DCN 429

# BRAC 1995 - Staff Briefing

April 13, 1995

OPERATION HORNETS' NEST

MCAS CHERRY POINT

# Agenda

- Overview of MCAS Cherry Point
- Training Airspace
- BRAC Decisions / Recommendations
- What Has Changed?
- COBRA Analysis
- Cherry Point and Oceana
- Economic Impact
- Environmental Issues
- Recommendations

# Cherry Point - Overview

- World's Largest MCAS at 13,164 acres
- Home of 2nd Marine Aircraft Wing (MAW)(AV8B, EA6, & KC-130)
- Home of Award Winning Naval Aviation Depot (NADEP)
- Aerial Port of Embarkation (APOE)
- $400 M in infrastructure spending over last decade
  - 16 ***New*** BEQ's over last 7 yrs
  - Opened ***New*** Full Service Naval Hospital on October 1, 1994
  - Opened ***New*** Sewage Treatment Facility in last 12 months (6mgd capacity; 2.1 mgd current use)
  - Opened ***New*** Water Treatment Facility in last 12 months (6 mgd capacity; 3.5 mgd current use)
- Environmental Award Winner
- Winner of Commander in Chief's award for installation excellence (1988 & 1993)

# Cherry Point - Training Area and Airspace

- Proximity to Marine Corps Base Camp Lejeune
- Proximity to Electronic Warfare Range, Cherry Point
- Overwhelming ***majority*** of Air-to-ground training, for both Navy and Marine Corps, is conducted in North Carolina
- Easy access to Air-to-Air ranges off coast of North Carolina

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - BRAC '93 Decision / Implementation

- "preponderance of aircraft to be redistributed from NAS Cecil Field to two MCAS on the East Coast, Cherry Point and Beaufort"
- "dovetail with the recent *determination for joint military operation of Navy and Marine Corps aircraft...*"
- "Alleviated concerns with regard to future environmental and land use problems..."
- Aviation Intermediate Maintenance Activity (AIMD) to Cherry Point
- 204 F/A-18s to Cherry Point
- Thirteen 12 Aircraft Sqdns and one Fleet Replacement Sqdn (FRS) of 48 aircraft

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - BRAC '95 Recommendation (Redirect)

- F/A-18s to Oceana, VA - Eight 10 Aircraft Sqdns and one 48 Aircraft FRS
- F/A-18s to Beaufort, SC - two 10 aircraft sqdns
- F/A-18s to NAS Atlanta - two 10 aircraft sqdns (Reserve)

# Cherry Point - What has changed?

1 ▪ "The two rules built into the configuration model are that average military value of air stations left open must be at least equal to the average military value of all air stations considered and that <u>the introduction of aircraft types not currently aboard a station is not allowed</u>"

pulation of rules

- Designed to eliminate Cherry Point as an F/A-18 site
- Designed to qualify Oceana for Active component F/A-18s by reliance on 1 RESERVE sqdn of F/A-18s
- Seriously undermines the inter-service operations mandated by BRAC '93
- *S-3s* moved from NAS Oceana to NAS Jacksonville

Violation of rules

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - What has changed? (cont'd)

2 ▪ The application of "significant cost avoidance ... through cancellation of budgeted military construction (milcon) and fuller utilization of existing capacity at other receiving sites..."

- **COBRA Analysis 1993:**
  - Move F/A-18s and S-3s to Oceana - **$228,084,877 million**
  - "Movement of NAS Cecil Field F/A-18 aircraft and personnel to NAS Oceana defeats the increase in military value achieved by the integration of Navy Carrier based aviation with the Marine Corps carrier aviation at MCAS's Cherry Point and Beaufort."
  - Move F/A-18s Cherry Point - $201,031,110 million
  - Move S-3s to Oceana - $42,871,751 million

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - COBRA Analysis 1995

Inaccurate Figures !

- Move F/A-18s to Oceana - **$29,570,545** ?
- w/ $332,342,000 million (cost avoidance) at Cherry Point
- This cost avoidance was calculated on a plan for Cherry Point to receive thirteen sqdns of 12 aircraft each and an FRS of 48 aircraft
- ***SHOULD be consistent based on eight sqdns of 10 aircraft each + FRS of 48 aircraft (as was Oceana Cobra)***

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point and Oceana - *Personnel*

| | | |
|---|---|---|
| Personnel | 8713 | 8730 |
| Housing | 2840 units | 1225 units |
| BEQ | 3750 beds | 2640 beds |

# Cherry Point - COBRA Analysis 1995 (cont'd)

- Family Housing *
  - Cherry Point 2,840 units
  - Includes $42,800,000 for 447 family housing units in addition to the 2,840 units currently at Cherry Point ?

Not Required!

Not Required!

- Bachelor Enlisted Housing
  - Includes $39,500,000 for BEQs at Cherry Point
  - Capacity is in place for additional personnel at Cherry Point
  - No BEQ growth is planned for Oceana ?

* Family Housing Market Analysis (HMA) - May 1994 - Naval Facilities Command, Atlantic Division

# Cherry Point - *Costs*

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point and Oceana - *Excess Capacity*

- Outlying Air Field Requirement
  - $49.5 million
  - This would balance the OLF requirements between MCAS Cherry Point and NAS Oceana
  - This would relieve the congestion at Fentress OLF
  - Minimal environmental impact

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point and Oceana

- Economic Impact Validation - EID vs EIFS

| | | | | | |
|---|---|---|---|---|---|
| MCAS Cherry Point | -7.4% | -8.142% | -7.370% | -7.636% | -6.503 % |
| MCAS Beaufort | .5% | | NET IN | | |
| NAS Oceana | .5% | | NET IN | | |
| NAS Atlanta | 0.0% | | NET IN | | |

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point and Oceana

## ▪ Environmental Issues

- 1980-81:SE Virginia drought - Oceana builds emergency wells. "Efforts to curtail consumption were successful, but these measures were at the expense of operational readiness." [1]
- 1985-88:Variety of voluntary and mandatory water use restrictions imposed.
- 1991-92:Virginia Beach imposes mandatory, long-term water use restrictions and places a moratorium on all new water system connections. These restrictions remain in place.
- 1994:U.S. Army Corps of Engineers concludes the area is very vulnerable to drought and, without an additional water supply, faces water problems of extreme proportions.[2]
- 1995:Virginia Beach provides comments to FERC on the January 1995 DEIS: "the Lake Gaston Project will not eliminate the need for Virginia Beach or Chesapeake to restict water use..." [3]

*1 December 1980 Navy Oceana Environmental Assessment, page 1.
2 Quoted in January 1995 Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Statement ( DEIS) at page 1-5.
3 January 1995 FERC DEIS, pages 1-8 to 1-10

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Executive Summary to BRAC Commission and Staff

- Proper COBRA analysis with consistent numbers for Oceana and Cherry Point
  - # of aircraft per squadron
  - # of squadrons in question
  - Milcon avoidance
  - BEQ requirements
  - Family housing requirements
  - Parallel taxiway
  - Outlying Field (OLF) requirements
- Revalidate introduction of "rules" which were designed to facilitate non-integration of Marine and Navy assets
- Relocation costs should be based on aircraft / personnel moving from Cecil Field, FL to new home base

# BRAC 1995 - Regional Hearing

May 4, 1995

OPERATION HORNETS' NEST

MCAS CHERRY POINT

# BRAC 1995 - Regional Hearing

**May 4, 1995**

OPERATION HORNETS' NEST

MCAS CHERRY POINT

# Agenda

- BRAC Decisions / Recommendations
- Return on Investment - COBRA Analysis
- Overview
- Military Value - Cherry Point and Oceana
- Environmental Issues
- Economic Impact
- Conclusions
- Recommendations

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# 1993 D.O.D. Recommendation and BRAC Decision

- "preponderance of aircraft to be redistributed from NAS Cecil Field to two MCAS on the East Coast, Cherry Point and Beaufort"
- Aviation Intermediate Maintenance Activity (AIMD) to Cherry Point
- Cherry Point allocation
  - (13) 12-aircraft operational squadrons
  - ( 1) 48-aircraft training squadron
  - Total of 204 F/A-18 aircraft

# 1993 Rationale

- "...dovetail with the recent *determination for joint military operation of Navy and Marine Corps aircraft...*"
- "...Alleviated concerns with regard to future environmental and land use problems..."
- Oceana considered as receiver but *rejected*:
  - "...Movement of NAS Cecil Field F/A-18 aircraft and personnel to NAS Oceana defeats the increase in military value achieved by the integration of Navy carrier-based aviation with the Marine Corps carrier aviation at MCAS's Cherry Point and Beaufort..."
- 1993 COBRA analysis found that movement of Cecil Field:
  - F/A-18 and S-3 aircraft to Oceana would cost $228,084,877
  - F/A-18 aircraft to Cherry Point would cost $147,453,000
  - S-3 aircraft to Oceana would cost $42,871,751
- Navy rationale made sense

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# 1995 Navy / D.O.D. Recommendation

- From Cecil Field to Oceana:
  - (8) operational squadrons
  - ( 1) training squadron
- From Cecil Field to Beaufort, SC:
  - ( 2) operational squadrons
- From Cecil Field to Atlanta:
  - ( 2) operational squadrons (Reserve)

# 1995 Navy Rationale totally changed!

- "The rules built into the configuration model are:
  - Rule 1: that average military value of air stations left open must be at least equal to the average military value of all air stations considered and that *the introduction of aircraft types not currently aboard a station is not allowed"*
- This rule:
  - Eliminates Cherry Point as an F/A-18 base
  - Qualifies Oceana for active component F/A-18s by virtue of its ONE F/A-18s Reserve squadron
  - Destroys the inter-Service synergy sought in the BRAC '93 recommendations and confirmed by the BRAC '93 decision
  - Violated by redirecting S-3s from NAS Oceana to NAS Jacksonville

Substantial Deviation

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Return on Investment - COBRA Analysis

**Rule 2: The application of "significant cost avoidance...through cancellation of budgeted military construction (MILCON) and fuller utilization of existing capacity at other receiving sites..."**

- **Cherry Point Costs Overstated:**
  - **Cost avoidance for Cherry Point calculated at $332,342,000**
  - **Including:**
    - **$42,800,000 for 447 *MORE* family housing units at Cherry Point that are NOT required**
    - **$39,500,000 for 6 additional BEQs which are NOT required**
    - **$25,000,000 for unnecessary and counterproductive parallel taxiway**
  - **Unlike Oceana costs, Cherry Point savings are based on original plan to house 204 aircraft**
  - ***SHOULD be consistent based on eight operational squadrons plus an FRS of 48 aircraft (as was Oceana Cobra)***

# Return on Investment - COBRA Analysis

- <u>Oceana Costs Understated:</u>
  - Move of F/A-18s to Oceana costed at $28,370,000, rather than the 1993 figure of $228,084,877
  - No calculation for additional family / bachelor housing

| | | |
|---|---|---|
| Personnel | 8713 | 8730 |
| Housing | 2840 units | 1225 units |
| BEQ | 3750 beds | 2640 beds |

# Return on Investment - COBRA Analysis

| | 1993 | 1995 ? |
|---|---|---|
| Oceana | $228,084,877 | $28,370,000 |
| Cherry Point | $147,453,000 | $332,342,000 |

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - Overview

## Installation Summary

- Largest MCAS - 13,164 acres + 17,000 acres of training areas
- Master Jet Base
- Home of:
  - 2nd Marine Aircraft Wing - AV8B, EA6, & KC-130 aircraft
  - Award Winning Naval Aviation Depot
- Aerial Port of Embarkation
- Environmental Award Winner
- Two-time winner of Commander in Chief's award for installation excellence

# Cherry Point - Overview

## Infrastructure

- $400M MILCON expenditure in last decade
  - 16 ***New*** BEQ's with additional capacity
  - ***New*** Full Service Naval Hospital
  - ***New*** Water Treatment Facility with additional capacity
  - ***New*** Sewage Treatment Facility with additional capacity

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - Overview

## Proximity to Training Areas

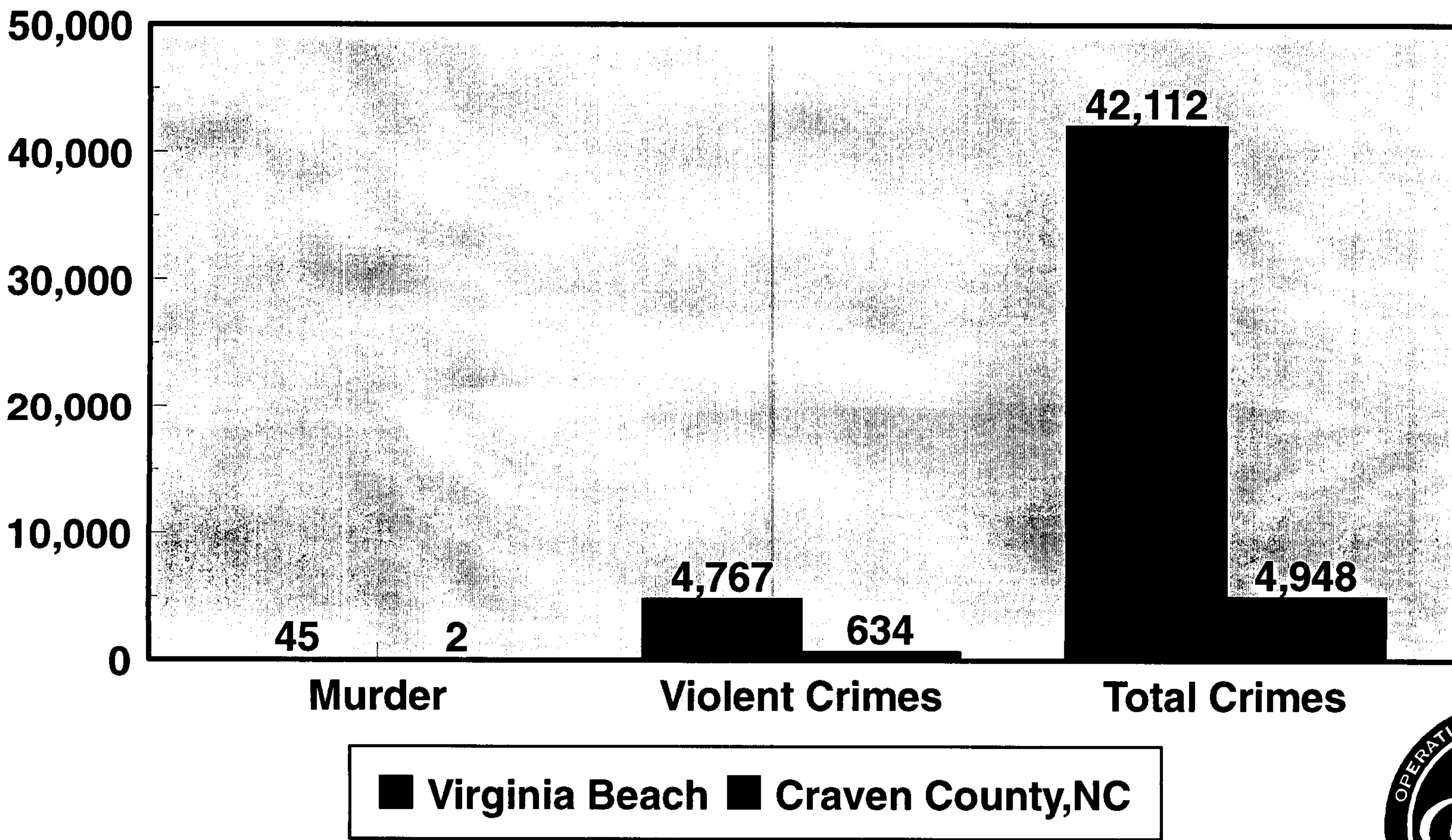
- Marine Corps Base Camp Lejeune
- Electronic Warfare Range, Cherry Point
- Air-to-Air ranges off coast of North Carolina

***Note:***

**Overwhelming *majority* of Air-to-ground training done in North Carolina**

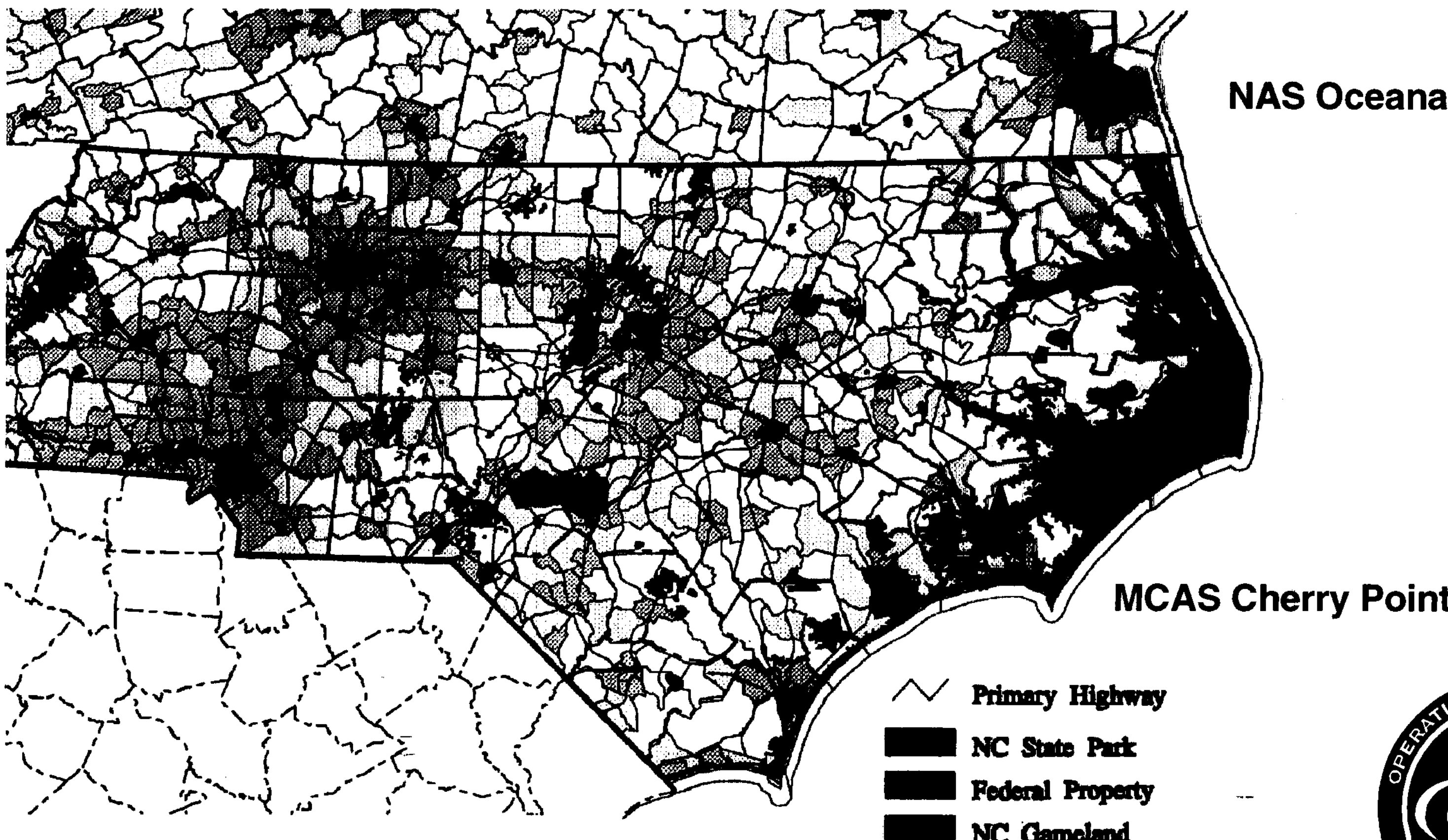
**Greater productivity for each hour of flying time**

# Community Crime Rates 1992-1994



# Military Value - Cherry Point and Oceana

## Population Density



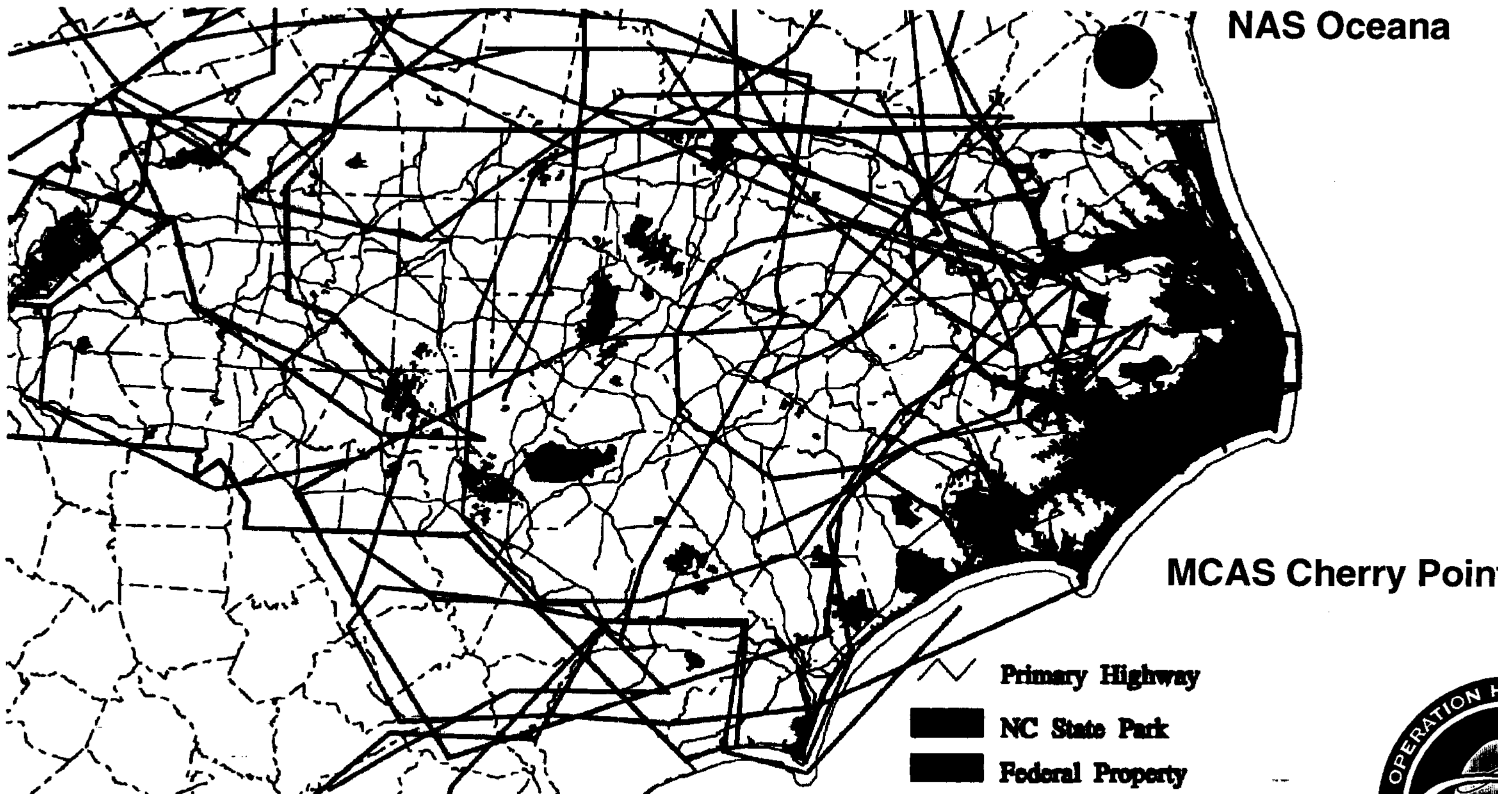

Map produced April 1995 by the
North Carolina Center for Geographic Information and Analysis
115 Hillsborough Street * Raleigh, NC 27603 * (919) 733-2090

State of North Carolina Office of the Governor
116 W Jones St * Raleigh, NC 27603 * (919) 733-5201

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Military Value - Cherry Point and Oceana

## Military Training Routes




Map produced April 1995 by the
North Carolina Center for Geographic Information and Analysis
115 Hillsborough Street * Raleigh, NC 27603 * (919) 733-2090

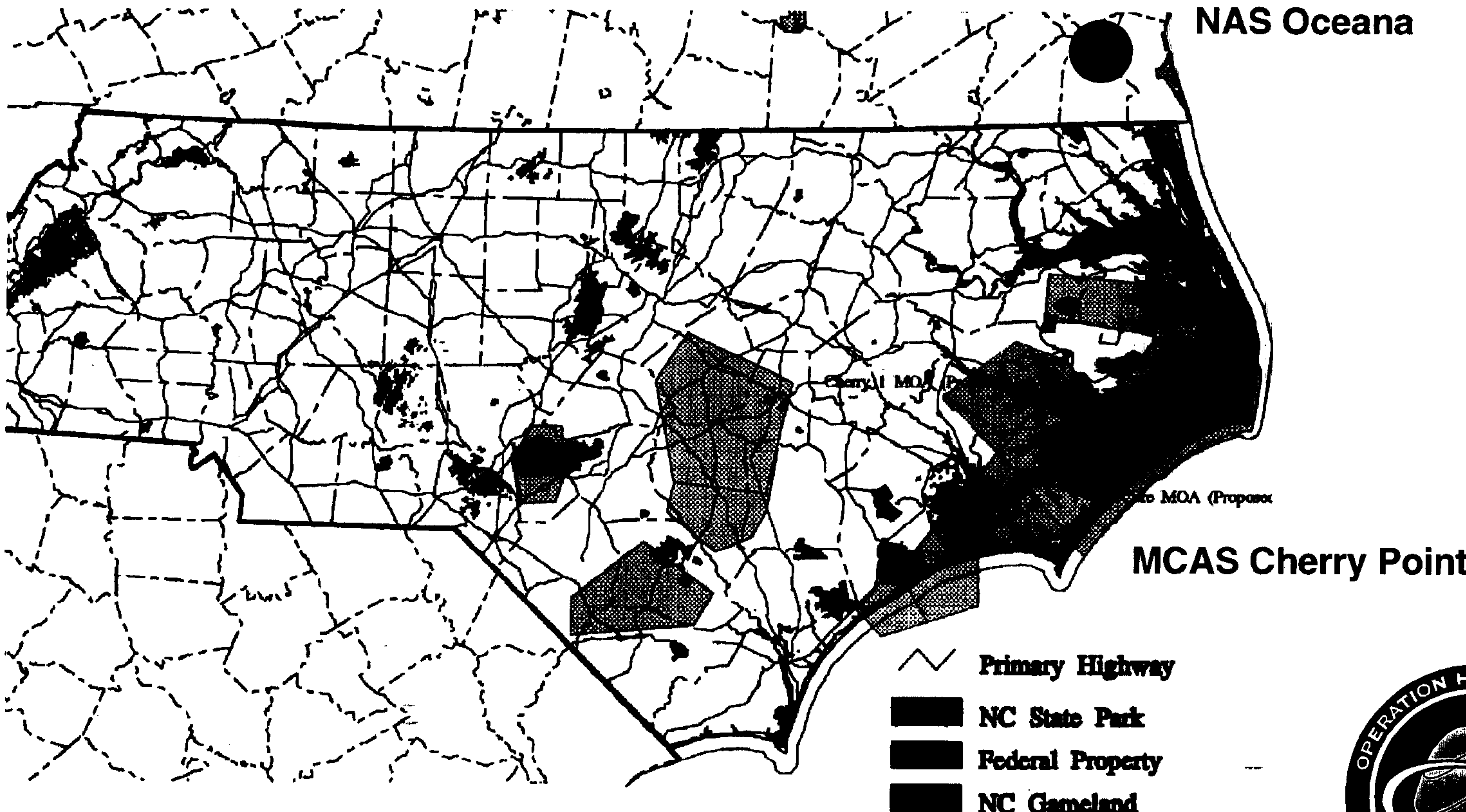
State of North Carolina Office of the Governor
116 W Jones St * Raleigh, NC 27603 * (919) 733-5201

# How is proximity to the fleet an issue?


OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Military Value - Cherry Point and Oceana

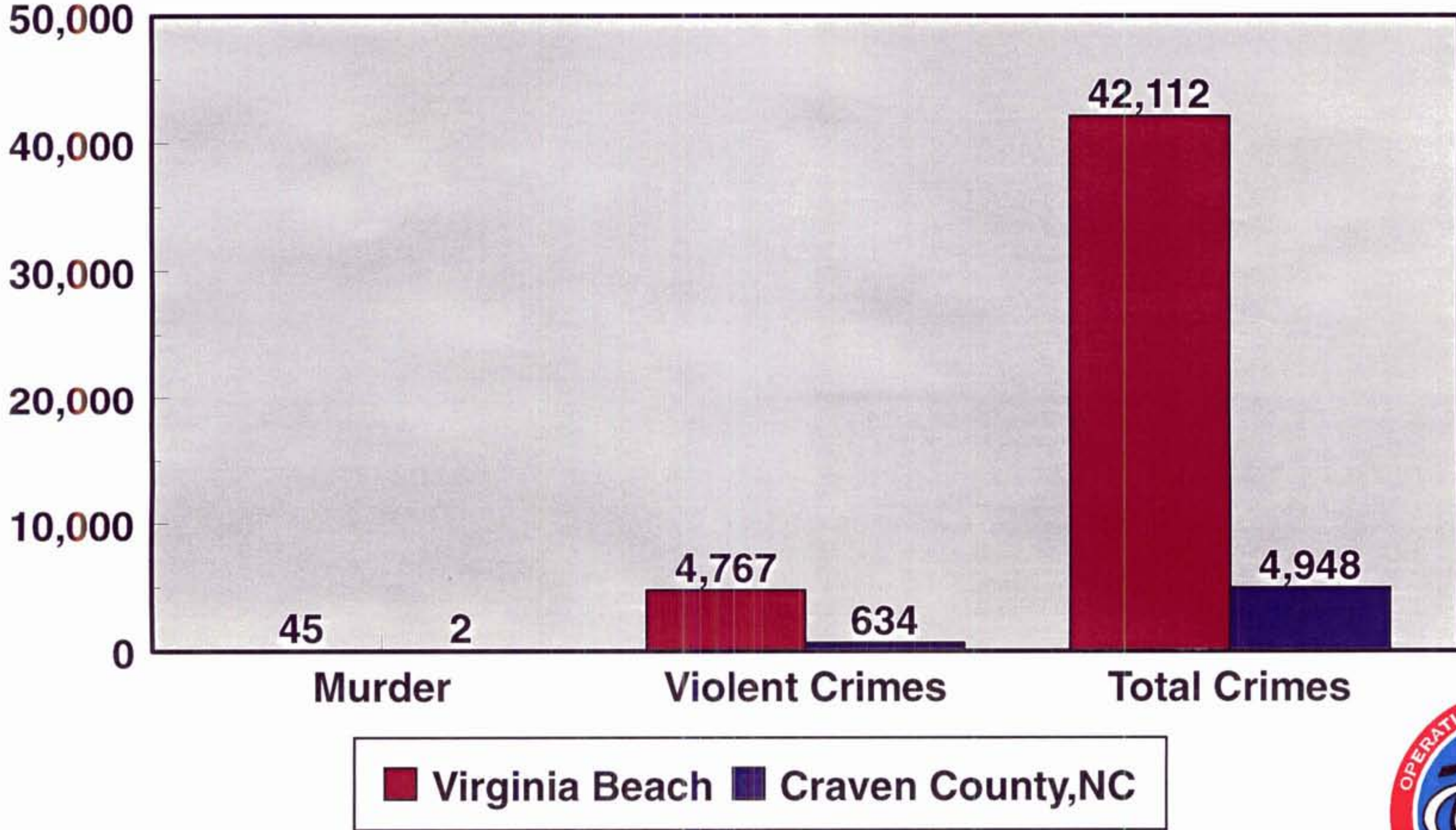
## Military Airspace




Map produced April 1995 by the
North Carolina Center for Geographic Information and Analysis
115 Hillsborough Street • Raleigh, NC 27603 • (919) 733-2090

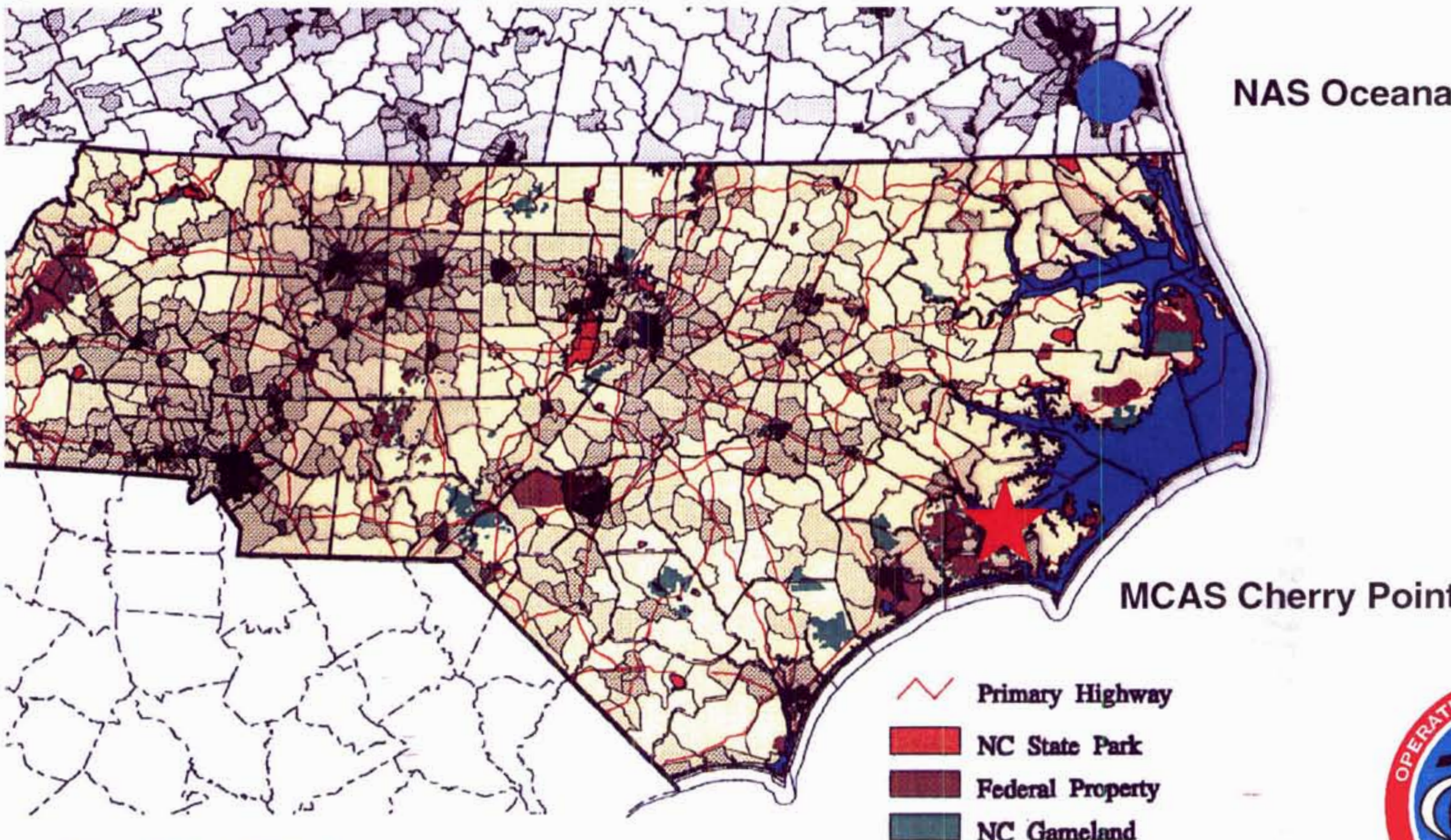
State of North Carolina Office of the Governor
116 W Jones St • Raleigh, NC 27603 • (919) 733-5201

# Community Crime Rates 1992-1994



# Military Value - Cherry Point and Oceana

## Population Density

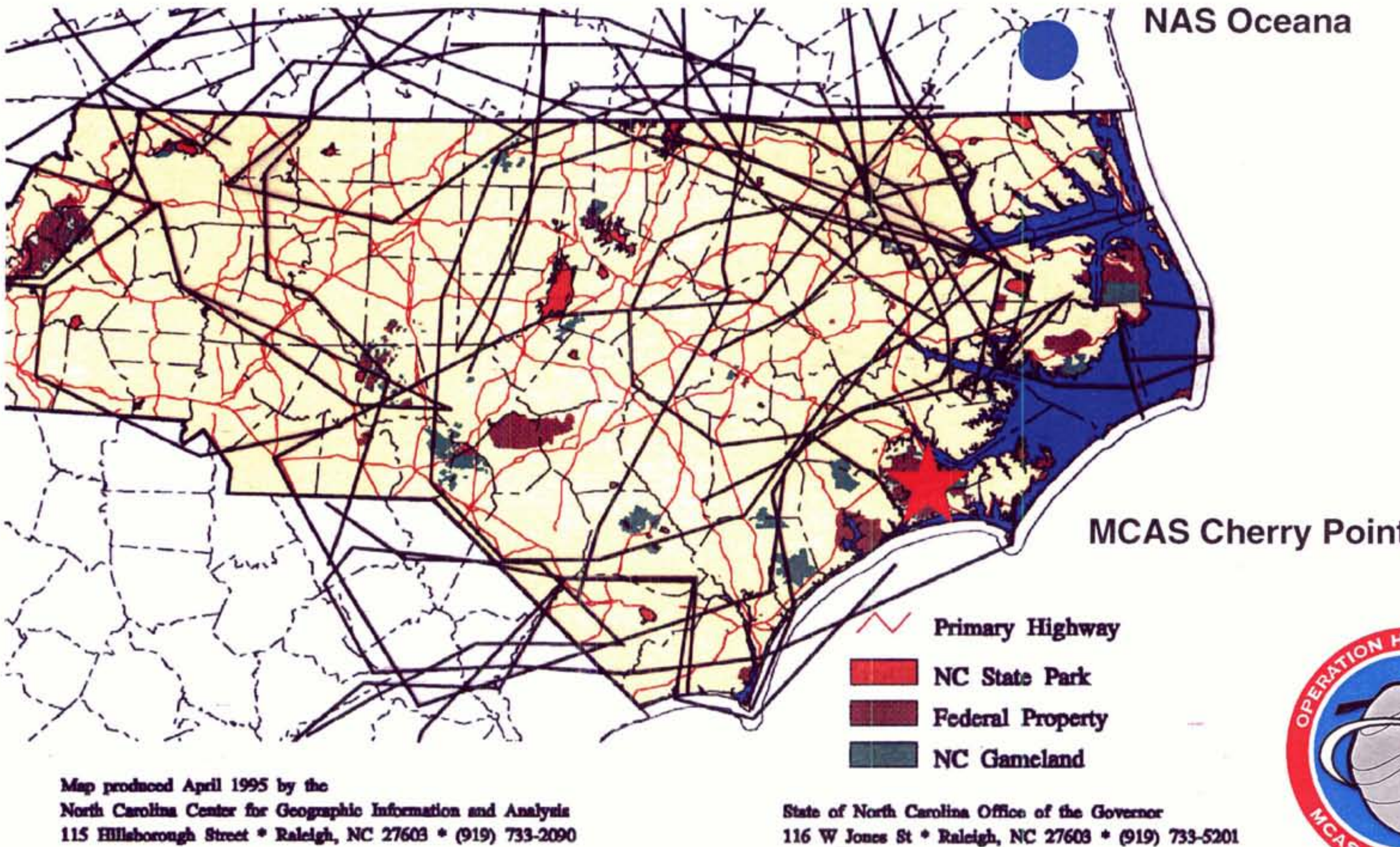



Map produced April 1995 by the
North Carolina Center for Geographic Information and Analysis
115 Hillsborough Street * Raleigh, NC 27603 * (919) 733-2090

State of North Carolina Office of the Governor
116 W Jones St * Raleigh, NC 27603 * (919) 733-5201

