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FEDERAL FACILITIES AGREEMENT SITE MANAGEMENT PLAN 2011 NAS PENSACOLA FL  
10/1/2010  
TETRA TECH NUS

**FEDERAL FACILITIES AGREEMENT  
SITE MANAGEMENT PLAN**

**FISCAL YEAR 2011**

**NAVAL AIR STATION PENSACOLA  
PENSACOLA, FLORIDA**

**Submitted to:**

**Naval Facilities Engineering Command  
Southeast  
Naval Air Station Jacksonville  
Jacksonville, Florida, 32212-0030**

**Submitted by:**

**Tetra Tech NUS, Inc.  
661 Andersen Drive  
Foster Plaza 7  
Pittsburgh, Pennsylvania, 15220**

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## ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirements
BEQ	Benzo(a)Pyrene Equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIP	Community Involvement Plan
COPC	Chemical of Potential Concern
CVOC	Chlorinated Volatile Organic Compound
CTL	Cleanup Target Level
DDT	Dichlorodiphenyltrichloroethane
EP Toxic	Extraction Procedure Toxicity
ESI	Extended Site Inspection
FDER	Florida Department of Environmental Regulation
FDEP	Florida Department of Environmental Protection
FFA	Federal Facilities Agreement
FOTW	Federally Owned Treatment Works
FS	Feasibility Study
FY	Fiscal Year
GCTL	Groundwater Cleanup Target Level
HSWA	Hazardous and Solid Waste Amendments
HW	Hazardous Waste
IAS	Initial Assessment Study
IRA	Interim Remedial Action
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plan
LUC	Land Use Controls
MCL	Maximum Contaminant Level
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mm	millimeters
mR/hr	millirem per hour
MWR	Morale, Welfare, and Recreation
NACIP	Navy Assessment and Control of Installation Pollutants
NARF	Naval Air Rework Facility
NAS	Naval Air Station
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEESA	Naval Energy and Environmental Support Activity

## ACRONYMS (CONTINUED)

NEPA	National Environmental Policy Act
NFA	No Further Action
NFRAP	No Further Action Planned
OU	Operable Unit
PA	Preliminary Assessment
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
POL	Petroleum, Oil and Lubricant
PP	Proposed Plan
ppb	Parts per Billion
ppm	Parts per Million
PSC	Potential Source of Contamination
PWC	Public Works Center
RAB	Restoration Advisory Board
RC	Reference Concentration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager (NAVFAC and regulatory)
SARA	Superfund Amendments and Reauthorization Act
SCTL	Soil Cleanup Target Level
SI	Site Inspection
SMP	Site Management Plan
SPAWAR	Space and Naval Warfare System Command
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
TRPH	Total Recoverable Petroleum Hydrocarbon
Tetra Tech	Tetra Tech NUS, Inc.
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
VS	Verification Study
WWTP	Wastewater Treatment Plant

## **1.0 INTRODUCTION**

This Site Management Plan (SMP) provides a summary of response actions and associated documentation to be undertaken at the Naval Air Station (NAS) Pensacola according to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, as implemented by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and to the extent practicable the National Environmental Policy Act (NEPA) of 1969.

The requirement for this SMP is identified in the Federal Facilities Agreement (FFA) that was signed by the United States Environmental Protection Agency (USEPA), the state of Florida, Department of Environmental Regulation (FDER), now Florida Department of Environmental Protection (FDEP), and the Department of the Navy. The FFA is based on the requirement for an interagency agreement that is identified in Section 120 (e)(2) of SARA.

The FFA was signed on October 23, 1990, and has a declared effective date of November 1, 1990. Therefore, the SMP for Fiscal Year (FY) 2011 is the 21<sup>st</sup> annual update.

### **1.1 OVERVIEW OF SITE MANAGEMENT PLAN**

The intent of the plan is to provide: (1) an action deemed necessary to mitigate any immediate threat to human health or the environment, (2) a list of Operable Units (OUs) subject to the terms of the FFA, (3) a prioritization and rationale for the OUs at NAS Pensacola, and (4) activities and schedules for work planned for the current year, including the submittal schedule for both primary and secondary documents. A Gantt Chart showing the schedule for primary and secondary documents to be submitted to USEPA and FDEP is included in Appendix A.

A schedule of the sites in the Petroleum Program is included in Appendix B. The sites in the petroleum program are not subjected to the requirements of the FFA and SMP

### **1.2 INSTALLATION RESTORATION PROGRAM**

Brief descriptions, with a current regulatory status, of the sites and Potential Sources of Contamination (PSCs) identified under the FFA are presented in Table 1. The status of these sites will be coordinated, updated and submitted during the NAS Pensacola Partnering Team meetings, which occur quarterly.

### **1.2.1 Military Munitions Response Program**

The Department of Defense has established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program to address munitions and explosives of concern (MEC; including unexploded ordinance and discarded military munitions) and munitions constituents (MC) at other than operational military ranges and other sites. Closed or transferred military ranges and sites not located on an operational range are considered "other than operational". As part of the Navy's assessment of "other than operational" ranges at active installations, a Preliminary Assessment (PA) was completed at NAS Pensacola in 2007. The PA identified 10 "other than operational" ranges at NAS Pensacola. The individual ranges are listed and described on Table 1. In 2010, the Navy initiated Site Inspections (SI) at the 10 sites and the final SI reports should be completed by the end of Fiscal Year 2010.

### **1.3 PETROLEUM PROGRAM**

To assist the NAS Pensacola Partnering Team, which is comprised of representatives from USEPA, FDEP and Navy, a schedule of the sites in the Petroleum Program is included. The FFA does not extend to petroleum releases. However, to provide regulatory agencies a comprehensive yearly schedule, a Gantt Chart with the schedule for the sites managed under the Petroleum Program for FY 2011 is included in Appendix B.

**TABLE 1**

**SITE DESCRIPTION CHART  
INSTALLATION RESTORATION PROGRAM  
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Operable Unit (OU)	PSC	Site Description	Waste Type	Regulatory Status
-	13	Magazine Point Rubble Disposal	Rubble, Metal, Concrete	No Further Action (NFA) (1996)
PSC 13 was investigated and reported on concurrently with OU 10. This PSC is within the same area as PSC 32 and 33, and was found in 1971 during the construction and upgrading of the existing Wastewater Treatment Plant (WWTP), which provides tertiary treatment of industrial wastes and secondary treatment of the domestic wastes.				
OU 10	32	Industrial Wastewater Treatment Plant (IWTP) Sludge Drying Beds	F006 Hazardous Waste (HW)	Transferred to Resource Conservation and Recovery Act (RCRA) (2003)
	These contiguous units operated with the IWTP from 1971 to 1984. These units received listed hazardous waste sludge (F006) from the RCRA surface impoundment (IWTP Surge Pond), and, as a result, underwent RCRA closure in 1989. Contents of the drying beds (remaining sludge and leachate drainage system) and an underlying layer of sand were removed to about 6 feet below ground surface. Material removed was disposed of as a hazardous waste. The PSC was then backfilled with clean sand and capped with high density asphalt. The site's groundwater is monitored by three monitoring wells and the surrounding Hazardous Solid Waste Act (HSWA) permit groundwater monitoring system. The PSC will continue to be monitored under the HSWA permit.			
	33	WWTP	F006 HW wood, bricks	Transferred to RCRA (2003)
	These surface impoundments consist of the domestic polishing pond, phenol/stabilization pond, and industrial surge pond. In 1987, the USEPA RCRA Compliance Branch determined the polishing and stabilization ponds received listed F006 hazardous waste from the surge pond. The ponds were taken out-of-service. In 1988 to 1989, the ponds underwent RCRA permitted "clean closures". The sediment in the ponds was removed and disposed of as a hazardous waste. No further formal monitoring of these surface impoundments is required, but they are in range of the HSWA permit monitoring system. The industrial surge pond was taken out-of-service and underwent closure in 1989. The industrial surge pond is suspected of being the prime contributor to the IWTP groundwater contamination. The surge pond was removed to the groundwater table. The groundwater table is approximately 6 feet below ground surface. Removed material was disposed of as a hazardous waste. The surge pond PSC will continue to be monitored under the NAS Pensacola HSWA permit.			
OU 10	35	Miscellaneous IWTP Solid Waste Management Units (SWMUs)	Unknown	Transferred to RCRA (2003)
	These contiguous units operated with the IWTP from 1971 to 1984. These units received listed hazardous waste sludge (F006) from the RCRA surface impoundment (IWTP Surge Pond), and, as a result, underwent RCRA closure in 1989. Contents of the drying beds (remaining sludge and leachate drainage system) and an underlying layer of sand were removed to about 6 feet below ground surface. Material removed was disposed of as a hazardous waste. The PSC was then backfilled with clean sand and capped with high density asphalt. The site's groundwater is monitored by three monitoring wells and the surrounding HSWA permit groundwater monitoring system. The PSC will continue to be monitored under the HSWA permit.			

