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NSWC PANAMA CITY
5090.3a

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) FACILITY INVESTIGATION

REGULATORY REVIEW MEETING

COASTAL SYSTEM STATION (CSS) PANAMA CITY
PANAMA CITY, FLORIDA

UNIT IDENTIFICATION CODE: N61331
CLEAN, DISTRICT 1
CONTRACT NO. N62467-89-D-0317

FEBRUARY 3, 1995

SWMU 1, LANDFILL A, ORIGINAL DISPOSAL AREA, AND AOC 2, UNDERGROUND OIL CONTAMINATED AREA.

Site Location. SWMU 1 is located on the eastern shore of the northwestern part of Alligator Bayou. The SWMU covers approximately 1 acre and is bordered by Buildings 92 and 94 on the south, Skylark Drive on the north, and Buildings 51 and 52 on the east. AOC 2 is located in the area of the Explosive Ordnance Disposal (EOD) yard (Building 370) and adjacent areas in the parking lot and towards the South Dock. Because SWMU 1 is immediately downgradient of AOC 2, these two sites are being investigated as a single unit.

Site Description. SWMU 1 is almost entirely covered by a parking lot, concrete dock, and Buildings 77, 293, 307, 172, and 333. A small lawn area exists between the parking lot and the dock. AOC 2 is the area of a former aboveground 10,000 barrel petroleum storage tank (Tank 11) and its associated underground distribution and transfer lines. It is located in the approximate location of the present EOD yard. Related to Tank 11 is an area under the south dock that was contaminated by a break in a transfer line between the dock and the tank during the mid-1960's, but which was not investigated during the RFI because it is being administered under separate authority. The potentially contaminated area of AOC 2 is estimated to cover approximately 3 acres and includes surface soil, subsurface soil, and groundwater contamination.

Site History. SWMU 1 was originally a marshy depression along the shore of Alligator Bayou that was used for general waste disposal and burning of combustible waste from approximately 1945 to 1953. The part of the site nearest to Alligator Bayou is now under the concrete deck of the West Dock. Buried wastes in this area may have been moved during dock construction in the early 1950's or during dock reconstruction in the late 1970's. During its period of operation, the site was the principal disposal area for CSS Panama City, and it received nearly all wastes generated during that period. The SWMU received general household waste, food waste, scrap metal, and scrap lumber. It is also reported that small quantities of paint, paint thinners, battery acid, solvents (acetone, methyl ethyl ketone [MEK], trichloroethene, and CRC-336 spray lubricant), and photographic chemicals from black and white and color processes were also disposed at this SWMU. Most of these latter materials were poured onto the site from 55-gallon containers or may have been present as residues from cans ranging in size from 4 ounces to 5 gallons. Bilge water and waste oil were also poured on the ground and burned. It is estimated that approximately 3,000 cubic yards (before burning) of waste per year were disposed at the site.

Wastes associated with AOC 2 are from the aboveground storage tank and its associated transfer piping. This tank was constructed in 1943 and was originally used to store diesel fuel unloaded from barges at the south dock. The tank, in turn,

distributed fuel by underground transfer lines to other vessels. According to a previous reports, approximately 50,000 gallons of diesel oil were lost from the tank system in 1953, but the exact location of the leak and whether the underground piping was involved is unknown. The tank was rehabilitated in 1957 by complete dismantling, cleaning, reassembly with new bolts and gaskets, and replacement of its 28 bottom plates. It was then used for storage of gasoline, aviation fuel, and diesel fuel oil . CSS Panama City personnel report that the tank has also been used for waste oil storage. It is reported that numerous small leaks, primarily at the tank seams, occurred both before and after the tank was rehabilitated.

During the mid 1960's, the fuel transfer lines between the dock and storage tank ruptured and an estimated 10,000 gallons of oil collected under the south dock. Following the leak, seepage of diesel oil occurred through numerous small pits and holes in the south dock's steel bulkhead. During periods of low tide, the floating oil layer beneath the dock escaped to Alligator Bayou through holes in the bulkhead..

The tank was removed in 1979. An earthen berm for secondary containment existed prior to the tank's removal at a distance of 60 feet from the tank wall. According to demolition plans, the transfer piping between the tank and the berm was removed during tank removal. The remaining piping was capped and abandoned in place.

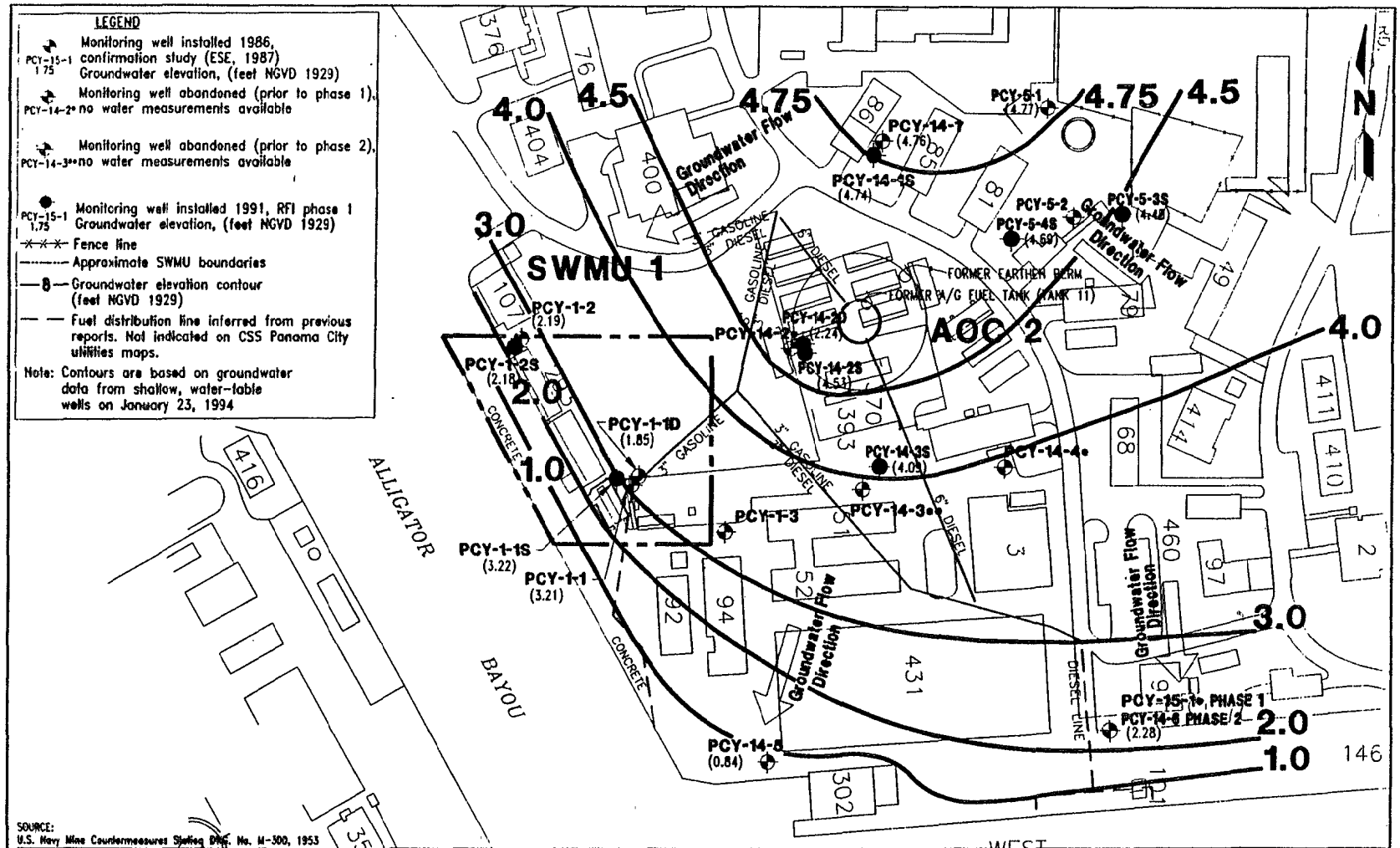
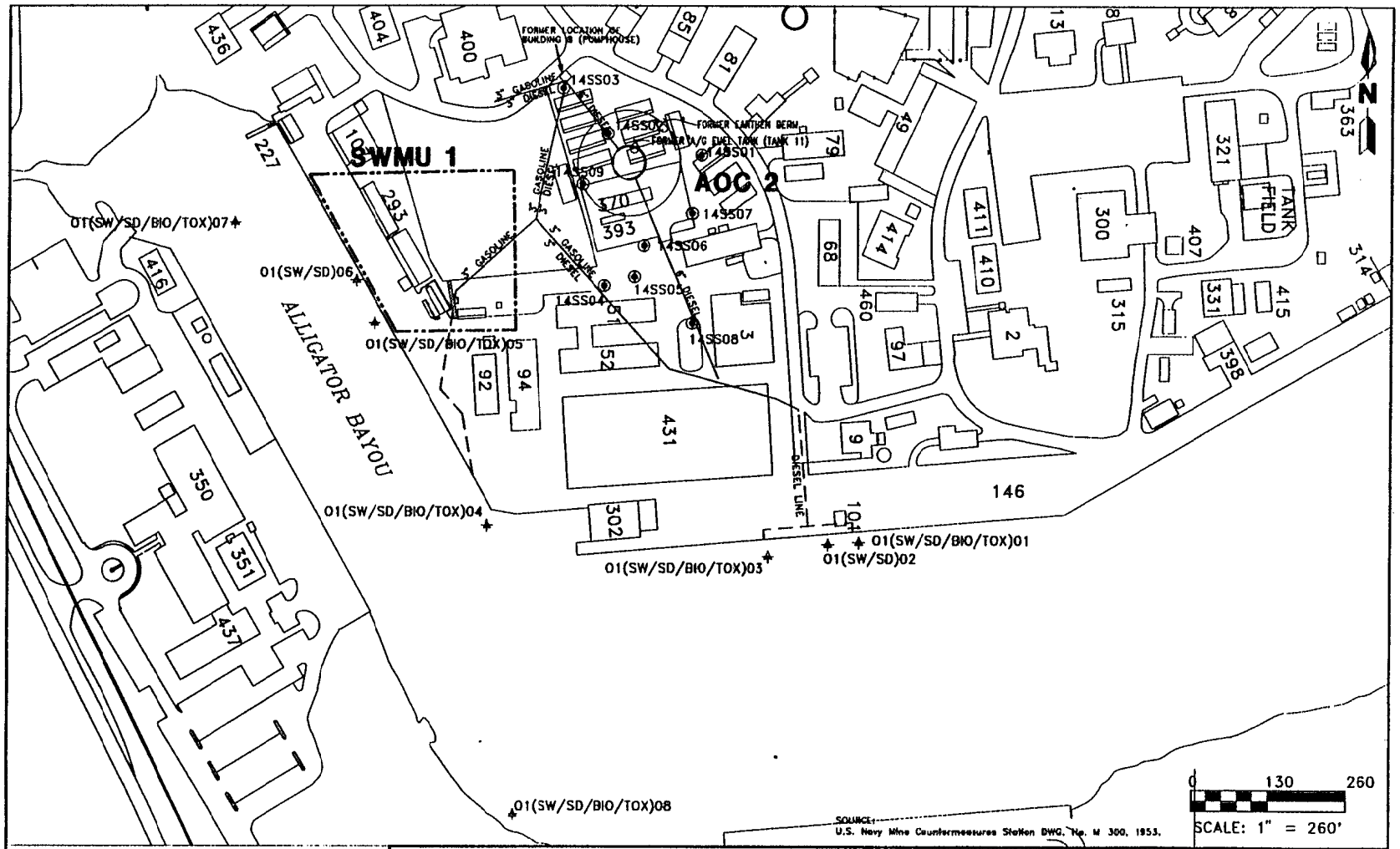


FIGURE 8-1
SWMU 1 MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATION CONTOURS JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION PANAMA CITY, FLORIDA



LEGEND

- Surface water/sediment sample (phase 2)
- Surface soil sample (phase 2)
- Approximate SWMU boundary
- Fuel distribution line inferred from previous reports. Not indicated on CSS Panama City utilities maps.

BIO = Benthic macroinvertebrate sample
TOX = Sediment toxicity

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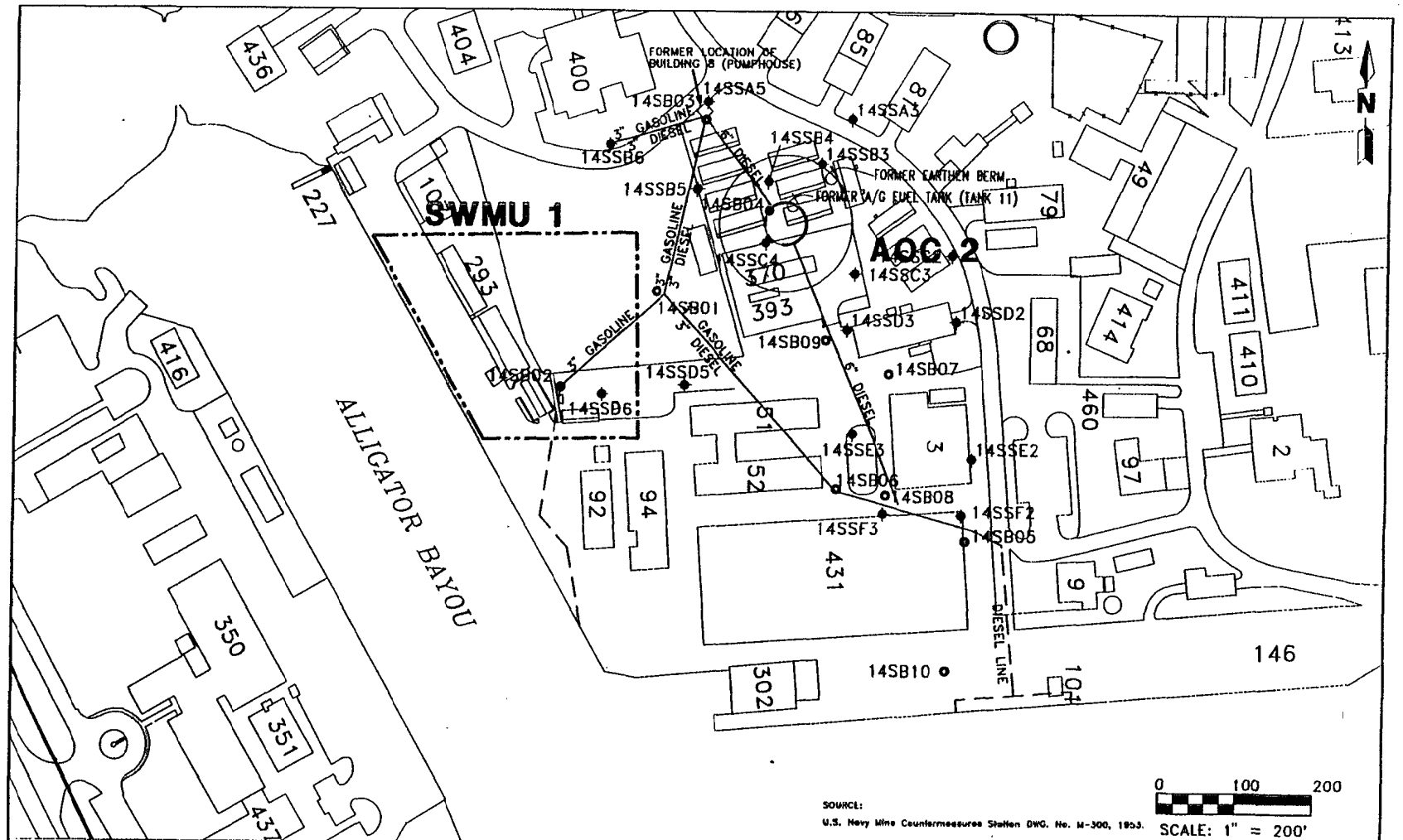
FIGURE 8-2
SOLID WASTE MANAGEMENT UNIT NO. 1 AND AREA OF CONCERN (AOC) 2 SURFACE SOIL, SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION PANAMA CITY, FLORIDA



LEGEND

- ◆ Subsurface soil sample (soil boring) (phase 1)
- ○ Subsurface soil sample (soil boring) (phase 2)
- Approximate SWMU boundary
- Fuel distribution line inferred from previous reports. Not indicated on CSS Panama City utilities maps.

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FIGURE 8-3
SOLID WASTE MANAGEMENT UNIT NO. 1 AND AREA OF CONCERN (AOC) 2 SUBSURFACE SOIL SAMPLE (SOIL BORING) LOCATIONS

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION PANAMA CITY, FLORIDA

Nature and Distribution Summary for SWMU 1/AOC 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics**: Primary - SVOCs (PAHs). Others - carbazole and di-n-butylphthalate **Inorganics**: Inorganics detected above two times the maximum background concentrations: aluminum, barium, calcium, iron, lead, and magnesium Inorganics detected in site-related samples but not in background: antimony, arsenic, beryllium, cadmium, chromium, copper, cyanide, manganese, mercury, nickel, potassium, selenium, silver, thallium, vanadium, and zinc. Inorganics detected above regional background concentrations: zinc		some or all analytes detected (samples collected further away form tank had highest concentrations) some or all analytes detected (samples collected from within the berm area had the lowest concentrations)
Subsurface Soil	**Organics**: Primary - fuel-related VOCs (ethylbenzene, toluene, and 1,1,1-trichloroethane) and SVOCs (PAHs). Others - acetone, 2-butanone, phthalates and pesticides	ethylbenzene, toluene, and1,1,1-trichloroethane and PAHs	acetone, 2-butanone, phthalates, and pesticides

See notes at end of table

Nature and Distribution Summary for SWMU 1/AOC 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Subsurface Soil	**Inorganics:** Inorganics detected above two times the maximum background concentrations:barium, calcium, chromium, lead, magnesium, manganese, mercury, potassium, and zinc. Inorganics detected in site-related samples but not in background: antimony, arsenic, beryllium, cobalt, copper, nickel, selenium, and sodium. Inorganics detected above regional background concentrations: zinc.	some or all analytes detected	
Groundwater	**Organics:** BTEX, PAHs, 2-butanone, acetone, chlorobenzene, chloroform, phthalates,and pesticides. **Inorganics:** Inorganics detected above two times the maximum background concentrations: calcium, lead, magnesium, manganese, sodium, and zinc. Inorganics detected in site-related samples but not in background: antimony and thallium	BTEX, PAHs, chlorobenzene, and chloroform iron and manganese	acetone, 2-butanone, phthalates, and pesticides some or all other analytes listed
Surface Water	**Organics:** None **Inorganics:** Inorganics detected above two times the maximum background concentration: copper Inorganics detected in site-related samples but not in background: beryllium, cadmium, lead, mercury, and nickel.	--	-- some or all analytes listed (most likely due to other activities in Alligator Bayou)

See notes at end of table.

Nature and Distribution Summary for SWMU 1/AOC 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Sediment	**Organics**: Primary -PAHs. Others - carbon disulfide, phenol, phthalates, and PCBs	PAHs, carbon disulfide, phenol, and PCBs (probable source - observed free product behind the South Dock and industrial activities along the docks)	Phthalates
	Inorganics: Inorganics detected above two times the maximum background concentrations: aluminum, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, potassium, selenium, sodium, and zinc. Inorganics detected in site-related samples, but not in background: antimony, beryllium, cobalt, mercury, nickel, silver, thallium, and vanadium.		some or all anlaytes listed (probably related to other activities in Alligator Bayou)

Notes: SWMU = solid waste management unit
AOC = area of concern
SVOCs = semivolatile organic compounds
PAHs = polynuclear aromatic carbons
VOCs = volatile organic compounds
BTEX = benzene, toluene, ethylbenzene, and xylene
PCBs = polychlorinated byphenols

Summary of Human Health Risk Assessment at SWMU 1/AOC 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - not evaluated for SWMU 1, adult and child transient scenario for ingestion, dermal contact, and fugitive dust inhalation for AOC 2	None	None
	Future Land Use - not evaluated for SWMU 1, adult and child resident for ingestion, dermal contact, and fugitive dust inhalation for AOC 2	None	None
Subsurface soil	**Current Land Use** - not evaluated for SWMU 1 or AOC 2	--	--
	Future Land Use - not evaluated for SWMU 1, adult excavation worker for AOC 2	None	None
Groundwater	**Current Land Use** - not evaluated for SWMU 1 or AOC 2	--	--
	Future Land Use - adult resident for ingestion and inhalation of volatiles while showering for both SWMU 1 and AOC 2	antimony, manganese, and thallium (SWMU 1) and antimony, manganese, bis(2-ethylhexyl)phthalate, dieldrin,and thallium (AOC 2)	None
Surface Water	**Current Land Use** - adult SCUBA diver including ingestion and dermal contact	None	None
	Future Land Use - child and adult resident ingestion and dermal contact	None	None
Sediment	**Current Land Use** - not evaluated	--	--
	Future Land Use - child and adult resident ingestion and dermal contact	None	None

Note: SWMU = solid waste management unit
AOC = area of concern

Summary of Ecological Risk Assessment at SWMU 1/AOC 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Wildlife** - ingestion of soils and contaminated food	None	None
Groundwater	**Aquatic Receptors** - dermal contact with surface water	None based on 100 times dilution	None
Surface Water	**Aquatic Receptors** - dermal contact with surface water	None	None
	Terrestrial Wildlife - ingestion of surface water and contaminated food	None	None
Sediment	**Aquatic Receptors** - dermal contact with sediment	PAHs, arsenic, and vanadium (likely associated with other activities in Alligator Bayou)	None
	Terrestrial Wildlife - indirect ingestion of sediment and ingestion of contaminated food	copper via sediment ingestion for terrestrial wildlife (likely associated with other activities in Alligator Bayou)	None

Note: SWMU = solid waste management unit
AOC = area of concern

CONCLUSIONS AND RECOMMENDATION

Surface Soil - no action (no risk identified)

Subsurface soil - no action (no risk identified)

Groundwater - no action (risk mainly associated with ingestion of inorganics that are likely due to adsorbtion to suspended soil particles)

Surface water - no action (no risk identified)

Sediment - no action (dermal risk to aquatic receptors with PAHs, arsenic, and vanadium and risk to terrestrial wildlife for ingestion of copper - detections are likely associated with free product behind seawall and other activities in Alligator Bayou)

A separate investigation of the South Dock area is recommended.

SWMU 2, LANDFILL B, BURN AND LANDFILL AREA.

Site Location. SWMU 2, Landfill B, Burn and Landfill Area, covers approximately 11 acres that surround Pirate Place in the central part of the facility. This area is surrounded by an open storage area on the northeast, Building 455 on the southeast, the Base Exchange to the west, and recreational facilities including a softball field and boy scout trailer to the south.

Site Description. Landfill operations have reportedly occurred in five areas at SWMU 2. These areas include the Burn Area, Ash Disposal Area, the General Household Waste Disposal Area, the Red Lead Paint Disposal Area, and the One-Time Base Cleanup Disposal Area. SWMU 2 is now heavily vegetated with trees planted in 1983, shrubs, and grass and has low-lying areas that collect water during rain events.

Site History. SWMU 2, Landfill B, Burn and Landfill Area, was in operation from 1947 until 1982 and is the largest and longest operating disposal site at CSS Panama City. Although waste disposal took place in the late 1940's and early 1950's, major operations at SWMU 2 began in 1957 when the site was first used as a general burn and disposal area. Wastes burned and disposed at the Burn Area reportedly included household garbage, tires, wooden crates, pallets, scrap lumber, tree limbs, metal shavings, conduit, rope, paint cans and drums (mostly empty or with residues), paint thinners, waste oil (possibly including transformer oil containing PCBs), solvents (trichloroethene, dry cleaning solvents, MEK, and acetone), mineral spirits, alcohol, hydraulic fluids, and bilge water. The waste volume received at SWMU 2 is estimated to be 6,240 cubic yards per year for a period of 8 years, beginning around 1957. Reportedly, beginning in approximately 1955, between 700 and 1,500 gallons of bilge water per week were discharged onto the ground.

The areas originally designated as ash disposal piles in the IAS may have actually have been coal storage piles. The facility's power plant was once fired by coal, and this area is considered by present CSS Panama City public works personnel to be a likely location for coal stockpiles. Presently, the central area of the site is covered with visible coal fragments to a depth of 0.5 to 1.5 feet. Nevertheless, at least one vegetated mound of gray, ashy material exists in the woods behind the Base Exchange parking lot in the approximate area indicated as ash disposal in the IAS.

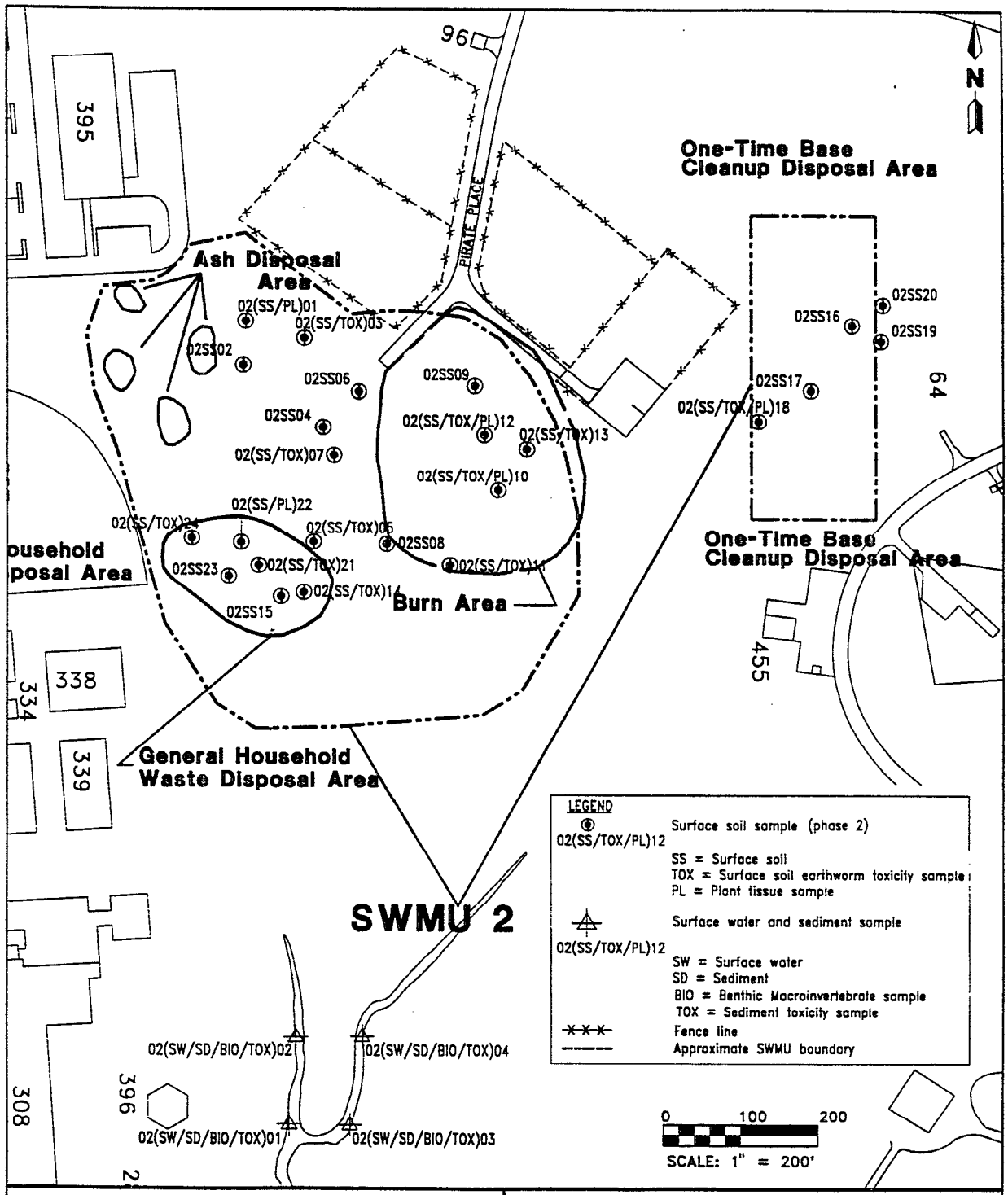

FIGURE 8-11
SWMU 2 SURFACE SOIL, PLANT TISSUE, AND SURFACE WATER SEDIMENT SAMPLE LOCATIONS

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RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

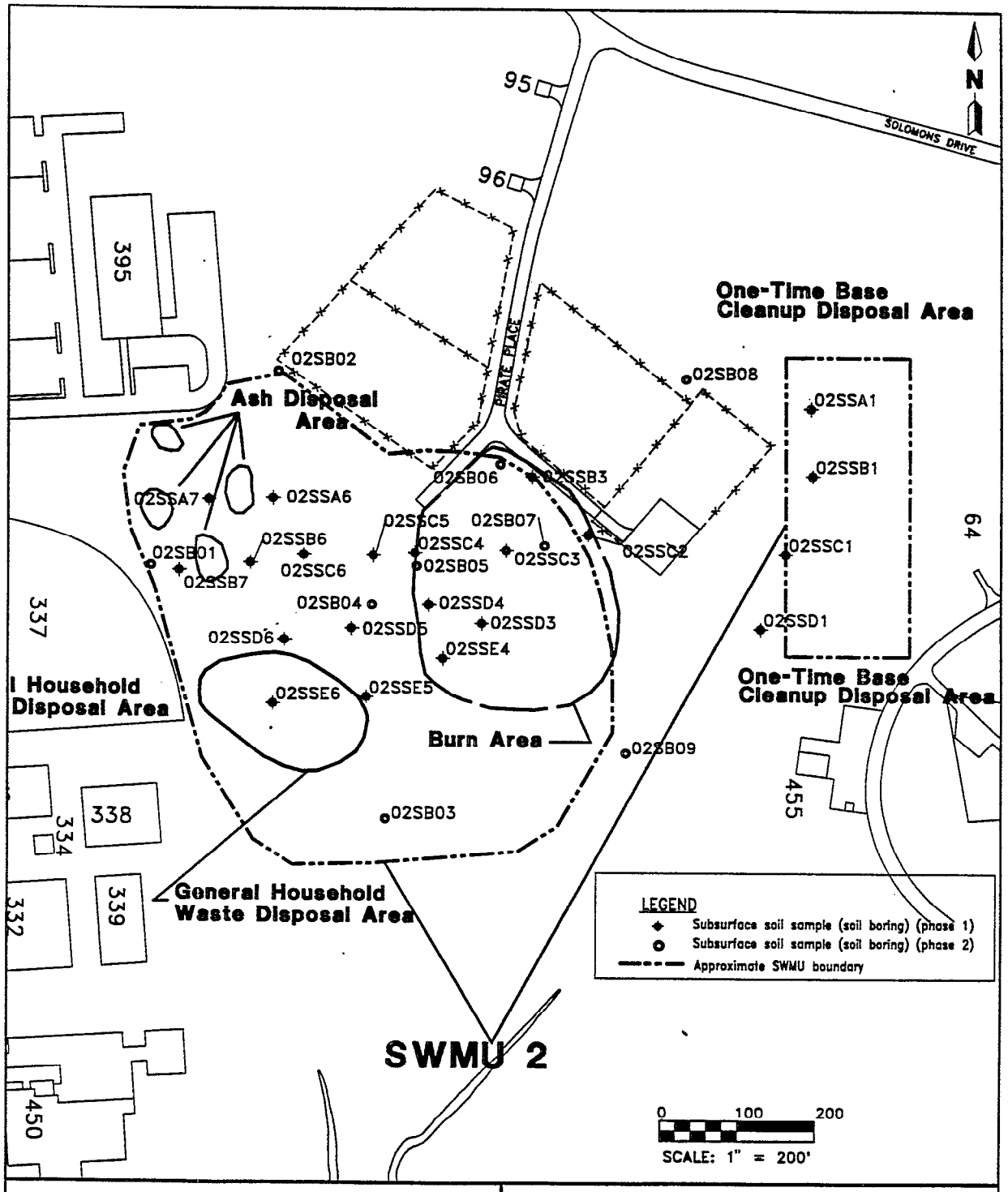

FIGURE 8-14
SWMU 2 SUBSURFACE SOIL SAMPLE (SOIL BORING) LOCATIONS

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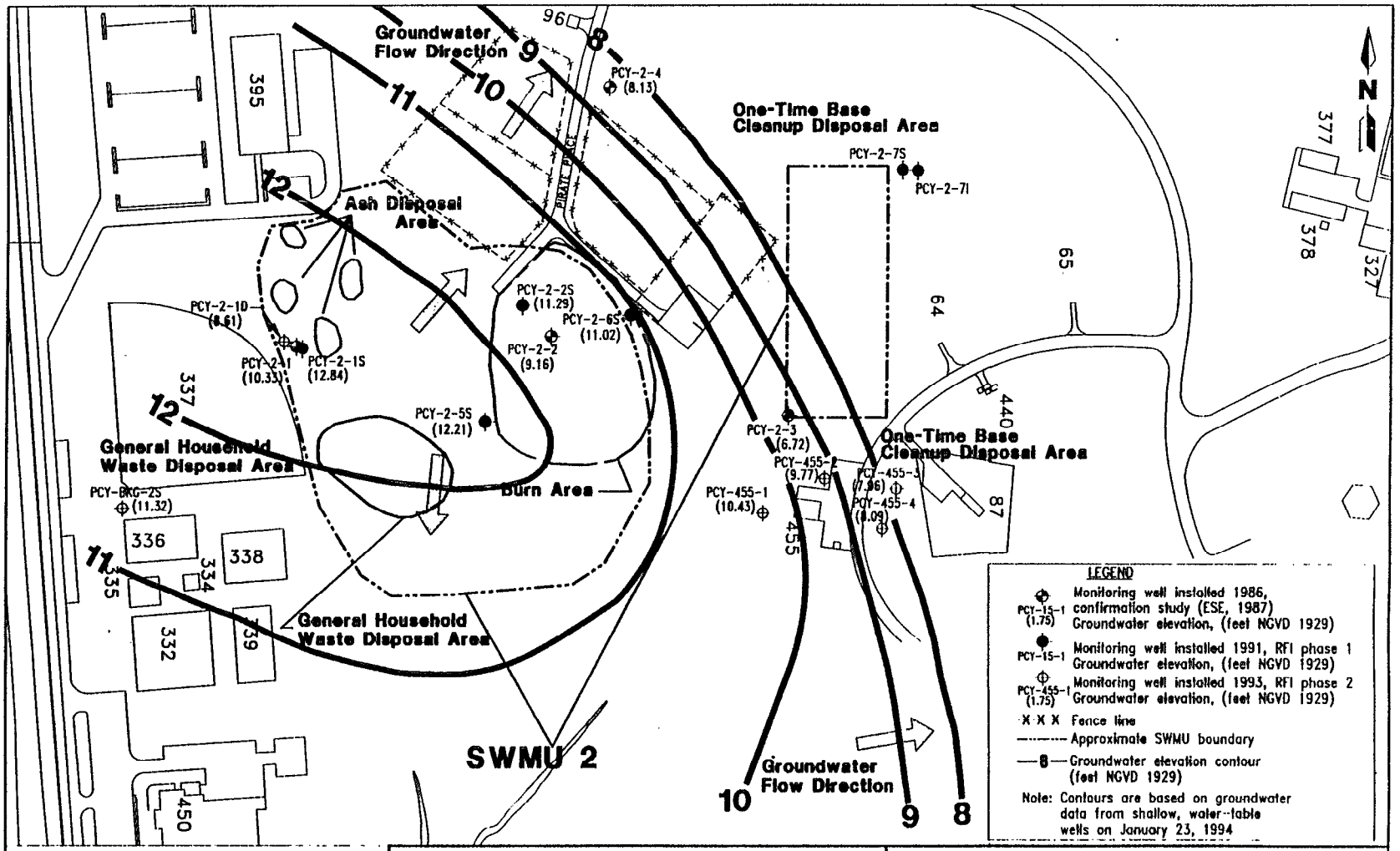
RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



0 125 250
SCALE: 1" = 250'

FIGURE 8-16
SWMU 2 MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATION CONTOURS JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION PANAMA CITY, FLORIDA

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When the burn area was closed in 1982, a 3- to 4-acre area (where waste disposal had occurred) was mechanically raked to a depth of 2 feet to remove shallow wastes, which were present in low piles. Reportedly, approximately 30 miles of cable and other wastes including tin, copper, lead, wood, and cardboard boxes were removed from the burn area. The site was subsequently graded and planted with pine trees.

Wet household garbage and food waste brought to the burn and disposal area during its period of operation were not burned. These wastes were landfilled separately in the General Household Waste Disposal Area, located immediately to the south of the Burn Area.

The Red Lead Paint Disposal Area was reportedly used for the burial of 2 to 4 tons of red lead-based paint in 1946 or 1947. During an interview for the IAS, it was stated that a trench approximately 100 feet long and 8 feet deep was bulldozed, and that 5-gallon paint cans were deposited, compacted, and covered with earth. The existence of this disposal site is questionable. Later interviews suggest that if such wastes were deposited at CSS Panama City, it is unlikely that the quantity would be as large as reported. A search for this disposal site was conducted using surface geophysical techniques during the RFI, but it could not be located.

The One-Time Base Cleanup Disposal Area is located to the east of the present open storage area on Pirate Place. The site is a location where wastes from a 1-day base-wide cleanup event were reportedly landfilled at some time between 1970 and 1975. Trenches dug approximately 100 feet long by 10 feet wide by 8 feet deep were used to bury materials such as general household garbage, scrap lumber, construction rubble, and drums or cans possibly containing paints, oils, or solvents (Johnson and Associates, 1985).

Nature and Distribution Summary for SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics:** Primary - fuel related SVOCs (PAHs), phthalates, PCBs, and pesticides. Others - carbon disulfide, toluene, carbazole, and phenol **Inorganics:** Inorganics detected above two times the maximum background concentrations: aluminum, arsenic, barium, calcium, iron, lead, magnesium, manganese, mercury, vanadium, and zinc Inorganics detected in site-related samples but not in background: antimony, beryllium, cadmium, chromium, cobalt, copper, cyanide, nickel, potassium, selenium, silver, sodium, and thallium Inorganics detected above regional background concentrations: antimony and lead	PAHs, phthalates, PCBs, carbon disulfide, toluene, carbazole, and phenol some or all of the listed analytes	pesticides
Subsurface Soil	**Organics:** Primary - fuel related PAHs and phthalates. Others - fuel-related VOCs, benzoic acid, and pesticides.	PAHs, phthalates, VOCs (not significant), and benzoic acid	pesticides
See notes at end of table			

Nature and Distribution Summary for SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Subsurface Soil	**Inorganics:** Inorganics detected above two times the maximum background concentrations: aluminum, barium, calcium, chromium, iron, lead, magnesium, manganese, mercury, vanadium, and zinc. Inorganics detected in site-related samples but not in background: antimony, arsenic, beryllium, cadmium, cobalt, copper, nickel, selenium, silver, sodium, and tin. Inorganics detected above regional background concentrations: antimony and lead	some or all analytes listed (localized under Burn Area)	
Groundwater	**Organics:** Low concentrations of 1,1-DCA, chlorobenzene, toluene, benzo(a)pyrene, 4-methylphenol, nitrobenzene, diethylphthalate, BEHP, and dieldrin	1,1-DCA, chlorobenzene, toluene, benzo(a)pyrene, 4-methylphenol, and nitrobenzene (localized under Burn Area)	diethylphthalate, BEHP, and dieldrin

See notes at end of table

Nature and Distribution Summary for SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Groundwater	**Inorganics (unfiltered):** Inorganics detected above two times the maximum background concentrations: aluminum, copper, iron, lead, magnesium, manganese, mercury, vanadium, and zinc Inorganics detected in site-related samples but not in background: thallium **Inorganics (filtered):** Inorganics detected above two times the maximum background filtered concentrations: aluminum, calcium, copper, iron, magnesium, manganese, zinc, and vanadium Inorganics detected in unfiltered samples but not filtered samples: beryllium, cadmium, cobalt, mercury, nickel, selenium, and thallium	some or all analytes listed (localized under Burn Area)	
Surface Water	**Organics:** 2-butanone **Inorganics:** Inorganics detected above two times the maximum background concentration: 22 inorganics were detected in surface water samples collected from SWMU 2 Background sediment data are not available for comparison		2-butanone some or all listed analytes (probably due to natural conditions - low pH and DO)
Sediment	**Organics:** Primary -PAHs, 2-butanone, di-n-butylphthalate, and pesticides	possibly PAHs,	possibly PAHs, 2-butanone, di-n-butylphthalate, and pesticides
See notes at end of table			

Nature and Distribution Summary for SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Sediment	**Inorganics:** Inorganics detected above two times the maximum background concentrations: 16 inorganics were detected in sediment samples collected at SWMU 2 Background sediment data are not available for comparison	unknown (may be due to natural conditions - organic environment)	unknown

Notes: SWMU = solid waste management unit
RCRA = resource conservation and recovery act
SVOCs = semivolatile organic compounds
PAHs = polynuclear aromatic hydrocarbons
PCBs = polychlorinated byphenols
BEHP = bis (2-ethylhexyl)phthalate

Summary of Human Health Risk Assessment at SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - adult and child transient for ingestion, dermal contact, and fugitive dust inhalation[1]	aroclor-1248, benzo(a)pyrene, beno(b)anthracene, benzo(b)fluoranthene, dieldrin, and arsenic (risk mainly driven by aroclor- 1248 found in one sample 02SS06)	aroclor-1248, benzo(a)pyrene, benzo(b)fluoranthene, and arsenic
	Future Land Use - adult and child resident for ingestion, dermal contact, and fugitive dust inhalation[1]	aroclor-1248, benzo(a)pyrene, dieldrin, benzo(b)fluoranthene, dibenzo(a,h)anthracene, Aroclor-1254, and arsenic (risk mainly driven by aroclor-1248 found in one sample 02SS06)	aroclor-1248, benzo(a)pyrene, dieldrin, benzo(b)fluoranthene, dibenzo(a,h)anthracene, Aroclor-1254, and arsenic
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use - adult excavation worker for ingestion, dermal contact, and fugitive dust inhalation	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use -adult resident for ingestion, and fugitive dust inhalation	chromium, manganese, thallium, and vanadium	some or all listed analytes (may also be inorganics adsorbed to suspended soil particles)
Surface Water	**Current Land Use** - NE	--	--
	Future Land Use - adult and child resident for ingestion, and fugitive dust inhalation	none	none

Summary of Human Health Risk Assessment at SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

See notes at end of table.

Sediment	**Current Land Use** - NE	--	--
	Future Land Use - adult and child resident for ingestion, and fugitive dust inhalation	none	none

[1]Three areas evaluated: One Time Base Clean-Up Disposal area, Burn and Ash area, and the Household Waste Disposal area.

Note: NE = not evaluated

Summary of Ecological Risk Assessment at SWMU 2

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Wildlife** - ingestion of soil and contaminated food	aroclor-1248 and dieldrin (Burn and Ash Disposal areas) and dieldrin (General Household Waste Disposal area)	aroclor-1248
	Terrestrial Invertebrates - direct contact with and ingestion of soil	none	none
	Terrestrial Plants - direct contact with soil (based on phytotoxicity literature data - may not represent true site conditions)	antimony, chromium, copper, lead, silver, thallium, vanadium, and zinc (Burn and Ash Disposal area). copper mercury, and zinc (General Household Waste Disposal Area	some or all analytes listed
Groundwater	**Aquatic Receptors** - dermal contact with surface water	none	none
Surface Water	**Aquatic Receptors** - dermal contact with surface water	aluminum, cadmium, copper, iron, lead, mercury, nickel, silver, and zinc[1]	none
	Terrestrial Wildlife - ingestion of surface water and contaminated food	aluminum[1] (related to the ingestion of contaminated food)	none
Sediment	**Aquatic Receptors** - dermal contact with sediment	pesticides	none
	Terrestrial Wildlife - indirect ingestion of sediment and contaminated food	none	none

[1]Background surface water and sediment samples are not available for comparison to determine if SW/SD ECPCs are associated with past activities at SWMU 2.

Notes: SWMU =solid waste management unit
RCRA = Resource Conservation and Recovery Act

CONCLUSIONS AND RECOMMENDATIONS

Surface soil - confirm result of high PCB sample. (If confirmed recommend a removal action)

Subsurface soil - no action (no risk was identified)

Groundwater - no action (human health risk identified with chromium, manganese, thallium, and vanadium for future groundwater scenario - inorganics are likely sorbed to suspended soil particles in groundwater)

Surface Water - no action (ecological risk identified with some inorganics - environmental conditions (i.e., low DO and pH) is probably causing naturally occurring metals to dissolve into surface water)

Sediment - no action (ecological risk identified with some inorganics -environmental conditions (The presence of organic material on top of sediment may be increasing the organic content of the sediment and lowering the pH, which may result in concentrating inorganics that are naturally present in sediment)

SWMU 3, LANDFILL C, BURN AND DISPOSAL AREA.

Site Location. SWMU 3, Landfill C, Burn and Disposal Area, is located northeast of the Amphibious Assault Landing Craft Area (Building 319) on the beach of St. Andrew Bay. The site is bordered on the east by St. Andrew Bay, on the north by a small tidal inlet and pond leading into the St. Andrew Bay, and on the west by Building 292.

Site Description. SWMU 3, Landfill C, Burn and Disposal Area, is reported to be 150 feet long by 50 feet wide by 12 feet deep. It is unclear from previous reports exactly where the landfill was located. The IAS diagrams the location to extend from the fence line on the north side of the Amphibious Assault Landing Craft Area for 150 feet to the south, along the water line of St. Andrew Bay. Historical aerial photographs confirm this approximate location, but suggest the site was larger. The entire area adjacent to the Amphibious Assault Landing Craft Area is covered with concrete riprap. A grassy area lies beyond the riprap and fence line to the north, around the tidal inlet.

Site History. SWMU 3, Landfill C, Burn and Disposal Area, was the second landfill at CSS Panama City. The site was used for waste disposal from 1953 to 1959. Wastes disposed included general household garbage, scrap lumber and metal, tree limbs, paint, paint thinner and solvent cans (mostly empty or with residue), bilge water, and waste oil (possibly transformer oil containing PCBs). Between 24 and 48 cubic yards of waste were brought to the site each day and burning took place once per month. Bulldozers were used to push the piles together to a height of about 25 feet and the piles were doused with gasoline and ignited. The ash piles were then covered with sand. Aerial photographs, dated 1956 and 1959, show a bulldozed area along the beach with apparent debris and waste extending in width from the bay to a point approximately halfway to Solomon Drive, which parallels the shore. The area extends in length along the beach from a line parallel to the back of the supply warehouses (Buildings 99 and 100) at the north end, to Vernon Street on the south. Wastes were also apparently filled into the bay itself. Today, debris can be seen in the water in this area.

When the Amphibious Assault Landing Craft Area was constructed, a natural wetland was destroyed. Under the requirements of the National Wetlands Protection Act, it was replaced by constructing the tidal inlet visible today. During low tide, evidence of waste disposal is apparent.

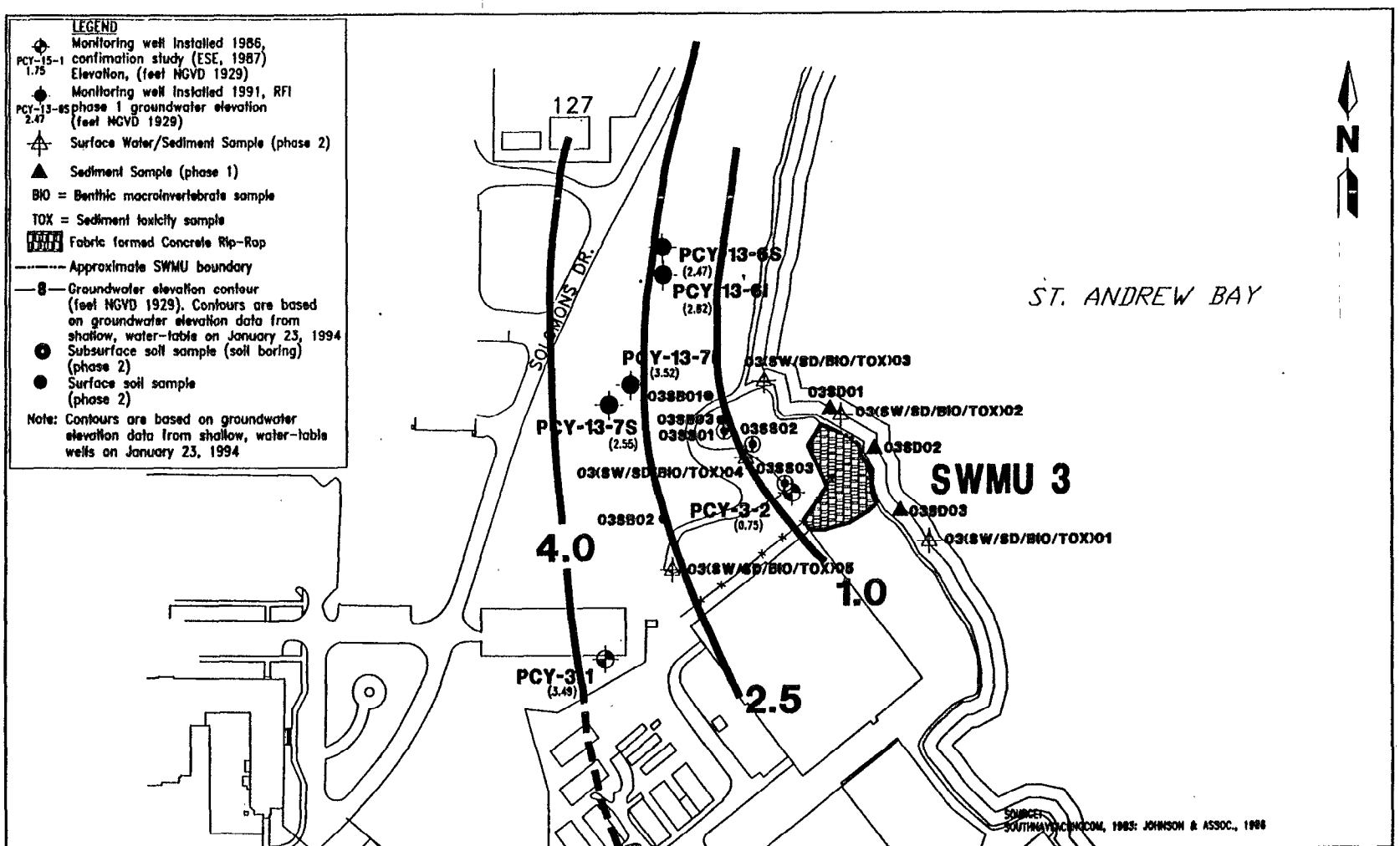


FIGURE 8-17
SWMU 3 MONITORING WELL LOCATIONS, GROUNDWATER ELEVATION CONTOURS, AND SAMPLE LOCATIONS

RCRA FACILITY INVESTIGATION WORKPLAN

COASTAL SYSTEMS STATION PANAMA CITY, FLORIDA

Nature and Distribution Summary for SWMU 3

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics:** Primary - fuel related SVOCs (PAHs). Others - PCBs, pesticides, and di-n-octylphthalate	PAHs, PCBs,	pesticides, di-n-octylphthalate
	Inorganics: Inorganics detected above the maximum background concentrations: arsenic, barium, iron, lead, magnesium, manganese, mercury, and zinc	some or all listed analytes	
	Inorganics detected in site-related samples but not in background: antimony, beryllium, cadmium, chromium, cobalt, copper, cyanide, nickel, potassium, selenium, silver, and sodium Inorganics detected above regional background concentrations: antimony, nickel, and zinc		
Subsurface Soil	**Organics:** Primary - fuel related SVOCs (PAHs). Others - pesticides, chlorobenzene, carbazole, and BEHP	PAHs, possibly BEHP, chlorobenzene, and carbazole	pesticides, possibly BEHP
	Inorganics: Inorganics detected above the maximum background concentrations: lead and mercury	some or all listed analytes	
	Inorganics detected in site-related samples but not in background: copper, silver, and sodium		
	Inorganics detected above regional background concentrations: none		

See notes at end of table.

Nature and Distribution Summary for SWMU 3

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Groundwater	**Organics**: 1,1-dichloroethane and pesticides **Inorganics (unfiltered)**: Inorganics detected above the maximum background concentrations: beryllium, iron, magnesium, and manganese Inorganics detected in site-related samples but not in background: antimony Inorganics (filtered): Inorganics detected above the maximum filtered background concentrations: vanadium Inorganics detected in filtered site-related samples but not in filtered background: none	1,1-dichloroethane	pesticides some or all analytes detected
Surface Water	**Organics**: benzo(b)fluoranthene **Inorganics**: Inorganics detected above the maximum background concentration: copper, iron, manganese, and zinc Inorganics detected in site-related samples but not in background: beryllium, cadmium, and lead	benzo(b)fluoranthene some or all analytes listed	
Sediment	**Organics**: Primary - fuel related SVOCs (PAHs). Others: pesticides, toluene, carbazole, butylbenzylphthalate, dimethylphthalate, and BEHP	PAHs, carbazole, possibly phthalates	pesticides, toluene, possibly phthalates
See notes at end of table.			

Nature and Distribution Summary for SWMU 3

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Sediment	**Inorganics**: Inorganics detected above the maximum background concentrations: aluminum, barium, chromium, copper, iron, lead, magnesium, manganese, and zinc Inorganics detected in site-related samples, but not in background: antimony, beryllium, mercury, nickel, silver, and vanadium	some or all anlaytes listed	

Notes: SWMU = solid waste management unit
RCRA = resource concervation and recovery act
SVOCs = semivolatile organic compounds
PAHs = polynuclear aromatic compounds
PCBs = polychlorinated byphynols
BEHP = bis(2-ethylhexyl)phthalate

Summary of Human Health Risk Assessment at SWMU 3

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - adult and child transient for ingestion, dermal contact, and fugitive dust inhalation	none	none
	Future Land Use - adult and child resident for ingestion, dermal contact, and fugitive dust inhalation	arsenic and antimony	arsenic and antimony
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use - adult excavation worker for ingestion, dermal contact, and fugitive dust inhalation	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use - adult resident for ingestion and inhalation while showering	beryllium, antimony, and thallium	none
Surface Water	**Current Land Use** -NE	--	--
	Future Land Use - adult and child resident for ingestion and dermal contact	none	none
Sediment	**Current Land Use** - NE	--	--
	Future Land Use - adult and child resident for ingestion and dermal contact	none	none

Note: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
NE = not evaluated

Summary of Ecological Risk Assessment at SWMU 3

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Receptors** - NE	--	--
Groundwater	**Aquatic Receptors** - dermal contact with surface water	pesticides	none
Surface Water	**Aquatic Receptors** - dermal contact with surface water	benzo(b)flouranthene, beryllium, copper, iron, lead, manganese, and zinc	some or all of the analytes listed
	Terrestrial Wildlife - ingestion of surface water and contaminated food	none	none
Sediment	**Aquatic Receptors** - dermal contact with sediment.	lead, iron, and zinc	lead, iron, and zinc
	Terrestrial Wildlife - indirect ingestion of sediment and contaminated food	copper	copper

Note: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
NE = not evaluated

CONCLUSIONS AND RECOMMENDATIONS

Surface soil - no action (human health risk associated with arsenic and antimony - HI = 3, probably an overestimate).

Subsurface soil - no action (no risk identified).

Groundwater - no action (human health risk associated with inorganics and ecological risk associated with pesticides - risks were associated with upgradient monitoring well and are likely present because of facility wide use of pesticides for pest control).

Surface Water - CMS (ecological risk associated with inorganics are likely associated with past burn and disposal activities at the SWMU).

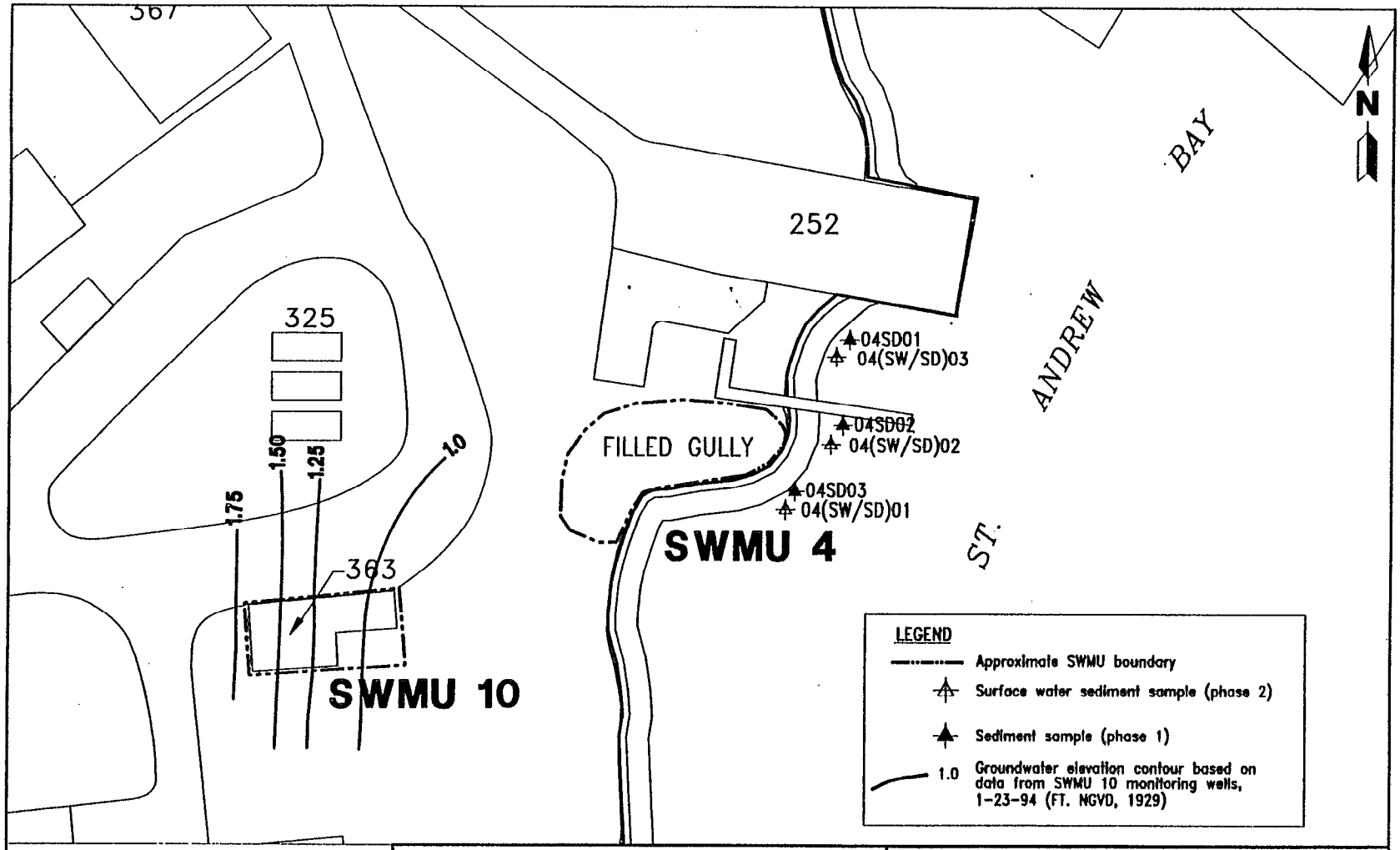
Sediment - CMS (ecological risk associated with inorganics are likely associated with past burn and disposal activities at the SWMU).

SWMU 4, LANDFILL D, FILLED GULLY.

Site Location. SWMU 4 is located on the shore of St. Andrew Bay south of the docks numbered 252 and 295. This SWMU is in the southeastern section of CSS Panama City.

Site Description. SWMU 4 is a grassy area located on the shore of St. Andrew Bay. Surface water runoff from the site is discharged into the bay. Piles of broken concrete and other debris are present at SWMU 4.

Site History. SWMU 4 is approximately 1/4 acre in size and was originally a surface water drainage ravine discharging to St. Andrew Bay. The ravine still receives surface water runoff from the surrounding areas. During the period from 1954 to 1958, concrete blocks, pieces of broken concrete, hardened asphalt, tires, and other inert materials were disposed in the ravine. Aerial photographs suggest that the site was only sporadically active during the 1960's, and apparently did not receive any additional fill material after 1970.



0 40 80
SCALE: 1" = 80'

H:/PANAMA/SWMU4/WDW-GLC/12-21-94

FIGURE 8-18
SWMU 4 SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Nature and Distribution Summary for SWMU 4

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Water	**Organics**: di-n-octylphthalate		di-n-octylphthalate
	Inorganics: Inorganics detected above two times the maximum background concentration: copper	some or all analytes listed (however, likely associated with other activities in St. Andrew Bay)	some or all analytes listed
	Inorganics detected in site-related samples but not in background: antimony and mercury		
Sediment	**Organics**: fuel related SVOCs (PAHs) and pesticides		PAHs and pesticides (likely associated with other activities in St. Andrew Bay and the facility wide use of pesticides for pest control)
	Inorganics: Inorganics detected above two times the maximum background concentrations: barium, calcium, manganese, and zinc	some or all analytes listed (however, likely associated with other activities in St. Andrew Bay)	some or all listed analytes
	Inorganics detected in site-related samples, but not in background:cobalt and silver		

Notes: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
SVOCs = semivolatile organic compounds
PAHs = polyaromatic hydrocarbons

Summary of Human Health Risk Assessment at SWMU 4

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Water	**Current Land Use** - NE **Future Land Use** - adult and child resident for ingestion and dermal contact	none	none
Sediment	**Current Land Use** - NE **Future Land Use** - adult and child resident for ingestion and dermal contact	none	none

Note: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
NE = not evaluated

Summary of Ecological Risk Assessment at SWMU 4

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Water	**Aquatic Receptors** - dermal contact with surface water	none	none
	Terrestrial Wildlife - ingestion of surface water and contaminated food	none	none
Sediment	**Aquatic Receptors** - dermal contact with sediment, toxicity testing of sediment and benthic macroinvertebrate community sampling.	none	none
	Terrestrial Wildlife - indirect ingestion of sediment and contaminated food	none	none

Notes: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act

CONCLUSION AND RECOMMENDATION

Surface Water - no action (no risks identified)

Subsurface Soil - no action (no risks identified)

This SWMU is recommended for no further action

SWMU 5, PAINT EQUIPMENT CLEANING AREA.

Site Location. SWMU 5 is reportedly located at the eastern back corner of the paint shop (Building 47) on Solomon Drive, in the southern part of the facility.

Site Description. SWMU 5 was a sand area located at the eastern back corner of Building 47 and was approximately 225 square feet in size. The SWMU is currently paved and no evidence of the rinse area is visible.

Site History. The rinse area at SWMU 5 was used to clean painting equipment from the early 1950's until 1979. Brushes and other painting equipment were cleaned with mineral spirits, MEK, acetone, and paint thinners. Paint and cleaning wastes may have been poured directly onto the ground. It has been estimated that 19,500 gallons of waste may have been disposed in this area.

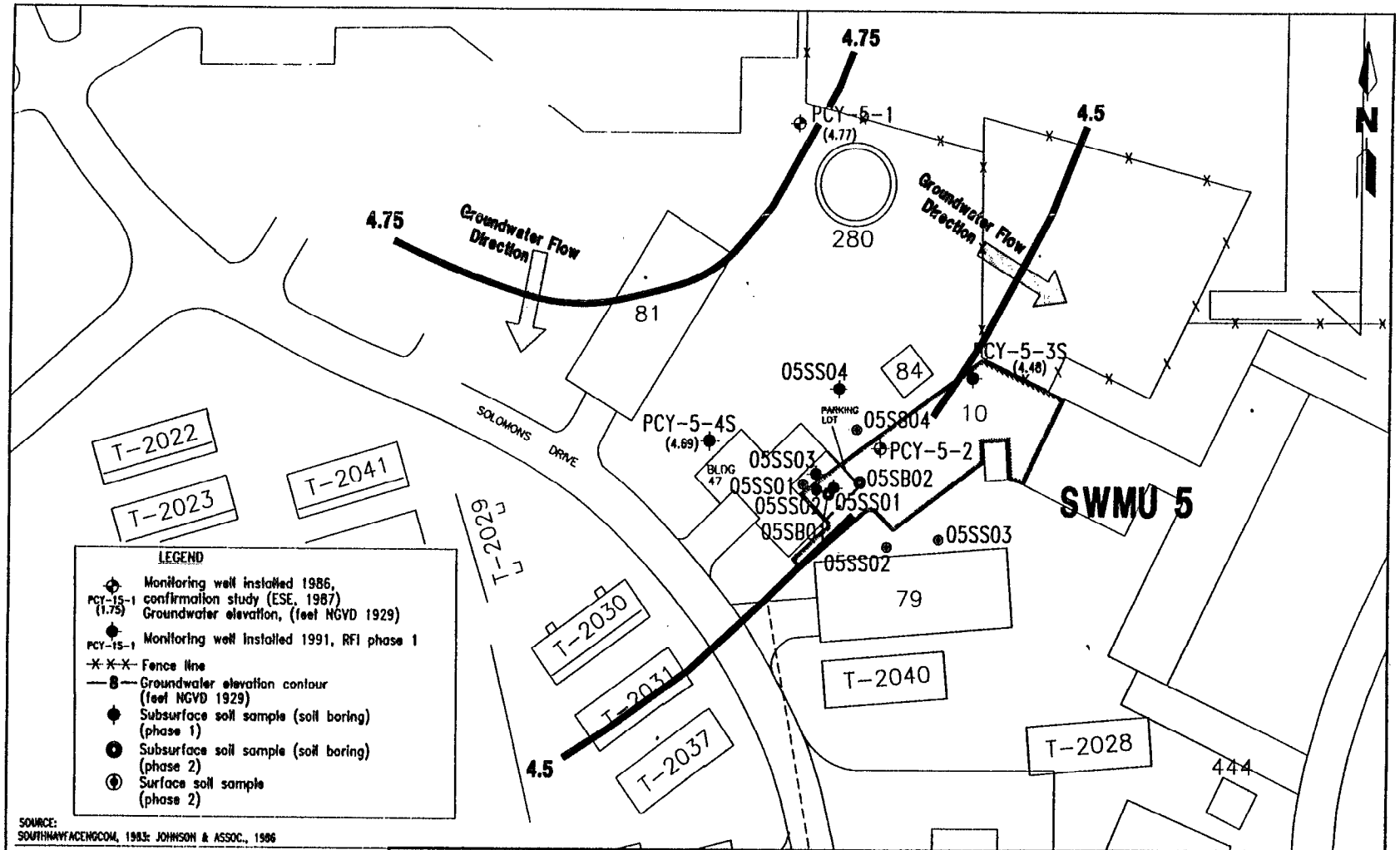


FIGURE 8-19
SWMU 5 SAMPLING LOCATIONS, MONITORING WELLS, AND GROUNDWATER ELEVATION CONTOURS
JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Nature and Distribution Summary for SWMU 5

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics:** Primary - fuel related SVOCs (PAHs) and phthalates. Others - chlorobenzene, trichloroethene, and acetone	phthalates, chlorobenzene, and trichloroethene	PAHs and acetone
	Inorganics: Inorganics detected above two times the maximum background concentrations: aluminum, arsenic, barium, calcium, iron, lead, magnesium, manganese, vanadium, and zinc	some or all analytes listed	
	Inorganics detected in site-related samples but not in background: antimony, beryllium, cadmium, chromium, cobalt, copper, cyanide, nickel, potassium, selenium, silver, sodium, and thallium		
	Inorganics detected above regional background concentrations: antimony, barium, calcium, magnesium, nickel, and zinc		
Subsurface Soil	**Organics:** acetone, toluene (phase 1 samples only), BEHP, and di-n-octylphthalate	toluene	acetone, BEHP, and di-n-octylphthalate
See notes at end of table			

Nature and Distribution Summary for SWMU 5

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
	Inorganics: Inorganics detected above two times the maximum background concentrations: barium, calcium, iron, lead, and zinc Inorganics detected in site-related samples but not in background: arsenic, cadmium, copper, nickel, and sodium Inorganics detected above regional background concentrations: zinc	some or all listed analytes	
Groundwater	**Organics**: none (detection of 2-butanone from phase 1 sample PCY-05-02 was not confirmed) **Inorganics**: Inorganics detected above two times the maximum background concentrations: manganese (filtered data is not available for SWMU 5 groundwater samples) Inorganics detected in site-related samples but not in background: none	none	none manganese

Notes: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
SVOCs = semivolatile organic compounds
PAHs = polynuclear aromatic hydrocarbons
bis(2-ethylhexyl)phthalate

Summary of Human Health Risk Assessment at SWMU 5

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - adult and child transient for ingestion, dermal, and inhalation	none	none
	Future Land Use - adult and child transient for ingestion, dermal, and inhalation	cadmium, chromium, barium, antimony, and arsenic	some or all of analytes listed
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use -adult and child transient for ingestion, dermal, and inhalation	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use - adult resident for ingestion and inhalation	manganese	none

Note: SWMU = solid wast management unit
RCRA = Resource Conservation and Recovery Act
NE = not evaluated

Summary of Ecological Risk Assessment at SWMU 5

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Wildlife** - NE	--	--
Groundwater	**Aquatic Receptors** - dermal contact with surface water	none	none

Note: SWMU = solid wast management unit
RCRA = Resource Conservation and Recovery Act
NE = not evaluated

CONCLUSIONS AND RECOMMENDATIONS

Surface Soil - Removal action (human health risk associated with cadmium, chromium, barium, antimony, and arsenic).

Subsurface soil - no action (no risks identified).

Groundwater - no action (human health risk associated with manganese - no apparent source of manganese at this location - filtered data is not available).

SWMU 8, CLASSIFIED DOCUMENTS INCINERATOR.

Site Location. The original Classified Documents Incinerator (SWMU 8) is reported to have been located behind Building 110 on Solomon Drive and adjacent to the building where the current Classified Documents Incinerator is located. This area lies in the south central part of CSS Panama City and is bounded by buildings on three sides and a parking area on the fourth.

Site Description. It is reported that the original Classified Documents Incinerator was located on a raised concrete pad behind Building 110. The unit had a 300-pound capacity, and was replaced in 1987 with the current 1,000-pound unit.

Site History. The original Classified Documents Incinerator was a natural gas-fired, solid waste incinerator used exclusively for the destruction of classified materials. The original unit was operated twice per week with an approximate burn time of 8 hours. The current unit has increased capacity, so incineration take place only once per week.

Materials incinerated at SWMU 8 are primarily paper documents, but it is reported that some photographs and photograph negatives were also incinerated. Ash from the incinerator is disposed off site by the CSS Panama City solid waste contractor.

FINDINGS

The RI field investigation consisted of the collection of one composite ash sample from the existing classified document incinerator. The sample was analyzed for Toxicity Characteristics Leaching Procedure (TCLP) metals.

The only analyte detected above the CRDL was barium (0.18) mg/l). Barium at the reported concentration is well below the concentration that may contribute to leaching of this element into the groundwater.

CONCLUSION AND RECOMMENDATIONS

Based on the results of the ash sample, SWMU 8 is recommended for no further action.

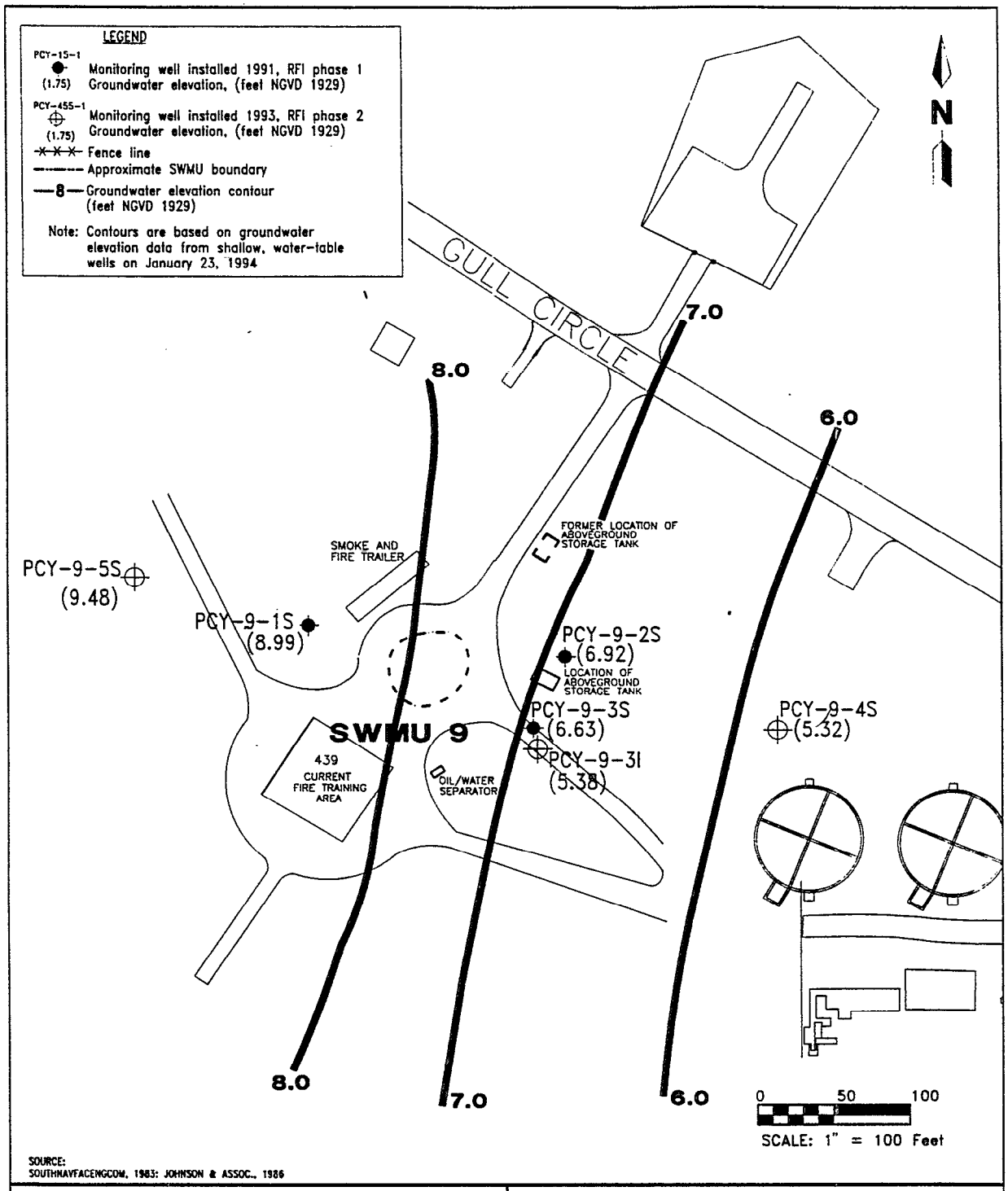
SWMU 9, FIRE-FIGHTING TRAINING AREA NO. 2.

Site Location. SWMU 9 is located southwest of Gull Circle near Building 61 in the central part of CSS Panama City. This SWMU is bordered by an open field on the west, a wooded area on the south, the wastewater treatment facility on the east, and Gull Circle on the north.

Site Description. SWMU 9 is a circular earthen area with an approximate diameter of 20 to 30 feet. The current concrete fire-fighting training pad is located adjacent to the old area on the southern side. An aboveground storage tank and a mobile trailer are also present at the site, both of which were used to support fire-fighting training exercises.

Site History. SWMU 9 was used for fire-fighting training exercises starting in approximately 1980. Exercises consisted of pouring and igniting fuel on the ground in the circular area described above. A 4,500-gallon aboveground storage tank was used to store the fuel used for the training exercises, and a mobile trailer was used for smoke training. Fuels used during training exercises have reportedly included JP-5 aviation fuel, diesel fuel, and gasoline. CSS Panama City personnel reported that it is possible that flammable waste solvents may also have been used as fuel during the exercises. Approximately 100 to 500 gallons of fuel were used for each of the 18 to 20 fire-fighting training exercises conducted each year, and from this information it is estimated that up to 50,000 gallons of fuel were ignited for fire-fighting training exercises.

Firefighter training exercises were reportedly suspended at SWMU 9 in 1985 until the current concrete-lined pad was constructed. However, although the old firefighter training pit was observed to be vegetated during a site visit in 1992, during RFI activities in 1993 the circle was black with ash and soot and devoid of vegetation, suggesting that the site had been used for fire-fighting training.



SOURCE:
SOUTHNAVFACENGCOM, 1983; JOHNSON & ASSOC., 1986

FIGURE 8-20
SWMU 9 MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATION CONTOURS JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

SWMU9/CLC -NP/01-25-95

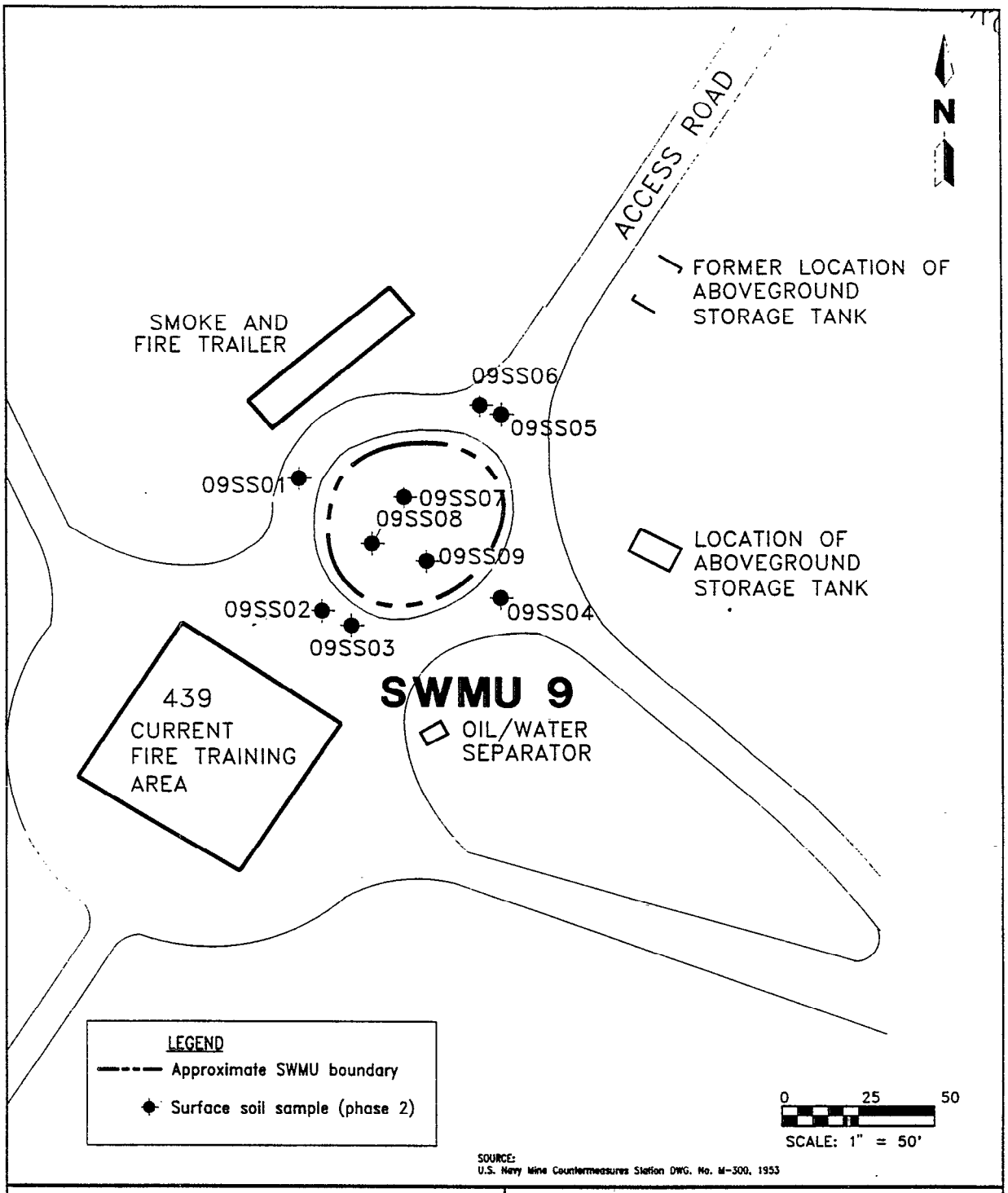
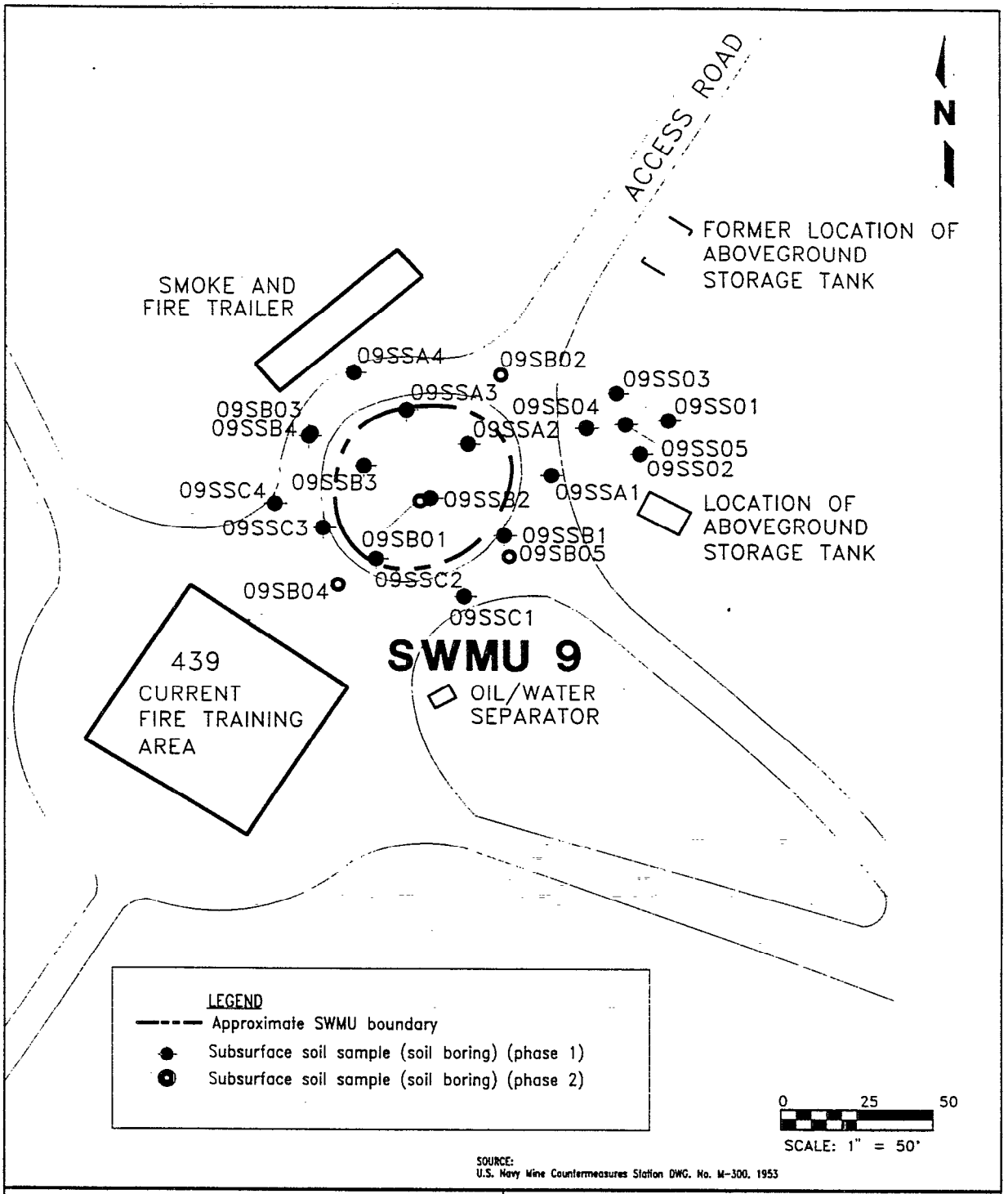


FIGURE 8-21
SWMU 9, SURFACE SOIL SAMPLE LOCATIONS

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

PANAMA/SWMU9SSS/WDW/GLC/NP/01-25-95



SOURCE:
U.S. Navy Mine Countermeasures Station DWG. No. M-300, 1953

FIGURE 8-22
SWMU 9, SUBSURFACE SOIL SAMPLE (SOIL BORING) LOCATIONS

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

PANAMA/SWMU9SSS/WDW-GLC/9-23-94

Nature and Distribution Summary for SWMU 9

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics:** PAHs, toluene, carbon disulfide, phthalates, and dieldrin	PAHs, toluene, carbon disulfide, and dieldrin	phthalates
	Inorganics: Inorganics detected above the maximum background concentrations: aluminum, arsenic, barium, calcium, iron, lead, magnesium,manganese, vanadium, and zinc	some or all listed analytes	
	Inorganics detected in site-related samples but not in background: antimony, beryllium, cadmium, chromium, cobalt, copper, nickel, selenium, silver, and sodium		
	Inorganics detected above regional background concentrations: antimony		
Subsurface Soil	**Organics:** Primary - fuel related VOCs and SVOCs (PAHs), and acetone	some or all listed analytes	
	Inorganics: Inorganics detected above the maximum background concentrations: barium, calcium, lead, magnesium, manganese, and zinc	some or all listed analytes	
	Inorganics detected in site-related samples but not in background: antimony, arsenic, beryllium, copper, cyanide, nickel, selenium, and sodium		
	Inorganics detected above regional background concentrations: antimony		

See notes at end of table.

Nature and Distribution Summary for SWMU 9

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Groundwater	**Organics**: methylene chloride, toluene, xylene, naphthalene,, and diethylphthalate	methylene chloride, toluene, xylene, naphthalene	diethylphthalate
	Inorganics (unfiltered): Inorganics detected above the maximum background concentrations in unfiltered samples: Potassium		some or all listed analytes
	Inorganics detected in unfiltered site-related samples but not in the unfiltered background samples: thallium		
	Inorganics (filtered): Inorganics detected above the maximum background concentrations in filtered samples: calcium, copper, iron, manganese, potassium, vanadium and zinc (highest concentration of zinc was found in upgradient monitoring well)		
	Inorganics detected in filtered site-related samples but not in the filtered background samples: thallium (upgradient monitoring well only)		

Notes: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
PAHs = polynuclear aromatic hydrocarbons
VOCs = volatile organic compounds
SVOCs = semivolatile organic compounds

Summary of Human Health Risk Assessment at SWMU 9

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - adult and child transient and adult worker for ingestion, dermal contact, and fugitive dust inhalation	none	none
	Future Land Use - adult and child resident for ingestion, dermal contact and fugitive dust inhalation	antimony, and arsenic	antimony and arsenic
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use - adult excavation worker for ingestion, dermal contact and fugitive dust inhalation	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use - adult resident for ingestion and inhalation while showering	thallium	none

Note: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act
NE = not evaluated

Summary of Ecological Risk Assessment at SWMU 9

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Wildlife** - ingestion of soils and contaminated food	none	none
	Terrestrial Invertebrates - direct contact with and ingestion of soils	none	none
	Terrestrial Plants - direct contact with surface soil	copper, antimony, vanadium, chromium, and zinc	some or all analytes listed
Groundwater	**Aquatic Receptors** - dermal contact with surface soil	none assuming 20 X dilution	none

Note: SWMU = solid waste management unit
RCRA = Resource Conservation and Recovery Act

CONCLUSIONS AND RECOMMENDATIONS

Free Product - conduct a free product investigation (concentration of PAHs in subsurface soil suggests the presence of free product on the surface of the water table directly under the fire-fighting training area).

Surface Soil - CMS

Subsurface Soil - although no risk were identified for subsurface soil, CMS to remove potential source are soil is recommended if free product is found and or if it is determined that the deeper groundwater at SWMU 9 is contaminated (see groundwater discussion below).

Groundwater - concentration of PAHs in subsurface soil indicates that groundwater at SWMU 9 should be contaminated. Confirmation of the steep downward vertical gradient observed in downgradient monitoring wells at this SWMU is recommended. If confirmed, samples of deeper groundwater should be collected to confirm the absence of groundwater contamination. A steep vertical gradient at this SWMU may cause contamination to move rapidly to deeper water and not show up in more shallow downgradient monitoring wells.

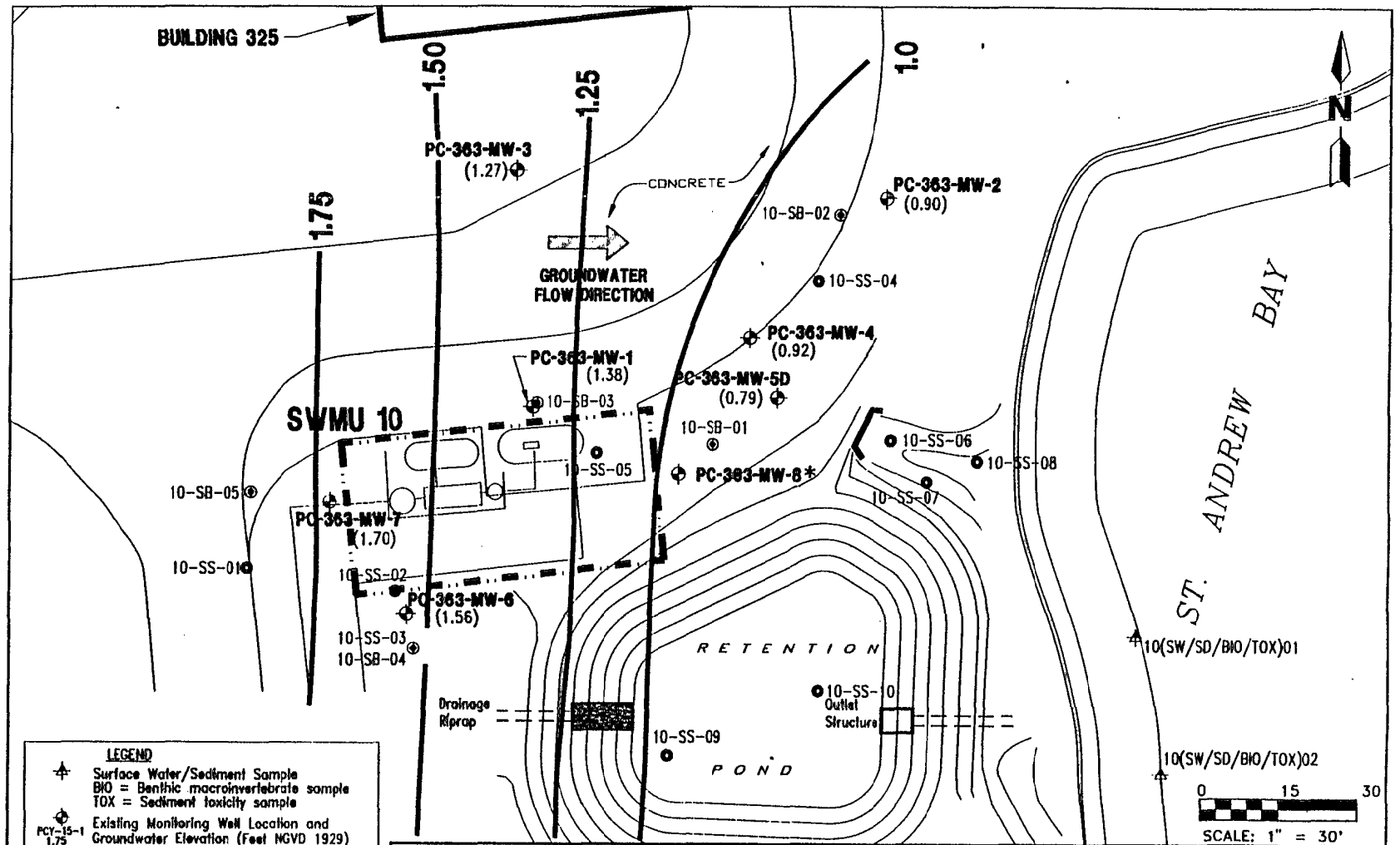
SWMU 10, BUILDING 363, OIL-WATER SEPARATOR.

Site Location. SWMU 10 is an oil-water separator (OWS) system located along the eastern boundary of CSS Panama City, approximately 120 feet directly south of the JP-5 subsurface storage facility (Building 325) and approximately 120 feet from St. Andrew Bay. It is also identified as Building 363.

Site Description. The OWS system, in operation since 1968, consists of a 6,000-gallon underground waste oil tank, a 10,000-gallon fiberglass reinforced plastic (FRP) oily waste holding tank, the OWS, pumps, controls, and associated piping. In part, the OWS is used to treat bilge water that is offloaded from naval vessels. The area adjacent to the OWS system is a retention pond (approximately 15 feet southeast of the OWS system).

Site History. SWMU 10 was investigated as part of the RFA (E.C. Jordan, 1987). The RFA recommended no action at the site because no evidence of a release of contaminants to groundwater, surface water, air, or soil was documented at that time. Two releases of oil and bilge water from the OWS were reported by CSS Panama City personnel in 1992. Furthermore, information obtained by the FDEP during a hazardous waste compliance inspection suggested that waste chlorinated solvents had been disposed in the OWS. Sampling performed at the OWS during a Contamination Assessment in 1992 confirmed the presence of chlorinated solvents in soil and groundwater.

The first release of oil and bilge water from the OWS occurred in February 1992. It was noted that a petroleum-like discharge was rising to the ground surface above the 10,000-gallon FRP tank. CSS Panama City personnel removed approximately two 55-gallon drums of soil from the area of the release. The cause of this release was never determined. Visual inspection of the pipes at this time did not indicate leakage. A second release of oil and bilge water occurred in March 1992 when valves were inadvertently left in incorrect positions and stormwater was diverted into the 10,000-gallon holding tank. The manway at the top of the tank was not fastened securely and stormwater and bilge water that was already in the tank was released into the ground and onto the ground surface. Some of the release was retained by the retention pond; however, an estimated 600 gallons of stormwater and bilge water were discharged to St. Andrew Bay from a stormwater outfall located in a low lying area approximately 20 feet from the bay, and 15 feet to the north of the retention pond. CSS Panama City personnel removed approximately 20 cubic yards of soil from the retention pond for offsite disposal.



SITE363/GLC/1-25-95

FIGURE 8-24
SWMU 10 SAMPLING LOCATIONS, MONITORING WELLS, AND GROUNDWATER ELEVATION CONTOURS, JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Nature and Distribution Summary for SWMU 10

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics**: Primary - PAHs. Other - 2-butanone, carbon disulfide, methylene chloride, acetone, phthaltes, and pesticides **Inorganics**: Inorganics detected above two times the maximum background concentrations: aluminum, barium, calcium, iron, lead, and magnesium Inorganics detected in site-related samples but not in background: arsenic, beryllium, chromium, copper, cyanide, manganese, mercury, nickel, selenium, vanadium, and zinc Inorganics detected above regional background concentrations: barium, beryllium, calcium, cobalt, iron, magnesium, nickel, sodium, and zinc	PAHs	2-butanone, carbon disulfide, and methylene chloride, phthalates, and pesticides some or all analytes listed
Subsurface Soil	**Organics**: Primary - VOCs (chlorinated solvents and fuel-related compounds) and SVOCs (PAHs). Other - 2,6-dinitrotoluene, carbon disulfide, phthalates, and pesticides **Inorganics**: Inorganics detected above two times the maximum background concentrations: barium, calcium, chromium, iron, lead, magnesium, manganese, potassium, vanadium, and zinc Inorganics detected in site-related samples but not in background: arsenic, beryllium, copper, cyanide, nickel, selenium, silver, and sodium Inorganics detected above regional background concentrations: magnesium	VOCs, SVOCs, 2,6-dinitrotoluene,	carbon disulfide, phthalates, and pesticides some or all listed analytes

See notes at end of table.

Nature and Distribution Summary for SWMU 10

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Groundwater	**Organics**: VOCs (chlorinated solvents and fuel-related compounds), and fuel-related SVOCs (phenols and PAHs) **Inorganics (filtered)**: Inorganics detected above the maximum background concentrations: beryllium, chromium, magnesium, sodium, and zinc (low frequency of detection - one detection in five for each analyte and samples from MWs 10GW01 and 10GW04 did not exceed background for any inorganics) Inorganics detected in site-related samples but not in background: antimony **Inorganics (unfiltered)**: Inorganics detected in filtered samples above the maximum filtered background concentrations: calcium, iron, magnesium, manganese, sodium, and zinc Inorganics detected in site-related filtered samples but not in background filtered samples:antimony and thallium	VOCs, SVOCs,	some or all analytes listed
Surface Water	**Organics**: n-nitrosodiphenylamine **Inorganics**: Inorganics detected above the maximum background concentration: none Inorganics detected in site-related samples but not in background: beryllium, cadmium, and nickel		n-nitrosodiphenylamine (not detected in associated duplicate sample and not in any other media) some or all analytes listed

See notes at end of table.

Nature and Distribution Summary for SWMU 10

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Sediment	**Organics**: Primary - fuel-related SVOCs (PAHs). Others - BEHP and pesticides **Inorganics**: Inorganics detected above the maximum background concentrations: lead Inorganics detected in site-related samples, but not in background: vanadium	PAHs	PAHs, BEHP, and pesticides both lead and vanadium

Notes: SWMU = solid waste manatgementunit.
RCRA = Resource Conservation and Recovery Act.
PAHs = polynuclear aromatic hydrocarbons
SVOCs = semivolitile organic compounds
VOCs = volitile organic compounds
BEHP = bis 2-ehtyl hexyl phthalate

?

Summary of Human Health Risk Assessment at SWMU 10

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - adult and child transient for ingestion, dermal contact, and fugitive dust inhalation	none	none
	Future Land Use - adult and child resident for ingestion, dermal contact, and fugitive dust inhalation	none	none
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use - adult resident for ingestion and inhalation while showering	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use - adult and child resident for ingestion and dermal contact	antimony, beryllium, chromium, vanadium, 1,1-dichloroethane, and 1,1,1-trichloroethane	none
Surface Water	**Current Land Use** - NE	--	--
	Future Land Use - adult and child resident for ingestion and dermal contact	none	none
Sediment	**Current Land Use** - NE	--	
	Future Land Use - adult and child resident for ingestion and dermal contact	none	none

Note: SWMU = solid waste management unit
RCRA = resource conservation and recovery act
NE = not evaluated

Summary of Ecological Risk Assessment at SWMU 10

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Wildlife** - ingestion of soils and contaminated food	none	none
	Terrestrial Invertebrates - direct contact with and ingestion of surface soil	none[1]	none
	Terrestrial Plants - direct contact with surface soil	vanadium, and zinc	none
Groundwater	**Aquatic Receptors** - dermal contact with surface water	none assuming 50 X dilution	none
Surface Water	**Aquatic Receptors** - dermal contact with surface water	nickel and beryllium	none
	Terrestrial Wildlife - ingestion of surface water and contaminated food		
Sediment	**Aquatic Receptors** - dermal contact with sediment	none	none
	Terrestrial Wildlife - indirect ingestion of sediment and contaminated food	none	none

[1]As compared to the literature reported invertebrate toxicity values

Note: SWMU = solid waste management unit
RCRA = resource conservation and recovery act
NE = not evaluated

CONCLUSIONS AND RECOMMENDATION

Free Product - CMS.

Surface Soil - no action (ecological risks associated with vanadium and zinc - samples with elevated levels of these analytes were detected father away from contaminated area).

Subsurface Soil - (no risks identified).

Groundwater - no action (human health risks associated with thallium - samples with elevated levels of inorganics did not detect organics).

Surface Water - no action (risks identified for aquatic receptors - contaminates not detected in surface soil, subsurface soil, and groundwater at SWMU 10).

Sediment - no action (risks identified for aquatic receptors - contaminates not detected in surface soil, subsurface soil, and groundwater at SWMU 10).

AOC 1, FIRE-FIGHTING TRAINING AREA NO. 1.

Site Location. AOC 1 is located immediately to the west of Buildings 290 and 399 in a fenced and paved area used for open storage. The IAS diagramed the location of the fire-fighting training area to be approximately 140 feet west of Building 100. Based on a site visit interview, later sources map it as an 80-foot square, located 10 feet west of the south wall of Building 399 and abutting the present fence line. Historical aerial photographs and RFI Phase 2 field program sampling suggest that the source area (the fire-fighting training area) is actually located farther north, to the west of the northern wall of Building 399 but still within the fenced area.

Site Description. AOC 1 is currently a fenced and paved open storage area. It is bordered by parking to the west and south, by CSS Panama City's shipping and receiving facilities to the east, and by woodland and SWMU 9 to the north. St. Andrew Bay is visible across Solomon Drive approximately 700 feet away.

Site History. Fire-fighting training occurred at AOC 1 approximately once per month in an unlined pit approximately 500 square feet in size. The firefighter training area was operational from the mid 1950's until the late 1970's, when the new facility on Gull Circle (SWMU 9) was constructed. The AOC was graded and paved in 1978. Materials reported to be used for the fire-fighting exercises included waste oils (possibly containing PCBs), fuels (diesel, gasoline, and JP-5), paint, paint thinners, and bilge water. These materials were spilled onto the ground and ignited. It is reported that approximately 8 to 9, 55-gallon drums of wastes were burned during each training exercise, and approximately 45 to 50 drums were burned each year. An estimated 2,000 to 6,000 gallons per year of waste materials were spilled onto the ground and ignited.

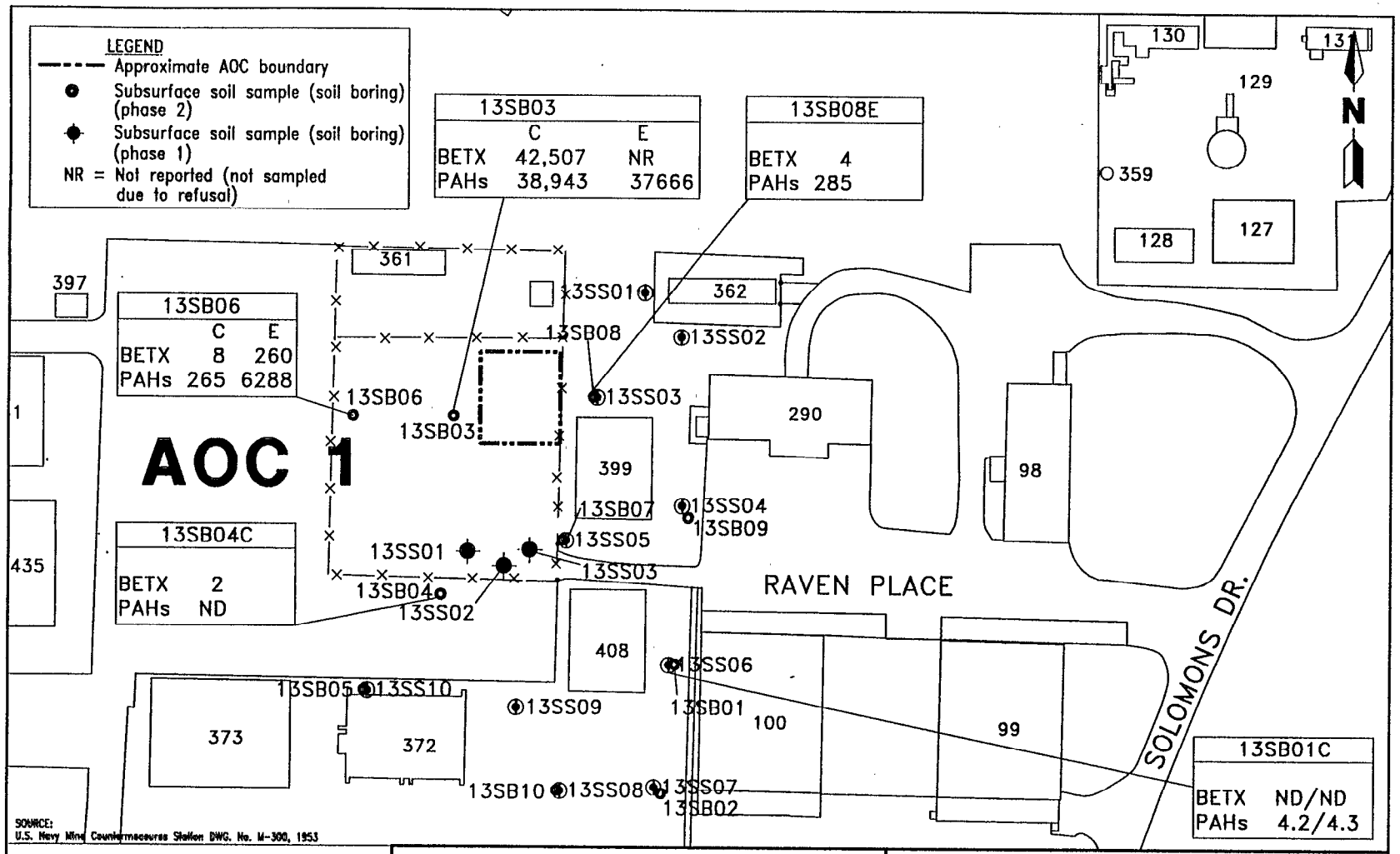
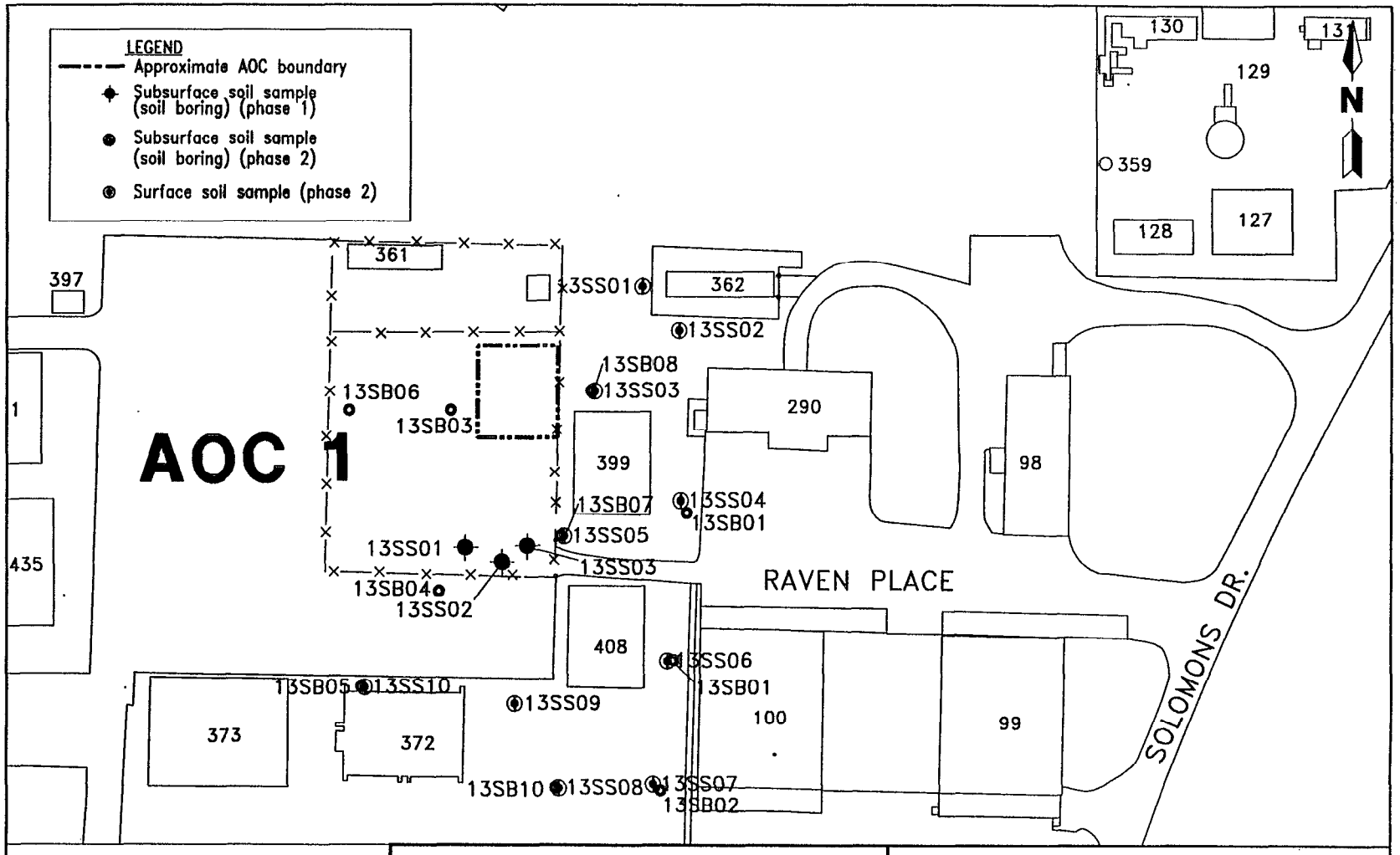


FIGURE 8-27
AOC 1 BETX AND TOTAL PAH CONCENTRATIONS IN SUBSURFACE SOIL

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



0 100 200

SCALE: 1" = 200'

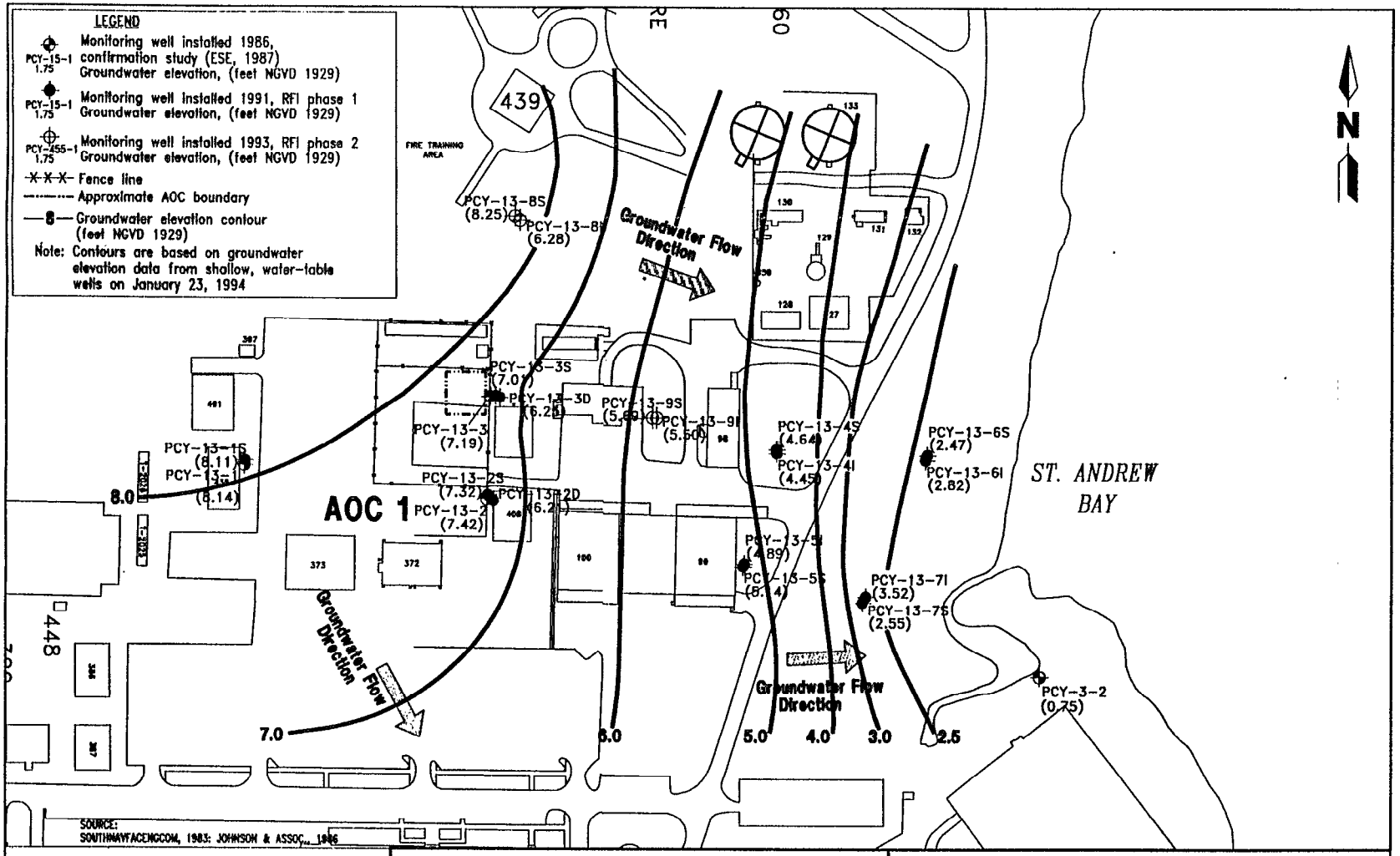
SOURCE:
U.S. Navy Mine Countermeasures Station DWG. No. M-300, 1953

H:/PANAMA/AOC1NEW/GLC/WDW/12-21-94

FIGURE 8-26
LOCATION OF SURFACE SOIL AND SUBSURFACE SOIL (SOIL BORINGS) COLLECTED DURING RCRA FACILITY INVESTIGATION

PERFORMANCE CRITERIA PACKAGE, FREE PRODUCT REMOVAL AOC 1, FIRE-FIGHTING TRAINING AREA NO.1

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



0 100 200
SCALE: 1" = 200 Feet

AOC1/9LC/12-21-94

FIGURE 8-25
AREA OF CONCERN (AOC) NO. 1, MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATION CONTOURS JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION PANAMA CITY, FLORIDA

Nature and Distribution Summary for AOC 1

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics:** Primary - fuel-related SVOCs (PAHs). Others - acetone **Inorganics:** Inorganics detected above the maximum background concentrations: aluminum, arsenic, calcium, iron, manganese,mercury, vanadium, and zinc Inorganics detected in site-related samples but not in background: beryllium, cadmium, chromium, cobalt, nickel, silver, and sodium Inorganics detected above regional background concentrations: none	PAHs	acetone some or all of the analytes listed
Subsurface Soil	**Organics:** Primary - fuel-related VOCs and SVOCs (PAHs) and chlorinated solvents. Others - 2-butanone, chloroform, di-n-octylphthalate, and pesticides	VOCs, PAHs and chlorinated solvents	chloroform, di-n-octylphthalate, and pesticides
See notes at end of table			

Nature and Distribution Summary for AOC 1 RCRA Facility Investigation Coastal System Station Panama City Panama City, Florida			
Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Subsurface Soil	**Inorganics**: Inorganics detected above the maximum background concentrations: barium, lead, potassium, and zinc Inorganics detected in site-related samples but not in background: arsenic, beryllium, cadmium, cobalt, copper, nickel, and sodium Inorganics detected above regional background concentrations: zinc	some or all analytes listed	
Groundwater[1]	**Organics**: Primary - VOCs (benzene (below the SQL) ethylbenzene, toluene, and total xylene), SVOCs, chlorinated solvents, phenols, and PAHs. Others - acetone, methylene chloride, BEHP, and pesticides	VOCs, SVOCs, chlorinated solvents	acetone, methylene chloride, BEHP, and pesticides
See notes at end of table.			

Nature and Distribution Summary for AOC 1

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Groundwater	**Inorganics (unfiltered)** : Inorganics detected in unfiltered samples above the maximum unfiltered background concentration: arsenic, barium, chromium, iron, lead, magnesium, manganese, vanadium, zinc, and cyanide Inorganics detected in site-related samples but not in background: none **Inorganics (filtered)** : Inorganics detected in filtered samples above the maximum filtered background concentration: aluminum, barium,calcium, copper, iron, manganese, vanadium, and zinc Inorganics detected in filtered site-related samples, but not in filtered background samples: none	barium (detected at elevated levels in subsurface soil)	some or all other listed analytes

[1]Free product sample collected from monitoring well PCY-13-03 indicates that the free product in this well is most likey associated with the fire-fighting training exercises at AOC 1.

Notes: AOC = area of concern
RCRA = resource concervation and recovery act
SVOCs = semivolitile orgainic compounds
PAHs = polynuclear aromatic hydrocarbons
VOC = volitile organic compounds
SQL = sample quantitation limit

Summary of Human Health Risk Assessment at AOC 1

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - adult and child transient for ingestion,dermal contact, and fugitive dust inhalation	none	none
	Future Land Use - adult and child resident for ingestion, dermal contact, and fugitive dust inhalation	none	none
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use - adult excavation worker for ingestion, dermal contact, and fugitive dust inhalation	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use - adult resident ingestion and inhalation while showering	1,1-dichloroethene and trichloroethene	1,1-dichloroethene and trichloroethene

Notes: AOC 1 = area of concern
RCRA = resource concervation and recovery act
NE = not evaluated

Summary of Ecological Risk Assessment at AOC 1

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Receptors** - NE	--	--
Groundwater	**Aquatic Receptors** - dermal contact with surface water	No risk assuming 20 X dilution	

Note: AOC 1 = area of concern
RCRA = resource concervation and recovery act
NE = not evaluated

CONCLUSIONS AND RECOMMENDATIONS

Free Product - being investigated under separate program.

Surface Soil - no action (no risk identified).

Subsurface Soil - although no risk were identified for subsurface siol, may need to address as potential continuing source of contamination to groundwater.

Groundwater - CMS (human health risks associated with 1,1-dichloroethene and trichlorethene).

BUILDING 455, PAINT RINSING AREA.

Site Location. Building 455 is located on Gull Circle and is approximately 500 feet southeast of the burn area at SWMU 2. The site is bordered on the south and west by an open field, on the northwest and north by woods, and on the east by Gull Circle. SWMU 2 is located in the woods to the northwest.

Site Description. Building 455 is a small building used to store painting equipment and supplies. The building is positioned at the base of a T-shaped open-air concrete pad, on which stripping and painting operations are performed. The immediate vicinity around the pad is open, unvegetated or grassy sandy soil. During the RFI Phase 2 field program, a fabric-walled roofless enclosure in which sandblasting was performed was present at the northernmost corner of the pad. The purpose of the enclosure was apparently to reduce wind dispersion of the blasting agent. During a previous visit sandblasting was performed at the southern side of the concrete pad. Black sandblasting sand with paint chips is visible on the surface of the ground for a distance of more than 60 feet in all directions around the pad.

Site History. According to CSS Panama City personnel, this area was formerly known as Building 63. Building 63 was demolished in 1989 and Building 455 was built at the same location. Paint stripping activities were conducted at this location for at least 15 years (pre-1978 until June 1993). During a Hazardous Material Minimization Survey, conducted by the facility in 1993, it was discovered that rinse water from the chemical stripping operation contained a listed hazardous waste (methylene chloride) that may have been released onto the ground around Building 455. The facility notified FDEP of this potential release and discontinued paint stripping activities.

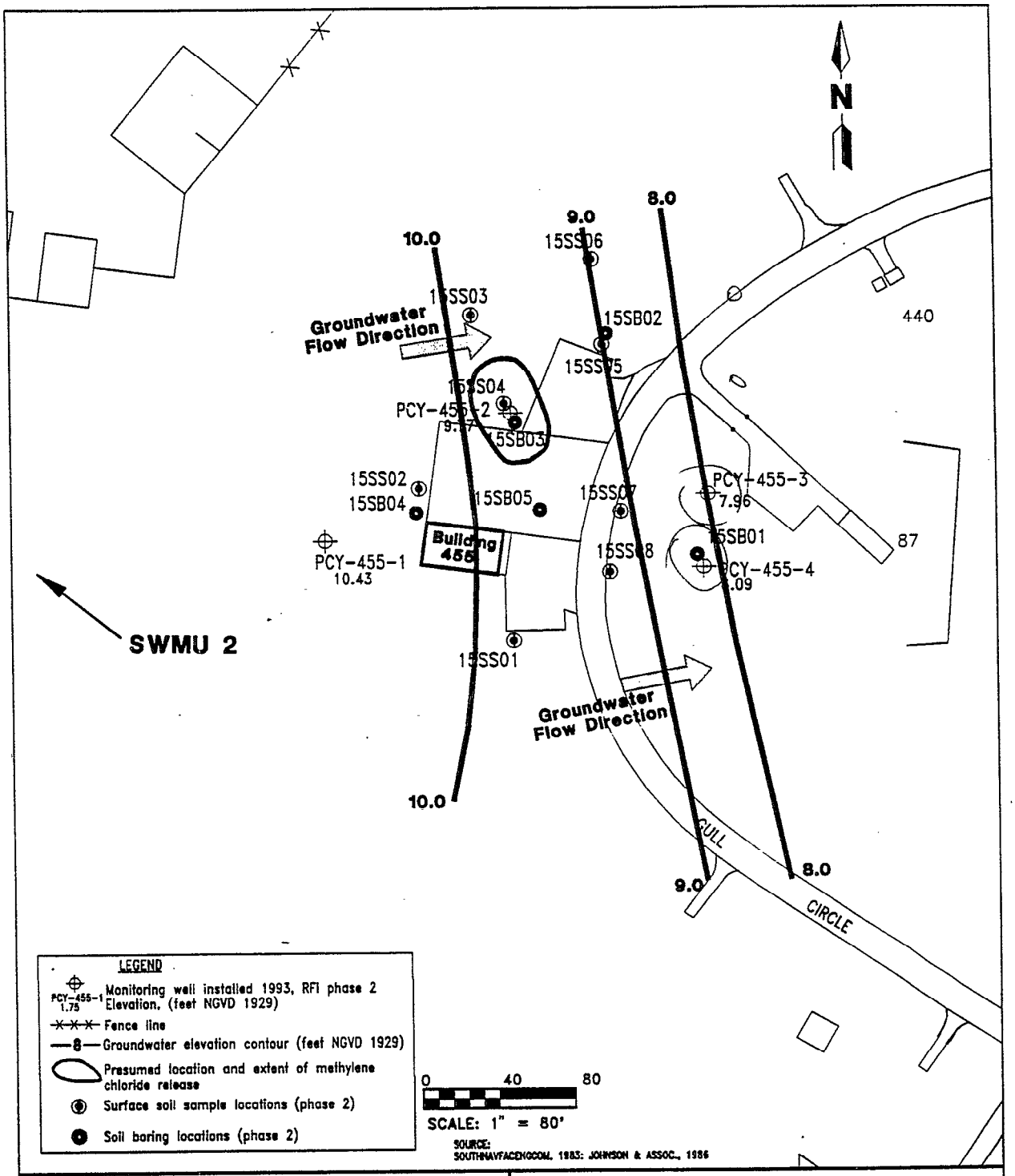


FIGURE 8-29
BUILDING 455 SAMPLE LOCATIONS, MONITORING WELL LOCATIONS, AND GROUNDWATER ELEVATION CONTOURS
JANUARY 23, 1994

RCRA FACILITY INVESTIGATION REPORT

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Nature and Distribution Summary for Building 455

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Surface Soil	**Organics:** Primary - fuel-related SVOCs (PAHs). Others - chlorobenzene, acetone, phthalates, pesticides, and PCBs **Inorganics:** Inorganics detected above the maximum background concentrations: aluminum, arsenic, barium, calcium, iron, lead, magnesium, manganese, mercury, vanadium, and zinc Inorganics detected in site-related samples but not in background: antimony, beryllium, cadmium, chromium, cobalt, copper, cyanide, nickel, potassium, selenium, silver, and sodium Inorganics detected above regional background concentrations: barium, beryllium, calcium, cobalt, iron, magnesium, nickel, sodium, and zinc	chlorobenzene (below SQL) and phthalates some or all of the analytes listed (probably due to sand blasting)	PAHs, acetone, pesticides, and PCBs
Subsurface Soil Correct this	**Organics:** PAHs, phthalates, and pesticides ~~**Inorganics (unfiltered):**~~ ~~Inorganics detected in unfiltered samples~~ above the maximum ~~unfiltered~~ background concentrations: chromium, lead, and mercury (low concentrations - only slightly above two time the maximum background concentrations) Inorganics detected in site-related samples but not in background: antimony, arsenic, beryllium, selenium, and sodium (low concentrations - only slightly above two times the maximum background concentrations) Inorganics detected above regional background concentrations: none	phthalates —	PAHs and pesticides some or all of listed analytes

See notes at end of table.

Nature and Distribution Summary for Building 455

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Analytes detected	Analytes Assumed to be Associated with Site Activities	Analytes Assumed not to be Associated with Site Activities
Groundwater	**Organics:** carbon disulfide (below the SQL) and benzol(b)fluoranthene (highest concentration in upgradient monitoring well) **Inorganics (unfiltered):** Inorganics detected above two times the maximum background concentrations: none Inorganics detected in site-related samples but not in background: thallium **Inorganics (filtered):** Inorganics detected above the maximum background concentrations: copper and zinc (only slightly above two times the maximum background concentrations) Inorganics detected in site-related samples but not in background:none		carbon disulfide and benzol(b)fluoranthene some or all of the analytes listed

Notes: RCRA = resource conservation and recovery act
SVOCs = semivolatile organic compounds
PAHs = polynuclear aromatic compounds
SQL = sample quantitation limits

Summary of Human Health Risk Assessment at Building 455

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Current Land Use** - child and adult transient and adult site worker for ingestion, dermal contact, and fugitive dust inhalation	none	none
	Future Land Use - adult and child resident for ingestion, dermal contact, and fugitive dust inhalation	beryllium, chromium, cadmium, barium, arsenic, antimony, and dieldrin	all analytes listed except for dieldrin (probably due to sand blasting activities)
Subsurface soil	**Current Land Use** - NE	--	--
	Future Land Use - adult excavation worker for ingestion, dermal contact, and fugitive dust inhalation	none	none
Groundwater	**Current Land Use** - NE	--	--
	Future Land Use - adult resident for ingestion and inhalation of volatiles while showering	chromium	none (probably adsorbed to soil particles in groundwater - not detected above two time the maximum background concentrations for filtered and unfiltered)

Note: RCRA = Resource Conservation and Recovery Act
NE = not evaluated

Summary of Ecological Risk Assessment at Building 455

RCRA Facility Investigation
Coastal System Station Panama City
Panama City, Florida

Medium	Risk Scenarios	Risk Drivers	Risk Drivers Assumed to be Associated With Site Activities
Surface Soil	**Terrestrial Receptors** - Wildlife for ingestion of soils and contaminated food	none	none
	- Invertebrates for direct contact with and ingestion of soils	none[1]	none
	- Plants for direct contact with surface soil	antimony, cadmium, chromium, copper,lead, vanadium, and zinc	none
Groundwater	**Aquatic Receptors** - dermal contact with surface water	none[2]	none

[1]As compared to the literature reported invertebrate toxicity values
[2]As compared to the literature reported aquatic toxicity values

Note: RCRA = Resource Conservation and Recovery Act

CONCLUSIONS AND RECOMMENDATIONS

Surface Soil - removal action (human health and ecological risks associated with inorganics)

Subsurface Soil - no action (no risks identified)

Groundwater - no action (human health risks associated with chromium - most likely adsorbed to soil particles)

RISK ASSESSMENT MEMORANDUMS

ABB

April 8, 1994

Mr. David Clowes
Federal Facilities Coordinator
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Clowes,

The purpose of this letter is to present the human health and environmental assessment (HEA) exposure scenarios that will be used to characterize risk at the Coastal System Station (CSS) Panama City for the Final Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report and to present the data management process for the evaluation of each contaminated area at the facility. By presenting these issues, the Navy would like to reach a consensus with the U.S. Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (FDEP) on the exposure scenarios and data management process prior to development of the RFI report.

Based on comments received from EPA and FDEP on the HEA completed for the Phase 1 draft RFI and discussions held with EPA and FDEP, the Final RFI HEA will follow Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance. Therefore, terminology used in this correspondence reflect CERCLA guidance. The human health and ecological exposure pathways for the Phase Final RFI report are presented in Attachment A.

The Navy is also proposing, in this memorandum, a strategy for evaluating the RFI Phase 1 and Phase 2 analytical data for surface and subsurface soils, groundwater, surface water, and sediment. It is imperative that a consensus be reached by all parties prior to initiation of report writing. The primary data management issue is how to effectively utilize the Phase 1 data that was analyzed using SW-846 methods (USEPA, 1986) and the Phase 2 data that was analyzed using CLP methodologies (USEPA, 1991). The variation in analytical methods poses difficulties in broadly combing the two data sets in the Final RFI report. Media-specific approaches to most appropriately utilize the available Phase 1 and Phase 2 data are discussed in Attachment B.

A consensus on these issues should be reached as soon as possible. A telephone conference call between the Navy, EPA, and FDEP is currently scheduled for April 22, 1994 at 3:00 pm. If you have a conflict with this date or have any questions regarding this issue, please feel free to call me at (703) 769-8166.

Sincerely,

Tracey Kauffman
Associate Project Manager

cc: Wayne Hansel

ABB Environmental Services Inc.

2120 Washington Boulevard, Suite 300 Tel. (703) 769-8181 Fax (703) 769-8182
Arlington, Virginia 22204

ABB

April 8, 1994

Mr. Peter Dao
U.S. Environmental Protection Agency
Waste Management Division
Federal Facilities Branch
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Dao,

The purpose of this letter is to present the human health and environmental assessment (HEA) exposure scenarios that will be used to characterize risk at the Coastal System Station (CSS) Panama City for the Final Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report and to present the data management process for the evaluation of each contaminated area at the facility. By presenting these issues, the Navy would like to reach a consensus with the U.S. Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (FDEP) on the exposure scenarios and data management process prior to development of the RFI report.

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Sincerely,

Tracey Kauffman
Associate Project Manager

cc: Wayne Hansel

ATTACHMENT A

ABB Environmental Services Inc.

2120 Washington Boulevard, Suite 300 Tel. (703) 769-8181 Fax (703) 769-8182
Arlington, Virginia 22204

ATTACHMENT A

HUMAN HEALTH AND ENVIRONMENTAL EXPOSURE SCENARIOS

Seven Solid Waste Management Units (SWMUs) and two Areas of concern (AOCs) (SWMU 1/AOC 2, SWMU 2, SWMU 3, SWMU 4, SWMU 5, SWMU 8, SWMU 9, and AOC 1) (Figure 1) were investigated as part of the Phase 1 RFI field program. The results of the RFI Phase 1 investigation resulted in a recommendation of No Further Action (NFA) at SWMUs 4 and 8. The regulatory agencies agreed with the NFA recommendation for SWMU 8. However, they requested that additional surface water and sediment samples be collected and analyzed at SWMU 4 to more accurately define site conditions. The RFI Phase 2 field program investigated the remaining seven SWMUs/AOCs plus two additional sites (SWMU 10 and Building 455) (Figure 1). The proposed HEA exposure scenarios for the risk assessment component of the Final RFI report for CSS Panama City are based on information gathered by ABB-ES during 1993/1994 site visits and recent communication with the regulatory agencies. All pathways proposed for evaluation (e.g., surface soil at SWMU 3) are subject to confirmation of site-related contamination in the contact media and migration potential.

Human Health Exposure Scenarios: The rationale used to select the proposed human health exposure scenarios for current land use is based on: (1) current activity on site, (2) proximity of the site to current housing or recreational facilities, (3) physical attractiveness of the site, (4) media available for contact at the site, (5) evidence of human presence on the site (i.e., trash, footprints), (6) accessibility of the site, and 7) distance between the site and St. Andrew Bay or Alligator Bayou. Media available for contact at CSS Panama City under current land use conditions are surface soils, surface water, and sediments. Groundwater is not currently used for potable water in the CSS Panama City area.

The proposed exposure scenarios for future land use are generally directed by USEPA guidance and may include a future resident or future construction utility worker. The selection of a future land use exposure scenario is dependent on 1) the physical location of each site, and (2) the likelihood of the alteration of current land use. Media available for contact at CSS Panama City under future land use are surface soils, subsurface soils, surface water, sediments, and groundwater. Future domestic use of groundwater at CSS Panama City is highly unlikely based on the potential for salt water intrusion. At the request of USEPA, the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident scenario as a conservative approach; however, inclusion of the evaluation of groundwater is not an acknowledgement that future potable use of groundwater is probable.

Table 1 identifies the proposed human health exposure scenarios on a SWMU by SWMU basis, which are further described in the following text. Table 2 identifies the complete exposure pathways (e.g., ingestion of soil) for each receptor-specific exposure scenario (e.g., resident). Table 2 also presents justification for the exclusion of the evaluation of any viable exposure pathways in the HEA.

Ecological Exposure Scenarios: The rationale used to select the proposed ecological exposure scenarios is based on the potential for ecological receptors to come in contact with contaminated media and is based on identifying (1) the contaminant source, (2) the environmental transport medium, (3) the point of receptor contact, and (4) the exposure route (e.g., ingestion of prey items that

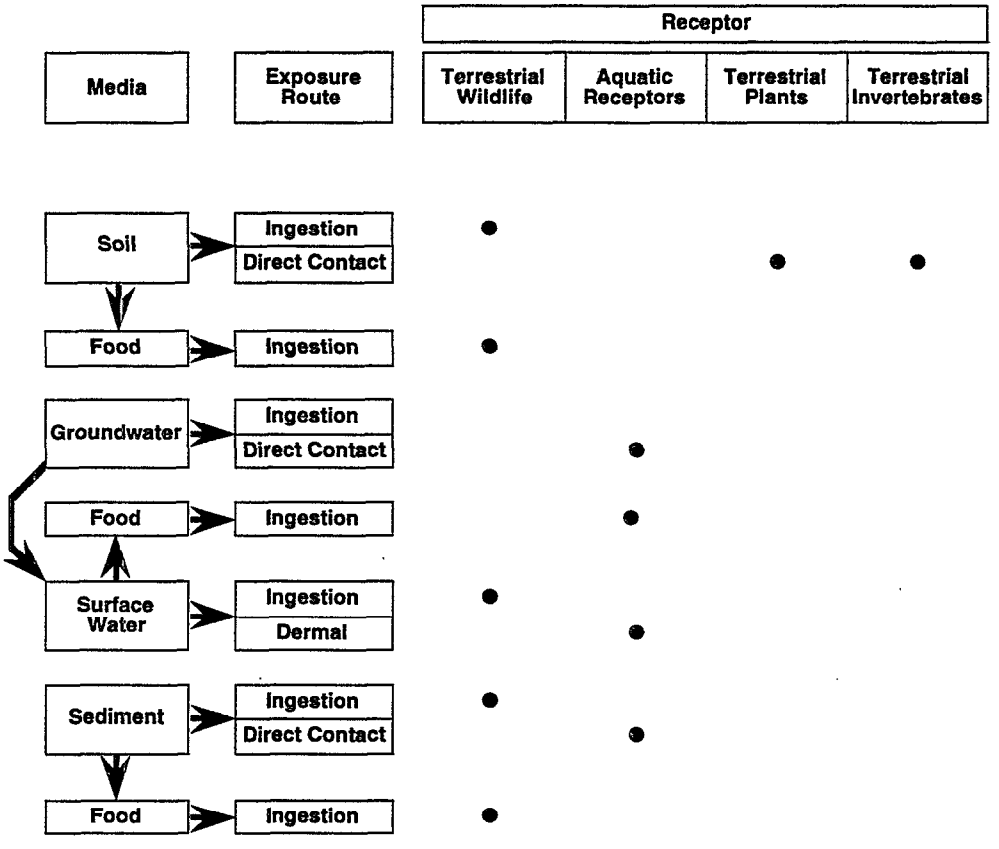

FIGURE 2

CONTAMINANT PATHWAY MODEL FOR ECOLOGICAL RECEPTORS

BASELINE RISK ASSESSMENT

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PANAMA CITY, FLORIDA

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Table 1
Exposure Scenarios Listed by SWMU/AOC[1]

RCRA Facilities Investigation
CSS Panama City, Panama City, Florida

SWMU	Exposure Scenarios					
	Current Land Use				Future Land Use	
	Worker (adult)	Site Trespasser (Surface Soils) (adult/child)	Site Trespasser (Surface Water/Sediment) (adult/child)	Scuba Diver (adult)	Construction/ Utility Worker (adult)	Future Resident (adult/child)
SWMU 1				X	X	
AOC 2		X[2]		X[3]	X	X
SWMU 2		X			X	X
SWMU 3		X	X		X	
SWMU 4			X			
SWMU 5		X			X	X
SWMU 9	X	X			X	X
SWMU 10		X	X		X	X
AOC 1		X			X	X
Building 455	X	X			X	X

Notes: AOC = Area of Concern
RCRA = Resource Conservation and Recovery Act
SWMU = Solid Waste Management Unit

[1] The contact media (i.e., surface soil) and the exposure pathways (i.e., ingestion of surface soil) that will be evaluated under each exposure scenario are detailed in Table 1.
[2] Adult site trespasser only.
[3] Because SWMU 1 and AOC 2 are being treated as a unit in the RFI report (SWMU 1 is downgradient of AOC 2), AOC 2 will be indirectly evaluated in Alligator Bayou during the scuba diver scenario.

Table 2
Complete Exposure Pathways Listed by Exposure Scenario[1]

RCRA Facilities Investigation
CSS Panama City, Panama City, Florida

Exposure Medium / Exposure Route	Exposure Scenarios				
	Current Land Use			Future Land Use	
	Worker (adult)	Site Trespasser (adult/child)	Scuba Diver (adult)	Construction/ Utility Worker (adult)	Future Resident (adult/child)
Soil[2]					
Incidental Ingestion	X	X		X	X
Dermal Contact[3]	X	X		X	X
Inhalation (particles from soil)[4]	(X)	(X)		(X)	(X)
Inhalation (volatiles from soil)[5]	(X)	(X)		(X)	(X)
Groundwater[6]					
Ingestion					X
Dermal Contact[7]					(X)
Inhalation (volatiles from groundwater)[8]					X
Surface Water[9]					
Incidental Ingestion		X	X		X
Dermal Contact[3]		X	X		X
Sediments					
Incidental Ingestion		X	X		
Dermal Contact[3]		X	X		

Notes: X = Exposure pathway will be evaluated in the HEA for the RFI
(X) = Exposure pathway will not be evaluated in the HEA for the RFI based on the footnoted explanation
AOC = Area of Concern
HEA = Health and Environmental Assessment
RCRA = Resource Conservation and Recovery Act
RFI = Resource Conservation and Recovery Act Facility Investigation
SWMU = Solid Waste Management Unit
USEPA = U.S. Environmental Protection Agency

[1] This table provides justification for the inclusion and exclusion of specific exposure pathways proposed for evaluation in the listed exposure scenarios. The exposure scenarios that are proposed for each specific SWMU and AOC are presented in Table 1 and in the text of Attachment A.
[2] All exposure scenarios will be evaluated using surface soils, with the exception of the construction/utility worker who will be evaluated using subsurface soil data.
[3] The intake of dermal contact with soils, sediment, and surface water will be based on dermal guidance (USEPA, 1992) for children to account for changing surface areas and body weights to estimate the mg (or ug) of contaminant passing the skin per exposure event. The approach for the adult exposures will follow the dermal guidance based on the surface area remain constant.
[4] Although the inhalation of windborne particulates derived from soil was considered for evaluation, the inhalation of particulates is not normally considered a primary route of exposure compared to ingestion and dermal exposures, so the inhalation of wind borne particulates will not be completed for the SWMUs in the HEA for the RFI.
[5] Although the inhalation of volatiles from soil was considered, it is not appropriate to evaluate potential exposure to volatile emissions based on concentrations of volatile compounds detected during the Phase 1 field program.
[6] Groundwater within a four mile radius of CSS Panama City is currently not considered potable and is not likely to be considered potable in the future because of the potential of saltwater intrusion.
[7] As per USEPA guidance (USEPA, 1993), dermal contact will not be evaluated for groundwater exposure.
[8] Inhalation of volatiles resulting from showering.
[9] A wading scenario will be completed for shallow surface water in St. Andrew Bay along the shoreline (2 feet or less in depth) and a scuba diving scenario in Alligator Bayou (6 feet or greater in depth). The wading scenario will only take into account partial body immersion. Total body immersion will be considered for the scuba diving scenario. The exposures for the resident will be considered interchangeable with the exposures that a trespasser might encounter. All surface water ingestion rates will be conservative values for the Southeastern United States.

have bioaccumulated chemicals in their tissues, drinking of contaminated surface water, incidental soil ingestion, and dermal absorption). Risks from potential discharge of contaminated groundwater to surface water will be evaluated using a simple model to calculate a dilution factor.

Potential ecological receptors include terrestrial wildlife, aquatic life, terrestrial plants, and terrestrial invertebrates. Terrestrial wildlife species include reptiles, amphibians, birds, and mammals. Potential aquatic receptors include invertebrates, plants, algae, amphibians, and fish.

Figure 2 presents the contamination pathway model that was used to develop the proposed ecological exposure pathways. Not all potential routes of exposure are presented in the model, which represents only those pathways that will be evaluated in the ecological assessment for the HEA. This limitation is necessary to focus the risk evaluation on those pathways for which contaminant exposures are the highest and most likely to occur.

Exposures related to inhalation and dermal absorption by terrestrial receptors will not be evaluated. Fur, feathers, or chitinous exoskeleton of terrestrial species limit the transfer of contamination across the dermis. Exposures related to inhalation are considered as an insignificant route of exposure, except in unusual circumstances, such as following a spill or release. Consumption of contaminated food items by aquatic receptors may not be evaluated because little information on the toxicity of contaminants to aquatic life via the ingestion route exists.

<u>SWMU 1/AOC 2 Landfill A, Original Disposal Area and Underground Oil Contaminated Area</u> SWMU 1 encompasses a total area of one acre along the northwestern edge of Alligator Bayou (Figure 3). This site was the original disposal area for the facility. AOC 2 consists of the area where a former aboveground 10,000-barrel petroleum storage tank was located and includes associated distribution and supply lines under the south dock. Both areas are almost entirely covered with concrete or asphalt and are in a heavily industrialized area. Because SWMU 1 is immediately downgradient of AOC 2, these two sites are being investigated as a single unit. Contact with the SWMU 1/AOC 2 is limited because access to the area is restricted to Navy personnel or civilian workers only. Children are not known to be present at the sites at any time. Surface soil, subsurface soil, groundwater, surface water, and sediment samples were collected during the Phase 2 field investigation. Additional sediment sample volume was collected for toxicity testing and macroinvertebrate identification. Samples collected and analyzed during the Phase 1 investigation included subsurface soil and groundwater samples.

Human Health Exposure Scenarios: Exposure for human receptors under current land use (i.e., heavy industrial) of SWMU 1 includes an adult scuba diver being exposed to surface water/sediments in Alligator Bayou. No other potentially contaminated media are currently available for exposure at SWMU 1 because extensive concrete is present over the soil and because groundwater is not used as a potable resource in the area. Site-specific exposure parameters will be obtained for the adult scuba diver from the Naval Diving and Salvage Training Center during April 1994. The Naval Diving and Salvage Training Center is adjacent to SWMU 1 and across Alligator Bayou.

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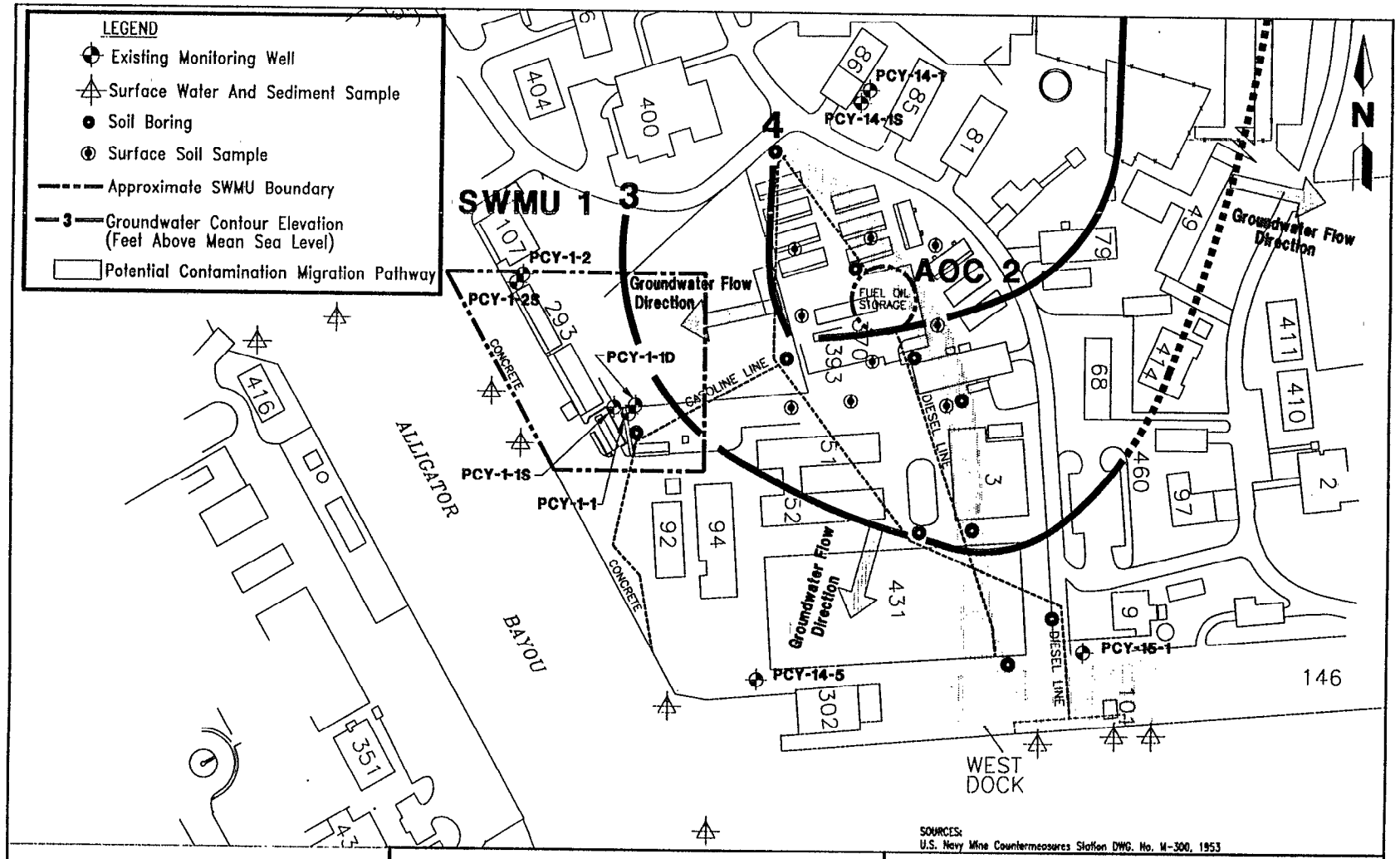

SOURCES:
U.S. Navy Mine Countermeasures Station DWG. No. M-300, 1953

0 125 250
SCALE: 1" = 250 Feet

SWMU1/NWP/2-7-94

FIGURE 3

AREA OF CONCERN (AOC) 2 AND SOLID WASTE MANAGEMENT UNIT NO. 1, UNDERGROUND OIL CONTAMINATED AREA AND LANDFILL A, ORIGINAL DISPOSAL AREA, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

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Future land use at SWMU 1 is not expected to change from heavy industrial use; however, under future land use, an adult construction/utility worker might be present at the SMWU during construction and/or maintenance activities on the dock. Such an individual would be expected to contact subsurface soils for 6 work weeks for a total of 30 days (8 hours per day) as a one-time event. A future residential scenario is not considered appropriate at SWMU 1 because of the acreage of land dedicated to industrial efforts at and in the area of SWMU 1.

At AOC 2, current land use (i.e., light industrial use) indicates that an adult trespasser scenario would be appropriate for evaluation of surface soil ingestion and dermal contact based on the location of research trailers at the AOC and CSS Panama City personnel being present in the vicinity of the AOC. Although the area is restricted, the restriction is not considered to prevent adult persons from being in contact with the site. A picnic table is present near AOC 2 between the trailers and CSS Panama City personnel may frequent the area for lunch or coffee breaks in fair weather.

Under future land use at AOC 2, an adult/child resident scenario and an adult construction/utility worker scenario would be considered appropriate if the current land use (light industrial) was shifted. The adult/child resident scenario is appropriate because of the attractive location of the AOC. Surface soil ingestion and dermal contact as well as the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident. The adult construction/utility worker scenario is appropriate for evaluation because utility lines are located in the area and future development of land near AOC 1 could include construction and/or earthwork. The worker could be expected to contact subsurface soils for a period of 6 work weeks, or 30 days.

Ecological Exposure Scenarios: Exposures to aquatic receptors including piscivorous birds will be evaluated for contaminated groundwater discharge to surface waters and sediments of Alligator Bayou. It is unlikely that any terrestrial receptors would be exposed to surface contamination because the majority of this former waste disposal area is paved. At AOC 2, the only vegetation in the vicinity consists of narrow strips of mowed grass adjacent to the parking lot. Moreover, the frequent human activity nearby would tend to discourage the presence of wildlife.

<u>SWMU 2 Landfill B, Burn and Landfill Areas</u> SWMU 2 consists of an area of approximately 11 acres (Figure 4). Within the confines of SWMU 2, five areas have been identified where separate landfill or burn operations have occurred. The area is heavily vegetated with trees and shrubs and has low-lying areas (intermittent drainage courses) that collect water during rain events. These intermittent drainage courses drain SWMU 2 to the south. Surface water and sediment samples, sediment toxicity samples, and benthic macroinvertebrate samples were collected from these drainage courses during the Phase 2 field investigation. St. Andrew Bay is located approximately 1800 feet east of the SWMU. In addition to the samples collected from the intermittent drainage courses, surface soil, subsurface soil, and groundwater samples were collected and analyzed. Additional surface soil sample volume was collected at selected locations for toxicity testing. Plant samples were also collected. Samples collected and analyzed during the Phase 1 field program included subsurface soil and groundwater samples. Two of the 5 areas within SWMU 2 (the One-Time Base Cleanup Disposal Area and the General Household Waste Burial Area) will be

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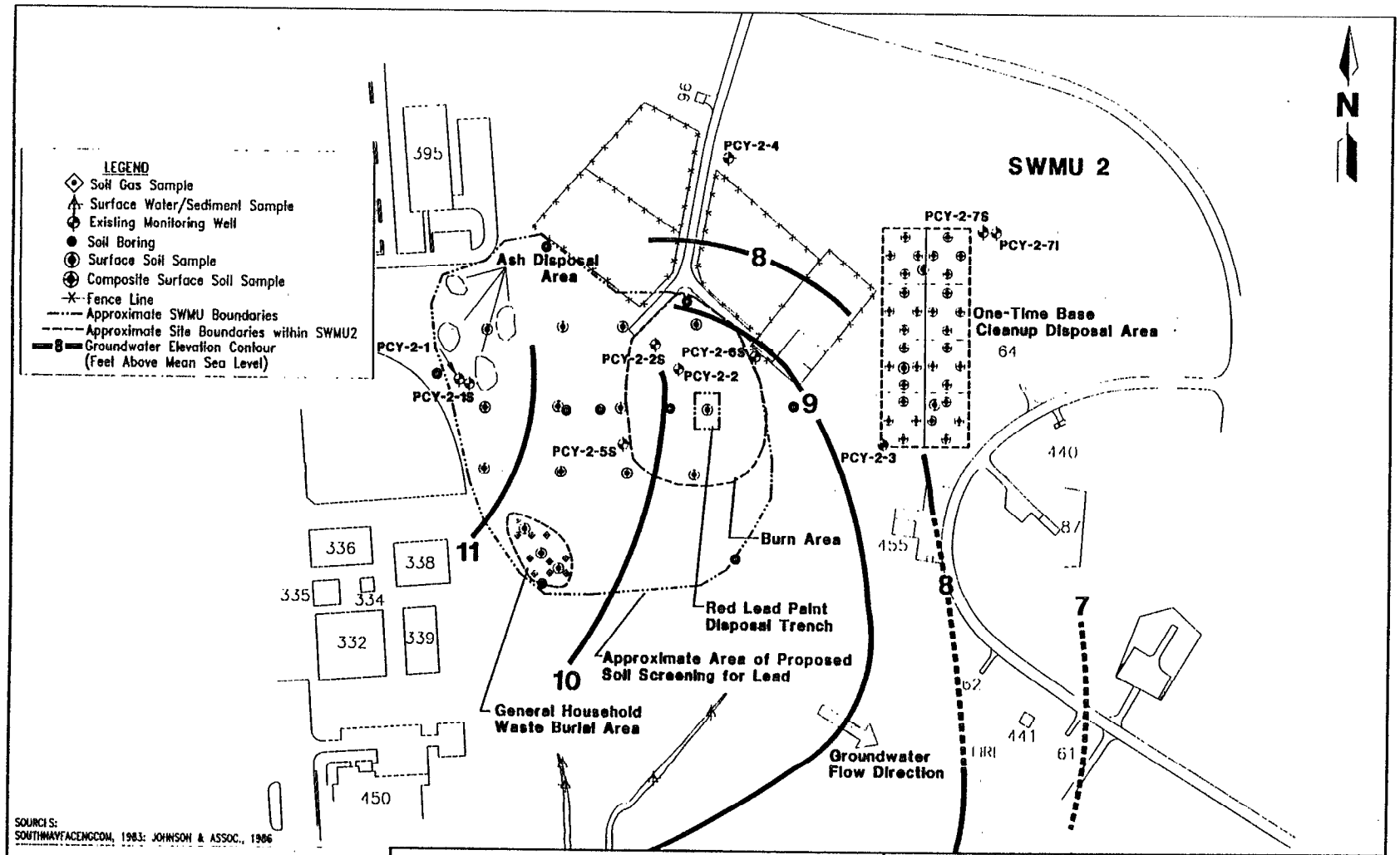

SOURCES:
SOUTHWAYFACENGCOM, 1983; JOHNSON & ASSOC., 1986

0 150 300
SCALE: 1" = 300'

SWMU2/HPG/11-11-93

FIGURE 4

SOLID WASTE MANAGEMENT UNIT NO. 2, LANDFILL B, BURN AND LANDFILL AREA, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

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Cleanup Disposal Area and the General Household Waste Burial Area) will be evaluated separately in the HEA. Due to the close proximity and overlapping nature of the other three areas, the Red Lead Paint Disposal Trench, Burn Area, and Ash Disposal Area will be evaluated together (Figure 4).

Human Health Exposure Scenarios: At SWMU 2, current land use indicates that an adult/child trespasser scenario would be appropriate for evaluation of surface soil ingestion and dermal contact. The adult/child trespasser scenario is appropriate because of the close proximity of recreational facilities (i.e., softball field) and the Boy Scout Troop 317 trailer, and because trespassers have been observed on site (ABB-ES Site Visit, March 1994). Site-specific exposure parameters for the trespasser scenario will be explored during April 1994 by obtaining a schedule of recreational and maintenance activities occurring in the area from the CSS Panama City Department of Morale, Welfare, and Recreation.

Under future land use at SWMU 2, an adult/child resident scenario and an adult construction/utility worker scenario would be considered appropriate if the current land use was shifted to housing or industrial use. The adult/child resident scenario is appropriate because of the attractive location for potential housing and close proximity to current recreational facilities. Surface soil ingestion and dermal contact and the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident. The adult construction/utility worker scenario is appropriate for evaluation because utility lines are located in the area and future development of land near SWMU 2 could include construction and/or earthwork. The worker would be expected to contact subsurface soils for a period of 30 days.

Ecological Exposure Scenarios: Terrestrial fauna at SWMU 2 will be evaluated for exposure to soil constituents via incidental ingestion of soil and the ingestion of food (including vegetation and seeds) items that have bioaccumulated chemicals in their tissue. Terrestrial plants and soil invertebrates will also be considered as ecological receptors. Depending on the contaminants of concern and possible receptors at the SWMU, a food web model may be developed to estimate exposure concentrations to various primary and secondary consumers that may forage in this area. Aquatic receptors will be evaluated for exposure to landfill constituents via intermittent drainage courses that drain SWMU 2 to the south. Risks will also be evaluated for potential discharge of contaminants in groundwater to surface water in the drainage ditches and Alligator Bayou.

<u>SWMU 3; Landfill C, Burn and Disposal Area</u> SWMU 3 is a former burn and disposal area that is located north of the Amphibious Assault Landing Craft area on the beach of St. Andrew Bay (Figure 5). The SWMU is bordered on the east by St. Andrew Bay, on the north by a small tidal inlet leading into the Bay, and on the west by Building 292. Concrete riprap covers the shoreline of SWMU 3 to reduce the potential for erosion. Surface soil, subsurface soil, groundwater, surface water, and sediment samples were collected and analyzed during the Phase 2 field investigation. Additional sediment volume was collected for macroinvertebrate identification and sediment toxicity testing. Samples collected and analyzed during the Phase 1 field investigation included subsurface soil and surface water samples.

Human Health Exposure Scenarios: At SWMU 3, current land use indicates that an adult/child trespasser (wader) scenario would be appropriate for evaluation of surface water/sediment ingestion and dermal contact in St. Andrew Bay. An

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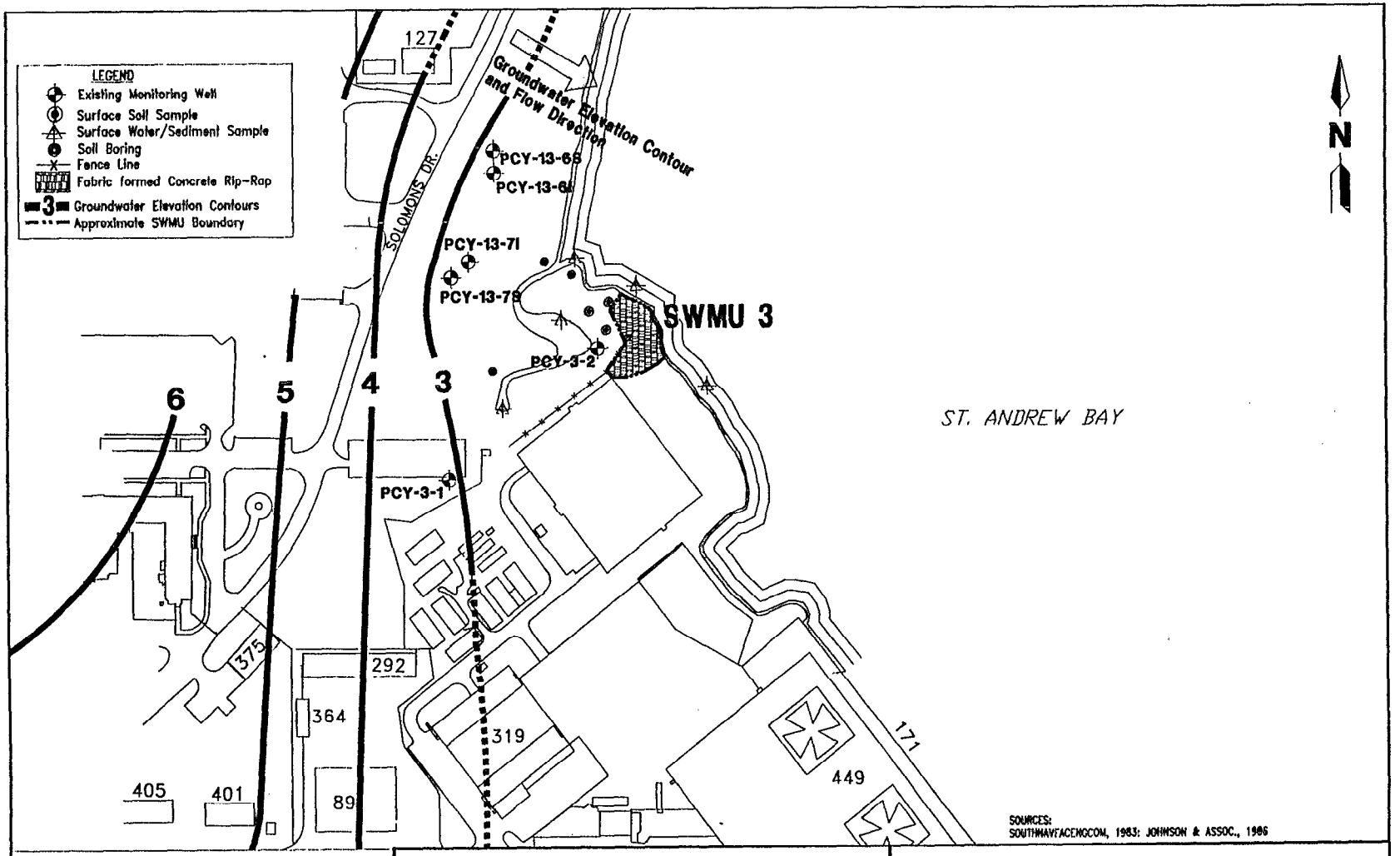

SOURCES:
SOUTHNAVFACENGCOM, 1983; JOHNSON & ASSOC., 1986

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SCALE: 1" = 300'

SWMU3/MP/2-8-94

FIGURE 5

SOLID WASTE MANAGEMENT UNIT NO. 3, LANDFILL C, BURN AND DISPOSAL AREA, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

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adult/child trespasser scenario would also be appropriate to evaluate surface soils exposed near the riprap. Riprap is believed to cover approximately 90% of the surface of the burn and disposal area. The Amphibious Assault Landing Craft Area is less than 20 feet from the SWMU and provides a deterrence to intruders. Because adjacent land use is highly industrial (i.e., concrete pads, heavy machinery), current land use of SWMU 3 is not expected to change. However, under future land use conditions, an adult construction/utility worker might be present at the SMWU during maintenance activities on the riprap. Such an individual would be expected to contact subsurface soils for 6 work weeks for a total of 30 days as a one-time event. A residential scenario is not considered appropriate in the future because of the acreage dedicated to industrial efforts in the area of SWMU 3 and because of the mitigated wetlands within 40 feet of the site.

Ecological Exposure Scenarios: Aquatic organisms in the vicinity of SWMU 3 will be evaluated for exposure to sediment constituents through dermal contact with and ingestion of sediment. Dermal contact (including exposure of respiratory surfaces) with contaminated surface water is also a potential pathway and will be evaluated. In addition, exposures to aquatic receptors will be evaluated for potential discharge of contaminants in groundwater to the surface water of St. Andrew Bay. Terrestrial ecological receptors are not expected to occur in the vicinity of this site because the paved Amphibious Assault Landing Craft Area directly abuts the southwestern edge of the former burn/landfill area, concrete riprap covers part of the site, and little vegetation, other than mown grass, and weeds occurs in the general area. However, foraging birds may be exposed via the consumption of contaminated food items.

<u>SWMU 4; Landfill D, Filled Gully</u> SWMU 4 is located on the shoreline of St. Andrew Bay directly north of the inlet to Alligator Bayou (Figure 6). This area was originally used as a surface water drainage ravine, into which concrete blocks, pieces of broken concrete and hardened asphalt, tires, and other inert materials were placed. Currently, the ravine receives surface water runoff from surrounding areas. During the Phase 1 field investigation, SWMU 4 was recommended for NFA. At that time, the regulatory agencies indicated that additional surface water and sediment samples should be collected and analyzed to more accurately define site conditions. Surface water and sediment samples were collected and analyzed from St. Andrew Bay adjacent to SWMU 4 during the Phase 2 field investigation. Sediment samples were also collected and analyzed during the Phase 1 field investigation. No other environmental samples were collected from SWMU 4.

Human Health Exposure Scenarios: Under current and future land use, an adult/child trespasser (wader) scenario would be appropriate for evaluation of surface water and sediment ingestion and dermal contact in St. Andrew Bay. No other potentially contaminated media is known to be present at SWMU 4. The Amphibious Assault Landing Craft Area is less than 50 feet from the SWMU and provides a deterrence to intruders. Additional exposure scenarios are not proposed for the HEA because contamination in surface soils, subsurface soil, and groundwater was not anticipated and analytical samples for such media have not been collected.

Ecological Exposure Scenarios: Aquatic organisms in the vicinity of SWMU 4 will be evaluated for exposure to potential sediment and surface water contamination through direct contact with and ingestion of sediment as well as direct contact with surface water. Terrestrial receptors such as foraging birds will also be

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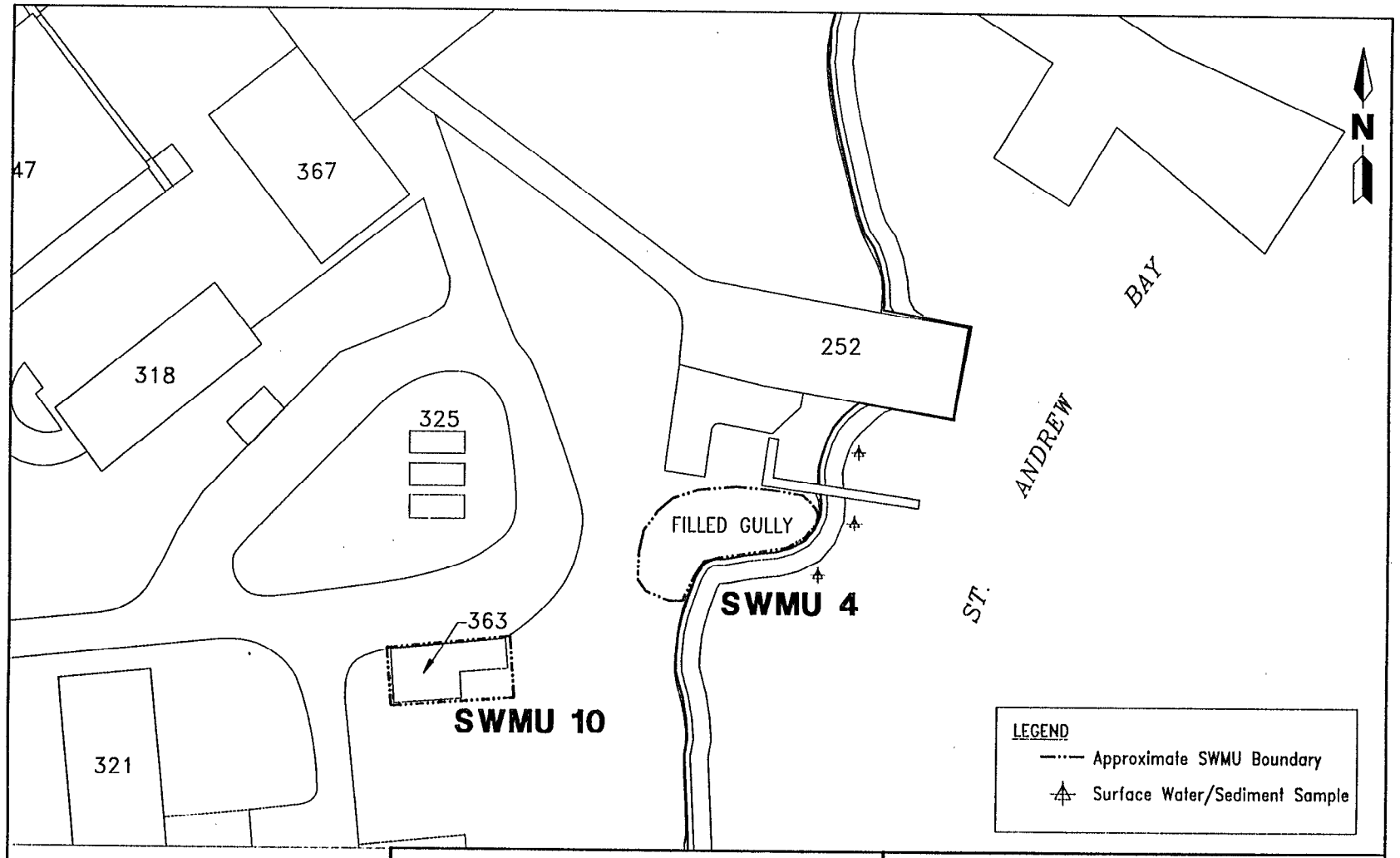

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SCALE: 1" = 100'

SWMU4/WPG/11-11-93

FIGURE 6

SOLID WASTE MANAGEMENT UNIT NO. 4, LANDFILL D, FILLED GULLY, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

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evaluated for exposure to surface water and sediment ingestion. It is unlikely that other terrestrial receptors would use this area because of poor habitat quality (i.e., SWMU 4 is predominantly covered with either asphalt or buildings). Few soil invertebrates are expected to occur in this dry sandy substrate and consequently, little forage base for primary consumers exists at SWMU 4.

SWMU 5; Paint Equipment and Cleaning Area SWMU 5 is the former location of a sand pit that was used to clean painting equipment (Figure 7). SWMU 5, the majority of which is paved, is located behind Building 47. Surface soil, subsurface soil, and groundwater samples were collected during the Phase 2 investigation. Subsurface soil and groundwater samples were also collected and analyzed during the Phase 1 field investigation.

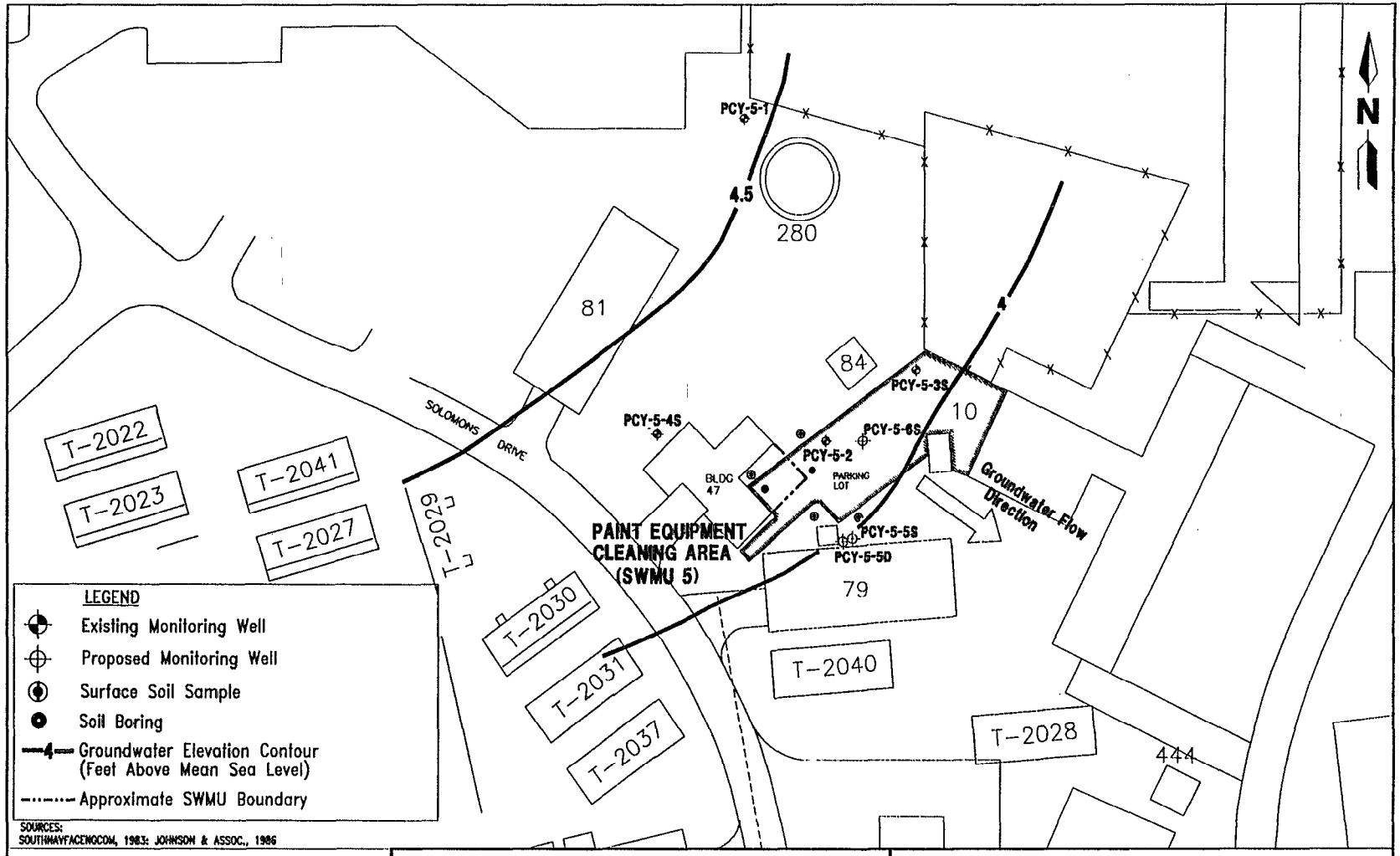
Human Health Exposure Scenarios: At SWMU 5, current (i.e., light industrial) land use indicates that an adult/child trespasser scenario would be appropriate for evaluation of surface soil ingestion and dermal contact based on the location of research buildings and CSS Panama City personnel being present in the vicinity of the SWMU. Under future land use at SWMU 5, an adult/child resident scenario and an adult construction/utility worker scenario would be considered appropriate for evaluation if the current land use (light industrial) was shifted. Surface soil ingestion and dermal contact as well as the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident scenario. The adult construction/utility worker scenario is appropriate because utility lines are located in the area and future development of land at or near SWMU 5 could include construction and/or earthwork. The worker could thus be expected to contact subsurface soils for a one-time event of 30 days.

There is no surface water in close proximity to SWMU 5, therefore, surface water and sediment are not appropriate contact media for evaluation of risks to humans.

Ecological Exposure Scenarios: It is unlikely that any terrestrial receptors would be exposed to surface soils, because this former sand pit is currently paved. In addition, there is little vegetation on the site. Consequently, risks to terrestrial receptors will not be considered at SWMU 5. Risks to aquatic receptors will be evaluated for potential discharge of contaminants in groundwater to surface water in Alligator Bayou.

SWMU 9; Fire Training Area No. 2. SWMU 9 is located southwest of Gull Circle near Building 61 (Figure 8). Fire training exercises were conducted at SWMU 9 in the early 1980s. During site visits, it was noted that the SWMU is a bare, circular, level area with no vegetation. The SWMU is bordered by a driving range on the west, a wooded area on the south, the wastewater treatment facility on the east, and Gull Circle on the north. Surface soil, subsurface soil, and groundwater samples were collected and analyzed during the Phase 2 field investigation. Additional surface soil sample volume was collected for toxicity testing and earthworm chemical analysis. Subsurface soil and groundwater samples were also collected and analyzed during the Phase 1 field investigation.

Human Health Exposure Scenarios: At SWMU 9, the current fire training area is less than 50 feet from the historical fire training area. Current adjacent land use indicates that an adult/child trespasser scenario and an adult worker scenario would be appropriate for evaluation of surface soil ingestion and dermal contact. The adult/child trespasser scenario is appropriate because of easy



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SCALE: 1" = 100'

FIGURE 7

SOLID WASTE MANAGEMENT UNIT NO. 5, PAINT EQUIPMENT CLEANING AREA, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

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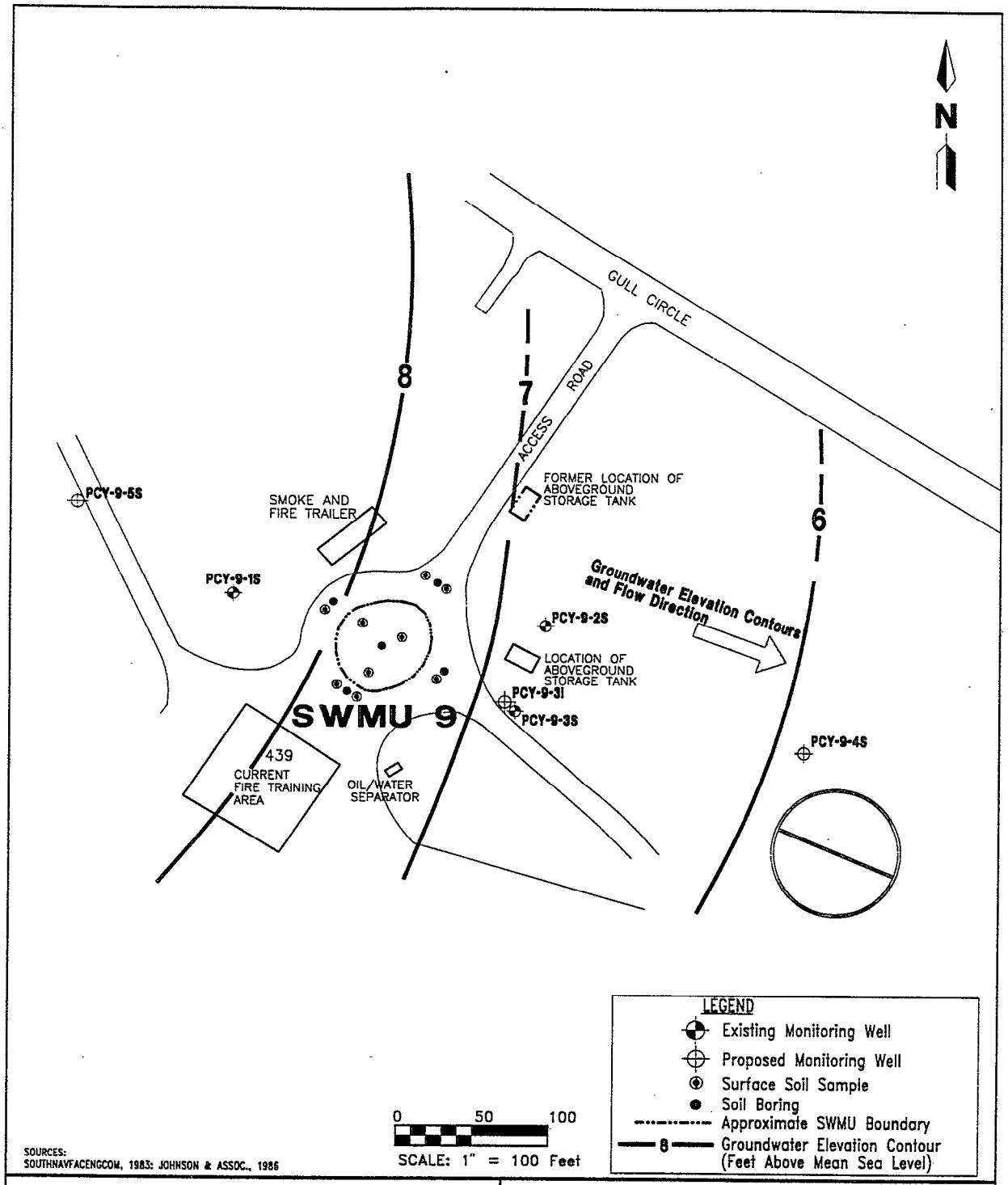

SOURCES:
SOUTHNAVFACENGCOM, 1983; JOHNSON & ASSOC., 1986

FIGURE 8

SOLID WASTE MANAGEMENT UNIT NO. 9, FIRE-FIGHTING TRAINING AREA NO. 2

SWMU9/KGP/11/11/93

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access to the site from Gull Circle and its close proximity to housing. The site worker scenario is appropriate because undocumented burns have occurred at the site in the past 6 months. The site worker and trespassers would be limited to contacting surface soils at the site because no other media are available for contact.

Under future land use at SWMU 9, an adult/child resident scenario and an adult construction/utility worker scenario would be considered appropriate for evaluation if the current land use was shifted to housing or industrial use. The adult/child resident scenario is appropriate for evaluation because of the attractive location for potential housing and close proximity to other housing units. In the future land use scenarios, surface soil ingestion and dermal contact as well as the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident scenario. The adult construction/utility worker scenario is appropriate because utility lines are located in the area and future development of land at or near SWMU 9 could include construction and/or earthwork.

There is no surface water in close proximity to SWMU 9, therefore, surface water and sediment are not appropriate contact media for evaluation of risks to humans.

Ecological Exposure Scenarios: Terrestrial fauna at SWMU 9 will be evaluated for exposure to soil constituents associated with historical fire-training activities via the ingestion of soil and food (including vegetation and seeds) items that have bioaccumulated chemicals. Plants and soil invertebrates will also be evaluated for exposure to soil contaminants via direct contact and ingestion, respectively. Exposures to aquatic receptors will be evaluated for potential discharge of contaminants in groundwater to surface water.

<u>SWMU 10: Oil-Water Separator, Site 363.</u> SWMU 10 is an underground Oil-Water Separator (OWS) system located along the eastern boundary of CSS Panama City (Figure 9). The SWMU is located approximately 90 feet directly south of the JP-5 subsurface storage facility and approximately 100 feet east of St. Andrew Bay. The area adjacent to the OWS system is used as a retention pond (approximately 15 feet southeast of the OWS system). The OWS is surrounded by a fence; however, contamination may have migrated to the soils and groundwater outside the fenced area, including the retention pond. Contamination may have also migrated to St. Andrew Bay. There is easy access to the areas outside the fence and to the retention pond. Surface soils, subsurface soils, groundwater, surface water, and sediment samples were collected and analyzed during the RFI Phase 2 field investigation. Additional sediment volume was collected for toxicity testing. SWMU 10 was not investigated during the RFI Phase 1 field investigation. Subsurface soil and groundwater data is available as part of the 1993 Contamination Assessment Report (CAR) prepared for this SWMU.

Human Health Exposure Scenarios: Under current land use conditions, it is appropriate to evaluate surface soil ingestion and dermal contact for an adult/child trespasser. Also, under current and future land use, an adult/child trespasser (wader) scenario is appropriate for the evaluation of the ingestion and dermal contact with surface water and sediment in St. Andrew Bay. The Amphibious Assault Landing Craft Area is less than 50 feet from the SWMU and provides a deterrence to intruders.

Because adjacent land use is highly industrial (i.e., concrete pads, heavy

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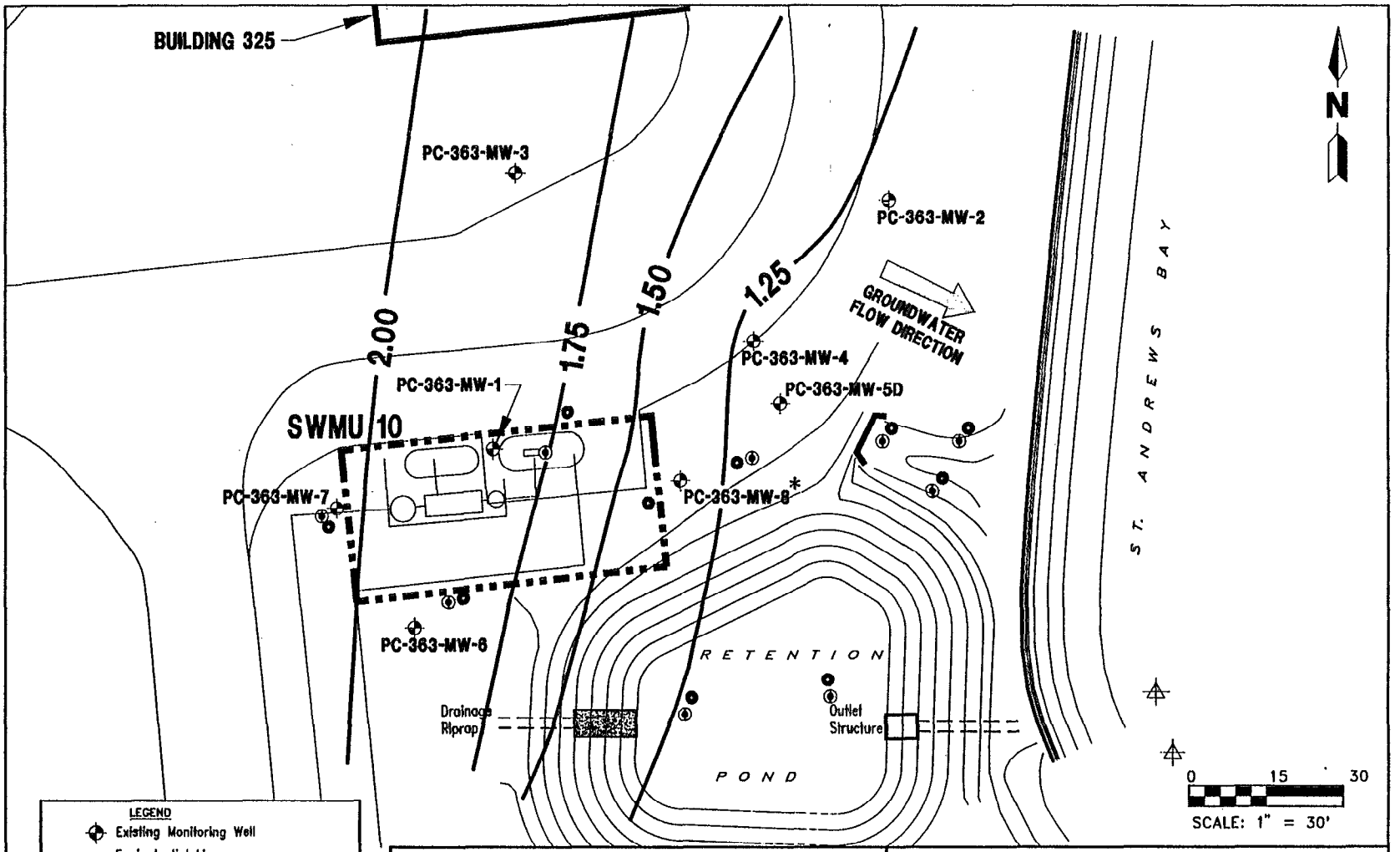

FIGURE 9

SOLID WASTE MANAGEMENT UNIT NO. 10, OIL/WATER SEPARATOR, PROPOSED PHASE II RFI EXPLORATION LOCATIONS

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machinery), current land use of SWMU 10 is not expected to change in the future. However, to provide conservative exposure scenarios under future land use conditions, a child/adult resident scenario and an adult construction/utility worker scenario are appropriate for evaluation. The residential scenario is appropriate because of the scenic location of the SWMU on St. Andrew Bay. The adult construction/utility worker might be present at the SMWU during maintenance activities for the OWS system or construction of housing. Such an individual would be expected to contact subsurface soils for 30 days (8 hours per day) as a one-time event.

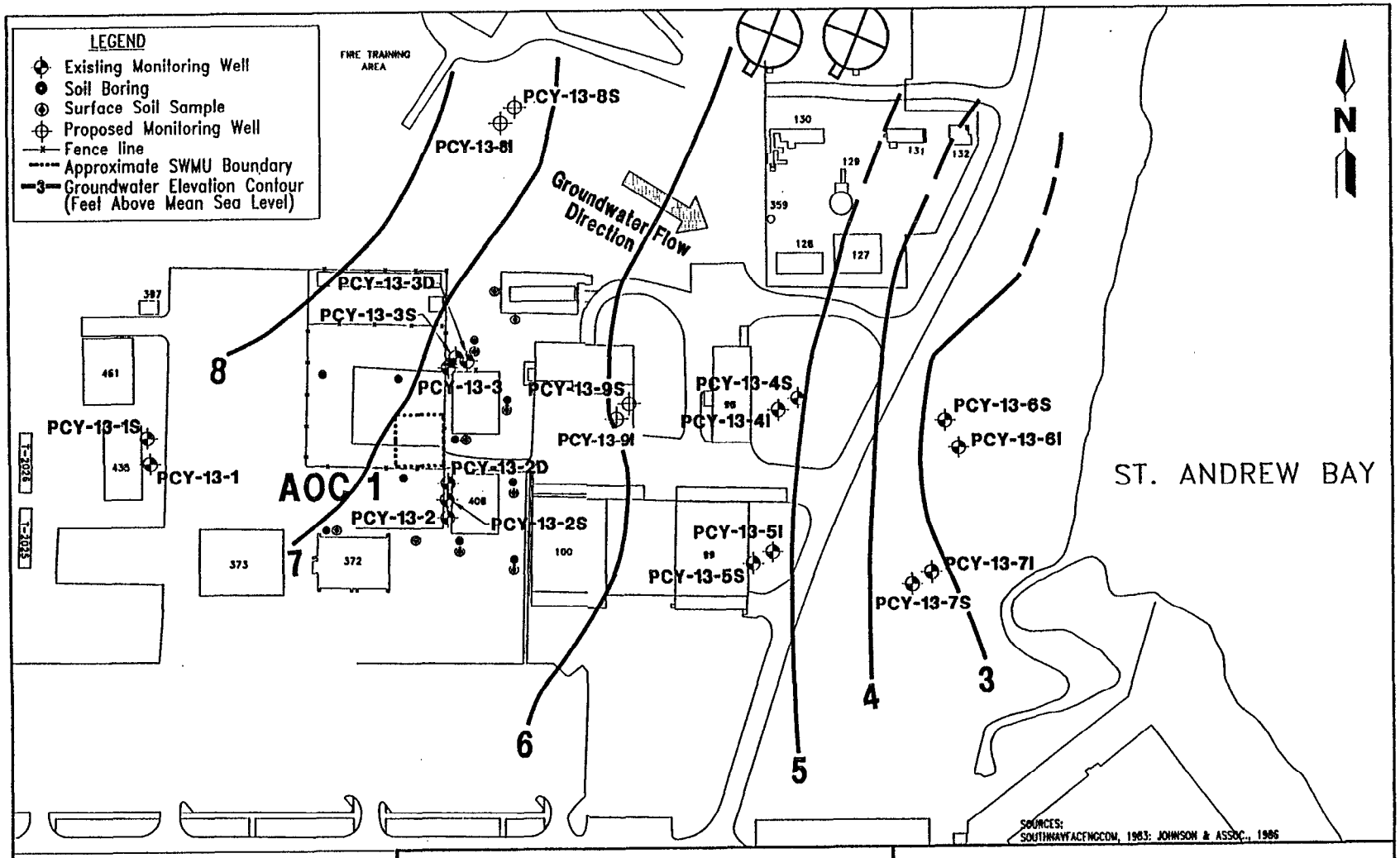
Ecological Exposure Scenarios: Aquatic receptors will be evaluated for exposure to contaminated groundwater discharge to the surface waters of St. Andrew Bay. Terrestrial fauna in the area adjacent to SWMU 10 will be evaluated for exposure to soil constituents via the ingestion of soil and food (including vegetation and seeds) items that have bioaccumulated chemicals. Terrestrial plants and invertebrates will also be considered as receptors in this area. Depending on the contaminants of concern and possible receptors identified at the SWMU, a food web model may be developed to estimate exposure concentrations to various primary and secondary consumers that may forage in this area.

<u>AOC 1; Old Fire Training Area No. 1.</u> AOC 1 is located approximately 140 feet west of Building 100 and approximately 1000 feet west of St. Andrew Bay (Figure 10). Fire-fighting training exercises occurred once a month in an unlined pit of approximately 500 square feet from the mid-1950s to the late 1970s. In 1978, the site was paved with concrete and asphalt. Presently, the site is used as an open storage area. Vegetation bordering the paved area was not observed to be stressed during site visits or during the Phase 2 field investigation. There is easy access to this SWMU. Subsurface soil, and groundwater samples were collected during the Phase 1 and Phase 2 field investigation. In addition, surface soil samples were collected during the Phase 2 field investigation.

Human Health Exposure Scenarios: Under current land use, no contaminated media are available for exposure to human receptors at AOC 1 because of extensive concrete over the soil and no potable use of groundwater. Soils that were not actually at the site of the old fire training area, but which may have over the years, received contamination via overland surface water flow or seepage may be available for contact. Therefore, under current light industrial land use, a child/adult trespasser scenario would be appropriate to evaluate surface soil ingestion and dermal contact in the vicinity of AOC 1.

Under future land use at AOC 1, an adult/child resident scenario and an adult construction/utility worker scenario would be considered appropriate for evaluation if the current land use (light industrial) was shifted. Surface soil ingestion and dermal contact as well as the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident scenario. The adult construction/utility worker scenario is appropriate for evaluation because utility lines are located in the area and future development of land at or near AOC 1 could include construction and/or earthwork. The workers could be expected to contact subsurface soils. AOC 1 is not in close proximity to St. Andrew Bay or Alligator Bayou and, therefore, surface water and sediment are not appropriate contact media for evaluation.

Ecological Exposure Scenarios: Terrestrial ecological receptors are not66Xexpected to occur in the vicinity of this site because the majority of the site is paved



0 125 250
SCALE: 1" = 250 Feet

FIGURE 10
AREA OF CONCERN (AOC) NO. 1, FIRE TRAINING AREA NO. 1, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

SOURCES: SOUTHNAVFACENGCOM, 1983; JOHNSON & ASSOC., 1986

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with concrete and is highly industrialized. Therefore, no ecological risk characterization will be conducted for terrestrial receptors at this site. Risks to aquatic receptors will be evaluated for potential migration of contaminants in groundwater to surface water of St. Andrew Bay.

Building 455: Paint Stripping Area. Building 455 is located on Gull Circle, and is approximately 500 feet east of the Burn Area at SWMU 2 (Figure 11). Paint stripping activities were conducted at this location for at least 15 years (pre-1978 until June 1993). During the Hazardous Material Minimization Survey, conducted by CSS Panama City personnel in 1993, it was discovered that rinse water from the chemical stripping operation contained a listed hazardous waste (methylene chloride), which may have been released onto the ground around Building 455. Access to the site is easy. Currently, the site is being used as a sand blasting area and is easily accessible to trespassers directly off of Gull Circle. Surface soil, subsurface soil, and groundwater samples were collected during the Phase 2 field investigation. This site was not investigated during the Phase 1 field investigation.

Human Health Exposure Scenarios: The majority of the site consists of a concrete pad that is currently used as a sandblasting area. Over time, surface water runoff from past rinsing activity may have migrated to surrounding surface soils off the concrete pad adjacent to the site resulting in possible surface soil contamination. Under current land use conditions, it is appropriate to evaluate surface soil ingestion and dermal contact for an adult/child trespasser and an adult worker. No other media are available for contact at the site under current land use.

Under future land use at Building 455, an adult/child resident scenario and an adult construction/utility worker scenario would be considered appropriate for evaluation if the current land use (light industrial) was shifted. The adult/child resident scenario is appropriate for evaluation because of the attractive location and proximity to current housing. Surface soil ingestion and dermal contact and the domestic use of groundwater (ingestion and inhalation of volatiles while showering) will be evaluated for the future resident. The adult construction/utility worker scenario is appropriate for evaluation because utility lines are located in the area and future development of land near Building 455 could include construction and/or earthwork and could be expected to contact subsurface soils. Building 455 is not in close proximity to St. Andrew Bay or Alligator Bayou and, therefore, surface water and sediment are not appropriate contact media for evaluation.

Ecological Exposure Scenarios: Terrestrial fauna at Building 455 may be exposed to soil constituents associated with historical paint stripping activities via the ingestion of soil and food (including vegetation and seeds) items that have bioaccumulated chemicals. Terrestrial plants and soil invertebrates may be exposed to soil contaminants via direct contact and ingestion, respectively. Depending on the contaminants of concern and possible receptors, a food web model may be developed to estimate exposure concentrations to various primary and secondary consumers that may forage in this area. Exposures will also be evaluated for potential discharge of contaminants in groundwater to surface water of St. Andrew Bay.

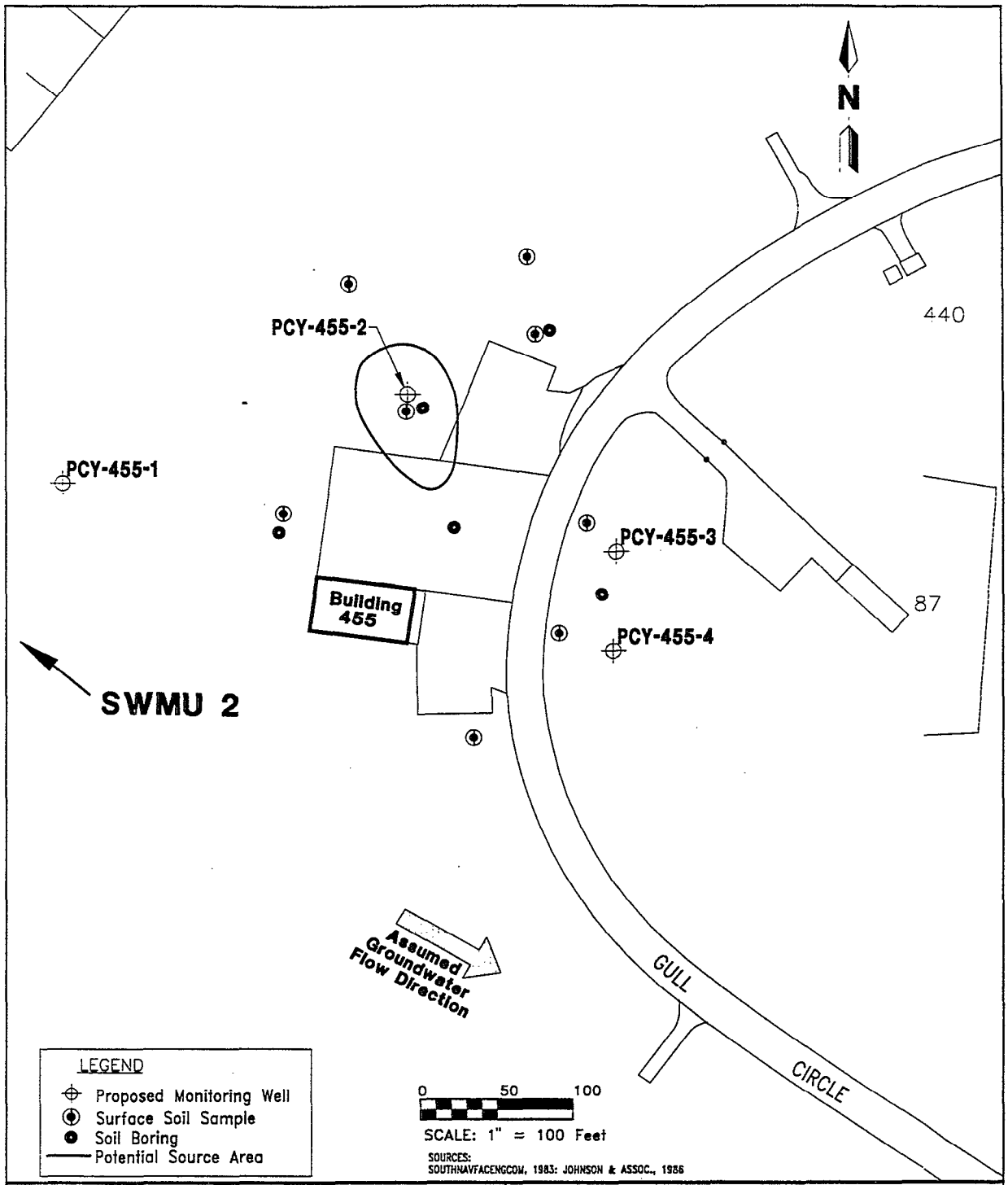

FIGURE 11

BUILDING 455, PAINT STRIPPING AREA, PROPOSED PHASE 2 RFI EXPLORATION LOCATIONS

BLDG-455/NP/10-11-93

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ATTACHMENT B

RFI PHASE 1 AND PHASE 2 DATA MANAGEMENT

Surface soil samples (i.e. soils from 0 - 1 foot) were not collected during the Phase 1 field investigation; therefore, only surface soil analytical data collected during the Phase 2 field investigation will be evaluated in the HEA.

Surface water and sediment analytical data collected during the Phase 2 field investigation will be used to complete the HEA, however, the Phase 1 analytical data will be discussed as historical data. The surface water and sediment analytical data collected during the Phase 2 field investigation were analyzed for all Target Compound List (TCL) compounds and Target Analyte List (TAL) analytes. Additional furnace and SW-846 analyses were also completed for selected compounds and analytes for the surface water and sediment samples collected during the Phase 2 field investigation to achieve lower detection limits for comparison to the State of Florida Surface Water Quality Standards for Class III Marine Waters and the EPA Region IV Waste Management Division Sediment Screening Values for Hazardous Waste Sites.

The proposed strategy for utilizing Phase 1 and Phase 2 analytical data for groundwater and subsurface soil samples will be determined on a SWMU by SWMU basis upon receipt of Phase 2 analytical data. Once a strategy has been developed for each SWMU, an additional memorandum will be submitted to EPA and FDEP for review and concurrence.

REFERENCES

U.S. Environmental Protection Agency (USEPA), 1986, "Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods, SW-846, 3rd edition, September 1986".

USEPA, 1991, "USEPA Contract Laboratory Program, Statement of Work for Organic and Inorganics Analysis, Multi-Media, Multi-Concentration, Document Numbers ILM03.0 and OLM02.1"

USEPA, 1992. "Dermal Exposure Assessment: Principles and Applications"; United States Environmental Protection Agency, Office of Health and Environmental Assessment. Washington, D.C., Publication EPA/600/8-91/011F.

USEPA, 1993. Personal communication between Julie Keller, USEPA Region IV, and Mike Murphy, ABB Environmental Services, Inc. August 13, 1993.

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FILE COPY

DATE: July 15, 1994

TO: Jim Reed, EIC, CSS Panama City RFI, SOUTHNAVFACENGCOM

FROM: Mark Cheyne, Geological Engineer, ABB-ES
Steve Watson, CSS Panama City RFI Phase 2 Task Order Manager, ABB-ES

SUBJECT: Preliminary assessment of Solid Waste Management Unit (SWMU) 10 and Building 455
RFI Phase 2
Coastal Systems Station (CSS) Panama City
Contract Task Order No. 083
Contract No. N62467-89-D-0317

During a conference call between SOUTHNAVFACENGCOM, USEPA, FDEP, and ABB Environmental Services, Inc. (ABB-ES), the question was raised whether data collected during the RCRA Facility Investigation (RFI) Phase 2 field program for Solid Waste Management Unit (SWMU) 10 or Building 455 at CSS Panama City was sufficient to complete a Health and Environmental Assessment (HEA) or Corrective Measures Study (CMS), if required. These two sites had not previously been investigated under the facility's Installation Restoration (IR) program prior to the RFI Phase 2. SOUTHNAVFACENGCOM decided to undertake a preliminary review of sampling results at the two sites to identify potential data gaps. If data gaps were identified, SWMU 10 and Building 455 would not be included in the CSS Panama City RFI Report, and instead would be documented in a later, supplementary document after data gaps had been addressed.

The preliminary review was conducted on the data from the RFI Phase 2 field investigation performed at SWMU 10 and Building 455. The hardcopy RFI Phase 2 validated analytical data was consolidated into summary tables (not included with this memorandum), grouped by analyte type. The review of data from SWMU 10 and Building 455 preceded the scheduled review of data for the RFI report, so the database of validated background sample data was not yet complete. As a result, the review of inorganic analytical results was qualitative. Background organic data will also be utilized in the final analysis for the RFI report, but for this preliminary review, detection of organic compounds was assumed to indicate environmental contamination.

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Potential data gaps were evaluated by considering analytical results, sample locations and sample media type. This review indicates that sufficient environmental data is available for both SWMU 10 and Building 455 to complete the RFI, perform a quantitative HEA and to scope potential corrective actions for a CMS, if the HEA indicates that a CMS is required. The following pages summarize this review. This review is preliminary; detailed scrutiny during the HEA may reveal chemical-specific data gaps which are not identified here. The complete analytical dataset is not presented with this memorandum; data are summarized and presented in tabular format only in cases where they relate to conclusions concerning data gaps. All analytical and physical data for SWMU 10 and Building 455 will be presented in the RFI report.

SWMU 10 DATA EVALUATION AND CONCLUSIONS.

SWMU 10 (previously identified as Site 363 or Building 363) was added to the CSS Panama City RFI by SOUTHNAVFACENGCOM after completion of the RFI Phase 1. The SWMU consists of an oil-water separator system (OWS) that is located along the eastern boundary of CSS Panama City, approximately 120 feet directly south of the JP-5 subsurface storage facility (Building 325, Site 325) and approximately 120 feet from St. Andrew Bay. The area south of the OWS system is a stormwater retention pond (located approximately 15 feet southeast of the OWS system). In part, the OWS is used to treat bilge water that is offloaded from naval vessels. Two releases of oil and bilge water were reported in 1992 by CSS Panama City to have occurred from the OWS to the surrounding soils and to St. Andrew Bay. Furthermore, sampling performed during a Contamination Assessment (CA) in 1992 detected the presence of solvents in soil and groundwater. These data confirmed that waste solvents had been disposed of in the OWS. This information was originally obtained by the Florida Department of Environmental Protection (FDEP) during a hazardous waste compliance inspection in November, 1992.

Several underground tanks for the storage of fuel are located in an area approximately 80 feet to the north of SWMU 10 known as Building 325 or Site 325. A particular data gap to be addressed in the discussion to follow is the potential that the tanks at Site 325 are contributing to the contamination

detected at SWMU 10. The data collected suggest that there is no such contribution.

Sampling Summary The following samples were collected at SWMU 10 during the RFI Phase 2 field program:

Sample Matrix	Samples	Duplicates	Total
Groundwater	5	1	6
Surface Soil	10	2	12
Subsurface Soil	5	2	7
Surface Water	2	1	3
Sediment	2	1	3
LNAPL (light, non-aqueous phase liquid)	1	0	1

In addition to the RFI Phase 2 sample data, hydraulic conductivity data from slug tests performed in 1992 at 3 wells at Site 325, located immediately north of SWMU 10, are referenced in this memorandum.

Geologic/Hydrogeologic Evaluation The soils encountered at SWMU 10 in borings completed to a depth of 8 feet below land surface (bls) were fine grained, uniform, subangular to subrounded, clean quartz sand. The water table was found at depths of 2 feet to 7 feet bls in the unconfined surficial aquifer.

Groundwater levels were recorded for monitoring wells 363-MW-02 through 363-MW-07 on 23 January, 1994. Groundwater elevation, relative to the National Geodetic Vertical Datum of 1929 (NGVD 1929), ranges from 1.70 feet at 363-MW-07 to 0.79 feet at 363-MW-05D. Groundwater level measurements were used to construct the attached preliminary water-table elevation contour map (Figure 1). The data indicate flow of groundwater in a nearly due east direction through SWMU 10. Well 363-MW-07 is upgradient of the site, and wells 363-MW-04 and 363-MW-05D are downgradient. Well 363-MW-04 is slightly (14 feet) to the north of the direct line of flow from well 363-MW-01, which is located near the point of release of oil. The groundwater flow direction suggests that Site 325 does not contribute contamination to SWMU 10. Site 325 is located lateral to SWMU 10, relative to the groundwater flow direction; water that flows under Site 325, and any

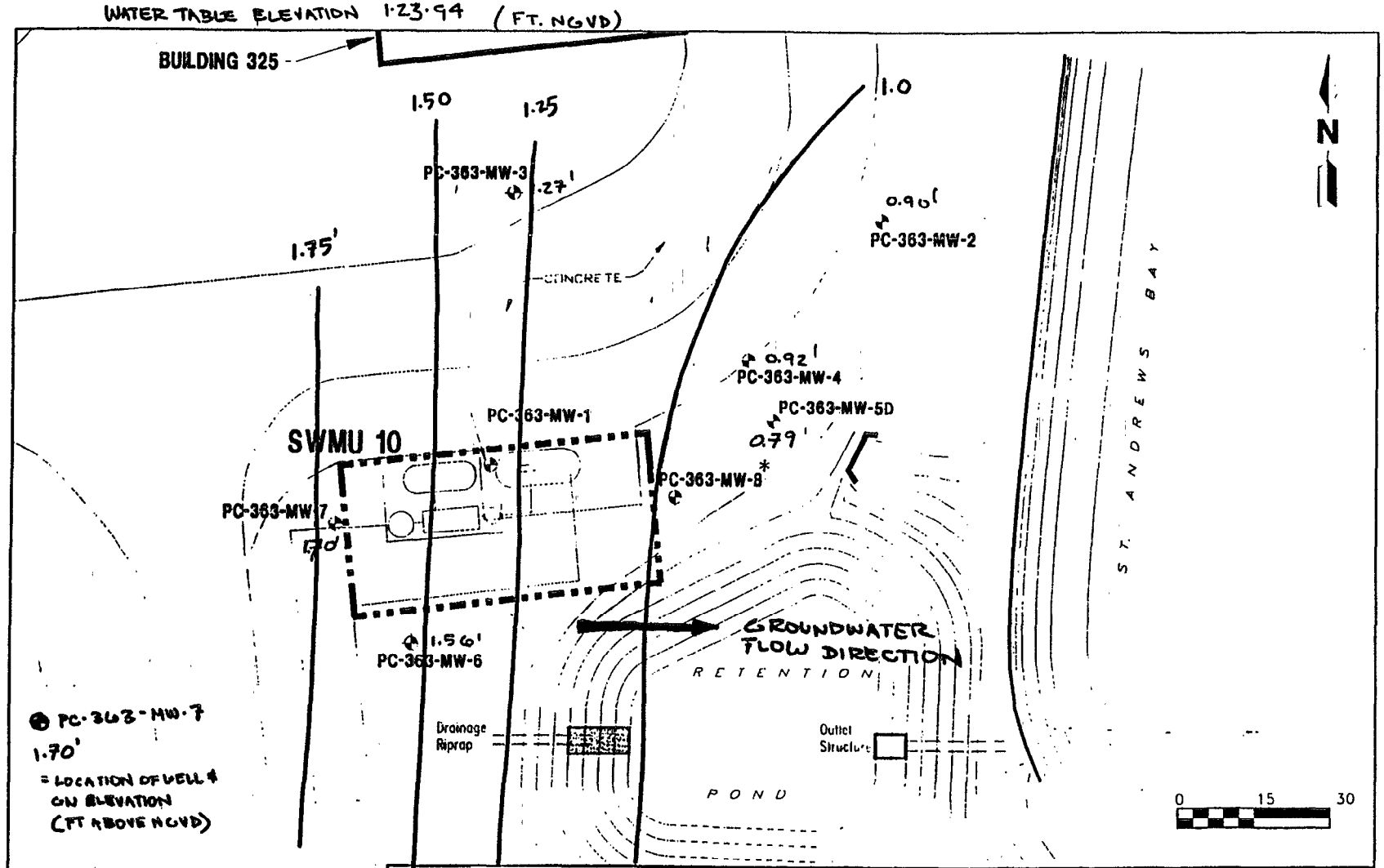

FIGURE 1
SOLID WASTE MANAGEMENT UNIT NO. 10, OIL/WATER SEPARATOR

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potential groundwater contamination originating there, migrates easterly to the bay, not to the south, towards SWMU 10.

All monitoring wells at SWMU 10 are screened to span the water table (each is screened for 10 feet), with the exception of 363-MW-05D, which is screened for five feet between approximately 20 to 25 feet depth bls. Head difference between wells 363-MW-04 and 363-MW-05D is negligible, suggesting that there is no vertical head gradient in the aquifer between the water table and 25 feet bls at SWMU 10, which in turn suggests horizontal groundwater flow.

The calculated horizontal hydraulic gradient (i) at SWMU 10 is 0.100 ft/ft. Hydraulic conductivity (K) is estimated from slug tests performed in 1992 at three wells at Site 325, located approximately 100 feet north of SWMU 10. The geometric mean K value is 0.00712 ft/min. Assuming Darcian groundwater flow and an average effective porosity (n_e) of 0.30, these data yield an average groundwater flow velocity of 3.4 ft/day.

<u>Surface Soil Sampling Results</u> Surface soil samples were collected from ten locations at SWMU 10 from the 0 to 1 foot bls. Sample locations are indicated on the attached preliminary figure (Figure 2). Analytical results are summarized on Table 1. Samples from the first five locations, collected on 15 November 1993, were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals and cyanide, and SW846 method 8310 polycyclic aromatic hydrocarbons (PAHs). Samples from the remaining five locations, sampled on 21 January, 1994, were analyzed for the above analytes, and also for TCL pesticides and polychlorinated biphenyls (PCBs). The analytical results indicate that 4 of the ten surface soil samples contained detectable concentrations of VOC compounds, at concentrations ranging between 1 and 62 μg/kg; 4 contained SVOCs (39-210 μg/kg); 9 contained PAHs (3.6-350 μg/kg); 4 of the 5 locations analyzed for pesticides and PCBs were found to contain pesticides (2.9-8.0 μg/kg); and all 10 contained TAL metals at concentrations that are likely to exceed background. No cyanide or PCBs were detected in surface soils. Two areas at SWMU 10 displayed higher concentrations of organic compounds than other areas at the SWMU: (1) the stormwater outfall

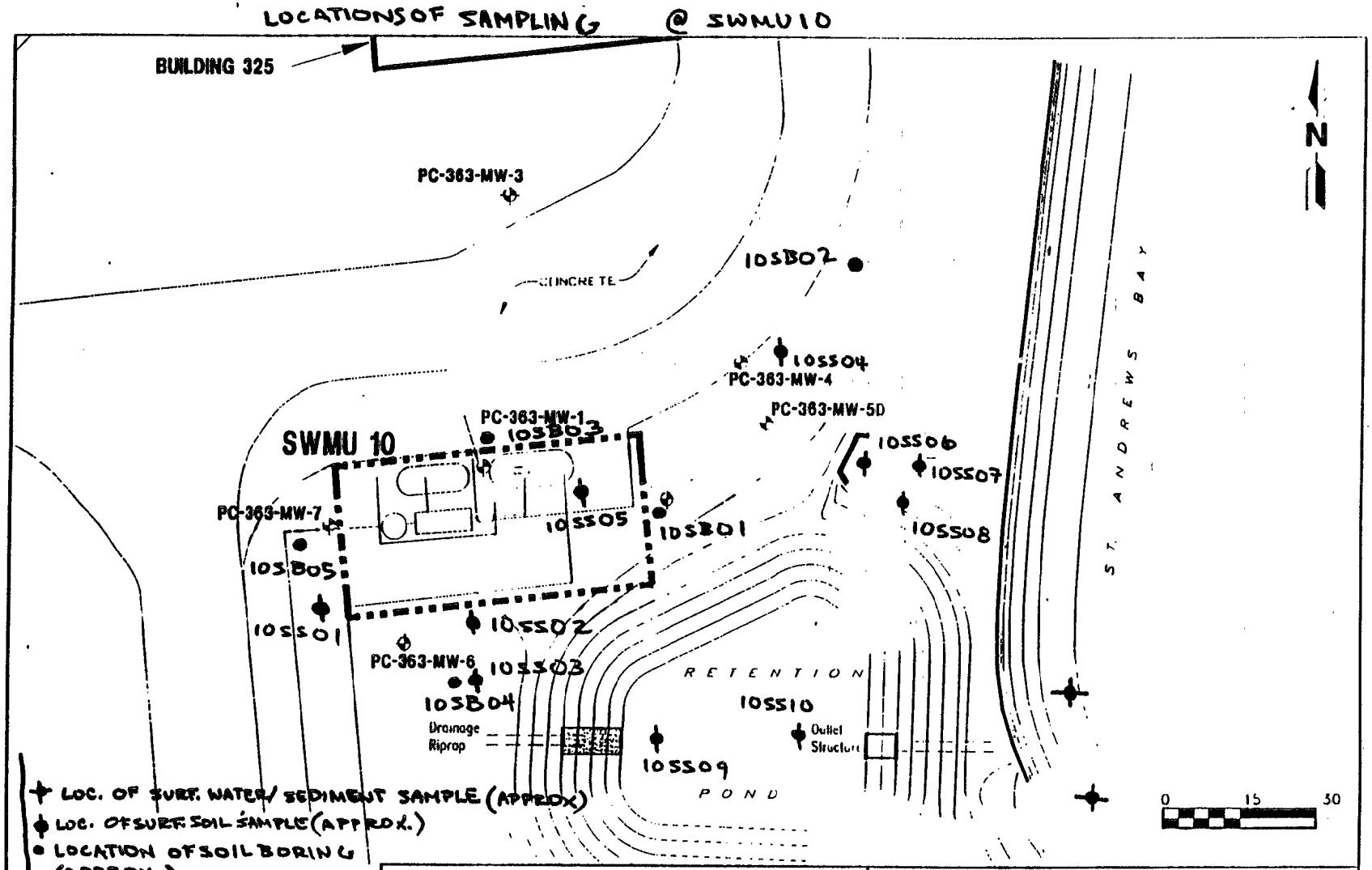

FIGURE 2
SOLID WASTE MANAGEMENT UNIT NO. 10, OIL/WATER SEPARATOR

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Table 1
Summary of Analytical Results - SWMU 10

Surface Soil

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis	Number of Compounds Detected	Maximum Concentration (µg/kg)	Compound Detected at the Maximum Concentration
10SS01			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	not analyzed		
8310 PAH	2	8.2	Benzo(b)flouranthene
10SS02			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	not analyzed		
8310 PAH	5	9.7	Benzo(g,h,i)perylene
10SS03			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	not analyzed		
8310 PAH	5	11	Benzo(b)flouranthene
10SS04			
TCL VOC	1	5J	Acetone
TCL SVOC	none		
TCL Pest/PCB	not analyzed		
8310 PAH	8	29	Benzo(b)flouranthene
10SS05			
TCL VOC	1	10J	2-Butanone
TCL SVOC	1	120J	Di-n-Octyl Phthalate
TCL Pest/PCB	not analyzed		
8310 PAH	none		
10SS06			
TCL VOC	none		
TCL SVOC	8	210J	Benzo(b)flouranthene
TCL Pest/PCB	2	7.9J	Dieldrin
8310 PAH	10	350	Chrysene
10SS06D			
TCL VOC	none		
TCL SVOC	2	140J	bis (2-Ethylhexyl) Phthalate
TCL Pest/PCB	2	8.1J	Dieldrin
8310 PAH	8	190	Ideno(1,2,3-cd)pyrene
10SS07			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	1	5.4J	Dieldrin
8310 PAH	5	37	Ideno(1,2,3-cd)pyrene

See notes at end of table.

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Table 1
Summary of Analytical Results - SWMU 10

Surface Soil

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis	Number of Compounds Detected	Maximum Concentration (µg/kg)	Compound Detected at the Maximum Concentration
10SS08			
TCL VOC	none		
TCL SVOC	5	180J	Benzo(k)flouranthene
TCL Pest/PCB	2	3.3J	4,4'-DDD
8310 PAH	12	220	Chrysene
10SS09			
TCL VOC	2	62	Acetone
TCL SVOC	4	180J	Pyrene
TCL Pest/PCB	2	4.6J	4,4'-DDE
8310 PAH	8	79	Benzo(b)flouranthene
10SS10			
TCL VOC	2	7J	Acetone
TCL SVOC	none		
TCL Pest/PCB	none		
8310 PAH	6	140	Phenanthrene

Notes:

TCL	Target Compound List
TAL	Target Analyte List
VOC	volatile organic compounds
SVOC	semi-volatile organic compounds
Pest/PCB	pesticides and polychlorinated biphenyls
8310 PAH	SW846 (RCRA) polynuclear aromatic hydrocarbons
J	estimated concentration

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to the east of the OWS, and (2) the bottom of the retention pond.

The VOCs detected were: acetone, methylene chloride, carbon disulfide, and 2-butanone. Of these four, acetone, methylene chloride and 2-butanone are common laboratory contaminants, and may not actually be present in the soils at SWMU 10. The highest VOC concentration detected was that of acetone, at 62 μg/kg. Carbon disulfide, methylene chloride, and 2-butanone were present at 1 μg/kg, 6 μg/kg and 10 μg/kg, respectively. The SVOCs detected were generally polynuclear aromatic compounds, which are constituents of used oil. Some forms of phthalate (bis[2-ethylhexyl]phthalate or di-n-octyl phthalate) were also present in each sample that contained SVOCs. The pesticides detected were Dieldrin, DDT, DDE, and DDD.

<u>Subsurface Soil Sampling Results</u> Five soil borings were completed at SWMU 10. Sample locations are indicated on Figure 2. Analytical results are summarized on Table 2. One subsurface soil sample was collected from the 2-foot interval immediately above the water table in each boring. Samples were analyzed for the same set of analytes as the surface soil samples, described above. The analytical results indicate that three of the five subsurface soil samples contained detectable concentrations of VOCs (1-10,000 μg/kg); all contained SVOCs (47-38,000 μg/kg); 2 contained pesticides (1.1-14 μg/kg); all contained PAHs (6.6-18,000 μg/kg); and 4 contained apparently elevated TAL metals. Cyanide and PCBs were not detected in any subsurface soil sample.

Very high concentrations of individual organic compounds (VOCs, SVOCs, and PAHs) were detected in borings 10SB01 and 10SB03. These two borings are located in an area which most likely contains light, non-aqueous phase liquid (LNAPL) floating above the water table. The VOCs detected in borings 10SB01 and 10SB03 included compounds which are typical constituents of petroleum, and also chlorinated hydrocarbons such as 1,1-dichloroethane and 1,1,1-trichloroethane. As was the case for surface soils, SVOCs detected were generally polynuclear aromatic compounds, which are constituents of oil. Some forms of phthalate (bis[2-ethylhexyl]phthalate, butylbenzylphthalate, or di-n-butylphthalate) were also present in each sample that contained SVOCs. The pesticides detected in

Table 2
Summary of Analytical Results - SWMU 10

Subsurface Soil

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis	Number of Compounds Detected	Maximum Concentration (µg/kg)	Compound Detected at the Maximum Concentration
10SB01G			
TCL VOC	13	510	1,1,1-Trichloroethane
TCL SVOC	9	4600	2-Methylnaphthalene
TCL Pest/PCB	none		
8310 PAH	11	620	Pyrene
10SB02G			
TCL VOC	none		
TCL SVOC	3	130J	bis(2-Ethylhexyl)Phthalate
TCL Pest/PCB	4	13	4,4'-DDT
8310 PAH	1	4.4	Benzo(b)flouranthene
10SB02GD			
TCL VOC	none		
TCL SVOC	1	58J	bis(2-Ethylhexyl)Phthalate
TCL Pest/PCB	4	14	4,4'-DDT
8310 PAH	5	38	Benzo(g,h,i)perylene
10SB03E			
TCL VOC	5	9000J	Total Xylenes
TCL SVOC	1	35,000J	2-Methylnaphthalene
TCL Pest/PCB	none		
8310 PAH	16	18,000	Phenanthrene
10SB03ED			
TCL VOC	5	11,000J	Total Xylenes
TCL SVOC	1	41,000	2-Methylnaphthalene
TCL Pest/PCB	none		
8310 PAH	16	18,000	Phenanthrene
10SB04G			
TCL VOC	none		
TCL SVOC	3	1100	bis(2-Ethylhexyl)Phthalate
TCL Pest/PCB	1	1.3J	4,4'-DDE
8310 PAH	3	120	Benzo(b)flouranthene
10SB05G			
TCL VOC	1	2J	Carbon Disulfide
TCL SVOC	3	72J	Flouranthene
TCL Pest/PCB	none		
8310 PAH	3	13	Benzo(b)flouranthene

See notes at end of table.

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Table 2
Summary of Analytical Results - SWMU 10

Subsurface Soil

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis	Number of Compounds Detected	Maximum Concentration (µg/kg)	Compound Detected at the Maximum Concentration

Notes:

TCL	Target Compound List
TAL	Target Analyte List
VOC	volatile organic compounds
SVOC	semi-volatile organic compounds
Pest/PCB	pesticides and polychlorinated biphenyls
8310 PAH	SW846 (RCRA) polynuclear aromatic hydrocarbons
J	estimated concentration

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subsurface soils were Dieldrin, DDT, and DDE, as was the case for surface soils, and also alpha-Chlordane. DDD was not detected.

Groundwater Sampling Results Groundwater samples were collected from 5 wells and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals and cyanide, PAHs, SW846 method 8010 purgeable halocarbons (HVOCs), SW846 method 8040 phenols, and select metals for SW846, lower detection limit analysis. Monitoring well locations are indicated on Figure 2. Analytical results are summarized on Table 3. The analytical results indicate that 2 of the five groundwater samples contained detectable concentrations of VOCs (2.0-79.0 μg/l); 2 contained method 8010 halocarbons (2.4-5.3 μg/l); 1 contained SVOCs (1-53 μg/l); 3 contained PAHs (0.16-8.7 μg/l); and all samples contained 6 unfiltered TAL metals that are likely to exceed background. Phenols, cyanide, pesticides and PCBs were not detected in any groundwater sample.

The highest concentrations of organic compounds were detected in monitoring well 363-MW-01, which is located immediately adjacent to the OWS. LNAPL was found in the well, and groundwater from that well was contaminated with a variety of solvent and fuel-related VOCs, HVOCs, SVOCs, and PAHs. A sample of the LNAPL was collected for fingerprint analysis; the results of that analysis suggest that the LNAPL is primarily diesel fuel, which is representative of the oil likely to be found in bilge water. The wells downgradient of the OWS (363-MW-04 and 363-MW-05D) also contained detectable quantities of the following compounds: benzo(b)flouranthene and benzo(a)pyrene at 0.16 and 0.34 μg/l, respectively, in well 363-MW-05D, and 1,1-dichloroethane at 2.7 μg/l in 363-MW-04. Benzo(a)pyrene was also detected at 0.19 μg/l in the sample from 363-MW-04, but not in a duplicate sample taken at the same time. Wells 363-MW-06 and 363-MW-07 did not contain detectable concentrations of organic compounds.

This pattern of groundwater contamination is consistent with the results of groundwater sampling performed during the CA. During that study, groundwater samples were analyzed for a limited set of VOCs, PAHs, and total recoverable petroleum hydrocarbons; 363-MW-01 contained high concentrations of organic compounds, 363-MW-04 contained a low concentration of 1,1-dichloroethane, and the

Table 3
Summary of Analytical Results - SWMU 10

Groundwater

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis	Number of Compounds Detected	Maximum Concentration (µg/l)	Compound Detected at the Maximum Concentration
10GW01			
TCL VOC	5	79	Total Xylenes
TCL SVOC	8	53	Naphthalene
TCL Pest/PCB	none		
8310 PAH	6	42	Naphthalene
8040 Phenols	none		
8010 HVOC	2	5.3	1,1,1-Trichloroethane
10GW04			
TCL VOC	1	2J	1,1-Dichloroethane
TCL SVOC	none		
TCL Pest/PCB	none		
8310 PAH	1	0.19	Benzo(a)pyrene
8040 Phenols	none		
8010 HVOC	1	2.7	1,1-Dichloroethane
10GW04D			
TCL VOC	1	2J	1,1-Dichloroethane
TCL SVOC	none		
TCL Pest/PCB	none		
8310 PAH	none		
8040 Phenols	none		
8010 HVOC	1	2.4	1,1-Dichloroethane
10GW05D			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	none		
8310 PAH	2	0.34	Benzo(a)pyrene
8040 Phenols	none		
8010 HVOC	none		
10GW06			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	none		
8310 PAH	none		
8040 Phenols	none		
8010 HVOC	none		
10GW07			
TCL VOC	none		
TCL SVOC	none		
TCL Pest/PCB	none		
8310 PAH	none		
8040 Phenols	none		
8010 HVOC	none		

See notes at end of table.

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Table 3
Summary of Analytical Results - SWMU 10

Groundwater

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis	Number of Compounds Detected	Maximum Concentration (µg/l)	Compound Detected at the Maximum Concentration

Notes:

TCL	Target Compound List
TAL	Target Analyte List
VOC	volatile organic compounds
SVOC	semi-volatile organic compounds
Pest/PCB	pesticides and polychlorinated biphenyls
8310 PAH	SW846 (RCRA) polynuclear aromatic hydrocarbons
8010 HVOC	SW846 (RCRA) halogenated volatile organic compounds
J	estimated concentration

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other samples did not contain detectable concentrations of any of the organic compounds analyzed. Benzo(b)flouranthene and benzo(a)pyrene were not included in the CA analysis. Details of previous sampling are presented in the Final CSSPanama City RFI Phase 2 Workplan, dated March, 1994.

The existing wells at SWMU 10 allow adequate characterization of the groundwater contamination at SWMU 10. Well 363-MW-01 represents the source, 363-MW-04 and 363-MW-05D are downgradient contaminated wells, and 363-MW-06 and 363-MW-07 define a maximum lateral extent of contamination to the south because they are uncontaminated. Well 363-MW-03 was not sampled during the Phase 2 field program, but previous sampling during the Site 363 CA in 1992 did not detect any organic compounds. Therefore it appears to document lateral extent to the north. Well 363-MW-03 also suggests that the contamination detected at SWMU 10 does not originate from the tanks at Site 325, because 363-MW-03 is located between the two sites. This conclusion is also supported by the evidence that groundwater flow is to the east at SWMU 10, so that groundwater passing through Site 325 travels to the east, towards the bay, not to the south towards SWMU 10.

<u>Surface Water Sampling Results</u> Surface water samples were collected from St. Andrew Bay near SWMU 10 and submitted for analysis for TCL VOCs, SW846 method 8010 HVOCs, TCL SVOCs, TCL pesticides/PCBs, SW846 method 8310 PAHs, SW846 method 8040 phenols, TAL metals and cyanide, hardness, hexavalent chromium, and select metals for special lower detection limit analysis. Two samples, and one duplicate, were collected in the bay: 10SW01, 10SW02, and 10SW02D, at the north and south of the retention pond outfall, respectively (Figure 2). The SVOC n-Nitrosodiphenylamine was detected at 1 μg/l in the duplicate sample 10SW02D, but not in the sample 10SW02 collected at the same time. All other organic analytes were undetected in both samples. No apparently elevated inorganic analytes were detected except potassium, calcium, and sodium, which are natural constituents of sea water.

<u>Sediment Sampling Results</u> Two sediment samples, and a duplicate, (10SD01, 10SD02, 10SD02D) were collected at SWMU 10, at the same locations as the surface water samples. The samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs,

SW846 method 8100 PAHs, SW846 method 8310 PAHs, TAL metals and cyanide, total organic carbon (TOC), select metals for special lower detection limit analysis, and toxicity.

The sediment sample 10SD01, collected between the retention pond outfall and a second stormwater outfall located approximately thirty feet to the north (this second outfall is the one in which surface soil samples 10SS06, 10SS07, and 10SS08 were collected; these surface soil samples were contaminated with organic compounds), showed evidence of organic contamination. 10SD01 contained 2 method 8100 PAHs (39-58 μg/kg); 11 method 8310 PAHs (13-240 μg/kg); 2 pesticides (0.70-0.83 μg/kg); and 7 SVOCs (22-55 μg/kg). Both samples and the duplicate contained concentrations of 5 TAL metals which are likely to exceed background. No cyanide or PCBs were detected. 10SD02 and its duplicate, 10SD02D, contained only one SVOC (bis[2-Ethylhexyl]phthalate), at an average concentration of 58 μg/kg.

<u>Summary</u> In conclusion, as discussed in the previous paragraphs, there is significant detectable contamination in surface soils, subsurface soils, sediment, and groundwater at SWMU 10. The RFI Phase 2 sampling discussed above is considered adequate to complete the RFI and to perform the HEA. The sampling locations were effective in defining the nature of contamination and areas of highest contamination. Groundwater sampling was also sufficient to determine the extent of groundwater contamination.

Soil samples were not collected which can be identified as unimpacted by the waste oil releases from the OWS. Although exact areal extent of soil contamination cannot be determined from the RFI Phase 2 data, this lack of data regarding exact areal extent does not require further sampling at this time. The scale of the site is small, and enough information is available from existing data to make reasonable assumptions in the RFI report. If a CMS becomes necessary for SWMU 10, additional soil samples can be collected and analyzed during the Corrective Measure Implementation (CMI).

BUILDING 455 DATA EVALUATION AND CONCLUSIONS.

Building 455 was added to the CSS Panama City RFI after completion of the RFI Phase 1 when it was discovered, during a hazardous material minimization survey conducted in 1993, that rinse water from chemical stripping operations contained a listed hazardous waste, methylene chloride, which may have been released onto the ground around Building 455. Building 455 is located on Gull Circle, and is approximately 500 feet east of the burn area at SWMU 2. According to CSS Panama City personnel, this area was formerly known as Building 63. Building 63 was demolished in 1989 and Building 455 was built at the same location. Paint stripping activities were conducted at this location for at least 15 years (pre-1978 until June 1993). Sandblasting is still performed at the site to strip paint from metal parts.

Sampling Summary The following samples were collected at Building 455 during the RFI Phase 2 field program:

Sample Matrix	Samples	Duplicates	Total
Groundwater	4	0	4
Surface Soil	8	0	8
Subsurface Soil	15	1	16

Geologic/Hydrogeologic Evaluation The soils encountered at Building 455 in borings completed to a depth of 8 feet bls were fine grained, uniform, subangular quartz sand. The water table was found at depths of approximately 6 to 7 feet bls in the unconfined surficial aquifer.

Groundwater levels were recorded for monitoring wells 455-01 through 455-04 on 23 January, 1994. Groundwater elevations ranged from 7.96 feet NGVD at 455-03 to 10.43 feet at 455-01 . These measurements were contoured in conjunction with measurements from SWMU 2 and SWMU 9 to generate a preliminary groundwater elevation contour map (Figure 3). The data indicate groundwater flow to be in a direction of approximately 080° (10° north of East). Monitoring well 455-01 is upgradient of Building 455, well 455-02 is located near the potential release

WATER TABLE ELEVATION 1-23-94 (FT NGVD)

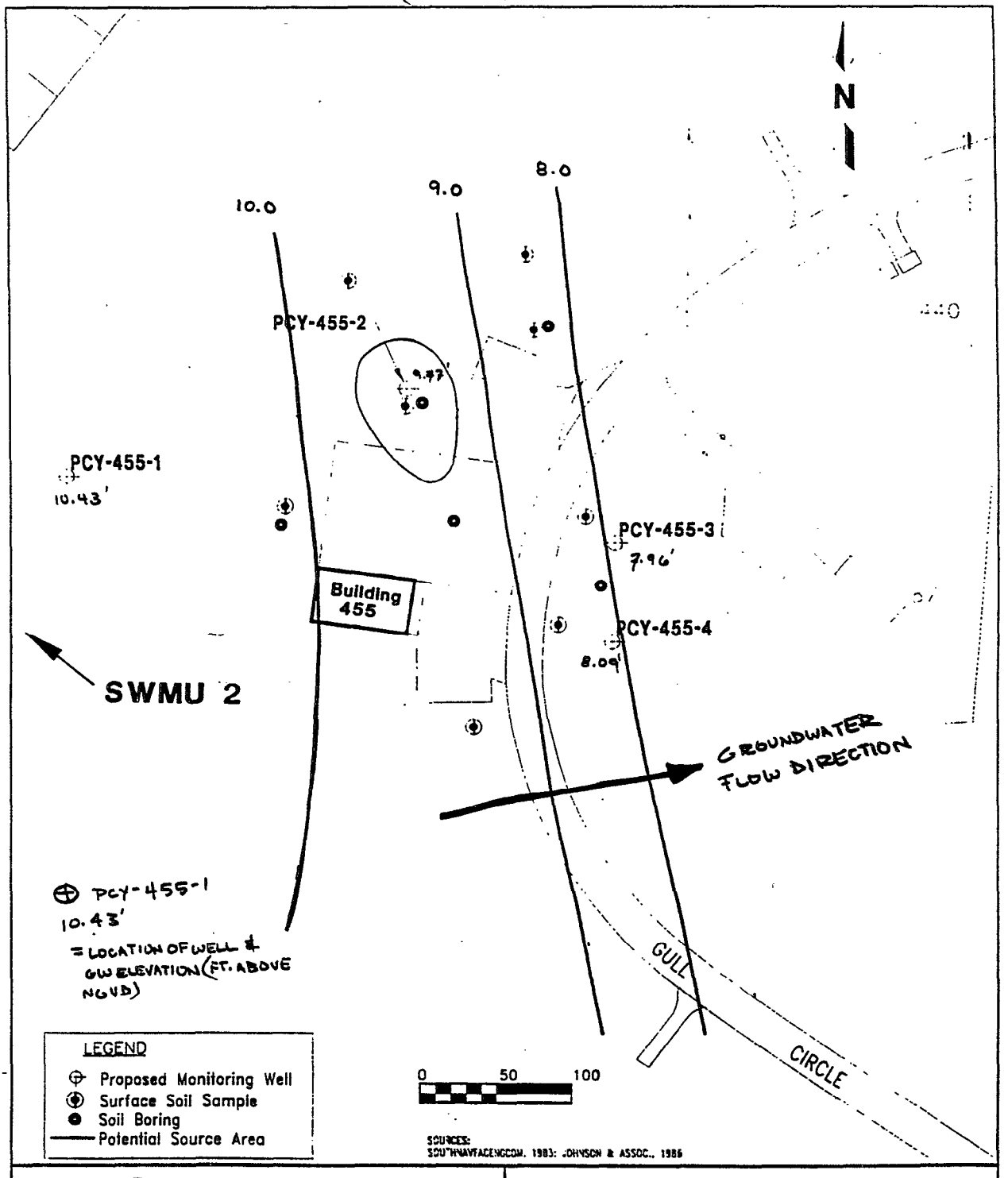

FIGURE 3

BUILDING 455, PAINT STRIPPING AREA

RCRA FACILITY INVESTIGATION WORKPLAN

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

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of methylene chloride, and both 455-03 and 455-04 are located downgradient of Building 455. The two downgradient wells are placed lateral to the potential release; their locations were selected based on water level contours extrapolated from SWMU 2 and SWMU 9 measurements collected in 1991. Those contours suggested a flow direction slightly south of east, but the actual flow direction, based on data from the new Building 455 wells, is slightly north of east. The placement of the downgradient wells, based on the new data, is downgradient of Building 455 itself, but lateral to the presumed location of the potential release of methylene chloride. Though the downgradient wells are not directly downgradient of the presumed release, this is not considered a data gap. Monitoring well 455-02 is located at the location of the reported release of methylene chloride. As detailed below, no trace of methylene chloride was detected in this well or in surface and subsurface soil samples collected nearby. These data suggest that it is unlikely that there was a detectable release of methylene chloride from the site.

All of the wells at Building 455 are screened to span the water table (each is screened for 10 feet). Well depths are 14 to 15 feet bls. The calculated hydraulic gradient (i) is 0.010 ft/ft. Hydraulic conductivity (K) was not measured at Building 455; the basewide geometric mean K value is 0.0038 ft/min. Assuming Darcian groundwater flow and an average effective porosity (n_e) of 0.30, these data yield an average groundwater flow velocity of 0.19 ft/day.

<u>Surface Soil Sampling Results</u> Locations for the 8 surface soil samples at Building 455 are indicated on Figure 4. Analytical results are summarized on Table 4. Samples were analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals and cyanide, and SW846 method 8310 PAHs. The analytical results indicate that all of the 8 surface soil samples contained detectable concentrations of SVOCs (45-2300 μg/kg); all samples contained pesticides (Dieldrin, DDE, and DDT) (2.8-930 μg/kg); 7 contained PAHs (3.6-4200 μg/kg); 7 contained the VOC acetone (2-18 μg/kg); 2 contained PCBs (230-710 μg/kg); and all samples contained elevated levels of TAL metals, especially lead and chromium.

The surface soil contamination does not appear to relate to the presumed source

LOCATIONS OF SAMPLING @ BUILDING 455

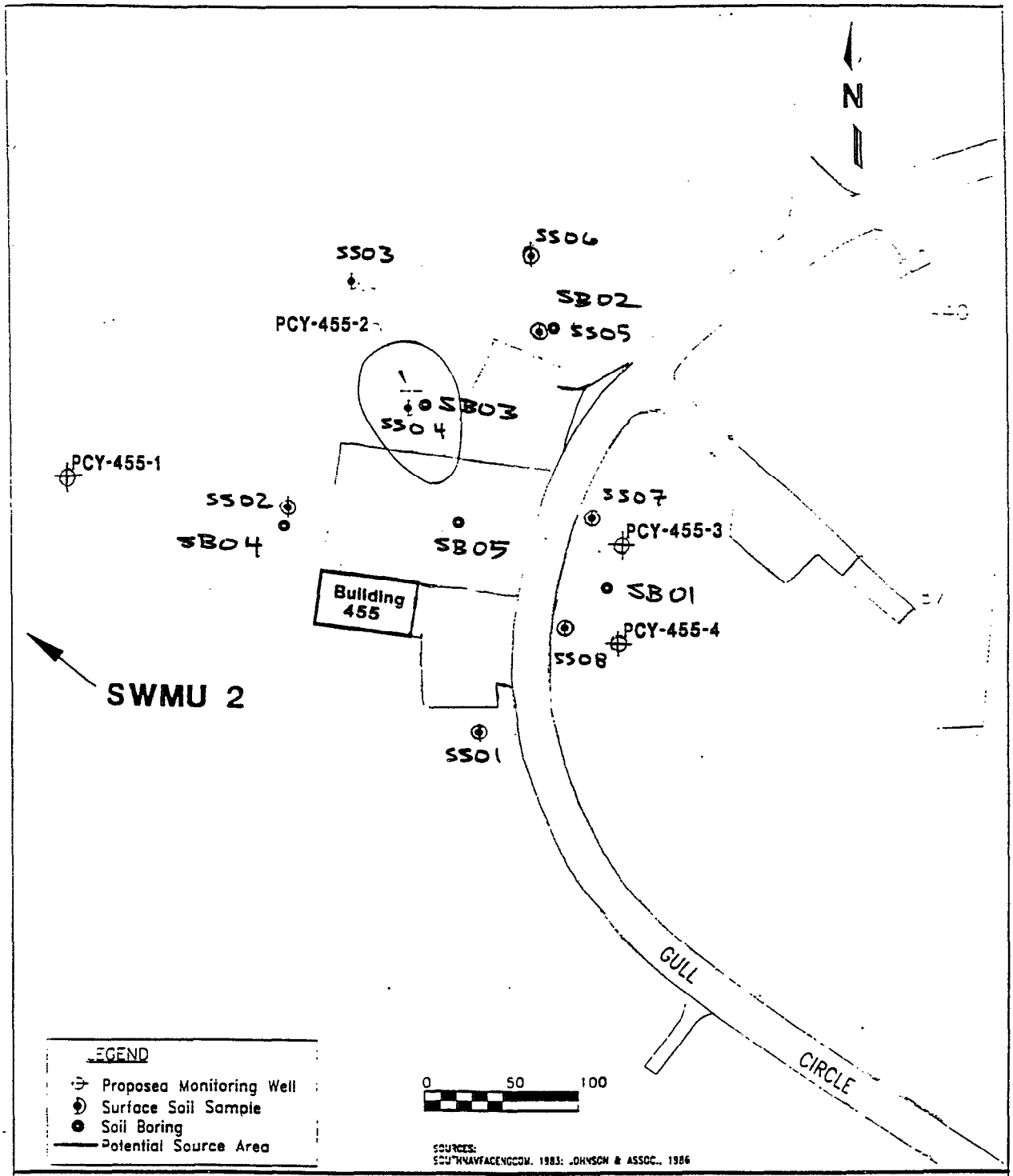

FIGURE 4

BUILDING 455, PAINT STRIPPING AREA

RCRA FACILITY INVESTIGATION

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

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Table 4
Summary of Analytical Results - Building 455

Surface Soil

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis		Number of Compounds Detected	Maximum Concentration (µg/kg - organics) (mg/kg - metals)	Compound Detected at the Maximum Concentration
15SS01				
	TCL VOC	1	8J	Acetone
	TCL SVOC	10	370	bis(2-Ethylhexyl)Phthalate
	TCL Pest/PCB	4	230	Aroclor-1254
	8310 PAH	11	270	Flouranthene
	Lead		436	
	Chromium		109J	
15SS02				
	TCL VOC	none		
	TCL SVOC	1	190	bis(2-Ethylhexyl)Phthalate
	TCL Pest/PCB	2	190	Dieldrin
	8310 PAH	none		
	Lead		15.2	
	Chromium		3.9J	
15SS03				
	TCL VOC	1	7J	Acetone
	TCL SVOC	8	700	Flouranthene
	TCL Pest/PCB	3	190	Dieldrin
	8310 PAH	13	4200J	Flouranthene
	Lead		150	
	Chromium		34.3J	
15SS04				
	TCL VOC	2	13J	Acetone
	TCL SVOC	3	880	bis(2-Ethylhexyl)Phthalate
	TCL Pest/PCB	2	56	Dieldrin
	8310 PAH	2	5.8	Benzo(b)flouranthene
	Lead		40.6	
	Chromium		45J	
15SS05				
	TCL VOC	1	18J	Acetone
	TCL SVOC	6	2300	bis(2-Ethylhexyl)Phthalate
	TCL Pest/PCB	1	12J	Dieldrin
	8310 PAH	4	21	Flouranthene
	Lead		515	
	Chromium		301J	
15SS06				
	TCL VOC	1	8J	Acetone
	TCL SVOC	7	210	Flouranthene
	TCL Pest/PCB	1	230	Dieldrin
	8310 PAH	7	95	Flouranthene
	Lead		88.1	
	Chromium		26.5J	

See notes at end of table.

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Table 4
Summary of Analytical Results - Building 455

Surface Soil

RCRA Facility Investigation Phase 2
CSS Panama City, Florida

Sample ID and Analysis		Number of Compounds Detected	Maximum Concentration (µg/kg - organics) (mg/kg - metals)	Compound Detected at the Maximum Concentration
15SS07				
	TCL VOC	1	7J	Acetone
	TCL SVOC	10	230	bis(2-Ethylhexyl)Phthalate
	TCL Pest/PCB	1	930	Dieldrin
	8310 PAH	12	220	Benzo(b)flouranthene
	Lead		64.3	
	Chromium		42J	
15SS08				
	TCL VOC	1	17J	Acetone
	TCL SVOC	16	1600	bis(2-Ethylhexyl)Phthalate
	TCL Pest/PCB	4	710J	Aroclor-1254
	8310 PAH	10	1400	Flouranthene
	Lead		315	
	Chromium		71.5	

Notes:

TCL	Target Compound List
TAL	Target Analyte List
VOC	volatile organic compounds
SVOC	semi-volatile organic compounds
Pest/PCB	pesticides and polychlorinated biphenyls
8310 PAH	SW846 (RCRA) polynuclear aromatic hydrocarbons
J	estimated concentration

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of contamination, the methylene chloride release. In part, the contamination appears to be related to sandblasting activities. Most significant are the levels of lead, total chromium, SVOCs, and PAHs. Concentrations detected are indicated on Table 4. The distributions of lead, chromium, SVOCs and PAHs in surface soils are similar, suggesting that these contaminants share a common source. The areas of contamination north of Building 455 correlate with areas in which black sandblasting sand covers the ground surface. The open areas surrounding the concrete work pad at Building 455 are covered to a depth of several inches with black-colored blasting sand. Deposits are thickest to the north of the pad, where sandblasting is presently performed, but is visible throughout the area. During the field sampling event, it was observed and noted that the blasting sand was intermixed with visible flakes of paint. Lead and chromium are common constituents of paint, as are some of the SVOCs detected. The origin of compounds detected to the south and east of Building 455 is unclear at this time. It may be related to windblown sandblasting sand.

Concentrations of lead detected were high (ranging from 15.2 mg/kg at 15SS02 to 515 mg/kg at 15SS05). The highest concentrations were detected to the north of the sandblasting area and to the south and east of the concrete pad surrounding the building. Data gaps exist to the north, south, and southeast. For purposes of risk assessment, the present dataset is adequate, but for purposes of CMS, which requires data on the extent of contamination, it is not. If a CMS becomes necessary for Building 455, additional soil samples required to determine the areal extent of contamination can be collected and analyzed during the Corrective Measure Implementation (CMI). Because the contamination appears to be related to the presence and distribution of black sandblasting sand, the areal extent may also be considered to be the areal extent of visible sandblasting sand.

The VOC acetone was detected in 7 of the 8 surface soil samples. Acetone is most likely a laboratory contaminant, and is probably not actually present in the soils at Building 455. The highest VOC concentration detected was that of acetone, at 18J μg/kg in 15SS05. The only other VOC detected in surface soils was chlorobenzene, at 2J μg/kg in 15SS04.

SVOCs detected in surface soils generally consisted of polynuclear aromatic compounds. Some forms of phthalate (bis[2-ethylhexyl]phthalate, butylbenzylphthalate, or di-n-octyl phthalate) were also present in each sample that contained SVOCs.

Pesticides (one or more of the following: Dieldrin, DDE, DDT) were consistently detected in all surface soil samples. Concentrations of Dieldrin, found in all samples, range from 12 μg/kg at 15SS05 to 930 μg/kg at 15SS07. The distribution of pesticides in the surface soils seems erratic and not related to activities at Building 455. High concentrations are found at samples 15SS07, 15SS02, 15SS03, and 15SS06, all of which are located at the periphery of the area investigated. The origin and distribution of pesticides in surface soils further from the site are not known.

PCBs were detected in two surface soil samples located near the roadway. Aroclor 1254 was detected in 15SS01 at a concentration of 230 μg/kg, and both Aroclor 1254 and Aroclor 1260 were detected in 15SS08, at concentrations of 710 and 420 μg/kg, respectively. The source of PCBs is not known.

<u>Subsurface Soil Sampling Results</u> Subsurface soils were collected at three depth intervals between 2 and 8 feet bls in each of the five soil borings conducted at Building 455 (indicated on Figure 4). Soil samples were analyzed for the same set of analytes as the surface soil samples. No organic compounds were detected in any of the five soil borings. Four TAL metals (chromium, iron, lead, and mercury) were found at detectable concentrations in all soil borings. The lack of detectable contamination, especially of compounds known to be used in the area, suggests that the subsurface soils have not been impacted by the stripping or sandblasting activities at Building 455.

<u>Groundwater Sampling Results</u> Groundwater was sampled from all four monitoring wells at the site for analysis for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals and cyanide, and SW846 method 8310 PAHs. No SVOCs, pesticides, or PCBs were detected in any well. The only VOC detected was carbon disulfide, at a concentration of 2 μg/l in well 455-2. The other samples contained no detectable

concentrations of VOCs. The PAH compound benzo(b)flouranthene was detected in three of the four wells, including the background well. Concentrations were as follows: 15GW01 (2.2 μg/l); 15GW02 (0.33 μg/l); 15GW03 (0.25 μg/l). Elevated TAL chromium was found in samples 15GW02 and 15GW03 (173 μg/l and 446 μg/l, respectively).

The fact that benzo(b)flouranthene was detected upgradient of Building 455 at higher concentrations than downgradient suggests that the source of that compound is upgradient of Building 455, and does not relate to activities at Building 455. In that case, the detection of benzo(b)flouranthene does not constitute a data gap for this site.

Summary In summary, as described in the previous paragraphs, there is detectable contamination in the surface soils at Building 455. However, that contamination does not appear to extend to subsurface soil or groundwater. The source of surface soil contamination is something other than the solvent paint stripping operations that made Building 455 a site for the RFI. There are no gaps in the characterization of Building 455 regarding the use of methylene chloride; the data indicate that it is not present. The contamination appears to relate to windblown dispersal of blasting sand and associated paint chips, and to unknown, non-point sources of pesticides, and unknown sources of PCBs. The contamination is limited to surface soils. The existing set of samples is sufficient to quantify the risks posed by those contaminants. However, the areal extent of those contaminants is not defined by the existing set of surface soil samples. If a CMS becomes necessary for Building 455, additional soil samples can be collected and analyzed during the Corrective Measure Implementation (CMI). Alternatively, because the contamination appears to be related to the presence and distribution of black sandblasting sand, the areal extent may also be considered to be the areal extent of visible sandblasting sand.

In conclusion, for both SWMU 10 and Building 455, sufficient data is available to complete the RFI and to perform an HEA as a part of the CSS Panama City RFI report. The nature of contamination is well documented, and areas of maximum contamination have been identified. The lateral extent of soil contamination at both sites is not explicitly known from the existing data.

ABB

MEMORANDUM

Date: August 12, 1994

To: Jim Reed

From: Mark Woodruff and Steve Watson

Subject: Development of groundwater and subsurface soil data sets for the CSS Panama City RFI Report

The Coastal Systems Station (CSS) Panama City Resource Conservation and Recovery Act Facility Investigation (RFI) was conducted in two Phases, Phase 1 in 1991 and Phase 2 in 1993/1994. For groundwater and subsurface soil, sampling results from both phases will be combined to develop data sets for risk assessment and contaminant nature and distribution evaluation. The management and uses of groundwater and subsurface soil data from the RFI Phase 1 and 2 field investigations are described in the following paragraphs.

Groundwater

Phase 1 and Phase 2 groundwater samples were collected from the same wells (except for new wells installed during Phase 2 and selected wells which were not resampled during Phase 2). Phase 1 samples were analyzed using SW-846 methods and Phase 2 samples were analyzed using a combination of Contract Laboratory Program (CLP) and SW-846 methods. In cases where groundwater samples were collected from the same monitoring wells, each sampling round can be used to develop an independent evaluation of groundwater contamination. Because the Phase 2 data are more recent it will be the basis of the risk assessment data set. In some cases, the Phase 2 data will be supplemented with Phase 1 data. The following guidelines will be used to determine what data are used in the risk assessment data set:

- For monitoring wells where Phase 2 groundwater samples were analyzed for all parameters (i.e., volatile organics, semivolatile organics, pesticides, polychlorinated biphenyls, and inorganics), only the Phase 2 data will be used.

- For monitoring wells where Phase 2 groundwater samples were analyzed for a partial set of parameters because Phase 1 data indicated that some parameters were not present or only present at very low concentrations, data for the missing parameters will be taken from the Phase 1 data set.

- For monitoring wells where no groundwater samples were collected during Phase 2, Phase 1 data will be used.

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ABB Environmental Services Inc.

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Arlington, Virginia 22204

Table 1, developed using these guidelines, shows which groundwater data will be used for each monitoring well. As indicated by the table, the groundwater data sets for Solid Waste Management Units (SWMUs) 3, 9, and 10 and Building 455 will contain only Phase 2 data and the groundwater data sets for SMWUs 1, 2, and 5 and Areas of Concern 1 and 2 will contain a mixture of Phase 1 and 2 data.

The groundwater data set developed for risk assessment will also be used to evaluate the nature and distribution of contaminants. Additional Phase 1 groundwater sampling results will only be considered as historical information during the nature and distribution evaluation.

Subsurface Soil

Subsurface soil samples were collected during Phase 1 and analyzed using SW-846 methods. Data gaps were identified after Phase 1 data was evaluated and Phase 2 sampling locations were selected to supplement Phase 1 explorations. The Phase 2 samples were collected and analyzed using a combination of CLP and SW-846 methods. Because Phase 1 and Phase 2 subsurface soil samples were collected at different locations, data from both phases are needed to develop a complete understanding of subsurface soil contamination. Therefore, Phase 1 and 2 subsurface soil data will be combined into one data set for risk assessment and nature and distribution evaluation.

TABLE 1
GROUNDWATER ANALYSES FOR USE IN RISK ASSESSMENT

RCRA FACILITY INVESTIGATION
CSS PANAMA CITY, PANAMA CITY, FLORIDA

Site	Well	Phase 1 Sample ID	Phase 2 Sample ID	VOA	SVOA	PEST/PCB	METAL (TOTAL)	METAL (DIS.)	Cyanide
Background	PCY-0-1D		00GW01D	2	2	2	2	2	2
	PCY-0-1S		00GW01S/D	2	2	2	2	2	2
	PCY-0-2S		00GW02S	2	2	2	2	2	2
SWMU 1	PCY-1-1	01MW101	01GW01	2	2	1	2	2	2
	PCY-1-1D	01MW1D01	01GW01D	2	2	1	2	2	2
	PCY-1-1S	01MW1S01	01GW01S	2	2	1	2	2	2
	PCY-1-2	01MW201	01GW02	2	2	1	2	2	2
	PCY-1-2S	01MW2S01	01GW02S	2	2	1	2	2	2
	PCY-1-3	01MW301		1	1	1	1		
SWMU 2	PCY-2-1	02MW101	02GW01	1	1	2	2	2	
	PCY-2-1D		02GW01D	2	2	2	2	2	2
	PCY-2-1S	02MW1S01	02GW01S	1	1	2	2	2	
	PCY-2-2	02MW201	02GW02	2	1	1	2	2	
	PCY-2-2S	02MW2S01/D	02GW02S/D	2	2	1	2	2	
	PCY-2-3	02MW301	02GW03	1	1	1	2	2	
	PCY-2-4	02MW401	02GW04	1	1	1	2	2	
	PCY-2-5S	02MW5S01	02GW05S	2	1	1	2	2	
	PCY-2-6S	02MW6S01	02GW06S	2	1	1	2	2	
	PCY-2-7I	02MW7I01	02GW07I	2	1	1	2	2	2
	PCY-2-7S	02MW7S01	02GW07S	2	1	1	2	2	2
SWMU 3	PCY-3-1		03GW01	2	2	2	2	2	2
	PCY-3-2		03GW02	2	2	2	2	2	2
SWMU 5	PCY-5-1	05MW101		1	1	1	1		
	PCY-5-2	05MW201	05GW02	2	1	1	1		
	PCY-5-3S	05MW3S01		1	1	1	1		
	PCY-5-4S	05MW4S01		1	1	1	1		

TABLE 1
GROUNDWATER ANALYSES FOR USE IN RISK ASSESSMENT

RCRA FACILITY INVESTIGATION
CSS PANAMA CITY, PANAMA CITY, FLORIDA

Site	Well	Phase 1 Sample ID	Phase 2 Sample ID	VOA	SVOA	PEST/PCB	METAL (TOTAL)	METAL (DIS.)	Cyanide
SWMU 9	PCY-9-1S		09GW01S	2	2	2	2	2	2
	PCY-9-2S		09GW02S	2	2	2	2	2	2
	PCY-9-3I		09GW03I	2	2	2	2	2	2
	PCY-9-3S		09GW03S	2	2	2	2	2	2
	PCY-9-4S		09GW04S/D	2	2	2	2	2	2
	PCY-9-5S		09GW05S	2	2	2	2	2	2
SWMU 10	PCY-10-1		10GW01	2	2	2	2	2	2
	PCY-10-4		10GW04	2	2	2	2	2	2
	PCY-10-4D		10GW04D	2	2	2	2	2	2
	PCY-10-5D		10GW05D	2	2	2	2	2	2
	PCY-10-6		10GW06	2	2	2	2	2	2
	PCY-10-7		10GW07	2	2	2	2	2	2
AOC 1	PCY-13-1	13MW101	13GW01	2	2	1	2	2	2
	PCY-13-1S	13MW1S01	13GW01S	2	2	1	2	2	2
	PCY-13-2	13MW201		1	1	1	1		
	PCY-13-2D	13MW2D01		1	1	1	1		
	PCY-13-2S	13MW2S01		1	1	1	1		
	PCY-13-3	[redacted]	[redacted]	2	2	1	2	2	2
	PCY-13-3D	13MW3D01	13GW03D/D	2	2	1	2	2	2
	PCY-13-4I	[redacted]	[redacted]	2	2	1	2	2	2
	PCY-13-4S	13MW4S01	13GW04S	2	2	1	2	2	2
	PCY-13-5I	13MW5I01	13GW05I	2	2	1	2	2	2
	PCY-13-5S	13MW5S01	13GW05S	2	2	1	2	2	2
	PCY-13-6I	[redacted]	[redacted]	2	2	1	2	2	2
	PCY-13-6S	[redacted]	[redacted]	2	2	1	2	2	2
	PCY-13-7I	13MW7I01	13GW07I/D	2	2	1	2	2	2
	PCY-13-7S	13MW7S01/D	13GW07S	2	2	1	2	2	2

TABLE 1
GROUNDWATER ANALYSES FOR USE IN RISK ASSESSMENT

RCRA FACILITY INVESTIGATION
CSS PANAMA CITY, PANAMA CITY, FLORIDA

Site	Well	Phase 1 Sample ID	Phase 2 Sample ID	VOA	SVOA	PEST/PCB	METAL (TOTAL)	METAL (DIS.)	Cyanide
AOC 1 (cont.)	PCY-13-8I		13GW08I	2	2		2	2	2
	PCY-13-8S		13GW08S	2	2		2	2	2
	PCY-13-9I		13GW09I	2	2		2	2	2
	PCY-13-9S		~~13GW09S~~	2	2		2	2	2
AOC 2	PCY-14-1	14MW101/D	14GW01	2	2	1	2	2	2
	PCY-14-1S	14MW1S01	14GW01S	2	2	1	2	2	2
	PCY-14-2D	14MW2D01	14GW02D	1	1	1	2	2	
	PCY-14-2S	14MW2S01	14GW02S	1	1	1	2	2	
	PCY-14-3S	14MW3S01		1	1	1	1		
	PCY-14-5	14MW501	14GW05	2	2	1	2	2	2
	PCY-14-6	14MW601/D	14GW06	2	2	1	2	2	2
Bldg. 455	PCY-15-1		15GW01	2	2	2	2	2	2
	PCY-15-2		15GW02	2	2	2	2	2	2
	PCY-15-3		15GW03	2	2	2	2	2	2
	PCY-15-4		15GW04	2	2	2	2	2	2

Notes:

The numbers 1 and 2 indicate which phase of the investigation is the source of the data

VOA - volatile organic analytes
SVOA - semivolatile organic analytes
PEST/PCB - pesticides and polychlorinated biphenyls
DIS - dissolved