# Military Value - Cherry Point and Oceana

## Military Training Routes



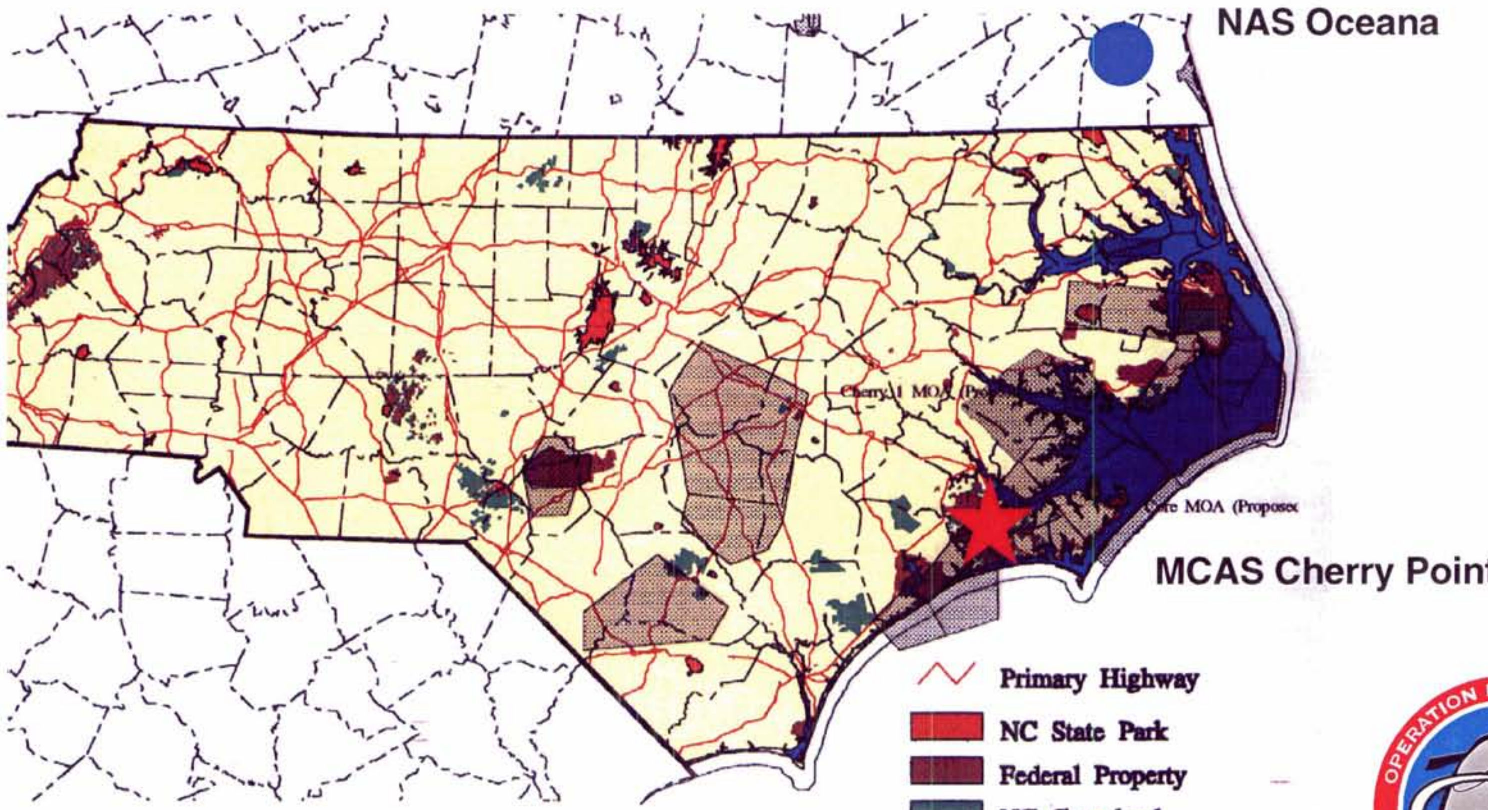

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# *How is proximity to the fleet an issue?*


OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Military Value - Cherry Point and Oceana

## Military Airspace




Map produced April 1995 by the
North Carolina Center for Geographic Information and Analysis
115 Hillsborough Street • Raleigh, NC 27603 • (919) 733-2090

State of North Carolina Office of the Governor
116 W Jones St • Raleigh, NC 27603 • (919) 733-5201

# Cherry Point and Oceana

- **Economic Impact Validation of 1995 D.O.D. Recommendation to Ignore 1993 BRAC Commission Directive**

| Activity | EID |
|---|---|
| MCAS Cherry Point | -7.4% |
| MCAS Beaufort | .5% |
| NAS Oceana | .5% |
| NAS Atlanta | 0.0% |

# New Sewage Treatment Plant

# New Sewage Treatment Plant

# New Water Treatment Plant

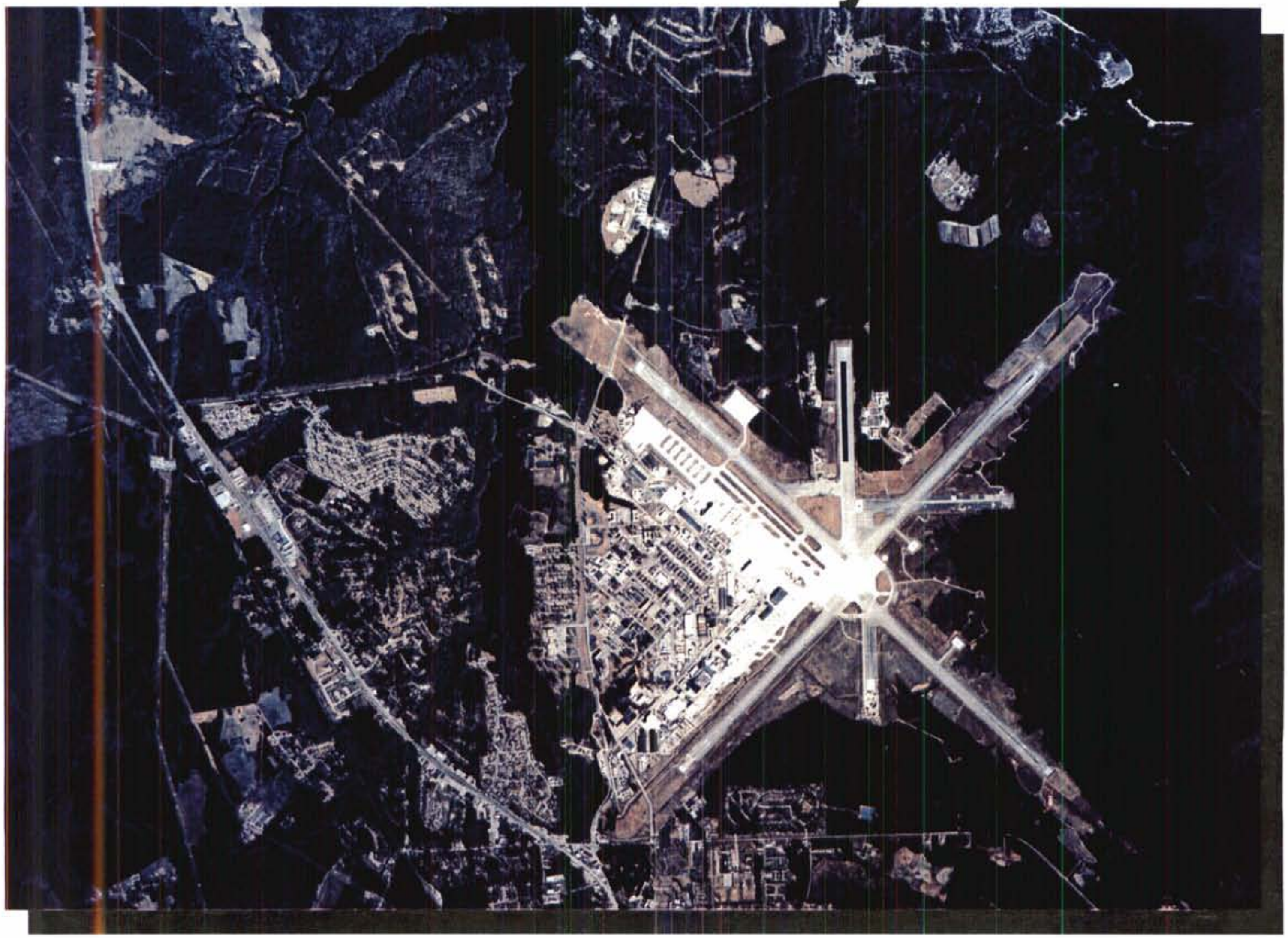
# New Water Treatment Plant

# 16 New BEQs

# 16 New BEQs

# 1988 & 1993 Installation Excellence Award

# Aerial View of Cherry Point



# Aerial Port of Embarkation

# Cherry Point - Award Winning NADEP

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# New Naval Hospital

Final Selection

# Appendix C
# Final Selection Criteria

## Military Value
### (given priority consideration)

1. The current and future mission requirements and the impact on operational readiness of the Department of Defense's total force.

2. The availability and condition of land, facilities, and associated airspace at both the existing and potential receiving locations.

3. The ability to accommodate contingency, mobilization, and future total force requirements at both the existing and potential receiving locations.

4. The cost and manpower implications.

## Return on Investment

5. The extent and timing of potential costs and savings, including the number of years, beginning with the date of completion of the closure or realignment, for the savings to exceed the costs.

## Impacts

6. The economic impact on communities.

7. The ability of both the existing and potential receiving communities' infrastructure to support forces, missions and personnel.

8. The environmental impact.

Mission

# 1993 Rationale

- "...dovetail with the recent *determination for joint military operation of Navy and Marine Corps aircraft...*"
- "...Alleviated concerns with regard to future environmental and land use problems..."
- Oceana considered as receiver but *rejected*:
  - "...Movement of NAS Cecil Field F/A-18 aircraft and personnel to NAS Oceana defeats the increase in military value achieved by the integration of Navy carrier-based aviation with the Marine Corps carrier aviation at MCAS's Cherry Point and Beaufort..."
- 1993 COBRA analysis found that movement of Cecil Field:
  - F/A-18 and S-3 aircraft to Oceana would cost $228,084,877
  - F/A-18 aircraft to Cherry Point would cost $201,031,110
  - S-3 aircraft to Oceana would cost $42,871,751
- Navy rationale made sense

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Cherry Point - Overview

## Proximity to Training Areas

- Marine Corps Base Camp Lejeune
- Electronic Warfare Range, Cherry Point
- Air-to-Air ranges off coast of North Carolina

***Note:***

Overwhelming *majority* of Air-to-ground training done in North Carolina

Greater productivity for each hour of flying time

## MARINE CORPS AIR STATION
## CHERRY POINT, NORTH CAROLINA 28533

*As we enter 1995, the good-neighbor spirit which has always characterized the relationship between the Marines, Sailors and Civilians at Marine Corps Air Station, Cherry Point and the surrounding communities continues to thrive.*

*Cherry Point, home of the Second Marine Aircraft Wing and the Naval Aviation Depot (NAVAVNDEPOT), is a large positive contributor to the regional economy. Throughout 1995, the quad-counties of Carteret, Craven, Jones, and Pamlico can expect considerable growth from the actions of the 1993 Defense Base Realignment and Closure (BRAC) Commission. This will include continued expansion of NAVAVNDEPOT workload and personnel, as well as preparation for the relocation of fighter squadrons from Naval Air Station, Cecil Field, Jacksonville, Florida to Cherry Point.*

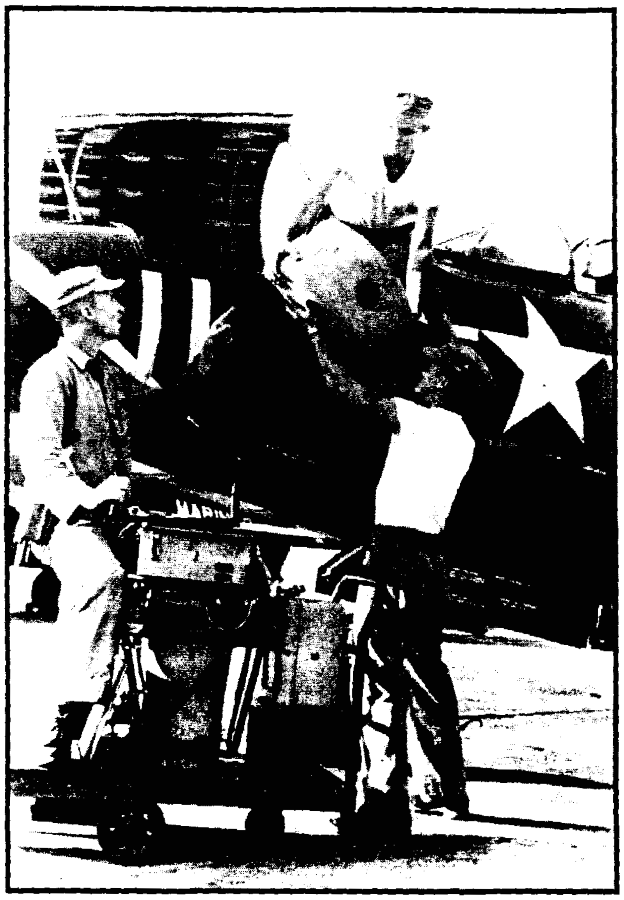
*Salaries in 1995 are expected to exceed $471.3 million. Contracts awarded to North Carolina companies for construction, maintenance and services are projected to exceed $22 million and other Air Station services and support will total nearly $140 million. These figures are part of Cherry Point's projected $563.4 million total contribution to be spent in North Carolina in the coming year.*

*This report contains information about Cherry Point that you can use in planning for the future. I appreciate your support of the Air Station and its mission, and remain committed to the dynamic partnership we have formed. Through our combined efforts, our uniquely shared heritage will continue to accommodate meaningful progress.*

Fred McCorkle

**F. MCCORKLE**
**BRIGADIER GENERAL, U.S. MARINE CORPS**
**COMMANDING GENERAL**

# HISTORY



Marines loading film magazine in F9F-6P "Cougar"
MCAS Cherry Point, 6 September 1954

Pilot climbing in F9F-6P "Cougar" of VMT-2.
MCAS Cherry Point, 3 February 1955

During the summer of 1940, a search began along the South Atlantic and Gulf Coast states for a suitable site to locate a division and wing size air-ground team. In 1941, this search led to the selection of a site on the North Carolina coast of New River and an inland site on the south bank of the Neuse River, between Slocum and Hancock Creeks, known today as Marine Corps Air Station, Cherry Point.

This new site was designated as "Cunningham Field." With $15 million allocated from Congress, construction began in 1941, to include the construction of landing field runways. Flight operations officially began in March 1942 when the Air Station's Commanding Officer, Lieutenant Colonel Thomas J. Cushman, USMC, landed a Grumman J2F "Duck" amphibian.

In May 1942, Marine Corps Air Station, Cherry Point, was officially commissioned. This Command rapidly grew and became the world's largest Marine Corps Air Station (MCAS) and home for a number of Marine Aircraft Wings (MAW).

MCAS Cherry Point has been the home to the 3d MAW, 9th MAW and, since 1946, home of the 2d MAW. Through the years, well over 100 squadrons have been formed and deployed in harms way and tens of thousands of young men and women have trained as individual replacements when duty called.

Personnel of MCAS Cherry Point have participated in world events defending vital national interests including World War II, Korea, Lebanon, Vietnam, Dominican Republic, Cuban Missile Crisis, Grenada, Panama and Desert Storm. Additionally, personnel assigned to Cherry Point have assisted in humanitarian relief efforts throughout the world.

# MISSION

## MARINE CORPS AIR STATION CHERRY POINT

MCAS Cherry Point's mission is to maintain and operate facilities and provide services and material support operations for a Marine Aircraft Wing, and other activities and units as designated by the Commandant of the Marine Corps, in coordination with the Chief of Naval Operations.

In order to provide the United States with the best trained, best led, best supported armed forces, capable of operating anytime, anywhere to fight, survive and win, the Air Station furnishes the highest quality operating environment; provides a full range of vital support services; nurtures quality of life; protects the natural environment; and conducts proactive community relations.

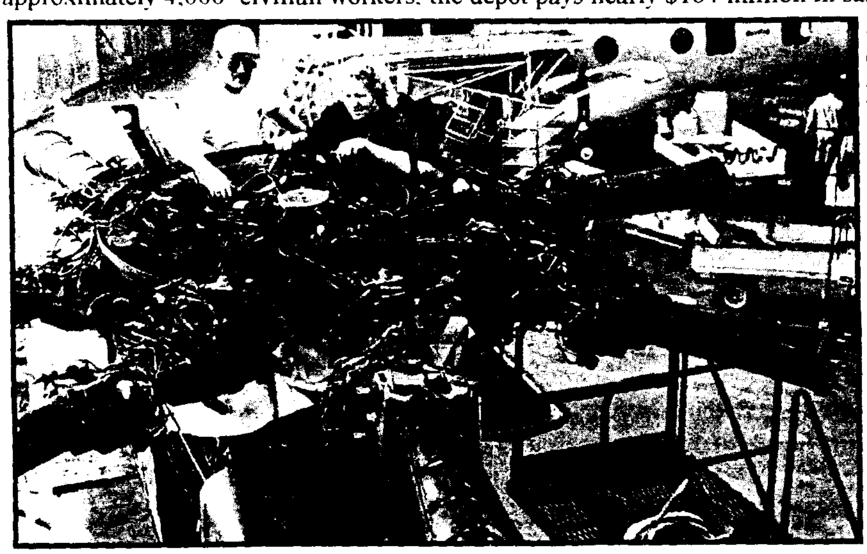
THE AIR STATION "RAPID JETS" REFUELERS PROVIDE SERVICES FOR 2D MAW AND VISITING AIRCRAFT

## NAVAL AVIATION DEPOT CHERRY POINT

The mission of the Naval Aviation Depot (NAVAVNDEPOT) at Cherry Point is to provide our nation with the highest quality worldwide aviation depot-level maintenance, engineering and logistics support, on time and at the least cost. Since 1943, the depot has been a vital resource in supporting fleet combat operations throughout the world.

During FY 94, significant new programs were undertaken here, including the transition of the H-53 helicopter program, from the Naval Aviation Depot Pensacola. Significant engineering responsibilities for the H-1, H-2, H-3, and H-60 were also relocated to Cherry Point. These vital naval aviation functions provide the base of a nearly 30% growth in the overall work performed at this facility over that of the previous year.

NAVAVNDEPOT Cherry Point continues to be a driving force in the regional economy. Employing approximately 4,000 civilian workers, the depot pays nearly $164 million in salaries and will spend nearly $12 million through purchasing and contracting actions in the coming year.



NAVAVNDEPOT TEAM INSPECTS AN H-53 HELICOPTER ROTOR HEAD

# MISSION


2D MAW AV-8B "Harrier" From VMA-542 Prepares For Flight

## SECOND MARINE AIRCRAFT WING (2D MAW)

MCAS Cherry Point is home to 2d MAW, the largest Marine Aircraft Wing. The 2d MAW provides the aviation arm of the Air-Ground Task Force for the II Marine Expeditionary Force (MEF). The 2d MAW is comprised of four aircraft groups, one Wing support Group, one air control group and one Wing headquarters squadron. These units provide over 450 tactical aircraft and over 13,000 Marine and Navy personnel to support II MEF missions.

Located at the Air Station, Marine Aircraft Group (MAG) 14 provides light attack, in-flight refueling, fixed-wing assault support, and electronic warfare capability for II MEF. MAG-14 has ten flying squadrons and one Marine Aviation Logistics Squadron. MAG 14 operates and maintains the EA-6B Prowler, KC-130F and KC-130R Hercules, the TAV-8B and AV-8B Harriers.

Marine Wing Support Group (MWSG) 27 provides the aviation support for the 2d MAW and is capable of establishing expeditionary airfields and forward operating bases anywhere in the world utilizing its organic assets. Marine Air Control Group (MACG) 28 provides II MEF with Low Altitude Air Defense and with the capability to command and control aircraft and missiles in both the joint service and allied theaters of operation.

Marine Aircraft Groups 26 and 29 are located at MCAS New River, NC and provide helicopter support. MAG 31 is located in Beaufort, SC and operates the F/A-18A/C and F/A-18D fighter/attack squadrons.

Professional Nursing Staff Tends New Patient in Newborn Nursery

## NAVAL HOSPITAL CHERRY POINT

The Naval Hospital at Cherry Point provides medical and administrative support to personnel of MCAS, 2d MAW, NAVAVNDEPOT, and other tenant activities. The Naval Hospital is responsible for maintaining the health of all eligible personnel through the promotion of physical fitness, prevention and control of diseases and injuries, and the treatment and care of the sick and injured. The Naval Hospital is staffed and quipped to provide for the primary medical needs of the eligible personnel in the surrounding areas.

Land, Facilities,

# Return on Investment - COBRA Analysis

- <u>Oceana Costs Understated:</u>
  - Move of F/A-18s to Oceana costed at $29,570,545, rather than the 1993 figure of $228,084,877
  - No calculation for additional family / bachelor housing

| | Cherry Point | Oceana |
|---|---|---|
| Personnel | 8713 | 8730 |
| Housing | 2840 units | 1225 units |
| BEQ | 3750 beds | 2640 beds |

# Cherry Point - Overview

## Installation Summary

- Largest MCAS - 13,164 acres + 17,000 acres of training areas
- Master Jet Base
- Home of:
  - 2nd Marine Aircraft Wing - AV8B, EA6, & KC-130 aircraft
  - Award Winning Naval Aviation Depot
- Aerial Port of Embarkation
- Environmental Award Winner
- Two-time winner of Commander in Chief's award for installation excellence

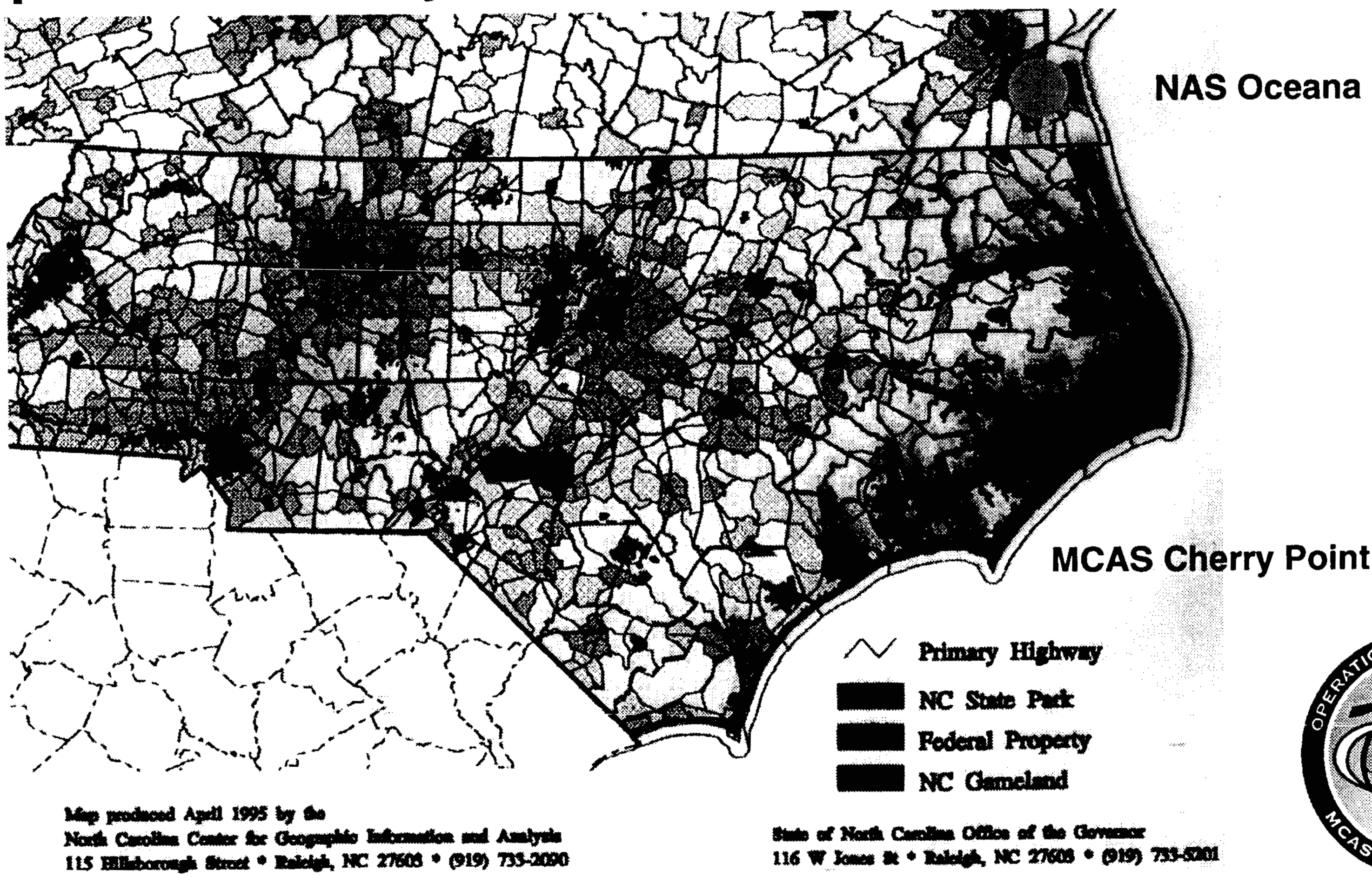
# Cherry Point - Overview

## Infrastructure

- $400M MILCON expenditure in last decade
  - 16 ***New*** BEQ's with additional capacity
  - ***New*** Full Service Naval Hospital
  - ***New*** Water Treatment Facility with additional capacity
  - ***New*** Sewage Treatment Facility with additional capacity

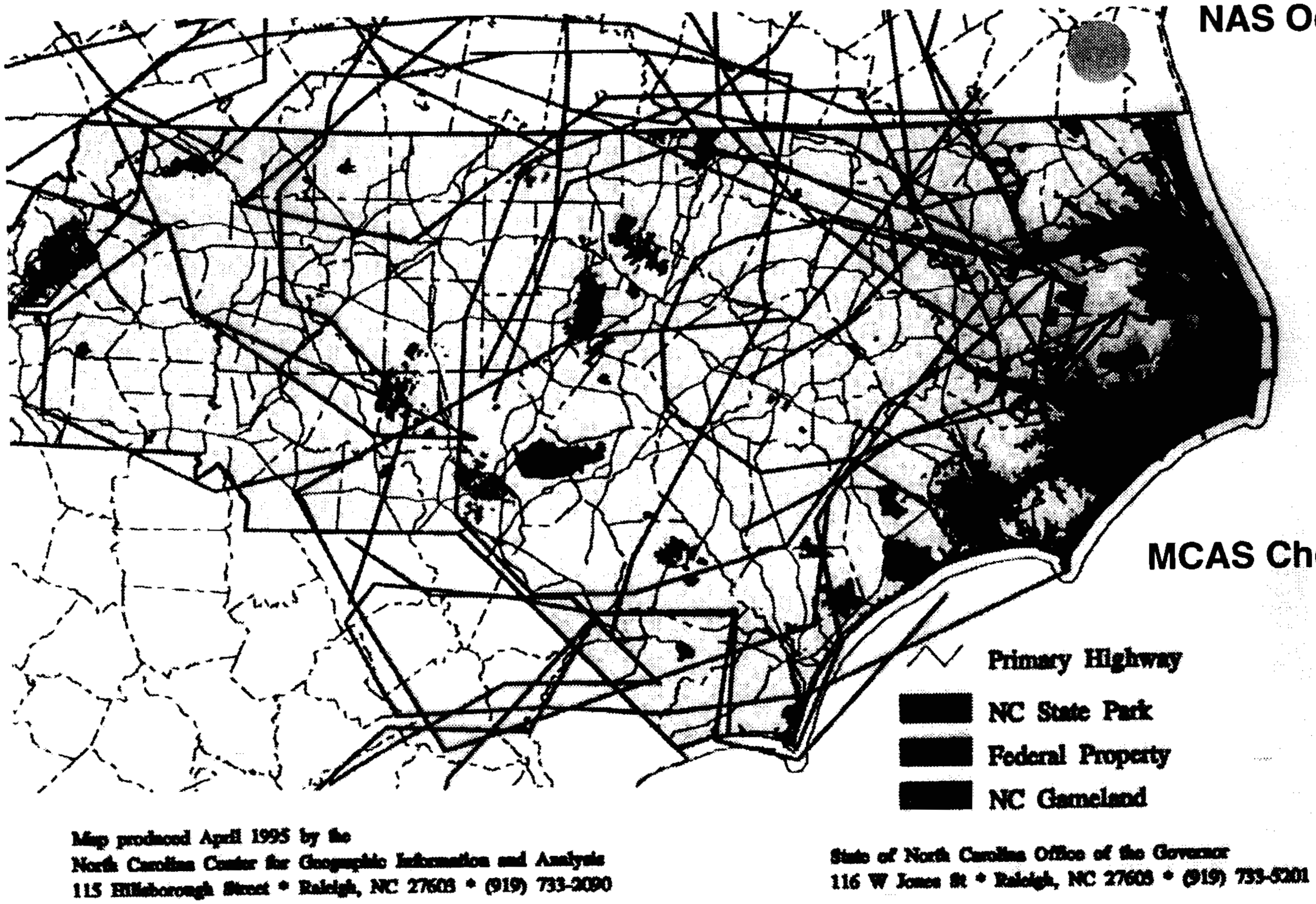
# Military Value - Cherry Point and Oceana

## Population Density



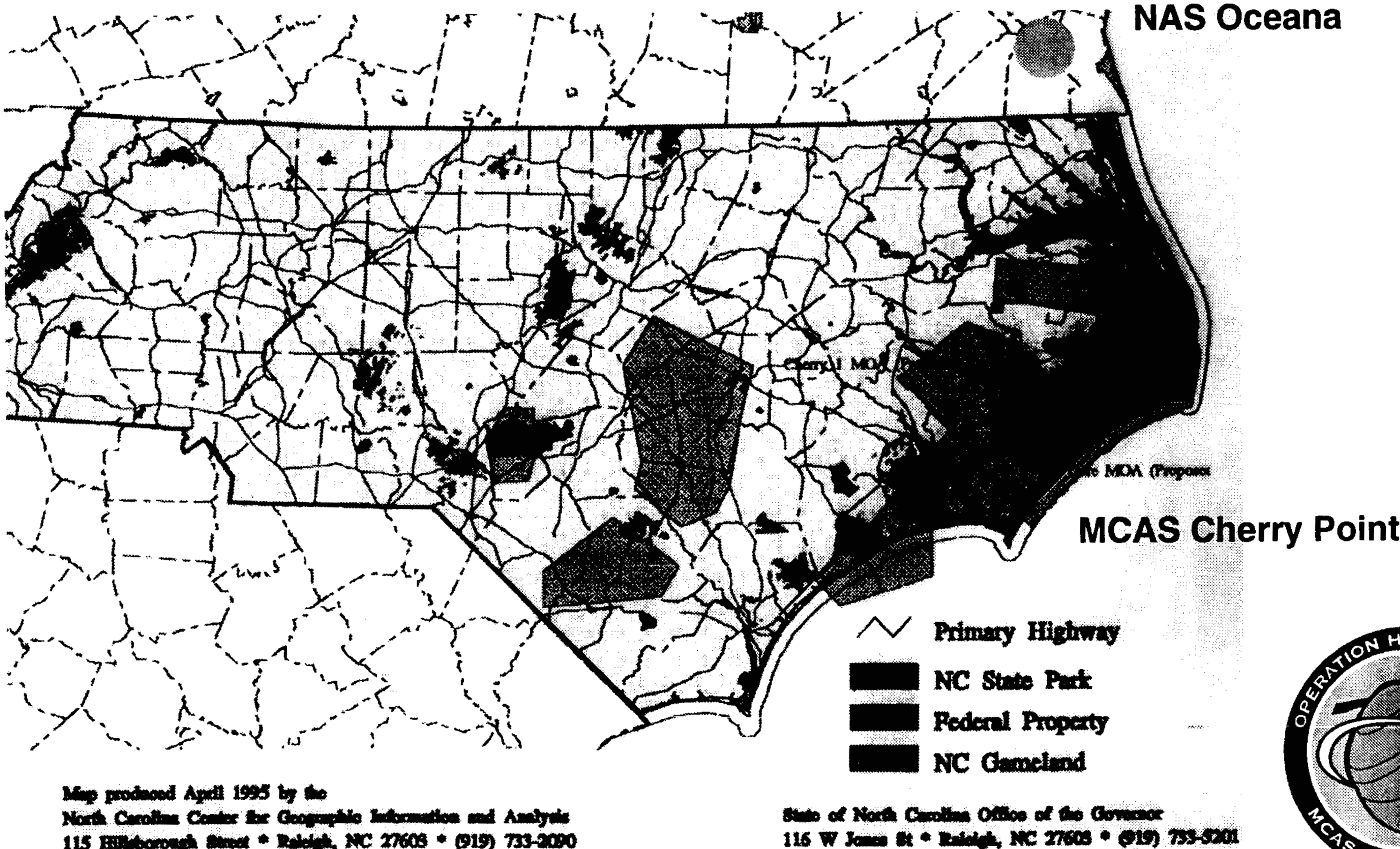
# Military Value - Cherry Point and Oceana

## Military Training Routes



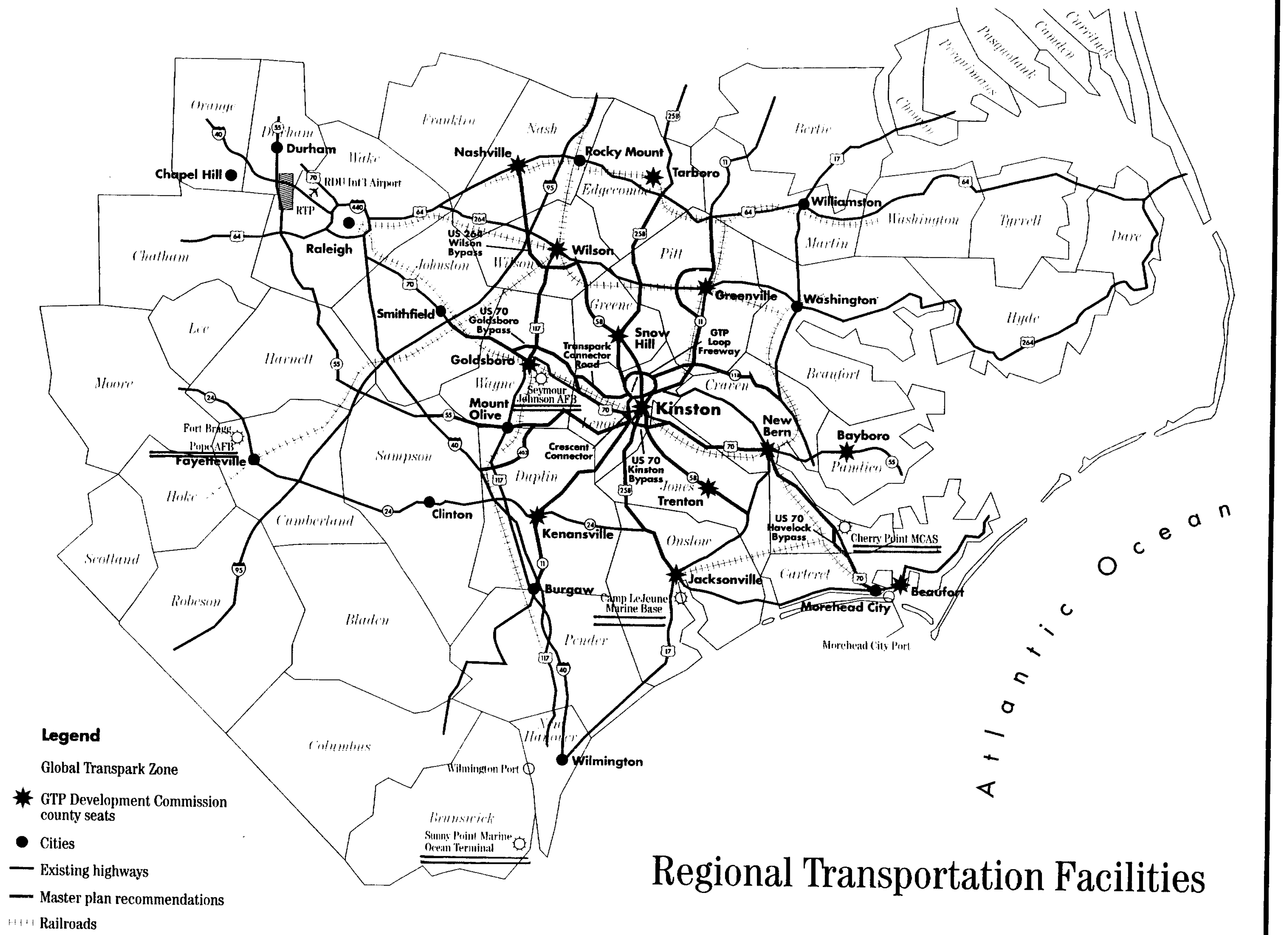
# Military Value - Cherry Point and Oceana

## Military Airspace



Mobilization & Total
Force Requirements

# Regional Transportation Facilities



# Return on Investment - COBRA Analysis

Rule 2: The application of "significant cost avoidance...through cancellation of budgeted military construction (MILCON) and fuller utilization of existing capacity at other receiving sites..."

- <u>Cherry Point Costs Overstated:</u>
  - Cost avoidance for Cherry Point calculated at $332,342,000
  - Including:
    - $42,800,000 for 447 *MORE* family housing units at Cherry Point that are NOT required
    - $39,500,000 for 6 additional BEQs which are NOT required
    - $25,000,000 for unnecessary and counterproductive parallel taxiway
  - Unlike Oceana costs, Cherry Point savings are based on original plan to house 204 aircraft
  - *SHOULD be consistent based on eight operational squadrons plus an FRS of 48 aircraft (as was Oceana Cobra)*

# Return on Investment - COBRA Analysis

- <u>Oceana Costs Understated:</u>
  - Move of F/A-18s to Oceana costed at $28,370,000, rather than the 1993 figure of $228,084,877
  - No calculation for additional family / bachelor housing

| | | |
|---|---|---|
| Personnel | 8713 | 8730 |
| Housing | 2840 units | 1225 units |
| BEQ | 3750 beds | 2640 beds |

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Return on Investment - COBRA Analysis

| | 1993 | 1995 ? |
|---|---|---|
| Oceana | $228,084,877 | $29,570,545 |
| Cherry Point | $201,031,110 | $332,342,000 |

Return on

# Return on Investment - COBRA Analysis

**Rule 2: The application of "significant cost avoidance...through cancellation of budgeted military construction (MILCON) and fuller utilization of existing capacity at other receiving sites..."**

- **<u>Cherry Point Costs Overstated:</u>**
  - **Cost avoidance for Cherry Point calculated at $332,342,000**
  - **Including:**
    - **$42,800,000 for 447 *MORE* family housing units at Cherry Point that are NOT required**
    - **$39,500,000 for 6 additional BEQs which are NOT required**
    - **$25,000,000 for unnecessary and counterproductive parallel taxiway**
  - **Unlike Oceana costs, Cherry Point savings are based on original plan to house 204 aircraft**
  - ***SHOULD be consistent based on eight operational squadrons plus an FRS of 48 aircraft (as was Oceana Cobra)***

OPERATION HORNETS' NEST
MCAS CHERRY POINT

# Return on Investment - COBRA Analysis

- Oceana Costs Understated:
  - Move of F/A-18s to Oceana costed at $28,370,000, rather than the 1993 figure of $228,084,877
  - No calculation for additional family / bachelor housing

| | | |
|---|---|---|
| Personnel | 8713 | 8730 |
| Housing | 2840 units | 1225 units |
| BEQ | 3750 beds | 2640 beds |

# Return on Investment - COBRA Analysis

| | 1993 | 1995 ? |
|---|---|---|
| Oceana | $228,084,877 | $28,370,000 |
| Cherry Point | $147,453,000 | $332,342,000 |

# Cherry Point - Overview

## <u>Infrastructure</u>

- $400M MILCON expenditure in last decade
  - 16 ***New*** BEQ's with additional capacity
  - ***New*** Full Service Naval Hospital
  - ***New*** Water Treatment Facility with additional capacity
  - ***New*** Sewage Treatment Facility with additional capacity

OPERATION HORNETS' NEST
MCAS CHERRY POINT

Data As Of 11:58 02/22/1992, Report Created 10:36 05/01/1995

All Costs in $K

| Base Name | Total MilCon | Land Purchase | Cost Avoid | Total Cost |
|---|---|---|---|---|
| NAS Cecil Field | 0 | 0 | -25,900 | -25,900 |
| MCAS Beaufort | 10,550 | 0 | 0 | 10,550 |
| MCAS Cherry Point | 147,453 | 0 | 0 | 147,453 |
| NAS Oceana | 42,722 | 0 | 0 | 42,722 |
| NAS Norfolk | 3,200 | 0 | 0 | 3,200 |
| Totals: | 203,924 | 0 | -25,900 | 178,024 |

Data As Of 15:10 06/15/1993, Report Created 07:43 04/04/1995

Base: NAS Oceana, VA
(All values in Dollars)

| | |
|---|---|
| MilCon w/o Avoidances | 222,534,877 |
| + Moving | 0 |
| + Eliminated Military PCS | 0 |
| + Administrative/Support | 0 |
| + Mothball/Shutdown | 0 |
| + Civilian RIF | 0 |
| + Civilian Early Retirement | 0 |
| + Civilian New Hires | 0 |
| + Civilian PPS | 0 |
| + Land Purchases | 0 |
| + Environmental Mitigation | 5,000,000 |
| + One-Time Unique Costs | 550,000 |
| + HAP / RSE | 0 |
| + Unemployment | 0 |
| + Info Management Account | 0 |
| = Total One-Time Costs | 228,084,877 |

| | |
|---|---|
| Milcon Cost Avoidances | 0 |
| + Procurement Cost Avoidances | 0 |
| + Land Sales | 0 |
| = Total One-Time Savings | 0 |

| | |
|---|---|
| Total One-Time Costs | 228,084,877 |
| - Total One-Time Savings | 0 |
| = Total Net One-Time Costs | 228,084,877 |

TOTAL MILITARY CONSTRUCTION ASSETS (COBRA v5.08) - Page 1/8
Data As Of 17:53 12/12/1994, Report Created 08:02 04/04/1995

Department : NAVY
Option Package : F18 RSVS TO ATLANTA
Scenario File : A:\F18ATL.CBR
Std Fctrs File : A:\N95CM.SFF

All Costs in $K

| Base Name | Total MilCon | IMA Cost | Land Purch | Cost Avoid | Total Cost |
|---|---|---|---|---|---|
| MCAS BEAUFORT | 0 | 0 | 0 | 0 | 0 |
| MCAS CHERRY POINT | 0 | 0 | 0 | -332,342 | -332,342 |
| NAS OCEANA | 28,370 | 0 | 0 | 0 | 28,370 |
| NAS ATLANTA | 0 | 0 | 0 | 0 | 0 |
| Totals: | 28,370 | 0 | 0 | -332,342 | -303,971 |

Data As Of 17:53 12/12/1994, Report Created 08:02 04/04/1995

Department : NAVY
Option Package : F18 RSVS TO ATLANTA
Scenario File : A:\F18ATL.CBR
Std Fctrs File : A:\N95OM.SFF

MilCon for Base: MCAS CHERRY POINT, NC

All Costs in $K

| Description: | MilCon Categ | Using Rehab | Rehab Cost* | New MilCon | New Cost* | Total Cost* |
|---|---|---|---|---|---|---|

| | |
|---|---|
| Total Construction Cost: | 0 |
| + Info Management Account: | 0 |
| + Land Purchases: | 0 |
| - Construction Cost Avoid: | 332,342 |
| TOTAL: | -332,342 |

* All MilCon Costs include Design, Site Preparation, Contingency Planning, and SIOH Costs where applicable.