**TABLE 1**

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Operable Unit (OU)	PSC	Site Description	Waste Type	Regulatory Status
OU 1	1	Sanitary Landfill	Solvents, polychlorinated biphenyl (PCB), Plating Solution, oil, paints, mercury, and asbestos	Record of Decision (ROD) (1998) / 5 year Review (2008)
<p>OU 1, also referred to as PSC 1 or Site 1, is an inactive sanitary landfill encompassing approximately 85 acres. The landfill surface varies from 8 to 20 feet above mean sea level and is densely vegetated with 15- to 40-foot tall planted pines and natural scrub vegetation. During the early 1950s and until the official closing October 1, 1976, a variety of domestic and industrial wastes generated from NAS Pensacola and other outlying Navy facilities were disposed of the PSC 1.</p> <p>Following completion of the ROD in 1998, an interceptor trench was installed to prevent iron-contaminated groundwater from discharging to Wetland 3 and long-term monitoring was implemented. Semiannual groundwater monitoring is conducted for the following constituents: nickel, benzene, chlorobenzene, vinyl chloride, naphthalene, 1,1,2,2-tetrachlorethane, total xylenes, aluminum, cadmium, chromium, iron, and manganese.</p> <p>In 2007 a System Optimization Study was completed to evaluate the interceptor trench and monitoring program. The interceptor trench was installed by Bechtel and has operated since 1999. Intercepted groundwater has been discharged to the Federally Owned Treatment Works (FOTW) for treatment. Despite the operation of that system, iron concentrations in Wetland 3 remain above reference concentrations. FDEP considered the location where groundwater discharged to surface water at Wetland 3 to be the point of compliance. As stated in the Optimization Study and agreed by the NAS Pensacola Tier I Partnering Team, use of the interceptor trench was discontinued in 2009 because historic data had indicated that the system was not effective in reducing iron concentrations in the wetland.</p> <p>In addition, a Technical Memorandum for Reconnaissance Phase Flow Control Pilot Study was submitted in February 2009. The memorandum was completed to address the possibility of blocking the culvert between Wetland 3 and Wetland 4 to isolate Wetland 3 and thereby protect Wetland 4 by creating an infiltration area within Wetland 3 for the treatment of iron. The Memorandum also addressed the establishment of a revised Point of Compliance sampling location for the wetlands. The Pilot Study memorandum documented that the culvert could not be blocked because of the persistent upward groundwater flow which would not allow infiltration within the wetland. The Pilot Study also recommended that the Point of Compliance sampling location should be moved to Wetland 4 prior to the discharge location to Bayou Grande. The regulatory agencies concurred with the recommendation to move the compliance location.</p>				
OU 3	2	Waterfront Sediments	Solvents, cyanide, metals	No Action ROD (2005)
<p>PSC 2 is along the southeastern shoreline of NAS Pensacola and Pensacola Bay. The site consists of near-shore sediments along the waterfront. From 1939 to 1973, untreated industrial wastes from Naval Aviation Depot and Naval Air Rework Facilities operations were routinely discharged into Pensacola Bay, near PSC 2. Over 34 years, an estimated 83 million gallons of the following materials were disposed of in the bay: waste-containing paint, paint solvents, thinners, ketones, trichloroethylene, alodine, mercury, and concentrated plating wastes (primarily chromium, cadmium, lead, nickel, and cyanide).</p> <p>Other potential impacts may have occurred from vessel operations at the pier and docks in the immediate area. Additionally, off-site sources (other non-Navy vessels or operations) may have impacted the site due to the fluctuating nature of bay waters and sediment. The Remedial Investigation (RI) and risk assessment have addressed all media at the site; however, no other actions can be considered for Site 2 unless restrictions by the Homeland Security Department are substantially changed.</p>				

TABLE 1

**SITE DESCRIPTION CHART  
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Operable Unit (OU)	PSC	Site Description	Waste Type	Regulatory Status
OU 11	38	Bldg. 71 Sewer Line TL 073/C southwest to the end	Paint stripper, ketones, Trichloroethene (TCE), Industrial waste	ROD (2006) / 5 year Review (2008)
<p>OU 11, Site 38 consists of the contaminated soil and groundwater identified at Buildings 71 and 604 and associated IWTP sewer line area of NAS Pensacola. Building 71, was used from 1935 to the late 1970s for aircraft paint stripping and painting operations, and consisted of a steel-framed structure with metal siding on a 10- to 14-inch-thick concrete slab. The building was approximately 100 feet wide by 160 feet long and approximately 35 feet high. Waste stored during this period reportedly consisted of solvents, acids, caustics, oxidizers, and liquid and non-liquid toxic materials (Ecology and Environment, 1992). The building structure has subsequently been demolished and the area is used by Morale, Welfare, and Recreation (MWR) for parking large trucks.</p> <p>Building 604, was an irregularly shaped, brick/masonry structure built in 1937. Naval Aviation Depot metal plating operations were located in Building 604 until it was closed in May 1996. Initial plating operations were conducted in the western portion of Building 604 from approximately 1960 until the shop was demolished around 1970. Wastes from various operations at Site 38 (including paint stripping) were discharged to Pensacola Bay until the IWTP was built in 1973. Because of Hurricane Ivan damage (2004), the Navy elected to remove the buildings and associated parking lots. Also, surface soil areas identified as exceeding FDEP Industrial Soil Cleanup Target Levels (SCTLs) were removed and replaced with clean fill to prevent unacceptable exposure by current industrial receptors.</p> <p>Source removal activities were reportedly conducted at Site 38 in conjunction with cleanup of hurricane related debris, and clean fill was placed in the excavated areas to limit direct exposure to impacted soil. However, a report by the contractor documenting associated activities was not available for review. Monitoring of natural attenuation of groundwater quality has not been initiated because documentation of the source removal activity had not been provided.</p> <p>Confirmatory sampling was completed in 2009 to determine if the removal was done according to the remedy as needed to prevent unacceptable risk exposure. A remedial design is being prepared and includes Land Use Control (LUCs) implementing a groundwater monitoring plan.</p>				
OU 12	39	Oak Grove Campground Site	Debris, Petroleum, Oil and Lubricants (POL), broken clay, coal, cleaning solutions	NFA ROD (1998)
<p>Oak Grove is a campground area located immediately south of Sherman Field on the south side of Radford Boulevard. An area of stressed vegetation and stained soil approximately 150 feet in diameter was found near Pensacola Bay. The selected remedy for Site 39 was for NFA with a review of the site within five years. A significant difference to the July 1995 ROD deleted the five-year review, which was included because the risk assessment indicated arsenic and aluminum in groundwater contributed to a potential for excess lifetime cancer risk. However, it was determined that arsenic occurs naturally and the detected levels in groundwater [5 parts per billion (ppb)] are less than the Federal Maximum Contaminant Level (MCL) and Florida Primary Drinking Water Standard (50 ppb, which was in effect at that time). This change provided cost savings while protecting human health and the environment. Aluminum occurs naturally and exceeded its Federal Secondary MCLs and Florida Secondary Drinking Water Standards. The exceedances are limited to the upper portion of the shallow aquifer, which is not used for potable water in this area because of saltwater intrusion from Pensacola Bay.</p>				

**TABLE 1**

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Operable Unit (OU)	PSC	Site Description	Waste Type	Regulatory Status
OU 2	11	North Chevalier Disposal Field	Industrial waste, oils, HW	ROD (2008)
	<p>This PSC received industrial waste and oils, including hazardous waste. Groundwater analytical data from the on-site monitoring wells indicate both shallow and deep groundwater contamination with heavy metals and VOCs. Groundwater flow in the shallow system is eastward toward the creek leading into Bayou Grande. Sediment samples taken during the Navy Assessment and Control of Installation Pollutants (NACIP) Study showed high concentrations of heavy metals. However a study completed by Space and Naval Warfare Systems Command (SPAWAR) in 2009 did not indicate increased toxicity in Wetland 64 leading the Bayou Grande.</p> <p>The RI identified the source of contamination at Site 11 as a former landfill, where trenching revealed evidence of a "seam" of blackened debris at the water table. This oily material contained corroded bits of metal and other debris. Organic compounds detected in soil at PSC 11 in excess of FDEP residential SCTLs included carcinogenic Polynuclear Aromatic Hydrocarbons (PAHs), evaluated collectively as benzo(a)pyrene equivalents (BEQs) and Aroclor-1260. Inorganics detected in soil in excess of FDEP residential SCTLs included arsenic and chromium. Chromium was detected at a concentration in excess of FDEP leachability to groundwater SCTL. Inorganics detected in excess of NAS Pensacola background RCs included aluminum, arsenic, and cadmium. BEQs and chromium were detected at concentrations in excess of FDEP industrial SCTLs.</p>			
	12	Scrap Bins	Wet garbage material	ROD (2008)
<p>Screening PSC 12 is being investigated and reported on concurrently with this OU. It is located approximately 800 feet northwest of Chevalier Field and 600 feet west of PSC 11. Most of the site area is enclosed by a fence and covered with a large concrete pad where heavy equipment is currently kept. From the early 1930s to mid 1940s, garbage from NAS Pensacola was placed in scrap bins and stored in this area (industrial waste was sent to the North Chevalier Disposal Area). Approximately 16 cubic yards (2 truck loads) per day of wet garbage was stored before being hauled off and used as livestock feed.</p> <p>Organic compounds detected in soil at Site 12 in excess of FDEP residential SCTLs included BEQs and Aroclor-1260. Inorganics detected in soil in excess of FDEP residential SCTLs included arsenic, cadmium, and copper. Antimony, cadmium, and chromium were detected at concentrations in excess of FDEP leachability to groundwater SCTLs. Inorganics detected in excess of NAS Pensacola background Reference Concentration (RCs) included aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, and manganese. BEQs and Aroclor-1260 were detected at concentrations in excess of FDEP industrial SCTLs.</p>				

