consisted of exposed land surface.

CONCLUSIONS:

The potential for release to air is moderate due to the propensity of the materials being tested to vent to the atmosphere. The potential for release to soil and groundwater is moderate due to the large area of exposed

ground surface at this unit which may have received residual propellant constituents during test firing procedures. The potential for release to surface water is low due to the unit's distance from any drainage ditch or other surface water body. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the waste managed at the unit.

Soil samples should be collected in the vicinity of the test firing bays on the south side of Building 3 and analyzed to determine if any hazardous propellant or explosive constituents are present.

2.2.2.17 AOC K: C Range

This range (operated during the 1940s) was located near the area where Building 4 now stands on the Plant 1 property. The unit was used for the test firing of .50-caliber machine gun ammunition during World War II. The unit consisted of an open land area. Facility representatives did not have any information regarding the size of the unit. This area is now partially paved with the remainder of the area vegetated. Building 4 is located at the site of the former unit.

This range received bullets which were fired into the ground during testing operations. According to the facility, composition of the bullets is not known with certainly. They may have been lead, they may have been jacketed, or they may have been steel with copper gas check ring. According to the facility, no explosive warheads were used at this unit.

According to the IAS Report bullets were fired into the ground during routine ammunition testing procedures. No sampling data is available for this area, according to the facility. Subsequent to the VSI, the facility stated that "It must be assumed that all projectiles hit a backstop and were contained. This backstop is no longer in existence and its disposition is not known. Excavations in the area have not shown evidence of projectiles as were found in connection with H Range." No further evidence of release was identified in the file material or observed during the VSI.

CONCLUSIONS:

The potential for release to air is low due to the solid, non-volatile nature of the wastes managed at this unit, and the below ground location of the bullets. The potential for release to soil and groundwater is moderate due to the large area of exposed ground surface at this unit which may have received lead bullets during test firing procedures. The potential for release to surface water is low due to the unit's distance

from any drainage ditch or other surface water body. The potential for subsurface gas generation is low due to the solid, non-volatile nature of the waste managed at the unit.

Soil samples should be collected randomly at the firing range and analyzed to determine if any lead is present.

2.2.2.18 AOC L: H Range

This range was located approximately 500 feet from the North (operating during the 1940s) Branch Potomac River, north of where Building 275 is currently located on the Plant 1 property. The unit was used as a mortar testing range during World War II. The unit includes the impact area for the testing operations. The ballistics characteristics of mortar propellant were tested by firing the materials toward the hillside to the north (the impact area). The unit measured approximately 100 feet by 300 feet in area. This area is now completely vegetated. The unit is located approximately 100 feet east of the Former Burning Ground I (SWMU 4).

This range potentially received propellant and explosive constituents during testing operations. According to the facility, no explosive warheads were used at this unit.

No release controls are associated with this unit. The range area consisted of exposed land surface.

According to facility officials, several mortar shells were unearthed at this unit in 1991 when Building 356 was being constructed, approximately 500 feet to the southeast of this range. No sampling data is available for this area, according to the facility. No further evidence of release was identified in the file material or observed during the VSI.

CONCLUSIONS:

The potential for release to air is moderate due to the propensity of the materials being tested to vent to the atmosphere. The potential for release to soil and groundwater is moderate due to the large area of exposed ground surface at this unit which may have received residual propellant constituents during test firing procedures. The potential for release to surface water is moderate because the unit is located within approximately 500 feet of the North Branch Potomac River and a drainage ditch. The potential for subsurface gas generation is low due to the above ground location of the unit and the non-volatile nature of the waste managed at the unit.

Soil samples should be collected randomly at the unit and analyzed to determine if any hazardous propellant or explosive constituents are present.

2.2.3 Integrity Testing Sites

This section contains the SWMUs and AOCs the EPA recommends for integrity testing.

2.2.3.1 SWMU 17: Plant 2 Wastewater Treatment Systems

This unit consists of a secondary treatment tank system on the Hercules-owned portion of the facility. The unit is a 7,500-gallon-per day activated sludge package plant. It is located outside Building 8560 and the tanks are recessed in the ground. The area surrounding the unit is covered with vegetation and soil. According to a site inspection report, since this is a secondary treatment unit, it has never required the disposal of sludge. Sodium hypochlorite was used to treat effluent at this unit in the past. According to the facility, chlorine cylinders are currently used (Reference 151). The effluent from the unit is discharged to the sanitary sewer system which eventually discharges to the North Branch Potomac River. According to facility officials, sludge from the sludge holding tank, or the settling tank was occasionally pumped directly to trucks from the local POTW and taken there.

The unit began operation in 1967, and is currently operating.

According to the facility records the unit manages sanitary sewage. However, during the VSI the facility representatives indicated that the unit receives effluent from the Silver Recovery Unit (SWMU 28) at Building 2010.

After silver is precipitated at the Silver Recovery Units (SWMU 28), the wastewater is discharged to this unit.

The unit may have also received Alodine wastewater as a result of spills at the Former Alodine Waste Storage Area (SWKU 13). The spills were below the reportable quantities and may have been discharged to the unit through the sanitary piping system.

There are no release controls associated with this unit.

No evidence of release was identified in the file material or observed during the VSI. According to the facility no spills or uncontrolled releases are known to have occurred.

CONCLUSIONS:

The potential for release to air is low because of the non-volatility of the waste managed by the unit. The potential for release to soil and groundwater is unknown because the integrity of the unit is not known and a release may occur prior to treatment. The potential for release to surface water is low because the unit primarily manages sanitary sewage. The potential for subsurface gas generation is unknown because of the unknown integrity of the unit.

The integrity of the unit should be assessed. If the integrity is impaired, then soil samples should be collected from around the unit, and analyzed to determine if VOCs and heavy metals are present.

2.2.3.2 SWMU 36: Oil Pit

This unit (presumably starting operation in the 1960s) consists of a below grade circular pit measuring two feet in diameter and two feet in depth, located approximately ten feet northwest of Building 215. The unit is located immediately north of above ground tank saddles which formerly supported two above ground storage tanks. The unit is located within the perimeter of the two and one-half foot concrete containment barrier which surrounds the tank area. During the VSI, facility representatives stated that the unit may have served as a transfer hose drip catchment.

The unit contains waste oil, however, the facility states that this unit is not currently operational.

During the VSI, this unit contained a dark, highly viscous petroleum substance.

This unit is located within the perimeter of a concrete containment barrier measuring two and one-half feet high. According to the facility, the barrier was installed in 1975. No other release controls were observed.

According to the facility, no information regarding any releases from this unit exist. No evidence of release was identified in the file material or observed during the VSI.

CONCLUSIONS:

The potential for release to air is high because the source of the accumulation may be from fuel oil transfer at the location and the waste may contain highly volatile compounds. The potential for release to soil and groundwater is unknown because no information is available regarding the structure and integrity of the unit. The unit is located below the ground surface level so any release would potentially occur directly to soil. The potential for release to surface water is low because the unit is located within a bermed containment area. The unit is also not near any surface water body. The potential for subsurface gas generation is unknown at this time because of the unknown volatility of the waste constituents.

The integrity of the unit should be verified. If the integrity is breached, then soil samples should be collected from around the unit and analyzed to determine if any petroleum hydrocarbons, VOCS, and heavy metals are present.

2.2.3.3 SWMU 37: Wastewater Sumps

Eighteen units have been identified as wastewater sumps at the facility. Several of the units consist of concrete enclosed below-grade structures. These include the sumps at Buildings 4, 7, 12, 13, 167, 256, and 2003. Each of these units was covered with a wooden or metal cover at the time of the VSI. Several other units, referred to as sumps by facility officials, consist of earthen discharge areas. These include the units located at Buildings 15, 22, 27, 32, 49, 100, 103, 105, and 105A. The earthen units viewed during the VSI consisted of exposed, vegetated ground surface areas measuring between approximately five and 20 feet in diameter. According to the facility, the accumulated explosive material in the units at Buildings 22, 49, 103, and 105A was periodically initiated in place using a blasting cap and a stick of dynamite. In addition, the sumps are not lined and have discharged into nearby components of the facility's Drainage Ditch System (SWMTJ 27).

SWMUs 37E, 37J, 37L, and 37M have received contact cooling water from propellant machining operations. SWKUs 37A, 37C, 37D, 37F, 37G, 37H, 37I, 37J, 37K, 37L, and 37R

have managed building washdown water from structures at which solid explosives are processed. Three below-grade concrete enclosed sumps at the facility have received wastewater containing materials other than propellants and explosives. SWMU 37B at the automotive maintenance garage at Building 7 has potentially received coolants, oil, and solvents. SWMU 37N at Building 167 has potentially received Alodine wastewater. Salts, sand, and sediment have been discharged to the mandrel wash pit, SWMU 37Q, at Building 256.

Release controls for each unit can be found on Table II-2.

Soil samples at SWMU 37E documented the presence of approximately 400 mg/kg AP, according to facility officials. Concentrations for HMX and RDX were below detection limits. During the VSI, accumulation of solid deposits was observed at SWMU 37R. The deposits are potentially AP. No evidence of releases from the other units was identified in the file material or observed during the VSI.

CONCLUSIONS:

The potential for release to air is low due to the nonvolatile nature of the wastes managed at these units. Only the fully covered sump at the automotive maintenance area may have received volatile wastes. The potential for release to soil and groundwater is high due to the land-based location of the units. In addition, none of the units is unlined, according to the facility. The potential for release to surface water is high because all of the units discharge to drainage ditches, according to the facility, which eventually discharge to the North Branch Potomac River. The potential for subsurface gas generation is low due to the above ground location of many of the units and the non-volatile nature of the wastes managed at the units.

The integrity of the concrete enclosed, below-grade units should be assessed. If the integrity of any of these units is determined to be unsound, then soil samples should be collected from around the units and analyzed to determine if any petroleum hydrocarbons, VOCS, heavy metals, and explosive constituents are present. In addition, soil samples should be collected from the remaining earthen discharge units and analyzed to determine if any explosive constituents are present.

Table 2.4

SWMU 37 - Wastewater Sumps

Unit #	Location (Bldg. #)	Period of Operation	Waste Managed	Release Controls	History of Release
37A	4	1940s	Wastewater from operations involving PETN (solid explosive)	Concrete sump with wooden lid	No known release
37B	7	1940s-present	Washdown from automotive maintenance activities (coolant, oil, solvents)	Concrete enclosed with convers	No known release
37C	12	1940s	Wastewater from operations involving PETN (solid explosive)	Concrete sump with wooden lid	No known release
37D	13	1940s	Wastewater from operations involving PETN (solid explosive)	Concrete sump with wooden lid	No known release
37E	15	1950s-present	Propellant contact cooling water (nitrate esters, nitramines, aluminum, AP, lead)	Filter to remove solid propellant chips	~ 400 mg/kg AP detected; HMX and RDX below detection
37F	22	Late 1940s-Early 1960s	Wastewater contaminated with liquid explosives	Periodic detonation of accumulated explosive material in sump	Unit is earthen lined
37G	27	1970s-1984	Washdown from HMX/RDX grinding	Metal catch basin	No known releases
37H	32	Mid 1970s-1984	Washdown from HMX/RDX grinding	Metal catch basin	No known releases
37I	49	1940s-present	Wastewater contaminated with liquid explosives	No known release controls	Unit is earthen lined
37J	100	Mid 1970s-present	Washdown from explosives processing operations	No known release controls	Unit is earthen lined

Table 2.4 (continued)

SWMU 37 - Wastewater Sumps

Unit #	Location (Bldg. #)	Period of Operation	Waste Managed	Release Controls	History of Release
37K	103	1961-1963	Wastewater contaminated with liquid explosives	No known release controls	Unit is earthen lined
37L	105	1950s-present	Propellant contact cooling water (nitrate esters, nitramines, aluminum, AP, lead)	Filter to remove solid propellant chips	Unit is earthen lined
37M	105A	Unknown-1961	Wastewater contaminated with liquid explosives	Periodic detonation of accumulated explosive material in sump	Unit is earthen lined
37N	167	Unknown-present	Potentially received Alodine waste and/or product from Alodine treatment operations	Concrete enclosed with cover	No known releases
37O	226	1962-1970	Contact cooling water and building washdown water	No know release controls	Unit is earthen lined
37P	248	1962-1970	Contact cooling water and building washdown water	No know release controls	Unit is earthen lined
37Q	256	Late 1960s-present	Salts, sand, sediment from mandrel washdown operations	Concrete enclosed with wooden cover	No known release
37R	2003	Early 1970s-present	AP grinding washdown water	Concrete enclosed with wooden cover	Visible accumulation of AP deposits

2.2.3.4 SWMU 41: Automotive Maintenance Area Drain

This unit consists of a below grade collection drain located in the Building 7 automotive maintenance facility. The unit measures approximately two feet by two feet in area. According to facility officials, the unit discharges to one of two sumps located outside of Building 7 to the east. Accumulated sediment from the unit is collected in 55-gallon drums two times per year.

This unit started operation during the 1940s, and is currently operational.

According to the facility, this unit manages washdown water and liquids from inside the automotive maintenance building. Waste oil, coolants, and solvents are used regularly in this area. Accumulated sediment from the unit is collected in 55-gallon drums two times per year.

No release controls are associated with this unit.

No evidence of release was identified in the file material or observed during the VSI. Some minor stains were evident on the concrete surface in the vicinity of the unit. In addition, a Parts Cleaner (SWMU 38) is located approximately 15 feet north of the unit.

CONCLUSIONS:

The potential for release to air is low due to the indoor location of the unit. The potential for release to soil and groundwater is unknown because no information is available regarding the structure and integrity of the unit. The unit is located below the ground surface level so any release would be directly to soil. The potential for release to surface water is low due to the indoor location of the unit and the unit's distance from any drainage ditch or surface water body. The potential for subsurface gas generation is unknown because no information is available regrading the structure and integrity of the underground unit.

The integrity of the unit should be assessed. If the integrity is determined to be unsound, then soil samples should be collected from around the unit and analyzed to determine if any petroleum hydrocarbons, VOCS, and heavy metals are present.

2.2.3.5 AOC D: Building 181 Pit

This unit consists of a round, vertical, belowgrade terracotta pipe unit located approximately ten feet northeast of Building 181 and five feet west of a shallow drainage ditch which is part of the facility's Drainage Ditch System (SWMU 27). The unit appears to have served as a possible discharge outlet. The opening to the unit is approximately two feet in diameter and was partially covered with a broken lid. The unit is also partially overgrown with vegetation. Facility officials had no historical information regarding this unit. According to the facility, this unit does not appear to be part of any building drainage system. Facility officials speculate that it is part of a field drainage system.

CONCLUSION:

The potential for release to air is not known at this time because of the unknown volatility of the waste constituents. The potential for release to soil and groundwater is unknown because of the unknown nature of the wastes managed at this unit. The potential for release to surface water is moderate due to the unit's proximity to the Photo Solution Discharge Area I (SWMU 18) located near Building 181. The potential for subsurface gas generation is unknown at this time because of the unknown volatility of the waste constituents.

The integrity of the unit should be assessed. If the integrity is determined to be unsound, then soil samples should be collected from around the unit and analyzed to determine if any petroleum hydrocarbons, VOCs, and heavy metals are present.

3.0 CERCLA PROCESS ACTIVITIES

The investigation and remediation activities to be completed at ABL will follow the guidelines established by the USEPA as part of the CERCLA process. Once an SSA has been identified as potentially containing contaminated media (soil, sediment, groundwater, etc.) and the site screening investigation and risk screening process (both limited in scope) have determined that a potential risk to human health and/or the environment exists, the SSA will undergo the full Remedial Investigation/Feasibility Study (RI/FS) process. However, a removal action and/or an interim remedial action may also be appropriate. The decision to implement one or a combination of these actions at either already established RI/FS sites or SSAs is dependent upon the nature and extent of contamination at the site, how well it is characterized, the degree of associated human health and/or environmental risks, and the complexity of the potential remedial actions (i.e., how apparent the optimal remedy is). These CERCLA processes are described below.

3.1 RI/FS Process

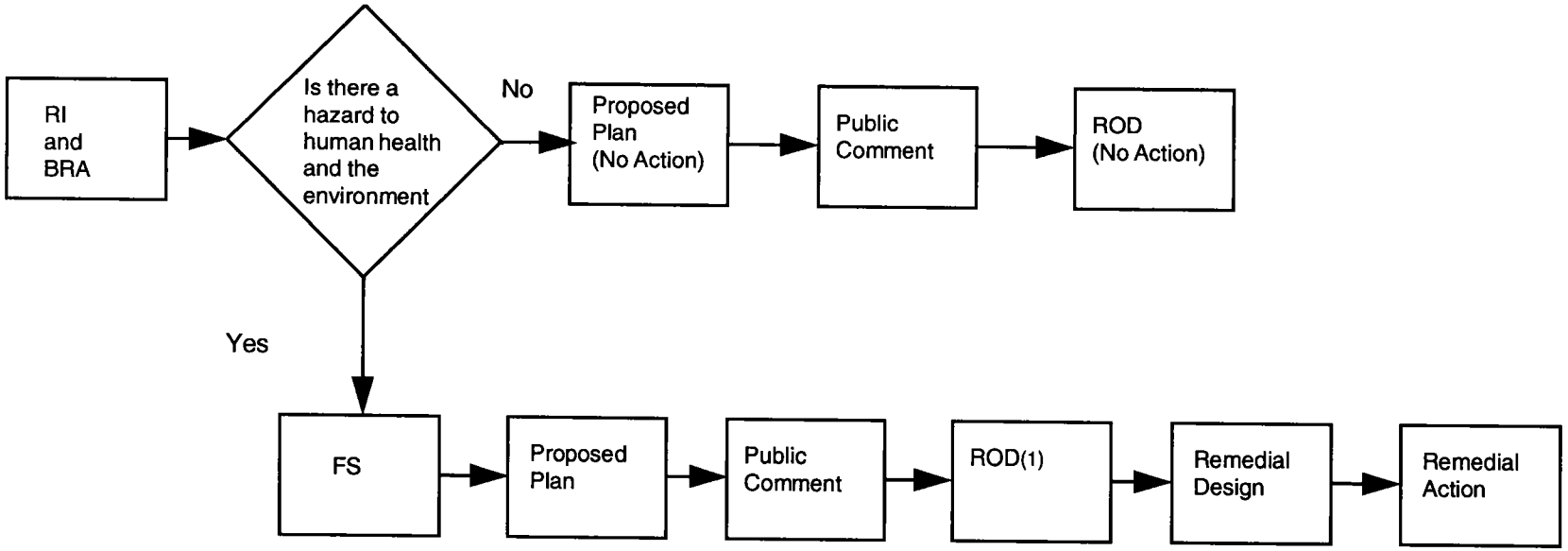
The RI/FS process is generally the longest process for investigation and remediation of CERCLA sites. Figure 3-1 outlines the steps to remedial action under the RI/FS process. For this process, a full RI, Baseline Risk Assessment and FS are completed, along with a Proposed Remedial Action Plan (PRAP) prior to the formal public comment period. After the public comments have been addressed as part of the Responsiveness Summary in the Record of Decision (ROD), the ROD is placed in the Administrative Record. Subsequent to completion of the ROD, remedial design (RD) activities are initiated, followed by the implementation of the remedial action (RA).

3.2 Removal Actions

Removal actions are those actions taken to clean up or remove released hazardous substances from the environment. In addition, a removal action may also be implemented to mitigate, minimize, or prevent damage to human health and the environment from a release or threat of a release by limiting exposure to the hazardous substances (i.e., security fencing or access limitation). Removal actions are classified as either time-critical or non-time-critical. Time-critical removal actions are taken when there is an imminent threat to human health and the environment, such as corroded drums of wastes that are leaking into groundwater. Non-time-critical removal actions are defined as actions that, based on the degree of potential risk to human health and/or the environment, may be delayed for six months or more before on-site cleanup is initiated. All removal actions currently planned at ABL are classified as non-time-critical

FIGURE 3-1

RI/FS PROCESS



RI = Remedial Investigation
BRA = Baseline Risk Assessment
FS = Feasibility Study
ROD = Record of Decision (including Responsiveness Summary)

(1) = Includes summary of any Interim Remedial Actions or Removal Actions for the Operable Unit.

removal actions. A removal action may be completed any time during the RI/FS process; however, it will often begin prior to the completion of the RI/FS to mitigate the spread of contamination.

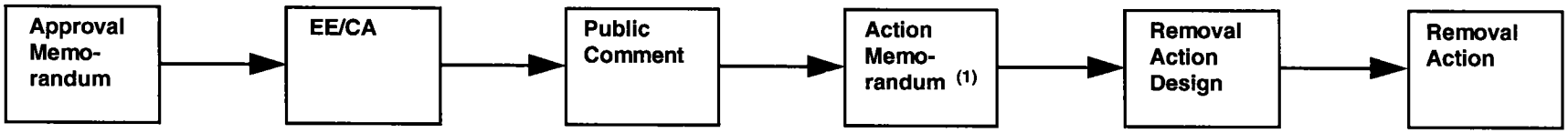
Figure 3-2 shows the general process for non-time-critical removal actions. Rather than preparing an FS, an Engineering Evaluation/Cost Analysis (EE/CA) is completed which focuses only on the substances to be removed and not on all potentially contaminated media (other contaminated media will be addressed as part of the RI/FS process). Because the scope of a removal action is typically smaller than a final, full-scale remedial action, the time frames for completion of the EE/CA, related design efforts, and implementation of the removal action are much shorter than for a full scale FS. The opportunity for public involvement is similar to the FS, with a public comment period and a Removal Action Memorandum completed to document the evaluation and choice of removal action procedures. It should be noted that a removal action may become the final remedial action if the risk screening/assessment results indicate that further remediation is not required for protection of human health and the environment. Where no further action is required at a site that has undergone a removal action, a no action ROD will be signed between the concerned parties in order to remove the site from the program.

3.3 Interim Remedial Actions

Interim remedial actions are those activities which are designed to provide temporary mitigation of potential risks posed by a site until a final remedial action is selected. As with removal actions, interim remedial actions usually take place prior to initiation of a full-scale FS because of the risks posed by the contamination in the area. For example, installation of a groundwater pump and treat system to control plume migration would be considered an interim remedial action. Initiation of an interim remedial action early in the CERCLA process might reduce costs in the long term by limiting the extent of contaminant migration.