MILITARY CONSTRUCTION ASSETS (COBRA v5.08) - Page 3/5
Data As Of 17:53 12/12/1994, Report Created 08:02 04/04/1995

Department : NAVY
Option Package : F18 RSVS TO ATLANTA
Scenario File : A:\F18ATL.CBR
Std Fctrs File : A:\N95OM.SFF

MilCon for Base: NAS OCEANA, VA

All Costs in $K

| Description: | MilCon Categ | Using Rehab | Rehab Cost* | New MilCon | New Cost* | Total Cost* |
|---|---|---|---|---|---|---|
| AIR MAINTENANCE | AIROP | 0 | 0 | 57,717 | 10,592 | 10,592 |
| SIMULATOR | SCHLB | 0 | 0 | 83,308 | 13,534 | 13,534 |
| MANTRA | SCHLB | 0 | 0 | 26,131 | 4,245 | 4,245 |

| | |
|---|---|
| Total Construction Cost: | 28,370 |
| + Info Management Account: | 0 |
| + Land Purchases: | 0 |
| - Construction Cost Avoid: | 0 |
| TOTAL: | 28,370 |

* All MilCon Costs include Design, Site Preparation, Contingency Planning, and SIOH Costs where applicable.

Economic Impact

# Cherry Point and Oceana

- **Economic Impact Validation of 1995 D.O.D. Recommendation to Ignore 1993 BRAC Commission Directive**

| Activity | EID |
|---|---|
| MCAS Cherry Point | -7.4% |
| MCAS Beaufort | .5% |
| NAS Oceana | .5% |
| NAS Atlanta | 0.0% |

# ECONOMIC IMPACT

# 1995

*Marine Corps Air Station*
*Cherry Point, North Carolina*

# ORGANIZATIONS

**HOSTED**
**BY**
**MARINE CORPS AIR STATION**
**CHERRY POINT**

## TENANT COMMANDS

*2d Marine Aircraft Wing*
*Naval Aviation Depot*
*Naval Hospital*

## SERVICE CLUBS

*Officers' Club*
*Staff Noncommissioned Officers' Club*

## *-ACTIVITIES REPRESENTED-*

*2d Force Services Support Group, Camp Lejeune, NC*
*Defense Commissary Agency, Central Region, Little Creek, VA*
*Defense Finance and Accounting Service, Kansas City, MO*
*Defense Logistics Agency, Defense Distribution Region East, New Cumberland, PA*
*Defense Printing Service, Naval Base, Charleston, SC*
*Human Resources Office, East, Headquarters, U.S. Marine Corps, Washington, DC*
*Federal Aviation Administration, Southern Region, Atlanta, GA*
*Fleet Aviation Specialized Operational (FASO) Training Group NAS, Norfolk, VA*
*Naval Air Maintenance Training Group, NAS, Millington, TN*
*Naval Air Warfare Center, Point Mugu, CA*
*Naval Audit Service, S.E. Region, Virginia Beach, VA*
*Naval Aviation Engineering Service Unit, NAS, Norfolk, VA*
*Naval Aviation Supply Office, Philadelphia, PA*
*Naval Criminal Investigative Service, Camp Lejeune, NC*
*Naval Surface Warfare Center, Crane, IN*
*Naval Warfare Assessment Center, Corona, CA*
*Personnel Support Activity, NAS, Jacksonville, FL*
*Program Management Office, Naval Air Systems Command, Washington, DC*
*Resident Officer in Charge of Construction, Atlantic Division, Naval Facilities Engineering Command, Norfolk, VA*
*United States Army Medical Department Activity, Fort Bragg, NC*
*United States Postal Service*

## *SOME OF THE MANY OTHER ORGANIZATIONS ABOARD THE AIR STATION*

*American Federation of Government Employees*
*American Red Cross*
*Cherry Point Employees' Association*
*Cherry Point Toastmasters, Club 2055*
*Coastal Carolina Council of Girl Scouts of America*
*East Carolina Council of Boy Scouts of America*
*Federal Managers' Association, Chapter 21*
*Federally Employed Women*
*International Assoc. of Machinists and Aerospace Workers, Locals 110, 1859, 2296, 2297*
*International Club*
*Marine Corps Aviation Association*
*Model Aviation Group-75 Club*
*NADEP Golf Association*
*NADEP Toastmasters, Club 4806*
*National Air Traffic Controllers Assoc., Local NKT*
*National Assoc. of Aeronautical Examiners, Local 2*
*Navy and Marine Corps Relief Society*
*Officers' Wives' Club*
*Professional Airways Systems Specialists, Locals 250, 252*
*Staff NCOs' Wives' Club*
*Warrant Officers' Association*

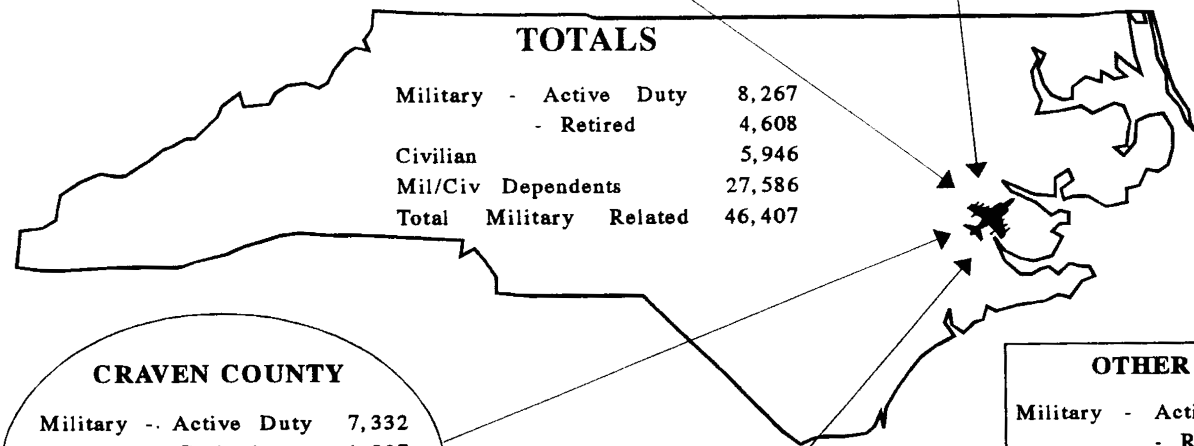
# CHERRY POINT-RELATED POPULATION

### JONES COUNTY

| | |
|---|---|
| Military - Active Duty | 4 |
| - Retired | 113 |
| Civilian | 102 |
| Mil/Civ Dependents | 370 |
| Total Military Related | 589 |

### PAMLICO COUNTY

| | |
|---|---|
| Military - Active Duty | 3 |
| - Retired | 137 |
| Civilian | 163 |
| Mil/Civ Dependents | 483 |
| Total Military Related | 786 |



### TOTALS

| | |
|---|---|
| Military - Active Duty | 8,267 |
| - Retired | 4,608 |
| Civilian | 5,946 |
| Mil/Civ Dependents | 27,586 |
| Total Military Related | 46,407 |

### CRAVEN COUNTY

| | |
|---|---|
| Military -. Active Duty | 7,332 |
| - Retired | 1,827 |
| Civilian | 3,274 |
| Mil/Civ Dependents | 17,581 |
| Total Military Related | 30,014 |

### OTHER COUNTIES

| | |
|---|---|
| Military - Active Duty | 306 |
| - Retired | 1,344 |
| Civilian | 522 |
| Mil/Civ Dependents | 3,568 |
| Total Military Related | 5,740 |

### CARTERET COUNTY

| | |
|---|---|
| Military - Active Duty | 622 |
| - Retired | 1,187 |
| Civilian | 1,885 |
| Mil/Civ Dependents | 5,584 |
| Total Military Related | 9,278 |

## TOTAL WORKFORCE FOR FY95

| | MCAS CHERRY POINT | 2D MAW | NAVAL AVIATION DEPOT | NAVAL HOSPITAL | OTHER TENANT ACTIVITIES | TOTAL |
|---|---|---|---|---|---|---|
| OFFICER | 95 | 740 | 20 | 75 | 50 | 980 |
| ENLISTED | 607 | 6,151 | 57 | 183 | 289 | 7,287 |
| CIVIL SERVICE | 1,020 | | 3,900 | 118 | 443 | 5,481 |
| NAFI | 465 | | | | | |
| | | | | TOTAL WORKFORCE | | 14,213 |

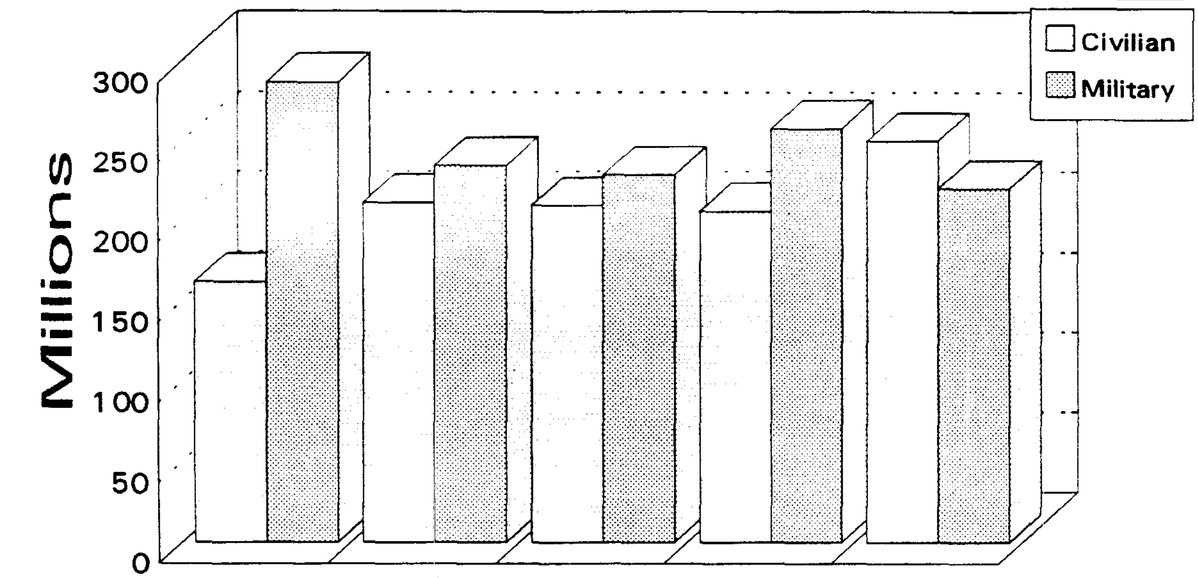
# SALARIES

## FY 95 SALARIES:
**(Projected)**

| | |
|---|---|
| **MILITARY** ........ | $220,616,300 |
| **CIVILIAN APPROPRIATED** ..... | $244,096,900 |
| **CIVILIAN NONAPPROPRIATED** .. | $6,600,000 |

**TOTAL:** $471,313,200

# 5 YEAR SALARY IMPACT




Combined Totals: $449.7 $446.8 $439.1 $464.7 $471.3 (Projected)

**Millions**

**MILITARY SALARIES** - are calculated based on composite standard military rates which include base pay, housing allowance, subsistence, clothing and various incentive pay.

**CIVILIAN SALARIES** - reflect gross pay plus fringe benefits.

## SOME OF THE VARIOUS CIVILIAN PROFESSIONAL/TECHNICAL SPECIALTIES FILLED ABOARD THE AIR STATION*

Accountant
Air Traffic Controller
Analyst
- Budget
- Management &
- Program
- Supply

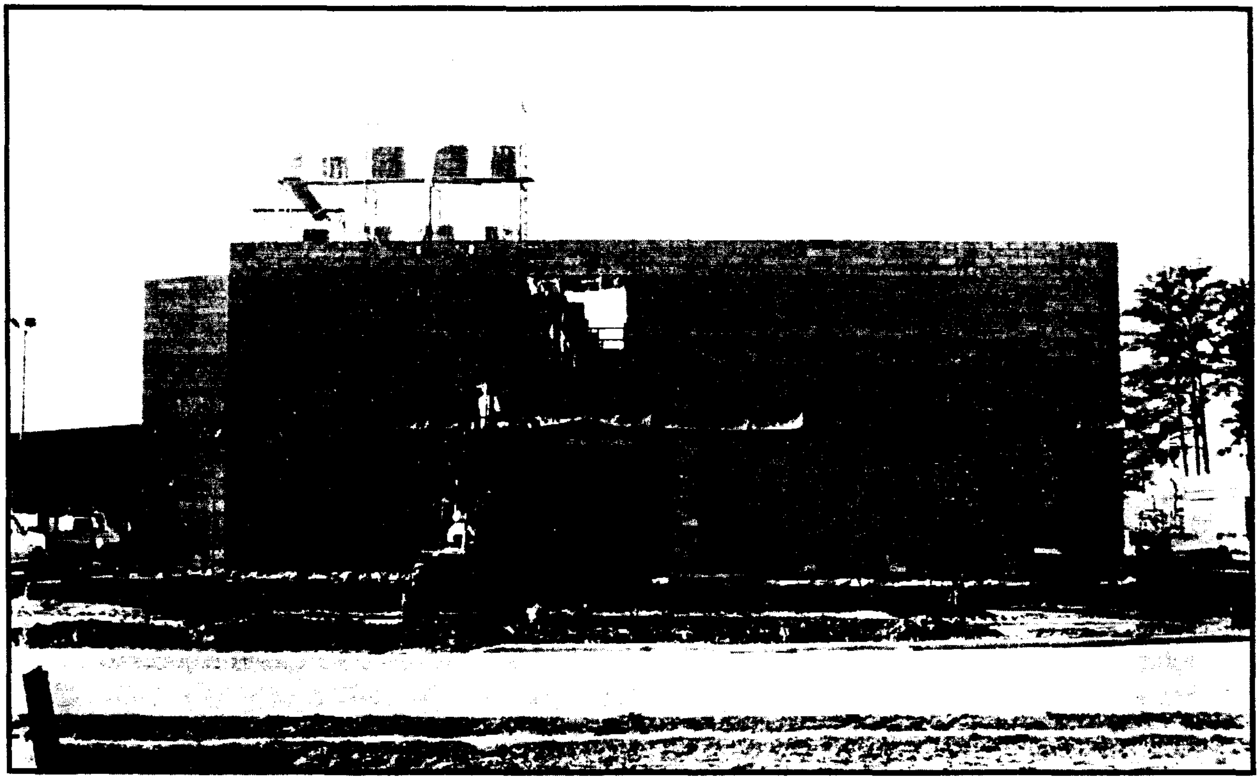
Architect
Auditor
Chemist
Caterer Chef
Computer Programmer
Computer Systems Analyst
Computer Systems Programmer
Computer Specialist
Computer Programmer Analyst
Computer Equipment Analyst
Contract Negotiator
Contract Surveillance Representative
Counseling Psychologist
Diagnostic Radiologist Technician
Electronic Integrated Systems Mechanic
Engineer
- Aeronautical
- Electrical
- Environmental
- General
- Industrial
- Mechanical

Firefighter
Fish & Wildlife Manager
Forestry Technician
Hazardous Waste Handler
Industrial Hygienist
Information & Referral Counselor
Inspector
Librarian
Library Technician
Logistics Management Specialist
Marketing Specialist
Medical Technician
Nurse
Personnel Specialist
Pharmacist
Physician
Production Controller
Realty Specialist
Recreation Specialist
Secretary
Service Contract Manager
Social Services
- Social Worker
- Family Advocacy Counselor
- Relocation Assistance Coord
- Transition Assistance Coord

Training & Development Specialist
Test Range Tracker
Travel/Tour Specialist
Various Clerical Positions
Various Trade Positions

***List Not Inclusive**

# CONSTRUCTION/MAINTENANCE/SERVICE



Future 'Aircraft Maintenance Training Facility,' J.W. COOK &SONS, INC. Jacksonville, NC

## FY 94 TOP 12 NORTH CAROLINA CONTRACTORS

| | | |
|---|---|---|
| PRO CONSTRUCTION, INC. | JACKSONVILLE | $8,779,991 |
| J.W. COOK & SONS, INC. | WHITEVILLE | $2,613,614 |
| L. A. DOWNEY & SON, INC. | NEWPORT | $2,027,443 |
| ELECO | NEW BERN | $1,253,870 |
| ROSS-MARKHAM, INC. | KINSTON | $1,212,657 |
| CIESZKO | HAVELOCK | $936,926 |
| CMC MAINTENANCE | RALEIGH | $582,131 |
| BOLTON, INC. | MOREHEAD CITY | $554,488 |
| RAMSEY AIR CONDITIONING, INC. | JACKSONVILLE | $390,400 |
| PARKWAY SERVICES | GREENSBORO | $383,198 |
| REFRIGERATION SERVICES | MOREHEAD CITY | $333,646 |
| FAULKNER & SON CONSTRUCTION, INC. | JACKSONVILLE | $295,983 |

**NORTH CAROLINA FY 94 CONTRACTS TOTAL .................... $22,161,446**
**CONTRACTS AWARDED OUTSIDE of NORTH CAROLINA ............... $36,126,740**
**TOTAL FY 94 CONTRACTS ................................ $58,288,186**

**Construction/maintenance and service contract expenditures for FY 95 are projected to total approximately $43.6 million with $22.2 million (51%) in awards to North Carolina companies.**

# CONTRACT AND PURCHASING

## (SERVICE AND SUPPORT)

**FY 95 CONTRACT & PURCHASING**

FY 95 Air Station purchases for supplies, equipment, and services are expected to total more than $47.1 million, with total nationwide purchases projected to exceed $139 million.

### FY 95 Itemized Projections

| SOURCE | TOTAL | STATE |
|---|---|---|
| Supplies, Equipment and Services | $47,296,400 | $19,521,500 |
| Aircraft Fuel | 21,900,000 | -0- |
| Commissary (resale/operational support) | 17,430,000 | 522,900 |
| Morale, Welfare and Recreation | 26,000,000 | 11,929,000 |
| Household Goods Storage/Transportation | 5,403,800 | 5,403,800 |
| Mess Attendant Services | 1,652,100 | 1,652,100 |
| Mess Hall Subsistence | 466,200 | 326,700 |
| Aircraft Refueling Services | 581,800 | -0- |
| Naval Hospital | 4,300,000 | 86,000 |
| Naval Aviation Depot (Capital Equipment) | 11,800,000 | 5,675,800 |
| Defense Logistics Agency | 3,000,000 | 2,001,000 |
| 12th Dental Company | 75,000 | 41,000 |
| **TOTALS:** | **$139,905,300** | **$47,159,800** |

**DEFENSE REUTILIZATION AND MARKETING OFFICE (DRMO)**

We recycle, through **DRMO,** government equipment which either ends its useful life or is superseded by technological advances that allow us to operate more efficiently.

In FY 94, the **DRMO** donated 1,850 items valued at **$1,081,073** to the state of North Carolina.

# ECONOMIC IMPACT SUMMARY

## -1995-

| | TOTAL EXPENDITURES | TOTAL SPENT IN NC | PERCENT SPENT IN NC | TOTAL SPENT QUAD-COUNTY | PERCENT of N TOTAL SPENT QUAD-COUNT |
|---|---|---|---|---|---|
| **SALARIES** | | | | | |
| Military | $220.616.300 | $220.616.300 | 100% | $212.453.500 | 96% |
| Civilian | | | | | |
| Appropriated | 244.096.900 | 244.096.900 | 100% | 222.128.200 | 91% |
| Nonappropriated | 6.600.000 | 6.600.000 | 100% | 6.402.000 | 97% |
| **PURCHASING & CONTRACTING** | 139.905.300 | 47.159.800 | 34% | 19.853.300 | 42% |
| **CONSTRUCTION/ MAINTENANCE/ SERVICE** | 43.637.000 | 22.161.000 | 51% | 6.001.000 | 27% |
| **ELECTRIC** | 13.885.200 | 13.885.200 | 100% | 13.885.200 | 100% |
| **TELEPHONE** | 650.000 | 290.700 | 45% | -0- | -0- |
| **TRAVEL** (Admin/Training) | 11.574.300 | 115.700 | 1% | -0- | -0- |
| **TRAINING** | 2.319.800 | 1.126.800 | 49% | 1.019.500 | 90% |
| **FEDERAL SCHOOL FUNDS** | 2.535.400 | 2.535.400 | 100% | 2.207.500 | 87% |
| **HEALTH and MEDICAL** | | | | | |
| Civilian Health & Medical Program Of The Uniform Services (CHAMPUS) | 4.116,700 | 3,595,400 | 87% | 2,253,800 | 63% |
| Active Duty Inpatient Care In Civilian Hospitals | 237,100 | 237,100 | 100% | 184,900 | 78% |
| Supplemental Care | 357,900 | 357,900 | 100% | 293,400 | 82% |
| **COMBINED FEDERAL CAMPAIGN** | 281,400 | 72,300 | 26% | 47,100 | 65% |
| **NAVY/MARINE CORPS RELIEF SOCIETY** | 554,600 | 554,600 | 100% | 543,500 | 98% |
| **PROJECT EQUAL** | 400 | 400 | 100% | 400 | 100% |
| **TOTALS:** | **$691,368,300** | **$563,405,500** | **82%** | **$487,273,300** | **86%** |

# TOTAL NC IMPACT

**$563,405,500**

CUSTOM SUMMARY REPORT
(BUSINESS FACTS: ALL BUSINESSES)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information

COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| TOTAL BUSINESSES | 1,639 |
| RETAIL TRADE | 490 |
| HOME IMPROVEMENT STORES | 23 |
| GENERAL MERCHANDISE STORES | 10 |
| FOOD STORES | 56 |
| AUTO DEALERS & GAS STATIONS | 76 |
| APPAREL & ACCESSORY STORES | 36 |
| FURNITURE/HOME FURNISHINGS | 62 |
| EATING & DRINKING PLACES | 99 |
| MISCELLANEOUS RETAIL STORES | 128 |
| FINANCE-INSURANCE-REAL ESTATE | 130 |
| BANKS, SAVING & LENDING INST | 18 |
| SECURITIES BROKERS & INVEST | 4 |
| INSURANCE CARRIERS & AGNCS | 33 |
| REAL ESTATE-TRUST-HOLDING CO | 75 |
| SERVICES | 613 |
| HOTELS & LODGING | 19 |
| PERSONAL SERVICES | 212 |
| BUSINESS SERVICES | 83 |
| MOTION PICTURE & AMUSEMENT | 36 |
| HEALTH SERVICES | 74 |
| LEGAL SERVICES | 21 |
| EDUCATION SERVICES | 28 |
| SOCIAL SERVICES | 26 |
| OTHER SERVICES | 114 |
| AGRICULTURE | 29 |
| MINING | 1 |
| CONSTRUCTION | 126 |
| MANUFACTURING | 49 |
| TRANS, COMMUN/PUBLIC UTIL | 62 |
| WHOLESALE TRADE | 70 |
| GOVERNMENT | 69 |

Mon Apr 24, 1995 

CUSTOM SUMMARY REPORT
(POP FACTS: SUMMARY REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION | |
| 1999 PROJECTION | 54,111 |
| 1994 ESTIMATE | 52,330 |
| 1990 CENSUS | 50,594 |
| 1980 CENSUS | 42,757 |
| GROWTH 1980 - 1990 | 18.33% |
| HOUSEHOLDS | |
| 1999 PROJECTION | 18,955 |
| 1994 ESTIMATE | 18,323 |
| 1990 CENSUS | 17,423 |
| 1980 CENSUS | 13,486 |
| GROWTH 1980 - 1990 | 29.19% |
| 1994 ESTIMATED POPULATION BY RACE | 52,330 |
| WHITE | 70.36% |
| BLACK | 26.10% |
| ASIAN & PACIFIC ISLANDER | 1.53% |
| OTHER RACES | 2.01% |
| 94 ESTIMATED POPULATION | 52,330 |
| HISPANIC ORIGIN | 3.44% |
| CCUPIED UNITS | 17,423 |
| OWNER OCCUPIED | 54.54% |
| RENTER OCCUPIED | 45.46% |
| 1990 PERSONS PER HOUSEHOLD | 2.90 |
| 1994 ESTIMATED HH BY INCOME | 18,323 |
| $150,000 + | 1.01% |
| $100,000 TO $149,999 | 1.42% |
| $ 75,000 TO $ 99,999 | 3.54% |
| $ 50,000 TO $ 74,999 | 12.29% |
| $ 35,000 TO $ 49,999 | 19.16% |
| $ 25,000 TO $ 34,999 | 18.22% |
| $ 15,000 TO $ 24,999 | 20.38% |
| $ 5,000 TO $ 14,999 | 17.42% |
| UNDER $ 5,000 | 6.56% |
| 1994 EST. AVERAGE HH INCOME | $34,422 |
| 1994 EST. MEDIAN HH INCOME | $28,097 |
| 1994 EST. PER CAPITA INCOME | $12,612 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION | |
| 1999 PROJECTION | 54,111 |
| 1994 ESTIMATE | 52,330 |
| 1990 CENSUS | 50,594 |
| 1980 CENSUS | 42,757 |
| GROWTH 1980 - 1990 | 18.33% |
| HOUSEHOLDS | |
| 1999 PROJECTION | 18,955 |
| 1994 ESTIMATE | 18,323 |
| 1990 CENSUS | 17,423 |
| 1980 CENSUS | 13,486 |
| GROWTH 1980 - 1990 | 29.19% |
| 1994 ESTIMATED POPULATION BY RACE | 52,330 |
| WHITE | 70.36% |
| BLACK | 26.10% |
| ASIAN & PACIFIC ISLANDER | 1.53% |
| OTHER RACES | 2.01% |
| 94 ESTIMATED POPULATION | 52,330 |
| HISPANIC ORIGIN | 3.44% |
| CCUPIED UNITS | 17,423 |
| OWNER OCCUPIED | 54.54% |
| RENTER OCCUPIED | 45.46% |
| 1990 PERSONS PER HH | 2.90 |
| 1994 EST. HOUSEHOLDS BY INCOME | 18,323 |
| $150,000 OR MORE | 1.01% |
| $100,000 TO $149,999 | 1.42% |
| $ 75,000 TO $ 99,999 | 3.54% |
| $ 50,000 TO $ 74,999 | 12.29% |
| $ 35,000 TO $ 49,999 | 19.16% |
| $ 25,000 TO $ 34,999 | 18.22% |
| $ 15,000 TO $ 24,999 | 20.38% |
| $ 5,000 TO $ 15,000 | 17.42% |
| UNDER $ 5,000 | 6.56% |
| 1994 ESTIMATED AVERAGE HOUSEHOLD INCOM | $34,422 |
| 1994 ESTIMATED MEDIAN HOUSEHOLD INCOME | $28,097 |
| 1994 ESTIMATED PER CAPITA INCOME | $12,612 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information

COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| 1994 ESTIMATED POPULATION BY SEX | 52,330 |
| MALE | 50.30% |
| FEMALE | 49.70% |
| MARITAL STATUS | 38,090 |
| SINGLE MALE | 15.00% |
| SINGLE FEMALE | 8.49% |
| MARRIED | 60.03% |
| PREVIOUSLY MARRIED MALE | 5.69% |
| PREVIOUSLY MARRIED FEMALE | 10.79% |
| HOUSEHOLDS WITH CHILDREN | 7,872 |
| MARRIED COUPLE FAMILY | 75.22% |
| OTHER FAMILY-MALE HEAD | 3.68% |
| OTHER FAMILY-FEMALE HEAD | 20.19% |
| NON FAMILY | 0.91% |
| 1994 ESTIMATED POPULATION BY AGE | 52,330 |
| UNDER 5 YEARS | 9.90% |
| 5 TO 9 YEARS | 8.36% |
| 10 TO 14 YEARS | 7.20% |
| 15 TO 17 YEARS | 3.72% |
| 18 TO 20 YEARS | 4.90% |
| 21 TO 24 YEARS | 8.84% |
| 25 TO 29 YEARS | 9.40% |
| 30 TO 34 YEARS | 8.77% |
| 35 TO 39 YEARS | 7.59% |
| 40 TO 49 YEARS | 9.96% |
| 50 TO 59 YEARS | 7.22% |
| 60 TO 64 YEARS | 3.58% |
| 65 TO 69 YEARS | 3.97% |
| 70 TO 74 YEARS | 2.80% |
| 75 + YEARS | 3.78% |
| MEDIAN AGE | 28.76 |
| AVERAGE AGE | 32.14 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information

COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| 1994 ESTIMATED FEMALE POP. BY AGE | 26,009 |
| UNDER 5 YEARS | 10.26% |
| 5 TO 9 YEARS | 8.25% |
| 10 TO 14 YEARS | 7.14% |
| 15 TO 17 YEARS | 3.86% |
| 18 TO 20 YEARS | 4.35% |
| 21 TO 24 YEARS | 6.88% |
| 25 TO 29 YEARS | 8.79% |
| 30 TO 34 YEARS | 8.58% |
| 35 TO 39 YEARS | 7.56% |
| 40 TO 49 YEARS | 10.14% |
| 50 TO 59 YEARS | 7.84% |
| 60 TO 64 YEARS | 3.89% |
| 65 TO 69 YEARS | 4.17% |
| 70 TO 74 YEARS | 2.87% |
| 75 + YEARS | 5.43% |
| FEMALE MEDIAN AGE | 30.28 |
| FEMALE AVERAGE AGE | 33.56 |
| POPULATION BY HOUSEHOLD TYPE | 50,594 |
| FAMILY HOUSEHOLDS | 83.80% |
| NON-FAMILY HOUSEHOLDS | 9.59% |
| GROUP QUARTERS | 6.60% |
| HOUSEHOLDS BY TYPE | 17,423 |
| SINGLE MALE | 8.64% |
| SINGLE FEMALE | 11.00% |
| MARRIED COUPLE | 62.03% |
| OTHER FAMILY-MALE HEAD | 2.76% |
| OTHER FAMILY-FEMALE HEAD | 12.03% |
| NON FAMILY-MALE HEAD | 2.40% |
| NON FAMILY-FEMALE HEAD | 1.13% |
| POPULATION BY URBAN VS. RURAL | 50,619 |
| URBAN | 67.41% |
| RURAL | 32.59% |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| FEMALES 16+ WITH CHILDREN 0 - 17: BASE | 18,195 |
| WORKING WITH CHILD 0 - 5 | 5.63% |
| NOT WORKING WITH CHILD 0 - 5 | 1.54% |
| NOT IN LABOR FORCE WITH CHILD 0 - 5 | 6.54% |
| WORKING WITH CHILD 6 - 17 | 12.32% |
| NOT WORKING WITH CHILD 6 - 17 | 1.15% |
| NOT IN LAB. FORCE WITH CHILD 6 - 17 | 5.02% |
| WORKING WITH CHILD 0 - 5 & 6 - 18 | 4.22% |
| NOT WORKING WITH CHILD 0-5 & 6-18 | 0.52% |
| NOT IN LAB. FORCE W/CHILD 0-5 &6-18 | 3.46% |
| WORKING WITH NO CHILDREN | 27.94% |
| NOT WORKING WITH NO CHILDREN | 2.27% |
| NOT IN LAB. FORCE WITH NO CHILD. | 29.40% |
| HH BY AGE BY POVERTY STATUS | 17,366 |
| ABOVE POVERTY UNDER AGE 65 | 72.36% |
| ABOVE POVERTY AGE 65 + | 13.21% |
| BELOW POVERTY UNDER AGE 65 | 10.67% |
| BELOW POVERTY AGE 65 + | 3.76% |
| ?ULATION 16+ BY EMPLOYMENT STATUS | 37,458 |
| EMPLOYED IN ARMED FORCES | 19.09% |
| EMPLOYED CIVILIANS | 45.89% |
| UNEMPLOYED CIVILIANS | 3.98% |
| NOT IN LABOR FORCE | 31.05% |
| POPULATION 16+ BY OCCUPATION | 17,189 |
| EXECUTIVE AND MANAGERIAL | 9.19% |
| PROFESSIONAL SPECIALTY | 10.50% |
| TECHNICAL SUPPORT | 3.72% |
| SALES | 13.34% |
| ADMINISTRATIVE SUPPORT | 14.35% |
| SERVICE: PRIVATE HOUSEHOLD | 0.58% |
| SERVICE: PROTECTIVE | 1.21% |
| SERVICE: OTHER | 13.69% |
| FARMING FORESTRY & FISHING | 2.24% |
| PRECISION PRODUCT. & CRAFT | 14.75% |
| MACHINE OPERATOR | 6.73% |
| TRANS. AND MATERIAL MOVING | 4.74% |
| LABORERS | 4.95% |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information

COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| FAMILIES BY NUMBER OF WORKERS | 13,354 |
| NO WORKERS | 11.32% |
| ONE WORKER | 29.42% |
| TWO WORKERS | 48.61% |
| THREE + WORKERS | 10.65% |
| HISPANIC POPULATION BY TYPE | 50,594 |
| NOT HISPANIC | 96.76% |
| MEXICAN | 1.32% |
| PUERTO RICAN | 0.94% |
| CUBAN | 0.11% |
| OTHER HISPANIC | 0.87% |
| 1994 HISPANIC RACE BASE | 1,798 |
| WHITE | 45.73% |
| BLACK | 7.56% |
| ASIAN | 3.29% |
| OTHER | 43.42% |
| POPULATION BY TRANSPORTATION TO WORK | 23,930 |
| DRIVE ALONE | 70.13% |
| CAR POOL | 20.02% |
| PUBLIC TRANSPORTATION | 0.86% |
| DRIVE MOTORCYCLE | 0.56% |
| WALKED ONLY | 4.99% |
| OTHER MEANS | 2.10% |
| WORKED AT HOME | 1.35% |
| POPULATION BY TRAVEL TIME TO WORK | 23,930 |
| UNDER 10 MINUTES / WORK AT HOME | 23.03% |
| 10 TO 29 MINUTES | 61.48% |
| 30 TO 59 MINUTES | 13.36% |
| 60 TO 89 MINUTES | 1.67% |
| 90+ MINUTES | 0.46% |
| AVERAGE TRAVEL TIME IN MINUTES | 16.08 |
| HOUSEHOLDS BY NO. OF VEHICLES | 17,446 |
| NO VEHICLES | 11.15% |
| 1 VEHICLE | 35.70% |
| 2 VEHICLES | 39.32% |
| 3+ VEHICLES | 13.83% |
| ESTIMATED TOTAL VEHICLES | 27,671 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION 25+ BY EDUCATION LEVEL | 28,091 |
| ELEMENTARY (0-8) | 8.89% |
| SOME HIGH SCHOOL (9-11) | 13.97% |
| HIGH SCHOOL GRADUATE (12) | 32.77% |
| SOME COLLEGE (13-15) | 24.02% |
| ASSOCIATES DEGREE ONLY | 6.64% |
| BACHELORS DEGREE ONLY | 10.05% |
| GRADUATE DEGREE | 3.67% |
| POPULATION ENROLLED IN SCHOOL | 12,770 |
| PUBLIC PRE- PRIMARY | 4.49% |
| PRIVATE PRE- PRIMARY | 3.09% |
| PUBLIC ELEM/HIGH | 63.48% |
| PRIVATE ELEM/HIGH | 3.91% |
| ENROLLED IN COLLEGE | 25.04% |
| HOUSING UNITS BY OCCUPANCY STATUS | 19,204 |
| OCCUPIED | 90.72% |
| VACANT | 9.28% |
| CANT UNITS | 1,781 |
| FOR RENT | 34.66% |
| FOR SALE ONLY | 12.77% |
| SEASONAL | 13.93% |
| OTHER | 38.64% |
| OWNER OCCUPIED PROPERTY VALUES | 7,016 |
| UNDER $25,000 | 6.39% |
| $25,000 TO $49,999 | 26.10% |
| $50,000 TO $74,999 | 34.76% |
| $75,000 TO $99,999 | 15.52% |
| $100,000 TO $149,999 | 10.14% |
| $150,000 TO $199,999 | 3.59% |
| $200,000 TO $299,999 | 2.82% |
| $300,000 TO $399,999 | 0.46% |
| $400,000 TO $499,999 | 0.13% |
| $500,000 + | 0.09% |
| MEDIAN PROPERTY VALUE | $66,815 |
| TOTAL RENTAL UNITS | 6,978 |
| MEDIAN RENT | $296 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

avelock Business and Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| PERSONS IN UNIT | 17,423 |
| 1 PERSON UNITS | 19.64% |
| 2 PERSON UNITS | 32.52% |
| 3 PERSON UNITS | 20.52% |
| 4 PERSON UNITS | 17.06% |
| 5 PERSON UNITS | 6.77% |
| 6 PERSON UNITS | 2.23% |
| 7 + UNITS | 1.26% |
| YEAR ROUND UNITS IN STRUCTURE | 19,204 |
| SINGLE UNITS DETACHED | 58.52% |
| SINGLE UNITS ATTACHED | 8.57% |
| DOUBLE UNITS | 3.53% |
| 3 TO 9 UNITS | 10.25% |
| 10 TO 19 UNITS | 1.53% |
| 20 TO 49 UNITS | 0.41% |
| 50 + UNITS | 0.02% |
| MOBILE HOME OR TRAILER | 16.02% |
| ALL OTHER | 1.15% |
| NGLE/MULTIPLE UNIT RATIO | 4.26 |
| USING UNITS BY YEAR BUILT | 17,446 |
| BUILT 1989 TO MARCH 1990 | 2.38% |
| BUILT 1985 TO 1988 | 10.42% |
| BUILT 1980 TO 1984 | 14.46% |
| BUILT 1970 TO 1979 | 20.76% |
| BUILT 1960 TO 1969 | 13.33% |
| BUILT 1950 TO 1959 | 15.49% |
| BUILT 1940 TO 1949 | 14.04% |
| BUILT 1939 OR EARLIER | 9.12% |