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25	Radium Spill Site	Radioactive waste	ROD (2008)
<p>PSC 25 is being investigated and reported on concurrently with this OU and is located on the eastern portion of NAS Pensacola just east of Murray Road and north of Farrar Road on the east side of Building 780. Naval Energy and Environmental Support Agency (NEESA, 1983) reported a small spill of low-level radioactive waste containing radium at this site in 1978. The spill occurred on pavement and was properly cleaned up according to NEESA. The spill occurred because drums of waste were being stored outside and allowed to corrode and leak. Building 780 was the location of radium removal operations for radium dials and other equipment. The equipment was decontaminated in the site location before being repainted in the radium dial shop (former Building 708). Contamination resulting from the spill or waste handling was the focus of the spill investigation.</p> <p>Organic compounds detected in soil at PSC 25 in excess of FDEP residential SCTLs included BEQ, Aroclor-1254, Aroclor-1260, and dieldrin. Dieldrin was detected at a concentration in excess of FDEP leachability to groundwater SCTL. Inorganics detected in soil in excess of FDEP residential SCTLs included arsenic, chromium, and mercury. Cadmium, chromium, mercury, and silver were detected at concentrations in excess of FDEP leachability to groundwater SCTLs. Inorganics detected in excess of NAS Pensacola background RCs included aluminum, arsenic, beryllium, cadmium, chromium, manganese, mercury, silver, and zinc. BEQs were detected at concentrations in excess of FDEP industrial SCTLs.</p>			
26	Supply Department Outside Storage	Industrial waste, oils	ROD (2008)
<p>PSC 26 is a 90 square foot outside area, south of Building 684, used to store containers of industrial materials. Containers were stored on steel mats. Leakage is reported to have occurred from these containers. Because PSC 11 is down gradient from the area of PSC 26, investigations were conducted as part of OU 2.</p>			
27	Radium Dial Shop Sewer	Radium, phosphorus	ROD (2008)
<p>From 1940s to 1976, Building 709 was used to rework instrument dials painted with radium containing paint. Spent cleaning solutions and luminous paint were routinely poured into the sanitary sewer system. In 1976, the building was dismantled and the drain pipe found to have a reading of 1.2 millirem per hour (mR/hr). The drain pipe was removed to a depth of 18 inches. The remaining lateral underground portion of the pipe was capped and covered with concrete. At PSC 27, radium removal operations at NAS Pensacola involved stripping radium-containing paint from instrument dials prior to repainting. From 1965 to 1975, these operations were conducted in Building 709. In 1975, all activities related to radium painted instruments, including stripping and re-painting, were permanently moved to Building 780. At the present, aircraft instruments containing radium are disassembled in Building 780. Instrument dials were stripped using paint thinner, then soaked in a lye and nitric acid solution. Contaminated instrument cases were processed by soaking in a "turco" acid solution. Components were cleaned with a wire brush to remove all residues.</p> <p>PSC 25 was grouped with PSC 27 to investigate the extent of contamination. Organic compounds detected in soil at Site 27 in excess of FDEP residential SCTLs included BEQs and dieldrin. BEQs and dieldrin were detected at concentrations in excess of FDEP leachability to groundwater SCTLs. Inorganics detected in soil in excess of FDEP residential SCTLs included arsenic, chromium, and mercury. Cadmium, chromium, mercury, and silver were detected at concentrations in excess of FDEP leachability to groundwater SCTLs. Inorganics detected in excess of NAS Pensacola background RCs included aluminum, arsenic, beryllium, cadmium, chromium, manganese, mercury, and silver. BEQs, dieldrin, and mercury were detected at concentrations in excess of FDEP industrial SCTLs. Analyses of shallow groundwater samples indicate gross Alpha concentrations below the primary drinking water standard. Chlorinated hydrocarbons were detected in shallow groundwater samples. Chlorinated hydrocarbons were not detected in samples from the deep wells. The groundwater flow direction is south-southeast and toward PSC 30. Analyses for Chlorinated Volatile Organic Compounds (CVOs) from the several monitoring well locations indicate traces of solvents are present in the groundwater.</p>			

**TABLE 1**

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30	Sewer Line TL 045/A north to IWTP	Metals, acids, caustic, degreasers, chromic solution, cyanide, paint, pesticides, paint thinner and sludge, industrial waste	ROD (FY 2008)
<p>Over a 15 year period north of Building 648, waste paint, thinner, and paint sludge were poured onto the ground in the area of PSC 30. A monitoring well located near the site indicated the presence of low concentrations of chlorinated hydrocarbons, however, analysis of additional samples did not detect CVOC. The exact location of the disposal site in relation to the monitoring well is not reported. On October, 14 1992, the UST Program transferred 647N and 648N, which are at PSC 31, to the IRP.</p> <p>Building 755 operated 50 tanks located inside this building over a 10 year period as a plating facility for nickel, lead, tin, chromium and miscellaneous metals. These tanks, ranging in capacity from 50 to 200 gallons, were drained periodically into the ditch near the site. Sediment samples from four separate locations in the ditch were analyzed for metals and cyanide. Low levels of metal [below Extraction Procedure Toxicity (EP Toxic)] were found.</p> <p>Maintenance operations such as painting, solvent use, and plating are the most likely sources of contamination at this site. Organic compounds detected in soil at the PSC 30 in excess of FDEP residential SCTLs included BEQs, Aroclor-1242, Aroclor-1254, Aroclor-1260, and dieldrin. BEQs and dieldrin were detected at concentrations in excess of FDEP leachability to groundwater SCTLs. Inorganics detected in soil in excess of FDEP residential SCTLs included arsenic and chromium. Cadmium and chromium were detected at concentrations in excess of FDEP leachability to groundwater SCTLs. Inorganics detected in excess of NAS Pensacola background RCs included aluminum, arsenic, beryllium, cadmium, chromium, and manganese. BEQs and Aroclor-1242 were detected at concentrations in excess of FDEP industrial SCTLs.</p> <p>These PSCs were grouped together mainly due to the following: geographic proximity of PSCs, the potential for off-site migration, and its impact on the other PSC. Prioritization of these PSCs was due to the suspected magnitude and toxicity of contamination, the potential for off-site migration of contaminants via several pathways, and the potential for human exposure. Prioritization of this PSC was due to the suspected magnitude and toxicity of contamination, the potential for off-site migration of contaminants via several pathways, and the potential for human exposure.</p> <p>Waste from various types of operations entered the Industrial Waste Sewer Line (TL 045/A north to the IWTP) without any pretreatment or segregation. Consequently, the waste stream prior to 1962 may have consisted of everything generated or used in the facility, including paint strippers, heavy metals, pesticides, radioactive wastes, fuels, cyanide wastes, solvents, and waste oils. In 1979, a pump failure at the final industrial waste lift station, located approximately 2,000 feet southwest of the IWTP, caused a spill of industrial waste into a nearby unnamed creek, which leads into the south arm of Bayou Grande. The spill was investigated by the FDER, and a Notice of Violation was issued to NAS Pensacola. The spill caused a minor fish kill in the creek.</p>			