The interim remedial action process is shown in Figure 3-3. Rather than preparing an FS, a Focused FS is completed, as is an interim ROD to document the activities to be performed. Design and implementation activities follow. It should be noted that an interim remedial action may become the final remedial action if the risk screening/assessment results for protection of human health and the environment indicate that further remediation is not required.

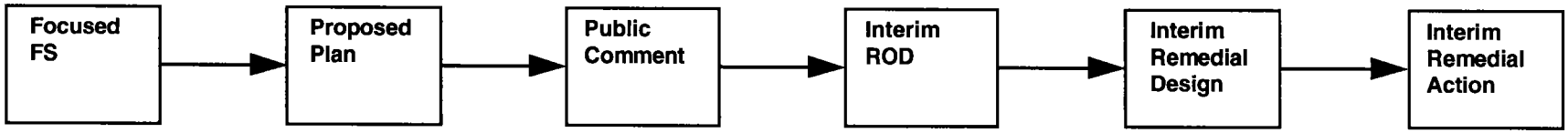
FIGURE 3-2
NON-TIME CRITICAL REMOVAL ACTION PROCESS



EE/CA = Engineering Evaluation/Cost Analysis

(1) Includes Responsiveness Summary to Public Comment

FIGURE 3-3
INTERIM REMEDIAL ACTION PROCESS



FS = Feasibility Study

ROD = Record of Decision

3.4 Treatability Studies

Treatability studies may also be conducted prior to signature of the ROD and potentially prior to finalization of the FS to better evaluate a particular technology's performance. The purpose of the treatability study is to:

- Provide sufficient data to allow treatment alternatives to be fully developed and evaluated.

- Support the remedial design of a selected alternative.

- Reduce cost and performance uncertainties for treatment alternatives to acceptable levels to aid in remedy selection.

Whether or not a treatability study will be conducted will be determined once the contaminants have been identified and the need for clean-up of that specific environmental medium is established.

5.0 SITE MANAGEMENT PLAN SCHEDULES

This section presents the project schedules for the sites and SSAs identified in Section 2 and prioritized in Section 4. Schedules depicting the major project activities for each site and SSA are provided. In addition, specific submittal deadlines planned for fiscal years 1995 and 1996 have been developed. For sites potentially undergoing RI, Baseline Risk Assessment, or FS activities in fiscal years 1995 or 1996, detailed master schedules showing all report preparation and review cycles, through completion of RD activities, are included in Appendix A. Table 5-5 presents deadlines and target dates for activities planned during fiscal years 1995 and 1996. Appendix B presents summary schedules, including target dates, for all activities scheduled to begin after FY 96.

The schedules were developed based on currently available information and are intended to be adjusted annually or in the work plan stage as new site data become available. In general, the schedules were developed in accordance with the expected FFA for Allengany Ballistics Laboraotry, WV. In some cases, however (e.g., for documents expected to be short in length), review periods have been decreased in order to expedite the project schedule. It is acknowledged that these accelerated review periods do not correspond with the established FFA periods. When possible, it is projected that these review periods will be achieved.

5.1 Scheduling Assumptions

Assumptions regarding document review periods and deviations from the FFA are discussed in the following section.

5.1.1 Federal Facility Agreement Assumptions

RI/FS and RD/RA deliverables are classified as "primary" or "secondary" documents in the FFA, as shown in Table 5-1. A primary document is typically a major, discrete portion of an RI/FS or RD/RA activity, whereas a secondary document may be a discrete portion of a primary document or may serve as a feeder document to a primary document. The project schedules have been developed using the primary and secondary document review and comment process specified in the FFA. This process is summarized in Table 5-2.

The time required for document review will vary according to its length and complexity. In an effort to expedite document finalization, the draft document review period has been decreased from the FFA 60-day duration to a 30-day period for the secondary documents listed below:

TABLE 5-1

PRIMARY AND SECONDARY DOCUMENTS AS DEFINED IN THE FFA
NAVAL INDUSTRIAL RESEVRE ORDNANCE PLANT
ROCKET CENTER, WEST VIRGINIA

Primary Documents	Secondary Documents
Site Screening Process Work Plans	Health and Safety Plans
Site Screening Process Reports	Non-Time Critical Removal Action Plans
RI/FS and FFS Work Plans	Pilot/Treatability Study Work Plans
Remedial Investigation Reports	Pilot/Treatability Study Reports
FS and FFS Reports	N/A
Proposed Plans	Engineering Evaluation/Cost Analysis Reports
	Well Closure Methods and Procedures
Final Remedial Designs	N/A
Remedial Action Work Plans •Remedial Action Sampling Plan •Remedial Action Construction Quality Assurance Plan •Remedial Action Environmental Monitoring Plan	Preliminary Conceptual Design or Equivalent Documents
Remedial Action Completion Reports	Prefinal Remedial Designs
Operation and Maintenance Plans	Periodic Review Assessment Reports
Site Management Plan	Removal Action Memorandums
Community Relations Plan (for submission only)	N/A
Long-Term Remedial Action Monitoring Plan (for submission only)	N/A

RI/FS = Remedial Investigation/Feasibility Study
FFS = Focused Feasibility Study
N/A = Not Applicable

TABLE 5-2

PRIMARY AND SECONDARY DOCUMENT REVIEW PROCESS
NAVAL INDUSTRIAL RESEVRE ORDNANCE PLANT
ROCKET CENTER, WEST VIRGINIA

Primary Document	Review Duration	Secondary Document	Review Duration
Draft Document	60 Days	Draft Document	60 Days
Incorporation of Comments	60 Days	Incorporation of Comments	30 Days
Draft Final Document	30 Days	N/A	
Final Document		Final Document	

Table 5-3

- •Treatability Study Work Plan
- •Treatability Study Report
- •Engineering Evaluation/Cost Analysis Report
- •Removal Action Memorandum

These secondary documents are expected to be short in length and relatively straightforward in nature compared to the other primary and secondary documents listed in Table 5-1.

5.1.2 Document Preparation, Field Investigation, and SampleAnalysis/Validation Assumptions

Durations for work plan preparation and field investigation activities have been based on the available information for the sites while taking into account the overall complexity of each area (e.g., size, media types, potential receptors, proximity to other sites), as well as the sampling efforts needed to support RI/FS activities (i.e., required to fill existing risk-, hydrogeologic-, and engineering-related data gaps). These factors will be more thoroughly evaluated during development of the work plans.

Work Plan development, field investigation, and sample analysis/validation activities for the sites and SSAs have been combined to optimize coordination of these efforts (e.g., document review, field mobilization/demobilization, database management). The site/SSA groupings and estimated work plan (both RI and SSP) and field investigation durations are summarized in Table 5-3.

The work plan durations represent the estimated time required to generate the first draft document (referred to as the Preliminary Draft). Preliminary Draft SSP Work Plans are anticipated to take slightly longer than Work Plans for established RI/FS sites because a geophysical investigation was assumed to

TABLE 5-4

DOCUMENT PREPARATION DURATIONS
NAVAL INDUSTRIAL RESEVRE ORDNANCE PLANT
ROCKET CENTER, WEST VIRGINIA

Document	Duration (Months) (1)
Site Screening Process Report	3
Remedial Investigation Report	4
Feasibility Study	4
Proposed Plan	2
Record of Decision	2
Draft Remedial Design	5
Prefinal Remedial Design	2
Final Design	2
Engineering Evaluation/Cost Analysis	2
Removal Action Memorandum	1
30% Removal Action Design	1
90% Removal Action Design	2
Final Removal Action Design	1
Treatability Study Work Plan	2
Treatability Study Report	1

(1) Durations represent estimated time required to complete Preliminary Draft Documents.

occur during work plan development to aid in the selection of sample locations. The field investigation durations include the time required for subcontractor procurement and mobilization of equipment and personnel.

With respect to sample analysis, a 30-day duration was assumed for all laboratory analyses, which is the standard turnaround time for the Naval Energy and Environmental Support Activity (NEESA)-approved laboratories. For data validation, a 15-day duration was assumed for all analytical data, which also is the standard turnaround time for the data validation firms.

For preparation of other RI/FS and RD/RA documents, "typical" or "average" durations were assumed based on prior experience in preparing these reports. Assumptions concerning document preparation are outlined in Table 5-4. More accurate estimates of document preparation times can be made in subsequent SMPs as more data become available; estimates will be updated in each site-specific work plan.

5.2 Site Management Plan Schedules

This section presents the SMP proposed activities and schedules for the sites and SSAs identified in Section 2 and prioritized in Section 4. Detailed SMP schedules for the RI/FS/RD activities are presented

This section presents the SMP proposed activities and schedules for the sites and SSAs identified in Section 2 and prioritized in Section 4. Detailed SMP schedules for the RI/FS/RD activities are presented in Appendix A for work beginning at the sites and SSAs in fiscal years 1995 and 1996. Appendix B presents summary schedules for those activities beginning in fiscal year 1997.

The basic strategy employed during development of the SMP schedules was to overlap the RI/FS and RD/RA activities to the maximum extent practicable in order to compress the entire project schedule as much as possible. The amount of overlap was based on the degree of dependency between the various tasks and documents. Key dependencies and related assumptions are outlined below.

- Remedial Investigation: Preparation of the Preliminary Draft RI was assumed to start once all the analytical data are received, prior to completion of data validation. Certain RI tasks can begin before the data are validated; to prevent duplication of effort, this overlap was assumed to be two weeks.

- Feasibility Study: Preparation of the Preliminary Draft FS was assumed to start approximately two months following the start of the RI. Many FS tasks are dependent on the nature and extent of contamination which is determined in the RI document. The time required to develop and compile this information is typically two months.

- Proposed Plan: Preparation of the Preliminary Draft Proposed Plan was assumed to start following receipt of USEPA/State comments on the Draft FS since selection of the proposed remedial action(s) is dependent on USEPA/State approval of the recommended alternative(s).

- Record of Decision: Preparation of the Draft ROD was assumed to start following closure of the public comment period on the Proposed Plan since community acceptance must be considered prior to selection of the interim or final remedial action(s).

- Remedial Design: The RD was assumed to start following finalization of the ROD since concurrence with the selected alternative(s) must be obtained before design activities can begin.

5.2.1 Proposed Removal Actions

Removal actions are currently planned for the following sites and SSAs in FY 94:

- Site 7

The removal actions planned for site 7 involves the removal of the entire lanfill fill contents. Schedules for the removal action is presented in Figure A-4.

5.2.2 RI/FS and RD/RA SMP Schedules

Figures A-1 through A-5 present detailed schedules, including submittal deadlines, for the activities beginning in fiscal years 1995 and 1996 through completion. As stated previously, these schedules will be updated annually in each FY SMP and in the specific work plans designed for each site.

5.2.3 Treatability Study SMP Schedule

None

TABLE 5-5

DEADLINES AND TARGET DATES FOR FISCAL YEARS 1995 AND 1996
NAVAL INDUSTRIAL RESEVRE ORDNANCE PLANT
ROCKET CENTER, WEST VIRGINIA

Submittal	Fiscal Year 1995	Fiscal Year 1996
Site 1		
Field Investigation	Completion Sampling and Anaylsis	
Remedial Investigation Report	Draft Draft Final Final	
Feasibility Study Report	Draft Draft Final Final	
Proposed Plan		Draft Draft Final Final
Redord of Decision		Draft Draft Final Final
Sites 2, 3, 10 (PWA)		
Field Investigation	Completion Sampling and Anaylsis	
Remedial Investigation Report	Draft Draft Final	Final
Feasibililty Study Report	Draft	Draft Final Final
Proposed Plan		Draft Draft Final Final

TABLE 5-5 (Continued)

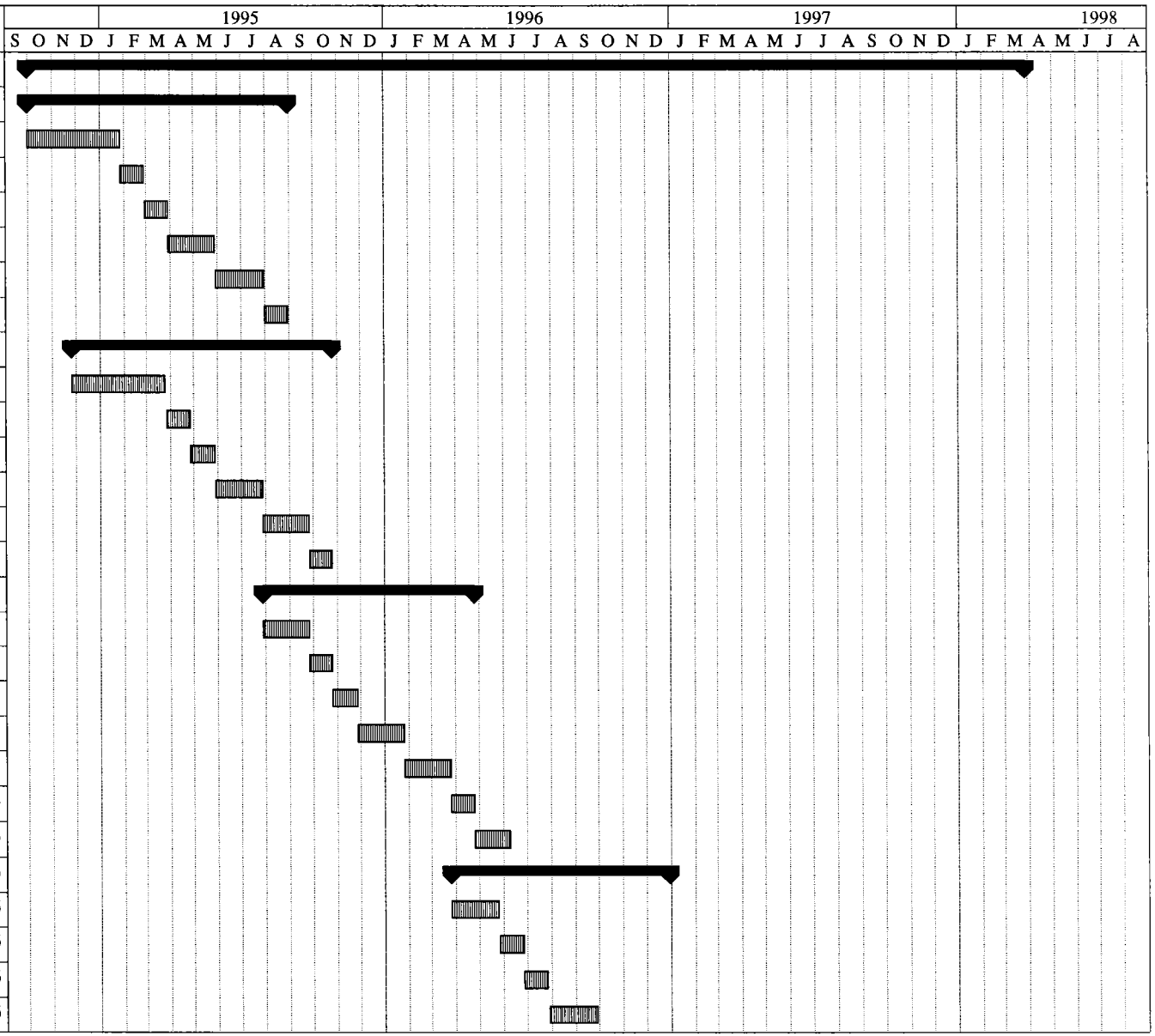
DEADLINES AND TARGET DATES FOR FISCAL YEARS 1995 AND 1996
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
ROCKET CENTER, WEST VIRGINIA

Record of Decision		Draft Draft Final Final
Site 5		
Field Investigation	Completion Sampling and Anaylsis	
Remedial Investigation Report	Draft Draft Final	Final
Feasibility Study Report	Draft	Draft Final Final
Proposed Plan		Draft Draft Final Final
Record of Decision		Draft Draft Final Final
Removal Action - Site 7		
SSA XXX		
Site 1		
Treatability Study Evaluation Report	Draft Final	
Treatability Study Work Plans		Draft Final
Treatment		Completion Sampling and Analysis
Treatability Study Report		Draft

Figure A - 1

Site 1 Remedial Investigation, Feasibility Study, Proposed Plan, Record of Decision, and Design
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
Site 1	911d	9/30/94	3/28/98
REMEDIAL INVESTIGATION	238d	9/30/94	8/30/95
Preliminary Draft	119ed	9/30/94	1/27/95
Review (Navy)	30ed	1/27/95	2/26/95
Draft	30ed	2/27/95	3/29/95
Review (EPA/State)	60ed	3/29/95	5/28/95
Draft Final	62ed	5/29/95	7/30/95
Final	30ed	7/31/95	8/30/95
FEASIBILITY STUDY	239d	11/25/94	10/26/95
Preliminary Draft	120ed	11/25/94	3/25/95
Review (Navy)	30ed	3/27/95	4/26/95
Draft	32ed	4/26/95	5/28/95
Review (EPA/State)	60ed	5/29/95	7/28/95
Draft Final	60ed	7/28/95	9/26/95
Final	30ed	9/26/95	10/26/95
PROPOSED PLAN	194d	7/28/95	4/25/96
Preliminary Draft	60ed	7/28/95	9/26/95
Review (Navy)	30ed	9/26/95	10/26/95
Draft	32ed	10/26/95	11/27/95
Review (EPA/State)	60ed	11/27/95	1/26/96
Draft Final	60ed	1/26/96	3/26/96
Final	30ed	3/26/96	4/25/96
PUBLIC COMMENT PERIOD	45ed	4/25/96	6/9/96
RECORD OF DECISION	199d	3/26/96	12/30/96
Preliminary Draft	60ed	3/26/96	5/25/96
Review (Navy)	31ed	5/27/96	6/27/96
Draft	30ed	6/27/96	7/27/96
Review (EPA/State)	61ed	7/29/96	9/28/96



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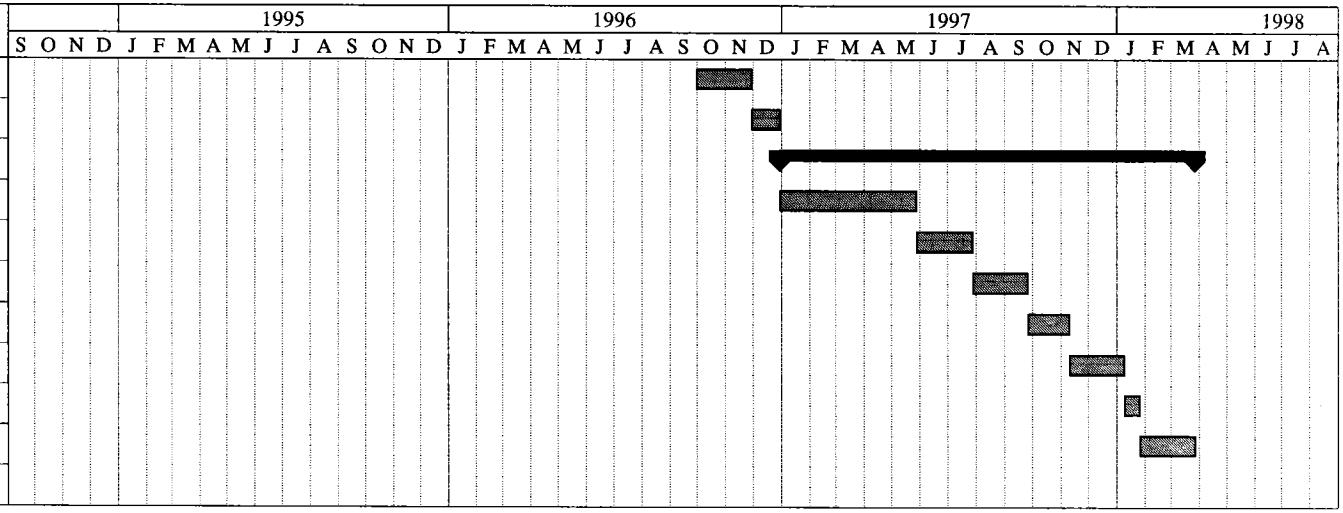
Critical Noncritical Progress Task Summary

Figure A - 1

Site 1 Remedial Investigation, Feasibility Study, Proposed Plan, Record of Decision, and Design
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
Draft Final	60ed	9/30/96	11/29/96
Final	31ed	11/29/96	12/30/96
REMEDIAL DESIGN	324d	12/30/96	3/27/98
Draft Remedial Design/Work Plans	149ed	12/30/96	5/28/97
Review (Navy/EPA/State)	61ed	5/28/97	7/28/97
Prefinal Remedial Design/Work Plans	60ed	7/28/97	9/26/97
Review (Navy/EPA/State)	45ed	9/26/97	11/10/97
Final Remedial Design/ Work Plans	60ed	11/10/97	1/9/98
Review/Concurrance (EPA/State)	17ed	1/9/98	1/26/98
Construction Contracting	60ed	1/26/98	3/27/98
REMEDIAL ACTION	1ed	3/27/98	3/28/98