Tue Apr 25, 1995 

CUSTOM SUMMARY REPORT
(BUSINESS FACTS: ALL BUSINESSES)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| TOTAL BUSINESSES | 3,016 |
| RETAIL TRADE | 819 |
| HOME IMPROVEMENT STORES | 51 |
| GENERAL MERCHANDISE STORES | 19 |
| FOOD STORES | 116 |
| AUTO DEALERS & GAS STATIONS | 120 |
| APPAREL & ACCESSORY STORES | 62 |
| FURNITURE/HOME FURNISHINGS | 94 |
| EATING & DRINKING PLACES | 146 |
| MISCELLANEOUS RETAIL STORES | 211 |
| FINANCE-INSURANCE-REAL ESTATE | 272 |
| BANKS, SAVING & LENDING INST | 48 |
| SECURITIES BROKERS & INVEST | 8 |
| INSURANCE CARRIERS & AGNCS | 82 |
| REAL ESTATE-TRUST-HOLDING CO | 134 |
| SERVICES | 1,128 |
| HOTELS & LODGING | 26 |
| PERSONAL SERVICES | 350 |
| BUSINESS SERVICES | 187 |
| MOTION PICTURE & AMUSEMENT | 67 |
| HEALTH SERVICES | 173 |
| LEGAL SERVICES | 41 |
| EDUCATION SERVICES | 54 |
| SOCIAL SERVICES | 42 |
| OTHER SERVICES | 188 |
| AGRICULTURE | 63 |
| MINING | 1 |
| CONSTRUCTION | 238 |
| MANUFACTURING | 109 |
| TRANS, COMMUN/PUBLIC UTIL | 120 |
| WHOLESALE TRADE | 161 |
| GOVERNMENT | 105 |

Tue Apr 25, 1995 

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION | |
| 1999 PROJECTION | 87,590 |
| 1994 ESTIMATE | 85,012 |
| 1990 CENSUS | 81,613 |
| 1980 CENSUS | 71,043 |
| GROWTH 1980 - 1990 | 14.88% |
| HOUSEHOLDS | |
| 1999 PROJECTION | 32,180 |
| 1994 ESTIMATE | 31,078 |
| 1990 CENSUS | 29,542 |
| 1980 CENSUS | 23,499 |
| GROWTH 1980 - 1990 | 25.72% |
| 1994 ESTIMATED POPULATION BY RACE | 85,012 |
| WHITE | 70.38% |
| BLACK | 27.13% |
| ASIAN & PACIFIC ISLANDER | 1.05% |
| OTHER RACES | 1.44% |
| 94 ESTIMATED POPULATION | 85,012 |
| HISPANIC ORIGIN | 2.53% |
| OCCUPIED UNITS | 29,542 |
| OWNER OCCUPIED | 63.32% |
| RENTER OCCUPIED | 36.68% |
| 1990 PERSONS PER HH | 2.76 |
| 1994 EST. HOUSEHOLDS BY INCOME | 31,078 |
| $150,000 OR MORE | 1.56% |
| $100,000 TO $149,999 | 1.75% |
| $ 75,000 TO $ 99,999 | 4.04% |
| $ 50,000 TO $ 74,999 | 13.44% |
| $ 35,000 TO $ 49,999 | 19.60% |
| $ 25,000 TO $ 34,999 | 17.00% |
| $ 15,000 TO $ 24,999 | 18.92% |
| $ 5,000 TO $ 15,000 | 17.32% |
| UNDER $ 5,000 | 6.36% |
| 1994 ESTIMATED AVERAGE HOUSEHOLD INCOM | $36,747 |
| 1994 ESTIMATED MEDIAN HOUSEHOLD INCOME | $29,350 |
| 1994 ESTIMATED PER CAPITA INCOME | $13,838 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| 1994 ESTIMATED POPULATION BY SEX | 85,012 |
| MALE | 49.34% |
| FEMALE | 50.66% |
| MARITAL STATUS | 62,769 |
| SINGLE MALE | 13.53% |
| SINGLE FEMALE | 8.85% |
| MARRIED | 60.65% |
| PREVIOUSLY MARRIED MALE | 5.41% |
| PREVIOUSLY MARRIED FEMALE | 11.56% |
| HOUSEHOLDS WITH CHILDREN | 12,238 |
| MARRIED COUPLE FAMILY | 74.73% |
| OTHER FAMILY-MALE HEAD | 3.60% |
| OTHER FAMILY-FEMALE HEAD | 20.78% |
| NON FAMILY | 0.89% |
| 1994 ESTIMATED POPULATION BY AGE | 85,012 |
| UNDER 5 YEARS | 8.39% |
| 5 TO 9 YEARS | 7.67% |
| 10 TO 14 YEARS | 7.44% |
| 15 TO 17 YEARS | 3.90% |
| 18 TO 20 YEARS | 4.24% |
| 21 TO 24 YEARS | 6.85% |
| 25 TO 29 YEARS | 8.02% |
| 30 TO 34 YEARS | 8.34% |
| 35 TO 39 YEARS | 7.87% |
| 40 TO 49 YEARS | 11.76% |
| 50 TO 59 YEARS | 8.68% |
| 60 TO 64 YEARS | 4.33% |
| 65 TO 69 YEARS | 4.72% |
| 70 TO 74 YEARS | 3.42% |
| 75 + YEARS | 4.36% |
| MEDIAN AGE | 32.09 |
| AVERAGE AGE | 34.63 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| 1994 ESTIMATED FEMALE POP. BY AGE | 43,071 |
| UNDER 5 YEARS | 8.45% |
| 5 TO 9 YEARS | 7.49% |
| 10 TO 14 YEARS | 7.24% |
| 15 TO 17 YEARS | 3.90% |
| 18 TO 20 YEARS | 3.86% |
| 21 TO 24 YEARS | 5.50% |
| 25 TO 29 YEARS | 7.53% |
| 30 TO 34 YEARS | 8.34% |
| 35 TO 39 YEARS | 7.68% |
| 40 TO 49 YEARS | 11.97% |
| 50 TO 59 YEARS | 9.15% |
| 60 TO 64 YEARS | 4.60% |
| 65 TO 69 YEARS | 4.93% |
| 70 TO 74 YEARS | 3.38% |
| 75 + YEARS | 5.97% |
| FEMALE MEDIAN AGE | 33.61 |
| FEMALE AVERAGE AGE | 36.00 |
| POPULATION BY HOUSEHOLD TYPE | 81,613 |
| FAMILY HOUSEHOLDS | 85.45% |
| NON-FAMILY HOUSEHOLDS | 10.14% |
| GROUP QUARTERS | 4.41% |
| HOUSEHOLDS BY TYPE | 29,542 |
| SINGLE MALE | 8.65% |
| SINGLE FEMALE | 12.07% |
| MARRIED COUPLE | 61.57% |
| OTHER FAMILY-MALE HEAD | 2.64% |
| OTHER FAMILY-FEMALE HEAD | 11.88% |
| NON FAMILY-MALE HEAD | 2.11% |
| NON FAMILY-FEMALE HEAD | 1.08% |
| POPULATION BY URBAN VS. RURAL | 81,613 |
| URBAN | 51.35% |
| RURAL | 48.65% |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| FEMALES 16+ WITH CHILDREN 0 - 17: BASE | 31,105 |
| WORKING WITH CHILD 0 - 5 | 5.12% |
| NOT WORKING WITH CHILD 0 - 5 | 0.96% |
| NOT IN LABOR FORCE WITH CHILD 0 - 5 | 5.07% |
| WORKING WITH CHILD 6 - 17 | 12.72% |
| NOT WORKING WITH CHILD 6 - 17 | 0.83% |
| NOT IN LAB. FORCE WITH CHILD 6 - 17 | 4.71% |
| WORKING WITH CHILD 0 - 5 & 6 - 18 | 3.96% |
| NOT WORKING WITH CHILD 0-5 & 6-18 | 0.38% |
| NOT IN LAB. FORCE W/CHILD 0-5 &6-18 | 2.58% |
| WORKING WITH NO CHILDREN | 28.88% |
| NOT WORKING WITH NO CHILDREN | 2.04% |
| NOT IN LAB. FORCE WITH NO CHILD. | 32.75% |
| HH BY AGE BY POVERTY STATUS | 29,435 |
| ABOVE POVERTY UNDER AGE 65 | 70.11% |
| ABOVE POVERTY AGE 65 + | 15.60% |
| BELOW POVERTY UNDER AGE 65 | 9.77% |
| BELOW POVERTY AGE 65 + | 4.52% |
| PULATION 16+ BY EMPLOYMENT STATUS | 61,617 |
| EMPLOYED IN ARMED FORCES | 11.98% |
| EMPLOYED CIVILIANS | 50.81% |
| UNEMPLOYED CIVILIANS | 3.48% |
| NOT IN LABOR FORCE | 33.73% |
| POPULATION 16+ BY OCCUPATION | 31,305 |
| EXECUTIVE AND MANAGERIAL | 9.38% |
| PROFESSIONAL SPECIALTY | 11.58% |
| TECHNICAL SUPPORT | 3.52% |
| SALES | 12.79% |
| ADMINISTRATIVE SUPPORT | 13.79% |
| SERVICE: PRIVATE HOUSEHOLD | 0.57% |
| SERVICE: PROTECTIVE | 1.28% |
| SERVICE: OTHER | 12.40% |
| FARMING FORESTRY & FISHING | 2.66% |
| PRECISION PRODUCT. & CRAFT | 14.54% |
| MACHINE OPERATOR | 8.37% |
| TRANS. AND MATERIAL MOVING | 4.73% |
| LABORERS | 4.38% |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| FAMILIES BY NUMBER OF WORKERS | 22,511 |
| NO WORKERS | 13.05% |
| ONE WORKER | 27.72% |
| TWO WORKERS | 48.41% |
| THREE + WORKERS | 10.83% |
| HISPANIC POPULATION BY TYPE | 81,613 |
| NOT HISPANIC | 97.77% |
| MEXICAN | 0.91% |
| PUERTO RICAN | 0.63% |
| CUBAN | 0.07% |
| OTHER HISPANIC | 0.62% |
| 1994 HISPANIC RACE BASE | 2,153 |
| WHITE | 48.86% |
| BLACK | 8.04% |
| ASIAN | 2.88% |
| OTHER | 40.22% |
| POPULATION BY TRANSPORTATION TO WORK | 38,116 |
| DRIVE ALONE | 72.64% |
| CAR POOL | 19.35% |
| PUBLIC TRANSPORTATION | 0.55% |
| DRIVE MOTORCYCLE | 0.39% |
| WALKED ONLY | 3.80% |
| OTHER MEANS | 1.73% |
| WORKED AT HOME | 1.55% |
| POPULATION BY TRAVEL TIME TO WORK | 38,116 |
| UNDER 10 MINUTES / WORK AT HOME | 21.37% |
| 10 TO 29 MINUTES | 58.84% |
| 30 TO 59 MINUTES | 17.24% |
| 60 TO 89 MINUTES | 2.16% |
| 90+ MINUTES | 0.39% |
| AVERAGE TRAVEL TIME IN MINUTES | 17.40 |
| HOUSEHOLDS BY NO. OF VEHICLES | 29,542 |
| NO VEHICLES | 10.45% |
| 1 VEHICLE | 32.82% |
| 2 VEHICLES | 40.17% |
| 3+ VEHICLES | 16.56% |
| ESTIMATED TOTAL VEHICLES | 49,086 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION 25+ BY EDUCATION LEVEL | 48,900 |
| ELEMENTARY (0-8) | 9.48% |
| SOME HIGH SCHOOL (9-11) | 14.67% |
| HIGH SCHOOL GRADUATE (12) | 31.52% |
| SOME COLLEGE (13-15) | 22.14% |
| ASSOCIATES DEGREE ONLY | 7.10% |
| BACHELORS DEGREE ONLY | 10.81% |
| GRADUATE DEGREE | 4.29% |
| POPULATION ENROLLED IN SCHOOL | 20,091 |
| PUBLIC PRE- PRIMARY | 4.24% |
| PRIVATE PRE- PRIMARY | 2.92% |
| PUBLIC ELEM/HIGH | 65.64% |
| PRIVATE ELEM/HIGH | 4.07% |
| ENROLLED IN COLLEGE | 23.13% |
| HOUSING UNITS BY OCCUPANCY STATUS | 32,293 |
| OCCUPIED | 91.48% |
| VACANT | 8.52% |
| CANT UNITS | 2,751 |
| FOR RENT | 31.84% |
| FOR SALE ONLY | 14.94% |
| SEASONAL | 12.25% |
| OTHER | 40.97% |
| OWNER OCCUPIED PROPERTY VALUES | 13,512 |
| UNDER $25,000 | 7.07% |
| $25,000 TO $49,999 | 22.93% |
| $50,000 TO $74,999 | 30.78% |
| $75,000 TO $99,999 | 17.31% |
| $100,000 TO $149,999 | 12.86% |
| $150,000 TO $199,999 | 4.93% |
| $200,000 TO $299,999 | 3.00% |
| $300,000 TO $399,999 | 0.75% |
| $400,000 TO $499,999 | 0.21% |
| $500,000 + | 0.16% |
| MEDIAN PROPERTY VALUE | $65,900 |
| TOTAL RENTAL UNITS | 9,465 |
| MEDIAN RENT | $302 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

raven County Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| PERSONS IN UNIT | 29,542 |
| 1 PERSON UNITS | 20.72% |
| 2 PERSON UNITS | 34.19% |
| 3 PERSON UNITS | 19.61% |
| 4 PERSON UNITS | 16.09% |
| 5 PERSON UNITS | 6.26% |
| 6 PERSON UNITS | 2.02% |
| 7 + UNITS | 1.11% |
| YEAR ROUND UNITS IN STRUCTURE | 32,293 |
| SINGLE UNITS DETACHED | 61.36% |
| SINGLE UNITS ATTACHED | 6.68% |
| DOUBLE UNITS | 2.69% |
| 3 TO 9 UNITS | 9.09% |
| 10 TO 19 UNITS | 1.41% |
| 20 TO 49 UNITS | 0.55% |
| 50 + UNITS | 0.28% |
| MOBILE HOME OR TRAILER | 16.96% |
| ALL OTHER | 0.98% |
| NGLE/MULTIPLE UNIT RATIO | 4.85 |
| USING UNITS BY YEAR BUILT | 29,542 |
| BUILT 1989 TO MARCH 1990 | 2.90% |
| BUILT 1985 TO 1988 | 12.55% |
| BUILT 1980 TO 1984 | 15.01% |
| BUILT 1970 TO 1979 | 24.25% |
| BUILT 1960 TO 1969 | 13.46% |
| BUILT 1950 TO 1959 | 12.94% |
| BUILT 1940 TO 1949 | 10.21% |
| BUILT 1939 OR EARLIER | 8.67% |

Tue Apr 25, 1995



CUSTOM SUMMARY REPORT
(BUSINESS FACTS: ALL BUSINESSES)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

Virginia Beach Business & Population Information

COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| TOTAL BUSINESSES | 11,826 |
| RETAIL TRADE | 3,142 |
| HOME IMPROVEMENT STORES | 127 |
| GENERAL MERCHANDISE STORES | 50 |
| FOOD STORES | 297 |
| AUTO DEALERS & GAS STATIONS | 296 |
| APPAREL & ACCESSORY STORES | 320 |
| FURNITURE/HOME FURNISHINGS | 378 |
| EATING & DRINKING PLACES | 794 |
| MISCELLANEOUS RETAIL STORES | 880 |
| FINANCE-INSURANCE-REAL ESTATE | 1,290 |
| BANKS, SAVING & LENDING INST | 335 |
| SECURITIES BROKERS & INVEST | 63 |
| INSURANCE CARRIERS & AGNCS | 297 |
| REAL ESTATE-TRUST-HOLDING CO | 595 |
| SERVICES | 4,845 |
| HOTELS & LODGING | 145 |
| PERSONAL SERVICES | 1,160 |
| BUSINESS SERVICES | 1,060 |
| MOTION PICTURE & AMUSEMENT | 302 |
| HEALTH SERVICES | 802 |
| LEGAL SERVICES | 230 |
| EDUCATION SERVICES | 209 |
| SOCIAL SERVICES | 192 |
| OTHER SERVICES | 745 |
| AGRICULTURE | 165 |
| MINING | 3 |
| CONSTRUCTION | 835 |
| MANUFACTURING | 350 |
| TRANS, COMMUN/PUBLIC UTIL | 293 |
| WHOLESALE TRADE | 608 |
| GOVERNMENT | 295 |

CUSTOM SUMMARY REPORT
(POP FACTS: SUMMARY REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

irginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION | |
| 1999 PROJECTION | 449,078 |
| 1994 ESTIMATE | 422,760 |
| 1990 CENSUS | 393,069 |
| 1980 CENSUS | 262,199 |
| GROWTH 1980 - 1990 | 49.91% |
| HOUSEHOLDS | |
| 1999 PROJECTION | 159,230 |
| 1994 ESTIMATE | 149,187 |
| 1990 CENSUS | 135,566 |
| 1980 CENSUS | 85,155 |
| GROWTH 1980 - 1990 | 59.20% |
| 1994 ESTIMATED POPULATION BY RACE | 422,760 |
| WHITE | 79.81% |
| BLACK | 13.81% |
| ASIAN & PACIFIC ISLANDER | 5.04% |
| OTHER RACES | 1.34% |
| 94 ESTIMATED POPULATION | 422,760 |
| HISPANIC ORIGIN | 3.51% |
| OCCUPIED UNITS | 135,566 |
| OWNER OCCUPIED | 62.49% |
| RENTER OCCUPIED | 37.51% |
| 1990 PERSONS PER HOUSEHOLD | 2.90 |
| 1994 ESTIMATED HH BY INCOME | 149,187 |
| $150,000 + | 2.43% |
| $100,000 TO $149,999 | 4.07% |
| $ 75,000 TO $ 99,999 | 6.82% |
| $ 50,000 TO $ 74,999 | 24.36% |
| $ 35,000 TO $ 49,999 | 22.48% |
| $ 25,000 TO $ 34,999 | 17.05% |
| $ 15,000 TO $ 24,999 | 14.11% |
| $ 5,000 TO $ 14,999 | 6.72% |
| UNDER $ 5,000 | 1.96% |
| 1994 EST. AVERAGE HH INCOME | $49,970 |
| 1994 EST. MEDIAN HH INCOME | $41,784 |
| 1994 EST. PER CAPITA INCOME | $18,051 |

Tue Apr 25, 1995 

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

Virginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| POPULATION | |
| 1999 PROJECTION | 449,078 |
| 1994 ESTIMATE | 422,760 |
| 1990 CENSUS | 393,069 |
| 1980 CENSUS | 262,199 |
| GROWTH 1980 - 1990 | 49.91% |
| HOUSEHOLDS | |
| 1999 PROJECTION | 159,230 |
| 1994 ESTIMATE | 149,187 |
| 1990 CENSUS | 135,566 |
| 1980 CENSUS | 85,155 |
| GROWTH 1980 - 1990 | 59.20% |
| 1994 ESTIMATED POPULATION BY RACE | 422,760 |
| WHITE | 79.81% |
| BLACK | 13.81% |
| ASIAN & PACIFIC ISLANDER | 5.04% |
| OTHER RACES | 1.34% |
| 94 ESTIMATED POPULATION | 422,760 |
| HISPANIC ORIGIN | 3.51% |
| OCCUPIED UNITS | 135,566 |
| OWNER OCCUPIED | 62.49% |
| RENTER OCCUPIED | 37.51% |
| 1990 PERSONS PER HH | 2.90 |
| 1994 EST. HOUSEHOLDS BY INCOME | 149,187 |
| $150,000 OR MORE | 2.43% |
| $100,000 TO $149,999 | 4.07% |
| $ 75,000 TO $ 99,999 | 6.82% |
| $ 50,000 TO $ 74,999 | 24.36% |
| $ 35,000 TO $ 49,999 | 22.48% |
| $ 25,000 TO $ 34,999 | 17.05% |
| $ 15,000 TO $ 24,999 | 14.11% |
| $ 5,000 TO $ 15,000 | 6.72% |
| UNDER $ 5,000 | 1.96% |
| 1994 ESTIMATED AVERAGE HOUSEHOLD INCOM | $49,970 |
| 1994 ESTIMATED MEDIAN HOUSEHOLD INCOME | $41,784 |
| 1994 ESTIMATED PER CAPITA INCOME | $18,051 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

Virginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| 1994 ESTIMATED POPULATION BY SEX | 422,760 |
| MALE | 50.76% |
| FEMALE | 49.24% |
| MARITAL STATUS | 298,461 |
| SINGLE MALE | 15.24% |
| SINGLE FEMALE | 10.02% |
| MARRIED | 60.06% |
| PREVIOUSLY MARRIED MALE | 5.08% |
| PREVIOUSLY MARRIED FEMALE | 9.60% |
| HOUSEHOLDS WITH CHILDREN | 60,711 |
| MARRIED COUPLE FAMILY | 80.23% |
| OTHER FAMILY-MALE HEAD | 3.74% |
| OTHER FAMILY-FEMALE HEAD | 14.79% |
| NON FAMILY | 1.23% |
| 1994 ESTIMATED POPULATION BY AGE | 422,760 |
| UNDER 5 YEARS | 9.07% |
| 5 TO 9 YEARS | 8.39% |
| 10 TO 14 YEARS | 7.39% |
| 15 TO 17 YEARS | 3.74% |
| 18 TO 20 YEARS | 4.16% |
| 21 TO 24 YEARS | 7.23% |
| 25 TO 29 YEARS | 11.12% |
| 30 TO 34 YEARS | 10.12% |
| 35 TO 39 YEARS | 8.99% |
| 40 TO 49 YEARS | 13.33% |
| 50 TO 59 YEARS | 7.40% |
| 60 TO 64 YEARS | 2.72% |
| 65 TO 69 YEARS | 2.49% |
| 70 TO 74 YEARS | 1.69% |
| 75 + YEARS | 2.15% |
| MEDIAN AGE | 29.50 |
| AVERAGE AGE | 30.99 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

irginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| 1994 ESTIMATED FEMALE POP. BY AGE | 208,153 |
| UNDER 5 YEARS | 8.95% |
| 5 TO 9 YEARS | 8.29% |
| 10 TO 14 YEARS | 7.45% |
| 15 TO 17 YEARS | 3.69% |
| 18 TO 20 YEARS | 3.62% |
| 21 TO 24 YEARS | 6.37% |
| 25 TO 29 YEARS | 10.54% |
| 30 TO 34 YEARS | 9.87% |
| 35 TO 39 YEARS | 9.04% |
| 40 TO 49 YEARS | 13.71% |
| 50 TO 59 YEARS | 7.93% |
| 60 TO 64 YEARS | 2.88% |
| 65 TO 69 YEARS | 2.69% |
| 70 TO 74 YEARS | 1.94% |
| 75 + YEARS | 3.03% |
| FEMALE MEDIAN AGE | 30.55 |
| FEMALE AVERAGE AGE | 32.08 |
| POPULATION BY HOUSEHOLD TYPE | 393,069 |
| FAMILY HOUSEHOLDS | 85.16% |
| NON-FAMILY HOUSEHOLDS | 11.95% |
| GROUP QUARTERS | 2.89% |
| HOUSEHOLDS BY TYPE | 135,566 |
| SINGLE MALE | 8.08% |
| SINGLE FEMALE | 9.04% |
| MARRIED COUPLE | 62.88% |
| OTHER FAMILY-MALE HEAD | 2.99% |
| OTHER FAMILY-FEMALE HEAD | 9.52% |
| NON FAMILY-MALE HEAD | 4.96% |
| NON FAMILY-FEMALE HEAD | 2.54% |
| POPULATION BY URBAN VS. RURAL | 393,069 |
| URBAN | 99.10% |
| RURAL | 0.90% |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

irginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| FEMALES 16+ WITH CHILDREN 0 - 17: BASE | 144,868 |
| WORKING WITH CHILD 0 - 5 | 7.03% |
| NOT WORKING WITH CHILD 0 - 5 | 0.60% |
| NOT IN LABOR FORCE WITH CHILD 0 - 5 | 4.79% |
| WORKING WITH CHILD 6 - 17 | 14.36% |
| NOT WORKING WITH CHILD 6 - 17 | 0.60% |
| NOT IN LAB. FORCE WITH CHILD 6 - 17 | 4.29% |
| WORKING WITH CHILD 0 - 5 & 6 - 18 | 4.45% |
| NOT WORKING WITH CHILD 0-5 & 6-18 | 0.29% |
| NOT IN LAB. FORCE W/CHILD 0-5 &6-18 | 3.23% |
| WORKING WITH NO CHILDREN | 36.64% |
| NOT WORKING WITH NO CHILDREN | 1.96% |
| NOT IN LAB. FORCE WITH NO CHILD. | 21.75% |
| HH BY AGE BY POVERTY STATUS | 135,736 |
| ABOVE POVERTY UNDER AGE 65 | 85.27% |
| ABOVE POVERTY AGE 65 + | 9.22% |
| BELOW POVERTY UNDER AGE 65 | 4.51% |
| BELOW POVERTY AGE 65 + | 1.00% |
| PULATION 16+ BY EMPLOYMENT STATUS | 293,469 |
| EMPLOYED IN ARMED FORCES | 14.29% |
| EMPLOYED CIVILIANS | 59.50% |
| UNEMPLOYED CIVILIANS | 2.96% |
| NOT IN LABOR FORCE | 23.25% |
| POPULATION 16+ BY OCCUPATION | 174,616 |
| EXECUTIVE AND MANAGERIAL | 14.45% |
| PROFESSIONAL SPECIALTY | 15.90% |
| TECHNICAL SUPPORT | 4.63% |
| SALES | 15.11% |
| ADMINISTRATIVE SUPPORT | 16.09% |
| SERVICE: PRIVATE HOUSEHOLD | 0.44% |
| SERVICE: PROTECTIVE | 1.70% |
| SERVICE: OTHER | 10.84% |
| FARMING FORESTRY & FISHING | 0.97% |
| PRECISION PRODUCT. & CRAFT | 11.24% |
| MACHINE OPERATOR | 2.76% |
| TRANS. AND MATERIAL MOVING | 3.00% |
| LABORERS | 2.88% |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

Virginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| FAMILIES BY NUMBER OF WORKERS | 102,963 |
| NO WORKERS | 5.53% |
| ONE WORKER | 25.65% |
| TWO WORKERS | 55.09% |
| THREE + WORKERS | 13.73% |
| HISPANIC POPULATION BY TYPE | 393,069 |
| NOT HISPANIC | 96.91% |
| MEXICAN | 0.84% |
| PUERTO RICAN | 0.88% |
| CUBAN | 0.15% |
| OTHER HISPANIC | 1.22% |
| 1994 HISPANIC RACE BASE | 14,820 |
| WHITE | 58.01% |
| BLACK | 6.73% |
| ASIAN | 8.21% |
| OTHER | 27.05% |
| POPULATION BY TRANSPORTATION TO WORK | 213,432 |
| DRIVE ALONE | 78.37% |
| CAR POOL | 11.96% |
| PUBLIC TRANSPORTATION | 0.77% |
| DRIVE MOTORCYCLE | 0.28% |
| WALKED ONLY | 3.45% |
| OTHER MEANS | 1.91% |
| WORKED AT HOME | 3.26% |
| POPULATION BY TRAVEL TIME TO WORK | 213,432 |
| UNDER 10 MINUTES / WORK AT HOME | 14.42% |
| 10 TO 29 MINUTES | 53.44% |
| 30 TO 59 MINUTES | 28.89% |
| 60 TO 89 MINUTES | 2.72% |
| 90+ MINUTES | 0.53% |
| AVERAGE TRAVEL TIME IN MINUTES | 21.97 |
| HOUSEHOLDS BY NO. OF VEHICLES | 135,566 |
| NO VEHICLES | 3.77% |
| 1 VEHICLE | 30.16% |
| 2 VEHICLES | 47.24% |
| 3+ VEHICLES | 18.82% |
| ESTIMATED TOTAL VEHICLES | 250,629 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

irginia Beach Business & Population Information

COORD: 00:00.00 00:00.00

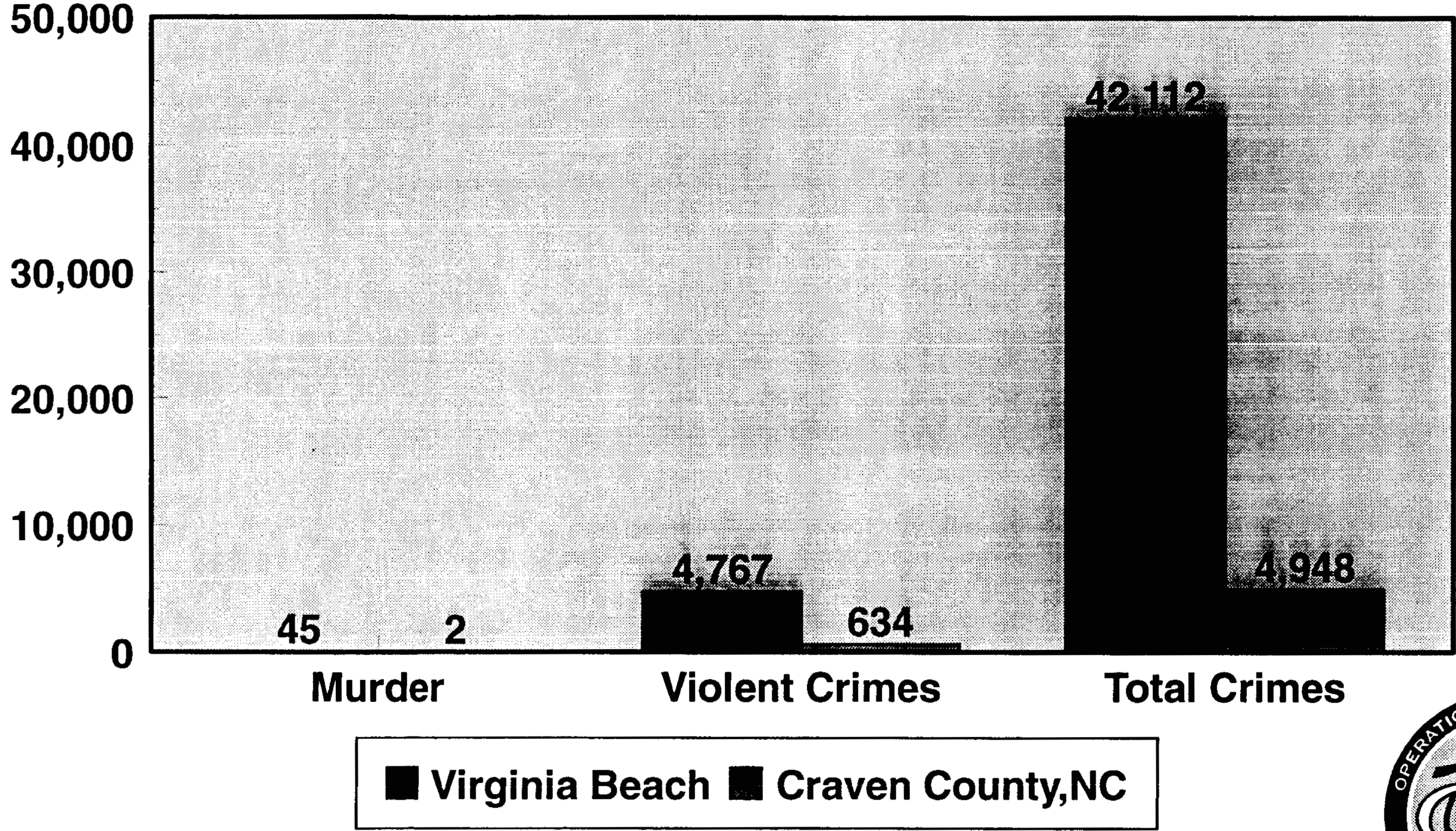
| DESCRIPTION | TOTALS |
|---|---|
| POPULATION 25+ BY EDUCATION LEVEL | 233,138 |
| ELEMENTARY (0-8) | 3.06% |
| SOME HIGH SCHOOL (9-11) | 8.97% |
| HIGH SCHOOL GRADUATE (12) | 28.85% |
| SOME COLLEGE (13-15) | 26.53% |
| ASSOCIATES DEGREE ONLY | 7.09% |
| BACHELORS DEGREE ONLY | 17.82% |
| GRADUATE DEGREE | 7.68% |
| POPULATION ENROLLED IN SCHOOL | 105,358 |
| PUBLIC PRE- PRIMARY | 4.00% |
| PRIVATE PRE- PRIMARY | 4.03% |
| PUBLIC ELEM/HIGH | 60.40% |
| PRIVATE ELEM/HIGH | 4.48% |
| ENROLLED IN COLLEGE | 27.09% |
| HOUSING UNITS BY OCCUPANCY STATUS | 147,037 |
| OCCUPIED | 92.20% |
| VACANT | 7.80% |
| CANT UNITS | 11,471 |
| FOR RENT | 38.90% |
| FOR SALE ONLY | 30.45% |
| SEASONAL | 15.06% |
| OTHER | 15.59% |
| OWNER OCCUPIED PROPERTY VALUES | 75,079 |
| UNDER $25,000 | 0.24% |
| $25,000 TO $49,999 | 1.02% |
| $50,000 TO $74,999 | 18.46% |
| $75,000 TO $99,999 | 35.19% |
| $100,000 TO $149,999 | 26.55% |
| $150,000 TO $199,999 | 9.54% |
| $200,000 TO $299,999 | 5.50% |
| $300,000 TO $399,999 | 1.86% |
| $400,000 TO $499,999 | 0.65% |
| $500,000 + | 0.99% |
| MEDIAN PROPERTY VALUE | $96,500 |
| TOTAL RENTAL UNITS | 48,086 |
| MEDIAN RENT | $484 |

CUSTOM SUMMARY REPORT
(POP FACTS: FULL DATA REPORT)
BY EQUIFAX NATIONAL DECISION SYSTEMS 800-866-6510

irginia Beach Business & Population Information
COORD: 00:00.00 00:00.00

| DESCRIPTION | TOTALS |
|---|---|
| PERSONS IN UNIT | 135,566 |
| 1 PERSON UNITS | 17.12% |
| 2 PERSON UNITS | 31.41% |
| 3 PERSON UNITS | 21.27% |
| 4 PERSON UNITS | 18.64% |
| 5 PERSON UNITS | 7.90% |
| 6 PERSON UNITS | 2.46% |
| 7 + UNITS | 1.19% |
| YEAR ROUND UNITS IN STRUCTURE | 147,037 |
| SINGLE UNITS DETACHED | 53.85% |
| SINGLE UNITS ATTACHED | 19.15% |
| DOUBLE UNITS | 2.10% |
| 3 TO 9 UNITS | 13.45% |
| 10 TO 19 UNITS | 4.96% |
| 20 TO 49 UNITS | 2.22% |
| 50 + UNITS | 1.69% |
| MOBILE HOME OR TRAILER | 1.85% |
| ALL OTHER | 0.74% |
| INGLE/MULTIPLE UNIT RATIO | 2.99 |
| OUSING UNITS BY YEAR BUILT | 135,566 |
| BUILT 1989 TO MARCH 1990 | 3.18% |
| BUILT 1985 TO 1988 | 19.69% |
| BUILT 1980 TO 1984 | 19.72% |
| BUILT 1970 TO 1979 | 27.70% |
| BUILT 1960 TO 1969 | 18.09% |
| BUILT 1950 TO 1959 | 8.74% |
| BUILT 1940 TO 1949 | 1.80% |
| BUILT 1939 OR EARLIER | 1.08% |

# Community Crime Rates 1992-1994



CRIME RATES BASED ON THE UNIFORM CRIME REPORT

| Year | Individual City/Total | County Sheriff Dept./Total | Total for Craven County |
|---|---|---|---|
| 1990 | Havelock/1046 | Craven County/204 | 5967 |
| 1991 | Havelock/1118 | Craven County/2568 | 5931 |
| 1992 | Havelock/1017 | Craven County/2658 | 9328 |
| 1993 | Havelock/1179 | Craven County/2943 | 9913 |
| 1994 | report will be out in Aug. 1995 | | |

PLEASE REFER TO UNIFORM CRIME REPORT WHEN REFERRING TO TOTALS

* The Crime Index Totals on the Uniform Crime Report includes all crimes except Violent Crimes, Property Crimes, and Arson.

** County Sheriff Department Totals are separate from the city totals.(cases outside city limits)

*** All crimes at Cherry Point are handled by the military and not including in the Uniform Crime Report done by the SBI and maintained by the Governor's Crime Commission.

Contacts

| | |
|---|---|
| Charlene Coppersmith 571-4736 | Governor's Crime Commission |
| Worth Brock 733-3171 | SBI |

VIRGINIA BEACH AND HAMPTON ROADS

* Reports can be obtained at Criminal Justice Research Center from Richard Kern. (804) 225-4565.
** Richard Kern referred me to State Police Department for information on their Crime in Virginia Report (804) 674-2023.
*** State Police Department gave me the following information on the phone.