**TABLE 1**  
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OU 15	40	Bayou Grande Area	Unknown	NFA ROD (2005)
<p>Bayou Grande, an estuarine water body connected to Pensacola Bay, lies adjacent to the northern boundary of NAS Pensacola. During contamination assessment investigations, total recoverable petroleum hydrocarbons (TRPHs), metals, PAHs, and phenols were detected in near shore Bayou Grande sediment samples, and metals were detected in near shore Bayou Grande surface water samples. Sixteen (16) PSCs (1, 3, 9, 10, 11, 12, 15, 16, 23, 29, 30, 32, 33, 34, 35, and 36) are believed to potentially contribute to the concentrations found in Bayou Grande.</p> <p>Bayou Grande has a total surface area of approximately 1.5 square miles and approximately 20 miles of total coastline. Approximately 8.5 miles of Bayou Grande coastline border NAS Pensacola property. Bayou Grande, with a mean depth of approximately 6 feet, is part of a larger surface water system known as the Pensacola Bay System. Site 40 (OU 15), Bayou Grande, was included as a separate site for an RI based on the possible receipt of hazardous substances and that media within Site 40 may individually provide exposure pathways impacting human health and the environment. The RI and the human health and ecological risk assessment conducted for OU 15 support a no-action remedial action.</p>				
OU 16	41	NAS Pensacola Wetlands	Unknown	RI/Feasibility Study (FS)
<p>Site 41 encompasses all of the wetlands potentially impacted by site activities, both tidal and non-tidal, within the NAS Pensacola boundary. A USEPA inventory of wetlands identified and enumerated 79 wetland complexes on NAS Pensacola. Two other wetlands were identified during habitat/biota surveys. For the purpose of these studies, freshwater and brackish water ponds, and drainage ditches are included as wetlands. The majority and largest of the wetlands on NAS Pensacola are located in the western portion of the installation, primarily south and west of Sherman Field. About a third of the 81 wetlands are located east of Sherman Field, where most of the IRP sites are located. Contamination was detected in eight wetlands that have been sampled during contamination assessments. Nineteen (19) PSCs (1, 3, 4, 5, 6, 9, 10, 11, 13, 14, 16, 29, 30, 32, 33, 34, 35, 36, and 39) on NAS Pensacola are suspected sources of contamination of PSC 41.</p> <p>Decision making TRIAD analyses were used to round-out the ecological assessment of each wetland, to determine if the ecological impacts to sediment and surface water were acceptable or not. A human health risk evaluation was conducted at wetlands determined to have Chemicals of Potential Concern (COPCs).</p>				
OU 17	42	Pensacola Bay	Unknown	NA ROD (1998)
<p>NAS Pensacola is bordered on the south by Big Lagoon and Pensacola Bay, on the east by Pensacola Bay, and on the north by Bayou Grande. Only a very small portion of the western end of NAS Pensacola is farther than a mile from one of these bodies of water. Swampy areas exist on or near the western portion of NAS Pensacola. Man-made drainage ways and storm drains feed into the short intermittent streams emptying into Pensacola Bay and Bayou Grande. During contamination assessment investigations, metals, TRPH, PAHs, and VOCs were detected in sediment samples collected along the southeastern waterfront of Pensacola Bay. Fourteen (14) PSCs (2, 3, 4, 13, 14, 17, 18, 28, 32, 33, 35, 36, 28, and 39) on NAS Pensacola are suspected sources of contaminants to Pensacola Bay.</p>				

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OU 6	9	Navy Yard Disposal	Trash and refuse	NFA ROD (1999)
	<p>This area was used for the disposal of trash and refuse during the period between 1917 and the early 1930s. It is reported that the PSC is shown on several old maps as the Navy Yard Dump or the Warrington Village Dump (NEESA, 1983). In the late 1960s, while trenching for the IWTP system, part of PSC 9 was excavated. Glass, scrap metal, and debris were unearthed. No unusual odor was reported associated with the PSC. The Initial Assessment Study (IAS) report concluded no further study was necessary and the PSC did not constitute a threat to human health or the environment. During the Verification Study (VS) of this PSC, monitoring wells were installed at the southwest corner of Chevalier Field to determine shallow groundwater flow and groundwater samples taken to further delineate the contamination problem in the general area of Screening PSC 34 and PSC 29. Groundwater samples were analyzed for VOCs; however, no VOCs were detected in any samples obtained.</p>			
--	10	Commodores Pond	Underwater storage of oak timbers	NFA (2000)
	<p>During the mid-nineteenth century, screening PSC 10 was the location of a small surface water body used for the underwater storage of shaped oak timbers. This underwater storage method preserved the wood prior to its use for shipbuilding. The original pond's, no longer in existence, exact dimensions are unknown. PSC debris was unearthed in the late 1960s during trenching operations for installations of the IWTP system. Abandoned oak timbers were exhumed and reburied on Magazine Point. It is reported no hazardous materials were encountered during this effort.</p>			
--	14	Dredge Spoil Fill	Dredge	NFA (1997)
	<p>PSC 14 has been used for placement of dredge materials removed from Pensacola Bay. These materials represent the sand, mud, and debris found at various depths within the Pensacola Bay dredged channels and basins.</p>			
OU 6	29	Soil South of Bldg. 3460	Slimy black substance (unknown)	NFA ROD (1999)
	<p>In 1981, workers excavating soil beneath the concrete apron south of Building 3460 received skin burns from a "black slimy liquid" in the soil. Types of chemicals involved and extent of contamination are unknown. A leak in the nearby industrial sewer line from the Naval Aviation Depot facility is the expected source. This site is part of the group including PSC 9 and Screening PSC 34.</p>			
--	34	Solvent North of Bldg. 3557	Solvent detergent	NFA (2000)
	<p>During May 1984, a leak occurred in a pipeline at the north end of Building 3557. The leak reportedly resulted in the loss of solvent detergent used for cleaning aircraft. The solution contained 1.7 percent chlorinated aromatic hydrocarbons solvent. Contamination of site soils and groundwater may have occurred as the result of the solvent detergent release. Contamination may have penetrated beneath the apron via the expansion joints which separated individual concrete tiles and via runoff of escaped solvent to the unpaved storage tank area. The unpaved drainage ditch in the tank area is suspected to have carried contamination off-site and is presumed to be connected to the paved drainage ditch located west Chevalier Field.</p> <p>These PSCs were grouped together mainly due to the following: geographic proximity of PSCs, the potential for off-site migration, and its impact on the other PSCs. Prioritization of these PSCs was based on to the suspected magnitude and toxicity of contamination, the potential for off-site migration of contaminants via several pathways, and the potential for human exposure.</p>			

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OU 4	15	Pesticide Rinsate Disposal Area	Organic pesticide	ROD (2000) / 5 year Review (2008)
<p>OU 4, Site 15, is located in the northern portion of NAS Pensacola, and includes portions of the golf course, the golf course maintenance facilities, three concrete wash-down pads, two asphalt wash-down pads, a former pesticide/drum storage building, a removed UST, equipment storage buildings, and several in-use buildings. In the past, a sink located outside of Building 3586 and a floor drain in a concrete pad north of the building collected pesticide and herbicide residue waste and discharged them into a UST. The contents were periodically pumped out by a contracted agent before its removal in 1993. Reportedly, the UST was removed in 1993 and the contents of the tank were spread across the ground surface, approximately 200 feet north-northwest of Building 3447 (EnSafe, 1999).</p> <p>The results presented in the Interim Remedial Action Report indicate that all arsenic impacted soil at concentrations above the remedial goal were removed and replaced with clean backfill. Additionally, a Groundwater Monitoring Plan was prepared by CH2MHill in June 2003 and nine semi-annual monitoring events have been completed through November 2008. Semi-annual and annual reports summarizing the analytical results of monitored natural attenuation of groundwater indicated that groundwater concentrations have continued to decrease. The most recent sampling event reviewed indicated that groundwater arsenic concentrations had decreased below the ROD specified remedial goal of 50 micrograms per liter (µg/L) in all but one monitoring well.</p>				
OU 14	17	Transformer Storage Yard	Dielectric oils, PCBs	NFA ROD (1998)
<p>Transformers containing PCBs as well as PCB-free transformers were stored on this paved area. A black oily residue on the pavement was found to contain high levels of PCBs as well as other chlorinated hydrocarbons. Three soil borings drilled through the pavement found significant concentrations of PCBs near the catch basin; leakage through joints in the pavement is the suspected cause. PCB concentrations were below the EP Toxic standard.</p>				
--	18	PCB Spill Area	Transformer oil, PCBs	NFA (2000)
<p>In 1966, a transformer at Substation A reportedly failed, spilling approximately 50 gallons of transformer oil containing an unknown concentration of PCBs on the small gravel-covered area along the northeast side of substation A. It is assumed no clean-up effort was conducted. During IAS field investigations, analysis of a field sample indicated Aroclor 1260 was present at a concentration of 4 parts per million (ppm), which was less than that considered hazardous under the Toxic Substance Control Act.</p>				
--	28	Transformer Accident	Transformer oil	NFA (1997)
<p>In 1969, a transformer fell from a truck traveling on Radford Boulevard, just north of Building 632. The transformer broke open and spilled approximately 50 gallons of transformer oil onto the pavement. It is not known whether the oil contained PCBs. The oil was reportedly washed into a nearby storm sewer drain.</p>				

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--	4	Army Rubble Disposal	Rubble, timber, pipes, other wastes	NFA (1997)
	Site 4 is an area of about 150 feet by 800 feet southeast of Forrest Sherman Field, just north of Building 3260. In the early 1950s, rubble from tearing down the old United States Army barracks at Fort Barrancas was disposed of at Site 4. The rubble included timber, pipes, mattresses, and other waste.			
--	5	Borrow Pit	Unknown	NFA (1995)
	Site 5, a long, shallow pit about 1 foot deep, is southeast of Forrest Sherman Field and east of Building 3221. Soil was removed ("borrowed") from the site in 1976 for use elsewhere on the facility.			
--	7	Firefighting School	POLs	NFA (2000)
	The firefighting training school in Building 1713 has been in operation since 1940. Training that involved gasoline fires (and perhaps other flammable liquids) in open tanks of water reportedly occurred west of Building 1713. The presence of a clearing and firefighting tower east to southeast of Building 1713 suggests there was training conducted in those areas as well. There is no evidence of hazardous waste disposal or threat to human health or the environment.			
OU 13	8	Rifle Range Disposal	Solid waste, paper	ROD (2006) / 5 yr Review (FY 2008)
	<p>The rifle range disposal area is located in the area now occupied by Building 3561, which houses the NAS Pensacola Public Works Center (PWC) Maintenance/Material Department. This building covers an area approximately 550 feet by 163 feet. Surrounding the building is an asphalt parking lot on the eastern, western, and northern sides of the building. Along the southern side of the building lies a small grassy area. This area was reportedly used for the disposal of solid waste (primarily paper) from NAS Pensacola between 1951 and 1955, and disposal was accomplished by burning and burial. Site 8 is surrounded by chain-link fencing.</p> <p>An interim remedial action soil removal was completed in 2004. Remaining analyte concentrations were generally below the current residential SCTLs except arsenic and some pesticide compounds. All pesticide soil exceedances remaining after the soil removal actions were detected in samples from the site's northern portion and were attributed to routine application and not indicative of a spill. Therefore, no additional action was needed for this area. Only cadmium, manganese, and an isolated lead exceeded Site 8 Groundwater cleanup criteria. No PCBs, Semivolatile Organic Compound (SVOCs) or VOCs were detected above cleanup criteria in Site 8 groundwater. The Groundwater Monitoring Plan has been approved and monitoring of natural attenuation has been initiated.</p>			
--	16	Brush Disposal Area	Pruning and tree trimming refuse	NFA (1997)
	Site 16 is northeast of the east end of Forrest Sherman Field. From the late 1960s to 1973 the site was used for the disposal of brush pruned and trimmed at NAS Pensacola. The Army may have used part of the site to burn garbage and dispose of ash.			

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OU 13	24	Dichlorodiphenyltrichloroethane (DDT) Mixing Area	DDT w/diesel fuel	ROD (2006) / 5 year Review (2008)
	<p>The OU 13 ROD specified removal of isolated hot spot areas of impacted soil to reduce the direct exposure potential at the site. Approximately 634 cubic yards of dieldrin-impacted soil were removed from the eastern side of Building 3561 and approximately 429 cubic yards of cadmium-impacted soil were also removed from the western side of Building 3561. All dieldrin and cadmium impacted soil with contaminant concentrations exceeding the remedial goal of 0.004 milligrams per kilogram (mg/kg), and 0.005 µg/L, respectively were removed. The Groundwater Monitoring Plan has been approved and monitoring of natural attenuation has been initiated.</p>			
--	36	IWTP Sewer Line	Industrial waste	NFA (1997)
	<p>The industrial waste sewer line is about 23,000 feet long and is located in an area approximately 1 mile wide by 1.5 miles long in the southeastern portion of NAS Pensacola. Flow within the sewer line is toward the IWTP, which is located at the northeast end of the base.</p>			
OU 18	43	Demolition Debris Disposal Area 43	Metals	ROD (2010)
	<p>Site 43 is located in a developed area of the base. A paved parking lot covers approximately 31,000 square feet of the site area. The history begins in 1992 with the discovery of a partially buried drum. Subsequent investigations for magnetic anomalies determined the existence of several areas where buried objects were suspected to be present. During a site characterization field event, test pitting revealed the presence of several drums, which were removed. An interim remedial action (IRA) followed, and debris and contaminated soil to a depth of 2 feet from the surface were removed. An RI in 2005 and 2006 provided data indicating the presence of residual surface soil and shallow subsurface soil contamination to a depth not exceeding 4 feet below land surface and the presence of lead in groundwater at one location exceeding the regulatory standards. A remedial action soil removal, implementation of Land Use Controls, and groundwater monitoring are being implemented at this site.</p>			
OU 19	44	Former UST 3221SW	Solvents	RI/FS
	<p>Site 44 is located at the southwest end of Building 3221, which is a large hangar currently used to refurbish aircraft used for museum display. Building 3221 is adjacent to Forrest Sherman Field. The hangar and adjacent paved areas were part of the Naval Air Rework Facility (NARF), and were probably used for aircraft maintenance before the current National Museum of Naval Aviation location opened in 1975. The paved area adjacent to the southwest corner of Building 3221 is currently used as a wash rack for cleaning aircraft and aircraft parts. Surface drainage in this area flows to a small concrete-lined ditch located on the southeast edge of the pavement. When aircraft parts washing activities are being conducted, a diverter system is used to direct the run off to the sanitary sewer system for treatment at the NAS Pensacola IWTP.</p> <p>Site 44 was first investigated as UST Site 3221 SW in 1992, following the removal of a 1,000-gallon UST located at the southwest corner of Building 3221. Tetrachloroethene (PCE) was detected at concentrations exceeding the state guidance concentrations in four wells downgradient of the UST. Because of the low concentrations of PCE, the site investigation was allowed to continue in accordance with the petroleum program. The source of chlorinated solvents in groundwater was not determined during the UST investigation. Because of the detection of chlorinated solvents in groundwater, the Navy transferred this site to the IRP for further assessment. (Tetra Tech NUS, Inc. [Tetra Tech], 2007b). The release of contaminants at Site 44 appears to have resulted from routine aircraft maintenance operations. However, the time of disposal or accidental releases are unknown. Arsenic and chlorinated PAHs were detected in surface soil and subsurface soil samples at concentrations exceeding risk-based screening criteria. TCE in groundwater samples exceeded risk-based screening criteria. A FS is under review and the PP is being prepared.</p>			

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OU 20	45	Building 603 Lead Site	Lead	RI/FS
<p>During an investigation to characterize Site 18 (PCB spill at Substation A), lead concentrations in soil were found to exceed screening levels in an area west of Site 18. This area was designated as PSC 45 (Site 45) - Building 603 Lead Site and its initial boundaries were presumed based on the Site 18 investigation. Site 45 lies near the intersection of Mustin Street and Center Avenue at NAS Pensacola. No known source of contamination has been identified for Site 45. From the Site 18 investigation, four surface soil samples and one shallow groundwater sample exceeded screening criteria to define what is now the historical boundary of Site 45. Although unpaved at the time of the PCB spill at Site 18, the surface of Site 45 now consists primarily of asphalt parking lots north and south of Mustin Street. Nearby areas are industrialized – containing warehouses, office spaces, and the old NAS power generating plant.</p> <p>The area to the west of Building 1 is the location where lead and PAHs were detected in surface soil and subsurface soil samples at concentrations exceeding risk-based screening criteria, including PAH and lead concentrations greater the Florida industrial SCTL. A FS is under review and the PP is being prepared for PSC 45.</p>				
OU 21	46	Former Building 72	Metals	RI/FS
<p>This PSC was discovered during the investigation of Site 38 – OU 11 (Building 71 Sewer Line). While investigating Site 38 (OU 11), lead concentrations detected appeared to be increasing further from the suspected source for Site 38. Buildings 71 and 72 were used from 1935 up to the late 1970's for aircraft paint stripping and painting. Before 1973, wastes from paint stripping and painting operations were discharged directly to Pensacola Bay. The release of contaminants at Site 46 probably resulted from routine aircraft maintenance activities and storage of materials used in these activities.</p> <p>Chlorinated VOCs and metals were originally detected at elevated concentrations in surface and subsurface soils in the area at the northeast corner of Building 72. However because of Hurricane Ivan damage (2004), the Navy elected to remove the buildings and associated parking lots in this area. Surface soil areas identified as exceeding FDEP SCTLs were removed and replaced with clean fill to prevent unacceptable exposure. Metals and chlorinated VOCs in groundwater at Site 46 exceeded risk based screening criteria. A FS is under review and the PP is being prepared for PSC 46.</p>				
--	--	Chevalier Field Machine Gun Range	Munitions constituents	SI
<p>The Chevalier Field Machine Gun Range is a 0.2-acre site located just north of Chevalier Field. Based on historical maps, the site was used from approximately 1939 to 1943. No other information regarding the range was located. Munitions use was probably limited to small arms ammunition; typical munitions used at a machine gun range included .30-and .90-caliber ammunition. Building 3644 has been constructed over the former range, and no former range features are present on the site.</p>				
--	--	Chevalier Field Pistol Range	Munitions constituents	SI
<p>The Chevalier Field Pistol Range is a 1.2-acre site located northwest of Chevalier Field. Based on historical maps, the site was used from approximately 1940 to 1942. No other information regarding the range was located. Munitions use was probably limited to small arms ammunition; typical munitions used at a pistol range included .38-and AS-caliber ammunition. Building 781 and the adjacent parking area have been constructed over the former range, and no range features are present on the site. IRP Site 12 within OU 2 overlaps the northeast corner of the site. Sampling of groundwater at IRP Site 12 showed exceedances of some metals above groundwater cleanup target levels (GCTLs); however, lead concentrations were within RC for NAS Pensacola.</p>				

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--	--	Fort Barrancas Rifle Range (3 Ranges)	Munitions constituents	SI
<p>The Fort Barrancas Rifle Ranges is a complex of three historical ranges: Fort Barrancas Rifle Range 1, Fort Barrancas Rifle Range 2a, and Fort Barrancas Rifle Range 2b. The range and associated butt and firing lines for Fort Barrancas Rifle Range 1 are denoted on a 1910 map that shows the range's orientation with a general direction of fire from northeast to southwest. Based on the map's depiction of the berm located closer to the firing position than the targets, munitions would have been fired over the berm and would have landed in Pensacola Bay and Big Lagoon. Fort Barrancas Rifle Ranges 2a and 2b were identified on an 1893 map that shows a range butt located near the front of Fort San Carlos at sea-level. Three firing points that fired towards a target in front of Fort San Carlos are denoted on the historical map, with the general direction of fire being from east to west or southeast to northwest, depending on the location of the firing point. Two of the firing points are denoted in the Preliminary Assessment (PA) as Fort Barrancas Rifle Range 2a and Rifle Range 2b. The third firing point was marked as 'proposed', indicating that it may not have been in use.</p>				
--	--	Fort Redoubt Skeet Range	Munitions constituents	SI
<p>The Fort Redoubt Skeet Range, also denoted as Gunnery Range and Army Range on historical maps, is located approximately 300 feet to the southwest of the walls of Fort Redoubt. The range is denoted on maps dated 1930 through 1954. Based upon information obtained from the 1950 map, the Fort Redoubt Skeet Range appears to have been a single-field range. One structure (Building 1712) is denoted on maps dated 1949 through 1954. Two features that appear to be a berm and a ditch appear on maps dated 1930 through 1954; however, no document was identified that explained the use or affiliation of these features. No berm, ditch, or structures exist at the site or in the immediate vicinity. Approximately 30% of the area comprising the surface danger zone for the Skeet Range falls on land that was transferred to the Department of the Interior (managed by the National Park Service) in 1947</p>				
--	--	Magazine Point Bombing Target	Munitions constituents and munitions and explosives of concern	SI
<p>The Magazine Point Bombing Target is a 72-acre site located on the Magazine Point peninsula, approximately 800 feet north of the boundary to Chevalier Field. The Magazine Point Bombing Target was first identified on a 1933 historical map, along with one powder magazine and a radio spotting system. The Bombing Target was no longer shown on a 1939 map. No records were located that indicate munitions used, or construction details; however, given the proximity to Chevalier Field, it is likely that the site was used as a practice bombing range. It is assumed in the PA that the Bombing Target utilized a typical 500-foot scoring arc to approximate the distance between the edge of the target and the dropped munitions</p>				
--	--	Magazine Point Rifle Range	Munitions constituents	SI
<p>The Magazine Point Rifle Range is an 8.6-acre site located on the Magazine Point peninsula that was used for small arms training during the early 1900's. The Rifle Range was a 1,000-yard range, with firing points at 200, 300, 500, 600, and 1,000 yards. Firing was directed towards the north into a backstop berm. The Rifle Range was partially destroyed by a hurricane in 1906 and no archival evidence exists of the range after 1910. The center of the 500-foot scoring arc for the Magazine Point Bombing Target lies just south of the 300 yard firing point for the Rifle Range, and a majority of the Rifle Range is encompassed within the surface danger zone for the Bombing Target</p>				

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--	--	National Cemetery Gunnery Range Area North (4 ranges)	Munitions constituents	SI
<p>The National Cemetery Gunnery Area North is a 12-acre complex of four historical ranges: Gunnery Area North Machine Gun Range, Gunnery Area North Pistol Range, Gunnery Area North Rifle Range, and Gunnery Area North Firing Stand. Each of the ranges is identified on various historical maps dated between 1933 and 1954. The northern portion of the rifle range was reportedly excavated based on a review of 1950s and 1960s aerial photography and maps (Tetra Tech, 2005). No other information regarding the ranges was located. Munitions usage in the gunnery area was likely limited to .22-caliber, .30-caliber, .45-caliber, .50-caliber, and 20-millimeter (mm) small arms ammunition based on the typical munitions usage for each type of range. The National Cemetery Skeet and Trap Ranges site overlaps a portion of the Gunnery Area North. IRP Site 8 (Rifle Range Disposal Area) and IRP Site 24 (DDT Mixing Area) are collectively known as OU 13 and overlap the northern and western portion of the National Cemetery Gunnery Area North, including the area of the former target berm. Soil and groundwater sampling were conducted at OU 13 between 1995 and 2006. The 2006 ROD for OU 13 stipulates no further action for soil at OU 13 and land-use controls to prevent use of the surficial aquifer for drinking water along with continued groundwater monitoring to be sufficient to protect human health and the environment (Tetra Tech, 2006). The entire Gunnery Area North is developed, and no former range features were identified at the site.</p>				
--	--	National Cemetery Gunnery Range Area South (2 ranges)	Munitions constituents	SI
<p>The National Cemetery Gunnery Area South is a complex containing the Gunnery Area South Pistol Range and Machine Gun Range. The National Cemetery Gunnery Area South is located north of Hovey Road. The Machine Gun Range is identified on historical maps dated 1933 and 1939 through 1943. The Pistol Range is located just west of the Machine Gun Range, illustrated on maps dated 1940 through 1943. Currently the National Cemetery Gunnery Area South is completely developed. Structures include Building 488, Building 461, and the associated asphalt parking lots.</p>				
--	--	National Cemetery Skeet Range and Trap Range (2 ranges)	Munitions constituents	SI
<p>The National Cemetery Skeet and Trap Ranges site includes the National Cemetery Skeet Range and the National Cemetery Trap Range. The National Cemetery Skeet and Trap Ranges site is adjacent to the Barrancas National Cemetery. The Skeet Range is identified on one 1940 map, and the Trap Range is identified on maps dated 1941 and 1942. Currently the National Cemetery Skeet and Trap Ranges site is completely developed.</p>				
--	--	Sherman Field Rifle Range	Munitions constituents	SI
<p>The Sherman Field Rifle Range is located southwest of Sherman Field, within the boundaries of NAS Pensacola, and includes the area west of the former and present fuel farms. The Sherman Field Rifle Range was denoted on one historical map dated 1951 and titled "Jet Training Field Land Use Map." Direction of fire is assumed to have been from the north-northeast to the south-southwest, based upon the range orientation and the surrounding development, as depicted on historical maps. Firing lines would have been located on the northern end of the Sherman Field Rifle Range, near the Sherman airfield, and there were probably multiple firing points throughout the length of the range. The location of a berm for the Sherman Field Rifle Range could not be identified and was not denoted on the map</p>				

## **2.0 OVERALL MANAGEMENT APPROACH**

As stated in the FFA and for the benefit of the parties involved in the revision and execution of the environmental activities in NAS Pensacola, a brief history of the development of the sites and the priorities is presented in this section.

### **2.1 BACKGROUND**

The Navy developed the Navy Assessment and Control of Installation Pollutants (NACIP) Program to identify and control environmental contamination from past use and disposal of hazardous substances at Navy and Marine Corps Installations. The NACIP Program is now part of the Navy's Installation Restoration Program (IRP), and is similar to the USEPA "Superfund" Program authorized by the CERCLA of 1980. The three major investigation activities performed at NAS Pensacola under the NIRP or Superfund Programs are the following: (1) Initial Assessment Study (IAS) or Preliminary Assessment (PA), (2) Verification Study (VS) or Site Inspection (SI), (3) and the Confirmation Study or Extended Site Inspection (ESI). The IAS (1982-1983) was conducted by the Naval Energy and Environmental Support Activity (NEESA) and identified and assessed 29 Potential Sources of Contamination (PSCs) at NAS Pensacola which could pose a potential threat to human health or the environment as a result of contamination from past naval operations. The VS (1984) and the CS (1985-1986) were conducted by Geraghty & Miller, Inc. to confirm or deny the presence of contamination at the PSCs identified in the IAS, as well as possibly locate additional PSCs. If contamination was detected, the magnitude and the extent of contamination would have been evaluated to allow for the recommendation of future remedial response action at these PSCs.

In addition to the Navy's IRP/CERCLA program, NAS Pensacola has other active regulatory programs. A Florida Resource Conservation and Recovery Act (RCRA) permit was issued to NAS Pensacola by the FDER (known FDEP). Concurrently, a RCRA Hazardous and Solid Waste Amendments (HSWA) permit was issued to the installation by USEPA in July 1988. A RCRA Facility Assessment was included in the USEPA issued permit, and additional PSCs were located. An Underground Storage Tank (UST) program is currently investigating multiple tank sites as provided by the Chapter 62-770 Florida Administrative Code.