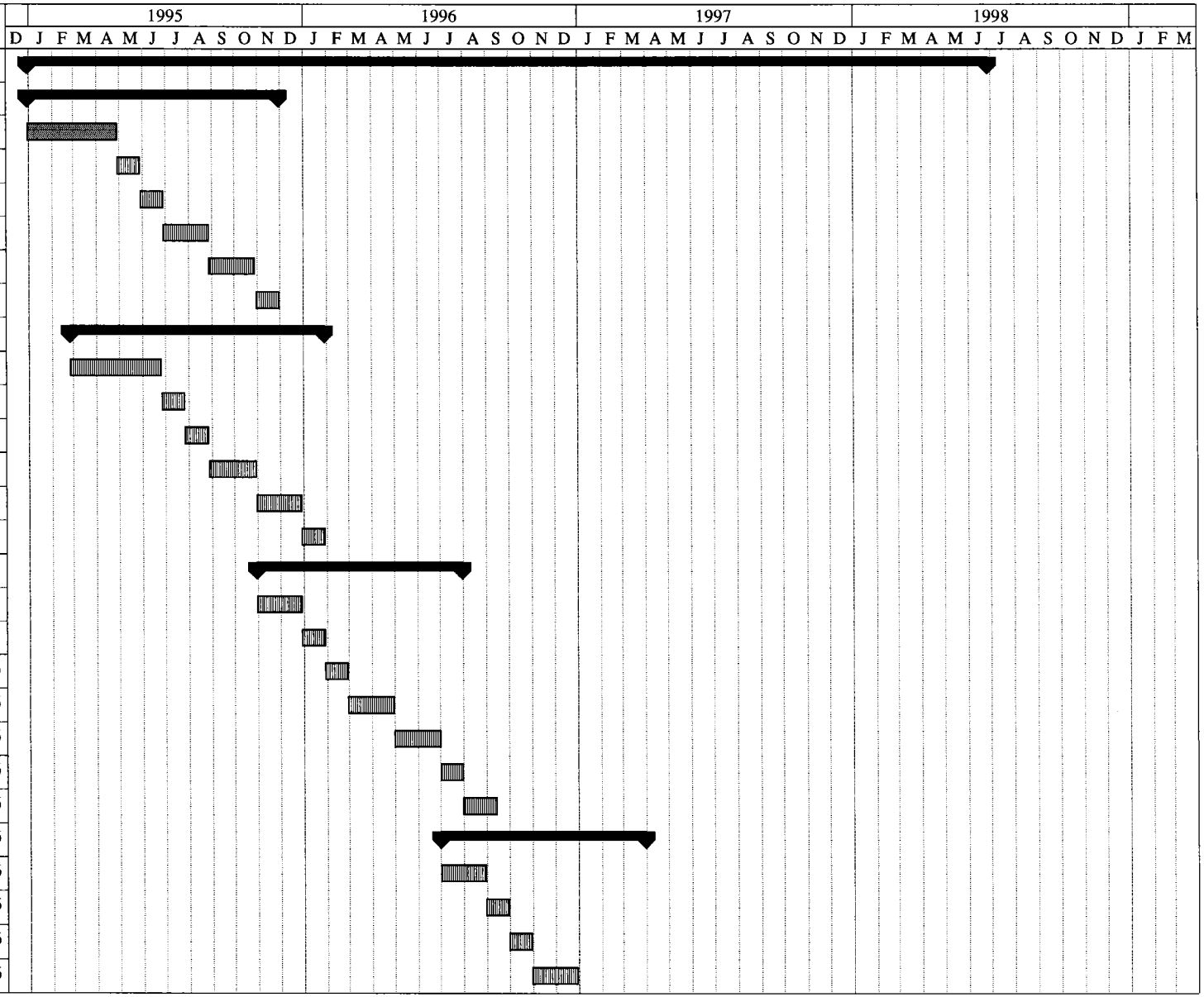


Critical Noncritical Progress Task Summary

Figure A - 2

Operable Unit #2, Sites 2, 3 and PWA Remedial Investigation, Feasibility Study, Proposed Plan, Record of Decision, and Design
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START
Operable Unit #2, Site 2, 3 and 10 (PWA)	911d	12/30/94
REMEDIAL INVESTIGATION	238d	12/30/94
Preliminary Draft	119ed	12/30/94
Review (Navy)	30ed	4/28/95
Draft	30ed	5/29/95
Review (EPA/State)	61ed	6/28/95
Draft Final	61ed	8/28/95
Final	30ed	10/30/95
FEASIBILITY STUDY	241d	2/24/95
Preliminary Draft	121ed	2/24/95
Review (Navy)	30ed	6/26/95
Draft	32ed	7/26/95
Review (EPA/State)	62ed	8/28/95
Draft Final	60ed	10/30/95
Final	31ed	12/29/95
PROPOSED PLAN	197d	10/30/95
Preliminary Draft	60ed	10/30/95
Review (Navy)	31ed	12/29/95
Draft	30ed	1/29/96
Review (EPA/State)	62ed	2/28/96
Draft Final	62ed	4/30/96
Final	30ed	7/1/96
PUBLIC COMMENT PERIOD	45ed	7/31/96
RECORD OF DECISION	195d	7/1/96
Preliminary Draft	60ed	7/1/96
Review (Navy)	31ed	8/30/96
Draft	30ed	9/30/96
Review (EPA/State)	61ed	10/30/96



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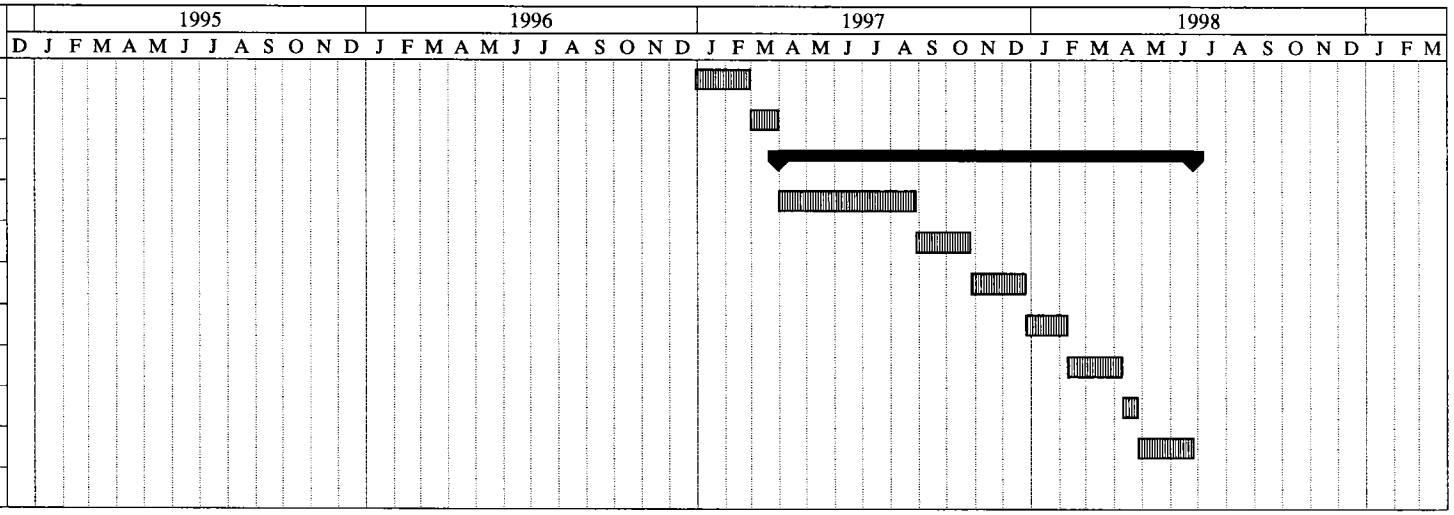
Critical Noncritical Progress Task Summary

Figure A - 2

Operable Unit #2, Sites 2, 3 and PWA Remedial Investigation, Feasibility Study, Proposed Plan, Record of Decision, and Design
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START
Draft Final	60ed	12/30/96
Final	31ed	2/28/97
REMEDIAL DESIGN	324d	3/31/97
Draft Remedial Design/Work Plans	150ed	3/31/97
Review (Navy/EPA/State)	60ed	8/28/97
Prefinal Remedial Design/Work Plans	60ed	10/27/97
Review (Navy/EPA/State)	45ed	12/26/97
Final Remedial Design/Work Plans	60ed	2/9/98
Review/Concurrance (EPA/State)	17ed	4/10/98
Construction Contracting	60ed	4/27/98
REMEDIAL ACTION	1ed	6/26/98

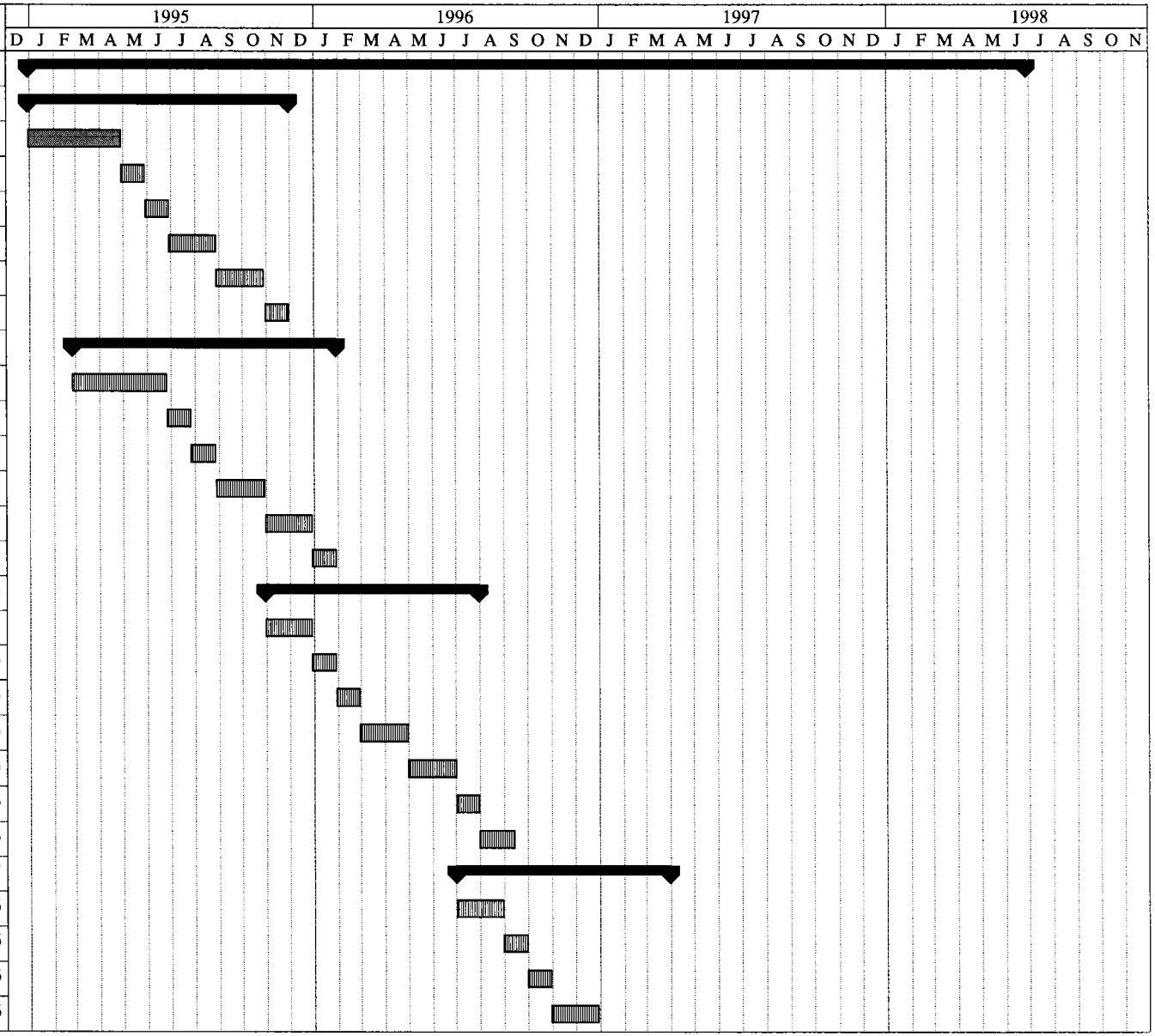


Critical Noncritical Progress Task Summary

Figure A - 3

Site 5 Remedial Investigation, Feasibility Study, Proposed Plan, Record of Decision, and Design
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
Site #5	911d	12/30/94	6/27/98
REMEDIAL INVESTIGATION	238d	12/30/94	11/29/95
Preliminary Draft	119ed	12/30/94	4/28/95
Review (Navy)	30ed	4/28/95	5/28/95
Draft	30ed	5/29/95	6/28/95
Review (EPA/State)	61ed	6/28/95	8/28/95
Draft Final	61ed	8/28/95	10/28/95
Final	30ed	10/30/95	11/29/95
FEASIBILITY STUDY	241d	2/24/95	1/29/96
Preliminary Draft	121ed	2/24/95	6/25/95
Review (Navy)	30ed	6/26/95	7/26/95
Draft	32ed	7/26/95	8/27/95
Review (EPA/State)	62ed	8/28/95	10/29/95
Draft Final	60ed	10/30/95	12/29/95
Final	31ed	12/29/95	1/29/96
PROPOSED PLAN	197d	10/30/95	7/31/96
Preliminary Draft	60ed	10/30/95	12/29/95
Review (Navy)	31ed	12/29/95	1/29/96
Draft	30ed	1/29/96	2/28/96
Review (EPA/State)	62ed	2/28/96	4/30/96
Draft Final	62ed	4/30/96	7/1/96
Final	30ed	7/1/96	7/31/96
PUBLIC COMMENT PERIOD	45ed	7/31/96	9/14/96
RECORD OF DECISION	195d	7/1/96	3/31/97
Preliminary Draft	60ed	7/1/96	8/30/96
Review (Navy)	31ed	8/30/96	9/30/96
Draft	30ed	9/30/96	10/30/96
Review (EPA/State)	61ed	10/30/96	12/30/96



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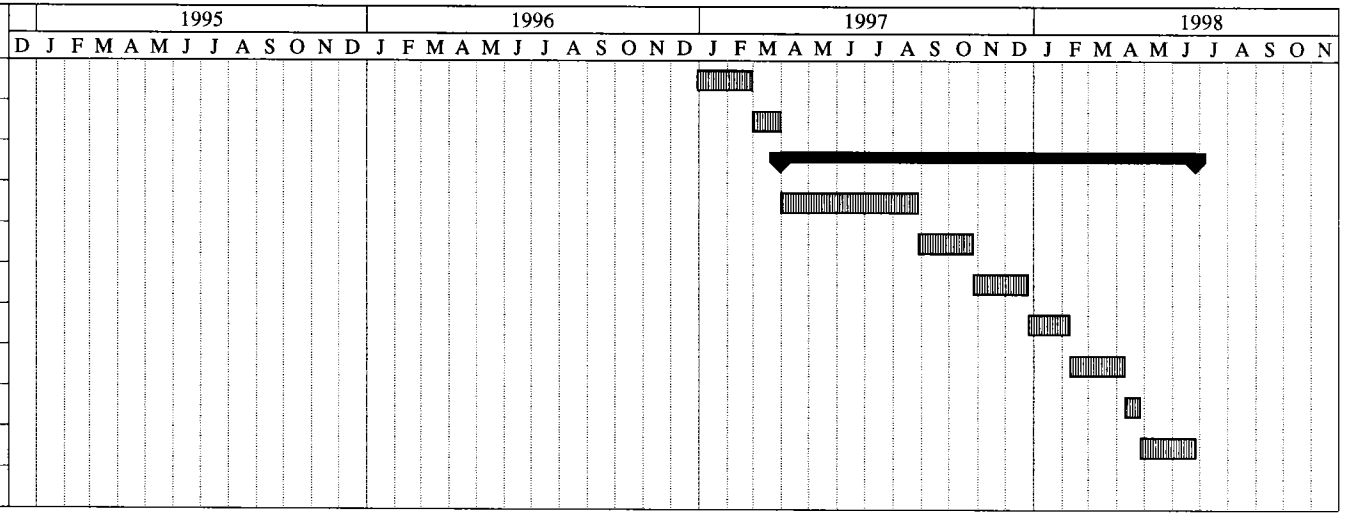
Critical Noncritical Progress Task Summary

Figure A - 3

Site 5 Remedial Investigation, Feasibility Study, Proposed Plan, Record of Decision, and Design
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
Draft Final	60ed	12/30/96	2/28/97
Final	31ed	2/28/97	3/31/97
REMEDIAL DESIGN	324d	3/31/97	6/26/98
Draft Remedial Design/Work Plans	150ed	3/31/97	8/28/97
Review (Navy/EPA/State)	60ed	8/28/97	10/27/97
Prefinal Remedial Design/Work Plans	60ed	10/27/97	12/26/97
Review (Navy/EPA/State)	45ed	12/26/97	2/9/98
Final Remedial Design/Work Plans	60ed	2/9/98	4/10/98
Review/Concurrance (EPA/State)	17ed	4/10/98	4/27/98
Construction Contracting	60ed	4/27/98	6/26/98
REMEDIAL ACTION	1ed	6/26/98	6/27/98

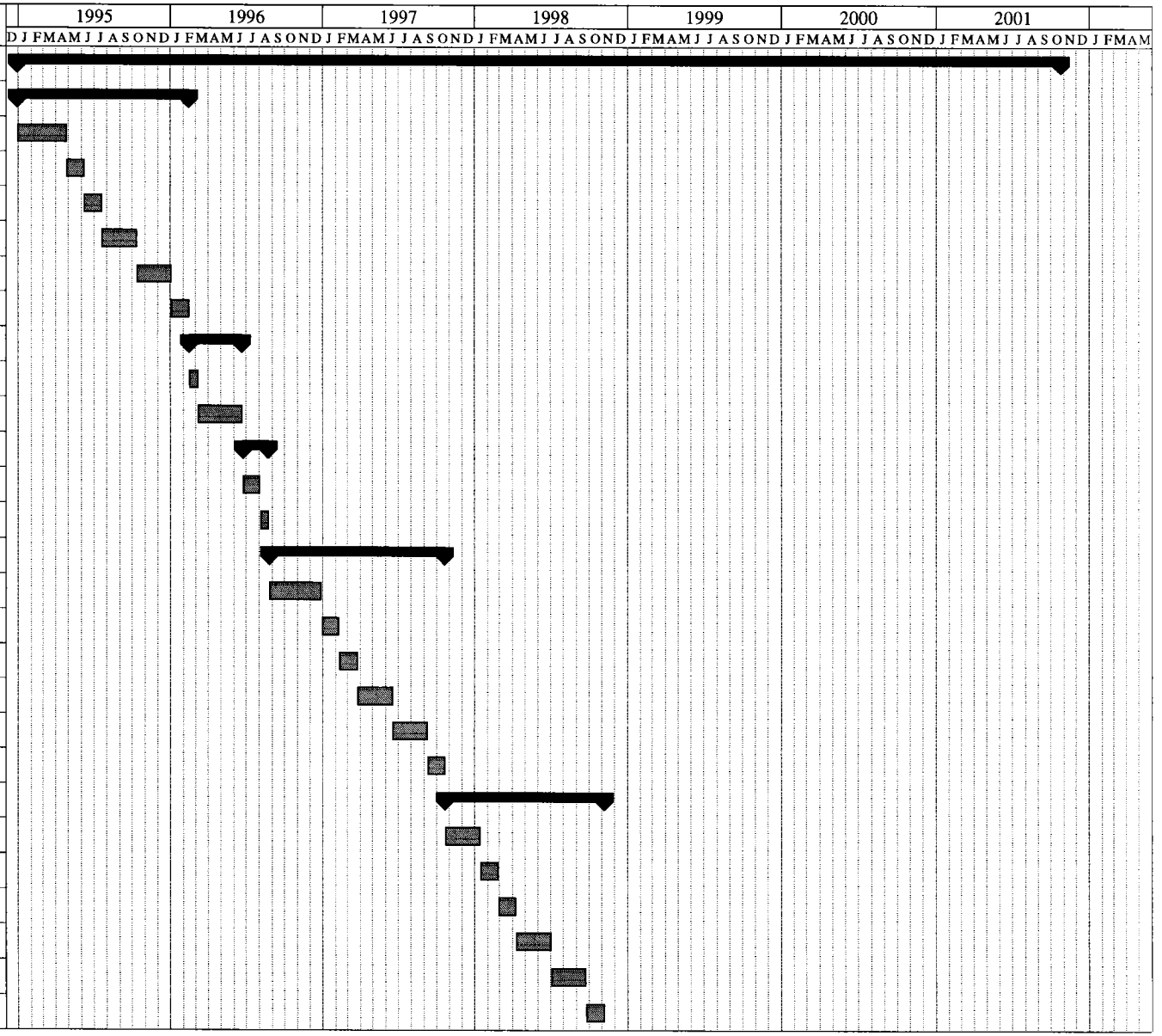


Critical Noncritical Progress Task Summary

Figure A - 4

RCRA Facility Investigation Sites Work Plans and Field Investigations
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
Site Screening Areas	**1779d**	**12/30/94**	**10/25/01**
SSA WORK PLAN	**294d**	**12/30/94**	**2/14/96**
Preliminary Draft	84d	12/30/94	4/26/95
Review (Navy)	30d	4/27/95	6/7/95
Draft	30d	6/8/95	7/19/95
Review (EPA/State)	60d	7/20/95	10/11/95
Draft Final	59d	10/12/95	1/2/96
Final	31d	1/3/96	2/14/96
SSA FIELD INVESTIGATION	**92d**	**2/15/96**	**6/21/96**
Mobilization	16d	2/15/96	3/7/96
Field Investigation	76d	3/8/96	6/21/96
SAMPLE ANALYSIS/VALIDATION	**45d**	**6/24/96**	**8/23/96**
Sample Analysis	30d	6/24/96	8/2/96
Data Validation	15d	8/5/96	8/23/96
SSA REPORT	**302d**	**8/26/96**	**10/21/97**
Preliminary Draft	90d	8/26/96	12/27/96
Review (Navy)	30d	12/30/96	2/7/97
Draft	32d	2/10/97	3/25/97
Review (EPA/State)	60d	3/26/97	6/17/97
Draft Final	60d	6/18/97	9/9/97
Final	30d	9/10/97	10/21/97
RI WORK PLAN	**273d**	**10/22/97**	**11/6/98**
Preliminary Draft	60d	10/22/97	1/13/98
Review (Navy)	32d	1/14/98	2/26/98
Draft	30d	2/27/98	4/9/98
Review (EPA/State)	60d	4/10/98	7/2/98
Draft Final	59d	7/3/98	9/23/98
Final	32d	9/24/98	11/6/98