REPORT FOR VIRGINIA BEACH

1991

| Murder | Rape | Robbery | Aggrv. Assault | Burglary | Larceny | Motor Veh. | Arson | Total |
|---|---|---|---|---|---|---|---|---|
| 29 | 127 | 512 | 421 | 4162 | 16,834 | 1327 | 219 | 23,631 |

1992

| Murder | Rape | Robbery | Aggrv. Assault | Burglary | Larceny | Motor Veh. | Arson | Total |
|---|---|---|---|---|---|---|---|---|
| 23 | 153 | 613 | 367 | 3709 | 15,124 | 1161 | 211 | 21,361 |

1993

| Murder | Rape | Robbery | Aggrv.Assault | Burglary | Larceny | Motor Veh. | Arson | Total |
|---|---|---|---|---|---|---|---|---|
| 22 | 181 | 633 | 415 | 3262 | 14,839 | 1199 | 200 | 20,751 |

REPORT FOR HAMPTON

1991

| Murder | Rape | Robbery | Aggrv.Assault | Burglary | Larceny | Motor Veh. | Arson | Total |
|---|---|---|---|---|---|---|---|---|
| 14 | 71 | 290 | 253 | 1316 | 5759 | 573 | 90 | 8366 |

1992

| Murder | Rape | Robbery | Aggrv. Assault | Burglary | Larceny | Motor Veh. | Arson | Total |
|---|---|---|---|---|---|---|---|---|
| 10 | 51 | 313 | 284 | 1035 | 5721 | 669 | 61 | 8144 |

1993

| Murder | Rape | Robbery | Aggrv. Assault | Burglary | Larceny | Motor Veh. | Arson | Total |
|---|---|---|---|---|---|---|---|---|
| 14 | 49 | 329 | 252 | 962 | 5538 | 570 | 73 | 7787 |

CRIME RATES BASED ON THE UNIFORM CRIME REPORT

| Year | Individual City/Total | County Sheriff Dept./Total | Total for Craven County |
|---|---|---|---|
| 1990 | Havelock/1046 | Craven County/204 | 5967 |
| 1991 | Havelock/1118 | Craven County/2568 | 5931 |
| 1992 | Havelock/1017 | Craven County/2658 | 9328 |
| 1993 | Havelock/1179 | Craven County/2943 | 9913 |
| 1994 | report will be out in Aug. 1995 | | |

PLEASE REFER TO UNIFORM CRIME REPORT WHEN REFERRING TO TOTALS

* The Crime Index Totals on the Uniform Crime Report includes all crimes except Violent Crimes, Property Crimes, and Arson

** County Sheriff Department Totals are separate from the city totals.(cases outside city limits)

*** All crimes at Cherry Point are handled by the military and not including in the Uniform Crime Report done by the SBI and maintained by the Governor's Crime Commission

Contacts

Charlene Coppersmith 571-4736 Governor's Crime Commission
Worth Brock 733-3171 SBI

VIRGINIA BEACH AND HAMPTON ROADS

* Reports can be obtained from Criminal Justice Research Center
I have called and left a message for Richard Kern to call be back. (804) 225-4565

1992- 1993

# Agency Profile

| CONTRIBUTOR | YEAR | Mos. on File | Crime Index Total[1] | Violent Crime Total[2] | Murder | Forcible Rape | Robbery | Aggravated Assault |
|---|---|---|---|---|---|---|---|---|
| (Cleveland County Continued) Grover | 1992 | | DNP | | | | | |
| | 1993 | | DNP | | | | | |
| Polkville | 1992 | | DNP | | | | | |
| | 1993 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Crowders Mtn. State Park | 1992 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1993 | 12 | 14 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL CLEVELAND** | 1992 | | 4,100 | 409 | 11 | 21 | 79 | 298 |
| | 1993 | | 4,825 | 502 | 19 | 28 | 121 | 334 |
| Columbus County Sheriff | 1992 | 12 | 1,240 | 133 | 8 | 17 | 14 | 94 |
| | 1993 | 12 | 1,155 | 156 | 3 | 9 | 16 | 128 |
| Chadbourn | 1992 | 12 | 241 | 28 | 0 | 0 | 0 | 28 |
| | 1993 | 12 | 233 | 44 | 1 | 1 | 7 | 35 |
| Fair Bluff | 1992 | 12 | 45 | 25 | 1 | 0 | 0 | 24 |
| | 1993 | 12 | 64 | 3 | 0 | 0 | 1 | 2 |
| Tabor City | 1992 | | DNP | | | | | |
| | 1993 | | DNP | | | | | |
| Whiteville | 1992 | 12 | 680 | 47 | 0 | 5 | 7 | 35 |
| | 1993 | 12 | 627 | 53 | 0 | 3 | 7 | 43 |
| Lake Waccamaw | 1992 | 1 | 6 | 0 | 0 | 0 | 0 | 0 |
| | 1993 | 12 | 68 | 4 | 0 | 0 | 0 | 4 |
| Brunswick | 1992 | | DNP | | | | | |
| | 1993 | | DNP | | | | | |
| Highway Patrol | 1992 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1993 | 12 | 1 | 1 | 0 | 0 | 0 | 1 |
| **TOTAL COLUMBUS** | 1992 | | 2,212 | 233 | 9 | 22 | 21 | 181 |
| | 1993 | | 2,148 | 261 | 4 | 13 | 31 | 213 |
| Craven County Sheriff | 1992 | 12 | 1,329 | 138 | 1 | 13 | 14 | 110 |
| | 1993 | 12 | 1,471 | 160 | 2 | 12 | 13 | 133 |
| Havelock | 1992 | 12 | 506 | 41 | 1 | 5 | 7 | 28 |
| | 1993 | 12 | 588 | 55 | 0 | 1 | 11 | 43 |
| New Bern | 1992 | 12 | 2,679 | 331 | 1 | 13 | 95 | 222 |
| | 1993 | 12 | 2,775 | 407 | 1 | 16 | 80 | 310 |
| Vanceboro | 1992 | 12 | 52 | 9 | 1 | 0 | 3 | 5 |
| | 1993 | 12 | 48 | 7 | 0 | 0 | 1 | 6 |
| Trent Woods | 1992 | 12 | 64 | 5 | 0 | 0 | 0 | 5 |
| | 1993 | 12 | 45 | 1 | 0 | 0 | 0 | 1 |
| River Bend | 1992 | 12 | 26 | 1 | 1 | 0 | 0 | 0 |
| | 1993 | 12 | 17 | 0 | 0 | 0 | 0 | 0 |
| Highway Patrol | 1992 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1993 | 12 | 4 | 4 | 0 | 0 | 0 | 4 |
| **TOTAL CRAVEN** | 1992 | | 4,656 | 525 | 5 | 31 | 119 | 370 |
| | 1993 | | 4,948 | 634 | 3 | 29 | 105 | 497 |
| Cumberland County Sheriff | 1992 | 12 | 11,080 | 850 | 18 | 99 | 238 | 495 |
| | 1993 | 12 | 10,879 | 948 | 27 | 95 | 331 | 495 |
| Fayetteville | 1992 | 12 | 10,120 | 1,561 | 12 | 92 | 525 | 932 |
| | 1993 | 12 | 10,189 | 1,786 | 30 | 92 | 583 | 1,081 |
| Hope Mills | 1992 | 12 | 845 | 19 | 0 | 0 | 2 | 17 |
| | 1993 | 12 | 828 | 32 | 2 | 0 | 8 | 22 |
| Spring Lake | 1992 | 12 | 1,161 | 218 | 1 | 12 | 46 | 159 |
| | 1993 | 12 | 1,301 | 257 | 1 | 8 | 63 | 185 |
| Fayetteville State Univ. | 1992 | 12 | 74 | 12 | 0 | 0 | 5 | 7 |
| | 1993 | 12 | 121 | 10 | 1 | 0 | 2 | 7 |

(continued)

See footnotes at end of table.

| Property Crime Total[3] | Breaking and Entering | Larceny | Motor Vehicle Theft | Arson[1] | Estimated Population Coverage | Character | Sworn Officers Male | Sworn Officers Female | Civilians | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Property Crimes | | | | Demographic Data | | Fulltime Police Employee Data | | | |
| | | | | | ( 638) | | 2 | 0 | 0 | 2 |
| | | | | | ( 637) | DNP | 2 | 0 | 0 | 2 |
| | | | | | ( 1,491) | | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 359 | R. City | 1 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | 0 | | 2 | 1 | 1 | 4 |
| 14 | 1 | 13 | 0 | 0 | 0 | State | 2 | 1 | 1 | 4 |
| 3,691 | 1,423 | 2,088 | 180 | 13 | 83,375 | | 107 | 16 | 58 | 181 |
| 4,323 | 1,647 | 2,506 | 170 | 17 | 85,546 | Rural | 127 | 16 | 59 | 202 |
| 1,107 | 516 | 507 | 84 | 21 | 38,210 | | 34 | 8 | 17 | 59 |
| 999 | 463 | 462 | 74 | 10 | 37,928 | R. County | 35 | 8 | 19 | 62 |
| 213 | 43 | 162 | 8 | 0 | 2,023 | | 6 | 0 | 3 | 9 |
| 189 | 48 | 121 | 20 | 0 | 2,034 | R. City | 6 | 0 | 2 | 8 |
| 20 | 12 | 6 | 2 | 0 | 1,075 | | 6 | 0 | 3 | 9 |
| 61 | 14 | 41 | 6 | 0 | 1,078 | R. City | 4 | 0 | 0 | 4 |
| | | | | | ( 2,321) | | 7 | 0 | 4 | 11 |
| | | | | | ( 2,368) | DNP | 7 | 0 | 3 | 10 |
| 633 | 125 | 480 | 28 | 4 | 5,054 | | 20 | 3 | 6 | 29 |
| 574 | 113 | 440 | 21 | 5 | 5,510 | R. City | 20 | 3 | 6 | 29 |
| 6 | 2 | 4 | 0 | 0 | 934 | | 1 | 0 | 0 | 1 |
| 64 | 13 | 49 | 2 | 0 | 910 | R. City | 1 | 0 | 0 | 1 |
| | | | | | ( 287) | | 1 | 0 | 0 | 1 |
| | | | | | ( 306) | DNP | 1 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 | | | | | | |
| 0 | 0 | 0 | 0 | 0 | | State | | | | |
| 1,979 | 698 | 1,159 | 122 | 25 | 47,296 | | 75 | 11 | 33 | 119 |
| 1,887 | 651 | 1,113 | 123 | 15 | 47,460 | Rural | 74 | 11 | 30 | 115 |
| 1,191 | 441 | 650 | 100 | 0 | 34,812 | | 44 | 5 | 40 | 89 |
| 1,311 | 428 | 793 | 90 | 1 | 35,548 | R. County | 44 | 5 | 40 | 89 |
| 192 465 | 145 | 307 | 13 | 5 | 16,361 | | 22 | 1 | 7 | 30 |
| 193 533 | 151 | 357 | 25 | 3 | 16,472 | R. Center | 21 | 1 | 7 | 29 |
| 2,348 | 671 | 1,569 | 108 | 10 | 20,645 | | 48 | 15 | 18 | 79 |
| 2,368 | 676 | 1,582 | 110 | 12 | 20,957 | R. Center | 52 | 15 | 20 | 87 |
| 43 | 12 | 29 | 2 | 0 | 959 | | 2 | 0 | 0 | 2 |
| 41 | 8 | 33 | 0 | 1 | 976 | R. City | 2 | 0 | 0 | 2 |
| 59 | 18 | 39 | 2 | 0 | 3,543 | | 3 | 0 | 0 | 3 |
| 44 | 8 | 35 | 1 | 0 | 3,622 | R. City | 3 | 0 | 0 | 3 |
| 25 | 9 | 16 | 0 | 1 | 2,483 | | 3 | 1 | 0 | 4 |
| 17 | 7 | 10 | 0 | 0 | 2,555 | R. City | 3 | 1 | 0 | 4 |
| 0 | 0 | 0 | 0 | 0 | | | | | | |
| 0 | 0 | 0 | 0 | 0 | | State | | | | |
| 4,131 | 1,296 | 2,610 | 225 | 16 | 78,803 | | 120 | 22 | 65 | 207 |
| 4,314 | 1,278 | 2,810 | 226 | 17 | 80,130 | Rural | 125 | 22 | 67 | 214 |
| 10,230 | 3,354 | 5,981 | 895 | 102 | 169,161 | | 249 | 47 | 70 | 366 |
| 9,931 | 3,183 | 5,880 | 868 | 97 | 174,845 | S. County | 260 | 51 | 74 | 385 |
| 8,559 | 2,341 | 5,456 | 762 | 72 | 75,787 | | 183 | 34 | 68 | 285 |
| 8,403 | 2,071 | 5,685 | 647 | 59 | 76,541 | Core City | 194 | 35 | 67 | 296 |
| 826 | 159 | 625 | 42 | 1 | 8,550 | | 13 | 1 | 7 | 21 |
| 796 | 192 | 566 | 38 | 2 | 8,808 | S. City | 13 | 1 | 7 | 21 |
| 943 | 369 | 533 | 41 | 5 | 7,883 | | 14 | 1 | 8 | 23 |
| 1,044 | 303 | 700 | 41 | 9 | 8,012 | S. City | 15 | 0 | 7 | 22 |
| 62 | 10 | 50 | 2 | 0 | 986 | | 11 | 2 | 6 | 19 |
| 111 | 17 | 91 | 3 | 0 | 1,019[4] | State | 13 | 2 | 8 | 23 |

See footnotes at end of table.

# AGENCY PROFILE

| CONTRIBUTOR | YEAR | Mos. on File | Crime Index Total | Violent Crime Total | Violent Crimes: Murder | Forcible Rape | Robbery | Aggravated Assault |
|---|---|---|---|---|---|---|---|---|
| Columbus County Sheriff | 1990 | 12 | 1097 | 114 | 8 | 10 | 17 | 79 |
| | 1991 | 12 | 1171 | 87 | 5 | 9 | 10 | 63 |
| Chadbourn | 1990 | 12 | 350 | 65 | 1 | 0 | 6 | 58 |
| | 1991 | 12 | 246 | 55 | 1 | 2 | 3 | 49 |
| Fair Bluff | 1990 | 12 | 63 | 23 | 0 | 0 | 0 | 23 |
| | 1991 | 12 | 61 | 41 | 0 | 0 | 1 | 40 |
| Tabor City | 1990 | | DNP | | | | | |
| | 1991 | | DNP | | | | | |
| Whiteville | 1990 | 12 | 443 | 42 | 0 | 5 | 6 | 31 |
| | 1991 | 12 | 639 | 59 | 3 | 5 | 9 | 42 |
| Lake Waccamaw | 1990 | 12 | 45 | 7 | 0 | 0 | 1 | 6 |
| | 1991 | 3 | 10 | 1 | 0 | 0 | 0 | 1 |
| SBI | 1990 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1991 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| Highway Patrol | 1990 | 12 | 2 | 2 | 0 | 0 | 0 | 2 |
| | 1991 | 12 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL COLUMBUS** | 1990 | | 2000 | 253 | 9 | 15 | 30 | 199 |
| | 1991 | | 2127 | 243 | 9 | 16 | 23 | 195 |
| Craven County Sheriff | 1990 | 1 | 102 | 2 | 0 | 0 | 0 | 2 |
| | 1991 | 12 | 1282 | 119 | 3 | 15 | 17 | 84 |
| Havelock | 1990 | 12 | 521 | 36 | 0 | 2 | 3 | 31 |
| | 1991 | 12 | 558 | 43 | 0 | 1 | 3 | 39 |
| New Bern | 1990 | 12 | 2197 | 304 | 6 | 11 | 82 | 205 |
| | 1991 | 12 | 2492 | 313 | 4 | 10 | 74 | 225 |
| Vanceboro | 1990 | 12 | 43 | 5 | 0 | 0 | 0 | 5 |
| | 1991 | 12 | 48 | 10 | 0 | 0 | 2 | 8 |
| Trent Woods | 1990 | 12 | 23 | 0 | 0 | 0 | 0 | 0 |
| | 1991 | 12 | 57 | 2 | 0 | 1 | 0 | 1 |
| River Bend | 1990 | 12 | 27 | 1 | 0 | 0 | 0 | 1 |
| | 1991 | 12 | 22 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL CRAVEN** | 1990 | | 2913 | 348 | 6 | 13 | 85 | 244 |
| | 1991 | | 4459 | 487 | 7 | 27 | 96 | 357 |
| Cumberland County Sheriff | 1990 | 12 | 11214 | 911 | 19 | 98 | 246 | 548 |
| | 1991 | 12 | 12358 | 929 | 21 | 101 | 298 | 509 |
| Fayetteville | 1990 | 12 | 11055 | 1744 | 17 | 96 | 418 | 1213 |
| | 1991 | 12 | 10580 | 1513 | 23 | 72 | 523 | 895 |
| Hope Mills | 1990 | 12 | 960 | 35 | 0 | 1 | 10 | 24 |
| | 1991 | 12 | 914 | 35 | 0 | 0 | 12 | 23 |
| Spring Lake | 1990 | 12 | 1232 | 179 | 3 | 10 | 39 | 127 |
| | 1991 | 12 | 1291 | 209 | 2 | 12 | 45 | 150 |
| Fayetteville State Univ. | 1990 | 3 | 23 | 1 | 0 | 0 | 0 | 1 |
| | 1991 | 12 | 104 | 13 | 0 | 1 | 1 | 11 |
| Stedman | 1990 | | Cover | | | | | |
| | 1991 | | Cover | | | | | |
| Highway Patrol | 1990 | 12 | 2 | 2 | 0 | 0 | 0 | 2 |
| | 1991 | 12 | 2 | 2 | 0 | 0 | 0 | 2 |
| **TOTAL CUMBERLAND** | 1990 | | 24486 | 2872 | 39 | 205 | 713 | 1915 |
| | 1991 | | 25249 | 2701 | 46 | 186 | 879 | 1590 |
| Currituck County Sheriff | 1990 | 12 | 335 | 11 | 0 | 3 | 5 | 3 |
| | 1991 | 12 | 403 | 16 | 0 | 4 | 1 | 11 |
| **TOTAL CURRITUCK** | 1990 | | 335 | 11 | 0 | 3 | 5 | 3 |
| | 1991 | | 403 | 16 | 0 | 4 | 1 | 11 |

| | Property Crimes | | | | * | Demographic Data | | Fulltime Police Employee Data | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Property Crime Total | Breaking and Entering | Larceny | Motor Vehicle Theft | Arson | Estimated Population Coverage | Character | Sworn Officers Male | Sworn Officers Female | Civilians | Total |
| | 983 | 508 | 397 | 78 | 31 | 39888 | | 34 | 6 | 16 | 56 |
| | 1084 | 551 | 461 | 72 | 21 | 38133 | R. County | 34 | 8 | 15 | 57 |
| | 285 | 81 | 194 | 10 | 0 | 1951 | | 6 | 0 | 4 | 10 |
| | 191 | 55 | 126 | 10 | 0 | 2004 | R. City | 2 | 0 | 0 | 2 |
| | 40 | 28 | 7 | 5 | 0 | 1117 | | 4 | 0 | 0 | 4 |
| | 20 | 14 | 6 | 0 | 1 | 1068 | R. City | 4 | 0 | 0 | 4 |
| | | | | | | ( 2698) | | 7 | 0 | 4 | 11 |
| | | | | | | ( 2329) | DNP | 7 | 0 | 4 | 11 |
| | 401 | 109 | 262 | 30 | 4 | 5698 | | 17 | 3 | 6 | 26 |
| | 580 | 124 | 425 | 31 | 3 | 5076 | R. City | 17 | 3 | 6 | 26 |
| | 38 | 12 | 25 | 1 | 0 | 1368 | | 1 | 0 | 0 | 1 |
| | 9 | 3 | 6 | 0 | 0 | 939 | R. City | 1 | 0 | 0 | 1 |
| | 0 | 0 | 0 | 0 | 1 | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | | State | | | | |
| | 0 | 0 | 0 | 0 | 0 | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | | State | | | | |
| | [illegible] | [illegible] | [illegible] | 124 | [illegible] | 60022 | | 89 | 19 | 30 | [illegible] |
| | 1984 | 747 | 1024 | 113 | 25 | 87220 | Rural | 85 | 11 | 25 | 101 |
| | 100 | 35 | 56 | 9 | 0 | 33005 | | 45 | 6 | 39 | 90 |
| 1990 | 1183 | 437 | 643 | 83 | 4 | 34175 | R. County | 43 | 6 | 39 | 88 |
| | 485 | 140 | 329 | 16 | 4 | 20620 | | 21 | 2 | 7 | 30 |
| 191 | 515 | 186 | 308 | 21 | 2 | 18417 | R. Center | 22 | 1 | 7 | 30 |
| | 1893 | 593 | 1234 | 66 | 17 | 20038 | | 40 | 13 | 9 | 62 |
| | 2179 | 637 | 1420 | 122 | 6 | 20471 | R. Center | 32 | 22 | 12 | 66 |
| | 38 | 16 | 22 | 0 | 0 | 959 | | 1 | 0 | 0 | 1 |
| | 38 | 14 | 22 | 2 | 0 | 949 | R. City | 1 | 0 | 0 | 1 |
| | 23 | 5 | 18 | 0 | 0 | 2259 | | 3 | 0 | 0 | 3 |
| | 55 | 13 | 37 | 5 | 0 | 3502 | R. City | 3 | 0 | 0 | 3 |
| | 26 | 5 | 21 | 0 | 0 | 2077 | | 2 | 1 | 0 | 3 |
| | 22 | 5 | 17 | 0 | 1 | 2416 | R. City | 3 | 1 | 0 | 4 |
| | 2565 | 794 | 1680 | 91 | 21 | 78958 | | 112 | 22 | [illegible] | 189 |
| | 3972 | 1292 | 2447 | 233 | 13 | 77930 | Rural | 104 | 30 | [illegible] | 192 |
| | 10303 | 3362 | 6167 | 774 | 82 | 150028 | | 216 | 35 | 58 | 309 |
| | 11429 | 3993 | 6528 | 908 | 78 | 165988 | S. County | 229 | 42 | 64 | 335 |
| | 9311 | 2626 | 6133 | 552 | 63 | 77185 | | 180 | 36 | 73 | 289 |
| | 9067 | 2623 | 5769 | 675 | 64 | 74888 | Core City | 180 | 36 | 72 | 288 |
| | 925 | 204 | 694 | 27 | 1 | 9521 | | 13 | 1 | 7 | 21 |
| | 879 | 178 | 666 | 35 | 6 | 8309 | S. City | 13 | 1 | 7 | 21 |
| | 1053 | 371 | 640 | 42 | 16 | 7273 | | 13 | 1 | 7 | 21 |
| | 1082 | 349 | 672 | 61 | 7 | 7580 | S. City | 13 | 1 | 8 | 22 |
| | 22 | 5 | 17 | 0 | 1 | 1000 | | 12 | 1 | 7 | 20 |
| | 91 | 18 | 72 | 1 | 2 | 1045 | State | 12 | 1 | 6 | 19 |
| | | | | | | | | 1 | 0 | 0 | 1 |
| | | | | | | | Cover | 1 | 0 | 0 | 1 |
| | 0 | 0 | 0 | 0 | 0 | | | | | | |
| | 0 | 0 | 0 | 0 | 0 | | State | | | | |
| | 21614 | 6568 | 13851 | 1395 | 163 | 245007 | | 437 | 74 | 152 | 661 |
| | 22548 | 7181 | 13707 | 1680 | 157 | 257810 | Suburban | 448 | 81 | 157 | 686 |
| | 324 | 108 | 202 | 14 | 0 | 14305 | | 19 | 1 | 9 | 29 |
| | 387 | 159 | 217 | 11 | 1 | 13800 | R. County | 21 | 0 | 10 | 31 |
| | 324 | 108 | 202 | 14 | 0 | 14305 | | 19 | 1 | 9 | 29 |
| | 387 | 159 | 217 | 11 | 1 | 13800 | Rural | 21 | 0 | 10 | 31 |

* The arson totals shown have not been included as part of the crime index.

# MORALE, WELFARE, AND RECREATION (MWR)

In order to retain our highly skilled, well trained Marines and sailors and to achieve maximum return on the taxpayers' dollar spent on defense, we are committed to pursuing a comprehensive program of morale, welfare and recreation.

**MWR**
**Total $ Spent for**
**FY 94:**

**$24,506,600**

Quality of life for Marines and family members is given the highest priority, in an effort to alleviate some of the strain that accompanies rigorous training and family separation.

**Total $ Spent in NC**
**from FY94 MWR:**

**$11,239,500**

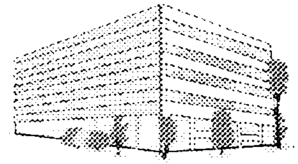
The MWR Directorate at MCAS Cherry Point operates a full recreation and athletic program, retail sales outlets, food and hospitality centers, arts and crafts, auto hobby, golf and bowling, and various other personal service activities. One hundred percent of MWR net profits stay at Cherry Point, of which 70% is used to enrich recreational activities and programs.

**TOTAL DIRECT $ TO NC COMPANIES**
**FY 94:**

**$10,474,000**

# FACTS about FACILITIES and SERVICES

## Marine Corps Air Station Cherry Point



| | | |
|---|---|---|
| Primary complex: | | 13,164 acres |
| w/associated support locations: | | 15,756 acres |
| Four active runways: | (approximately) | 30,000 linear ft |
| Square footage of building space: | | 10,689,738 sq ft |
| Current value of facilities and equipment: | | $2,029,407,242 |

| | | | |
|---|---|---|---|
| 1994 Electric Bill | $12,908,165 | 1994 Phone Bill | $443,400 |
| 1995 Projected Electric Bill | $13,885,204 | 1995 Projected Phone Bill | $650,000 |

**GOVERNMENT HOUSING CONSISTS OF A VARIETY OF ACCOMMODATIONS:**

| MARRIED | | BACHELOR | |
|---|---|---|---|
| **OFFICER** | | | |
| Apartments | 48 | Field Grade & Above | 14 |
| Two Story Units | 49 | Company Grade | 38 |
| Capehart | 169 | Transient Quarters | 78 |
| Townhouses | 60 | | |
| **STAFF NONCOMMISSIONED OFFICER** | | | |
| Capehart | 679 | E-6 & Above | 194 |
| Townhouses | 240 | Transient Quarters | 42 |
| **ENLISTED** | | | |
| Slocum Village | 775 | E-5 & Below | 3,412 |
| Hancock Village | 347 | Transient Quarters | 85 |
| Fort Macon Village | 249 | Permanent Change of Station | 36 |
| Lanham Housing | 148 | **TOTAL** | **3,899** |
| Mobile Home spaces | 76 (available to all ranks) | | |
| **TOTAL** | **2,840** | | |

**Support Services** are available to both active duty and retired military members and their families. Some of these services include: chapel, library, Federal Credit Union, Child Development Center and commissary; legal counseling is available through the Legal Assistance Office. Complete postal facilities are offered by the Cherry Point Post Office.

**Other Services** aboard the Air Station include, but are not limited to, a McDonald's, Shell Service Station, Subway, Domino's Pizza, Marbles Video, One Hour Photo, First Citizens' Bank, optical shop, telephone center, laundromat, shoe repair, flower shop, donut shop, ice cream shop, coffee shop, watch repair, dry cleaners, Hallmark Card Shop and television cable company.

# COMMUNITY SERVICES AND CONTRIBUTIONS

We work earnestly to promote the social and economic welfare of our region. We participate in county and city board meetings and interface with a multitude of local committees and government entities. We happily provide assistance and involvement in local community activities, festivals and social events. Our Community Plans and Liaison Office, in concert with local communities and the efforts of citizen working groups, focuses on developing regional solutions to common problems.

A CHERRY POINT MARINE JOINS THE LOCAL US FORESTRY SERVICE TO SUCCESSFULLY COMBAT THE "FISH DAY FIRE" IN THE CROATAN NATIONAL FOREST

## Educational Quality Up Another Level (EQUAL)

(Sponsored by the Havelock Chamber of Commerce Educational Committee)

In support of our local public schools, the Air Station will contribute approximately $400 during FY95 to Project EQUAL. Additionally, our personal concern about the quality of education of local school children, our future leaders and Marines, leads us to become involved in the classrooms throughout the surrounding area. We have an active "Adopt-a-School Program" which allows area schools to coordinate directly with adoptive military units to develop an individual list of needs that are met by our military volunteers.

## Navy/Marine Corps Relief Society

This Society provides a wide range of services and financial assistance to Marine and Navy families. In FY95, approximately **$554,600** will be distributed to local families needing assistance.

## Combined Federal Campaign

Federal workers contribute to many local organizations through the Combined Federal Campaign. Estimated collection for FY 95 is **$281,400**.

NC will receive **$72,300** in designated monies with **65%** of these funds being donated to organizations in the quad-counties.

## SOME GOOD NEWS

*

Golden Key Award (Aug 1994)

*

Secretary of the Navy's 1994 Environmental Pollution Prevention Team Award

*

Rear Admiral Christian J. Peoples Plaque Award

*

Commander-in-Chief's Award for Installation Excellence

*

# EDUCATION

Regionally accredited colleges and universities provide various educational programs on or near the Air Station. This is arranged through the Training and Education Center aboard MCAS Cherry Point. The primary purpose of the voluntary Education Program is to improve the competence of active duty Marines and civilian employees, assist in career progression, and generally strengthen the personnel base of the Marine Corps.

**PARK COLLEGE**
Bachelor of Science in
Computer Information Systems
Computer Science
Criminal Justice Administration
Human Resources
Industrial Security Management
Social Psychology

**BOSTON UNIVERSITY**
Master of Science in
Business Administration

**SOUTHERN ILLINOIS UNIVERSITY**
Bachelor of Science in
Aviation Management
Electronics Management

**CRAVEN COMMUNITY COLLEGE**
Associate Degrees
Certificate Program
Continuing Education
GED
High School Completion
Vocational/Technical Diplomas

**Projected 94-95 Off-duty Education Enrollment**

| | Vo/Tech | Under Graduate | Graduate |
|---|---|---|---|
| **Officer** | 0 | 43 | 68 |
| **Enlisted** | 20 | 1230 | 13 |
| **Marine Corps Tuition Assistance** | | **$950,000** | |
| **VA Benefits** | | **$617,700** | |
| **TOTAL** | | **$1,567,700** | |

**On Duty Training**
**$25,200**

## CIVILIAN DEVELOPMENT PROGRAMS

- Apprentice
- America 2000 Education Enhancement
- Consolidated Civilian Career Training
- Cooperative Education
- Defense Acquisition Workplace Implementation Act
- Federal Junior Fellowship Program
- Pre-supervisory
- Probationary Supervisory Training
- Retraining Individual Development Plans
- Senior Executive Management
- Stay-in-School
- Veterans Readjustment Appointment

Approximately **$726,900** will be expended for work-related training for Cherry Point's civilian employees during FY 95.

**North Carolina Impact: $1,126,800** **Quad-County Impact: $1,019,500**

Environmental
Impact

# Environmental Issues

- 1980-81:SE Virginia drought - Oceana builds emergency wells. "Efforts to curtail consumption were successful, but these measures were at the expense of operational readiness." [1]
- 1985-88:Variety of voluntary and mandatory water use restrictions imposed.
- 1991-92:Virginia Beach imposes mandatory, long-term water use restrictions and places a moratorium on all new water system connections. These restrictions remain in place.
- 1994:Corps of Engineers concludes the area is very vulnerable to drought and, without an additional water supply, faces water problems of extreme proportions.[2]
- 1995:In comments to FERC regarding the January 1995 DEIS, Virginia Beach comments that "the Lake Gaston Project will not eliminate the need for Virginia Beach or Chesapeake to restrict water use..." [3]

* 1 December 1980 Navy Oceana Environmental Assessment, page 1.
2 Quoted in January 1995 Federal Energy Regulatory Commission (FERC) Draft Environmental Impact Statement ( DEIS) at page 1-5.
3 January 1995 FERC DEIS, pages 1-8 to 1-10

# Environmental Issues

## Installation Quality of Life

- Safety
  - Oceana aircraft approaches are over dense population
  - Oceana aircraft approaches are over dense commercial development
- Underground contamination
  - Plume of fuel under Oceana
    - 10 gal / day
  - Reports of hospitalizations due to fuel in water system ("We don't drink the water" - Navy Families report - Navy Times - 7/4/94)

OPERATION HORNETS' NEST
MCAS CHERRY POINT

Navy Times 07-04-94 Issue

`WE DON'T TOUCH THE WATER,' FAMILIES SAY / NAVY SEEKS CAUSE OF MYSTERY ILLNESS

~y Rebecca D. Garrison

OCEANA, Va. - Kathy Rider swore she would never live in military housing, but this house held some appeal. It's an end unit with a shady tree next to it, located in the sprawling Wherry Housing complex just south of the Naval Air Station here. ``I told my husband, `This will be the prettiest house we've had,''' Rider said.

Instead, it's become a house of horror. Rider blames the house or, more specifically, the water system serving it for making her family and neighbors sick.

It started in September 1993, when her husband John, an aviation structural mechanic second class, was hospitalized for three days with severe headaches, abdomi nal pains, diarrhea and vomiting. Rider has been keeping a close watch on the family's health ever since.

Rider and her son, 11-year-old Curtis Osterman, have had the same symptoms her husband experienced, and doctors can't figure out the cause.

``When I saw my son laying on the front porch, crying out in pain, I got mad,'' Rider said.

Sick neighbors, too

Then Kathy Rider started talking to her neighbors. She found others with ıe same problems in her section of the Wherry Housing complex.

Brenda Bryant, whose home shares a courtyard with the Riders' place, was one of them. She was forced to send a daughter to stay with friends. Brandy, 11, had become so sick that doctors said they would ``remove child from area for a trial period to determine if she improves.''

It worked: Brandy is now healthy again but about a six-hour drive away, in Maytown, Pa. Gone are the chronic diarrhea, abdominal cramps and dehydration she suffered for months at Oceana.

The neighbors concluded that their illnesses were tied to water only after they discovered they all felt much better when they drank bottled water, rather than the stuff from their kitchen and bathroom taps.

``We don't touch the water,'' said one resident who asked not to be identified. Once, she said, ``We ran out of water and both of us drank one big glass and got really sick'' the next day.

They also complain about a poor sewage system that's prone to frequent backups and overflows. Between Feb. 1 and May 6, 62 plumbing calls have been made to the about 500 houses in the complex. Complaints range from a slow drain in a bathtub to raw sewage on the ground.

Unconvinced

But officials remain unconvinced. The Virginia Beach Water Department and the Navy have each run several tests without conclusive results.

``Every sample we have done has met state standards,'' said Cmdr. Konrad Hayashi, an epidemiologist with the Navy Environmental and Preventive Medicine Unit in Norfolk. Testing continues, however, because most residents stop suffering the symptoms when they stop drinking tap water and drink bottled water instead.

The Navy has sent questionnaires to residents, asking those suffering health problems to collect stool samples and bring them in to be tested. But so far, only two residents have taken stool samples to the clinic, said Troy Snead, a spokesperson for Oceana.

Without input from residents, the Navy's hands are tied. ``We're sort of stymied if they don't do the questionnaires,'' Hayashi said. ``They can help solve the problem and help us find out what's going on by bringing in the samples.''

But of 155 residents questioned, 24 said they had visited the doctor for intestinal problems. Three of those were diagnosed with a type of dysentery. The other visits to the clinic were self-reported, said Dr. Steve Hooker, an epidemiologist with the Environmental and Preventive Medicine Unit. The unit needs all medical records and documentation to help them find the problem, Hooker said. ``Our main concern is that people get evaluated.''

Not just the water

At the same time, residents are beginning to worry the problem at the Wherry complex runs deeper than just intestinal troubles: Some say they're also suffering from respiratory problems.

Several residents, including the Riders, have had shortness of breath, chest pains and bouts with coughing and wheezing. Those symptoms, coupled with a gaseous odor residents say sometimes comes from the tap water and sewage drains, have led to questions about whether the water system is contaminated with some kind of fuel.

Indeed, there are more than 2 million gallons of JP-5 jet fuel in tanks buried on base, about 11/2 miles from the housing complex.

The tanks are leaking, said Lt. Cmdr. Chris Willis, the base civil engineer. He said the leaks have nothing to do with the water problem, because there is no connection between the fuel farm and the housing complex. The base runway separates the fuel farm and the housing complex. ``The fuel tanks are far away from Wherry Housing,'' he said.

One of four underground tanks leaks about 10 gallons of fuel a day, and the other three leak less than one gallon a day, Willis said. Because the tanks leak and because they are old, new above-ground tanks will be installed by March 1997.

The Navy tested for fuel after an incident on May 15 when one residents' toilet overflowed. Rider says the water smel led like fuel, and Navy tests did urn up ``trace amounts of mostly aliphatic hydrocarbons'' which include fuel and oil the laboratory report shows. But the lab study was based only on samples taken from the commode cover, which got wet when the toilet overflowed.

That might have skewed the results, said Edward Bouwer, professor of environmental engineering at Johns Hopkins University in Baltimore, an expert in the field. ``Hydrocarbons are volatile, and you lose when it hits the air,'' he said.

Hooker said scientists had also tested two samples taken from the toilet. Those results were not included in the official report because they were after May 20, he said.

A June 21 letter from Capt. William Shurtleff to residents said all complaints of fuel-like odors had been fully investigated. ``All returned negative or negligible for the presence of petroleum products and chemicals.''

Still, residents are suspicious. The symptoms they're living with match those associated with ingestion of fuel, which can cause vomiting, abdominal pain and diarrhea. And they worry about the long-term health risks, since scientists say extended exposure to fuels may harm the lungs, liver, kidney, pancreas and spleen. Prolonged skin contact may cause dermatitis.

``Too many people are sick. I just want to get to the bottom of it,'' Rider said. ``We're not ones to complain, that's why you haven't heard about this. But maybe it's time to start complaining.''

Adding to their fears have been whiffs of fuel from other sources. When the smell of fuel started coming from a storm drain May 28, the Navy took soil samples May 31. The tests found small amounts of fuel, but not enough to be dangerous, Willis said.

The Navy Environmental and Preventive Medicine Unit conducted a survey May 6-19 of Wherry Housing, and included it in a May 20 preliminary report to Shurtleff. A nearly identical, final version of the report was completed June 21. The report also included results of recent tests for lead, copper and bacteria in the drinking water. Tests were conducted by the Navy and the Virginia Beach Department of Public Utilities.

Families in 64 apartments were interviewed, most from the eastern part of the complex, where Rider lives. Of those interviewed, 44 percent said they had diarrhea in the past three months, 33 percent had nausea and 36 percent had abdominal pain.

But, the report said, ``since the information was self-reported, there may be a bias for over-reporting in Wherry East, where most of the attention has been centered.'' And, it said, most of the c ases of chronic diarrhea have not been fully evaluated.

A little more than half the residents in Wherry East reported they had diarrhea in the past three months. Of those interviewed in Wherry West and Central, 30.6 percent and 37 percent, respectively, said they had.

Without stool samples and other input from residents, Hayashi said, the Navy will not have enough information to find the culprit. ``If over the 90 days we have only 10 to 15 specimens, then it's hard to determine the validity of the tests,'' he said.



Transmitted:  94-06-27 19:52:53 EDT

Navy Times 01-23-95 Issue

THE WATER IS STILL SUSPECT / OCEANA HOUSING RESIDENT TAKES CASE TO BOARD

y Becky Garrison

VIRGINIA BEACH, Va. -- On the day of the first public meeting of a board tasked with overseeing the environmental cleanup of Oceana Naval Air Station, Kathy Rider spent $10 at the library copying information about a landfill and hazardous wastes near her home there.

Armed and ready, she marched in Jan. 12 with copies of a study conducted in 1984. She fired off questions to board members about old landfills and fuel oil contamination.

They weren't ready for her. The board was meeting to discuss five sites at Oceana that are being cleaned up and three others that need attention. Each site has been contaminated by fuel oil, automotive fluids or aircraft and auto cleaning solvents from years of improper storage and handling. But none of them is on the grounds of Rider's housing complex, and environmental engineers working for the Navy say none pose a health threat.

Rider was told by the board that a landfill near her house -- called the 5th Green Landfill -- was closed and covered in the 1960s. The landfill is between 2,000 and 3,000 feet from her home in Wherry housing at Oceana. It was tested several times between 1986 and 1990, but no contamination was found, said Steve Brown, an environmental engineer working for a company under contract to the Navy.

Hair loss

Rider rattled off the ongoing problems she and some of her neighbors have: diarrhea, respiratory problems, hair loss, to name a few. She asked about tests on the water in the area and called for tests for radioactivity. ``When I see small children losing their hair, I can't take it anymore,'' she said.

Rider has been investigating and carefully documenting each outbreak during the past year. She has compilednames, phone numbers and medical histories for at least 40 residents.

Her comments were intriguing enough to win assurances from cochairperson Will Bullard. ``If you'll put your specific questions in writing and send them to me, I will do the best I can to address them,'' he said.

The board, called the NAS Oceana Restoration Advisory Board, is made up of civil servants who work for the Navy and civilian volunteers independent of the Navy. It was formed last fall in response to a Pentagon directive to inform communities about the types of contaminants on bases and what is being done to clean them up.

Four of the five sites at Oceana are being excavated -- a sort of cleaning of the dirt. The other site -- located on the base's Seabee compound

-- is also contaminated. But that compound is a bigger concern to the board because the contamination has reached the ground water in the area, said Steve Romanow, an environmental engineer for a company doing some of the cleanup for the Navy.

Of the five sites, the Seabee compound is the nearest to the Wherry Housing complex. It is unlikely the contaminated water would travel 3,000 feet to the homes, Brown said.

But Ira L. Whitman, president of The Whitman Companies, environmental engineers and consultants in East Brunswick, N.J., said the possibility shouldn't be ignored.

``Three thousand feet is a long distance, but it's not impossible,'' he said. ``What we've seen on occasion is a gas station on a corner in a city where [underground] tanks leak and it travels along the pipes. Then vapors get into the basement of houses.''

Contaminated ground water doesn't usually get through pipes and into drinking water, he said, but it can travel on the outside of the pipes and on the outside of the sewer system.

Fuel-like smells

Last summer, Rider and other residents complained about fuel-like smells coming from a nearby storm drain. They reported the same smell coming from one resident's toilet.

But tests taken on a toilet seat cover and the storm drain didn't show any problems, Navy officials said.

To address some of the residents' complaints, the Navy embarked on a three-month investigation that included water tests and surveys of residents. The base clinic also handed out stool sample kits but only six were returned, a Navy spokesman said.

Limited response from the residents and water tests that passed Environmental Protection Agency standards left the Navy with few answers.

To compound problems, Wherry housing residents are unwilling to report problems to housing officials. That's because they're worried about damaging their careers, Rider said.

Capt. Donald Santapaola, executive officer of the base, said the Navy has tried to help the residents by offering to pay for their move to off-base housing. In early January, 17 families -- including the Riders -- were moved to different houses on base because their houses were being torn down to make room for a new parking lot.

For those families who wanted to move off base, the Navy offered to cover the cost of moving. But the families were responsible for paying the rent, which is considerably higher than the cost of Wherry housing. Because Wherry is considered substandard housing, residents pay only 75 percent of their housing allowance, Santapaola said.

Now that the residents have been moved out of the units, the Navy will investigate three units from different sections in the housing complex to determine whether any environmental hazards may have been missed, a Navy spokesman said.



Transmitted: 95-02-07 13:55:26 EST

WATER SUPPLY CONCERNS -- CHRONOLOGY

- 1980-81: Southeastern Virginia suffers drought. Navy Oceana Command constructs two emergency water supply wells and, in supporting documentation, determines that:

  **Efforts to curtain consumption were successful, but these measures were at the expense of operational readiness.**

  . . .

  **The need for the Navy to have sufficient quantities of potable water to maintain operational readiness is of great importance for national security reasons.**[1]

- 1985: Suffolk and Chesapeake require emergency water supplies;[2]

- 1986: Norfolk, Virginia Beach, Suffolk and Portsmouth call for voluntary water conservation; Chesapeake requires emergency water supplies;[3]

- 1987: Norfolk and Virginia Beach renew calls for voluntary water conservation;[4]

- 1988: Chesapeake requires alternate water supplies due to salt water intrusion in groundwater well sources;[5]

- 1988: The Virginia State Water Supply board estimates **that the five-city area will need an additional 81 mgd of water by the year 2030 to avoid water storage depletion and mandatory water use restrictions during periods of drought.**[6]

- 1991: Norfolk, Virginia Beach, and Chesapeake impose mandatory water use restrictions'

- 1991-1992: Norfolk imposes a 30 mgd limit on water deliveries to Virginia Beach; in response, Virginia Beach imposes mandatory, long-term water use restrictions and

---

[1]December 1980 Navy Oceana Environmental Assessment, page 1.