A total of 46 PSCs have been identified at NAS Pensacola. Of the 46 PSCs, 25 PSCs have been classified as requiring Remedial Investigation and Feasibility Study (RI/FS) status and 21 PSCs have been classified as requiring screening status in accordance with the FFA. PSC 30 was combined with PSC 31. Twenty-two PSCs including PSCs 1, 2, 8, 9, 11, 12, 15, 17, 24, 25, 26, 27, 29, 30, 32, 33, 35, 38, 39, 40, 42, and 43, have had Records of Decisions (RODs) submitted. Of the 21 screening PSCs, none require secondary deliverables for the 2011 fiscal year, 7 PSCs have been transferred to the UST program including PSCs 3, 19, 20, 21, 22, 23, and 37, and 3 PSCs have been transferred to the RCRA

Program including PSCs 32, 33 and 35. Screening PSC 6 was removed from the screening process. These screening PSCs are listed in the SMP for planning purposes only. The NAS Pensacola Tier I Partnering Team elevated PSC 44, 45, and 46 to RI/FS status during the August 2006 meeting because elevated levels of Chemical of Potential Concern (COPCs) were identified in the Site Characterization Report investigation. USEPA has assigned OU numbers to these sites (OU 19, 20, and 21, respectively). Each OU narrative identifies and briefly describes all PSCs to which the accompanying OU specific schedules apply. PSCs 2, 4, 5, 6, 7, 9, 10, 13, 14, 16, 17, 18, 28, 29, 32, 33, 34, 35, 36, 39, 40 and 42 have obtained No Further Action or have a No Action ROD status under the IRP.

Schedules are in place for each screening PSC in the IR program, and will be used to track the investigation progress providing updates to the Remedial Project Managers (RPMs). Each screening PSC will remain a screening PSC until such time as defensible and validated Level III or IV laboratory analytical data becomes available. Once available, the Navy will utilize such data to either prepare individual PSC Site Characterization Reports to support a No Further Remedial Action Planned (NFRAP) determination with USEPA and FDEP concurrence, or immediately reclassify the PSC to RI/FS status. When any screening PSC is reclassified to RI/FS status, an enforceable schedule with due dates will be submitted at the next Tier I Partnering meeting. The parties will either reach agreement on a schedule at that meeting or will set a time frame for agreeing on that schedule.

For PSCs currently listed as RI sites, if upon review of the RI report, the Parties agree that no remedial action is needed, then a draft Proposed Plan (PP) will be submitted in place of the FS. The Parties should make this decision as early in the process as possible and revise the appropriate enforceable schedules. During the investigation, if a removal action is deemed necessary or desirable, the Navy will provide a schedule indicating impacts to the current enforceable schedule for the consideration by the NAS Pensacola Tier I Partnering Team.

Specific changes have been made to facilitate the investigation at OUs 2 and 3. The RI/FS PSCs including 11, 26, 27, and 30 have been combined into OU 2 due to their geographic proximity and common potential remediation. (Note: PSC 27 was originally OU-7 and PSC 30 was originally OU-5.) The Screening PSCs including 12 and 25 are associated with OU 2. It should be noted that PSC 25 was originally associated with OU-7. The original OU 9 – PSC 31 (Soil North of Building 648) has been combined with PSC 30 (Building 649 and 755) within OU 2 due to the proximity and similar contaminants. PSC 27 (Radium Dial Shop Sewer) and Screening PSC 25 (Radium Spill Site) have been moved and combined so they can be reported together with OU 2. This combination was necessary to allow study of contaminant migration across site boundaries.

Additional changes were agreed upon at the August, 22 1996, NAS Pensacola Tier I Partnering Team meeting. Due to the proximity of PSCs 8, 22, and 24 and the detected levels of contamination at PSCs 8 and

24, these sites were grouped into OU 13. Therefore, Screening PSC 24 (DDT Mixing Area) has been elevated to RI/FS status, and grouped into OU 13 based on geographic location. Screening PSC 8 (Rifle Range Disposal) has been elevated to RI/FS status and grouped into OU 13 based on geographic location. RI/FS PSC 22 has been transferred to the UST Program.

The seven remaining PSCs that will not proceed in the IRP are PSCs 3, 19, 20, 21, 22, 23, and 37. These PSCs were transferred to the UST Program and the proposed schedule of deliverables are included in Appendix B. The FDEP has a regulated process for the remediation of petroleum contaminated sites.

As agreed upon in the March 1999 NAS Pensacola Tier 1 Partnering Meeting in Tallahassee, Florida, the Navy, in a letter dated March 6, 2002, requested groundwater be handled under RCRA Authority at OU 10. The selected remedy for OU 10 was for soil excavation, with deferral of groundwater treatment to the RCRA program. Soil excavation has been completed in accordance with the ROD and is documented in a Remedial Action Completion Report.

OU 10 meets the criteria established in 62 FR 62523 to defer the site to the RCRA program. Performance standards for CERCLA were included in the RCRA Corrective Action Plan. The RCRA corrective action would, therefore, afford equivalent protection to a CERCLA action. The transfer to RCRA will eliminate the need for further cleanup under CERCLA. The transfer to RCRA, as concurred by FDEP and USEPA, will ensure that the remedy remains protective of human health and the environment, complies with federal and state requirements that were identified in the ROD as applicable or relevant and appropriate to this remedial action at the time the original ROD was signed, and is cost-effective.

The CERCLA RI/FS process is tailored to allow prioritization of PSCs according to potential threat to human health and the environment. The process initially focuses on source identification and delineation of soil, sediment, groundwater and surface water contamination. Data is continually assessed and PSCs evaluated to determine if contamination is present, to what extent, and what further action is needed. Should a threat to human health and or the environment exist, the process is responsive to provide time critical removal of contaminants from a PSC. If an initial data evaluation indicates groundwater and/or surface water to be an immediate threat to human health or the environment, interim actions may be performed to mitigate further transport from the PSC. If groundwater or surface water contamination is not judged to be an immediate threat, delineation may be performed on a larger scale by viewing local aquifer and surface water systems as an individual OU(s), which may be impacted by several PSCs simultaneously.

Innovative ways are continually sought to reduce lengthy interim report development and review process. Methods such as offering data presentations and "on-board" document reviews to regulatory agencies allowing continual data assessment and rapid decision-making are good examples. These data

presentations are in response to a need to eliminate formal interim data reports and thereby reduce the time required to reach critical decision points for each PSC. Specifically, the data gaps and the information needed to fill those gaps shall be identified by evaluating the data itself rather than by evaluating a formal data report. These data presentations to concerned agencies offer effective communication and a reduced schedule to reach a ROD. A formal report shall be prepared once the nature and extent of contamination has been adequately delineated for the purposes of performing a Baseline Risk Assessment and selecting a Remedial Action. Decisions concerning data assessment and actions to be taken can be made during NAS Pensacola Tier I Partnering meetings. These meetings will provide a forum for discussion of investigative results and proposed actions. The verbal decisions may be final with no reporting and review time required.

This approach synthesizes prioritization of PSCs with a realistic view of dynamic environmental systems. Areas more easily defined can be identified and treated, thereby removing PSCs in a timely manner. Flowing groundwater and surface water systems are naturally continuous without regard for PSC boundaries, and may be investigated and treated as a single system.

As agreed upon in the FFA, the Navy shall update the SMP yearly. This SMP provides event management planning. Included in this SMP is a description of NAS Pensacola's PSC program arrangement into remedial activity categories and OUs. Updates will reflect changes in project priorities, changes in scheduling, and the addition or deletion of PSCs due to the site condition or program accomplishments with the continued regulatory agency and the Restoration Advisory Board (RAB).

Upcoming deliverables are listed in Appendix A. Additionally, the next five year review is scheduled for FY 2013, and the next Community Involvement Plan (CIP) update is planned for FY 2014.

## **2.2 RATIONALE FOR OPERABLE UNIT GROUPING**

To facilitate implementation of the NAS Pensacola RI/FS program, the 22 PSCs requiring RI/FS have been clustered into 13 OUs. Additional OUs and sites have been included through the years. The scheduled work at these OUs is being prioritized based on relative potential threat, schedule optimization, and task management. The criterion used to generate the RI/FS OUs was as follows.

- Geographic proximity of PSCs
- Similar contamination types
- Similar aquifer contamination zones
- Similar potential investigation methods
- Potential scope and complexity of the investigation

- Mission impact of remedial activities
- Regulatory concerns
- Similarity of potential remedial actions
- Potential for human exposure/contact
- Suspected mobility of potential contaminants
- Potential for off-site migration and exposure
- Relative threat to groundwater (e.g., suspected date, and volume of release)

These OUs may be re-defined as more data is collected and evaluated. Ultimately, an OU will consist of PSCs and matrices which require similar remedial efforts, or potential for human exposure/contact, or for earlier remediation.

Due to the large number of PSCs on NAS Pensacola, the number of PSCs in each OU, and the aggregate complexity of the contamination problem at each OU, the commencement of work at all OUs concurrently is not feasible. The schedule has been staggered to relieve these and other problems such as regulatory staffing, monetary resources, and contractor resources

### **2.3 PRIMARY AND SECONDARY DOCUMENTS**

The NAS Pensacola FFA specifically designates “primary documents” and “secondary documents” that are part of the RI/FS and RD/RA process. Primary documents are major, discrete portions of RI/FS or RD/RA activities. Primary documents are initially issued by the Navy in draft form subject to review and comment by USEPA and FDEP. Following receipt of comments on a particular draft primary document, the Navy will respond to the comments received and issue a draft final primary document. The draft final document will become the final document thirty calendar days after issuance if dispute resolution is not initiated.

Secondary documents includes those reports, plans and studies that are discrete portions of the primary documents and are typically input or feeder documents. Secondary documents are initially issued by the Navy in draft form subject to review and comment by USEPA and FDEP. Although the Navy will respond to comments receive, the draft secondary documents may be finalized in the context of the corresponding primary documents.

The FFA specifies the following primary documents and unless otherwise specified the documents shall be for a specific operable unit.

**NAS Pensacola Primary Documents**

- Site Management Plan
- Site Community Relations Plan
- RI/FS Work Plan
- Baseline Risk Assessment Reports
- Remedial Investigation Reports
- Feasibility Study Reports
- Proposed Remedial Action Plans
- Records of Decision
- Remedial Design Reports
- Remedial Action Work Plans
- Final Remediation Reports
- 5 year Review Reports
- NPL Closeout Reports

**NAS Pensacola Secondary Documents**

- Preliminary Characterization Summary Reports
- Site Health and Safety Plans
- Preliminary Risk Assessments
- Site Sampling and Analysis Plans
- Site Quarterly Progress Reports
- Remedial Action Progress Reports
- Remedial Design Implementation Plans
- Remedial Pre-Design Reports
- Remedial Action Post Construction Reports
- Treatability Study Reports

### **3.0 SCHEDULING**

OU schedules are based on the issuance of draft primary and secondary submittals. The schedule is in accordance with the FFA and reflects USEPA and FDEP input allowing for review periods based on their resources. The SMP schedule assumes no delays for dispute resolutions. The schedule is presented in a calendar based on fiscal years without weekends, holidays, or other non-work days. The final comment responses to be submitted with each draft final primary document shall be the product of consensus of all Parties to the maximum extent practicable. In order to achieve this goal, the Navy shall notify the Parties in writing of any difficulties which it foresees in adequately addressing any agency's comments as soon as possible, and no later than 60 days from receipt of all regulatory comments. Submittal dates to the FFA parties for IRP activities are presented graphically in a Gantt Chart in Appendix A, and Petroleum Program activities are presented graphically through the Gantt Chart in Appendix B.

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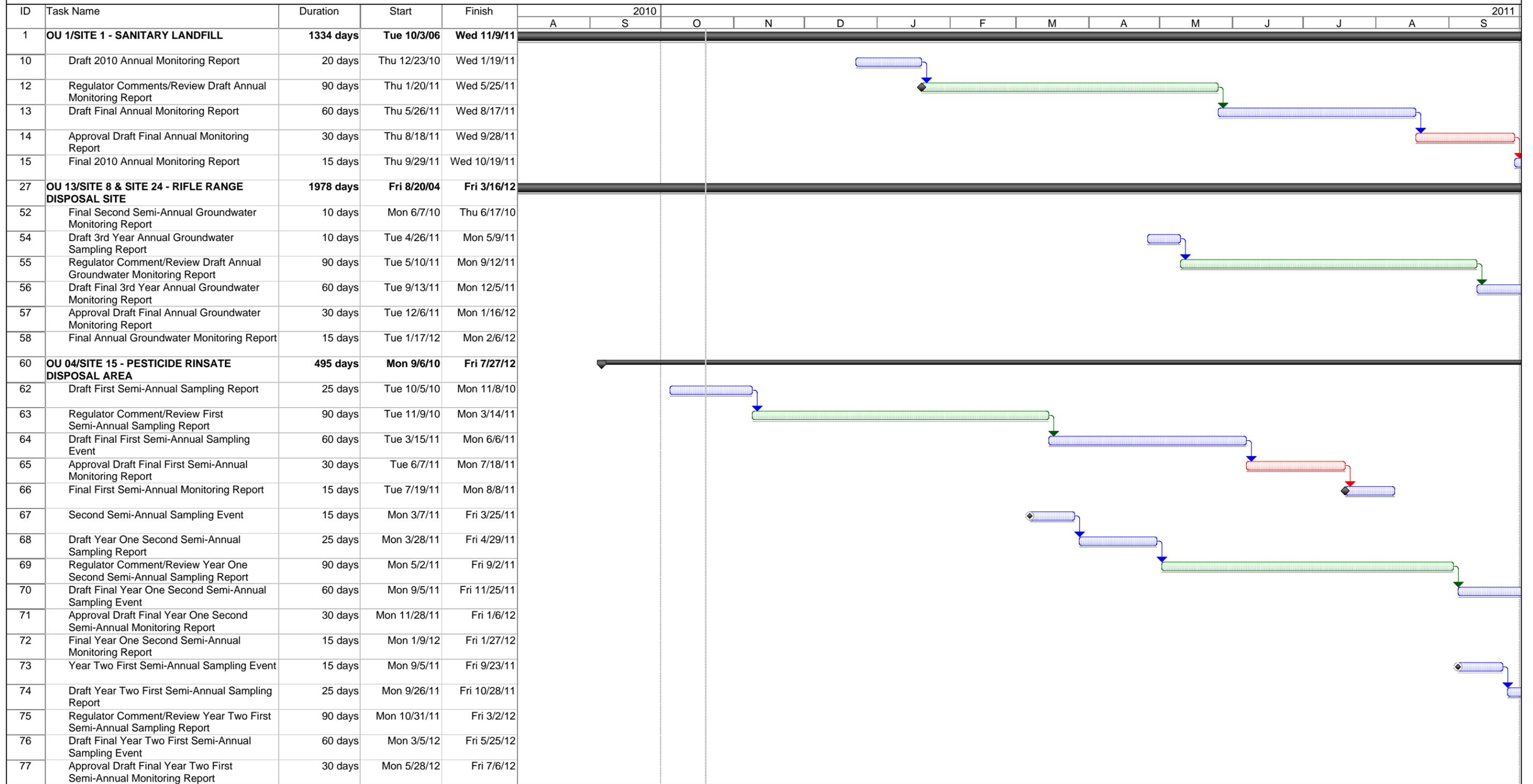
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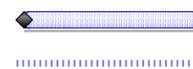
**APPENDIX A**  
**INSTALLATION RESTORATION PROGRAM SCHEDULE**

NAS PENSACOLA PARTNERING TEAM  
DOCUMENT GANTT CHART  
SEPTEMBER 2010



Blue block- Navy  
Green block- Regulators  
Red block- Approval

Task  
Split



Progress  
Milestone



Summary  
Project Summary



External Tasks  
External Milestone



Deadline









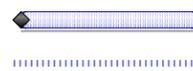


NAS PENSACOLA PARTNERING TEAM  
DOCUMENT GANTT CHART  
SEPTEMBER 2010

ID	Task Name	Duration	Start	Finish	2010												2011			
					A	S	O	N	D	J	F	M	A	M	J	J	A	S		
370	Approval Draft Final ROD	30 days	Tue 6/5/12	Mon 7/16/12																
371	Final ROD	15 days	Tue 7/17/12	Mon 8/6/12																
375	Draft Remedial Design	90 days	Tue 8/7/12	Mon 12/10/12																
377	Regulator Comments/Review Draft Final Remedial Design	90 days	Tue 12/11/12	Mon 4/15/13																
378	Draft Final Remedial Design	60 days	Tue 4/16/13	Mon 7/8/13																
379	Approval Draft Final Remedial Design	30 days	Tue 7/9/13	Mon 8/19/13																
380	Final Remedial Design	5 days	Tue 8/20/13	Mon 8/26/13																
384	<b>MMRP Sites</b>	<b>389 days</b>	<b>Wed 4/8/09</b>	<b>Thu 9/30/10</b>																
399	Prepare Draft SI Report (Non MEC Sites)	35 days	Tue 3/9/10	Mon 4/26/10																
401	Regulator Comments/ Review Draft SI Report (Non MEC Sites)	19 days	Tue 4/27/10	Fri 5/21/10																
402	Draft Final SI Report (Non MEC Sites)	58 days	Thu 5/27/10	Fri 8/13/10																
403	Approval Draft Final SI Report (Non MEC Sites)	24 days	Sat 8/14/10	Wed 9/15/10																
404	Final SI Report (Non MEC Sites)	6 days	Thu 9/16/10	Thu 9/23/10																
405	Prepare Draft SI Report (MEC Sites)	35 days	Tue 3/9/10	Mon 4/26/10																
407	Regulator Comments/Review Draft SI Report (MEC Sites)	19 days	Tue 4/27/10	Fri 5/21/10																
408	Draft Final SI Report (MEC Sites)	61 days	Mon 5/24/10	Fri 8/13/10																
409	Approval Draft Final SI Report (MEC Sites)	24 days	Sat 8/14/10	Wed 9/15/10																
410	Final SI Report (MEC Sites)	6 days	Thu 9/16/10	Thu 9/23/10																

Blue block- Navy  
Green block- Regulators  
Red block- Approval

Task  
Split



Progress  
Milestone



Summary  
Project Summary



External Tasks  
External Milestone



Deadline



**APPENDIX B  
PETROLEUM PROGRAM SCHEDULE**