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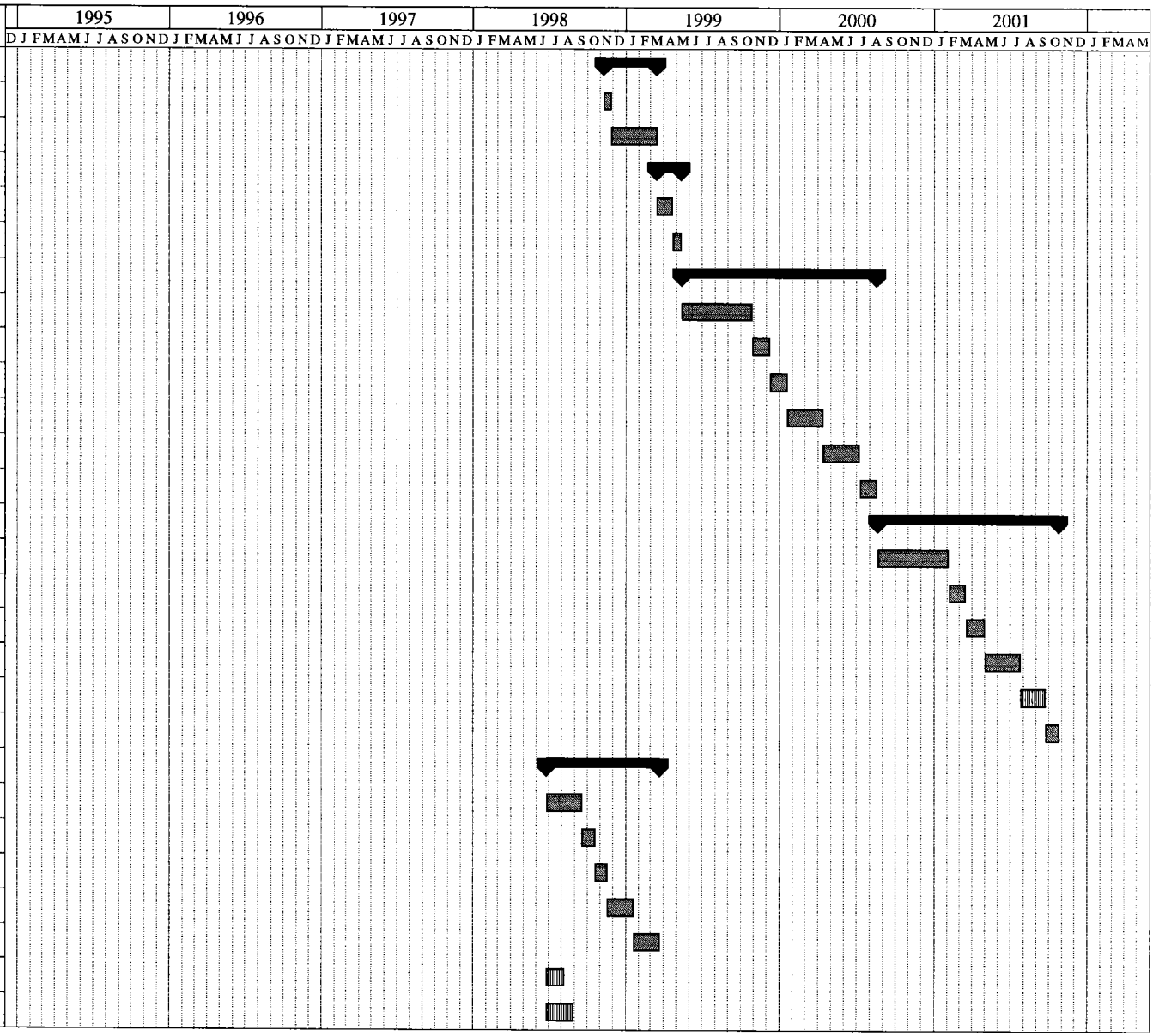
Critical Noncritical Progress Task Summary

Figure A - 4

RCRA Facility Investigation Sites Work Plans and Field Investigations
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
RI FIELD INVESTIGATION	**91d**	**11/9/98**	**3/15/99**
Mobilization	14d	11/9/98	11/26/98
Field Investigation	77d	11/27/98	3/15/99
SAMPLE ANALYSIS/VALIDATION	**43d**	**3/16/99**	**5/13/99**
Sample Analysis	28d	3/16/99	4/22/99
Data Validation	15d	4/23/99	5/13/99
RI REPORT	**331d**	**5/14/99**	**8/18/00**
Preliminary Draft	119d	5/14/99	10/27/99
Review (Navy)	30d	10/28/99	12/8/99
Draft	30d	12/9/99	1/19/00
Review (EPA/State)	60d	1/20/00	4/12/00
Draft Final	62d	4/13/00	7/7/00
Final	30d	7/10/00	8/18/00
FS REPORT	**308d**	**8/21/00**	**10/25/01**
Preliminary Draft	120d	8/21/00	2/2/01
Review (Navy)	30d	2/5/01	3/16/01
Draft	32d	3/19/01	5/1/01
Review (EPA/State)	60d	5/2/01	7/24/01
Draft Final	60ed	7/25/01	9/23/01
Final	31ed	9/24/01	10/25/01
PROPOSED PLAN	**191d**	**6/26/98**	**3/22/99**
Preliminary Draft	60d	6/26/98	9/17/98
Review (Navy)	31ed	9/18/98	10/19/98
Draft	30ed	10/19/98	11/18/98
Review (EPA/State)	62ed	11/18/98	1/19/99
Draft Final	62ed	1/19/99	3/22/99
Final	30d	6/26/98	8/6/98
PUBLIC COMMENT PERIOD	45d	6/26/98	8/27/98



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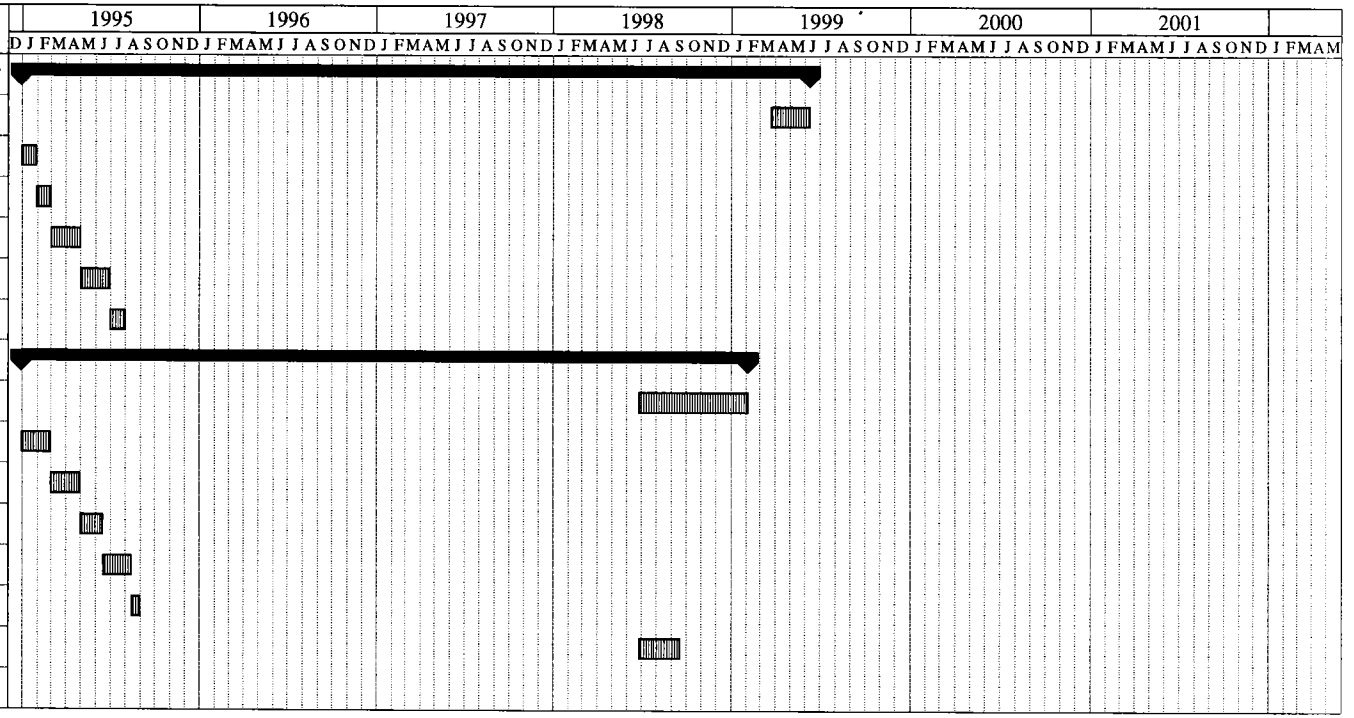
Date: 7/13/94

Critical Noncritical Progress Task Summary

Figure A - 4

RCRA Facility Investigation Sites Work Plans and Field Investigations
Naval Industrial Reserve Ordanance Plant, Rocket Center, West Virginia

TASK	DAYS	START	FINISH
RECORD OF DECISION	**1161d**	**12/30/94**	**6/11/99**
Preliminary Draft	60d	3/22/99	6/11/99
Review (Navy)	31ed	12/30/94	1/30/95
Draft	30ed	1/30/95	3/1/95
Review (EPA/State)	61ed	3/1/95	5/1/95
Draft Final	60ed	5/1/95	6/30/95
Final	31ed	6/30/95	7/31/95
REMEDIAL DESIGN	**1070d**	**12/30/94**	**2/4/99**
Draft Remedial Design/Work Plans	160d	6/26/98	2/4/99
Review (Navy/EPA/State)	60ed	12/30/94	2/28/95
Prefinal Remedial Design/Work Plans	60ed	2/28/95	4/29/95
Review (Navy/EPA/State)	45ed	5/1/95	6/15/95
Final Remedial Design/Work Plans	60ed	6/15/95	8/14/95
Review/Concurrance (EPA/State)	17ed	8/14/95	8/31/95
Construction Contracting	60d	6/26/98	9/17/98
REMEDIAL ACTION	1d	9/18/98	9/18/98

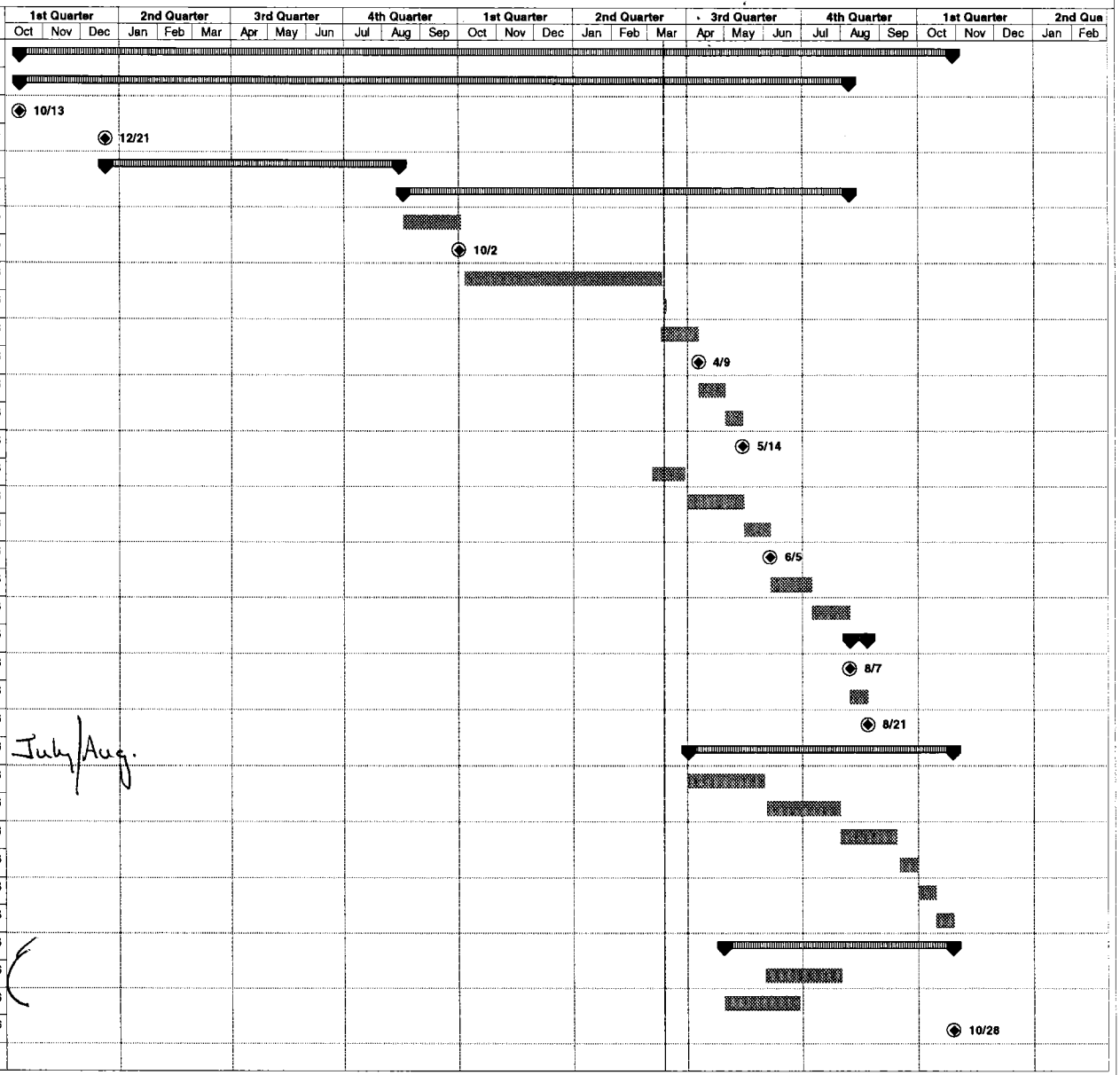


Page: 3
Date: 7/13/94

Critical Noncritical Progress Task Summary

INSTALLATION RESTORATION PROGRAM
at
Site 1, Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
1	**Site 1 Project Plan**	**747d**	**Thu 10/13/94**	**Mon 10/28/96**
2	**RI/FS at Site 1**	**665d**	**Thu 10/13/94**	**Wed 8/7/96**
3	Final RI/FS Workplan	0d	Thu 10/13/94	Thu 10/13/94
4	Complete Fieldwork	0d	Wed 12/21/94	Wed 12/21/94
5	**RI Report & Risk Assess.**	**237d**	**Wed 12/21/94**	**Tue 8/15/95**
13	**FS Report and Proposed Plan**	**356d**	**Fri 8/18/95**	**Wed 8/7/96**
14	Prepare Draft FS Report	46d	Fri 8/18/95	Mon 10/2/95
15	Issue Draft FS Report	0d	Mon 10/2/95	Mon 10/2/95
16	Agency Review	158d	Fri 10/6/95	Mon 3/11/96
17	Resolve exceptions to comments	1d	Thu 3/14/96	Thu 3/14/96
18	Incorporate comments, revise FS	30d	Mon 3/11/96	Tue 4/9/96
19	Issue Draft Final GW FS Report	0d	Tue 4/9/96	Tue 4/9/96
20	Agency review	21d	Wed 4/10/96	Tue 4/30/96
21	Incorporate comments	14d	Wed 5/1/96	Tue 5/14/96
22	Issue Final GW FS Report	0d	Tue 5/14/96	Tue 5/14/96
23	Develop Proposed GW Plan	26d	Mon 3/4/96	Fri 3/29/96
24	Regulatory agency review	45d	Mon 4/1/96	Wed 5/15/96
25	Incorporate comments	21d	Thu 5/16/96	Wed 6/5/96
26	Notice of Availability	0d	Wed 6/5/96	Wed 6/5/96
27	Public comment	33d	Thu 6/6/96	Mon 7/8/96
28	Response to comments	30d	Tue 7/9/96	Wed 8/7/96
29	**Record of Decision (ROD)**	**14d**	**Wed 8/7/96**	**Wed 8/21/96**
30	Issue ROD for signature	0d	Wed 8/7/96	Wed 8/7/96
31	Sign ROD	14d	Thu 8/8/96	Wed 8/21/96
32	Issue Final ROD	0d	Wed 8/21/96	Wed 8/21/96
33	**Remedial Design**	**210d**	**Tue 4/2/96**	**Mon 10/28/96**
34	GE, SOW & Award Design	60d	Tue 4/2/96	Fri 5/31/96
35	Prepare 60% P&S	58d	Mon 6/3/96	Tue 7/30/96
36	Agency Review	45d	Wed 7/31/96	Fri 9/13/96
37	Revise & Issue 100% P&S	15d	Mon 9/16/96	Mon 9/30/96
38	Agency review	14d	Tue 10/1/96	Mon 10/14/96
39	Revise & Issue Final P&S	14d	Tue 10/15/96	Mon 10/28/96
40	**Remedial Action**	**182d**	**Tue 4/30/96**	**Mon 10/28/96**
41	Develop SOW, negotiate & award RA	60d	Sun ~~6/2/96~~ 6/3	Wed 7/31/96
42	Dev. SOW, negotiate & award PCAS	60d	Tue ~~4/30/96~~ 4/3	Fri 6/28/96
43	Initiate fieldwork	0d	Mon 10/28/96	Mon 10/28/96
44				



Project: Site 1 Schedule to RA
Date: Wed 3/13/96
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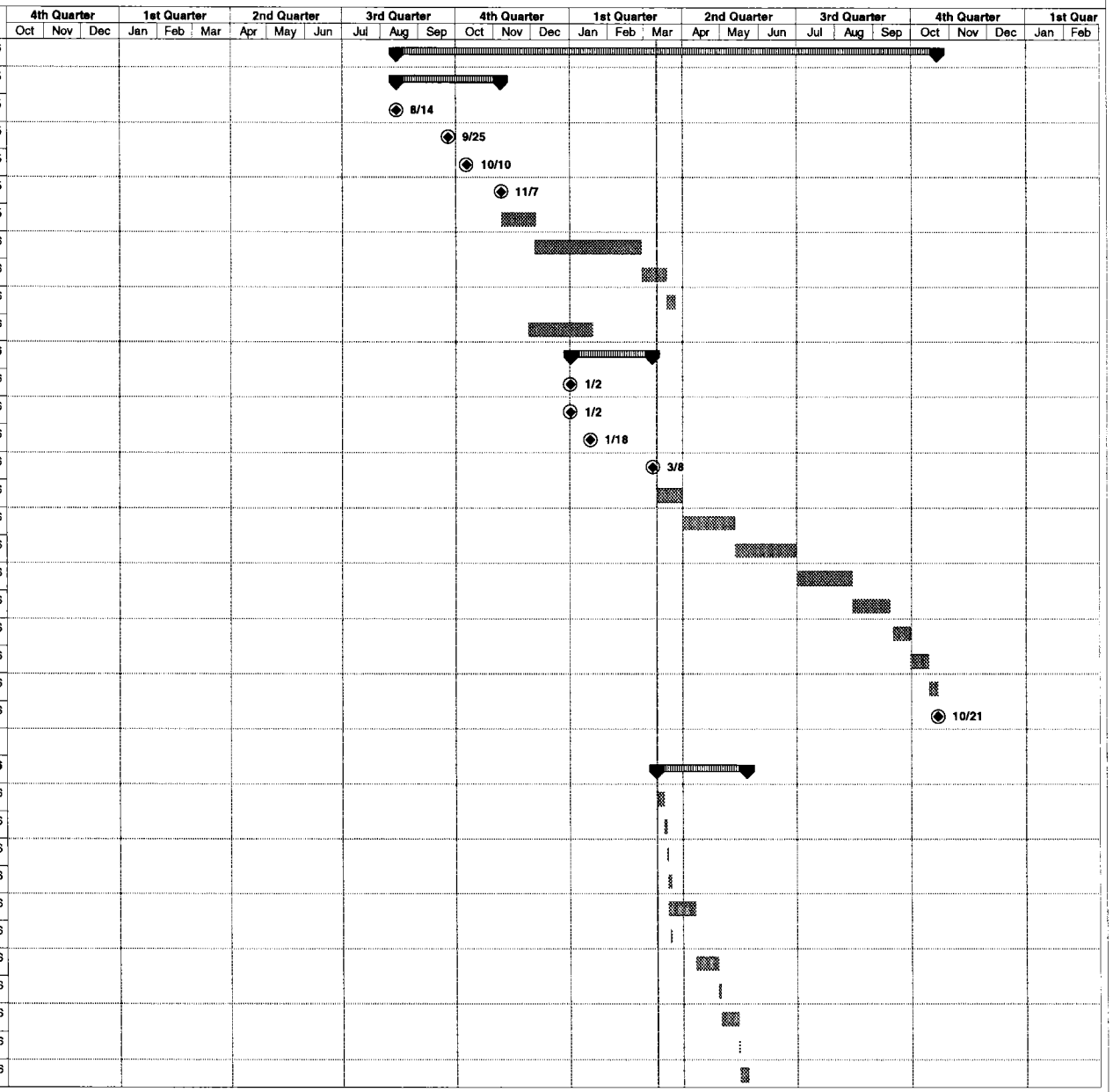
Task | Milestone | Rolled Up Task | Rolled Up Progress
Progress | Summary | Rolled Up Milestone

INSTALLATION RESTORATION PROGRAM
at
Site 1, Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
45	**Pre-Design and Aquifer Testing**	**435d**	**Mon 8/14/95**	**Mon 10/21/96**
46	**Well Inst. & WP dev. (contractual)**	**85d**	**Mon 8/14/95**	**Tue 11/7/95**
47	Issue SOW and GE	0d	Mon 8/14/95	Mon 8/14/95
48	Issue RFP	0d	Mon 9/25/95	Mon 9/25/95
49	Receive CH2 Fee Proposal	0d	Tue 10/10/95	Tue 10/10/95
50	Award DO #0007	0d	Tue 11/7/95	Tue 11/7/95
51	Develop Draft WP	28d	Tue 11/7/95	Mon 12/4/95
52	Agency Review	86d	Mon 12/4/95	Tue 2/27/96
53	Response to comments	20d	Wed 2/28/96	Mon 3/18/96
54	Incorp. comments, issue Final WP	7d	Tue 3/19/96	Mon 3/25/96
55	Well Installation	52d	Wed 11/29/95	Fri 1/19/96
56	**Aquifer Test**	**66d**	**Tue 1/2/96**	**Fri 3/8/96**
57	Issue SOW and GE	0d	Tue 1/2/96	Tue 1/2/96
58	Issue RFP	0d	Tue 1/2/96	Tue 1/2/96
59	Receive CH2 Fee Proposal	0d	Thu 1/18/96	Thu 1/18/96
60	Award DO #0007-02	0d	Fri 3/8/96	Fri 3/8/96
61	Mobilize, set-up and equip check	21d	Mon 3/11/96	Sun 3/31/96
62	Conduct pump tests	42d	Mon 4/1/96	Sun 5/12/96
63	Validate & evaluate data	49d	Mon 5/13/96	Sun 6/30/96
64	Draft Characteristics Report	45d	Mon 7/1/96	Wed 8/14/96
65	Agency Review	30d	Thu 8/15/96	Fri 9/13/96
66	Prepare R2Cs	14d	Mon 9/16/96	Sun 9/29/96
67	Agency review and exceptions to R2Cs	15d	Mon 9/30/96	Mon 10/14/96
68	Incorporate changes	7d	Tue 10/15/96	Mon 10/21/96
69	Issue Final Characteristics Report	0d	Mon 10/21/96	Mon 10/21/96
70				
71	**3D Seismic Survey**	**73d**	**Mon 3/11/96**	**Wed 5/22/96**
72	Develop geologic model	6d	Mon 3/11/96	Sat 3/16/96
73	Run 2D seismic reflection survey	2d	Sun 3/17/96	Mon 3/18/96
74	Review 2D data	1d	Tue 3/19/96	Tue 3/19/96
75	Begin land survey	3d	Wed 3/20/96	Fri 3/22/96
76	Run 3D seismic reflection survey	22d	Wed 3/20/96	Wed 4/10/96
77	Perform 2 VSPs	1d	Fri 3/22/96	Fri 3/22/96
78	3D data processing/interpretation	18d	Thu 4/11/96	Sun 4/28/96
79	Data presentation on site	2d	Mon 4/29/96	Tue 4/30/96
80	Draft Report	14d	Wed 5/1/96	Tue 5/14/96
81	Government comment	1d	Wed 5/15/96	Wed 5/15/96
82	Final Report	7d	Thu 5/16/96	Wed 5/22/96