[2]January 1995 FERC DEIS, page 1-5.

[3]January 1995 FERC DEIS, page 1-5.

[4]January 1995 FERC DEIS, page 1-5.

[5]January 1995 FERC DEIS, page 1-5.

[6]January 1995 FERC DEIS, page 1-17.

places a moratorium on all new water system connections. These restrictions remain in place to the present day.

- 1994: The U.S. Corps of Engineers concludes that the five-city area (Norfolk, Portsmouth, Chesapeake, Virginia Beach, and Suffolk) is very vulnerable to drought and, without an additional water supply, faces water problems of extreme proportions.[7]

- January of 1995: FERC publishes its Draft EIS on the Lake Gaston Pipeline project in which it concluded that:

  - The 60 mgd Lake Gaston Pipeline will only provide 54 mgd of available treated water safe yield due to pipeline transmission losses;[8]

  - The five-city area of Chesapeake, Norfolk, Suffolk, Portsmouth, and Virginia Beach is growing faster than previously projected, thus increasing long term water demand needs;[9]

  - Per capita water consumption in Virginia Beach is very low (about 89 gpd) relative to state and national averages, due to present water use restrictions -- the national average is 185 gpd and the average for the adjacent cities of Norfolk and Portsmouth is about 160 gpd. FERC stated that "(w)e would expect the per capita water use in the urbanizing cities (Virginia Beach, Chesapeake, and Suffolk) to increase as they become independent employment centers and their proportion of non-residential water use increases;"[10]

  - Virginia Beach, the State's largest city, has no independent water supply and the emergency wells drilled by the City during the 1980-81 drought cannot be relied upon in the future to provide any safe yield water;[11]

  - With regard to the Navy's two emergency supply wells, FERC stated that "(t)he Navy restricts use

---

[7]Quoted in January 1995 FERC DEIS at page 1-5.

[8]January 1995 FERC DEIS, page i.

[9]January 1995 FERC DEIS, pages 1-8 to 1-10.

[10]January 1995 FERC DEIS, pages 1-10 and 1-11.

[11]January 1995 FERC DEIS, page 1-13.

of these wells to droughts that threaten military readiness, and therefore, (they) are not included in our safe yield calculations."[12]

- In addressing long term water supply deficits for the five-city area, FERC stated: **"We adopt the Corps' criteria and estimate that the five-city area would need 48 mgd of additional water to avoid water rationing and 71 mgd of additional water to avoid water use restrictions during droughts."** (parenthetical omitted);[13]

- In concluding that the Lake Gaston Pipeline project was needed to help address long term water supply deficits in the five-city area, FERC found that: **"Mandatory water use restrictions could be avoided by providing an additional 71 mgd of water. Although 71 mgd would meet acceptable risk levels, decisions on whether to supply an additional 71 mgd to the five-city area needs (sic) to be balanced against the environmental consequences of developing that supply."**[14]

◆ March 13, 1995: Virginia Beach provides official comments to FERC on the January 1995 DEIS, stating that:

- **"the (FERC) deficit water calculation is subject to several sources of underestimation, such as its use of inaccurately high safe yield estimates."**[15]

- "The City believes that FERC's population projection is lower than that which likely will occur through the year 2030."[16]

- "FERC's deficit estimate is highly sensitive to the (per capita) value it uses here. With a value of 130 gpd, which is closer to but still less than the Virginia average, the 2030 treated water demand would be 11 mgd greater than FERC projected."[17]

---

[12]January 1995 FERC DEIS, page 1-15.

[13]January 1995 FERC DEIS, page 1-17.

[14]January 1995 FERC DEIS, page 1-18.

[15]March 13, 1995 Virginia Beach comments, page 1.

[16]March 13, 1995 FERC DEIS Comments, page 1.

[17]March 13, 1995 FERC DEIS Comments, pages 2-3.

- "(E)xcept in the early days of the project when supply will be greater than demand, the Lake Gaston Project will not eliminate the need for Virginia Beach or Chesapeake to restrict water use. Norfolk has been required to implement water restriction measures on numerous occasions when demand was less than the theoretical safe yield of the system. With projected system demands during the period 2000-2010, Virginia Beach, Norfolk and Chesapeake will be required to institute water use restrictions during severe droughts just as occurs now, even with a fully operational Lake Gaston Project."[18]

950193(A)
WSMAIN/140675.

[18]March 13, 1995 FERC DEIS Comments, page 9 (emphasis added).

OCEANA WATER SUPPLY CONCERNS -- HIGHLIGHTS

- 1980-81: Southeastern Virginia drought. Oceana builds emergency water supply wells and concludes that "Efforts to curtain consumption were successful, but these measures were at the expense of operational readiness. . . . The need for the Navy to have sufficient quantities of potable water to maintain operational readiness is of great importance for national security reasons.[1]

- 1985-1988: Chesapeake, Norfolk, Suffolk, Virginia Beach, and Portsmouth institute a variety of voluntary and mandatory water use restrictions;

- 1988: The Virginia State Water Supply board estimates that the five-city area will need an additional 81 mgd of water by the year 2030 to avoid water storage depletion and mandatory water use restrictions during periods of drought.[2]

- 1991-1992: Norfolk imposes a 30 mgd limit on water deliveries to Virginia Beach; in response, Virginia Beach imposes mandatory, long-term water use restrictions and places a moratorium on all new water system connections. These restrictions remain in place to the present day.

- 1994: The U.S. Corps of Engineers concludes that the five-city area (Norfolk, Portsmouth, Chesapeake, Virginia Beach, and Suffolk) is very vulnerable to drought and, without an additional water supply, faces water problems of extreme proportions.[3]

- January of 1995: FERC publishes its Draft EIS on the Lake Gaston Pipeline project in which it concluded that:

  - The five-city area of Chesapeake, Norfolk, Suffolk, Portsmouth, and Virginia Beach is growing faster than previously projected, thus increasing long term water demand needs;[4]

  - In addressing long term water supply deficits for the five-city area, FERC stated: "We adopt the Corps' criteria and estimate that the five-city

---

[1]December 1980 Navy Oceana Environmental Assessment, page 1.

[2]January 1995 FERC DEIS, page 1-17.

[3]Quoted in January 1995 FERC DEIS at page 1-5.

[4]January 1995 FERC DEIS, pages 1-8 to 1-10.

area would need 48 mgd of additional water to avoid water rationing and 71 mgd of additional water to avoid water use restrictions during droughts.";[5]

- In concluding that the Lake Gaston Pipeline project was needed to help address long term water supply deficits in the five-city area, FERC found that: "Mandatory water use restrictions could be avoided by providing an additional 71 mgd of water. Although 71 mgd would meet acceptable risk levels, decisions on whether to supply an additional 71 mgd to the five-city area needs (sic) to be balanced against the environmental consequences of developing that supply."[6]

♦ March 13, 1995: Virginia Beach provides comments to FERC on the January 1995 DEIS:

- "the (FERC) deficit water calculation is subject to several sources of underestimation, such as its use of inaccurately high safe yield estimates."[7]

- "FERC's deficit estimate is highly sensitive to the (per capita) value it uses here. With a value of 130 gpd, which is closer to but still less than the Virginia average, the 2030 treated water demand would be 11 mgd greater than FERC projected."[8]

- "(E)xcept in the early days of the project when supply will be greater than demand, the Lake Gaston Project will not eliminate the need for Virginia Beach or Chesapeake to restrict water use. . . . With projected system demands during the period 2000-2010, Virginia Beach, Norfolk and Chesapeake will be required to institute water use restrictions during severe droughts just as occurs now, even with a fully operational Lake Gaston Project."[9]

950193(A)
WSMAIN/140701.

---

[5]January 1995 FERC DEIS, page 1-17 (parenthetical omitted).

[6]January 1995 FERC DEIS, page 1-18.

[7]March 13, 1995 Virginia Beach comments, page 1.

[8]March 13, 1995 FERC DEIS Comments, pages 2-3.

[9]March 13, 1995 FERC DEIS Comments, page 9 (emphasis added).

FINAL

SITE CHARACTERIZATION REPORT

UNDERGROUND STORAGE TANK 20B

NAVAL AUXILIARY LANDING FIELD
FENTRESS
CHESAPEAKE, VIRGINIA

CONTRACT TASK ORDER 0166

*Prepared For:*

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
*Norfolk, Virginia*

*Under:*

LANTDIV CLEAN Program
Contract N62470-89-D-4814

*Prepared By:*

BAKER ENVIRONMENTAL, INC.
*Coraopolis, Pennsylvania*

JANUARY 25, 1994

# EXECUTIVE SUMMARY

A Site Characterization Study was performed in accordance with the Code of Federal Regulation (40 CFR) 280.63 and the Virginia State Water Control Board (SWCB) regulation VR 680-13-02. The study was performed to investigate the extent and severity of contamination related to underground storage tank (UST) 20B, Naval Auxiliary Landing Field (NALF) Fentress, Chesapeake, Virginia. This tank was formerly used to store gasoline.

Site Characterization investigation activities included: background information review, installation of 13 soil borings, field screening of subsurface soils, soil sampling and analysis, installation of five hydropunch penetrometers, field screening of groundwater samples collected from hydropunch locations, installation of nine groundwater monitoring wells, groundwater sampling and analysis, and performing hydraulic conductivity tests. All field activities were completed between February 24 and March 5, 1993.

Analytical data from the soil (total petroleum hydrocarbons - TPH; purgeable aromatics - BTEX; and TCLP lead) and groundwater (TPH, BTEX, and total lead) samples collected indicate that the site has been impacted by petroleum hydrocarbons. These results identified the presence of adsorbed phase petroleum hydrocarbon contamination in the soil, and dissolved petroleum hydrocarbon contamination in the groundwater. No free-phase petroleum was observed in the wells at the site.

Ten soil samples, of the 28 collected, exceeded the SWCB "action level" of 100 parts per million (ppm) for TPH in soil. Detected values ranged from 43.9 parts per million (ppm) to 748 ppm. Additionally, benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected in eight of the soil samples. Detected total BTEX values ranged from 0.002 ppm to 12.66 ppm. Accordingly, one of the samples exceeded the SWCB disposal criteria of 10 ppm.

TPH, as gasoline, were detected in seven of the 14 groundwater samples collected. These values ranged from 0.110 ppm to 10.0 ppm. TPH, as diesel, were detected in five of the 14 groundwater samples collected. These values ranged from 0.80 ppm to 4.60 ppm. Four of these samples exceeded the SWCB standard of 1 ppm. BTEX compounds were detected in nine of the samples collected. Benzene concentrations exceeded the Federal Maximum Contaminant Level (MCL) of 5 ppb in five samples.

Hydrogeologic conditions at the site indicate groundwater flow within the shallow water-bearing zone is to the southeast. Generally, groundwater at the site was encountered between two and four feet below ground surface. The estimated hydraulic conductivity value, determined from the slug tests, is 84 feet/day (0.029 cm/sec). The estimated groundwater gradient is $2.55 \times 10^{-3}$ and the estimated groundwater velocity is $7.14 \times 10^{-1}$ feet/day (261 feet/year).

The Risk Assessment investigated the likelihood of the contaminants at the site to affect human health and/or the environment, presently and in the future. A potential receptor, a potable water-supply well, was identified approximately 190 feet downgradient of the site.

A fate and transport model, PLUME2D, was used to determine if migration of the contaminants at the site would reach the downgradient well. The model predicted that benzene would reach the receptor after approximately one year, reflecting a worst case scenario. The model was then used to identify a remediation goal of 20 ppb for benzene in groundwater. This value was used in an organic leaching model to identify a remediation goal of 500 ppb for benzene in soils. Since only one soil sample exceeded this value (580 ppb), limited soil remediation at this site will be necessary.

Based on the results of the Risk Assessment, soil and groundwater require remediation. The USTs and contaminated soils adjacent to the tanks should be removed to eliminate the sources of contamination. The soils should be removed and treated at an approved facility.

Since the full extent of groundwater contamination at the site has not yet been defined, two potential groundwater remediation alternatives were identified. Upon complete definition of the groundwater plume, the most appropriate remediation technology will be identified. The two most appropriate technologies identified for this site include air sparging with soil vapor extraction, and fluid recovery with on-site treatment using an air stripper.

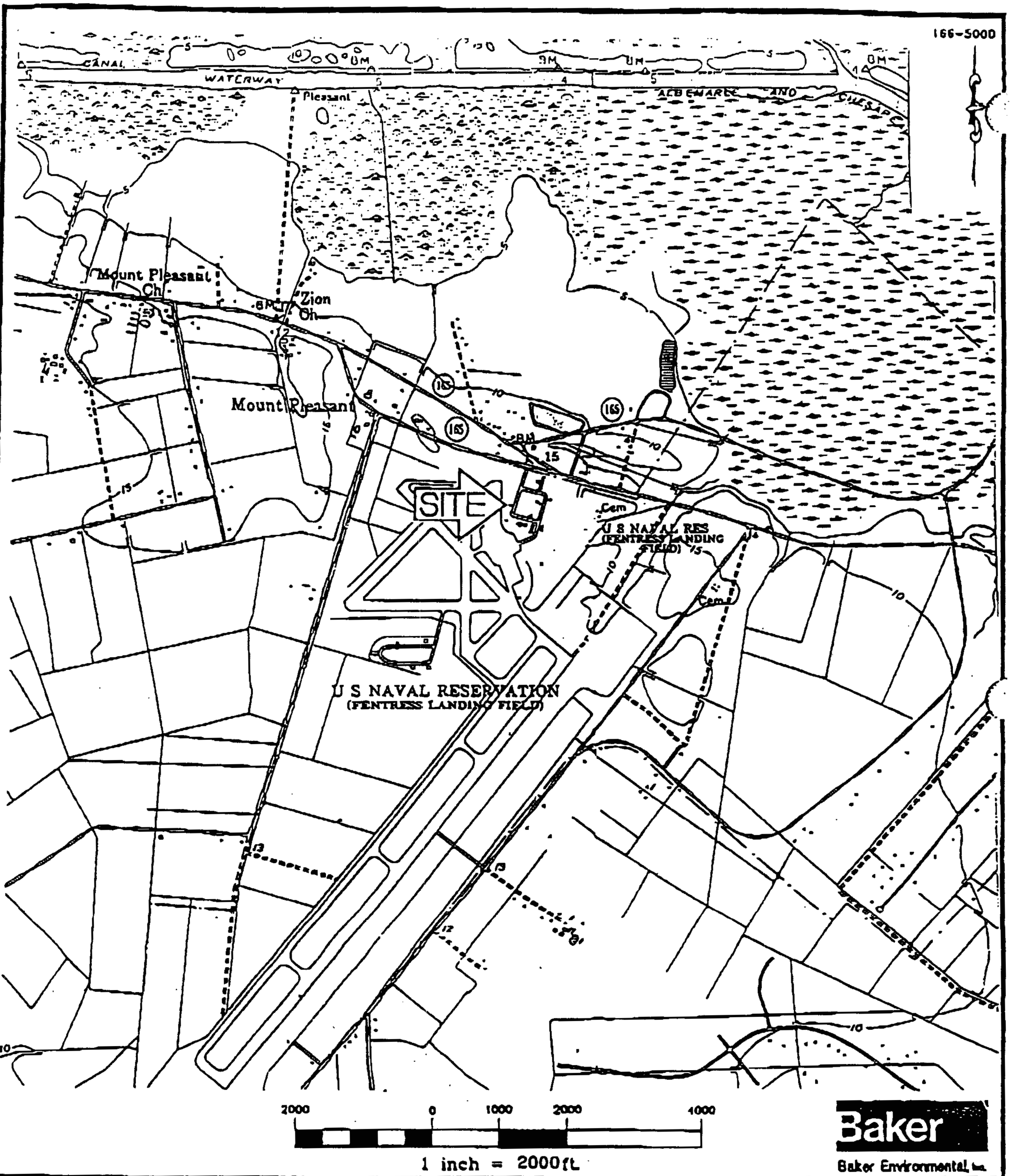



FIGURE 1–1
FACILITY LOCATION MAP
UST SYSTEM 20B

NAVAL AUXILIARY LANDING FIELD, FENTRESS
CHESAPEAKE, VIRGINIA

# DECEMBER, 1984

# INITIAL ASSESSMENT STUDY OF NAVAL AIR STATION, OCEANA VIRGINIA BEACH, VIRGINIA



## NEESA 13-067

**NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY**
**Port Hueneme, California 93043**

RELEASE OF THIS DOCUMENT REQUIRES PRIOR NOTIFICATION OF THE CHIEF OFFICIAL OF THE STUDIED ACTIVITY.

schedules Confirmation Studies for those sites which have been determined by scientific and engineering judgment to be potential hazards to human health or to the environment.

## 1.4 INITIAL ASSESSMENT STUDY.

1.4.1 Records Search. The IAS begins with an investigation of activity records, followed by a records search of various government agencies including EFDs, national and regional archives and records centers, and U.S. Geological Survey offices. In this integral step, study team members review records to assimilate information about the activity's past missions, industrial processes, waste disposal records, and known environmental contamination. Examples of records include activity master plans and histories, environmental impact statements, cadastral records, and aerial photographs. Appendix A lists the agencies contacted during this study.

1.4.2 On-Site Survey. After the records search, the study team conducts an on-site survey to complete documentation of past operations and disposal practices and to identify potentially contaminated areas. With the assistance of an activity point-of-contact, the team inspects the activity during ground and aerial tours, and interviews long-term employees and retirees. The on-site survey for NAS Oceana was conducted from 23 to 27 April 1984; the information in this report is current as of those dates.

Information obtained from interviews is verified by data from other sources or from corroborating interviews before inclusion in this report. If information for certain sites is conflicting or inadequate, the team may collect samples for clarification.

1.4.3 Confirmation Study Ranking System. With information collected during the study, team members evaluate each site for its potential hazard to human health or to the environment. A two-step Confirmation Study Ranking System (CSRS) developed at NAVENENVSA is used to systematically evaluate the relative severity of potential problems. The two steps of the CSRS are a flowchart and a numerical ranking model. The first step when using the CSRS is a flowchart based on type of waste, containment, and hydrogeology. This step eliminates innocuous sites from further consideration. If the flowchart indicates a site poses a potential threat to human health or to the environment, the second step, the model, is applied. This model assigns a numerical score from 0 to 100 to each site. The score reflects the characteristics of the waste, the potential migration pathways from the site, and possible contaminant receptors on and off the activity.

1.4.4 Site Ranking. After scoring a site, engineering judgment is applied to determine the need for a Confirmation Study or for immediate mitigating action. At sites recommended for further work, CSRS scores are used to rank the sites in a prioritized list for scheduling projects. For a more detailed description, refer to NEESA 20.2-042, Confirmation Study Ranking System.

1.4.5 Confirmation Study Criteria. A Confirmation Study is recommended for sites at which (1) sufficient evidence exists to indicate the presence of contamination and (2) the contamination poses a potential threat to human health or to the environment.

**1.5 CONFIRMATION STUDY.** Generally, the EFD conducts the Confirmation Study in two steps—verification and characterization. In the verification phase, short-term analytical testing and monitoring determines whether specific toxic and hazardous materials, identified in the IAS, are present in concentrations considered to be hazardous. Normally, the IAS recommends verification phase sampling and monitoring.

The design of the characterization phase usually depends on results from the verification phase. If required, a characterization phase, using longer-term testing and monitoring, provides more detailed information concerning the horizontal and vertical distribution of contamination migrating from sites, as well as site hydrogeology. If sites require remedial actions or additional monitoring programs, the Confirmation Study recommendations include the necessary planning information for the work, such as design parameters.

**1.6 IAS REPORT CONTENTS.** In this report, the significant findings and conclusions from the IAS are presented in Chapter 2. Recommendations are presented in Chapter 3. Chapter 4 describes general activity information, history, biology, and physical features. Chapters 5 through 8 trace the use of chemicals and hazardous materials from storage and transfer, through manufacturing and operations, to waste processing and disposal. The latter chapters provide detailed documentation to support the findings and conclusions in Chapters 2 and 3.

# 2. SIGNIFICANT FINDINGS AND CONCLUSIONS

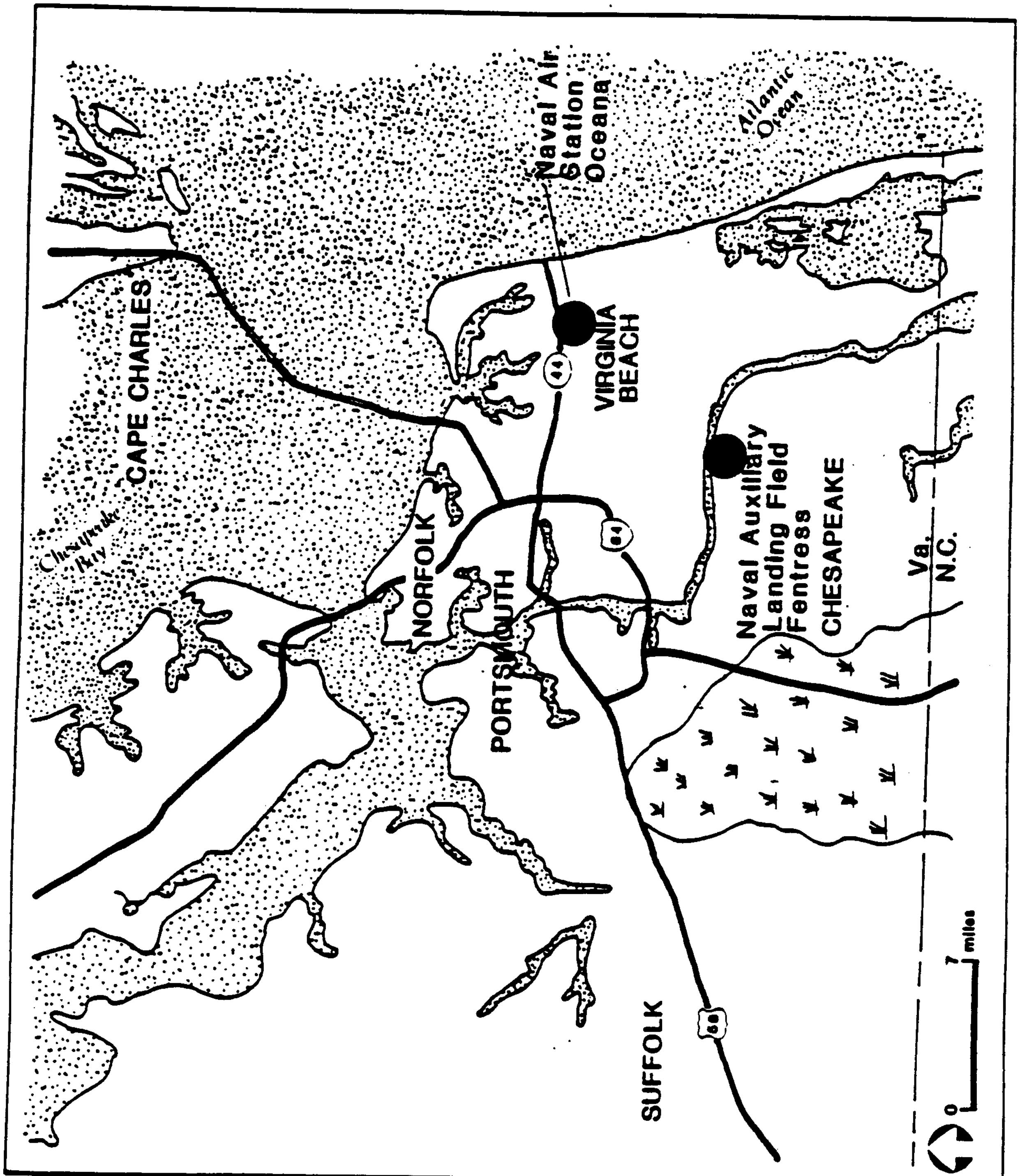
**2.1 INTRODUCTION.** This chapter summarizes the significant findings and conclusions of the IAS regarding characteristics of the disposal and spill sites identified at NAS Oceana and outlying areas. Outlying areas included in the investigation were NALF Fentress, Dare County Range, Palmetto Point Range, Tangier Island Range, Stumpy Point Range, Harvey Point Range, Air Combat Maneuvering Range, and Wadsworth Homes on Camp Pendleton. First, aspects of the local geology, surface drainage, hydrogeology, and biology are discussed with regard to potential contaminant migration pathways and potential contaminant receptors. Next, significant findings for sites recommended for confirmation studies are summarized and conclusions presented. Finally, sites not recommended for confirmation are discussed.

**2.1.1 Hydrogeology and Migration Potential.** NAS Oceana is located in the Tidewater region of Virginia (Figure 2-1). The base lies southeast of Norfolk, immediately west of the Atlantic Ocean, and just south of the Chesapeake Bay in Virginia Beach. Commissioned an Auxilliary Landing Field in 1941, it has developed into full Naval Air Station status and was commissioned the first Master Jet Base. The present Main Base has replaced the original North Station and USMC Bougainville areas which were the first constructed sections of the base (Figure 2-2). Demolition of the buildings in these areas is almost complete in 1984.

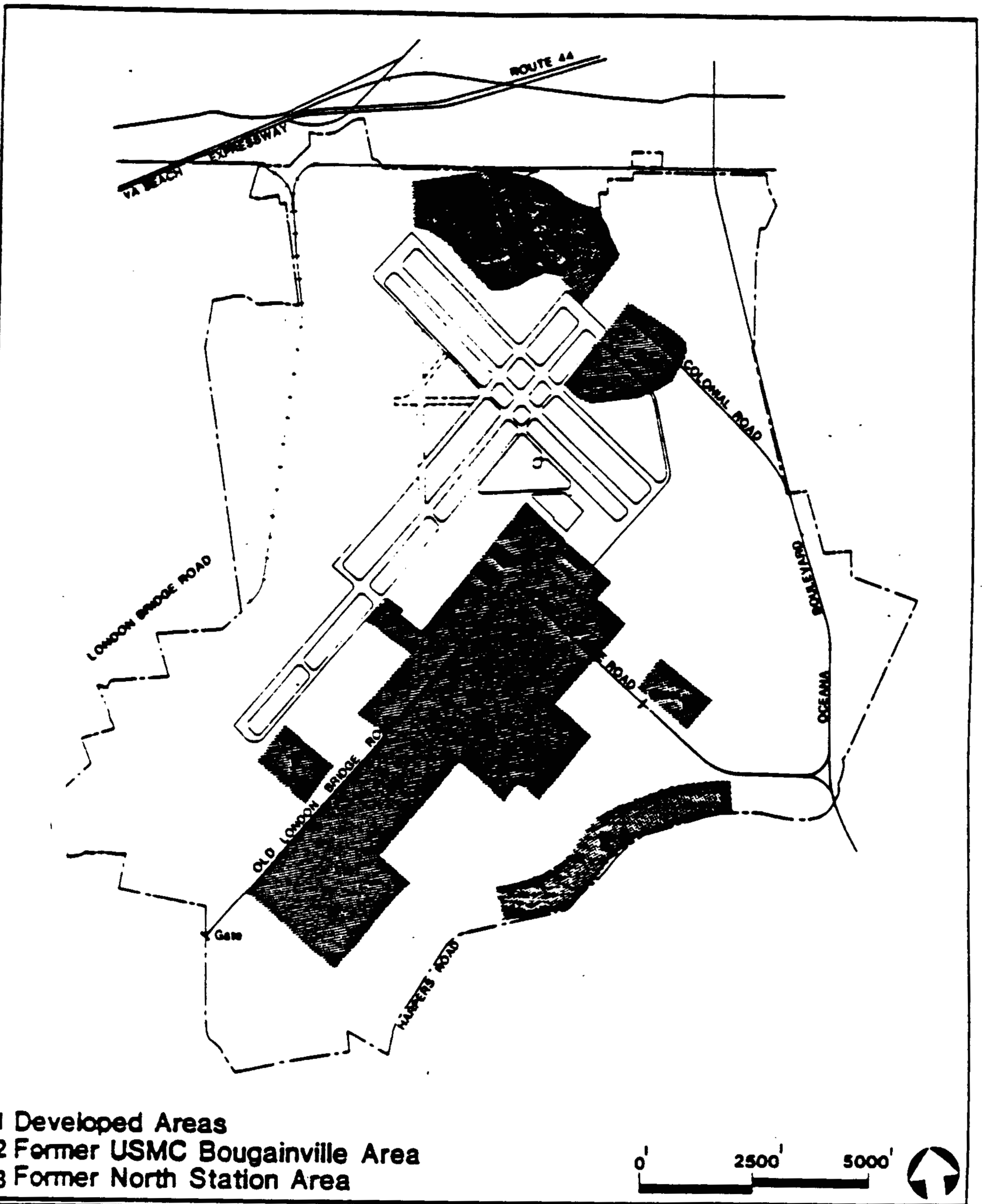
NAS Oceana is underlain by a shallow (less than ten feet below the ground surface) water table aquifer. This aquifer is composed of the geologically recent sand and gravel of marine and shoreline deposits. The deposits range from 10 to 50 feet thick in the area of the base. The shallow water table aquifer is not used for potable supplies in the area of the base. This area is served by public water from the cities of Norfolk and Virginia Beach. Use of water from the shallow aquifer for lawn irrigation and filling swimming pools has been reported.

Deeper water-bearing zones are present in this outer portion to the Atlantic Coastal Plain. The deeper water-bearing zones are not used for potable purposes in the area of NAS Oceana. They are used farther west in the Tidewater region. They are protected from surface activities by intervening geologic layers that do not transmit water readily. Surface drainage from the base primarily drains into West Neck Creek and London Bridge Creek (except for the northern part, which draws into the Great Neck Creek). These creeks in turn flow into Lynnhaven Bay and Linkhorn Bay, respectively. These bays are used primarily for ports for sport and fishing industry vessels. Contact recreation (water skiing and swimming, for example) are limited uses of these bays. No commercial fishing occurs in the shallow waters of these bays.

Soils on NAS Oceana base are primarily the sands and silts of a coastal complex. They tend to permit rapid migration of fluids like water and leachates without providing an opportunity for renovation, which more organic soils would allow. However, the limited topographic relief and water table slopes in the area provide a limited driving force for the migration of surface and ground waters. The result is that contaminants move very slowly from their source on the ground toward surface drainage features that are nearby. Once in the surface drainage features, migration of the contaminants is controlled most closely by the storm water flow resulting from precipitation. Renovation is not an important factor in the attenuation of contaminants in this environment.




| Figure 2-1<br>General Location Map | **Initial Assessment Study**<br>Naval Air Station Oceana<br>Virginia Beach, Virginia |
|---|---|
| **Rogers, Golden & Halpern** | |




1 Developed Areas
2 Former USMC Bougainville Area
3 Former North Station Area

Figure 2-2
Naval Air Station Oceana

Rogers, Golden & Halpern

**Initial Assessment Study**
**Naval Air Station Oceana**
**Virginia Beach, Virginia**

**2.2 SITES RECOMMENDED FOR CONFIRMATION.** Of the 16 disposal and spill sites identified at NAS Oceana and NALF Fentress, 6 are recommended for Confirmation Studies. Table 2-1 summarizes the findings on all the disposal and spill sites. Figure 2-3 shows the locations of these sites.

**2.2.1** **Site 1, West Woods Oil Disposal Pit.** The site is an old oil disposal pit, about 25 feet in diameter, located about 1,000 feet west of abandoned Runway 9 on the west side of the station. It was used between the mid-1950s and the late 1960s to dispose of waste oil, fuel, and other aircraft maintenance chemicals. Oil displaced from it by flood waters in the late 1960s contaminated properties off-base; its use was stopped and it was filled in with soil.

Fuels (JP-5, JP-3, and AVGAS), oils, PD 680, and various chlorinated hydrocarbons and aromatic compounds (trichlorotrifluoromethane, benzene, toluene and derivatives, and naptha) are the wastes of concern. These substances are found in paint stripping formulations and in degreasing agents that have been used in the aircraft maintenance facilities at Oceana and are likely to have been discarded with POLs in the West Woods oil pit. It is estimated that about 100,000 gallons of wastes were placed in the pit over its period of use and that large volumes remain held by capillary action in the soil and as a free-floating lens on the water table surface.

Migration of these wastes, either floating on the water table or dissolved in low concentration in ground water, would be toward a drainage ditch about 250 feet to the west of the pit site. This ditch drains to London Bridge Creek and ultimately to Lynnhaven Bay. Receptors would be the fish and wildlife in these water bodies and their recreational users. Because of the migration pathway to Lynnhaven Bay, this site is recommended for a confirmation study.

**2.2.2** **Site 2, Line Shack Oil Disposal Areas.** This site includes oil disposal areas behind Line Shacks 31-33, 109, 125, 131, and 400. These buildings were built in 1963. Although the Public Works hazardous waste pickup procedures were instituted in September of 1981 and resulted in a tripling of the wastes collected, field checks in 1984 revealed that these areas are still being used to some extent to dump oily wastes onto the ground.

The soil from beneath Line Shack 125 was excavated in the early 1980s and was found to be saturated with oily substances down to about 6 feet. Although the amounts of wastes disposed of over the past 20 years is not known, it is likely to be several to many thousands of gallons at each site. These wastes would be held by capillary action to soil particles to the point of saturation, beyond which they would form a free-floating lens above the water table. Both forms would be a source of dissolved toxic substances in the ground water. All line shack oil disposal areas are subject to the leaching effects of infiltrating rain water except that of Line Shack 400, which was covered with concrete in the early 1980s. Of the remaining ones, Line Shack 125 appeared by visual inspection to have the most extensive contamination, followed by Line Shacks 31-33, 109, and 131.

The wastes of concern are oil, hydraulic fluid, PD 680, and aromatic hydrocarbons (naptha, benzene, toluene, and derivatives) that are or have been commonly used in aircraft maintenance for lubrication, paint stripping, and grease removal. From the early 1960s when the line shacks began operation and 1981 when the Public Works hazardous pickup began, it is estimated that between 7,000 to 15,000 gallons of wastes were discarded behind the line shacks.

Table 2-1

Summary of Disposal and Spill Sites at
Naval Air Station Oceana, Virginia

| Site Number | Site Name | Map Coordinates[a] | Period of Operation | Types of Materials Disposed | Comments |
|---|---|---|---|---|---|
| SITES RECOMMENDED FOR CONFIRMATION STUDIES | | | | | |
| 1 | West Woods Oil Disposal Pit | 12-M | Mid-1950s to late 1960s | Waste fuel, oil, chlorinated and aromatic hydrocarbon solvents. | |
| 2 | Line Shack Oil Disposal Areas | 13-S, 18-R 15-R, 16-Q 17-Q | 1963-1981 | Waste fuel, oil, chlorinated and aromatic hydrocarbon solvents. | |
| 5 | Old Static Engine Test Cell Mercury Spill | 14-S | 1965-1973 | Mercury | |
| 7 | Fifth Green Landfill | 17-W | 1954-1961 | Solvents, pesticides, construction debris, transformers, mixed municipal wastes, unknowns. | |
| 8 | North Station Landfill | 21-P | About 1951-1954 | Solvents, pesticides, transformers, mixed municipal wastes, construction debris unknowns. | |
| 14 | Fentress Landfill | 14-a[b] | 1945-1970 | Solvents, pesticides, mixed municipal wastes, construction debris, unknowns. | |

a General Development Plan - NAS Oceana, VA 12/2/66

b Naval Auxiliary Landing Field, Fentress, VA: key map (no date).

Table 2-1

Summary of Disposal and Spill Sites at
Naval Air Station Oceana, Virginia
(continued)

| Site Number | Site Name | Map Coordinates | Period of Operation | Types of Materials Disposed | Comments |
|---|---|---|---|---|---|
| SITES NOT RECOMMENDED FOR CONFIRMATION STUDIES | | | | | |
| 3 | West Side Landfill | 13-N | 1940s | Construction debris, mixed municipal wastes, unknowns | |
| 4 | Bougainville Mercury Spill | 18-L | 1975-1982 | Mercury | |
| 6 | Navy Exchange Building Oil Disposal Area | 15-T | 1970s | Waste motor oil | |
| 9 | Construction Staging Area | 12-W | Intermittent since late 1950s | Railroad Ties, scrap iron | |
| 10 | Air Compressor Yard | 17-Q | 1973-1983 | Air compressor oil | |
| 11 | Fire Fighter Training Area | 14-M | Early 1960s-mid-1970s | POLs, aromatic and chlorinated hydrocarbons, unknowns. | |
| 12 | Day Tank | 15-P | 1952-1982 | JP-5 and other fuels | |
| 13 | Tank Farm | 11,12-K | 1951-1982 | JP-5 and other fuels | |
| 15 | Abandoned Tank | 16, 17-J | Mid-1950s to mid-1970s | Fuels and waste oils. | |
| 16 | PWD Pesticide Shop | 15-U | Since mid -1950s | Pesticides | |

a Master Shore Station Development Plan - NAS Oceana, VA 12/2/66

b Naval Auxiliary Landing Field, Fentress, VA: key map (no date).

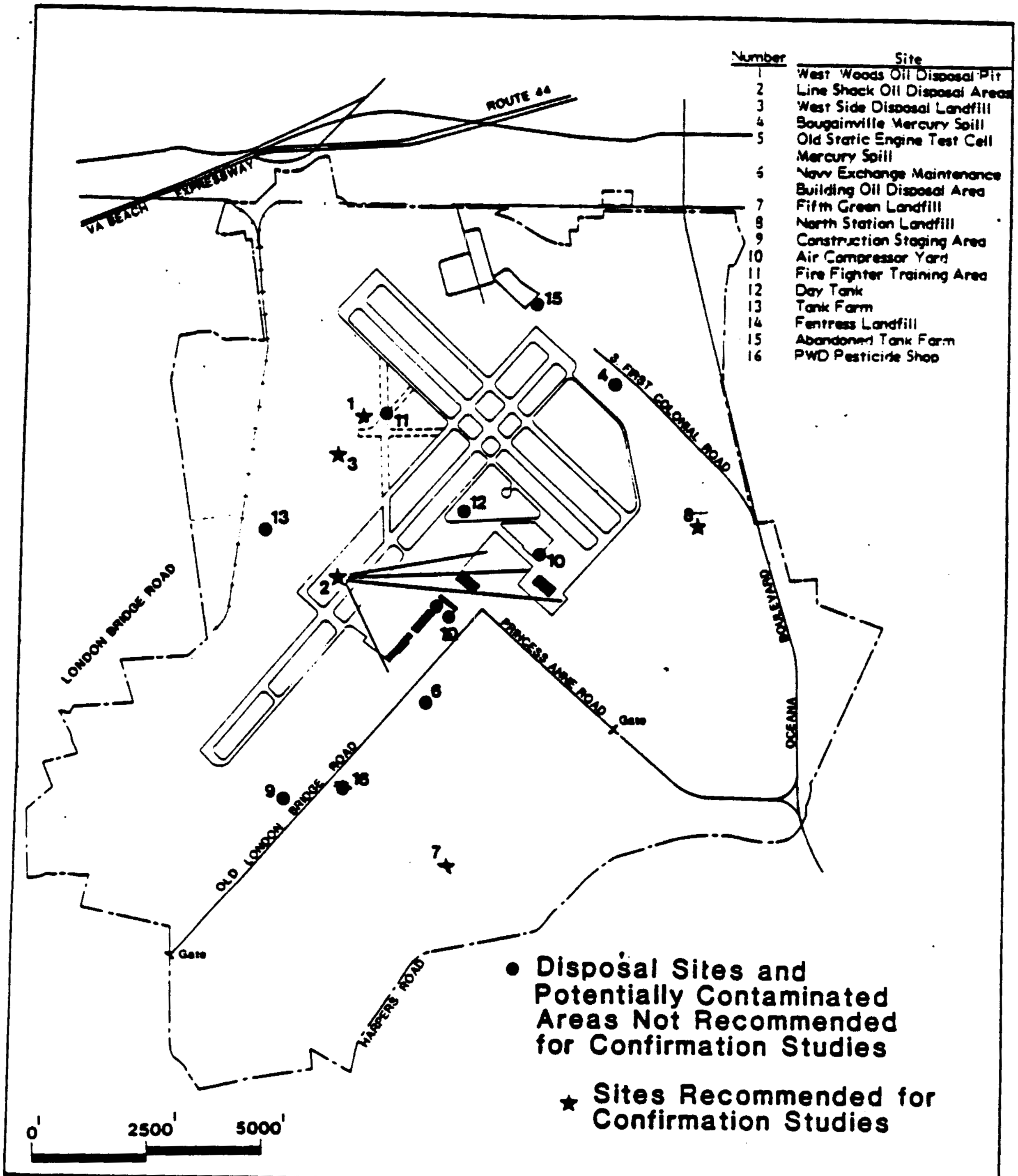



Figure 2-3

Sites Recommended for Confirmation Studies and Other Disposal Sites

Rogers, Golden & Halpern

Initial Assessment Study
Naval Air Station Oceana
Virginia Beach, Virginia

The line shacks are various distances ranging from about a hundred feet to 1,200 feet from drainage ditches. Underground flow would follow the same pathways as overland flow to the drainage ditches. These ditches converge within the station boundaries and join the waters of the West Neck Creek and ultimately those of Lynnhaven Bay. Receptors are wildlife in these water bodies and their recreational users. Due to the migration pathways possible to receptors, this site is recommended for confirmation.

2.2.3 Site 5, Old Static Engine Test Cell Mercury Spill. This site is the interior floor and the pedestrian approach to the old static engine test cell (Building 305). The control room floor is visibly contaminated with small mercury globules. It is possible that the ground outside the control room entrance is also contamined with mercury. The total metallic mercury on the floor could be up to one pound. Possible spillage outside the building on the ground probably would range from zero to three pounds.

The mercury spill in the test cell control room is contained by the floor but is a source of vapors that are a potential health hazard by inhalation. Any mercury carried outside could enter the soil just below the concrete entrance slab.

A confirmation study of this site is recommended.

2.2.4 Site 7, Fifth Green Landfill. This site is a four-acre area located beneath the fifth green of the station golf course. It was used as the base landfill between 1954 and 1961. Wastes were placed in trenches and burned, and then residuals were covered. Later it was covered, graded, and seeded for use as part of the golf course.

Its hazardous waste content is represented by pesticides, heavy metals, oil, aromatic and halogenated hydrocarbons, PCBs, mixed municipal wastes, and unknowns. It is likely that these items were incompletely burned or are not flammable.

Contaminants that leach from the landfill by precipitation or fluctuations in ground water level would be carried down gradient through soils to a drainage ditch within two hundred feet to the north of the site. There have been no water quality measurements of this ditch by which to confirm a leachate problem. The ditch merges with another one, then joins the waters of West Neck Creek, which then flow north to Lynnhaven Bay.

Confirmation of this site is recommended.

2.2.5 Site 8, North Station Landfill. This site is about a four-acre area located in the east side of the old North Station airfield near the end of runway 32R. It was a water-filled pit into which wastes were placed and was used as the station landfill between the early and mid-1950s. Because this landfill was the recipient of all solid wastes during its period of operation, its hazardous waste content included solvents, pesticides, construction debris, municipal wastes, electrical conductors and transformers, and sanitary, photo lab, and hospital wastes.

The site is about 900 feet east of a drainage ditch that flows north into Great Neck Creek and thence into Linkhorn Bay. Contaminants that leach from the landfill by precipitation or by fluctuations in water table level would be carried to these water bodies in the ground water. Affected receptors would be wildlife and recreational users.

2.2.6 Site 14, Fentress Landfill. This site is the now-closed landfill at NALF Fentress. It is located at the north end of Runway 23. It was used between 1945 and 1970 and covers about 3 acres. The pollutants of concern are asbestos, pesticides, PCBs, oil, and chlorinated and aromatic solvents.

The site is within several hundred feet of a drainage ditch that runs the length of the main runway. Contaminants from the landfill would move with ground water to the drainage ditch which flows off-base to join the Pocaty River. Recipients of concern are marsh and riverine wildlife.

This site is recommended for confirmation.

**2.3 SITES NOT RECOMMENDED FOR CONFIRMATION STUDIES.** Ten of the 15 potentially contaminated sites are not recommended for confirmation studies. Significant findings for these sites are summarized in Table 2-1. The locations of these sites are shown in Figure 2-2.

**2.3.1** Site 3, West Side Landfill. The site is a six-acre, solid waste disposal area on the west side of the station about 1,000 feet south of Site 1. It was used between the early 1940s and at least 1945. By 1949 the site had been graded. It is likely that this site served as the station landfill during its early construction and the site is therefore likely to contain a large proportion of construction debris. Since there is no information available on this site other than its appearance on a 1945 map of the base, it is not recommended for confirmation studies.

**2.3.2** Site 4, Bougainville Mercury Spill. This site is a suspected mercury spill area next to a dirt road at the Bougainville area of North Station. Mercury-contaminated material from cleanup of a spill at the old static engine test cell was stored at this site in the early 1980s in boxes that were later found to be leaking mercury. Soil samples were taken from the contaminated area in 1984. The results reported by COMNAVFACENGCOM letter of 25 May 1984 to Commanding Officer Oceana indicate that there is no contamination at the site. Thus additional confirmation study of this site is not needed at this time.

**2.3.3** Site 6, Navy Exchange Maintenance Building Waste Oil Disposal Area. This site is a strip of ground about 25 feet long next to a fence outside Building 518, the Naval Exchange maintenance building. For a ten-year period about 15 gallons per year of waste oil were dumped on the site.

Due to the small volume of oil contaminating this site (approximately 150 gallons) it is likely that soil near the ground surface holds the waste oil by capillary action and that contaminants are only slowly leached into the ground water by infiltrating precipitation. Therefore, no receptors are anticipated and the site is not recommended for a confirmation study. However, mitigative measures to clean up this site are recommended.

**2.3.4** Site 9, Construction Staging Area. This site is a 1.5-acre area along London Bridge Road opposite the Weapons Department complex. It was used in late 1950s as a construction staging area. It currently holds several hundred old and discarded railroad ties and some rusting iron plates and fasteners. The rail ties are bleached, decaying, and appear to be free of creosote material. These items pose no threat to the environment or to human health. There is no information to indicate that this site ever contained hazardous wastes or materials. Therefore, no confirmation study is recommended. Mitigation actions for aesthetic reasons are to remove the rail ties and metal plates to the landfill.

# 3. RECOMMENDATIONS

**3.1 INTRODUCTION.** Through the process of records searches, interviews and first-hand observations, this Initial Assessment Study (IAS) has identified disposal and spill sites at NAS Oceana. All of the sites identified have been screened through a two-step Confirmation Study Ranking System (CSRS) to systematically evaluate the relative severity of potential risk at the site. The results of the CSRS and a summary of the recommended actions for the sites designated for confirmation studies are listed in Table 3-1.

Six sites pose a potential threat to human health or the environment. Therefore, Confirmation Studies (Phase II of the NACIP program) are recommended for these sites. For sites that warrant cleanup actions but not confirmation studies, specific mitigating measures are proposed. The six sites recommended for Confirmation Study are the following:

- Site 1 - West Woods Oil Disposal Pit,
- Site 2 - Line Shack Oil Disposal Areas,
- Site 5 - Old Static Engine Test Cell Mercury Spill
- Site 7 - Fifth Green Landfill,
- Site 8 - North Station Landfill,
- Site 14 - Fentress Landfill.

The remaining sites are not recommended for confirmation studies.

## 3.2 CONFIRMATION STUDY RECOMMENDATIONS.

### 3.2.1 Site 1, West Woods Oil Disposal Pit.

Types of Samples: Ground water
Soil investigation (no samples)

Number of ground water monitoring wells: 3 water table wells to 10 feet below water table (See Figure 3-1 for well locations)

Frequency of Sampling: Ground Water: Quarterly for 1 year

Number of Samples: Ground Water: 12

Parameters to be tested:
Oil & Grease
Volatile organic carbon scan (EPA methods 601 and 602)
Total organic carbon (TOC)
Total organic halogen (TOX)
Chemical oxygen demand (COD)
Xylene
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
PCBs

## TABLE 3-1

### Summary of Confirmation Site Recommendations

| Site No. | Site Name | Map Coordinates | CSRS Score[a] | Number of Wells | Number and Type of Samples | Frequency of Sampling | Parameters |
|---|---|---|---|---|---|---|---|
| 1 | West Woods Oil Disposal Pit | 12-M | 6.35 | 3 | Ground water: two per well at water table surface: both water and oil phases | Once per quarter | Oil and grease volatile organic carbon scan total organic carbon chemical oxygen demand |
| 2 | Line Shack Oil Disposal Areas | 13-S, 18-R, 15-R, 16-Q 17-Q | 20 | 6 | Same | Once per quarter | Same |
| 5 | Old Static Engine | 14-S | — | 0 | Composite Soils | Once | Mercury |
| 7 | Fifth Green Landfill | 17-W | 7.93 | 3 | Groundwater: 1 per well Surface water: above, below landfill | Once per quarter | 129 Priority Pollutants (Appendix B); Xylene; Methyl Ethyl Ketone; Methyl Isobutyl Ketone |
| 8 | North Station Landfill | 21-P | 4.0 | 3 | Ground water 1 per well | Once per quarter | 129 Priority Pollutants (Appendix B); Xylene; Methyl Ethyl Ketone; Methyl Isobutyl Ketone |
| 14 | Fentress Landfill | 14-A | 24.7 | 3 | Same | Once per quarter | 129 Priority Pollutants (Appendix B); Xylene; Methyl Ethyl Ketone; Methyl Isobutyl Ketone |

### 3.2.3 Site 5-Old Static Jet Engine Test Cell Mercury Spill

Types of Samples: Floor scrapings: 3
Wood: 1
Ceiling materials: 1
Soils: 3

Frequency of Sampling: Once

Number of Samples: 8

Parameters to be tested:
129 Priority Pollutants (Appendix B)
Total organic halogen (TOX)
Total organic carbon (TOC)
Xylene
Methyl Ethyl Ketone
Methyl Isobutyl Ketone

Comments: It is recommended that the control room of the old static engine test cell in Building 305 be thoroughly cleaned up to remove all detectable traces of mercury. After the cleanup, the control room and test cell should be sealed and monitored for the presence of mercury vapor. Only when mercury vapor concentrations have fallen to safe levels should workers be allowed to enter the building (Figure 3-3).

### 3.2.4 Site 7-Fifth Green Landfill.

Types of Samples: Ground water
Surface water

Number of ground water monitoring wells: 3

Number of surface water sampling points: 2

Frequency of Sampling: Quarterly for one year

Number of Samples: Ground water: 12
Surface water: 8

Parameters to be tested:
129 Priority Pollutants (Appendix B)
Total organic halogen (TOX)
Total organic carbon (TOC)
Xylene
Methyl Ethyl Ketone
Methyl Isobutyl Ketone

Comments: The Fifth Green Landfill is known to have received almost every type of waste generated at the base. PCBs and pesticides should be tested in both oil and water fractions if they coexist in a sample. The sampling must be done with great care to avoid mixing the water column between samples (Figure 3-4).

A detailed reconnaissance of the perimeter of the landfill is also required to determine if any visible signs of contamination are present. If leachate seepage to the surface is observed, it should be sampled. Surface soil samples of oily accumulations or other signs of contaminant migration should be collected during this reconnaissance.

The exact boundaries of the disposal area should also be established during this site reconnaissance. It is especially important to determine how close it is to the drainage ditches that flank it. The surface water samples recommended will determine the extent to which leachate from the landfill is migrating to surface waters.

### 3.2.5 Site 8, North Station Landfill.

Types of Samples: Ground water

Number of ground water monitoring wells: 3

Frequency of Sampling: Quarterly for one year

Number of Samples: Ground water: 12

Parameters to be tested:
129 Priority Pollutants (Appendix B)
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Xylene
Total organic carbon (TOC)
Total organic halogen (TOX)

Comments: Like the Fifth Green Landfill, the North Station Landfill is known to have received almost every type of waste generated at the base. PCBs, volatile organic carbon compounds, and pesticides should be tested in both water and oil fractions if they coexist in a sample (Figure 3-5).

A detailed reconnaissance of the perimeter of the landfill is also required to determine if any leachate seeps are present. If present, they should be sampled for the parameters listed above.

### 3.2.6 Site 14, Fentress Landfill.

Types of Samples: Ground water
Surface water

Number of ground water monitoring wells: 5

Number of surface water sampling points: 2

Frequency of Sampling: Quarterly for one year

Number of Samples: Ground water: 20
Surface water: 8

Parameters to be tested:
129 Priority Pollutants (Appendix B)
Xylene
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Total organic carbon (TOC)
Total organic halogen (TOX)

Comments: The greatest hazard from this landfill is the leachates migrating in the ground water to the nearby drainage ditch that parallels the runway at Fentress (Figure 3-6).

# 5. WASTE GENERATION

**5.1 GENERAL.** Oceana had its beginnings in Princess Anne County in the early 1940s as an auxiliary landing field for the Naval Air Station, Norfolk, Virginia. It expanded during World War II and in 1952 was designated a Naval Air Station (NAS). This designation resulted in a major runway and aircraft support facility construction program between 1952 and 1956. Since then, most of its operational functions have remained the same. However, waste generation at Oceana generally increased over the years in response to its expanded capabilities to service carrier-based jet aircraft in the mid-1950s and the growth in the Air Intermediate Maintenance Department in the 1960s and 1970s.

Past and present operations generating hazardous waste are discussed in this section by department, division, branch, and shop. Oceana's auxiliary landing field at Fentress is also discussed here. Due to personnel changes, particularly in the squadrons, only a limited amount of information on past operations was available for presentation in this section.

Much of the petroleum, oil, and lubricant (POL) wastes generated at Oceana result from the operation and maintenance of aircraft squadrons rotated between aircraft carriers and NAS Oceana. In addition to a training fighter squadron and one fleet squadron permanently assigned to the air station, there are 19 temporarily based squadrons assigned to Oceana, of which up to 12 can be accommodated at Oceana at any one time. This presentation reports waste generation by a typical fighter and fleet squadron, taking into account the average proportion of time they are using Oceana facilities.

Hazardous waste disposal pathways in the immediate past are fairly clear. In late 1981 the Public Works Department initiated its comprehensive hazardous waste pickup program, working closely with the various shops at NAS Oceana to assure that wastes are properly contained, segregated, labeled, and collected. POL wastes continue to be placed in waste oil bowsers prior to their being transported to the fuel supply yard with other wastes collected separately. All waste POL is burned by the Fire and Rescue Division in its fire fighter training exercises.

Before 1982 most aqueous hazardous wastes were disposed by rinsing them into the sanitary sewer. Minor quantities, in some cases, were disposed on the ground.

Between 1977 and 1982, most POLs and other non-aqueous hazardous wastes generated by aircraft support shops were disposed together in the waste oil bowsers. The Fire and Rescue Division burned these mixed wastes.

Before 1977 hazardous waste disposal practices can only be stated in very general terms due to a lack of base personnel with specific knowledge of them. Waste POLs and other non-aqueous hazardous substances were collected for use by the Fire and Rescue Division (early 1960s to 1977), for disposal in the West Woods oil disposal pit (mid 1950s to late 1960s), for application to roads for dust control, or for storage and pickup by private waste oil dealers. Prior to 1977 waste POL and other hazardous wastes, both aqueous and non-aqueous, were also disposed into storm and sanitary sewers and on the ground near aircraft maintenance shops, particularly behind the line shacks. The latter practice has been largely eliminated since then by better housekeeping practices and the availability of waste oil bowsers. However, there are signs that wastes are still being disposed to the ground near the line shacks.

Table 5-1 summarizes the wastes generated at NAS Oceana and NAF Fentress as described in this chapter. The amount, period of disposal, and disposal mode or distination are listed for each waste generated. If a waste was landfilled, it is assumed that it was placed in the landfill active at the time of its generation (see Table 6-1). The WFUEL designation used in the Disposal Mode column refers to the waste oil bowsers used to accept waste POL and other hazardous wastes for disposal as discussed above.

**5.2 PUBLIC WORKS DEPARTMENT.** The Public Works Department operates, maintains, and repairs all public works and public utilities at NAS Oceana. The Public Works compound occupies Building 820 (administration and maintenance shops), Building 830 (transportation shops and yard), and Building 921 (utility shops). It has occupied these structures since their construction in 1957, 1954, and 1959, respectively. Previously, Public Work shops and storage buildings were located in several buildings in the North Field area. The center of the old public works area is about 1,300 feet NNW of the end of Runway R23. The old public works buildings were demolished in the late 1950s and early 1960s.

There are three divisions under the administrative control of the Shops Engineer: Maintenance, Transportation, and Utilities. These three divisions generate a variety of hazardous wastes and are responsible for the transportation of solid and hazardous wastes to the base landfill or the hazardous waste storage area.

**5.2.1 Maintenance Division.** The Maintenance Division of the Public Works Department maintains all buildings, grounds, and ground structures as well as public utilities, (including electric, water, steam, air, gas, fuel oil, sanitary sewers and refrigeration units), except that assigned to the Utilities Division. Other responsibilities include the collection of garbage, trash, and refuse, and the application of insect and rodent control measures.

**5.2.1.1 Metal Trades Branch.** Metal trades includes machine, piping/insulation, welding, and metal shops. These shops perform repair and installation work for the base.

The machine shop manufactures and repairs metal parts for Oceana facilities. The shop has used Agitine as a parts cleaner for over 15 years in a 35-gallon batch tank, which has been cleaned about three times per year on average. Waste Agitine is now drained into empty barrels and removed by Public Works hazardous waste pickup. It was usually placed in a bowser and spread on local roads for dust control before 1982.

The pipe shop performs repairs and insulation on base pipe systems and strips, and bags and disposes of asbestos insulation found during repair work. Since 1980 waste asbestos has been double-bagged and placed in a special asbestos landfill just to the northeast of the Avenue D landfill. Prior to that, asbestos was discarded in whatever landfill was active at the time. Asbestos from incoming pipe work orders has been wetted, stripped, and bagged for disposal at the asbestos landfill since 1980. Stripped asbestos went to the base landfill before 1980.

Cutting oils are used for threading pipes and are disposed of with metal scrap. Less than 2 gallon/year of waste oil are drained from the shop air compressor and picked up by Public Works hazardous waste disposal. This oil was put in the Public Works bowser for dust control before 1981.

## Table 5-1

## Waste Generation at NAS Oceana

| Activity | Waste | Generation Rate Per Year | | Duration | Disposal Mode* |
|---|---|---|---|---|---|
| I. Public Works Department | | | | | |
| A. Maintenance Division | | | | | |
| (1) Metal Trades | Agitine | 100 | Gal | 69 - 81 | WFUEL |
| | | 100 | Gal | 82 - 84 | PWHWP |
| | Air Compressor Oil | 2 | Gal | 41 - 81 | WFUEL |
| | | 2 | Gal | 82 - 84 | PWHWP |
| | Asbestos | 200 | Lbs | 45 - 79 | LNDFL |
| | | 2,000 | Lbs | 80 - 84 | ALF |
| (2) Building Trades | Waste Paint | 110 | Gal | 41 - 81 | LNDFL |
| | | 110 | Gal | 82 - 84 | PWHWP |
| | Waste Paint Thinner | 120 | Gal | 41 - 81 | LNDFL |
| | | 120 | Gal | 82 - 84 | PWHWP |
| (3) Pest Control Shop | Pesticide Tank Rinse | 150 | Gal | 41 - 81 | GROUND |
| | | 150 | Gal | 82 - 84 | PWHWP |
| | Pesticide Residues | 16 | Lbs | 41 - 81 | LNDFL |
| | | 16 | Lbs | 82 - 84 | PWHWP |
| (4) Heating, Ventilation, and Air Conditioning Shop | Freon 11 | 20 | Gal | 82 - 84 | PWHWP |
| | NaOH and NaBO3 (.005% solution) | 50,000 - 100,000 | Gal | 54 - 84 | GROUND |

*Key on page 5-12

Table 5-1

Waste Generation at NAS Oceana

(Page 3)

| Activity | Waste | Generation Rate Per Year | Duration | Disposal Mode |
|---|---|---|---|---|
| 2. Special Services Department | | | | |
| A. Recreational Facilities Division | | | | |
| (1) Golf Course | Pesticide Tank Rinse | 50 Gal | 56 - 81 | GROUND |
| | | 50 Gal | 81 - 84 | PWHWP |
| | Waste Motor Oil | 50 Gal | 56 - 84 | GROUND |
| (2) Boat/Camper Shop | Waste Motor Oil | 50 Gal | 67 - 81 | LNDFL |
| | | 50 Gal | 81 - 84 | WFUEL |
| (3) Auto Hobby Shop | Waste Motor Oil | 550 Gal | 65 - 76 | WFUEL |
| | | 1,110 Gal | 76 - 84 | CNTRCT |
| | PD 680 | 5 Gal | 65 - 76 | WFUEL |
| | | 5 Gal | 77 - 84 | CNTRCT |
| (4) Bowling Alley | PD 680 | 100 Gal | 71 - 81 | SS |
| | | 50 Gal | 71 - 81 | GROUND |
| | | 150 Gal | 82 - 84 | PWHWP |
| (5) Maintenance Shop | Waste Motor Oil | 20 Gal | 56 - 77 | GROUND |
| | | 20 Gal | 77 - 84 | CNTRCT |
| | Waste Paint Cans | 100 Gal | 56 - 81 | LNDFL |
| | | 100 Gal | 82 - 84 | PWHWP |

## Table 5-1

### Waste Generation at NAS Oceana

(Page 4)

| Activity | | Waste | Generation Rate Per Year | Duration | Disposal Mode |
|---|---|---|---|---|---|
| 3. | Air Operations Department | | | | |
| | A. ALF Fentress | AFFF | 300 Gal | 69 - 84 | GROUND |
| | | Waste Motor Oil | 250 Gal | 47 - 84 | WFUEL |
| | B. Ground Electronic | Trichloroethylene | 5 Gal | 55 - 81 | SS |
| | Maintenance Division | Paint Removers | 5 Gal | 55 - 81 | SS |
| | C. Fire and Rescue Division | AFFF | 400 Gal | 69 - 84 | GROUND |
| | D. Airfield Support Division | Antifreeze | 385 Gal | 61 - 84 | GROUND |
| 4. | Aircraft Intermediate Maintenance Department | | | | |
| | A. Power Plant Division | Waste Oil | 260 Gal | 74 - 84 | WFUEL |
| | B. Air Frames Division | Toluene, Methyl Isobutyl | 50 Gal | 70 - 81 | SS |
| | | Ketone | 50 Gal | 82 - 84 | PWHWP |
| | | Paint | 24 Gal | 70 - 81 | SS |
| | | | 24 Gal | 82 - 84 | PWHWP |
| | | Methyl Ethyl Ketone (MEK) | 240 Gal | 70 - 81 | SS |
| | | | 240 Gal | 82 - 84 | PWHWP |
| | | Paint Stripping Solution | 1,200 Gal | 70 - 81 | SS |
| | | | 1,200 Gal | 82 - 84 | PWHWP |
| | | Hydraulic Fluid | 1,200 Gal | 70 - 84 | WFUEL |
| | | Trichlorotrifluoroethane | 12 Gal | 70 - 84 | WFUEL |
| | | PD 680 | 1,800 Gal | 70 - 84 | WFUEL |

**Table 5-1**

**Waste Generation at NAS Oceana**

**(Page 5)**

| Activity | Waste | Generation Rate Per Year | Duration | Disposal Mode |
|---|---|---|---|---|
| | Turco Detergent | 1,000 Gal | 70 - 84 | SS/GROUND |
| | Photo Developers | 12 Gal | 70 - 84 | SS |
| | Photo Fixer | 30 Gal | 70 - 84 | Reclaimed |
| | Penetrant/Emulsifier | 40 Gal | 70 - 81 | SS |
| C. Avionics Division | | 40 Gal | 82 - 84 | PWHWP |
| | Cooling Oil | 120 Gal | 70 - 81 | SS/GROUND |
| | | 240 Gal | 82 - 84 | PWHWP |
| | Hydraulic Fluid | 15 Gal | 70 - 81 | SS/GROUND |
| | | 30 Gal | 82 - 84 | PWHWP |
| | Synthetic Turbine (Oil) | 72 Gal | 70 - 81 | SS/GROUND |
| | | 144 Gal | 82 - 84 | PWHWP |
| | PD 680 | 60 Gal | 70 - 81 | SS/GROUND |
| | | 120 Gal | 82 - 84 | PWHWP |
| | Epoxy Paint Waste | 6 Gal | 70 - 81 | LNDFL |
| | | 6 Gal | 82 - 84 | PWHWP |
| | Isopropyl Alcohol | 36 Gal | 70 - 84 | SS |
| | Electroplating Wastes | 0.5 Gal | 70 - 81 | LNDFL |
| D. Armament Equipment Division | | 1 Gal | 82 - 84 | PWHWP |
| | PD 680 | 120 Gal | 70 - 84 | WFUEL |
| | B&B Stripper | 400 Gal | 70 - 84 | WFUEL |

Table 5-1

Waste Generation at NAS Oceana

(Page 6)

| Activity | | Waste | Generation Rate Per Year | Duration | Disposal Mode |
|---|---|---|---|---|---|
| | | Cooling Oil | 90 Gal | 70 - 84 | WFUEL |
| | | Weapons Lube Oil | 120 Gal | 70 - 84 | WFUEL |
| | | Methyl Ethyl Ketone | 14 Gal | 70 - 81 | SS |
| E. | Support Equipment | Waste Petroleum, Lube Oils, Hydraulic Fluid, Antifreeze, Fuel | 7,200 Gal | 66 - 84 | WFUEL |
| | | Waste Paint | 5 Gal | 66 - 81 | WFUEL |
| | | | 5 Gal | 82 - 84 | PWHWP |
| | | Paint and Paint | 1,800 Gal | 66 - 81 | WFUEL |
| | | Stripper Sludges | 1,800 Gal | 82 - 84 | PWHWP |
| | | PD 680 | 600 Gal | 66 - 81 | WFUEL |
| | | | 600 Gal | 82 - 84 | PWHWP |
| | | Water Curtain Spray Paint Waste Water | 7,800 Gal | 66 - 84 | SS |
| 5. | Weapons Department | Dichlorodifluoromethane | 10 Gal | 54 - 81 | LNDFL |
| | | | 10 Gal | 82 - 84 | PWHWP |
| | | PD 680 | 5 Gal | 54 - 81 | LNDFL |
| | | | 5 Gal | 82 - 84 | PWHWP |
| | | Waste Lube Oils | 30 Gal | 54 - 81 | LNDFL |
| | | | 30 Gal | 82 - 84 | WFUEL |
| 6. | Naval Construction Battalion | Waste Lube and | 2,400 Gal | early 50s - 84 | WFUEL |
| | | Hydraulic Oils | 600 Gal | early 50s - 84 | SS |
| | | Antifreeze | 600 Gal | 82 - 84 | PWHWP |

Table 5-1

Waste Generation at NAS Oceana

(Page 7)

| Activity | Waste | Generation Rate Per Year | Duration | Disposal Mode |
|---|---|---|---|---|
| 7. Navy Exchange | | | | |
| A. Maintenance Shop | Safety Klean Solvent | 60 Gal | late 50s - 84 | CNTRCT |
| | Waste Lube Oil | 15 Gal | late 50s - 81 | GROUND |
| B. Gas Station | Waste Lube Oil | 15 Gal | 82 - 84 | PWHWP |
| | Waste Oils | 4,800 Gal | late 50s - 84 | CNTRCT |
| 8. Fighter Squadrons (The listed quantities should be multiplied by 12 to obtain totals for all squadrons) | Safety Klean Solvent | 60 Gal | late 50s - 84 | CNTRCT |
| | Old Batteries | 1,800 Units | late 50s - 84 | CNTRCT |
| | PD 680 | 390 Gal | 66 - 81 | WFUEL |
| | | 780 Gal | 82 - 84 | PWHWP |
| | Paint Stripper | 12 Gal | 66 - 81 | WFUEL |
| | | 24 Gal | 82 - 84 | PWHWP |
| | Naptha | 270 Gal | 66 - 81 | WFUEL |
| | | 540 Gal | 82 - 84 | PWHWP |
| | B&D 3400 Engine Cleaner | 90 Gal | 66 - 81 | WFUEL |
| | | 180 Gal | 82 - 84 | PWHWP |
| | UP-5 Fuel, Hydraulic Fluid, Cooling Oil 25R | 500 Gal | 66 - 84 | WFUEL |
| 9. Naval Regional Dental Center | Scrap Amalgam, X-ray Film, Film Fixing Solutions | Unknown | 79 - 84 | NORF |

Table 5-1

Waste Generation at NAS Oceana

(Page 8)

| | Activity | | Waste | Generation Rate Per Year | | Duration | Disposal Mode |
|---|---|---|---|---|---|---|---|
| 10. | Naval Regional Medical Center | | Iodine, Alcohol, Acetone | 20 | Gal | 54 - 84 | SS |
| 11. | Medium Attack Wing One | | | | | | |
| | A. | Corrosion Control | Paint, Thinners, Turco | 280 | Gal | 57- 76 | GROUND |
| | | | Stripping Chemicals | 280 | Gal | 77 - 81 | WFUEL/GROUND |
| | | | | | | 82 - 84 | PWHWP/GROUND |
| | | | Metal Etching Solution: Ferricyanide, Salts, Chromates, Fluorides in Acid | 110 | Gal | 57 - 84 | STMDRN |
| | B. | Power Plant Shops | JP-5 Fuel (Pencil Drained) | 4,200 | Gal | 57 - 84 | WFUEL |
| | | | Waste Lube Oil | 2,160 | Gal | 57 - 81 | WFUEL/GROUND |
| | | | Waste Lube Oil | 2,160 | Gal | 82 - 84 | WFUEL |
| | | | PD 680 | 360 | Gal | 57 - 81 | WFUEL/GROUND |
| | | | PD 680 | 360 | Gal | 82 - 84 | WFUEL |
| | C. | Airframe Shops | Hydraulic Fluids | 156 | Gal | 57 - 84 | WFUEL/GROUND |
| | | | PD 680 | 240 | Gal | 57 - 81 | WFUEL/GROUND |
| | | | PD 680 | 240 | Gal | 82 - 84 | PWHWP |

Table 5-1

Waste Generation at NAS Oceana

(Page 9)

| Activity | Waste | Generation Rate Per Year | Duration | Disposal Mode |
|---|---|---|---|---|
| D. Phase Division | PD 680 | 12 Gal | late 60s - 71 | GROUND |
| | | 12 Gal | 57 - 81 | WFUEL |
| | | 12 Gal | 82 - 84 | PWHWP |
| | Waste Lube Oil | 48 Gal | late 60s - 71 | GROUND |
| | | 48 Gal | 57 - 84 | WFUEL |
| | Waste Hydraulic Fluid | 144 Gal | 57 - 71 | GROUND |
| | | 144 Gal | 57 - 84 | WFUEL |
| E. Line Division | Waste Oil | 1,620 Gal | 57 - 84 | WFUEL/GROUND |
| | Waste JP-5 | 480 Gal | 57 - 84 | WFUEL/GROUND |
| F. Miscellaneous Shops | PD 680 | 540 Gal | 57 - 71 | GROUND |
| | PD 680 | 540 Gal | 72 - 81 | WFUEL |
| | PD 680 | 540 Gal | 82 - 84 | PWHWP |
| 12. Naval Air Maintenance Training Detachment | Radar Cooling Oil | 10 Gal | 75 - 81<br>82-84 | WFUEL<br>PWHWP |
| 13. Fleet Aviation Specialized Operational Training Group Atlantic | Hydraulic Fluid | 50 Gal | 60 - 84 | WFUEL |
| 14. Fleet Audio Visual Center | Black and White, Color Photo Processing Chemicals | 1,000 Gal | 60 - 84 | SS |
| | Photofixed, Used Films, Waste Photo Paper | Various | 60 - 84 | NORF |
| 15. Security Department | Conc. Sulfuric Acid | 0.3 Gal | 75 - 84 | SS |

**Table 5-1**

**Waste Generation at NAS Oceana**

(Page 10)

Abbrevations used for Disposal Mode:

- SS: Sanitary Sewer
- PWHWP: Public Works Hazardous Waste Pickup
- LNDFL: Landfill
- ALF: Asbestos Landfill
- NORF: Metal Salvage Yard at Norfolk
- STMDRN: Storm Drain
- CNTRCT: Contractor Removes From Base
- GROUND: Wastes Disposed on Ground
- WFUEL: Waste POL Pickup (1982-84) or Pickup of Waste POL Plus Other Non-Aquous Hazardous Wastes (Pre-1982)

Pesticides have been drained from the tank into a 55-gallon barrel and removed by Public Works hazardous waste pickup (less than one barrel/year) since 1982. Residual (diluted) pesticides were rinsed from the spray tank over a concrete rinsing pad outside Building 798 before 1982. Waste oil from golf course machinery (about 50 gallon/year) is spread over nearby gravel for dust control. Golf course personnel know of no pesticide dumping incidents since 1962, and there are no records of pesticide dumping or illegal disposal by golf course personnel.

**5.4.1.2 Boat Camper Shop.** The Boat/Camper Shop (Building TS-2) does maintenance on small outboard motors. It produces about 50 gallon/year of waste oil which is turned into PWD. Prior to 1982, it was placed in a dumpster.

**5.4.1.3 Auto Hobby Shop.** The present auto hobby shop in Building 543 has been at Oceana since 1976. It was located in the Special Services maintenance building (Building 527) prior to 1976. About 5 gallon/year of PD 680 are used in a batch tank for tool cleaning. Waste PD 680 and waste motor oil and fluids (about 1,110 gallons/year) have been placed in the shop oil/water separator since 1977, which has been pumped out by a local waste oil reclaimer. Oils and solvents from the previous shop (about 550 gallons/year) went into the Public Works bowser for local dust control.

**5.4.1.4 Bowling Alley.** The bowling alley in Bldg 540 has used PD 680 as a cleaning solvent (about 100-150 gallons/year) since its opening in 1971. Spent solvent has been drained back into the original barrels and picked up by Public Works hazardous waste pickup since 1982. Previously, waste solvents went down a sanitary drain or occasionally were poured on the ground outside the bowling alley.

**5.4.1.5 Maintenance Shop.** The Special Services Maintenance Shop is located in Building 527. The shop performs preventive maintenance (bulb-changing, touch-up painting, etc.) duties for Special Service Department facilities. Waste oil from shop vehicles (about 20 gallons/year) has been placed in the auto hobby shop oil/water separator since 1977. It went onto nearby grounds for dust control previously. The maintenance shop uses less than 100 gallons of paint per year. Waste paints have gone into a hazardous waste-designated 55 gallon drum outside building 527 since 1982, and waste paint and empty cans were picked up by Public Works hazardous waste pickup. Waste paints and cans went into dumpsters before that.

**5.5 AIR OPERATIONS DEPARTMENT.** The Air Operations Department operates the airfield at Oceana and the auxiliary landing field facilities at Fentress. It also supports operations of station, tenant, and transient aircraft. Its responsibilities include air traffic control, operation of the air terminal, repair and maintenance of ground electronic equipment, and fire protection.

**5.5.1 Auxiliary Landing Field - Fentress.** Fentress Field is used exclusively for practice carrier landings and night landing maneuvers. The primary users are experienced pilots who must maintain their qualifications or to qualify in a new aircraft. The 8,000-foot runway has carrier landing arresting gear to simulate a carrier landing. Fire-fighting drills are conducted on Thursday of each week. There are currently 41 people assigned to the station. Potable water is supplied from two onsite deep water wells. Sewage has been treated since 1980 in two operation basins at the north end of the station near Blackwater Road. Treated efficient from the basins is sprayed onto an adjacent field.

The present operations center was completed in June 1980. Operations at the facility date back to the early 1950s. Prior to 1981 there was a rapid refueling station for aircraft at the base. This system consisted of a 50,000 gallon underground fuel tank and a small day tank, connected by approximately 3,500 feet of underground pipe. At some time during 1981 the inside coating of the storage tank failed. It was subsequently emptied and is currently undergoing repairs.

The only wastes presently generated at the facility are empty 5-gallon plastic containers (25 per month) which contained aqueous film forming foam (AFFF) and used oil from the hobby shop. AFFF has been used in fire fighting exercises since 1969. The used oil is from work done on personal vehicles by base personnel. This oil is stored in a bowser and subsequently burned in the fire ring, located on an abandoned taxiway, during fire-fighting exercises. The volume of oil is estimated to be 10 to 20 gallons per month. Fuel for the fire training ring is stored in old tank trucks onsite. Spilled fuel and oils cover an area of approximately 2,000 square feet.

There is a three-acre landfill at the north end of Runway 23 which was used between 1945 to 1970. After its closing some construction, vegetation debris and discarded appliances were dumped on the surface of the closed landfill. In 1983 the accumulated material was buried in a 50 x 20 x 6 foot trench adjacent to the old landfill. At the same time another ditch, 70 x 20 x 12 feet was opened nearby and is currently used to burn the empty AFFF containers, dead tree debris and an occasional arresting gear belt.

5.5.2 Ground Electronic Maintenance Division. The Ground Electronics Maintenance Division (GEMD) has been based in Building 102 at NAS Oceana since 1955. The division consists of a Communications Maintenance Branch, a Radar Branch, and a Meteorology/Security/Storing Maintenance Branch. GEMD maintains radar, tactical/nontactical communications equipment, security systems, air monitering systems and all radios used at NAS Oceana, Fentress, and the Navy's Garrett County, N.C. facility. Solvents have been used by GEMD before 1981 include trichloroethylene (5 gallon/year), isopropyl alcohol (about 1 gallon/year) and organic paint removers (less than 5 gallon/year). Past disposal practices included dumping waste chemicals down drains and dumping waste chemicals into the ocean via ship or helicopter. Empty containers usually went into nearby dumpsters.

Chemicals now used by GEMD include solvents (1,1,1 trichloroethane, 5 gallon/year; PD 680, 5 gallon/year; isopropyl alcohol, 1 gallon/year; "superagitine" parts cleaning fluid, 2 gallon/year) and corrosion prevention compounds (sprays, less than 10 16-ounce cans/year). Solvents are applied by hand and evaporate, and corrosion prevention compounds are not wasted. Empty containers are thrown in nearby dumpsters.

5.5.3 Aircraft Structural Fire and Rescue Division. This division performs crash, fire, and rescue operations, both on and off station. It conducts training programs for these operation, fire inspection, and safety programs.

The Fire Prevention Branch has used a part of abandoned Runway 18-36 on the west side of the base for firefighting training exercises since the early 1960s. Two practice fires each weekend with favorable weather are lit using waste fuel and oil. Until the mid-1970s, 50 to 75 gallons of waste fuel was poured in the center of the runway, lit, then extinguished. Although a small fraction of the fuel remained unburned on the pad after the exercise, it was not usually enough to drain or be washed off the flat surface of the runway. In the mid-1970s, a fire pit was built consisting of an earthen berm, about 75 feet in diameter, resting directly on the runway. Due to the better containment provided by the fire pit, about 300 to 500 gallons of waste fuel per exercise is placed in the pit for burning. If the pit fills with water from the exercise or rainfall, it is pumped

# 6. MATERIAL HANDLING: STORAGE AND TRANSPORTATION

**6.1 INDUSTRIAL MATERIAL AND WASTE STORAGE.** The storage and transportation of industrial materials on NAS Oceana is discussed in this section.

**6.1.1 Materials Storage: Defense Property Disposal Office.** The Defense Property Disposal Office (DPDO) does not maintain any facilities on the Naval Air Station (NAS) Oceana. Instead, materials designated for DPDO disposal are transferred into their custody on a "as is, where is" basis. However, even though the DPDO may assume custody of a particular item or consignment, the base maintains the benefit or hazard of regular inspection and clean-up, if it becomes necessary. The local DPDO office is located at Camp Allen.

One example of the DPDO hazardous waste disposal program is cited here: disposal of polychlorinated biphenyl (PCB) transformers. PCB transformers that are taken out of service are stored at the large transformer storage area described in detail in Chapter 8 of this document. There, the transformers are stored in the open, on a gravel pad. A visual inspection of the site revealed that none of the visible surfaces had been leaking. None of the inspected transformers had been taken out of service because of leaks. Since there is no maintenance provision at this storage location, the command wishes to dispose of them as soon as possible after their designation as "surplus" to the Navy's needs. Paperwork is forwarded to the DPDO requesting DPDO to take paper custody of the surplus transformers. The process is reported to be very slow, with the transformers in paper limbo for the duration. The orphan transformers may receive little or no direct attention from their new custodian during the time of their storage awaiting removal. The most recent removal of PCB transformers by DPDO occurred in April 1983, when four transformers were taken to Camp Allen. Since then, four more out of service transformers containing PCBs have been placed in the storage area and scheduled for pickup in mid-1984.

**6.1.2 Chemicals and Hazardous Materials Storage.** Most of the units visited at NAS Oceana observed proper storage of flammables, and hazardous materials. Flammable materials are stored in Buildings 105, 500-A to -E, and TS-10. Buildings 135, 42, and 513-D are designated for paint storage. Compressed gases (oxygen, acetylene, and argon) are stored in Buildings 513-B, 513-C, and 609. Prominently labeled smaller areas or lockers within larger buildings are available wherever hazardous materials are stored or used. Past practice included special precautions observed for the obviously flammable materials and little or no regard for proper storage or handling of either hazardous materials or the wastes generated through their use. Unless the materials had a known acute toxic effect, handling precautions were casual. An education program is run intermittently by the Public Works Department (PWD) to acquaint staff of proper handling, storage, and disposal of the materials.

**6.1.3 Petroleum, Oil, and Lubricants.** The Fuel Division of the Supply Department stores and issues most petroleum, oil, and lubricants (POLs) on NAS Oceana. NAS Oceana has a total bulk oil storage capacity of 4,020,500 gallons. This total does not include individual tanks located at the Housing Apartments and certain buildings utilizing No. 6 fuel oil for heating purposes. The fuel oil storage capacity is principally intended for JP-5, No. 2 heating fuel, No. 6 heating fuel, MOGAS, AVGAS, E120 Lube, and contaminated fuel and sludge. A small quantity of JP-4 is stored for Air Force use.

**6.1.3.1 Tank Farm.** The tank farm is located west of Runway 23 off of London Bridge Road. Eight storage tanks are located in the complex (F11-16, F19, and F19A) JP-5 is transported to the tank farm by a pipeline which is owned and operated by W. R. Grace Company. There have reportedly been numerous leaks associated with this pipeline. Five 567,000-gallon tanks (F12-16) currently hold JP-5 and were constructed in 1951. Two 25,000-gallon tanks were also constructed in 1951. Although currently not in use, they recently were used to store No. 2 fuel oil. The 420,000-gallon tank (F11) was constructed in 1965 and is also used to store JP-5. Leakage of fuels from the five large tanks (F12-16) was documented through field investigation (R. E. Wright Associates, February 1983).

Fuel leakage at the Tank Farm is known to have occurred both at the surface and underground. The tanks are known to have leaked for more than a decade, although the volumes lost are unknown. Test boring/monitoring wells installed at the Tank Farm indicate thousands of gallons of fuel are floating on the water table in the vicinity of the tanks. To prevent future leakage of fuel, underground transfer lines have been moved above ground, and the base of these tanks is currently being resurfaced with concrete and fiberglass. Conclusions of recently completed field investigations by Wright Associates are presented in Chapter 8.

**6.1.3.2 Day Tank.** A 220,000-gallon day tank (F20) is located just east of Runway 23. This tank was constructed in 1952. The day tank is connected by pipeline to the Tank Farm and currently stores JP-5. The tank is used to fill the ten rapid refueling pits located adjacent to Runways 32 and 23. A system of filters is used to remove any impurities in the jet fuels. Filters are changed every three years and are disposed of in the sanitary landfill. Condensate formerly was drained to a dry well adjacent to the tank. Currently, the condensate is automatically pumped to an oil/water separator. The water is discharged into the depression near the tank.

There is a history of fuel leakage and spills associated with the day tank. During the 1960s there was a reported 80,000-gallon overfill at this tank. Since that time, substantial overfills of the tank have been reported in 1979 and 1981 (R. E. Wright Associates, 1983). More recently, slow leaks were detected in the subsurface fuel evacuation lines from the refueling pits. Although the return evacuation lines are no longer used, this leakage may have occurred between 1952 and 1983.

According to recent field investigations, the loss of fuel from the Day Tank has resulted in the seepage of significant amounts of fuel into the ground (R. E. Wright Associates, 1983). There is no evidence that fuel from this source has accumulated in large enough quantities to enable it to be mobile in pure form. Rather, it has probably dispersed to such an extent that it is largely retained in the soil by capillary action. Conclusions of a recent field investigation at the day tank are provided below.

> The leakage of fuel from the buried evacuation pipeline, however, has resulted in the accumulation of pure fuel, perhaps a few thousand gallons, that is floating on the water table. There appears to be little potential for the migration of pure fuel away from the site. The greatest environment risk resulting from the continuing presence of subsurface fuel at the Day Tank is expected to be the on-going contamination of groundwater by dissolved fuel. Based on the local topographic setting, the distance from the Day Tank to a point of potential groundwater discharge is probably at least a mile. Because of this, dissolved fuel contained in the shallow groundwater system would

probably be reduced to insignificant concentrations before reaching any downgradient points of discharge (R. E. Wright Associates, 1983).

**6.1.3.3 Steam Plant.** A 324,000-gallon tank (P602) is located adjacent to the steam plant and is currently used to store No. 6 fuel oil. This tank was constructed in the early 1950s. A 1,500-gallon spill occurred in 1976 and has since been cleaned up.

**6.1.3.4 Abandoned Tank Farm.** The abandoned tank farm is located approximately 300 yards east of the old CPO Club on the old North Station. There are two concrete 50,000-gallon tanks (G5 and G6) that were formerly used to store aviation gas during the operation of North Station. A number of smaller aboveground tanks formerly stored kerosene and lube oils. At least two buried lines exist at the abandoned tank farm by which wash fluids from tanks and pipes were drained to waste. The 50,000-gallon tanks were emptied of fuel and filled with water with the decomissioning of North Station. Tank G-5 was later used to store waste oil. It is no longer used for this purpose, but the tank is thought to still contain a foot of oil, or about 5,000 gallons.

Recent field investigations have shown that small amounts of fuel have leaked from either the tanks or buried pipeline and persist in the subsurface at the abandoned tank farm (R. E. Wright Associates, 1983). Conclusions of this study are provided below.

> There is no evidence, however, of any free product mobility. The relatively small amount of fuel which occurs in the subsurface appears to be bound in the soil by capillary action. Fuel was observed both above and below the water table, and was probably dispersed in that manner by water table fluctuations. Ground water at the site generally flows north to northeast, and may discharge into nearby shallow drainage ditches that flow north toward Potters Road. It is likely that ground water downgradient (north) from the site contains low levels of dissolved fuel. However, in view of the small volume of subsurface fuel that was observed at the site, the dissolved fraction in the ground water is expected to be so low that it is probably insignificant.

**6.1.3.5 Waste Oil Storage.** Until recently, waste oil was stored in three 1,000-gallon tanks located adjacent to the tank truck. Overflow problems and spillage into the adjacent creek became so widespread that tank use was discontinued. A new 25,000-gallon aboveground tank (F-55) has recently been constructed at this location and will provide waste oil storage in the future. Since 1979, waste oil from the Fuel Division storage facility has been taken to an aboveground bermed storage tank in the fire pit area on the west side of the base for use in fire fighter training. Throughout the 1970s, waste oil was stored in Tank G-5 at North Station awaiting sale to an oil recycling firm or transport to Brookhaven National Laboratories in New York.

**6.1.4 Pesticide Storage.** Pesticides have been stored in Building 821, located just behind Building 820 in the Public Works Department compound, since 1968. Prior to that, they were stored in Building 756 in the Evaluation of Base Construction area. Various pesticides are stored, including 2,4-D, 2,4,5-T, heptachlor, aldrin, chlordane, and Warfarin. DDT was stored in Building T5-6 prior to the DDT ban. Pesticide storage and use is the responsibility of the General Services Branch (Maintenance Division) of the Public Works Department.

Pesticides are also stored in the golf course barn (Building 758). Those stored for use in and around the golf course are Daconil, Chiopco 26019, and Turstan (fungicides); Daconte

6 (herbicide); and Oursban (insecticide). The storage, preparation, and use of these pesticides are the responsibility of the Recreational Facilities Division in the Special Services Department.

6.1.5 **Polychlorinated Biphenyl Storage.** Large electrical components known by label information to contain PCBs are stored on a gravel pad, against the southwest fence of the Public Works Transportation Yard (adjacent to Building 830). In early 1984, there were four sound PCB-containing units awaiting disposal. At the time of a station-wide inventory of PCB electrical components in 1976, there were no PCB units stored in this location. Information on transformer storage prior to 1976 was not available. Three retired PCB-containing capacitors are stored on uncurbed asphalt, with many small non-PCB transformers in the yard immediately northeast of Building 402. A PCB transformer stored in the yard for disposal leaked a significant quantity of PCB material in 1982. This spill was cleaned by a contractor and disposed off-base.

6.1.6 **Storage Lots and Scrap Yards.** The Public Works Department maintains a large storage lot behind its transportation maintenance building (830) for vehicles and parts and large electric components awaiting disposal. This lot has been in use since the early 1950s. There is a one and a half acre construction staging area just south of the Public Works compound along London Bridge Road that contains discarded railroad ties and large iron plates. This area has been used intermittently for storage and scrap since the late 1950s.

6.1.7 **Decontamination Material Storage.** The Public Works Department keeps hazardous waste cleanup equipment and supplies in a shed inside the hazardous waste storage area at the Avenue D landfill entrance. Other cleanup materials and equipment are maintained by the station's Safety Officer and by the Fire Prevention Branch of the Air Operations Department.

## 6.2 INDUSTRIAL MATERIAL AND WASTE TRANSPORTATION

6.2.1 **Supply Materials.** The shipment of almost all material both to and from NAS Oceana is controlled by the Material Division of the Supply Department. The transfer points of supply materials are the Supply Department warehouses (Buildings 720-22).

6.2.2 **Petroleum, Oil and Lubricants.** The Fuel Division of the Supply Department operates facilities and equipment for the delivery of aviation fuels and bulk lubricating oils alongside aircraft, and for transporting fuels drained from aircraft. JP-5 is barged from the Naval Supply Center Fuel Depot on Craney Island, Portsmouth, Virginia, to the North Landing River and pumped by pipeline to the fuel farm located on the west side of the station. From there, fuel is pumped across the field to holding tanks, called day tanks, and thence to the direct fueling stations.

6.2.3 **Hazardous Wastes.** Public Works hazardous waste pickup has removed industrial wastes from base and tenant activities at Oceana since September of 1981. A shop or activity that generates industrial wastes is responsible for placing wastes in marked, properly segregated containers and sealing the containers for pickup. When a pickup is needed, the shop/activity fills out Form 1348 and calls the Public Works Trouble Call desk to request a hazardous waste pickup. Wastes are picked up from the shop/activity and taken to the hazardous waste storage facility, a fenced area located near the Avenue D landfill entrance behind the Public Works Building. Typical waste pickups include paint, thinners, xylene, methyl ethyl ketone, toluene, methyl isobutyl ketone, strippers, PD-680 (solvent/gun cleaner), lacquers, and enamel. The hazardous wastes storage facility serves as a pickup point for the DPDO.

The Operations Branch also cleans and maintains oil booms in stormwater drainage ditches on the station. The booms intercept floating fuel and oil from spills that have been washed off runways and maintenance pads in the hanger area. Each boom is visually inspected twice per day. When a ditch must be cleaned, floating trash is skimmed off by dip nets, placed in barrels, and hauled to the hazardous waste storage facility to be removed by DPDO. Waste oil is pumped off of the water surface by an oil skimmer and taken to the waste oil tank in the Supply Department yard.

**6.2.4 Solid Waste.** Nonhazardous solid waste on the base is placed in dumpsters by the generating unit. These are picked up on a regular basis and are carried to the Avenue D landfill for disposal. Prior to 1961, wastes were carried to the Fifth Green Landfill (1954-1961), the North Station Landfill (1945-1954), and the West Side Landfill (1941-1945). Solid waste from NALF Fentress has been delivered to the Avenue D Landfill since 1970. Prior to that, Fentress's solid waste was burned and buried in a landfill at the north end of Runway 23. Destinations for solid wastes during the four-decade operation of Oceana are summarized in Table 6-1. Their locations are shown in Figure 6-1. Placement of hazardous waste in the base landfills stopped in 1982 with the implementation of the Public Works hazardous waste pickup program.

**6.3 ORDNANCE.** Out-of-date or defective ordnance is either sent directly to Naval Weapons Station Yorktown by truck or picked up by Explosives Ordnance Detachment (EOD) Division 2. Ordnance which is picked up by EOD Division 2 is stored in Magazine 12 at Little Creek Naval Amphibious Base until shipment to Yorktown for disposal.

**6.4 RADIOLOGICAL.** Except for recycled radiation sources used in for nondestructive testing, there is no radiological material used at NAS Oceana and thus no radiological waste is generated.

## Table 6-1

**Destinations for Solid Waste Transported from Generating Activities at NAS Oceana**

| Waste Disposal Area | Period of Use | Function | IAS Site Number |
|---|---|---|---|
| West Side Landfill | 1941 - late 40's | general base landfill | Site 3 |
| Old Salvage Pile | Mid 40's - mid 50's | scrap metal storage | not a site |
| North Station Landfill | Early to mid 50's | general base landfill | Site 8 |
| Fifth Green Landfill | 1954 - 1961 | general base landfill | Site 7 |
| Avenue D Landfill | 1961 - present | general base landfill | not a site |
| Potters Road Inert Material Disposal Area | Early 70's - present | inert construction/ demolition debris | not a site |
| Asbestos Landfill | 1980 - present | Asbestos | not a site |
| Bouganville Disposal Area | 1976 - present | dead vegetation, furniture (unregulated disposal) | not a site |

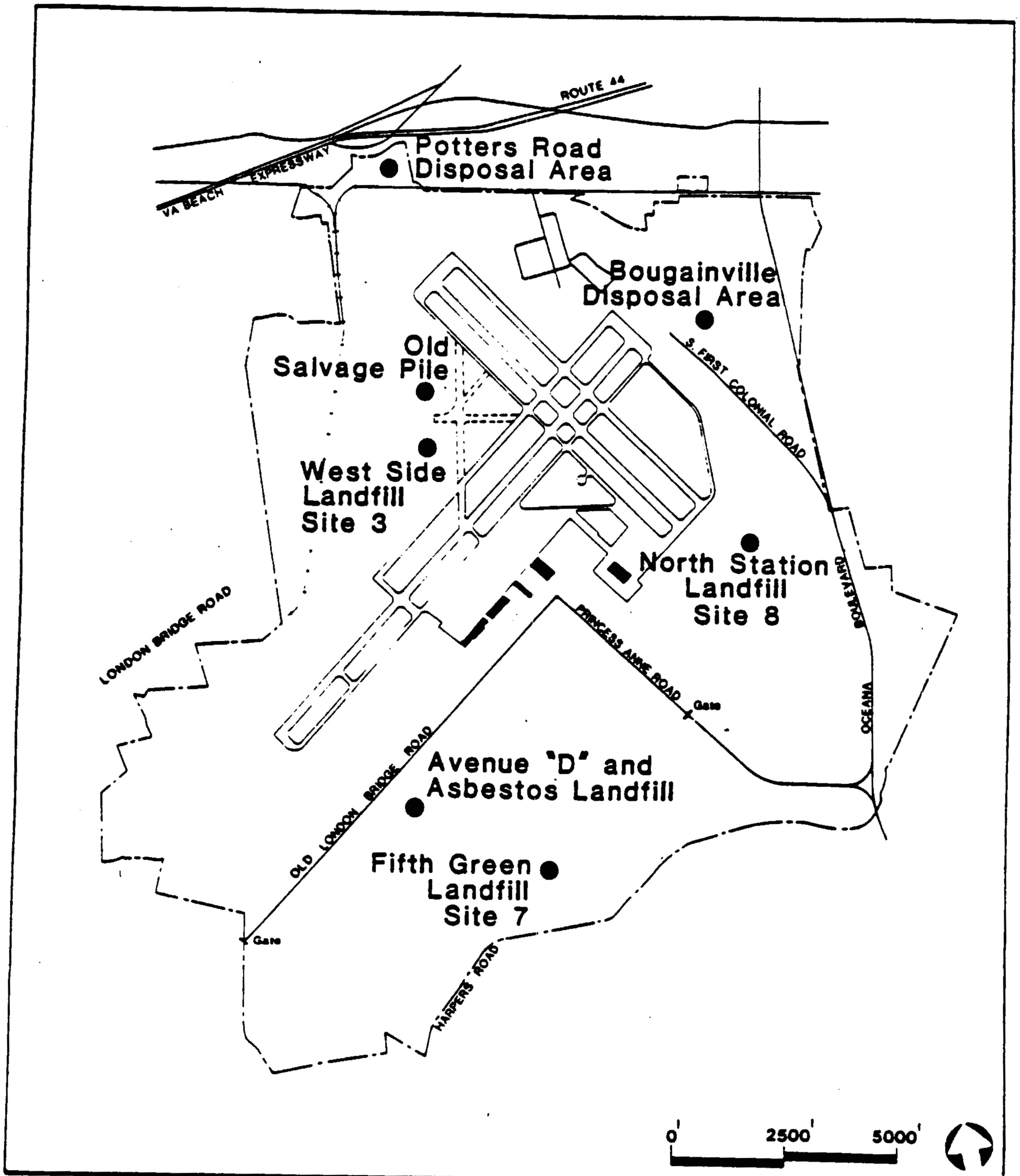



Figure 6-1
Location of NAS Oceana Landfills and Disposal Areas, 1941-84

Rogers, Golden & Halpern

**Initial Assessment Study**
**Naval Air Station Oceana**
**Virginia Beach, Virginia**

# 7. WASTE PROCESSING

**7.1 WASTEWATER TREATMENT.** Since the mid-1970s, Naval Air Station (NAS) Oceana has been connected to the Hampton Roads Sanitation District collection system. Prior to that, sanitary sewage generated on station received treatment at the Navy-owned plant located in the northwestern corner of the station (Buildings SD1-10). This plant was put into operation in 1951 and replaced another plant 1,500 ft to the northeast that was demolished because it would have obstructed aircraft maneuvers on Runway 14R. Treated effluent was discharged to a drainage ditch that leaves the base on its western edge. Sludge was routinely disposed of by land spreading on the western sides of the base, giving it away as fertilizer, and landfilling. In 1983-84 the inactive sewage treatment plant was demolished and the debris carried off-base for disposal. Residual sludge in the tanks was trucked to the main pumping station (SD-600), where it was added to the effluent.

Septic tanks with leach fields provide sewage treatment to several isolated buildings at Oceana: Buildings 197/199, 280, 3000, 3015, 3030, R31, R34, and R36. These septic tanks occasionally have perculation problems and flood during heavy rainfall. At NALF Fentress, sewage is treated in two aerobic lagoons. The treated effluent is sprayed on a nearby field. Sludge was taken to the landfill.

**7.2 WASTE FUEL AND SOLVENT RECYCLING.** Waste bowsers for fuel, lube oil, and hydraulic fluids are located throughout the flight lines and industrial areas of the station. When the bowsers are full, the shop responsible calls the Fuel Division for a pumpout by the Division's waste fuel tank truck. A shop can pick up an empty bowser from the Fuel Division or can request delivery of one from the Public Works Department.

Until recently, the shop using the bowser was responsible for transporting the full bowser to the Fuel Division yard for waste fuel transfer to one of three 1,000-gallon tanks. However, overflow problems and spillage into the adjacent ditch became so widespread that tank use was discontinued. A new 25,000-gallon aboveground tank (F-55) was recently constructed at this location and will provide waste fuel and oil storage in the future. This tank will be supervised by Fuel Division personnel.

In the 1950s and 1960s waste fuel and oil were dumped into an oil disposal pit in the field to the west of the fire fighter training area. Throughout the 1970s, waste oil was stored in Tank G-5 at North Station, awaiting use by the Fire Prevention Branch, sale to an oil recycling firm, or transport to Brookhaven National Laboratories in New York. Since 1979, waste fuel and oil from the Fuel Division storage facility has been taken to an aboveground bermed storage tank in the fire pit area on the west side of the base for use in fire fighter training. During this period, all waste fuel and oil was used by the Fire Prevention Branch. This amounts to approximately 25,000-40,000 gallons of waste fuel and oil per year.

Sludge removal from fuel tanks is subcontracted and the waste is disposed by the contractor off the station. This policy has been in practice since at least 1971. Descriptions of previous practices were unavailable.

Oil removed from the many oil/water separators and ditch oil booms on the base during routine maintenance by the Public Works Department is taken directly to the fire pit area for storage.

Other solvents are not recycled at Oceana; they are placed in drums by the generating shop, properly labeled, and transported by Public Works to the hazardous waste holding area at the entrance to the Avenue D landfill, where they are eventually picked up by the Defense Property Disposal Office (DPDO). Prior to 1981, these other solvents were put into the bowsers along with the waste oil, fuel and hydraulic fluid. The Supply Department is responsible for the proper identification of the wastes and releasing them to DPDO at the time of pick-up.

**7.3 CLINICAL WASTES.** The laboratory at the Naval Regional Medical Center generates small volumes (less than 1 gallons/month) of iodine, alcohol, and acetone wastes. These are washed down the sink into the sanitary sewer. Biological waste from the laboratory is sealed in special containers and sent to Portsmouth for disposal.

Scrap amalgam, x-ray film, and spent x-ray fixing solutions from the Naval Regional Dental Center are sent to Norfolk for mercury and silver recovery.

**7.4 ORDNANCE.** The Weapons Department is responsible for supply and storage of all ordnance employed at NAS Oceana. No disposal or processing of ordnance is made at Oceana. Out-of-date or defective ordnance is either sent directly to Yorktown or is picked up by Explosives Ordnance Detachment Division 2, temporarily stored in Magazine 12 at Naval Amphibious Base, Little Creek, and then shipped to Yorktown.

# 8. DISPOSAL SITES AND POTENTIALLY CONTAMINATED AREAS

8.1 SITE 1-WEST WOODS OIL DISPOSAL PIT. In the mid-1950s a pit roughly 25 feet in diameter was dug for disposal of waste oil, fuel, hydraulic fluid and other non-aqueous liquid wastes from the aircraft maintenance and repair shops. The pit was located about 1,000 feet west of old Runway 9 at its intersection with an old taxiway (Figure 8-1). The pit was used until the late 1960s, when a large storm caused flooding in the area. The flood waters floated the oil from the pit and carried it off base, where it contaminated privately owned land. The complaints arising from this event resulted in termination of this oil disposal method and the filling of the pit with earth. The pit was not visible on 1971 aerial photographs of the area, and a field check in early 1984 failed to discover its ocation. The pit is associated with a 1,000-foot long ditch that began at the edge of old Runway 9. This ditch was used to dispose of waste fuel and oil when wet ground conditions prevented truck access to the pit. After wastes were dumped in the ditch, they were ignited.

t is known that petroleum, oil, and lubricants (POLs) and other aircraft maintenance chemicals were also sold to a waste oil recycler, were used to control dust on unpaved oads, and were dumped behind line shacks, so it is difficult to attribute a precise volume o the oil disposal pit.

he hazardous wastes and their volumes that were placed in the disposal pit are assumed o be half of the totals placed in waste oil bowsers by the various shops during the period 955 through 1970 as listed in Table 5-1. These hazardous wastes and amounts are shown Table 8-1. According to the table about 70,000 gallons of waste fuel, oil, hydraulic PD 680, paints, and paint sludges, thinners, and strippers, naptha, B&D 3400 engine , agitine, and trichlorotrifluoroethane were placed in the pit. Benzene, toluene, d their derivatives are commonly used in paint stripping formulations.

illage around the edges of the pit visible on aerial photographs between 1958 and 1965 dicate that the pit was full and that oil wastes, under the pressure of their own weight, oved laterally into the soil above the water table.

e pit's location is about 250 feet east of a drainage ditch that flows north toward the d sewage treatment plant site, then off base to the west. There is concern that craft fuels (JP-4, JP-5, AVGAS), lubricating oils, and hazardous chlorinated and omatic hydrocarbons pose a threat to surface and ground water quality in the area.

! SITE 2-LINE SHACK OIL DISPOSAL AREAS. There are five line shacks that have )L and Hazardous liquid disposal areas associated with them (Figure 8-2). All of these e shacks were constructed in 1963. All display oil-soaked ground over roughly 1,000 to 00 square feet or more.

imations of wastes disposed behind the line shacks are based on hazardous waste eration rates listed in Table 5-1. It is assumed that 25 percent of all hazardous stes generated by MATWING and the fighter squadrons was disposed on the ground ind the line shacks between 1963 and 1976 and that ten percent of the same wastes e dumped there between 1977 and 1984. The wastes generated by MATWING are med to have been equally divided between line shacks 125 and 131; similarly, the stes generated by the fighter squadrons are allocated equally between line shacks 33 9, and 400. Table 8-2 lists the estimated wastes per line shack.

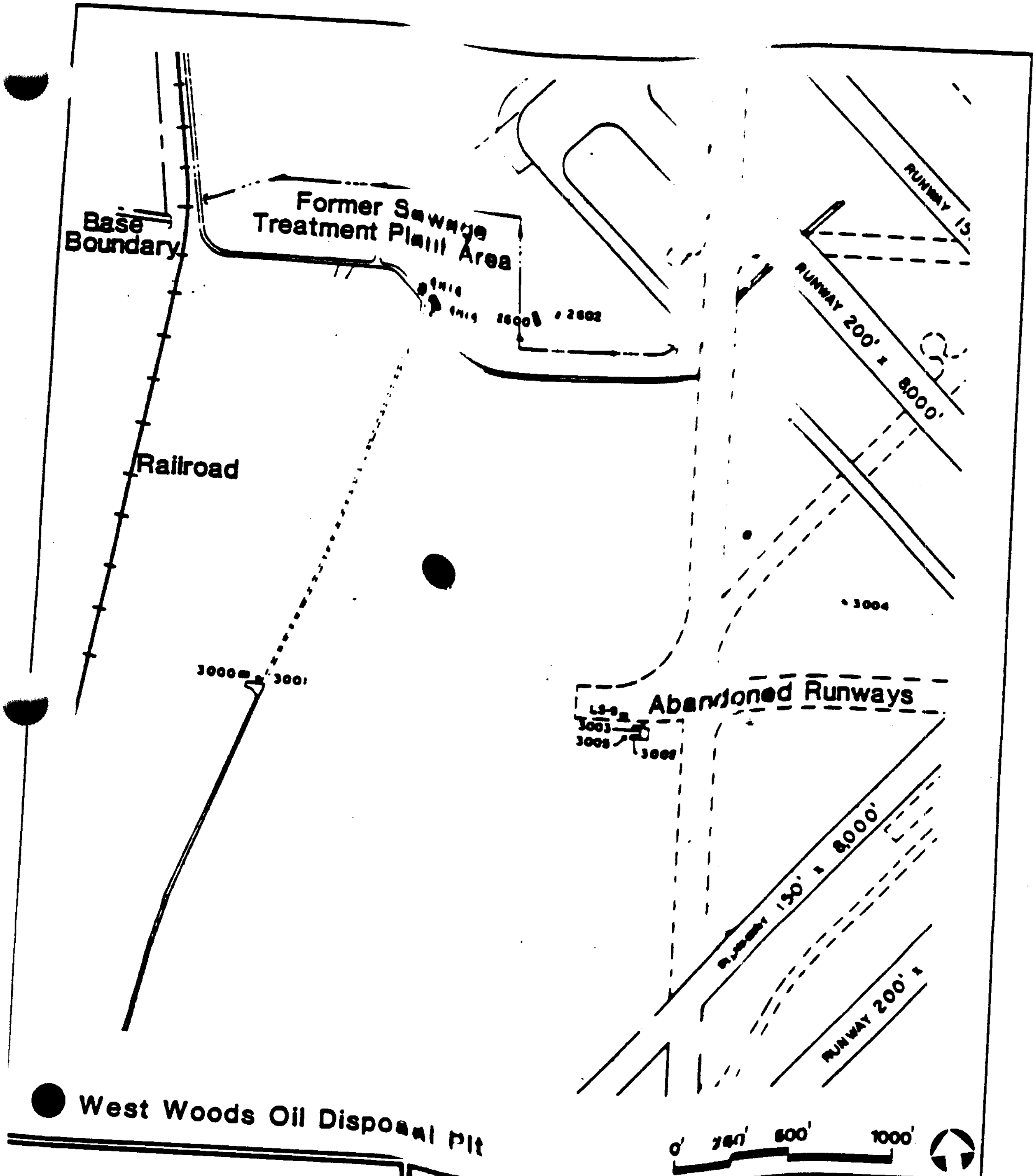



Figure 8-1
Site 1, West Woods Oil Disposal Pit

Rogers, Golden & Halpern

Initial Assessment Study
Naval Air Station Oceana
Virginia Beach, Virginia

**Table 8-1**

**Hazardous Wastes Disposed in the West Woods Oil Disposal Pit (mid 1950s - late 1960s)**

| Hazardous Waste | Approximate Volume[1] in Gallons |
|---|---|
| Waste Fuel Oil and Hydraulic Fluid | 70,000 |
| Paints, Paint Thinners, Strippers, and Sludges | 7,000 |
| PD 680 | 22,000 |
| Naptha | 8,000 |
| B&D 3400 Engine Cleaner | 2,700 |
| Agitine | 200 |
| Trichlorotrifluoroethane | 10 |
| Total Volume (approximate) | 110,000 |

[1] The volumes shown are one-half of those known to have been disposed in waste oil bowsers between 1955 and 1970.

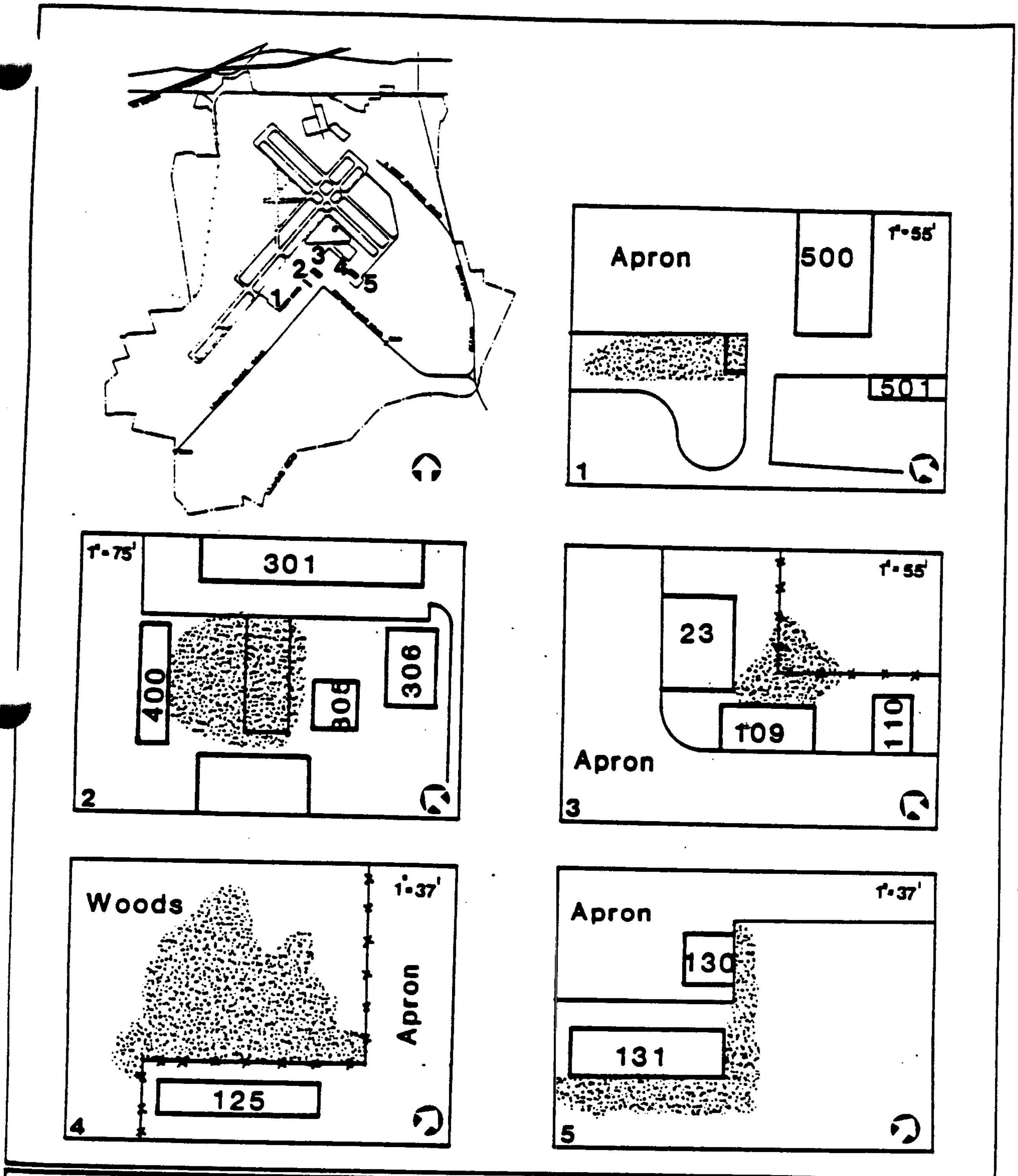



Figure 8-2
Site 2, Line Shack Oil Disposal Areas

Rogers, Golden & Halpern

**Initial Assessment Study**
Naval Air Station Oceana
Virginia Beach, Virginia

Table 8-2

Hazardous Wastes Disposed behind

MATWING and Fighter Squadron Line Shacks

| lazardous Waste | MATWING Line Shacks 124 and 131: Estimated Gallons per Line Shack Disposal Area | Fighter Squadron Line Shacks 31-33, 109, and 400: Estimated Gallons per Line Shack Disposal Area |
|---|---|---|
| 580 | 2,400 | 6,500 |
| nd Hydraulic Fluid | 4,100 | 2,900 |
| t Strippers, Thinners, co | 600 | 200 |
| ha | - | 4,500 |
| 3400 Engine Cleaner | - | 1,500 |
| L VOLUME | 7,100 | 15,600 |

The estimates presented in Table 8-2 indicate that the fighter squadron line shack disposal areas are more contaminated that those at MATWING, even though the area behind MATWING line shack 125 appears more grossly contaminated than any of the others. All the line shack disposal areas are on sandy soils. They are at various distances to drainage ditches ranging from about 100 feet to 1,200 feet.

8.2.1 Line Shack 400. Oil disposal area for Line Shack 400 is located on a barren area southwest of the building between the concrete pad and the old test cell. Recently this area was paved with an 18 inch layer of concrete for the wash rack. It is not known if the oil-saturated soil was removed and if so, where it was taken for disposal. This area is visible on the 1971 aerial photos. Line Shack 400 is about 500 feet from the closest drainage ditch.

8.2.2 Line Shack 109. There is a POL disposal area on the ground behind Line Shack 109. The disposal area extends along the fence; there are also a waste oil bowser and hazardous waste drums on the ground along the fence. Reportedly, waste oil has been dumped with a specially fashioned funnel into an electrical manhole near this line shack, resulting in damage to circuits and requiring cleanup. Line Shack 109 is about 1,000 feet from the nearest drainage ditch.

8.2.3 Line Shack 125. There is a waste POL disposal area on the ground behind Line Shack 125. In the early 1980s, this line shack was slowly sinking into the asphalt, which was being dissolved by the waste oil that had been dumped over the adjacent fence for many years. During the construction of a new concrete pad for the line shack, a bulldozer sank several feet into oil-saturated soil after the asphalt had been scraped away. Eventually, about six feet of oil-saturated soil was dug out by the Construction Battalion before the new concrete pad could be poured. The disposal area of this soil is unknown. Line Shack 125 is about 1,200 feet from the closest drainage ditch.

8.2.4 Line Shack 131. There is a POL disposal area behind Line Shack 131. This area is about 100 feet from a drainage ditch.

8.2.5 Line Shacks 31-33. There is a POL disposal area on barren soil between Line Shacks 31-33 and the aboveground steam line to the west. The disposal area is about 800 feet from the closest drainage ditch.

8.3 WEST SIDE LANDFILL. A landfill used in the first years (1941-45) of base operations is located on the west side of the base, about 1,000 feet south of Site 1. It appears on a 1945 map of the base with the annotations: dump, dump pit, broken concrete, ditch being filled with debris (see Figure 8-3). By 1945, the site had been graded. It is likely that this site served as the station landfill during its early construction and is therefore likely to contain a large proportion of construction debris. Apart from the 1945 map there is no other information available about this site. Based on information in Table 5-1 and an assumption that the base in this period generated about a third of the hazardous wastes that it did in the 1946-84 period, this site can be expected to contain roughly 60 pounds of asbestos, 400 gallons of paints and thinners, and 24 pounds of pesticide residues.

8.4 SITE 4—BOUGAINVILLE MERCURY SPILL. Mercury from spills cleaned up at the new test cells (Buildings 1100 and 1102) was placed in boxes and carried to the Bougainville area for storage in 1975. Later (1983) when the boxes were discovered, they were carried to the Air Intermediate Maintenance Department. They are estimated to contain between 10 to 50 pounds of mercury. During the transfer, some mercury leaked

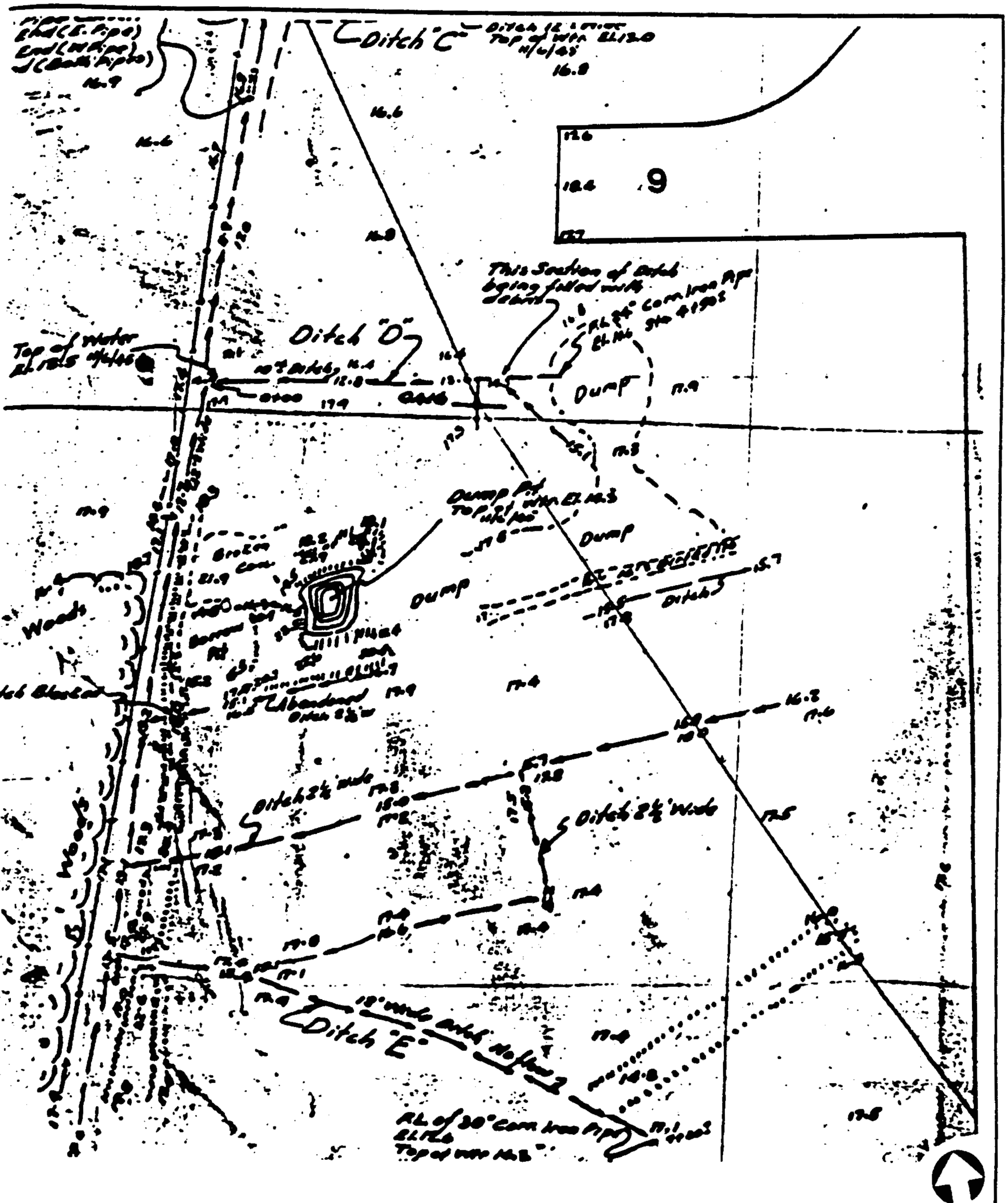



Figure 8-3
Site 3, West Side Disposal Landfill

Rogers, Golden & Halpern

**Initial Assessment Study**
Naval Air Station Oceana
Virginia Beach, Virginia

n the boxes. It is inferred that mercury may have been spilled at Bougainville during loading operation (Figure 8-4). Soil samples in the area were taken for testing in 4. The results reported by COMNAVFACENGCOM letter of 25 May 1984 to nmanding Officer Oceana indicate that there is no contamination at the site. