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ADDENDUM 8 TO THE HEALTH AND SAFETY PLAN FOR REMEDIATION OF SOURCES OF  
CONTAMINATION AT SOLID WASTE MANAGEMENT UNITS 1, 2, 3 AND 7, JET ENGINE  
TEST CELL, SITES 1, 3, 7 AND 8 AND AREAS OF CONCERN SITES A AND B NAS KEY  
WEST FL  
1/31/1995  
BECHTEL ENVIRONMENTAL INC

ADDENDUM NO. 8  
TO THE  
SITE SAFETY AND HEALTH PLAN  
DELIVERY ORDER NO. 0004 AT  
NAS KEY WEST, FLORIDA

Prepared for

DEPARTMENT OF THE NAVY  
SOUTHERN DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND

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## 1.0 GENERAL INFORMATION

This Task-Specific Safety and Health Plan (TSSHP) addresses safety and health issues related to the remediation of the sources of contamination at the Naval Air Station (NAS) Key West, Solid Waste Management Units (SWMU) 1, 2, 3, and 7, Jet Engine Test Cell (JETC), Installation Restoration (IR) sites 1, 3, 7, and 8, and Area of Concern (AOC) sites A and B. In addition to these task-specific requirements, general requirements are given in the Naval Remedial Action Contract (Navy RAC) Program Safety and Health Policy (PSHP), the Site Safety and Health Plan (SSHP) for Navy RAC Bases, the safety and health standard operating procedures (Navy RAC SOPs) for the Navy RAC program, and other work controlling documents such as hazardous work permits (HWPs). 

The TSSHP has been developed in compliance with requirements of 29 CFR 1910.120 (b) for a Site Safety and Health Plan.

The TSSHP is issued under controlled distribution. A TSSHP may be revised during the annual review process or at any time it is apparent that there has been a change in site conditions or scope of work. In addition, the Bechtel Environmental, Inc. (BEI) Program Safety and Health Manager (SHM) and/or the Navy Contracting Officer (CO) reserves the right to require changes to the TSSHP and operations as necessary to ensure the safety and health of persons on or near the site. BEI will revise the TSSHP if it does not protect site workers, the general public, or the environment. Any revision to an approved TSSHP shall require the written concurrence of the CO and the SHM. Changes are typically done by completing the Field Change Notices/Requests found in the SSHP.

All site safety and health personnel shall be familiar with the information and requirements contained in the TSSHP. Levels of protection may be up or downgraded by the Site Safety and Health Representative (SSHR) based on site conditions and air sampling results.

Appendixes A, B, and C contain additional descriptions of site activity, maps delineating anticipated work zones, and maps indicating hospital routes to be used in emergencies. 

### 1.1 IDENTIFICATION

Site Name: NAS Key West  
Site Location: Key West, Florida, including Boca Chica Island, Fleming Key, and Demolition Key  
Client: Department of the Navy Southern Division Naval Facilities Engineering Command (SOUTHDIVNAVFACENGCOM) 

### 1.2 DESCRIPTION OF ACTIVITIES

The following general categories of work are covered by this plan:

- Remedial Action (RA) of soil and groundwater
- Construction of a shoreline protection system 

Table 1-1 shows the activities and their descriptions.

Activity	SWMU No. 1	SWMU No. 2	SWMU No. 3	SWMU No. 7	Jet Engine Test Cell	IR Site No. 1	IR Site No. 3	IR Site No. 7	IR Site No. 8	AOC <sup>c</sup> Site A	AOC Site B
1 Mobilization/demobilization	X	X	X	X	X	X	X	X	X	X	X
2 Clear and grub sites using excavator, front end loader	X	X	X	NA	NA	NA	X	X	X	X	X
3 Excavate contaminated soils < 4 feet using excavator, front end loader	X	X	X	X	NA	X	X	NA	NA	X	X
4 Excavate contaminated soils > 4 feet using excavator, front end loader	NA	NA	NA	NA	NA	NA	X	NA	NA	NA	NA
5 Transport contaminated soils using trucks, front end loaders, and barges	X	X	X	X	NA	X	X	NA	NA	X	X
6 Installation of treatment plant	NA	NA	NA	NA	X	NA	NA	NA	NA	NA	NA
7 O&M of GW treatment facility	NA	NA	NA	NA	X	NA	NA	NA	NA	NA	NA
8 Sampling of soils and GW	X	X	X	X	X	X	X	X	X	X	X
9 Decontamination of equipment using pressurized spray equipment	X	X	X	X	X	X	X	NA	NA	X	X
10 Drill and develop wells using drill rig, compressors	NA	NA	NA	NA	X	NA	NA	NA	NA	NA	NA
11 Regrade surface water runoff structures using graders and/or compacters	X	X	X	NA	NA	X	X	X	NA	NA	X
12 Shoreline protection system installation using backhoe, front end loader	NA	NA	NA	NA	NA	NA	NA	NA	X	NA	NA

<sup>a</sup>Chemical contaminations for each site is listed in Table 2-1 and 2-2.

<sup>b</sup>Personal protective equipment for each activity is listed in Table 7-1.

<sup>c</sup>Possible unexploded ordinance at AOC Site A

Table 1-1  
Activity Description<sup>a,b</sup>

### 1.3 SITE HISTORY

Location, description, and history of the NAS Key West is found in Attachment D of the SSHP.

#### 1.3.1 Site Type and Regulatory Status

- Active
  - Secured
  - Federal Government
- a. CERCLA/SARA : FDEP (IR and AOC sites)  
b. RCRA : USEPA (SWMU sites)  
c. OSHA : 29 CFR 1910 and 1926, State (all sites)



#### 1.3.2 Site Owner

United States Navy

## 2.0 HAZARD ANALYSIS

### 2.1 TYPES OF HAZARDS

#### 2.1.1 Physiochemical Hazards Listing

- Flammable chemicals
- Ingestion exposure
- Mutagen
- Toxic inorganic chemicals
- OSHA specific hazard substance standards
  - 29 CFR 1926.62 Lead
  - 29 CFR 1926.1117 Vinyl Chloride
  - 29 CFR 1926.1128 Benzene
- Toxic organic chemicals
- Skin absorption
- Inhalation exposure
- Carcinogen
- Neurotoxin
- Explosive
- Contact exposure

#### 2.1.2 Biological Hazards Listing

- Poisonous plants (poison ivy, poison oak)
- Insects (mosquitos, spiders, ticks, etc.)
- Dangerous wildlife (snakes)

#### 2.1.3 Radiation Hazard Listing

- UV sunlight

#### 2.1.4 Physical Hazards and General Safety Hazard Listing

- Ladders
- Heavy lifting
- Pinch points
- Intense sunlight
- Trenching
- Hand tools (power tools)
- Remote areas
- Cave-ins
- Confined space
- Excavations
- Underground utilities
- Slips, trips, falls
- Traffic
- High-pressure water
- Overhead utilities
- Compressed gas
- Traffic
- Flying debris
- Heavy equipment use
- Electrical connections
- Heat
- Noise
- Welding/cutting
- Explosives
- Drowning

#### 2.1.5 Other Hazards

- Animals

#### 2.1.6 Marine Operations

The maritime work place is regulated by both the Occupational Safety and Health Administration (OSHA) and the U.S. Coast Guard (USCG). When conflicts arise, the USCG regulations take precedence.

Workers and visitors shall wear USCG-approved personal flotation devices (PFDs) when transferring from or to marine transportation and working over water near unguarded edges. PFDs must be securely fastened when worn.

Employees involved in material or equipment transfers are required to wear PFDs. Workers shall not work under suspended loads and shall stay clear of the swing radius of cranes. Material and equipment must be securely tied down to the boat or barge to avoid shifting in rough water.

All marine equipment, barges, boats, and platforms shall display appropriate markings, aids to navigation, lights, and fog signals required by the USCG. Lights must be protected from paint overspray or damage by other construction activities. Navigational aid must be kept in operating condition at all times. Damaged or extinguished lights shall be reported immediately for repair.

Operators of all watercraft must hold the appropriate certification from the USCG.

When operations are being conducted at locations which must be accessed by boat, backup transportation must be available. It shall not be acceptable to work at a remote location and not have transportation readily available. When a work crew is present on an island location without an alternate means of access, one boat must present at all times.

## 2.2 KNOWN AND/OR SUSPECTED CHEMICAL HAZARDOUS MATERIALS ONSITE

### 2.2.1 Chemical Hazards

Known or suspected hazardous chemicals identified include the constituents of oil and petroleum products, household waste, pesticides, JP-5, solvents, transformer oils, rubble, and **possible unexploded ordnance** (AOC Site A).

### 2.2.2 Chemical Hazard Assessment

The chemical hazard for the work is moderate. Tables 2-1 and 2-2 indicate chemicals and their known maximum concentration ranges in soils and groundwater. These tables were prepared for chemicals identified within or near the areas in which BEI will perform interim remedial actions (IRA). Chemicals outside these areas do not present a hazard to the IRA. Table 2-3 shows exposure limits, the symptoms of exposure, harmful effects of exposure, routes of exposure, and methods for detection.

The SSHR will implement an air monitoring program to confirm on a day-to-day basis that chemical hazards are not present. If new information indicates soil, water, or sediment contamination is significantly different than specified in this TSSHP, the plan will be revised to address the additional requirements.

## 2.3 UNEXPLODED ORDNANCE

AOC Site A, Demolition Key Open Disposal Area, utilized open burning and/or open detonation to dispose of explosives. During excavation work, BEI or the Navy will provide a qualified individual to assist in identification of ordnance and methods to be used to eliminate hazards.

In the event ordnance and explosive waste are encountered, they will be dealt with in strict accordance with Navy RAC SOP 2.1.17E (Ordnance and Explosive Waste). Bechtel personnel will stop work and evacuate the affected area until the Navy ordnance personnel deems the area safe for work to continue.

## 3.0 MEDICAL SURVEILLANCE

In addition to the basic medical examination described in Navy RAC SOP 2.1.80, workers participating in the activities covered under TSSHP shall receive the tests specified in Table 3-1. Workers outside regulated areas **with no potential for exposure are exempted** from the medical surveillance program. Exemption is determined on a case-by-case basis by the SHM.

**Table 2-1**  
**Maximum Contaminants of Concern Concentrations in Soils and Sediment**

Contaminant (mg/kg) <sup>a</sup>	SWMU No. 1	SWMU No. 2	SWMU No. 3	SWMU No. 7	Jet Engine Test Cell	IR Site No. 1	IR Site No. 3	IR Site No. 7	IR Site No. 8	AOC Site A	AOC Site B
<b>Volatiles</b>											
Benzene	ND	ND	ND	ND	NS	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	40	ND	NS	ND	ND	ND	ND	ND	ND
<b>Semivolatile</b>											
Naphthalene	ND	ND	40	ND	NS	ND	ND	ND	ND	ND	ND
Aroclor 1260	ND	ND	ND	19	NS	10	ND	ND	ND	ND	ND
<b>Pesticides</b>											
Chlordane	ND	24	ND	ND	NS	ND	ND	ND	ND	ND	ND
4,4 DDD	0.21	340	ND	ND	NS	0.036	26	ND	ND	ND	ND
4,4 DDE	0.11	29	ND	ND	NS	0.037	61	ND	ND	ND	ND
4,4 DDT	ND	180	ND	ND	NS	0.11	14	ND	ND	ND	ND
Lindane	ND	0.67	ND	ND	NS	ND	ND	ND	ND	ND	ND
<b>Metals</b>											
Antimony	31.9	ND	ND	ND	NS	6.8	ND	50.3	ND	43.5	8.9
Arsenic	4.5	8	ND	10.9	NS	38	213	84	8.1	19.3	9
Cadmium	94.1	2.3	ND	ND	NS	ND	ND	ND	ND	ND	15.6
Chromium	2700	ND	ND	ND	NS	ND	ND	ND	ND	ND	67.4
Lead	12,300	90.3	136	ND	NS	10,600	1050	32.5	27.4	2100	237
Mercury	8.0	0.11	0.14	ND	NS	0.12	ND	0.24	0.2	ND	2.4
Nickel	18.8	3.3 <sup>b</sup>	ND	ND	NS	78.4	ND	9.2	5.9	34.3	ND

<sup>a</sup>All values are mg/kg

<sup>b</sup>Estimated value

NS - Not sampled

ND - Not detected in area included in IRA scope of work

Source: "RCRA Facility Investigations/Remedial Investigation for SWMU 1, 2, 3, 4, 5, 7, IR Site 1, 3, 7, 8, AOC Site A and B" June 7, 1994; IT Corporation.

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**Table 2-2  
Maximum Chemicals of Concern Concentrations in Groundwater<sup>a</sup>**

Chemical	SWMU <sup>c</sup> #1	SWMU <sup>c</sup> #2	SWMU <sup>c</sup> #3	SWMU <sup>c</sup> #7	Jet Eng <sup>b</sup> Test Cells	IR Site 1 <sup>c</sup>	IR Site 3 <sup>c</sup>	IR Site 7 <sup>c</sup>	IR Site 8 <sup>c</sup>	AOC A <sup>c</sup>	AOC B <sup>c</sup>
<b>Volatiles</b>											
Benzene	ND	54	ND	ND	56 ppb	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	120	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2 - dichloroethene	ND	770	ND	ND	2800 ppb	ND	ND	ND	ND	ND	ND
1,1,1 Trichloroethane	ND	ND	ND	ND	3.9 ppb	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	44 ppb	ND	ND	ND	ND	ND	ND
Vinyl Chloride	3.2	ND	17	ND	ND	ND	ND	ND	ND	ND	ND
<b>Semivolatiles</b>											
Naphthalene	ND	ND	40	ND	340 ppb	ND	ND	ND	ND	ND	ND
<b>Inorganics</b>											
Antimony	251	88	152	ND	ND	563	83.2	292	231	249	240
Arsenic	94.5	ND	ND	ND	ND	ND	ND	ND	104	ND	83.4
Cadmium	ND	ND	ND	ND	ND	42.3	ND	ND	ND	52.2	6.2
Chromium	ND	ND	ND	ND	ND	394	ND	269	ND	ND	428
Lead	39.2 <sup>d</sup>	ND	ND	ND	ND	2170	26.9	2000	553	1610	309
<b>Pesticides</b>											
Aldrin	ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4 DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4 DDE	ND	3.8	ND	ND	ND	ND	0.84	0.28	ND	ND	ND
4,4 DDT	ND	6.9	ND	ND	ND	ND	0.5	0.42	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND	1.2	ND	ND	ND	ND
Cyanide	310	ND	ND	ND	ND	ND	ND	270	ND	ND	ND

<sup>a</sup>All values are µg/l unless noted otherwise.

<sup>b</sup>Source: Contamination Assessment Report Jet Engine Test Cell Building A968, June 1994, ABB Environmental Services, Inc.

<sup>c</sup>Source: "RCRA Facility Investigations/Remedial Investigation for SWMU 1,2,3,4,5,7, IR Site 1,3,7,8, AOC Site A and B," June 7, 1994, IT Corporation

<sup>d</sup>Estimated value

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**Table 2-3  
Chemical Hazard Information**

Chemical	Exposure limits <sup>a</sup>	Harmful effects	Symptoms	Method of analysis	Routes of Exposure
<b>Volatiles</b>					
Benzene	AL <sup>a</sup> : 0.5 ppm PEL <sup>a</sup> : 1 ppm STEL <sup>b</sup> : 5 ppm TLV <sup>b</sup> : 0.1 ppm IDLH <sup>c</sup> : 3000 ppm	Blood, CNS, skin, bone marrow, eyes, respiratory system, carcinogen	Irritated eyes, nose, respiratory system; giddiness; headache; nausea; staggering gait; fatigue; anorexia; lassitude; dermatitis	Charcoal tube	Inhalation; skin absorption; ingestion; contact
Chlorobenzene	AL <sup>a</sup> : PEL <sup>a</sup> : 75 ppm STEL <sup>b</sup> : TLV <sup>b</sup> : 10 ppm IDLH <sup>c</sup> : 2400 ppm	Respiratory system, eyes, skin, CNS, liver	Irritated eyes, nose, skin; drowsiness; uncoordinated; liver, lung, kidney damage	Charcoal tube	Inhalation; ingestion; contact
1,1-Dichloroethane	AL <sup>a</sup> : PEL <sup>a</sup> : 100 ppm STEL <sup>b</sup> : TLV <sup>b</sup> : 100 ppm IDLH <sup>c</sup> : 4000 ppm	Respiratory system, eyes, skin, CNS, liver	Irritated eyes, nose, skin; drowsiness; uncoordinated; liver, lung, kidney damage; depression	Charcoal tube	Inhalation; ingestion; contact
1,2-Dichloroethene	AL <sup>a</sup> : PEL <sup>a</sup> : 100 ppm STEL <sup>b</sup> : 125 ppm TLV <sup>b</sup> : 200 ppm IDLH <sup>c</sup> : 4000 ppm	Eyes, upper respiratory system, skin, CNS	Irritated eyes, mucous membrane; headache; dermatitis; narcolepsy; coma	Charcoal tube	Inhalation; ingestion; contact
Trichloroethene (TCE)	AL <sup>a</sup> : PEL <sup>a</sup> : 50 ppm STEL <sup>b</sup> : 200 ppm TLV <sup>b</sup> : 50 ppm IDLH <sup>c</sup> : 1000 ppm	Respiratory system, liver, heart, kidneys, CNS, skin	Headache, vertigo; vision disturbances; tremors; somnolence; nausea, vomiting; eye irritation; dermatitis	Charcoal tube	Inhalation; ingestion; contact
1,1,1-Trichloroethane (Methyl Chloroform)	AL <sup>a</sup> : PEL <sup>a</sup> : 350 ppm STEL <sup>b</sup> : 450 ppm TLV <sup>b</sup> : 350 ppm IDLH <sup>c</sup> : 1000 ppm	Respiratory system, liver, heart, kidneys, CNS, skin	Headache, vertigo, vision disturbances; tremors; somnolence; nausea, vomiting; eye irritation; dermatitis; cardiac arrhythmias; paresthesia	Charcoal tube	Inhalation; ingestion; contact

**Table 2-3 (cont.)  
Chemical Hazard Information**

Chemical	Exposure limits <sup>a</sup>	Harmful effects	Symptoms	Method of analysis	Routes of Exposure		
Vinyl Chloride (Chloroethene)	AL <sup>a</sup> :	1 ppm	Liver, CNS, blood, respiratory system, lymphatic system	Weakness; abdominal pain, GI bleeding; pallor or cyanosis of extremities; carcinogen	Two charcoal tubes in series	Inhalation	
	PEL <sup>a</sup> :						
	STEL <sup>b</sup> :						
	TLV <sup>b</sup> :	5 ppm					
	IDLH <sup>c</sup> :						
<b>Semi-Volatiles</b>							
Naphthalene	AL <sup>a</sup> :	5 ppm	Eyes, blood, liver, kidneys, skin, CNS	Dermal blemishes; respiratory irritation; kidney irritation; bronchitis	2 Microm 37 mm PTFE member filter and sorbent	Inhalation; skin absorption; ingestion; contact	
	PEL <sup>a</sup> :	10 ppm					
	STEL <sup>b</sup> :	15 ppm					
	TLV <sup>b</sup> :	10 ppm					
	IDLH <sup>c</sup> :	500 ppm					
<b>Metals</b>							
Antimony	AL <sup>a</sup> :	0.5 mg/m <sup>3</sup>	Respiratory system, cardiovascular system, skin, eyes	Throat, mouth, and nose irritation, cough, dizziness, headache; nausea, vomiting, stomach cramps; insomnia; anorexia; skin irritation; cardiac abnormalities; olfactory fatigue	0.8 microm MCEF filter	Inhalation; contact	
	PEL <sup>a</sup> :						
	STEL <sup>b</sup> :						
	TLV <sup>b</sup> :						0.5 mg/m <sup>3</sup>
	IDLH <sup>c</sup> :						80 mg/m <sup>3</sup>
Arsenic	AL <sup>a</sup> :	0.005 mg/m <sup>3</sup>	Liver, kidneys, skin, lungs, lymphatic system	Ulceration of nasal septum; dermatitis; GI disturbances; peripheral neuropathy; respiratory irritation; hyperpigmentation of skin	0.8 microm MCEF filter	Inhalation; skin absorption; ingestion; contact	
	PEL <sup>a</sup> :	0.01 mg/m <sup>3</sup>					
	STEL <sup>b</sup> :	0.002 mg/m <sup>3</sup>					
	TLV <sup>b</sup> :	0.2 mg/m <sup>3</sup>					
	IDLH <sup>c</sup> :	100 mg/m <sup>3</sup>					
Cadmium	AL <sup>a</sup> :	0.2 mg/m <sup>3</sup>	Respiratory system, kidneys, prostate, blood	Pulmonary edema, dyspnea, coughing, tight chest; substernal pain; headache; chills, muscular aches; nausea, vomiting, diarrhea	0.8 microm MCEF filter	Inhalation; skin absorption; ingestion; contact	
	PEL <sup>a</sup> :						
	STEL <sup>b</sup> :						NA
	TLV <sup>b</sup> :						
	IDLH <sup>c</sup> :						50 mg/m <sup>3</sup>
Chromium	AL <sup>a</sup> :	0.5 mg/m <sup>3</sup>	Respiratory system, skin	Histologic fibrosis of lung; sensitization dermatitis	0.8 microm MCEF filter	Inhalation; ingestion	
	PEL <sup>a</sup> :	1 mg/m <sup>3</sup>					
	STEL <sup>b</sup> :	NA					
	TLV <sup>b</sup> :	0.5 mg/m <sup>3</sup>					
	IDLH <sup>c</sup> :	500 mg/m <sup>3</sup>					

**Table 2-3 (cont.)  
Chemical Hazard Information**

Chemical	Exposure limits <sup>a</sup>	Harmful effects	Symptoms	Method of analysis	Routes of Exposure
Cyanide	AL <sup>a</sup> : PEL <sup>a</sup> : 5 mg/m <sup>3</sup> STEL <sup>b</sup> : NA TLV <sup>b</sup> : IDLH <sup>c</sup> :	CVS, CNS, liver, kidneys, skin	Asphyxiation and death can occur; weakness, head confusion; nausea, vomiting; irritated eyes, skin; slow gasping respiration	0.8 microm MCEF filter and bubbler	Inhalation; skin absorption; ingestion; contact
Lead	AL <sup>a</sup> : 30 mg/m <sup>3</sup> PEL <sup>a</sup> : 50 mg/m <sup>3</sup> STEL <sup>b</sup> : NA TLV <sup>b</sup> : 150 mg/m <sup>3</sup> IDLH <sup>c</sup> : 700 mg/m <sup>3</sup>	GI tract, CNS, kidneys, blood, gingival tissue	Weakness, lassitude; insomnia; facial pallor; pale eyes; anorexia; abdominal pain; anemia; tremors; irritated eyes	0.8 microm MCEF filter	Inhalation; ingestion; contact
Mercury	AL <sup>a</sup> : PEL <sup>a</sup> : 0.01 mg/m <sup>3</sup> STEL <sup>b</sup> : 0.03 mg/m <sup>3</sup> TLV <sup>b</sup> : IDLH <sup>c</sup> : 10 mg/m <sup>3</sup>	CNS, kidney, eyes, skin, respiratory system	Ataxia; vision, hearing disturbances; spastic or jerky movement; dizziness; nausea, vomiting, diarrhea; skin burns	Hydar solid sorbent tube	Inhalation; skin absorption; ingestion; contact
Nickel	AL <sup>a</sup> : PEL <sup>a</sup> : 1 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 0.05 mg/m <sup>3</sup> IDLH <sup>c</sup> :	Lungs, paranasal, sinus, CNS	Headache; vertigo; nausea, vomiting, epigastric pain, substernal pain; cough, hyperpnea, cyanosis, weakness; leukocytosis pneumonitis; delirium, convulsions	0.8 Microm MCEF filter	Inhalation; ingestion; contact
<b>Pesticides</b>					
Aldrin	AL <sup>a</sup> : PEL <sup>a</sup> : 0.25 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 0.25 mg/m <sup>3</sup> IDLH <sup>c</sup> : 100 mg/m <sup>3</sup>	Cancer, CNS, liver, kidneys, skin	Headache, dizziness; nausea, vomiting; malaise; myoclonic jerks of limbs, clonic, convulsions, coma; hematopoietic, azotemia	0.8 Microm MCEF filter	Inhalation; skin absorption; ingestion, contact
Chlordane	AL <sup>a</sup> : NA PEL <sup>a</sup> : 0.5 mg/m <sup>3</sup> STEL <sup>b</sup> : 2 mg/m <sup>3</sup> TLV <sup>b</sup> : 0.5 mg/m <sup>3</sup> IDLH <sup>c</sup> :	CNS, eyes, liver, kidneys, skin, lungs	Blurred vision; confusion; anorexia; delirium; coughing; abdominal pain; nausea, vomiting, diarrhea	0.8 Microm MCEF filter and chromosorb 102	Inhalation; skin absorption; ingestion; contact

Table 2-3 (cont.)  
Chemical Hazard Information

Chemical	Exposure limits <sup>a</sup>	Harmful effects	Symptoms	Method of analysis	Routes of Exposure
4,4-DDD	AL <sup>a</sup> : PEL <sup>a</sup> : 1 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 1 mg/m <sup>3</sup> IDLH <sup>c</sup> :	Experimental carcinogen and neoplastigen, poison by ingestion	Blurred vision; confusion; ataxia, delirium; coughing; abdominal pain; nausea, vomiting, diarrhea	0.8 Microm MCEF filter and chromosorb 102	Inhalation; skin absorption; ingestion; contact
4,4-DDE	AL <sup>a</sup> : PEL <sup>a</sup> : 1 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 1 mg/m <sup>3</sup> IDLH <sup>c</sup> :	Experimental carcinogen and neoplastigen, poison by ingestion	Blurred vision; confusion; ataxia; delirium; coughing; abdominal pain; nausea, vomiting, diarrhea	0.8 microm filter and chromosorb 102	Inhalation; skin absorption; ingestion; contact
4,4-DDT	AL <sup>a</sup> : PEL <sup>a</sup> : 1 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 1 mg/m <sup>3</sup> IDLH <sup>c</sup> :	CNS, kidneys, liver, skin, PNS	Paresthesia of the tongue, lip, face; tremors; apprehension, dizziness, confusion, malaise, headaches, fatigue; confusion; vomiting; irritated eyes, skin	0.8 microm MCEF filter	Inhalation; skin absorption; ingestion; contact
Dieldrin	AL <sup>a</sup> : PEL <sup>a</sup> : 0.25 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 0.25 mg/m <sup>3</sup> IDLH <sup>c</sup> : 450 mg/m <sup>3</sup>	CNS, liver, kidneys, skin	Headache, dizziness; nausea, vomiting; malaise; sweating; jerky limbs; convulsions	0.8 Microm MCEF filter and ISO octane	Inhalation; skin absorption; ingestion; contact
Lindane	AL <sup>a</sup> : PEL <sup>a</sup> : 0.5 mg/m <sup>3</sup> STEL <sup>b</sup> : TLV <sup>b</sup> : 0.5 mg/m <sup>3</sup> IDLH <sup>c</sup> : 1000 mg/m <sup>3</sup>	Eyes, CNS, blood, liver, kidneys, skin	Nose, throat and eyes irritation; headache; nausea, convulsions; respiratory difficulties, cyanosis, aplastic anemia, skin irritation, muscle spasm; liver and kidney damage	0.8 Microm filter and chromosorb 102	Inhalation; skin absorption; ingestion; contact

**Table 2-3 (cont.)  
Chemical Hazard Information**

Chemical	Exposure limits <sup>a</sup>	Harmful effects	Symptoms	Method of analysis	Routes of Exposure
<b>PCBs</b>					
Aroclor-1260	AL <sup>a</sup> : PEL <sup>a</sup> : 0.5 mg/m <sup>3</sup> STEL <sup>b</sup> : NA TLV <sup>b</sup> : IDLH <sup>c</sup> : NA	Skin, eyes, liver	Irritated eyes, skin, acne, formation dermatitis; liver damage	13 mm glass fiber filter and florisil	Inhalation; skin absorption; ingestion; contact

*Sources:*

<sup>a</sup>Action limits (AL), permissible exposure limits (PEL), 29 CFR 1910, Subpart Z, Toxic and Hazardous Substances

<sup>b</sup>Short-term exposure limits (STEL), immediate dangerous to life and health (IDLH), harmful effects, symptoms, method of analysis, and routes of exposure, National Institute for Occupational Safety and Health (NIOSH) *Pocket Guide to Chemical Hazards*

<sup>c</sup>Threshold limit values (TLV), American Conference of Governmental Industrial Hygienists (ACGIH)

**Table 3-1**  
**Bioassay Requirements for Suspected Chemical Contaminants**

<b>Contaminant</b>	<b>Media</b>
Lead	Blood sample analysis which determines levels of lead and zinc protoporphyrin (ZPP).
Cadmium	Cadmium in urine (CdU) standardized to grams of creatinine, cadmium in blood (CdB) standardized to liters of whole blood
Arsenic	Analysis of arsenic in blood or urine

#### **4.0 TRAINING**

Project training requirements are contained in Sections 9 and 11 of the PSHP. General training requirements are specified in Section 10 of the Navy RAC SSHP.

Prior to starting work, each worker assigned to perform tasks covered under this TSSHP will receive an initial safety and health orientation training from BEI, or designee. Workers outside regulated areas **with no potential for exposure** are exempted from HAZWOPER training requirements. This exemption is determined on a case-by-case basis by the SHM.

#### **5.0 SITE CONTROLS**

##### **5.1 PROGRAM REQUIREMENTS**

Program requirements for site access controls are specified in Section 4 of the PSHP and Navy RAC SOP 2.1.40, "Site Control." General site control requirements for NAS Key West are specified in Section 4 of the SSHP and Appendixes A and B of this TSSHP. At a minimum, HWP's will be initiated for activities requiring Level C protection (see Table 7-1).

##### **5.2 COMMUNICATIONS**

When working at remote locations, especially where separated by water, the ability to effectively communicate is of paramount importance. The subcontractor must clearly delineate his communication plan in this section. The plan should address protocols for standard communication and also what procedure should be followed in the event of an emergency.

The subcontractor will provide BEI with any specialized communication equipment necessary for the conduct of normal and emergency operations. BEI will request approvals for radio communications from NAS.

## 6.0 SAFETY AND HEALTH SURVEYS AND MONITORING

### 6.1 SAFETY AND HEALTH REQUIREMENTS FOR SPECIAL TECHNOLOGIES

NAS Key West will be utilizing one special technology:

- Air stripping of volatile organics from groundwater at the Jet Engine Test Cell Site

#### 6.1.1 Air Stripping

Groundwater at the Jet Engine Test Cell Site will have volatile organics removed via air stripping. Due to the close proximity of an active runway, and as the site is secured, no air emissions monitoring will be performed.

### 6.2 AIR MONITORING EQUIPMENT

The air monitoring devices used will be (1) a flame ionization and a photoionization detector; (2) a four-gas meter capable of determining oxygen (O<sub>2</sub>), lower explosive limit (LEL), carbon monoxide (CO), and hydrogen sulfide (H<sub>2</sub>S); (3) colorimetric detector tubes for benzene and vinyl chloride; (4) personal sampling pumps and filter media for benzene and lead; and (5) equipment to perform EPA T014 monitoring.

### 6.3 WORK STATION AND PERIMETER MONITORING REQUIREMENTS AND ACTION LEVELS

Table 6-1 provides occupational and perimeter monitoring action levels and responses to known and suspected site hazards. The table also provides the required instrumentation and frequency of monitoring. Perimeter monitoring will be conducted based on exposure levels found in the work area. Action levels acceptable at the perimeter are found in Table 6-2.

## 7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Program requirements for components of Level A, B, C and D levels of protection are specified in Sections 8 and 10 of the PSHP and Section 8 and 9 of the SSHP. PPE for specific activities are shown in Table 7-1.

The SSHR will specify PPE requirements in HWP. Due to the contamination it is anticipated that most work will be in Level D. Table 7-1 shows the activity, expected hazards, level of protection, and possible upgrade in the level of protection. Respirator canisters will be specified by the SSHR. Table 7-2 is a list of equipment expected to be needed.

**Table 6-1**  
**Work Station Air Monitoring Requirements and Action Levels**

Activity	Instrument or Contaminant	Frequency of Monitoring	Action Levels	Response
3, 4, 5, 7, 8, 9, 10	Four-gas meter	Initial and periodic	LEL < 5%	No action, periodic monitoring
			$5\% \leq \text{LEL} < 10\%$	Continuous monitoring
			LEL $\geq 10\%$	Stop work, engineering controls
			$\text{O}_2 \leq 19.5\%$	Stop work, engineering controls
			$\text{O}_2 \geq 22\%$	Stop work, engineering controls
			CO $\geq 200$ ppm (instantaneous)	Stop work, engineering controls
			CO $\geq 1$ ppm (routine)	Exhaust equipment away from source. Continue monitoring.
			CO $\geq 35$ ppm TWA	Stop work, engineering controls
			H <sub>2</sub> S $\geq 10$ ppm TWA	Stop work, engineering controls
			H <sub>2</sub> S $\geq 300$ ppm (instantaneous)	Stop work, engineering controls
	FID/PID <sup>a</sup>	Initial and periodic	< 25 ppm	Level D, improve engineering controls
			$\geq 25$ ppm	Level C, improve engineering controls
			$\geq 1000$ ppm	Level B, improve engineering controls, perimeter monitoring
	FID/PID <sup>b</sup>	Initial and periodic	< 1 ppm	Level D, improve engineering controls
			$\geq 1$ ppm	Level C, improve engineering controls
			$\geq 10$ ppm	Stop work, improve engineering controls, perimeter monitoring
			$\geq 50$ ppm	Level B, improve engineering controls
	Lead	Initial and periodic	$\geq 30 \mu\text{g}/\text{m}^3$	Medical surveillance training, perimeter monitoring, Bioassay
			$\geq 50 \mu\text{g}/\text{m}^3 \leq 2,500 \mu\text{g}/\text{m}^3$	Regulated areas, change and shower rooms, engineering controls, Level C
Benzene tube	Initial and periodic	< 0.5 ppm	No action.	
		$\geq 0.5$ ppm	Medical surveillance, training	
		$\geq 1$ ppm	Engineering controls Level C, perimeter monitoring	
6 at JETC	T014	Initial and periodic	$\geq 1$ ppm benzene	Stop work, engineering controls
			$\geq 12.8 \mu\text{g}/\text{m}^3$	See table 6-2

<sup>a</sup>Based on TCE, PEL of 25 ppm.  
<sup>b</sup>If Benzene is detected with tubes.

**Table 6-2**  
**Perimeter Monitoring, Action Levels, and Responses<sup>a</sup>**

<b>Contaminant</b>	<b>Action Level</b>	<b>Response</b>
Lead	12.8 $\mu\text{g}/\text{m}^3$ (1.5 ppb)	Stop work, engineering controls
Benzene	1 ppm	Stop work, engineering controls

<sup>a</sup>Based on T014 EPA method.

**Table 7-1  
 Levels of Personal Protective Equipment**

Activity*	A	B	C	D	E	F	G	H	I	J	K	L	M	Level of Protection	Possible Upgrade
1	X			X						X				C.A.	NA
2	X			X						X			X	C.A.	NA
3	X			X	X	X	X	X	X	X			X	D	C
4	X			X	X	X	X	X	X	X				D	C
5	X			X	X		X	X	X	X		X		D	C
6	X			X	X	X	X	X	X	X				C.A.	D
7	X			X		X	X	X	X	X				C.A. (Modified) <sup>b</sup>	D
8	X				X	X	X	X	X	X			X	C.A.	D
9	X			X	X	X	X	X	X	X				D	C
10	X			X	X	X	X	X	X	X				D	C
11	X			X						X				C.A.	D
12	X			X						X		X		C.A.	D

\*Activities from Table 1-1.

<sup>b</sup>Modified C.A. includes additional requirement of outer neoprene or nitrile gloves and neoprene or rubber overboots.

NOTE: Hazards may vary by site.

Key:

Hazard*	Safety & Health (S&H) Document/ Standard Operating Procedure (SOP) References
A Physical Injury Hazard	S&H, SOP 2.1.15A, 2.1.17, 2.1.17A, 2.1.40A; TSSHP 2.5.1
B Overhead/Underground Utility Hazard	S&H, SOP 2.1.17A, 2.1.40B, 2.1.40C
C Fire Explosion Hazard	S&H, SOP 2.1.24A
D Noise Hazard	S&H, SOP 2.1.21
E Contact with Contaminated Soil Hazard	S&H, SOP 2.1.17, 2.1.60A, 2.1.60B, 2.1.70
F Contact with Contaminated Water Hazard	S&H, SOP 2.1.17, 2.1.60A, 2.1.60B, 2.1.70
G Inhalation Hazard	S&H, SOP 2.1.15B, 2.1.28, 2.1.28A, 2.1.30H, 2.1.63D, 2.1.80
H Ingestion Hazard	S&H, SOP 2.1.15B, 2.1.28, 2.1.28A, 2.1.110
I Skin Contact Hazard	S&H, SOP 2.1.28, 2.1.28A, 2.1.70A
J Heat/Cold Stress Hazard	S&H, SOP 2.1.60C
K Vandalism Hazard	S&H, SOPs 2.1.15A, 2.1.40
L Maritime Hazard	TSSHP 2.1.16
M Ordnance and Explosive Waste	S&H SOP 2.1.17E

**Table 7-2**  
**Equipment List**

---

MSA Full face respirator, or equivalent	Safety barrier tape
MSA GMC-H cartridges, or equivalent	Yellow and black rope
Respirator cleaner/sanitizer	3/8 O.D. Tygon tubing
Respirator cleaning basins	Cotton inner liners
Soft bristle cleaning brushes	Drager pump/tubes for benzene
Rinse basins	Smoke tubes for respirator fit testing
Clean storage bags, zip-loc	Bloodborne pathogen waste container/signs
Face shields	Lockout/tagout locks and tags
Polycoated disposable coveralls	Stretcher
Neoprene overboots	Blanket
Nitrile outer gloves	Dustpans/broom
Vinyl inner liners	Street broom
Outer cotton gloves	Coal shovel
Leather work gloves	10 mil plastic trash bags
Goggles	12 inch by 12 inch plastic bags
Safety glasses	Wind sock with pole
Ear plugs	Ice vests
Hard hats	Blue ice for vests, 9 oz.
Spectacle kits	FID analyzer
Orange safety vests	Personal sampling pump w/low flow capacity
Sunscreen	Cal gas 37 ft <sup>3</sup> 10 ppm methane
Absorbent material	Cal gas 37 ft <sup>3</sup> 100 ppm methane
Air horn	Cal gas 37 ft <sup>3</sup> 1,000 ppm methane
First aid kit	Cal gas 37 ft <sup>3</sup> 30% LEL methane
PID analyzer	Hydrogen gas 300 ft <sup>3</sup> GC grade
Electrolyte replenishment fluid (e.g., Gatorade)	Industrial Scientific Combustible gas meter (or equivalent)
Eye wash station	Gilibrator (or equivalent)
Eye wash bottles, 500 ml	Noise SLM/DOS meter and calibration
Traffic cones (orange)	Cal gas 37 ft <sup>3</sup> 10 ppm H <sub>2</sub> S
Duct tape	Cal gas 37 ft <sup>3</sup> 250 ppm isobutylene
Insect repellent	Cal gas 37 ft <sup>3</sup> 90 ppm CO
Fire extinguisher 5-lb ABC	Cal gas 37 ft <sup>3</sup> zero air
Fire extinguisher - 20 lb ABC	

Equipment for Levels B, C, D, and Construction Attire (C.A.) personal protection is as follows:

• Level B Protection

- Positive-pressure, pressure-demand self-contained breathing apparatus (SCBA)
- Chemical resistant clothing (e.g., polyethylene or Saranex)
- Inner PVC or vinyl gloves
- Outer Neoprene or nitrile gloves
- Sturdy work shoes
- Hard hat
- Neoprene or rubber overboots
- Hearing protection (in designated areas)

• Level C Protection

- Full face air purifying respirator
- Organic vapor cartridges with HEPA filter (GMC-H or equivalent)
- Chemical resistant clothing (e.g., polyethylene or Saranex)
- Inner PVC or vinyl gloves
- Outer Neoprene or nitrile gloves
- Sturdy work shoes
- Hard hat
- Neoprene or rubber overboots
- Hearing protection (in designated areas)

• Level D Protection

- Hard hat
- Chemical resistant clothing (e.g., polyethylene or Saranex)
- Sturdy work shoes
- Neoprene or rubber overboots
- Neoprene or nitrile gloves with PVC or vinyl inner gloves (if there is a potential for dermal exposure - otherwise leather gloves may be used)
- Chemical safety goggles (must be worn for groundwater sampling and well pumping if splash hazard is present)
- Hearing protection (in designated areas)

• Construction Attire (C.A.)

- Hard hat
- Sturdy work shoes
- Sleeved shirt
- Hip boots (in designated areas)
- Safety glasses
- Long pants
- Hearing protection (in designated areas)
- Kneepads (in designated areas)

All personal protective equipment used during the course of this field investigation must meet the following applicable OSHA standards:

<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and face	29 CFR 1910.133	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134	ANSI Z88.1-1980
Head	29 CFR 1910.135	ANSI Z89.1-1969
Foot	29 CFR 1910.136	ANSI Z41.1-1967

ANSI = American National Standards Institute

The above designated levels of protection will be upgraded or downgraded by the SSHR based on site conditions and air monitoring results.

### 8.0 EMERGENCY RESPONSE

Emergency response and notification procedures are specified in Appendix A of the SSHP. From the site, call 911 for police, rescue, fire department, or ambulance. All telephone numbers have been verified, and the site contamination has been explained to the responder of the phone, especially to the medical providers (Table 8-1). Appendix C depicts emergency response routes to the work sites.

Emergency response personnel will be notified and provided with a copy of the TSSHP. They will be given a briefing covering relevant information such as project hazards, site layout, access points, and decontamination protocol. This briefing will be documented by a memorandum to the project file.

### 9.0 HURRICANE AND DESTRUCTIVE WEATHER RESPONSE

Hurricane and destructive weather procedures are specified in Attachment B of the Navy RAC Bases SSHP.

### 10.0 SPILL PREVENTION AND CONTROL

Spill control procedures are specified in Attachment C of the Navy RAC Bases SSHP.

**TABLE 8-1**  
**EMERGENCY TELEPHONE NUMBERS FOR NAS KEY WEST**

**EMERGENCY SERVICES**

POLICE DEPARTMENT .....	911
RESCUE SERVICE .....	911
BASE POLICE .....	(305) 293-2114
BASE FIRE DEPARTMENT .....	(305) 296-3333
LOWER FLORIDA KEYS HEALTH SYSTEM (PRIMARY MEDICAL PROVIDER) .....	(305) 294-5531
BASE AMBULANCE BOCA CHICA (ALTERNATE MEDICAL PROVIDER) .....	(305) 293-2337

**EMERGENCY CONTACTS**

PROJECT S&H MANAGER (MERVIN ATWOOD) .....	(615) 220-2344 (w) (615) 481-0144 (h)
PROJECT MANAGER (MAC McNEIL) .....	(615) 220-2745
PROJECT SCIENTIST (STEWART TAYLOR) .....	(615) 220-2788
PROJECT SUPERINTENDENT (ALLEN SALTZMAN) .....	(615) 220-2373
NAVY ROICC (LTC. JAMES G. CRUZ) .....	(305) 293-2069
NAS KEY WEST NAVOSH (EDWARD DONOHUE) .....	(305) 293-2314

**OTHER CONTACTS**

FLORIDA POISON CONTROL CENTER .....	(800) 282-3171
NATIONAL RESPONSE CENTER .....	(800) 424-8802
REGIONAL USEPA EMERGENCY RESPONSE .....	(800) 414-8802
CHEMICAL REFERRAL CENTER .....	(800) 262-8200

**HOSPITAL ROUTES**

A description of routes to the hospitals listed above will be provided and will be posted onsite by the SSHR during site mobilization (see Appendix C for route maps).

**APPENDIX A**  
**SITE SPECIFIC HAZARD ANALYSIS**

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## APPENDIX A

### SITE SPECIFIC HAZARD ANALYSIS

(Sampling only: SWMU-3 and 7, IR-3, and AOC-A and B)

#### 1.0 GENERAL

This hazard analysis is concentrated on the *initial sampling task*. Additional information will be provided for subsequent activities and locations, once the extent of contamination and scope of work have been more clearly defined by the results of this sampling for each individual site.

Table 1-1 of this Task Specific Health and Safety Plan (TSSHP) describes the various work activities associated with each of the sites included in the scope of work for Delivery Order 004 at NAS Key West, Florida. Table 7-1 identifies the hazards which may be associated with those activities in Table 1-1. The information in this appendix is supplied to provide more detail, in the form of a narrative description of each of the activities and associated hazards for each individual site.

The information provided below includes:

- a description of the anticipated activity at each of the sampling sites ( IR-3, AOC-A, AOC-B, SWMU 3, SWMU 7 and the Jet Engine Test Cell);
- an assessment of the potential hazards associated with each of the sites; and
- the health and safety measures employed to mitigate these hazards.

The primary contaminants of concern are metals, volatile organic compounds and polychlorinated biphenyls; they are identified on an individual site basis below. The primary metal of concern is lead. The concentrations identified at each of the site by previous sampling efforts have been analyzed to determine the likelihood of potential exposure which would approach the action level (AL) or permissible exposure level (PEL) for lead. It does not appear that even under a worst case scenario, the action level would be approached in the areas which will be included in this sampling effort. As a precaution, every effort will be made to minimize the generation of airborne dust during sampling activity. Technology is available to monitor airborne particulate levels on a real-time basis, however, based on the analysis of existing data, it is not anticipated to be necessary on this site.

In areas where sampling is being conducted to determine volatile compounds such as petroleum hydrocarbon and semivolatiles such as naphthalene, real-time monitoring will be conducted using a flame ionization detector (FID). Results will be used to upgrade/downgrade PPE based on the guidelines provided in Table 6-1.

Preliminary site maps depicting the control zones and entry points are provided in Appendix B. It should be noted that these zones and maps are subject to modification based on actual field conditions. Appendix C includes a map depicting the location of each site in relation to the hospital selected to provide emergency care.

## 2.0 SWMU 3

### 2.1 DESCRIPTION OF ACTIVITY

The primary objective of the current effort at SWMU 3 will be the collection of surface and subsurface soil samples and sediment samples to identify and define the vertical and horizontal extent of contamination. Sampling will be conducted using the combination of a portable power auger and a manual split spoon sampling device. Approximately 24 samples will be collected. The goal of the sampling is to identify petroleum hydrocarbon and PAH contamination. Immunoassay test kits will be used to analyze the samples on site. Based on observations made during the walkthrough, it is not anticipated that dust generation during sampling will be a problem.

The single contaminant identified in the Remedial Investigation Report prepared by IT Corporation in June of 1994 was mercury. The report shows a maximum soil concentration of 0.14 mg/kg. It should be noted that all of this concentration is below the required clean-up levels.

### 2.2 HAZARD ASSESSMENT

The primary hazards associated with this task include: hazards associated with the operation of the power auger, ergonomic issues associated with manual sampling techniques, dermal contact with poisonous vegetation, insect bites, wild life, overexposure to sunlight, slips, trips and falls. Physical hazards related to temperature stress could also be a problem during this task. The primary chemical hazards of concern noted above are metals. Exposure could result from generation of the metal present in the soil into an airborne particulate leading to an inhalation exposure. Based on the concentration of the contaminants identified in the soil occupational exposures which approach the permissible exposure limits for those metals identified are considered to be remote. Additionally, volatile organic compounds may be encountered at low levels.

### 2.3 SAFETY AND HEALTH MITIGATIVE MEASURES

Barrier tape will be used to establish a controlled work zone (exclusion zone). Only personnel who have completed the 40 hours of training required by 29 CFR 1910.120, have a current update for the training and are on the appropriate medical surveillance program may enter the controlled zone. Preventing unauthorized personnel from entering the exclusion zone will be the responsibility of the SSHR and the project superintendent.

Employees entering the exclusion zone will be required to wear construction attire with the potential to upgrade to level D. Respiratory protection and protective clothing will be maintained in readiness at the site should upgrade be required.

An equipment decontamination station will be established within the perimeter fence. The primary function of this station will be for the decontamination of sampling equipment in accordance with Florida Department of Environmental Protection Rules. A personnel decontamination area composed of two stations will be established at the entry gate. Station one will be a boot wash with detergent solution; station two will be a clean water rinse. Decontamination solutions will be disposed of on site as provided for in the sampling work plan.

A tailgate safety meeting will be held prior to the initiation of work each day. The safety meeting is mandatory for all personnel who will work on the site. Applicable safe work practices will be discussed. Emphasis will be placed on safe use of the power auger; this will include warnings against the use loose-fitting garments, information on safety lockout systems, etc. Heat stress and preventative measures will be discussed as will items which are specifically related to the day's anticipated activities.

## 3.0 SWMU 7

### 3.1 DESCRIPTION OF ACTIVITY

The primary objective of the current effort at SWMU 7 will be the collection of surface and subsurface soil samples and sediment samples to identify and define the vertical and horizontal extent of contamination. Sampling will be conducted using the combination of a portable power auger and a manual split spoon sampling device. The goal of the sampling is to identify the extent of PCB contamination. Immunoassay test kits will be used to analyze the samples on site. Based on observations made during the walkthrough, it is not anticipated that dust generation during sampling will be a problem.

The single contaminant identified in the Remedial Investigation Report prepared by IT Corporation in June of 1994 was Arochlor 1260 (PCB). The report shows a maximum soil concentration of 19 mg/kg.

### 3.2 HAZARD ASSESSMENT

The primary hazards associated with this task include: hazards associated with the operation of the power auger, ergonomic issues associated with manual sampling techniques, dermal contact with poisonous vegetation, insect bites, wild life, overexposure to sunlight, slips, trips and falls. Physical hazards related to temperature stress could also be a problem during this task. The primary chemical hazards of concern noted above are metals. Exposure could result from generation of the PCB present in the soil into an airborne particulate leading to an inhalation exposure.

Based on the concentration of the contaminants identified in the soil occupational exposures which approach the permissible exposure limits are considered to be remote. The low vapor pressure of PCB make it unlikely that the compound will volatilize and present that type of inhalation risk at ambient temperatures. The main potential exposure would be from the compound attached to particulate entrained in the air.

### 3.3 SAFETY AND HEALTH MITIGATIVE MEASURES

Barrier tape will be used to establish a controlled work zone (exclusion zone). Only personnel who have completed the 40 hours of training required by 29 CFR 1910.120, have a current update for the training and are on the appropriate medical surveillance program may enter the controlled zone. Preventing unauthorized personnel from entering the exclusion zone will be the responsibility of the SSHR and the project superintendent.

Employees entering the exclusion zone will be required to wear construction attire with the potential to upgrade to level D. Respiratory protection and protective clothing will be maintained in readiness at the site should upgrade be required.

An equipment decontamination station will be established within the perimeter fence. The primary function of this station will be for the decontamination of sampling equipment in accordance with Florida Department of Environmental Protection Rules. A personnel decontamination area composed of two stations will be established at the entry gate. Station one

will be a boot wash with detergent solution; station two will be a clean water rinse. Decontamination solutions will be disposed of onsite as provided for in the sampling work plan.

A tailgate safety meeting will be held prior to the initiation of work each day. The safety meeting is mandatory for all personnel who will work on the site. Applicable safe work practices will be discussed. Emphasis will be placed on the identification of OEW and the work sequence initiated by their encounter, safe use of the power auger; this will include warnings against the use loose-fitting garments, information on safety lockout systems, etc. Heat stress and preventative measures will be discussed as will items which are specifically related to the day's anticipated activities.

## 4.0 IR-3

### 4.1 DESCRIPTION OF ACTIVITY

The primary objective of the current effort at IR-3 will be the collection of surface and subsurface soil samples to define the vertical and horizontal extent of contamination. Sampling will be conducted using the combination of a portable power auger and a manual split spoon sampling device. Approximately 100 samples will be collected from the surface to depth of up to 6-8 ft. The walkthrough survey, which has been previously conducted, indicates the composition of the site to be of coarse granular material covered by vegetation. Based on observations made during the walkthrough, it is not anticipated that dust generation during sampling will be a problem.

The primary contaminants of concern are DDT, lead, and arsenic. The Remedial Investigation Report prepared by IT Corporation in June of 1994 shows a maximum lead in soil concentration of 1,050 mg/kg, a maximum concentration of DDT (including DDD and DDE) in soil of 61 mg/kg, and a maximum concentration of arsenic in soil of 213 mg/kg.

### 4.2 HAZARD ASSESSMENT

The primary hazards associated with this task include dangers associated with the operation of the power auger, ergonomic issues associated with manual sampling techniques, dermal contact with poisonous vegetation, insect bites, and overexposure to sunlight. Physical hazards related to temperature stress could also be a problem during this task. The primary chemical hazards of concern noted above are metals. Exposure could result from generation of the metal present in the soil into an airborne particulate leading to an inhalation exposure. However, based on the concentration of the contaminants identified in the soil, occupational exposure which approaches the permissible exposure limits for those metals identified is considered to be remote.

### 4.3 SAFETY AND HEALTH MITIGATIVE MEASURES

The site is currently fenced on four sides; the existing fencing and barrier tape will be used to establish a controlled work zone (exclusion zone). Only personnel who have completed the 40 hours of training required by 29 CFR 1910.120, have a current update for the training and are on the appropriate medical surveillance program may enter the controlled zone. Preventing unauthorized personnel from entering the exclusion zone will be the responsibility of the SSHR and the project superintendent.

Employees entering the exclusion zone will be required to wear construction attire with the potential to upgrade to level D. Respiratory protection and protective clothing will be maintained in readiness at the site should upgrade be required.

An equipment decontamination station will be established within the perimeter fence. The primary function of this station will be for the decontamination of sampling equipment in accordance with Florida Department of Environmental Protection Rules. A personnel decontamination area composed of two stations will be established at the entry gate. Station one will be a boot wash with detergent solution; station two will be a clean water rinse. Decontamination solutions will be disposed of on site as provided for in the sampling work plan.

A tailgate safety meeting will be held prior to the initiation of work each day. The safety meeting is mandatory for all personnel who will work on the site. Applicable safe work practices will be discussed. Emphasis will be placed on safe use of the power auger; this will include warnings against the use loose-fitting garments, information on safety lockout systems, etc. Heat stress and preventative measures will be discussed as will items which are specifically related to the day's anticipated activities.

## 5.0 AREA OF CONCERN A

### 5.1 DESCRIPTION OF ACTIVITY

Area of Concern A (AOC-A) will be accessed by water using a craft provided by the Navy. The primary objective of the current effort at AOC-A will be the collection of surface and subsurface soil samples to define the vertical and horizontal extent of contamination. Sampling will be conducted using the combination of a portable power auger and a manual split spoon sampling device. Approximately 24 samples will be collected from the 4 sites. The walkthrough survey of the which has been previously conducted indicates the composition of the site to be of coarse granular material covered by vegetation; this area appears to be more rocky than IR-3. Based on observations made during the walkthrough, it is not anticipated that dust generation during sampling will be a problem. Potential encounter of Ordnance and Explosive Waste (OEW) also exists on this site.

The primary chemical hazard at this site is lead which was detected in soil at a maximum concentration of 2,100 mg/kg. Antimony, arsenic and nickel were also detected at low levels (43.5, 19.3 and 34.3 mg/kg, respectively) and were identified in the Remedial Investigation Report prepared by IT Corporation in June of 1994.

### 5.2 HAZARD ASSESSMENT

The primary hazards associated with this task include: hazards associated with transport over water, hazards associated with the operation of the power auger, ergonomic issues associated with manual sampling techniques, dermal contact with poisonous vegetation, insect bites, wild life and overexposure to sunlight. Physical hazards related to temperature stress could also be a problem during this task. The primary chemical hazards of concern noted above are metals. Exposure could result from generation of the metal present in the soil into an airborne particulate leading to an inhalation exposure. Based on the concentration of the contaminants identified in the soil occupational exposures which approach the permissible exposure limits for those metals identified are considered to be remote.

### 5.3 SAFETY AND HEALTH MITIGATIVE MEASURES

Barrier tape will be used to establish a controlled work zone (exclusion zone). Only personnel who have completed the 40 hours of training required by 29 CFR 1910.120, have a current update for the training, and are on the appropriate medical surveillance program may enter the controlled zone. Preventing unauthorized personnel from entering the exclusion zone will be the responsibility of the SSHR and the project superintendent. An ordnance specialist will be supplied by the Navy and will clear each area prior to any intrusive activity. All efforts will be made to maintain the ordnance specialist outside the exclusion zone once intrusive activities have been initiated. Should the specialist be required to enter the area to conduct additional probing, sampling activity will be halted; he will be allowed to conduct his probing and the portion of his probe which may come in contact with the soil will be decontaminated by Bechtel.

Employees entering the exclusion zone will be required to wear construction attire with the potential to upgrade to level D. Respiratory protection and protective clothing will be maintained in readiness at the site should upgrade be required.

An equipment decontamination station will be established within the perimeter fence. The primary function of this station will be for the decontamination of sampling equipment in accordance with Florida Department of Environmental Protection Rules. A personnel decontamination area composed of two stations will be established at the entry gate. Station one will be a boot wash with detergent solution; station two will be a clean water rinse. Decontamination solutions will be disposed of on site as provided for in the sampling work plan.

A tailgate safety meeting will be held prior to the initiation of work each day. The safety meeting is mandatory for all personnel who will work on the site. Applicable safe work practices will be discussed. Emphasis will be placed on the identification of OEW and the work sequence initiated by their encounter, safe use of the power auger; this will include warnings against the use loose-fitting garments, information on safety lockout systems, etc. Heat stress and preventative measures will be discussed as will items which are specifically related to the day's anticipated activities.

## 6.0 AREA OF CONCERN B

### 6.1 DESCRIPTION OF ACTIVITY

The primary objective of the current effort at AOC-B will be the collection of surface and subsurface soil samples and sediment samples to identify and define the vertical and horizontal extent of contamination. Sampling will be conducted using the combination of a portable power auger and a manual split spoon sampling device. Approximately 50 samples will be collected. The walkthrough survey of the which has been previously conducted indicates the site has been used as a disposal area for abandoned automobiles, which have decayed to a state of rusted metal debris. The area is bounded on 3 sides by mangroves and water. Based on observations made during the walkthrough, it is not anticipated that dust generation during sampling will be a problem.

The primary contaminants of identified are arsenic, cadmium, chromium and lead. The Remedial Investigation Report prepared by IT Corporation in June of 1994 shows a maximum soil concentrations of 9, 15.6, 67.4 and 237 mg/kg, respectively. It should be noted that all of these concentrations were below the required clean-up levels.

### 6.2 HAZARD ASSESSMENT

The primary hazards associated with this task include: hazards associated with working near water, hazards associated with the operation of the power auger, ergonomic issues associated with manual sampling techniques, dermal contact with poisonous vegetation, insect bites, wild life, overexposure to sunlight, slips, trips and falls over mangrove roots or rusted metal objects, and the potential for puncture wounds from metal shards in the area. Physical hazards related to temperature stress could also be a problem during this task. The primary chemical hazards of concern noted above are metals. Exposure could result from generation of the metal present in the soil into an airborne particulate leading to an inhalation exposure. Based on the concentration of the contaminants identified in the soil occupational exposures which approach the permissible exposure limits for those metals identified are considered to be remote.

### 6.3 SAFETY AND HEALTH MITIGATIVE MEASURES

Barrier tape will be used to establish a controlled work zone (exclusion zone). Only personnel who have completed the 40 hours of training required by 29 CFR 1910.120, have a current update for the training and are on the appropriate medical surveillance program may enter the controlled zone. Preventing unauthorized personnel from entering the exclusion zone will be the responsibility of the SSHR and the project superintendent.

Employees entering the exclusion zone will be required to wear construction attire including hipboots with the potential to upgrade to level D. Respiratory protection and protective clothing will be maintained in readiness at the site should upgrade be required.

An equipment decontamination station will be established within the perimeter fence. The primary function of this station will be for the decontamination of sampling equipment in accordance with Florida Department of Environmental Protection Rules. A personnel decontamination area composed of two stations will be established at the entry gate. Station one

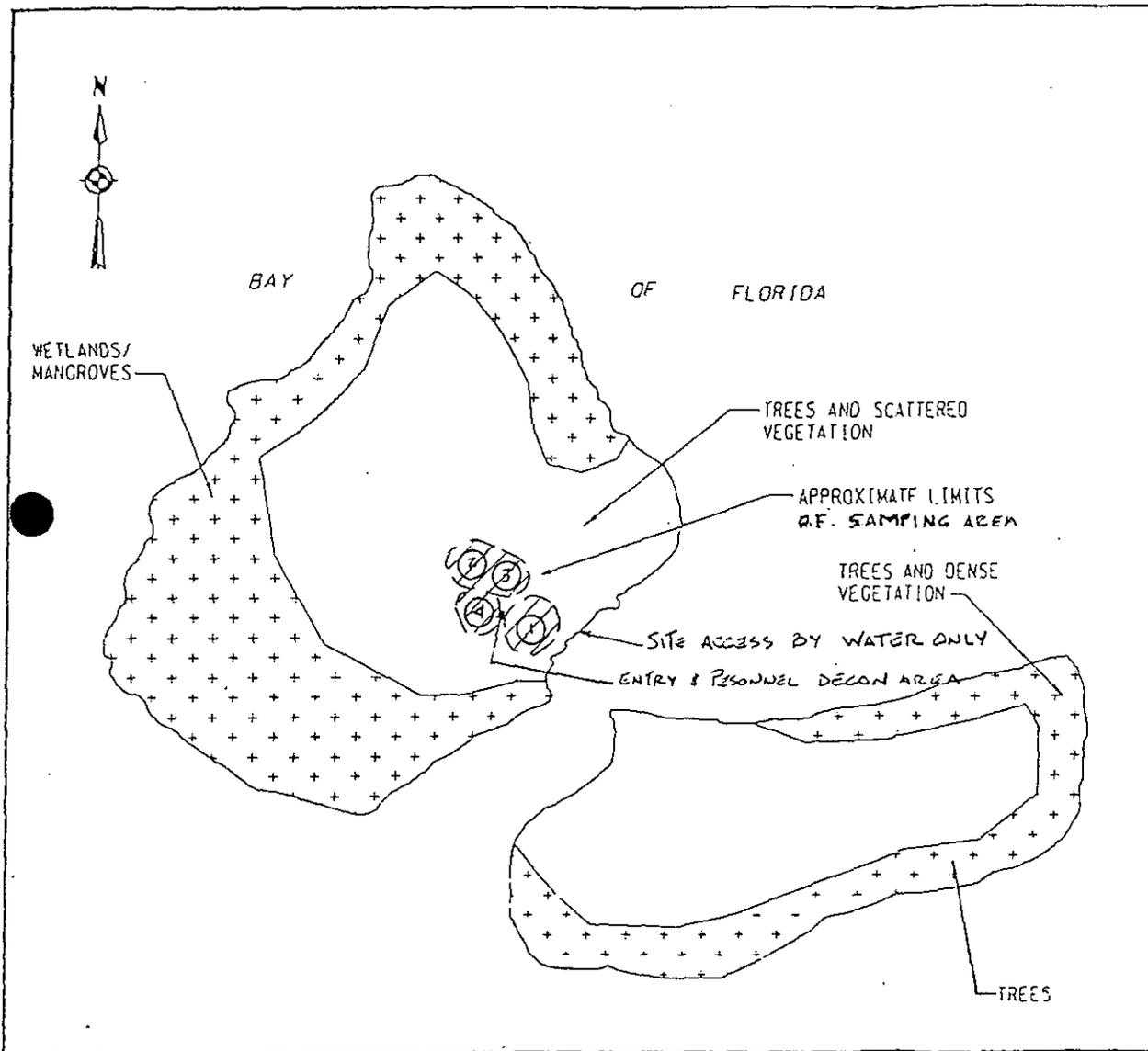
will be a boot wash with detergent solution; station two will be a clean water rinse. Decontamination solutions will be disposed of on site as provided for in the sampling work plan.

A tailgate safety meeting will be held prior to the initiation of work each day. The safety meeting is mandatory for all personnel who will work on the site. Applicable safe work practices will be discussed. Emphasis will be placed on the identification of OEW and the work sequence initiated by their encounter, safe use of the power auger; this will include warnings against the use loose-fitting garments, information on safety lockout systems, etc. Heat stress and preventative measures will be discussed as will items which are specifically related to the day's anticipated activities.

**APPENDIX B**  
**SITE LOCATION MAPS**

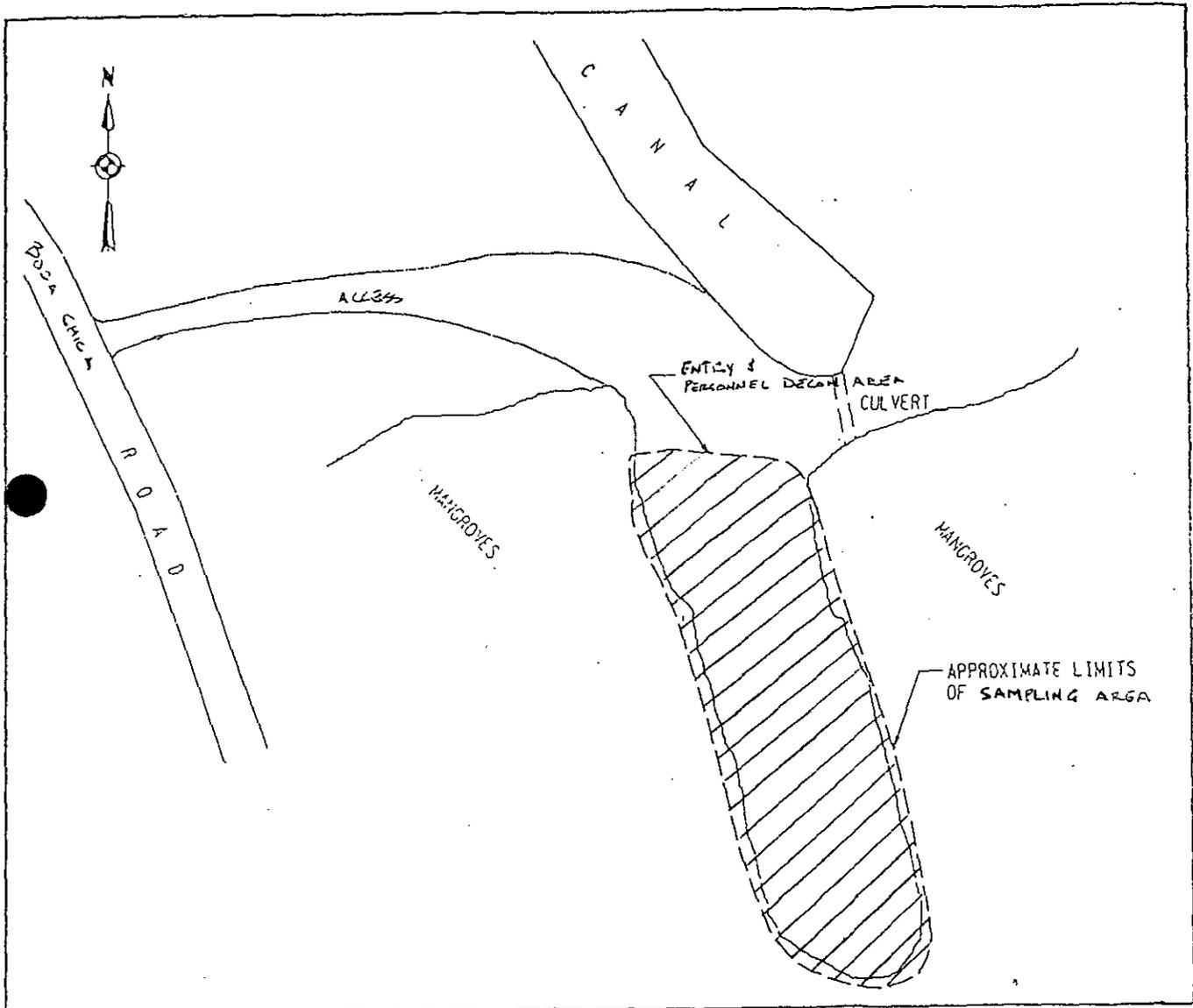
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4 SWMU No. 3 - Boca Chica Fire Fighting Training Area . . . . .	B-6
5 SWMU No. 7 - Boca Chica Building A-824 . . . . .	B-7



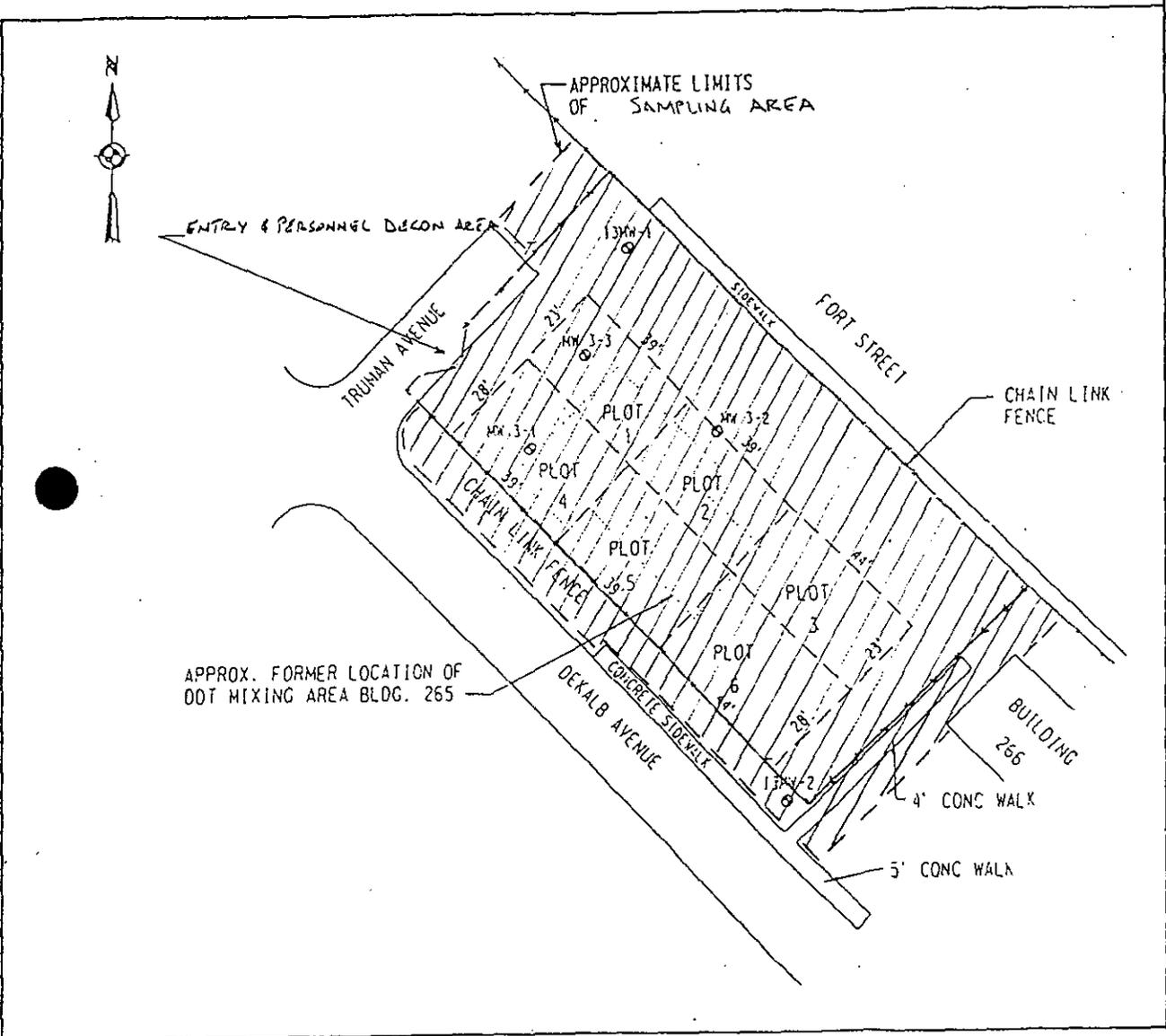
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FIGURE 1  
 AOC SITE A - DEMOLITION KEY  
 OPEN DISPOSAL AREA  
 SITES 1-4



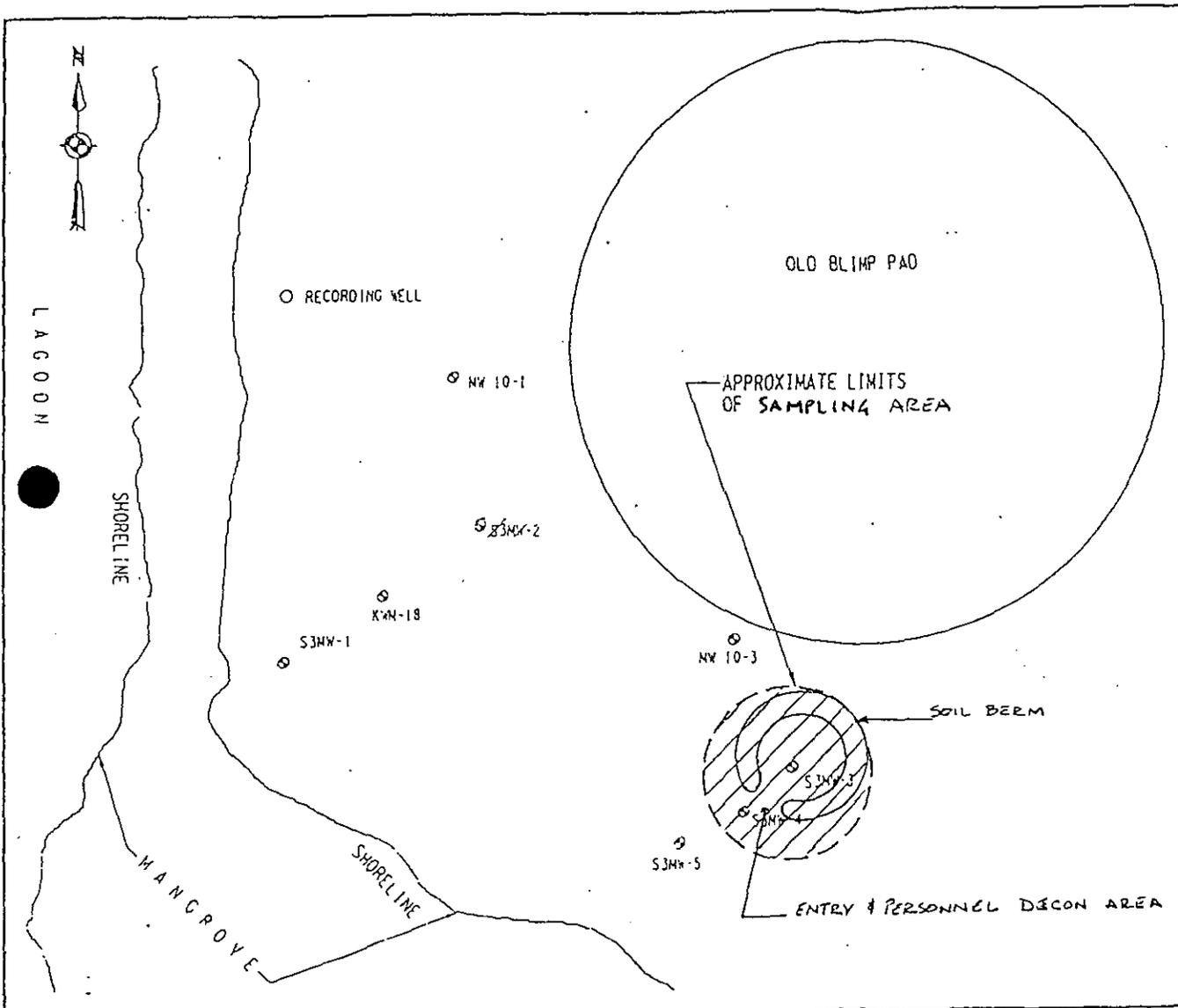
22567 321 AB702891.DCM

FIGURE 2  
 AOC SITE B - BIG COPPITT KEY  
 ABANDONED CIVILIAN - DISPOSAL AREA



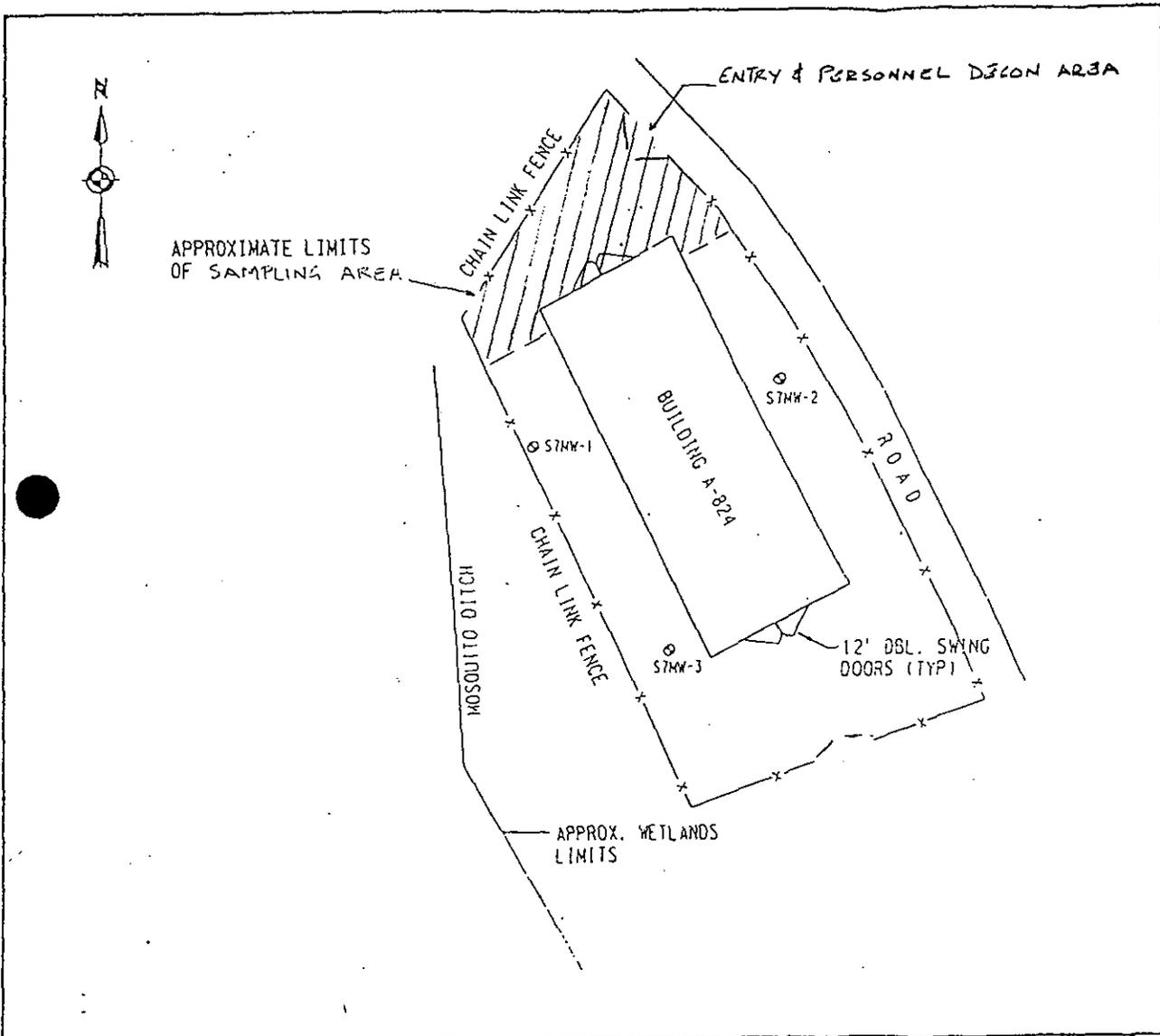
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FIGURE 3  
 IR NO. 3 - TRUMAN ANNEX (KEYWEST)  
 DDT MIXING AREA



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FIGURE 4  
 SWMU NO. 3 - BOCA CHICA  
 FIRE FIGHTING TRAINING AREA



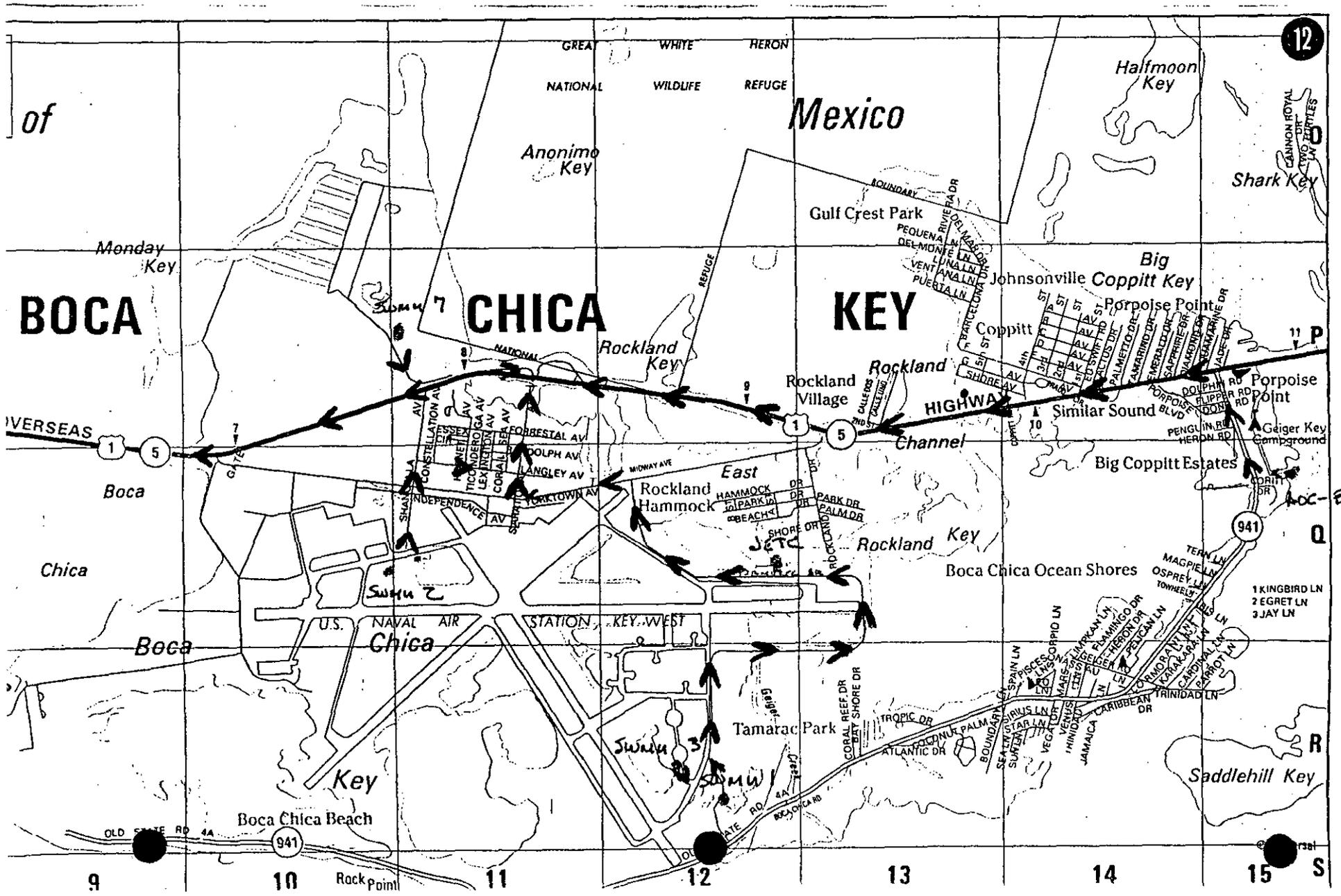
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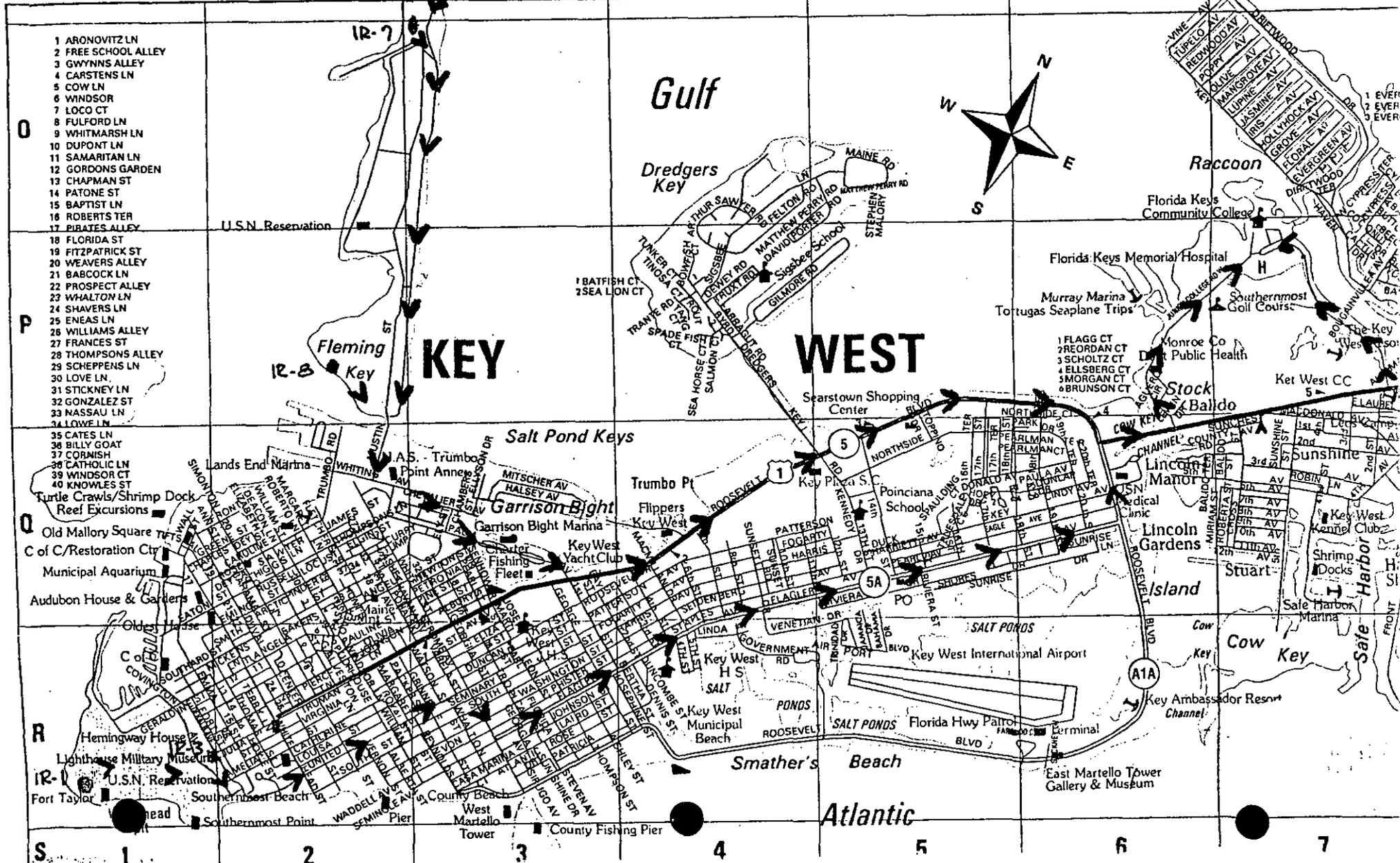
FIGURE 5  
 SWMU NO.7 - BOCA CHICA  
 BUILDING A-824

**APPENDIX C**  
**ROUTE MAPS TO AREA HOSPITALS**

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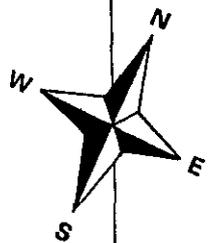


- 1 ARONOVITZ LN
- 2 FREE SCHOOL ALLEY
- 3 GWYNNS ALLEY
- 4 CARSTENS LN
- 5 COW LN
- 6 WINDSOR
- 7 LOCO CT
- 8 FULFORD LN
- 9 WHITMARSH LN
- 10 DUPONT LN
- 11 SAMARITAN LN
- 12 GORDONS GARDEN
- 13 CHAPMAN ST
- 14 PATONE ST
- 15 BAPTIST LN
- 16 ROBERTS TER
- 17 PIBATES ALLEY
- 18 FLORIDA ST
- 19 FITZPATRICK ST
- 20 WEAVERS ALLEY
- 21 BABCOCK LN
- 22 PROSPECT ALLEY
- 23 WHALTON LN
- 24 SHAVERS LN
- 25 ENEAS LN
- 26 WILLIAMS ALLEY
- 27 FRANCES ST
- 28 THOMPSONS ALLEY
- 29 SCHEPPENS LN
- 30 LOVE LN
- 31 STICKNEY LN
- 32 GONZALEZ ST
- 33 NASSAU LN
- 34 LOWELL LN
- 35 CATES LN
- 36 BILLY GOAT
- 37 CORNISH
- 38 CATHOLIC LN
- 39 WINDSOR CT
- 40 KNOWLES ST

- Turtle Crawls/Shrimp Dock Reef Excursions
- Old Mallory Square
- C of C/Restoration Ctr
- Municipal Aquarium
- Audubon House & Gardens
- Hemingway House
- Lighthouse Military Museum
- Fort Taylor
- Southernmost Beach
- Southernmost Point

U.S.N. Reservation

Gulf



KEY

WEST

Salt Pond Keys

Garrison Bight

Smather's Beach

Atlantic

Raccoon

Florida Keys Memorial Hospital

Murray Marina

Tortugas Seaplane Trips

Monroe Co Health

Stock

Baldo

Lincoln Manor

Lincoln Gardens

Stuart

Island

Cow Key

Key Ambassador Resort

Channel

East Martello Tower Gallery & Museum

Southernmost Golf Course

Key West CC

Key West Yacht Club