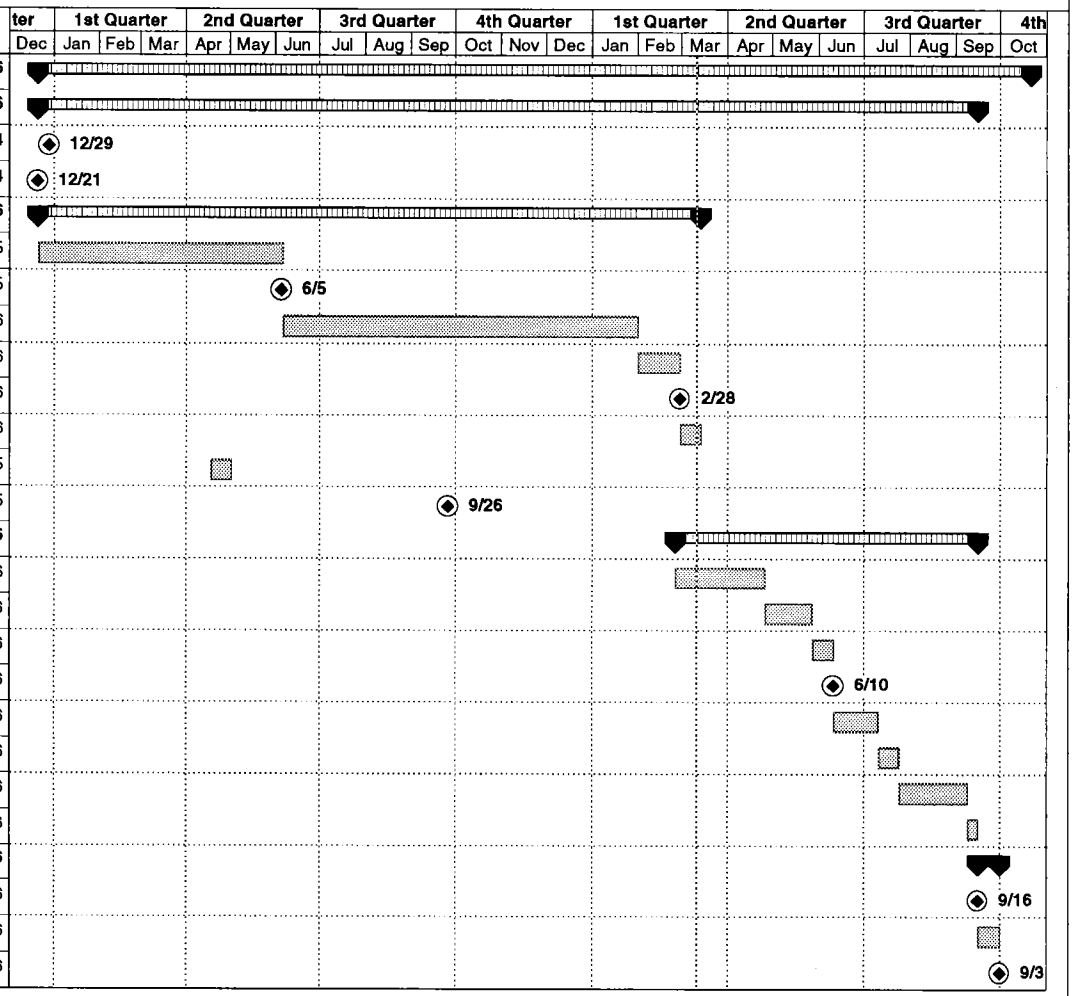


Project: Site 1 Schedule to RA
Date: Mon 3/11/96
File: C:\D\ABL\SCHEDULE\SITE1.MPP

Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress

INSTALLATION RESTORATION PROGRAM
at
Site 5, Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
1	**SITE 5 PROJECT PLAN**	**671d**	**Wed 12/21/94**	**Mon 10/21/96**
2	**Phase II RI/FS**	**635d**	**Wed 12/21/94**	**Sun 9/15/96**
3	Final RI/FS Workplan	0d	Thu 12/29/94	Thu 12/29/94
4	Complete Fieldwork	0d	Wed 12/21/94	Wed 12/21/94
5	**RI Report & Risk Assess.**	**449d**	**Wed 12/21/94**	**Wed 3/13/96**
6	Prepare Draft RI Report	167d	Wed 12/21/94	Mon 6/5/95
7	Issue Draft RI Report	0d	Mon 6/5/95	Mon 6/5/95
8	Agency Review	240d	Tue 6/6/95	Wed 1/31/96
9	Prepare response to comments (R2Cs)	28d	Thu 2/1/96	Wed 2/28/96
10	Issue R2Cs	0d	Wed 2/28/96	Wed 2/28/96
11	Agency review and exceptions to R2Cs	14d	Thu 2/29/96	Wed 3/13/96
12	Incorporate comments	14d	Tue 4/18/95	Mon 5/1/95
13	Issue Final RI Report	0d	Tue 9/26/95	Tue 9/26/95
14	**FS Report and Proposed Plan**	**203d**	**Mon 2/26/96**	**Sun 9/15/96**
15	Prepare Focused FS	60d	Mon 2/26/96	Thu 4/25/96
16	Agency review	32d	Fri 4/26/96	Mon 5/27/96
17	Incorporate comments	14d	Tue 5/28/96	Mon 6/10/96
18	Issue Final FS/Proposed Plan	0d	Mon 6/10/96	Mon 6/10/96
19	Agency Review	30d	Tue 6/11/96	Wed 7/10/96
20	Incorporate comments	14d	Thu 7/11/96	Wed 7/24/96
21	Public comment period	46d	Thu 7/25/96	Sun 9/8/96
22	Responsiveness summary	7d	Mon 9/9/96	Sun 9/15/96
23	**Record of Decision (ROD)**	**15d**	**Mon 9/16/96**	**Mon 9/30/96**
24	Issue ROD for signature	0d	Mon 9/16/96	Mon 9/16/96
25	Sign ROD	15d	Mon 9/16/96	Mon 9/30/96
26	Issue Final ROD	0d	Mon 9/30/96	Mon 9/30/96

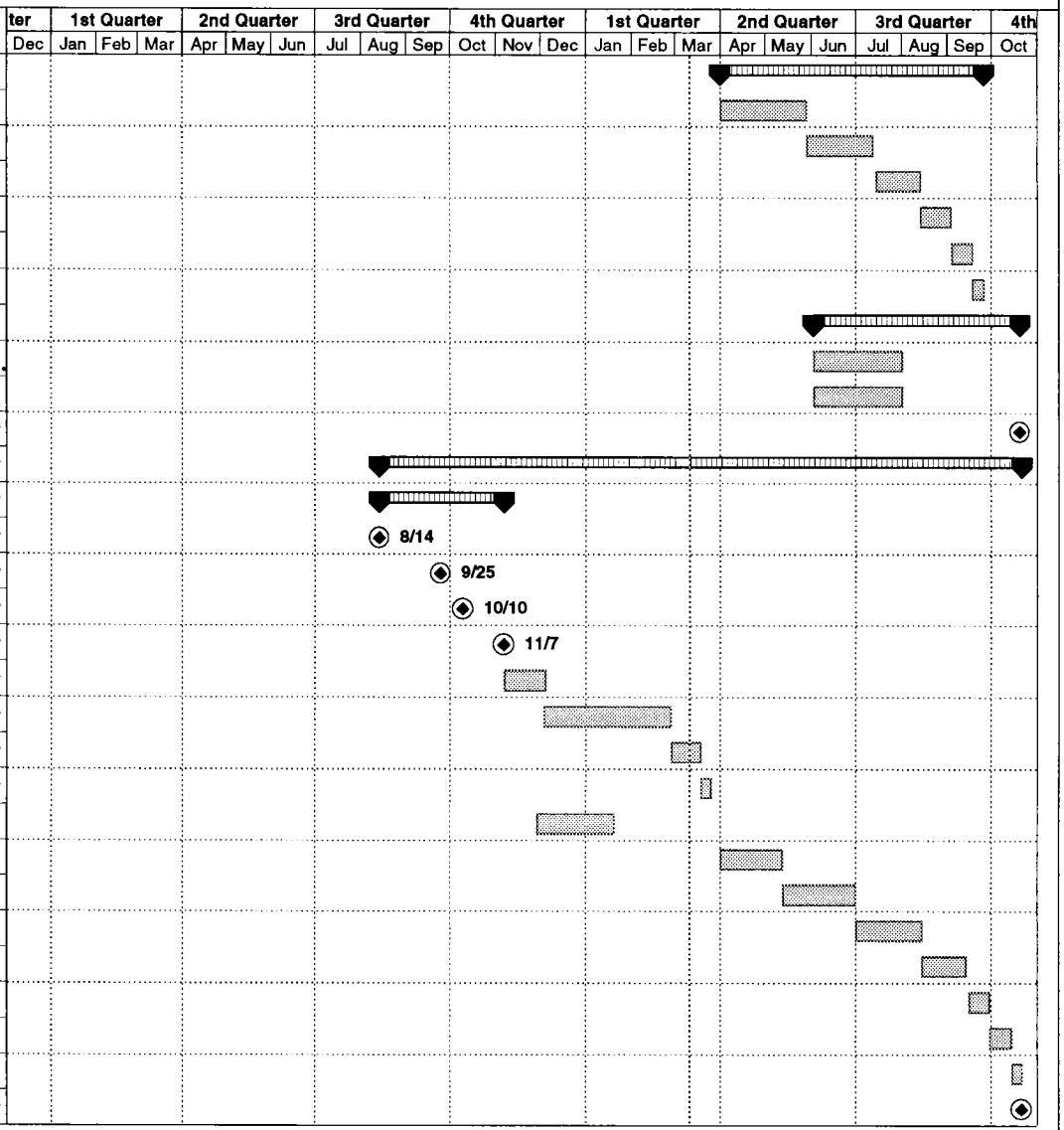


Project: Site 5 Schedule to RA, ABL
Date: Mon 3/11/96
File: C:\D\ABL\SCHEDULE\SITE5.MPP

Task | Milestone | Rolled Up Task | Rolled Up Progress
Progress | Summary | Rolled Up Milestone

INSTALLATION RESTORATION PROGRAM
at
Site 5, Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
27	**Remedial Design**	**178d**	**Mon 4/1/96**	**Wed 9/25/96**
28	Develop SOW, negotiate & award	58d	Mon 4/1/96	Tue 5/28/96
29	Prepare Plans & Specifications (30%)	45d	Wed 5/29/96	Fri 7/12/96
30	Agency review	30d	Mon 7/15/96	Tue 8/13/96
31	Revise & issue 100% P&S	21d	Wed 8/14/96	Tue 9/3/96
32	Agency review	14d	Wed 9/4/96	Tue 9/17/96
33	Revise & Issue Final P&S	8d	Wed 9/18/96	Wed 9/25/96
34	**Remedial Action**	**140d**	**Mon 6/3/96**	**Mon 10/21/96**
35	Develop SOW, negotiate & award RA	60d	Mon 6/3/96	Thu 8/1/96
36	Develop SOW, negotiate & award PCAS	60d	Mon 6/3/96	Thu 8/1/96
37	Initiate fieldwork	0d	Mon 10/21/96	Mon 10/21/96
38	**Well Installation and Sample Analysis**	**435d**	**Mon 8/14/95**	**Mon 10/21/96**
39	**Well Inst. & WP dev. (contractual)**	**85d**	**Mon 8/14/95**	**Tue 11/7/95**
40	Issue SOW and GE	0d	Mon 8/14/95	Mon 8/14/95
41	Issue RFP	0d	Mon 9/25/95	Mon 9/25/95
42	Receive CH2 Fee Proposal	0d	Tue 10/10/95	Tue 10/10/95
43	Award DO #0007	0d	Tue 11/7/95	Tue 11/7/95
44	Develop Draft WP	28d	Tue 11/7/95	Mon 12/4/95
45	Agency Review	86d	Mon 12/4/95	Tue 2/27/96
46	Response to comments	20d	Wed 2/28/96	Mon 3/18/96
47	Incorp. comments, issue Final WP	7d	Tue 3/19/96	Mon 3/25/96
48	Well installation	52d	Wed 11/29/95	Fri 1/19/96
49	New well sample collection & analysis	42d	Mon 4/1/96	Sun 5/12/96
50	Validate & evaluate data	49d	Mon 5/13/96	Sun 6/30/96
51	Draft Characteristics Report	45d	Mon 7/1/96	Wed 8/14/96
52	Agency Review	30d	Thu 8/15/96	Fri 9/13/96
53	Prepare R2Cs	14d	Mon 9/16/96	Sun 9/29/96
54	Agency review and exceptions to R2Cs	15d	Mon 9/30/96	Mon 10/14/96
55	Incorporate changes	7d	Tue 10/15/96	Mon 10/21/96
56	Issue Final Characteristics Report	0d	Mon 10/21/96	Mon 10/21/96

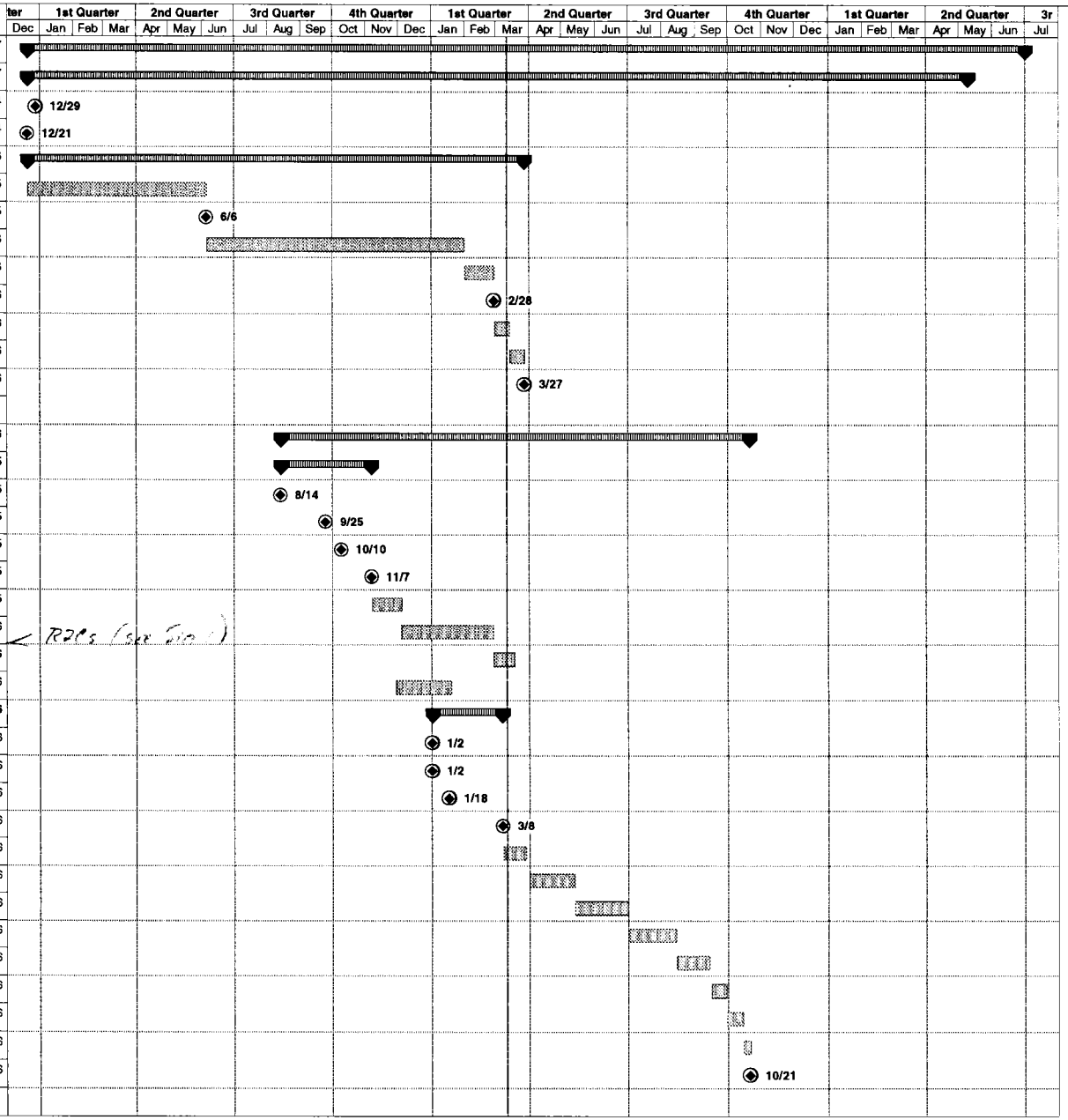


Project: Site 5 Schedule to RA, ABL
Date: Mon 3/11/96
File: C:\D\ABL\SCHEDULE\SITE5.MPP

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

INSTALLATION RESTORATION PROGRAM
at
Site 10, Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
1	**Site 10 Project Plan**	**924d**	**Wed 12/21/94**	**Tue 7/1/97**
2	**Phase II RI/FS**	**871d**	**Wed 12/21/94**	**Fri 5/9/97**
3	Final RI/FS Workplan	0d	Thu 12/29/94	Thu 12/29/94
4	Complete Fieldwork	0d	Wed 12/21/94	Wed 12/21/94
5	**RI Report & Risk Assess.**	**463d**	**Wed 12/21/94**	**Wed 3/27/96**
6	Prepare Draft RI Report	167d	Wed 12/21/94	Mon 6/5/95
7	Issue Draft RI Report	0d	Tue 6/6/95	Tue 6/6/95
8	Agency Review	240d	Tue 6/6/95	Wed 1/31/96
9	Prepare response to comments (R2Cs)	28d	Thu 2/1/96	Wed 2/28/96
10	Issue R2Cs	0d	Wed 2/28/96	Wed 2/28/96
11	Agency review and exceptions to R2Cs	14d	Thu 2/29/96	Wed 3/13/96
12	Incorporate comments	14d	Thu 3/14/96	Wed 3/27/96
13	Issue Final RI Report	0d	Wed 3/27/96	Wed 3/27/96
14				
15	**Pre-Design (Aquifer Testing)**	**435d**	**Mon 8/14/95**	**Mon 10/21/96**
16	**Well Inst. & WP dev. (contractual)**	**85d**	**Mon 8/14/95**	**Tue 11/7/95**
17	Issue SOW and GE	0d	Mon 8/14/95	Mon 8/14/95
18	Issue RFP	0d	Mon 9/25/95	Mon 9/25/95
19	Receive CH2 Fee Proposal	0d	Tue 10/10/95	Tue 10/10/95
20	Award DO #0007	0d	Tue 11/7/95	Tue 11/7/95
21	Develop Draft WP	28d	Tue 11/7/95	Mon 12/4/95
22	Agency Review	86d	Mon 12/4/95	Tue 2/27/96
23	Incorp. comments, issue Final WP	20d	Wed 2/28/96	Mon 3/18/96
24	Well installation	52d	Wed 11/29/95	Fri 1/19/96
25	**Aquifer Test**	**66d**	**Tue 1/2/96**	**Fri 3/8/96**
26	Issue SOW and GE	0d	Tue 1/2/96	Tue 1/2/96
27	Issue RFP	0d	Tue 1/2/96	Tue 1/2/96
28	Receive CH2 Fee Proposal	0d	Thu 1/18/96	Thu 1/18/96
29	Award DO #0007-02	0d	Fri 3/8/96	Fri 3/8/96
30	Mobilize, set-up and equip check	21d	Fri 3/8/96	Thu 3/28/96
31	Conduct pump tests	42d	Mon 4/1/96	Sun 5/12/96
32	Validate & evaluate data	49d	Mon 5/13/96	Sun 6/30/96
33	Draft Characteristics Report	45d	Mon 7/1/96	Wed 8/14/96
34	Agency Review	30d	Thu 8/15/96	Fri 9/13/96
35	Prepare R2Cs	14d	Mon 9/16/96	Sun 9/29/96
36	Agency review and exceptions to R2Cs	15d	Mon 9/30/96	Mon 10/14/96
37	Incorporate changes	7d	Tue 10/15/96	Mon 10/21/96
38	Issue Final Characteristics Report	0d	Mon 10/21/96	Mon 10/21/96
39				

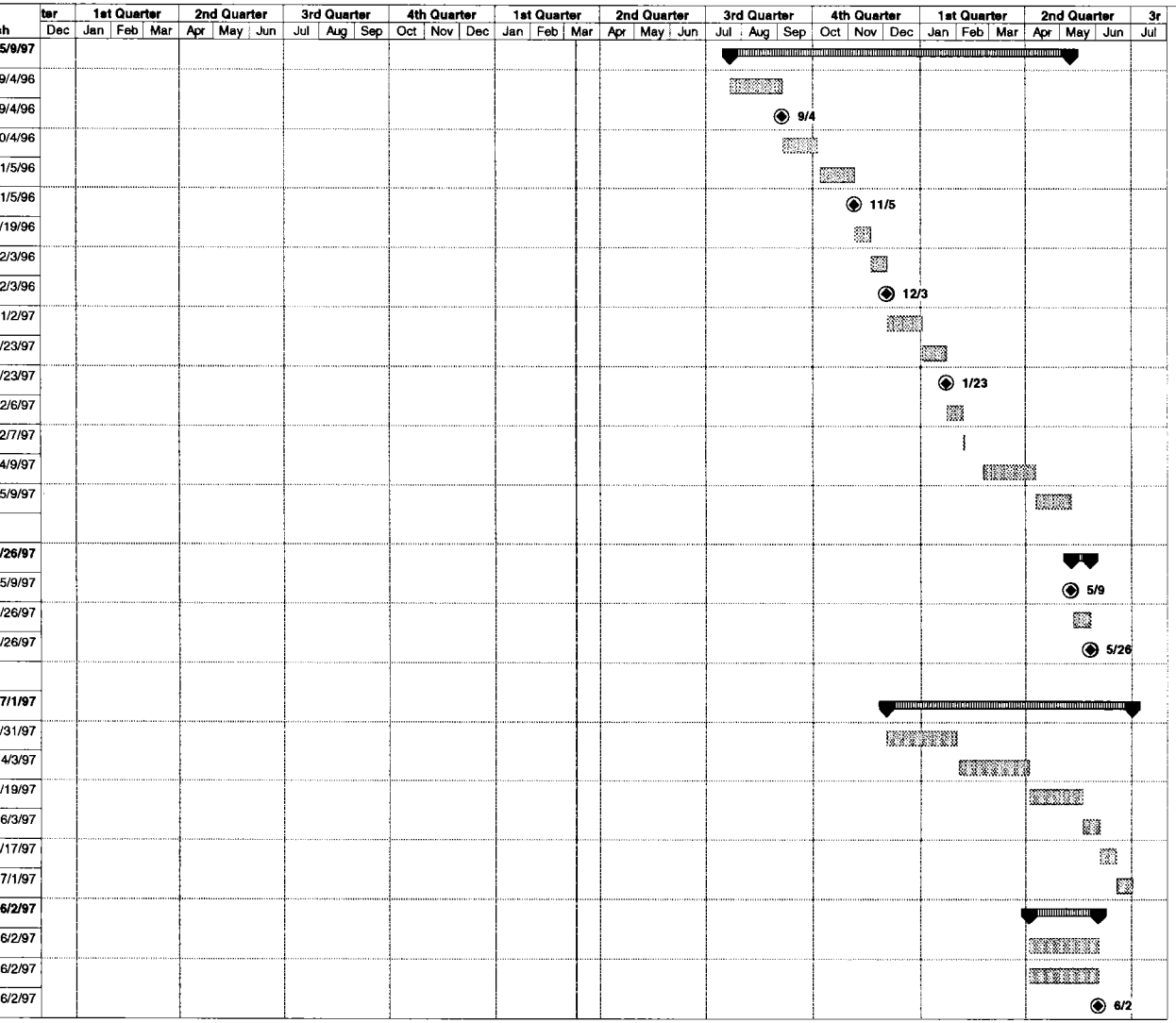


Project: Site 10 Schedule to RA
Date: Mon 3/11/96
File: C:\D\ABL\SCHEDULE\SITE10.MPP

Task | Milestone | Rolled Up Task | Rolled Up Progress
Progress | Summary | Rolled Up Milestone

INSTALLATION RESTORATION PROGRAM
at
Site 10, Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
40	**FS Report and Proposed Plan**	**292d**	**Mon 7/22/96**	**Fri 5/9/97**
41	Prepare Draft Focused FS Report	45d	Mon 7/22/96	Wed 9/4/96
42	Issue Draft FS Report	0d	Wed 9/4/96	Wed 9/4/96
43	Agency Review	30d	Thu 9/5/96	Fri 10/4/96
44	Prepare R2Cs	30d	Mon 10/7/96	Tue 11/5/96
45	Issue R2Cs	0d	Tue 11/5/96	Tue 11/5/96
46	Agency review and exceptions to R2Cs	14d	Wed 11/6/96	Tue 11/19/96
47	Incorporate changes, Revise FS Report	14d	Wed 11/20/96	Tue 12/3/96
48	Issue Final FS/Proposed Plan	0d	Tue 12/3/96	Tue 12/3/96
49	Agency review	30d	Wed 12/4/96	Thu 1/2/97
50	Prepare R2Cs	21d	Fri 1/3/97	Thu 1/23/97
51	Issue R2Cs	0d	Thu 1/23/97	Thu 1/23/97
52	Agency review and exceptions to R2Cs	14d	Fri 1/24/97	Thu 2/6/97
53	Incorporate changes to Proposed Plan	1d	Fri 2/7/97	Fri 2/7/97
54	Public comment period	45d	Mon 2/24/97	Wed 4/9/97
55	Responsiveness Summary	30d	Thu 4/10/97	Fri 5/9/97
56				
57	**Record of Decision (ROD)**	**17d**	**Fri 5/9/97**	**Mon 5/26/97**
58	Issue ROD for signature	0d	Fri 5/9/97	Fri 5/9/97
59	Sign ROD	15d	Mon 5/12/97	Mon 5/26/97
60	Issue Final ROD	0d	Mon 5/26/97	Mon 5/26/97
61				
62	**Remedial Design**	**211d**	**Tue 12/3/96**	**Tue 7/1/97**
63	GE, SOW & Award Design	60d	Tue 12/3/96	Fri 1/31/97
64	Prepare 60% P&S	60d	Mon 2/3/97	Thu 4/3/97
65	Agency Review	46d	Fri 4/4/97	Mon 5/19/97
66	Revise & Issue 100% P&S	15d	Tue 5/20/97	Tue 6/3/97
67	Agency review	14d	Wed 6/4/97	Tue 6/17/97
68	Revise & Issue Final P&S	14d	Wed 6/18/97	Tue 7/1/97
69	**Remedial Action**	**60d**	**Fri 4/4/97**	**Mon 6/2/97**
70	Develop SOW, negotiate & award RA	60d	Fri 4/4/97	Mon 6/2/97
71	Dev. SOW, negotiate & award PCAS	60d	Fri 4/4/97	Mon 6/2/97
72	Initiate fieldwork	0d	Mon 6/2/97	Mon 6/2/97



Project: Site 10 Schedule to RA
Date: Mon 3/11/96
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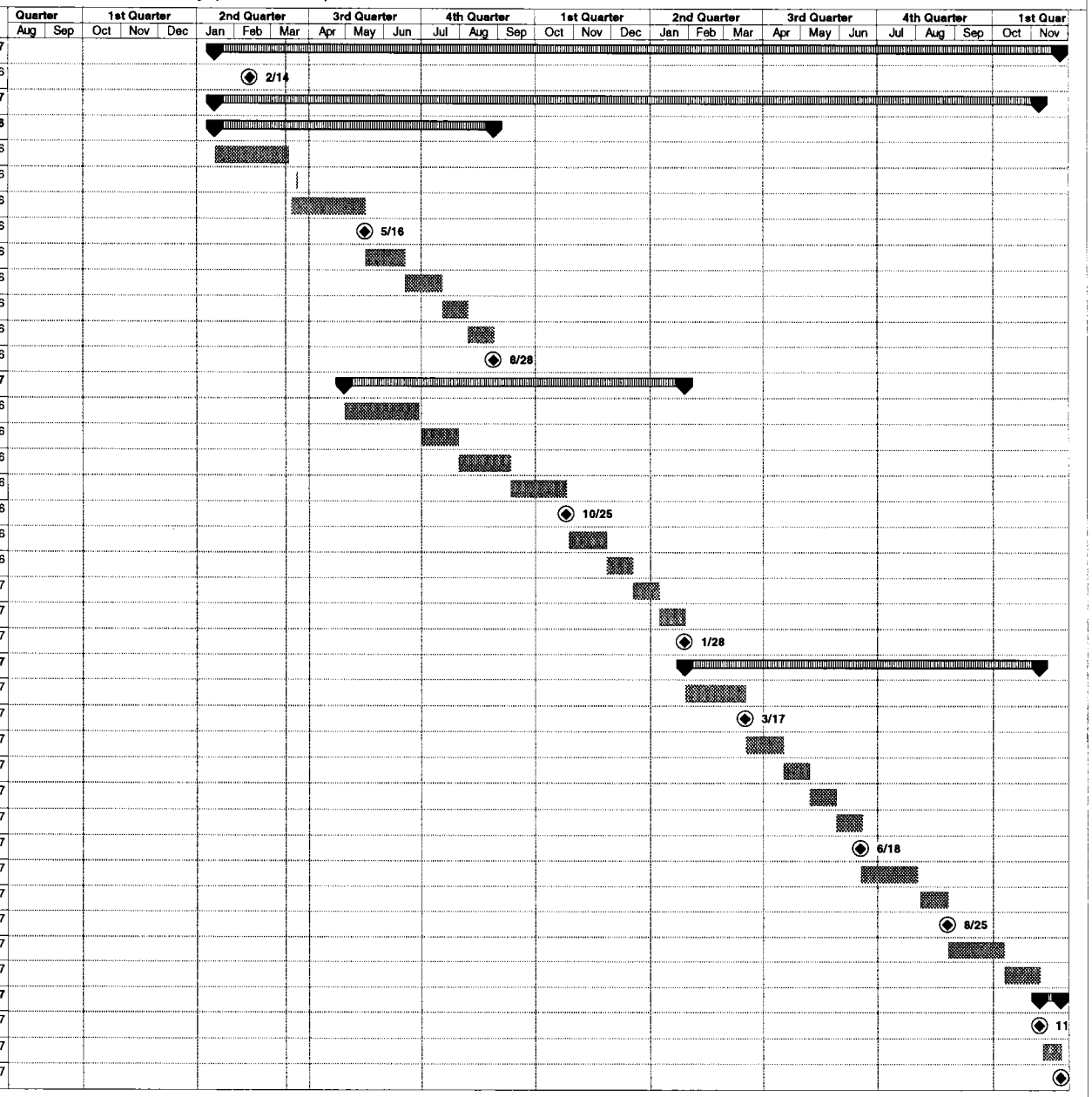
Task | Milestone | Rolled Up Task | Rolled Up Progress
Progress | Summary | Rolled Up Milestone

Department of the Navy
INSTALLATION RESTORATION PROGRAM
at Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
1	**Site 11 Project Plan**	**679d**	**Tue 1/16/96**	**Mon 11/24/97**
2	Issue Advanced Site Inspection Report	0d	Wed 2/14/96	Wed 2/14/96
3	**Remedial Investigation/Feasibility Study**	**662d**	**Tue 1/16/96**	**Fri 11/7/97**
4	**RI Workplan**	**226d**	**Tue 1/16/96**	**Wed 8/28/96**
5	Develop SOW, negotiate & award	60d	Tue 1/16/96	Fri 3/15/96
6	Site visit	1d	Fri 3/22/96	Fri 3/22/96
7	Draft RI Workplan	60d	Mon 3/18/96	Thu 5/16/96
8	Issue Draft Workplan	0d	Thu 5/16/96	Thu 5/16/96
9	Agency review	32d	Fri 5/17/96	Mon 6/17/96
10	Prepare response to comments (R2Cs)	30d	Tue 6/18/96	Wed 7/17/96
11	Agency review, resolve exceptions	21d	Thu 7/18/96	Wed 8/7/96
12	Incorporate changes	21d	Thu 8/8/96	Wed 8/28/96
13	Issue Final Workplan	0d	Wed 8/28/96	Wed 8/28/96
14	**RI Report**	**274d**	**Tue 4/30/96**	**Tue 1/28/97**
15	Develop SOW, negotiate & award	60d	Tue 4/30/96	Fri 6/28/96
16	Conduct fieldwork	30d	Mon 7/1/96	Tue 7/30/96
17	Sample analysis & validation	42d	Wed 7/31/96	Tue 9/10/96
18	Draft RI Report	45d	Wed 9/11/96	Fri 10/25/96
19	Issue Draft Report	0d	Fri 10/25/96	Fri 10/25/96
20	Agency review	30d	Mon 10/28/96	Tue 11/26/96
21	Prepare response to comments (R2Cs)	21d	Wed 11/27/96	Tue 12/17/96
22	Agency review, resolve exceptions	21d	Wed 12/18/96	Tue 1/7/97
23	Incorporate changes	21d	Wed 1/8/97	Tue 1/28/97
24	Issue Final RI Report	0d	Tue 1/28/97	Tue 1/28/97
25	**FS Report and Proposed Plan**	**283d**	**Wed 1/29/97**	**Fri 11/7/97**
26	Prepare Draft FS Report	48d	Wed 1/29/97	Mon 3/17/97
27	Issue Draft FS Report	0d	Mon 3/17/97	Mon 3/17/97
28	Agency Review	30d	Tue 3/18/97	Wed 4/16/97
29	Prepare response to comments (R2Cs)	21d	Thu 4/17/97	Wed 5/7/97
30	Agency review, resolve exceptions	21d	Thu 5/8/97	Wed 5/28/97
31	Incorporate changes	21d	Thu 5/29/97	Wed 6/18/97
32	Issue Final FS/Draft Proposed Plan	0d	Wed 6/18/97	Wed 6/18/97
33	Regulatory agency review	45d	Wed 6/18/97	Fri 8/1/97
34	Incorporate comments	22d	Mon 8/4/97	Mon 8/25/97
35	Notice of Availability	0d	Mon 8/25/97	Mon 8/25/97
36	Public comment	45d	Tue 8/26/97	Thu 10/9/97
37	Response to comments	29d	Fri 10/10/97	Fri 11/7/97
38	**Record of Decision (ROD)**	**17d**	**Fri 11/7/97**	**Mon 11/24/97**
39	Issue ROD for signature	0d	Fri 11/7/97	Fri 11/7/97
40	Sign ROD	15d	Mon 11/10/97	Mon 11/24/97
41	Issue Final ROD	0d	Mon 11/24/97	Mon 11/24/97



Project: Site 11 Schedule to ROD
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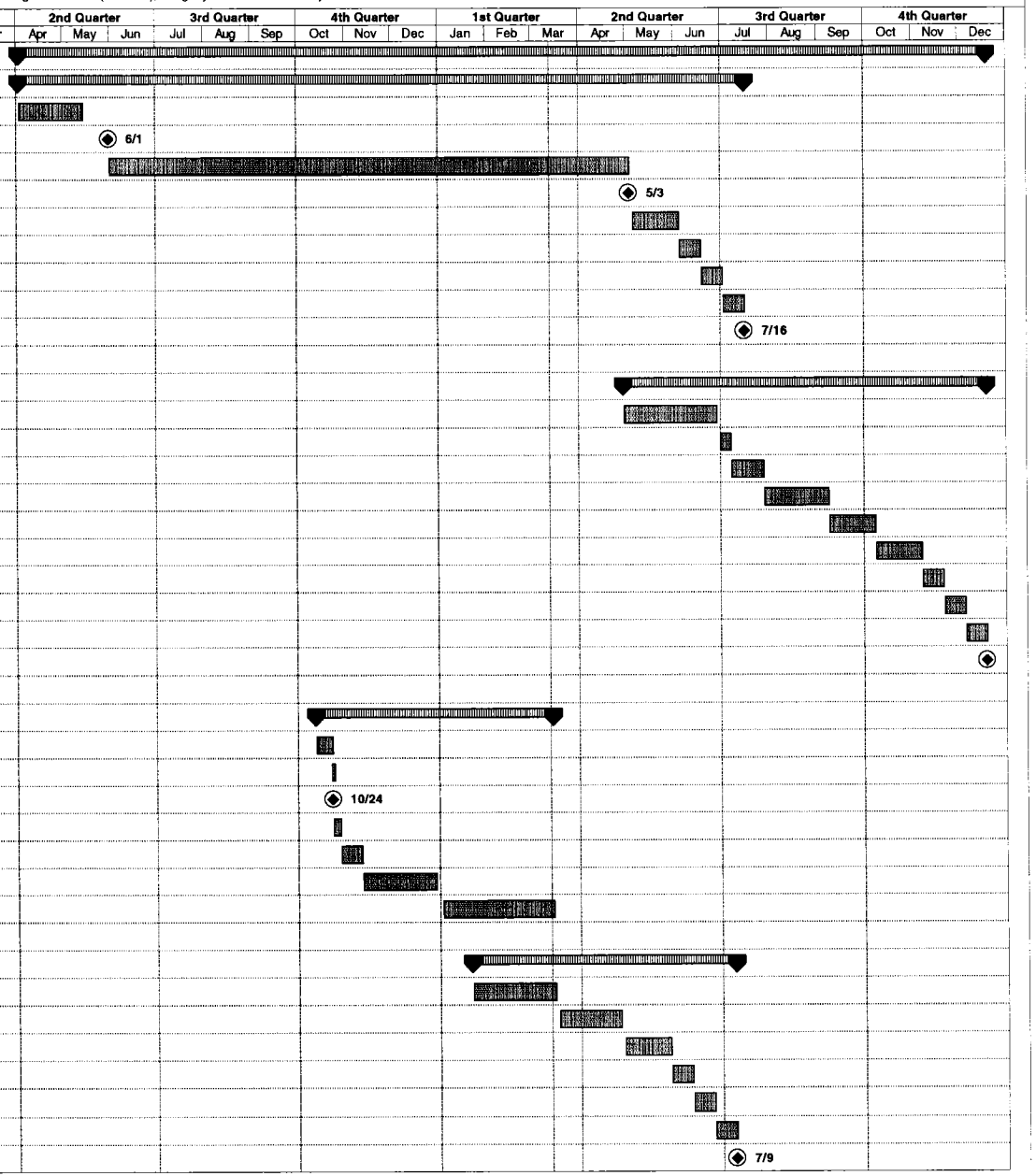
Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

INSTALLATION RESTORATION PROGRAM
at
Solid Waste Management Units (SWMUs), Allegany Ballistics Laboratory

ID	Task Name	Duration	Start	Finish
1	**SWMU Investigation**	**627d**	**Mon 4/3/95**	**Thu 12/19/96**
2	**RSSWP Development**	**471d**	**Mon 4/3/95**	**Tue 7/16/96**
3	Data Gathering	42d	Mon 4/3/95	Sun 5/14/95
4	Interim Memoranda	0d	Thu 6/1/95	Thu 6/1/95
5	Prepare Draft Phase II RSS Workplan	338d	Thu 6/1/95	Fri 5/3/96
6	Submit Draft Phase II RSS Workplan	0d	Fri 5/3/96	Fri 5/3/96
7	Agency review	30d	Mon 5/6/96	Tue 6/4/96
8	Prepare response to comments (R2Cs)	14d	Wed 6/5/96	Tue 6/18/96
9	Agency review, resolve exceptions	14d	Wed 6/19/96	Tue 7/2/96
10	Incorporate comments	14d	Wed 7/3/96	Tue 7/16/96
11	Issue Final Phase II RSS Workplan	0d	Tue 7/16/96	Tue 7/16/96
12				
13	**Phase II RSS Workplan Implementation**	**234d**	**Tue 4/30/96**	**Thu 12/19/96**
14	Develop SOW, negotiate & award	60d	Tue 4/30/96	Fri 6/28/96
15	Mobilization	7d	Mon 7/1/96	Sun 7/7/96
16	Fieldwork	21d	Mon 7/8/96	Sun 7/28/96
17	Sample analysis & validation	42d	Mon 7/29/96	Sun 9/8/96
18	Draft Phase II RSS Report	30d	Mon 9/9/96	Tue 10/8/96
19	Agency review	30d	Wed 10/9/96	Thu 11/7/96
20	Prepare response to comments (R2Cs)	14d	Fri 11/8/96	Thu 11/21/96
21	Agency review, resolve exceptions	14d	Fri 11/22/96	Thu 12/5/96
22	Incorporate comments	14d	Fri 12/6/96	Thu 12/19/96
23	Issue Final Phase II RSS Report	0d	Thu 12/19/96	Thu 12/19/96
24				
25	**Phase I Sample Collection and Analysis**	**154d**	**Fri 10/13/95**	**Thu 3/14/96**
26	Develop SOW, negotiate & award	11d	Fri 10/13/95	Mon 10/23/95
27	Identify sample locations in field	2d	Mon 10/23/95	Tue 10/24/95
28	Mobilization	0d	Tue 10/24/95	Tue 10/24/95
29	Fieldwork	5d	Tue 10/24/95	Sat 10/28/95
30	Sample analysis & validation	14d	Sun 10/29/95	Sat 11/11/95
31	Tabulate and issue analytical results	48d	Sun 11/12/95	Fri 12/29/95
32	Develop & issue Field Report	72d	Wed 1/3/96	Thu 3/14/96
33				
34	**Phase I RSS Report**	**170d**	**Mon 1/22/96**	**Tue 7/9/96**
35	Develop SOW, negotiate & award	54d	Mon 1/22/96	Fri 3/15/96
36	Draft Phase I RSS Report	40d	Mon 3/18/96	Fri 4/26/96
37	Agency review	30d	Mon 4/29/96	Tue 5/28/96
38	Prepare response to comments (R2Cs)	14d	Wed 5/29/96	Tue 6/11/96
39	Agency review, resolve exceptions	14d	Wed 6/12/96	Tue 6/25/96
40	Incorporate comments	14d	Wed 6/26/96	Tue 7/9/96
41	Issue Final Phase I RSS Report	0d	Tue 7/9/96	Tue 7/9/96



Project: RCRA Site Screening (RSS) and Investigation
Date: Wed 3/13/96
File: C:\D\ABL\SCHEDULE\SWMUSI.MPP

Task | Milestone | Rolled Up Task | Rolled Up Progress
Progress | Summary | Rolled Up Milestone

TABLE 4-3

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 1, Former Hazardous Waste Storage Area I (This SWMU is included as part of IR Site 1 western end group (1, 11, 22C, 22D)) CERCLA CLOSEOUT DOCUMENT ~~CHECK FFA FINDINGS OF FACT~~	D3	late 1970s - 1981	Approximately 360 square foot pad used for the storage of hazardous waste prior to disposal off site. A pilot study of a fluidized bed incinerator was conducted on the pad during the early 1980s for the disposal of propellants and explosives. The unit managed hazardous wastes F001, F002, F003, F005, D001, D002, and F019 including chlorinated solvents, still bottoms, metal plating pretreatment sludge, and waste acids and bases. Propellants and explosives were tested at the pilot test incinerator; reportedly the only wastes generated were aluminum oxide, aluminum, potassium chloride, and carbon.	The RFA recommended no further action for this SWMU. It is included as part of IR Site 1 under the IR Program. Based on the October 22, 1997 meeting, further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational since September 30, 1998.
SWMU 2, Former Hazardous Waste Storage Area II NOT CERCLA	D9	1981 - June 1990	Approximately 40 foot by 100 foot concrete pad designed to manage drums of wastes from satellite accumulation areas throughout the plant prior to being shipped off site. Typical wastes managed included: still bottoms (F001, F002), paint removers (F001, F002, F003, F005), paint related materials (D001, F001, F002, F003, F005), chromium containing wastes (D007), lead containing wastes (D008), and corrosive waste (D002).	The RFA recommended no further action. WV DEP wanted this SWMU reevaluated. After further evaluation, no evidence of releases was observed. Therefore, the RFA recommendation was accepted. This was a permitted pad under RCRA, and therefore, was properly closed under RCRA. ATK will need to submit documentation for closure. No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 3, Current Hazardous Waste Storage Area NOT CERCLA	D1, Bldg. 366	June 1990 - present	Concrete pad (maximum capacity 300 55-gallon drums) for the storage of hazardous wastes. Wastes include: still bottoms (F001, F002), paint removers (F001, F002, F003, F005), paint-related materials (D001, F001, F002, F003, F005), corrosive waste (D002), chromium-containing waste (D007), lead-containing waste (D008), ash from Burning Grounds. In addition, spent solvents, waste motor oil, coolant, antifreeze, cured and uncured resin, waste alcohol, asbestos, waste silver, Alodine solids, and PCB-contaminated materials were also managed in this unit.	No further investigative action recommended for this SWMU. This pad is permitted and managed under RCRA. No further action is planned for this SWMU.
SWMU 4, Former Burning Ground I (Also IR Site 2) CERCLA	D8, D9	1942 - 1949	A burning ground of approximately 20 feet by 40 feet (gravel covered surface), used for burning waste propellant components and explosives. Exact boundaries of the burning area are not known. Approximately 50 pounds of waste materials per day are estimated to have been burned. Also, prior to the mid 1960s, very small amounts of chlorinated hydrocarbons were used. Acetone was the primary solvent and cleaning liquid in use.	RFA recommended an RFI for this SWMU and that the RFI be coordinated with the ongoing activities of the RI. This SWMU is included as part of IR Site 2 under the IR Program. No further action is planned for this SWMU. NFRAP under development

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 5, Former Burning Ground II (This SWMU is IR Site 3) CERCLA	D8	1950 - 1958	A burning ground of approximately 40 feet by 200 feet (clay covered surface), used for burning reactive wastes consisting of propellants and explosives. Approximately 200 pounds of waste materials per day were burned.	RFA recommended an RFI for this SWMU and that the RFI be coordinated with the ongoing activities of the RI. This SWMU is IR Site 3 under the IR Program. No further action is planned for this SWMU. NFRAP under development
SWMU 6, Current Burning Ground (This SWMU is included as part of IR Site 1) ~~JOINT CERCLA/RCRA ACTION.~~Not CERCLA	D3	1958 - present	A fenced-in area measuring 280 feet by 1,250 feet, consisting of nine burning locations (pads). Typical wastes managed include: nitroglycerin, nitrocellulose, ammonium perchlorate, butanetriol trinitrate, HMX, RDX, and various propellants and explosives manufactured from the above. Most of the wastes generated at the facility between the 1940s and 1970, including flammable wastes, were disposed by burning; ash residues reportedly contained aluminum oxide and residual solvents such as methylene chloride and 1,1,1-TCA.	The RFA recommended that monitoring should continue at this SWMU under interim status. Investigated under IR Site 1 for past contamination (prior to 10/17/86). Based on the October 22, 1997 meeting, further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational (for solvent contamination of the past, but was not designed for possible expolosive contamination from RCRA Unit) since September 30, 1998. ~~Currently undergoing joint CERCLA/RCRA soil investigation.~~

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 7, Inert Burning Ground (This SWMU is included as part of IR Site 1) CERCLA	D3	1958 – 1985	Approximately 20 foot by 20 foot area located outside the fenced area of the Current Burning Ground. The unit managed waste materials contaminated with explosives, including explosive contaminated waste rags. These rags may also have been contaminated with solvents including methylene chloride and TCE.	RFA recommended an RFI for this SWMU and that the RFI be coordinated with the ongoing activities of the RI. Investigated under IR Site 1. Based on the October 22, 1997 meeting, further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational- (for solvent contamination of the past, but was not designed for possible expolosive contamination from RCRA Unit) since September 30, 1998. ~~FS under development for soil corrective action.~~

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 8, Acid Disposal Pits (This SWMU is included as part of IR Site 1) CERCLA	D3	1972 - 1982	Two unlined, crushed-limestone-filled, earthen pits approximately 10 feet by 10 feet in area and 4 feet in depth. Waste acids and bases generated by lab operations were poured into the pit and the chemicals were allowed to percolate through the limestone.	RFA recommended an RFI for this SWMU and that the RFI be coordinated with the ongoing activities of the RI. Investigated under IR Site 1. Based on the October 22, 1997 meeting, further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational (for solvent contamination of the past, but was not designed for possible expolosive contamination from RCRA Unit) since September 30, 1998. ~~FS~~Non time critical removal is under development for soil corrective action.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 9, Inert (Non-ordnance) Landfill (This SWMU is IR Site 5) CERCLA	South of Plant 2	1964 - 1988	Landfill approximately 420 feet long, 110 feet wide, and 20 feet deep. This unit received empty drums, unknown lab and photographic chemicals, scrap metal and plastic, large quantities of broken fluorescent tubes containing mercury, sandblasting grit, wood products, construction debris waste, fiberglass, and other resin-coated fibers. The empty drums were formerly used to store chemicals such as methylene chloride, TCE, acetone, and ammonium perchlorate. Chunk metallic lead potentially may have been disposed here.	RFA recommended an RFI for this SWMU and that the RFI be coordinated with the ongoing activities of the RI. This SWMU is IR Site 5 under the IR Program. Based on the October 22, 1997 meeting, further action is planned for IR Site 5. A ROD was signed for soil and waste remediation on January 1997. Construction of a landfill cap was completed and has been operational since October 1997. Further action is required for groundwater.
SWMU 10, Beryllium Landfill (This SWMU is IR Site 7) CERCLA	Off of Route 956	1964 - 1974	Earthen pit measuring approximately 10 x 10 feet in area and 6 feet in depth. A maximum of two pounds of beryllium and 100 pounds of excess lab chemicals were disposed here. Reportedly, the unit contained several hundred pounds of beryllium-contaminated wiping tissues, gloves, and sample containers. Glassware from the labs was also disposed at this unit.	RFA recommended an RFI for this SWMU, and that the RFI be coordinated with the ongoing activities of the RI. Soil removal at this site/SWMU was completed under the IR Program in 1994, with final disposition of the wastes in March 1997. See IR Site 7. Based on the October ~~22, 1997~~14, 1998 meeting, no further action is planned for IR Site 7.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 11, Former Burn Cages and Ash Landfill (This SWMU is included as part of IR Site 1) CERCLA, see SWMU 1	D3	prior to the 1970s	Unit consists of an ash landfill and at least 2 burn cages. During the 1960s and 1970s the facility burned paper, cafeteria garbage, packaging materials and non-explosive materials in open wire mesh cages. The ash generated from the burning was disposed at the landfill located adjacent to the cage areas. The landfill also contains ash and unburned waste from the Inert Burning Ground, demolition debris, empty solvent drums, and rocket motor casings.	RFA recommended an RFI for this SWMU and that the RFI be coordinated with the ongoing activities of the RI. Investigated under IR Site 1. Based on the October 22, 1997 meeting, further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational (for solvent contamination of the past, but was not designed for possible expolosive contamination from RCRA Unit) since September 30, 1998.
SWMU 12, Former Alodine Treatment Tank (This SWMU is included as part of AOC N) NOT CERCLA SAME PHYSICAL LOCATION AS SWMU 52	D2, outside of Bldg. 167	1978 - 1982 and closed (RCRA) in 1987, process changed in 1991to reinclude this unit	Industrial wastewater from the Alodine process (aluminum surface chemical conversion process) was pre-treated at the unit for chromium reduction and precipitation. As of 1980, 4,200 gallons of Alodine process wastewater were treated at this unit on a monthly basis. According to waste hauler=s profiles, Alodine waste contains up to 2% hexavalent chromium.	The RFA recommended no further action for this SWMU. The agencies agreed with this recommendation under the condition that possible releases from this tank be considered in the investigation of SWMU 52 (the current tank). SWMU 12 closed 12/87 per FFA p 16. Based on the October 22, 1997 meeting, further action is planned for AOC N.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 14, Current Alodine Waste Storage Area I (This SWMU is included as part of AOC N) NOT CERCLA	D2, Bldg. 167	1991 - present	Concrete area used to store Alodine waste and Alodine contaminated rags. According to waste hauler=s profiles, Alodine waste contains up to 2% hexavalent chromium.	The RFA recommended no further action for this SWMU. The agencies agreed with this recommendation under the condition that possible releases from this tank be considered in the investigation of SWMU 52. Based on the October 22, 1997 meeting, further action is planned for AOC N.
SWMU 16, Plant 1 Wastewater Treatment System NOT CERCLA	D7, Bldg. 294	1962 - December 1996	Wastewater treatment plant which treated all of the facility=s sanitary wastewater along with some industrial wastes from photographic processing and several labs. Also wastewater containing residual RDX, pre-treated wastewater from the Alodine process, and some water from oil/water separators was discharged to this unit. Also, a portion of the facility=s stormwater sewer system was routed to this unit from the 1970s until 1984.	The RFA recommended that soil samples be collected in the overflow area. These samples were collected as part of the Phase II RI. The analytical results indicated that no analytes were detected above the EPA Region III RBC values; therefore, no further action was recommended for this SWMU. Since industrial wastes were reportedly treated at this treatment plant, collection of soil samples was recommended when the treatment plant is demolished. Based on the October 22, 1997 meeting, further action is planned for this SWMU. ATK to demo and sample.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 18, Photo Solution Discharge Area I (This SWMU is IR Site 4B) CERCLA	D9, adjacent Bldg. 181	1959 - 1971	An unlined land-based area which received discharges of spent photographic and x-ray solutions from developing and processing operations. Unknown quantities of silver, cyanide, and phenol may have been discharged to the soil.	The RFA recommended that an RFI be conducted at this SWMU, and that the RFI be coordinated with the ongoing activities of the RI. Investigated under IR Site 4B. Based on ~~the October 22, 1997 meeting~~ the October 14, 1998 meeting, no further action is planned for IR Site 4B. NFRAP currently under develoment.
SWMU 19, Photo Solution Discharge Area II (This SWMU is IR Site 4A) CERCLA	D1, adjacent Bldg. 231	1959 - 1965	The sewage treatment plant received discharges of spent photographic and X-ray solutions from developing and processing operations.	The RFA recommended that soil samples be collected around the unit at Building 231. Possible releases from this area have been considered in the investigation of SWMU 26. The building drainage was always connected to the sewage treatment plant and soil testing has confirmed no release. Based on ~~the October 22, 1997~~ the October 14, 1998 meeting~~meeting~~, no further action is planned for IR Site 4A. Closed out in FFA under Findings of Fact p 19.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 20, Solvent Disposal Pit (This SWMU is included as part of IR Site 1) CERCLA	D3	Unknown - 1978	Unlined earthen pit used for the disposal of explosive contaminated solvents such as TCE, PCE, and 1,1,1-TCA. The wastes were poured into the pit and allowed to percolate into the soil or evaporate; the waste in the pit was then detonated.	The RFA recommended that an RFI be conducted at this SWMU and that the RFI be coordinated with the ongoing activities of the RI. Investigated as part of IR Site 1. Based on the October 22, 1997 meeting, further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational (for solvent contamination of the past, but was not designed for possible expolosive contamination from RCRA Unit) since September 30, 1998. Non time critical removal is under development for soil corrective action~~A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational since September 30, 1998.~~ ~~FS underway to assess corrective action for soil.~~

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 21, Building 241 Catch Basin CERCLA	D11, Bldg. 241	1960s - 1980s	The unit managed water, which may have contained residual explosive materials from testing operations in the Building 241 bunker. The unit is a metal catch basin, the bottom and sides of which consisted of a fine screen which filtered the particulate residue and allowed water to pass through.	No further investigative action recommended for this SWMU. Based on the October ~~22, 1997~~14, 1998 meeting, further action is planned for this SWMU.
SWMU 22, Incinerators SWMU 22A - Explosive Waste Incinerator SWMU 22B - Classified Document Incinerator SWMU 22C - Pilot Fluidized Bed Incinerator SWMU 22D - Non-Explosive Combustible Incinerator (SWMUs 22C and 22D are part of IR Site 1, SWMU 22D is also SWMU 11) CERCLA CLOSEOUT DOCUMENT (RFA)	D2, D3, D6, D8	1942 - 1980s	Includes an explosive waste incinerator (1942 - 1950s) which treated explosive wastes; classified document incinerator (1942 - 1980s) for scrap paper; pilot fluidized bed incinerator (1980s) for specially prepared propellant and explosive wastes; and non-explosive combustible incinerator (1960s - 1970s) for facility refuse and non-explosive combustible materials.	No further investigative action recommended for SWMUs 22A and 22B. SWMUs 22C and 22D will be investigated as part of IR Site 1. Based on the October 22, 1997 meeting, no further action is planned for SWMUs 22A and 22B. Further action is planned for IR Site 1. A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational (for solvent contamination of the past, but was not designed for possible expolosive contamination from RCRA Unit) since September 30, 1998. Soil will be evaluated for SWMU 22C & 22D under IR Site 1. ~~FS underway to assess corrective action for soil.~~

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 23, Salvage Yard CERCLA CLOSEOUT REPORT	D2, east of Bldg. 270	1950s - present	Unit managed scrap metals including aluminum and copper, also stores outdated equipment such as compressors (all PCB containing equipment has been removed from this area), empty drums, and, at one point, spent automotive batteries.	No further investigative action recommended for this SWMU. This SWMU will be ~~addressed under RCRA voluntary cleanup~~closed out in a NFA report. Site has been sampled.
SWMU 24, Satellite Accumulation Areas [24A through 24BB] (SWMUs 24S and 24T are included as part of AOC N) CERCLA/RCRA	D1, D2, D4, D5, D6, D7, D8	1940s - present	Several areas throughout the facility used to accumulate waste materials before they are transferred to the current hazardous waste storage area.	Based on the October 22, 1997 and the October 14, 1998 meetings, no further action is planned for SWMUs 24A, 24B, 24C, 24D, 24F, 24H, 24J through 24Q, 24U, 24W, 24Y, 24Z, 24AA, and 24BB. Further action is planned for 24E, ~~24I.~~ 24R, ~~24V.~~ and 24X. In addition, further action is planned for SWMUs 24S and 24T under AOC N. SWMU 24V was removed by the facility. Groundwater contamination from the former locatoin of SWMU 24V is being handled under IR Site 10. A ROD was signed in August 1998 to treat groundwater. SWMU 24I was removed June 1998 and is pending regulatory concurrence. 24W, 24BB – CERCLA (RFA)
SWMU 25, Solvent Recovery Stills [25A, 25B, and 25C] (SWMU 25B is included as part of AOC N) NOT CERCLA	D1, D2, Plant 2	currently active	Six solvent recovery stills located in Buildings 8, 167, 256, 2014, and 8203 which manage methylene chloride and spent solvents. TCE still bottoms, and 1,1,1-TCA still bottoms were generated.	No further investigative action was previously recommended for this SWMU. Based on the October 22, 1997 meeting, no further action is planned for SWMUs 25A and 25C. SWMU 25B will be further investigated under AOC N.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 26, Septic Tank CERCLA	D6, south of Bldg. 369	1940s - 1960s	Unit managed industrial and sanitary wastewater. Industrial wastewater was generated from photographic processes and lab glassware washing. Industrial wastewater potentially contained solvents, including acetone and photographic solutions.	No further investigative action recommended for this SWMU under the CERCLA program. SWMU 26 is being removed by Alliant Techsystems, Inc. as part of a demolition contract for bldg 369. ~~Based on the October 22, 1997 meeting, no further action is planned for this SWMU.~~
SWMU 27A, Plant 1 Drainage Ditch System Includes SWMU 39 NOT CERCLA	Throughout the facility (D1, D2, D3, D5, D6, D7, D8, D11)	1940s - present	A system of open earthen drainage ditches, catch basins, and culverts throughout the facility which serve as a stormwater drainage system. This system also receives washdown from some of the process buildings (e.g. Bldg. 181) and discharge from the settling basin (SWMU 44 which was removed in 1993).	SWMU 27A was recommended for further action (Phase II RFI).
SWMU 28, Silver Recovery Units NOT CERCLA	D1, Bldg. 181 and 300, D9	Bldg. 181, 1971 - present Bldg. 300, 1960s – present	Three units which are used to reclaim silver from photographic and x-ray development waste. Silver sludge is collected by plant personnel before transfer off site.	No further investigative action recommended for this SWMU. Based on the October 22, 1997 meeting, no further action is planned for this SWMU.
SWMU 29, Dust Collectors and Baghouses [29A through 29K] (SWMU 29F is included as part of AOC N) NOT CERCLA	Several areas throughout the facility (D1, D7, D8, D2)	1962 - present	Includes dust collectors and baghouses located at Buildings 2, 8, 35, 36, 145, 167, 256, 262, 300, and 344. Typical wastes managed at these units include sawdust, metal residues, and fly ash. Dust collectors at Buildings 262 and 2003 collected product, not waste. Thus, they should not have been classified as SWMUs.	No further investigative action was previously recommended for this SWMU. SWMU 29F will be included in AOC N. Based on the October 22, 1997 meeting, no further action is planned for SWMU 29A through 29E and 29G through 29K. Further action is planned for 29F which is included as part of AOC N.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 30, Spray Booth Filters (SWMU 30 in Building 167 included as part of AOC N) NOT CERCLA	Several areas throughout the facility (D1, D8)	Currently operational	The facility operates several paint and coating spray booths for painting and lining rocket motor cases, wooden signs, and other components. According the waste profiles, paint wastes contain paint resins, enamels, epoxides, and urethanes. In addition, MIK, MIBK, xylenes, toluene, petroleum distillates, 1,1,1-TCA, and TCL constituents are present in these wastes.	No further investigative action was previously recommended for this SWMU. Spray booth filters located in Building 167 will be included in AOC N. Based on the October 22, 1997 meeting, no further action is planned for the spray booth filters except for the one located in Building 167 (AOC N).
SWMU 31, Laboratory Waste Areas NOT CERCLA	Each lab area	Prior 1956-Present	Five-gallon plastic containers equipped with fitted lids, which are used to collect waste propellants from lab test areas. These units manage propellant waste materials that have been tested with VOCs, isocyanates, and inorganics. The propellants may contain NG, HMX, RDX, and AP; in addition some propellants may contain lead.	No further investigative action was previously recommended for this SWMU. No further action is planned for this SWMU.
SWMU 32, PCB Rags Storage Area CERCLA	D1, Bldg. 23	1970s - 1980s	An accumulation area measuring approximately 10 feet by 7 feet. Unit managed one drum of PCB-contaminated rags and one drum containing a PCB capacitor. In addition, a drum containing PCB fluid used for topping off electrical equipment was stored here.	The RFA recommended no further action. The agencies accepted this recommendation. During a site visit, two canisters of pesticide were observed. No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 33, Dumpsters NOT CERCLA	Throughout the facility	1988 - present	Leased side-loading and roll-off dumpsters. Most dumpsters receive non-hazardous general refuse including kitchen refuse, paper refuse, non-hazardous cured resin and composite materials, shop waste, waste tires, and non-hazardous ash from burning activities. Spray Booth filters are also disposed in these units.	No further investigative action was previously recommended for this SWMU No further action is planned for this SWMU.
SWMU 34A & B, Oil/Water Separators NOT CERCLA	D1, D2, D8	1991 and 1992 - present	Seven units located in Buildings 215, 252, 300, 341, 2026, and 8501. The primary waste managed by these units is waste lubricating oil from air compressors.	The RFA recommended no further action. Oil-stained soils were observed behind Building 252, and oil was observed in a shallow excavation adjacent to Building 341. Oil and visibly stained soils will be removed from both areas and confirmatory sampling will be performed. Based on the October 22, 1997 meeting, further action is planned for this SWMU.
SWMU 35, Paper Mulcher Waste Accumulation Area NOT CERCLA	D1, Bldg. 1	1983 - present	A temporary storage area for paper mulch generated by the facility=s security disintegrator machine. The unit manages paper mulch generated from classified documents and scrap paper.	No further investigative action was previously recommended for this SWMU. No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 36, Oil Pit Site 11 NOT CERCLA	Bldg. 215	1960s-1995 - unit contains waste oil but is not operational	A below grade circular pit measuring two feet in diameter and two feet in depth. This unit contained a dark, highly viscous petroleum substance during the RFA site visit.	The RFA recommended that the integrity of the oil pit be evaluated, and if impaired, soil sampling should be performed. A 55-gallon drum filled with No. 5 fuel oil and adjacent soils were removed to clean the area. Confirmatory soil samples indicated no contamination. However, core samples collected from F-Well (IR Site 11) investigation showed additional contamination below a clay layer which was previously determined to be clean. Based on the October 22, 1997 meeting, further action is planned for this SWMU. Based on the October 14, 1998 meeting, this SWMU is included as part of IR Site 11 under the IR Program.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 37, Wastewater Sumps [37A through 37Q, 37S through 37X] (SWMU 37N is part of AOC N) SWMU 41 to be evaluated with SWMU 37B per FFA	Throughout the facility (D1, D2, D5, D6, D8, D11)	1940s - present	Currently 24 units have been identified. These units have received or have potentially received contact cooling water from propellant machining operations, building washdown water from structures at which solid explosives are processed, wastewater containing materials other than propellants and explosives, coolants, oil, solvents, Alodine wastewater, salts, sands, and sediment. 37B, N, V, W, BB IN UIC LETTER AS PART OF THE SWMU INVESTIGATION.	Further investigation for SWMUs ~~37A,~~ 37B, 37G, 37J, 37P, 37S, 37V, 37W, and 37X. SWMU 37N will be included as part of AOC N. ~~SWMUs 37C, 37D, 37E, 37T, and 37U will be addressed under RCRA Voluntary Cleanup.~~ SWMU 37C, D, E, T and U were removed June 1998 and are pending regulatory concurrence. SWMU 37X is being removed under the RCRA program vice CERCLA. No further action is planned for SWMUs 37A, 37F, 37H, 37I, 37K, 37L, 37M, 37O, ~~37P,~~ 37Q, and 37S. 37Q closed out in FFA under finding of facts p 19. RFA – 37A, 37C, 37D, 37F, 37G, 37H, 37K, 37M, 37O, 37P.
SWMU 38, Parts Cleaners NOT CERCLA	D1	1960s - present	Several units located at Building 2014, Building 7, one of the satellite accumulation areas, Building 145,and Building 224. Solvents include 1,1,1-TCA and Varsol solvent.	No further action is planned for this SWMU.
SWMU 39, Weir NOT CERCLA	D7, near Bldg. 344; D11	1988 - present	Concrete skimmers are located along two of the swales which are part of the drainage ditch system. These units were constructed to provide secondary containment in the event of a fuel oil release from a boiler.	The RFA recommended that soil samples be collected around and upstream of the unit. Because this weir is part of the drainage ditch system on Plant 1, it is associated with SWMU 27A. Based on the October 22, 1997 meeting, further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 40, Laboratory Exhaust Filter NOT CERCLA	D1, Bldg. 12	1960s (maybe 1940s) - present	Disposable filter mechanism located outside of the Strand Bomb Testing Laboratory. It is approximately 18 inches above ground surface, and the majority of the surrounding ground surface is covered with cement. This unit manages combustion products from propellant testing.	Based on the October 22, 1997 meeting, further action is planned for this SWMU. SWMU 40 was removed June 1998 and is pending regulatory concurrence. ~~This SWMU was will be addressed under RCRA Voluntary Cleanup.~~ ~~Based on the October 22, 1997 meeting, further action is planned for this SWMU.~~
SWMU 41, Automotive Maintenance Area Drain NOT CERCLA	D1, Bldg. 7	1940s - present	Below grade collection drain located at Building 7. This unit manages washdown water and liquids from inside the building; waste oil, coolants, and solvents are used regularly in this area.	The RFA recommended that the integrity of the unit be assessed, and if impaired, soil samples to be collected. Soil sampling was conducted, low levels of VOCs were detected. Possible releases from this SWMU have been considered during the investigation of SWMU 37B - Building 7 Wastewater Sump. Based on the October 22, 1997 meeting, further action is planned for this SWMU.
SWMU 42 is AOC F	NA	NA	NA	NA
SWMU 43, Soil Pile NOT CERCLA	D1, Bldg. 7	1992	Soil was excavated from the area behind Bldg. 7 when six USTs were removed. The soil was contaminated with diesel fuel and gasoline (BTEX) from the UST cleanup operations. The soil was land farmed on plastic sheeting.	No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 44, Settling Basin NOT CERCLA	D1, Bldg. 7	1992 - present	When the tanks and surrounding soil were removed from Bldg. 7 the excavation pits filled with water. Air stripping was conducted on the water and the water is then pumped to a manmade basin. Solids are allowed to settle and water is discharged to the drainage ditch system. The unit receives water from the excavation area with TPH levels of less than 50 ppb.	The RFA recommended water samples be collected. Effluent water samples were collected and evaluated. The agencies agreed that no further actions were necessary at this SWMU. No further action is planned for this SWMU. Closed out under FFA finding of facts p 19.
SWMU 45, Air Stripper NOT CERCLA	D1, Bldg. 7	1992 - present	An air stripper was temporarily installed behind Bldg. 7 (see SWMU 43 and 44 description). The unit receives water from the excavation area with a TPH content of less than 10 ppb. The facility has estimated that emissions of VOCs total less than one half pound per hour during operation.	No further action is planned for this SWMU.
SWMU 46 is AOC G	NA	NA	NA	NA
SWMU 47 is AOC H	NA	NA	NA	NA
SWMU 48 is AOC I	NA	NA	NA	NA
SWMU 49 is AOC J	NA	NA	NA	NA
SWMU 50 is AOC K	NA	NA	NA	NA
SWMU 51 is AOC L	NA	NA	NA	NA

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 52, Current Alodine Treatment Tank (This SWMU is part of AOC N) NOT CERCLA	D2, south of Bldg. 167	1991 - 1995	A treatment tank which was open on top with a plastic containment structure (6 feet in diameter by 2 feet deep) beneath it. The tank and containment structure were on a concrete pad. This treatment tank operated at the same location as the former Alodine treatment tank (see SWMU 12 description). This unit managed spent Alodine.	This SWMU was recommended for further action (Phase II RFI). The tank was removed in 1995. Based on the October 22, 1997 meeting, further action is planned for AOC N.
SWMU 53, Former PCB Storage Area NOT CERCLA	D1, Bldg. 25	1980s - 1990	Fully enclosed wooden shed with a concrete base. 55-gallon drums of PCB material and hydraulic equipment units, which contained PCB oil, were stored at this unit.	No further action is planned for this SWMU.
SWMU 54, Building 7 UST Removal Site NOT CERCLA	D1, Bldg. 7	1950s - 1992	Former location of 7 USTs which held gasoline and diesel. These tanks were removed as part of the facility UST removal program in 1992. This unit manages contaminated soil and water (BTEX associated with gasoline and fuel oil from the former tanks).	The RFA recommended that an RFI be conducted to assess the nature and extent of contamination. A data package including documentation of pre-removal sampling, the removal action taken, confirmatory sampling, and groundwater monitoring was provided and reviewed. The removal effort was conducted under the direction of the WV DEP UST Division. Since the SWMU will continue to be monitored under the authority of the WV DEP UST Division, the agencies agreed to no further action for this SWMU under the IR Program. No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 55, Building 2 UST Removal Site NOT CERCLA	D1, Bldg. 2	1946 - 1991	Former location of 2 USTs, which were used to store heating, oil. These tanks were removed as part of the facility UST removal program in 1991. This unit manages contaminated soil (TPH associated with the heating oil from the former tanks).	The RFA recommended that an RFI be conducted to assess the nature and extent of contamination. A data package including documentation of pre-removal sampling, the removal action taken, confirmatory sampling, and groundwater monitoring was provided and reviewed. The tanks were not regulated, so no formal reporting of the removal effort was required. The work was monitored by the WV DEP and verbal authorization was given to close the excavation. Confirmatory soil sample results were evaluated. The agencies agreed that no further actions were necessary for this SWMU. No further action is planned for this SWMU. Closed out under FFA finding of facts p19.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 56, Building 3 UST Removal Site NOT CERCLA	D1, Bldg. 3	1966 - 1991	Former location of 4 USTs, which were used to store No. 5 fuel, oil. These tanks were removed as part of the facility UST removal program in 1991. This unit manages contaminated soil from No. 5 fuel oil spill from the former tanks (TPH levels less than 50 ppm).	The RFA recommended that an RFI be conducted to assess the nature and extent of contamination. A data package including confirmatory sampling was provided and reviewed. The tanks were not regulated, so no formal reporting of the removal effort was required. The work was monitored by the WV DEP and verbal authorization was given to close the excavation providing that a groundwater monitoring well was installed in the excavation of Tank 3-1. The well was installed and sampled. The groundwater results were reviewed. The agencies agreed that no further actions were necessary for this SWMU. No further action is planned for this SWMU. Closed out under FFA finding of facts p19.
SWMU 57, Building 300 UST Removal Site NOT CERCLA	D1, Bldg. 300	1964 - 1991	Former location of one UST which was apparently used to store No. 5 fuel oil. This tank was removed as part of the facility UST removal program in 1991. This unit manages contaminated soil from apparent No. 5 fuel oil releases.	The RFA recommended that an RFI be conducted to assess the nature and extent of contamination. A data package including confirmatory sampling was provided and reviewed. The tank was not regulated, so no formal reporting of the removal effort was required. The work was monitored by the WV DEP. The agencies agreed that no further actions were necessary for this SWMU. No further action is planned for this SWMU. Closed out under FFA finding of facts p19.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 58, Building 2 PCB Spill Area NOT CERCLA	D1	Unknown	A PCB spill was reported from hydraulics associated with a large hydraulic press, which had once operated in the building.	This SWMU was not identified in the RFA. RFA 1993. A remedial action of this reported PCB spill area was completed, but documentation of the remedial action was not available. Based on the October 22, 1997 meeting, further action is planned for this SWMU.
SWMU 59, Building 3 Drain NOT CERCLA	D1, Building 3	Unknown	Unknown	This SWMU was not identified in the RFA, but added to the list after it was observed by the WVDEP during their site visit. The agencies agreed that no further actions were required at this SWMU as long as possible releases from the drain are considered in the investigation of SWMUs 26 and 27A. No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
SWMU 60, Building 23 Pesticide Storage Area	D1, Bldg. 23	Unknown	Storage area used by a former maintenance supervisor to store tools.	This SWMU was not identified in the RFA. It was added to the list after two pesticide spray pump canisters were observed in the area during the site visit for SWMU 32. According to the former maintenance supervisor, the canisters were old fire extinguishers obtained when the fire department disallowed the use of carbon tetrachloride. The extinguishers were filled with methylene chloride and used to remove wasps from work areas. He stated that pesticides were never stored in this area. The agencies accepted the explanation and agreed that no further actions were required for this SWMU. No further action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
AOC A, Underground Storage Tanks NOT CERCLA	Several locations in Plant 1 (D1, D7, D8, D4)	1960s – 1980s	This AOC is comprised of 14 USTs. Several of the USTs have been removed and/or closed in place. Seven USTs remain in service; six of these tanks are regulated.	The RFA recommended that RCRA Phase II soil samples be collected where USTs had been removed at Buildings 100 and 504. It was also recommended that the USTs located at Building 224 be integrity tested, and if leaks were detected, soil samples be collected. The removal actions have been coordinated with the WV DEP UST Unit and Office of Environmental Enforcement. As long as the WV DEP UST Unit provides this oversight, the other agencies agreed that no further action is required for this AOC under the IR Program. Groundwater contamination detected in this area will be considered in conducting investigations and remedial actions under the IR Program.
AOC B, PCB Transformers Storage Area NOT CERCLA	D1, east of Bldg. 157	Unknown - 1991 and 1992	Concrete pad measuring approximately 20 feet by 30 feet. This unit served as a staging area for transformers which were designated for reuse at the facility. All transformers were removed from the area in 1991 and 1992.	Further investigative action is planned for this SWMU.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
AOC C, Condensate Discharge Area NOT CERCLA	D8, Bldg. 105	Present during RFA site visit (1993)	An earthen area, partially vegetated, which measures approximately 4 feet by 5 feet. A pipe extending from Building 105 discharged a warm liquid leaving a reddish-brown residue. According to the facility, this color is due to iron oxide from the iron condensate piping.	The RFA recommended that soil samples be collected from around the unit. The analytical data from these samples indicated that the condensate comes from steam generated in the boilers at Building 344. The agencies agreed that no further actions are required at this AOC since the condensate discharge will be regulated as Class 5 injection wells or under the NPDES for the facility. No further action is planned for this AOC. AOC C closed out in FFA finding of facts p 20.
AOC D, Building 181 Pit NOT CERCLA	D8, Bldg. 181	Present during RFA site visit (1993)	Round, vertical, below-grade terracotta pipe located near Building 181, which appeared to be a possible discharge outlet. There was no historical information regarding this unit.	The RFA recommended that the integrity of the pit be tested, and if unsound, soil samples be collected around the pit. Documentation and visual inspection of the "pit" by the agencies determined that the "pit" was a manhole for a sewer line to a now abandoned septic tank and no cracks or evidence of leaking was observed. Therefore, the agencies agreed that no further action was required for this AOC providing that the septic tank and drainage field be included as part of SWMU 26 investigation. No further action is planned for this AOC. AOC D closed out in FFA finding of facts p 20.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
AOC E, Above Ground Storage Tanks Spills Area NOT CERCLA	D7, Bldg. 344	Present during RFA site visit (1993)	During and EPA inspection, an oil spill was noted within the diked area at the above-ground tank farm located approximately 100 feet west of Bldg. 344. No further details were provided.	The RFA suggested that a sampling and monitoring program be implemented. ABL has already completed work (with EPA Region III concurrence) to remove contamination from the area. For this reason, the agencies have agreed that no further action is required for this AOC. No further action is planned for this AOC. AOC E closed out in FFA finding of facts p 20.
AOC F, Acid Neutralization Pit (This AOC is IR Site 9) NOT CERCLA	D7, near Bldg. 344	1970s - 1992 (however, not used until 1988)	Served as a contingency discharge area for sulfuric acid from a nearby storage tank. In August 1992, the facility replaced the sulfuric acid tank with a self-contained tank; during the replacement operation, a release of approximately 600 gallons of sulfuric acid occurred. The release was neutralized and reported to the National Response Center. The pit was backfilled in late 1992 and no contamination was found.	The RFA recommended that soil samples be collected from the pit area and between the pit area and the drainage ditch. Following the collection of samples and an inspection by the WV DEP, the agencies agreed that no further action was required for this AOC. No further action is planned for IR Site 9. AOC E closed out in FFA finding of facts p 20.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
AOC G, X Range Area NOT CERCLA	D11	1944 - present	Area is a static test firing range for rocket motors and igniters that are produced at ABL. This unit manages explosive residuals, which are generated as a result of the rocket motor and igniter testing procedures. Propellants may contain AP, aluminum, NG, nitrate esters, NC, RDX, and HMX as primary ingredients. Firing has lead to erosion of the hillside, and residues from fired materials may have reached the soil. Occasionally, rocket motors being tested explode; burning propellant and motor parts are discharged onto the hillside generating small fires.	The RFA recommended that soil samples be collected n the vicinity of test firing bays at Buildings 77, 193, 194, and 242. Further action is planned for this AOC. AOC G is being handled under the RCRA program vice CERCLA.
AOC H, Rocket Motor Test Area NOT CERCLA	500 Area	1960s - present	.50-caliber bullets are fired into anchored rocket motors for testing in this area. Motors are also tested for flammability in this area by placing them in bonfires. The unit manages explosive residuals, which are generated as a result of the rocket motor testing procedures. The propellants and explosives include HMX and RDX. Residues can be washed by stormwater runoff through a swale to the Sensitivity Test Area Pond, which flows to the North Branch of the Potomac River.	The RFA recommended that soil samples be collected from around the concrete pads and tunnel. Further action is planned for this AOC.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
AOC I, Sensitivity Test Area and Pond (This AOC includes IR Site 6) NOT CERCLA	500 Area	1970s - present	The insensitive munitions test area is located west of the pond. Since 1989, .50 caliber bullet impact testing and flammability testing of rocket motors have been conducted in this area. This unit includes a pond, which serves as a catch basin for runoff from the sensitivity area. The unit manages explosive residuals transported by stormwater runoff from this area, water from this pond would flow to the North Branch of the Potomac River.	The RFA recommended confirmatory surface water sampling be conducted at the pond. In addition, it was recommended that sediment samples be collected. Further action is planned for this AOC. AOC I is being handled under the RCRA program vice CERCLA.
AOC J, A and B Ranges CERCLA	D1, Bldg. 3	1940s - 1970s	This unit consists of two subscale rocket motor static test firing ranges, which were used from the 1940s to the 1970s. These ranges received propellant residue as a result of rocket motor test firing operations.	No further action is planned for this AOC.
AOC K, C Range CERCLA	D6, Bldg. 4	1940s	This unit was used for test firing of .50-caliber machine gun ammunition during World War II. Bullets were fired into a sand filled backstop (Building 43) during testing operations. The composition of the bullets is not known. The facility stated AIt must be assumed that all projectiles hit a backstop and were contained. Sand from this backstop has been removed and its disposition is not known. Excavations in the area have not shown evidence of projectiles as were found in connection with H Range.≅	Further action is planned for this AOC.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
AOC L, H Range CERCLA	D8, north of Bldg. 275	1940s	The unit is believed to have been used as a mortar testing range during World War II. The ballistics characteristics of mortar propellant were tested by firing the materials toward the hillside. This range potentially received propellant and explosive constituents during testing operations.	No further action is planned for this AOC.
AOC M, Solid Waste Landfill CERCLA	D3	Unknown	Established during the October 22, 1997 meeting.	Based on the October 22, 1997 meeting, further action is planned for this AOC.
AOC N, Building 167 SWMUs NOT CERCLA	D2, Building 167	Primarily 1970s – Present	Established during the October 22, 1997 meeting.	Based on the October 22, 1997 meeting, further action is planned for this AOC. SWMU 52, 37N, 12, 24S, 29F, 24T, 25B, 14.
AOC O, Impact Area from Ranges F, G, and H CERCLA	D11	Unknown	Established during the October 22, 1997 meeting.	Based on the October 22, 1997 meeting, further action is planned for this AOC.
IR Site 1 - Northern Riverside Waste Disposal Area Includes SWMU 1, 7, 8, 11, & 20 CERCLA/RCRA	D3	Late 1950s to present	See SWMUs 1, 6, 7, 8, 11, 20, and 22C and 22D descriptions	1996 Actions: RI; Focused FS for Groundwater; and Phase I Aquifer Testing 1997 Actions: Groundwater remedial design and soil FS in process A ROD was signed for groundwater remediation on April 1997. Construction of a groundwater treatment plant was completed and has been operational since September 30, 1998. Further action is planned for this IR Site regarding Soil.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
IR Site 2 - Previous Burning Ground (1942 – 1949) Includes SWMU 4 CERCLA	D8, D9	1942 – 1949	See SWMU 4 description	1996 Actions: RI, Phase II RI No further action is planned for this IR Site.
IR Site 3 - Previous Burning Ground (1950 – 1958) Includes SWMU 5 CERCLA	D8	1950 - 1958	See SWMU 5 description	1996 Actions: RI, Phase II RI No further action is planned for this IR Site.
IR Sites 4A and 4B – Spent Photographic Developing Solutions Disposal Sites 4A includes SWMU 18 CERCLA	D9, adjacent to Bldg. 181; D1 adjacent to Bldg. 231	1959 – 1971	See SWMUs 18 and 19 descriptions	Last Actions: Interim RI (October 1989) 1996 Actions: Phase II RI (August 1996) No further action is planned for IR Site 4A; further action is planned for IR Site 4B.
IR Site 5 - Inert Landfill SWMU 9 CERCLA	South of Plant 1	1964 – 1988	See SWMU 9 description	1996 and 1997 Actions: RI, Focused FS for Landfill Contents and Surface Soil, Phase I Aquifer Testing, Focused FS for Groundwater; Phase II RI; Landfill construction and design; Groundwater monitoring A ROD was signed for soil remediation on January 1997. Construction of a landfill cap was completed October 1997. Further action is planned for the IR Site regarding groundwater.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
IR Site 6 - Sensitivity Test Area Surface Water Impoundment NOT CERCLA	500 Area	1970s – present	See AOC I description	Last Actions: Interim RI (October 1989) Further action is planned for the IR Site under the RCRA program.
IR Site 7 - Beryllium Landfill SWMU 10 CERCLA	Off of Route 956	1964 – 1974	See SWMU 10 description	1994 Actions: Pit was excavated 1996 Actions: RI and EE/CA 1997 Actions: Contaminated wastes and soil were removed for off-site disposal Based on the October 14, 1998 meeting, no ~~F~~further action is planned for the IR Site.
IR Site 8 - Explosives Wastewater Sumps/Catch Basin NOT CERCLA	Throughout the facility (D1, D2, D5, D6, D8, D11)	1940s – present	See SWMU 37 description	The IAS recommended no further action at this site. No actions have been taken to date. No further action is planned for this IR Site.
IR Site 9 (AOC F) - Former Acid Disposal Pit NOT CERCLA	D7	1972 – 1979	Served as a contingency discharge area for sulfuric acid from a nearby storage tank. In August 1992, the facility replaced the sulfuric acid tank with a self-contained tank; during the replacement operation, a release of approximately 600 gallons of sulfuric acid occurred. The release was neutralized and reported to the National Response Center. The pit was backfilled in late 1992 and no contamination was found.	The IAS recommended no further action at this site. No actions have been taken to date. No further action is planned for this IR Site.

TABLE 4-3 (Continued)

SWMU, AOC, AND IR SITE DESCRIPTION AND STATUS
ALLEGANY BALLISTICS LABORATORY
ROCKET CENTER, WEST VIRGINIA

Name	Location	Dates of Operation	Description and Wastes Managed	Status (Actions Taken and/or Reason Removed from List)
IR Site 10 – Contaminant Plume Thought to Originate Near Building 157 CERCLA	D1, D8	1959 – early 1960s	TCE has been detected in a plume originating in Subarea D1. A potential source is believed to be from a still which operated adjacent to Building 157. Former still is not listed as a separate SWMU.	1996 Actions: RI, Phase I Aquifer Testing, Focused FS for Soil and Groundwater; Phase II RI 1997 Actions: Phase II aquifer testing at Site 10 (anticipated) A ROD was signed for groundwater remediation on August 1998. Construction of a groundwater treatment plant was completed and has been operational since September 30, 1998. Further action is planned for this IR Site.
IR Site 11 - Building 215 (F-Well) CERCLA	D2	1961	An 8-inch diameter production well never used due to poor production. Well was uncovered during demolition of Building 215. Petroleum hydrocarbons and solvents found in well.	1996 Actions: Advanced Site Inspection 1997 Actions: RI ~~(anticipated October 1997)~~ Further action is planned for this IR Site.

Notes:

ABL = Allegany Ballistics Laboratory
1,1,1-TCA = 1,1,1-trichloroethane
TCE = Trichloroethene
HMX = Octahydro-1, 3, 5, 7-tetranitro-1, 3, 5, 7,-tetrazocine
RDX = Hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine
PCE = Tetrachloroethene
PCB = Polychlorinated Biphenyls
MEK = Methyl Ethyl Ketone
MIBK = Methyl Isobutyl Ketone
TCL = Target Compound List
VOC = Volatile Organic Compounds
NA = Not Available
NG = Nitroglycerin
NC = Nitrocellulose
AP = Ammonium perchlorate
RFA = RCRA Facility Agreement
BTEX = Benzene, Toluene, Ethylbenene, Xylenes
TPH = Total Petroleum Hydrocarbon
ppb = Parts per billion
ppm = Parts per million
UST = Underground Storage Tank
RFI = RCRA Facility Inspection
ROD = Record of Decision
RBC = Risk Based Concentration

* It should be noted that the Phase I RFI is a "Draft" document which has not been approved as an RFI by the regulatory agencies.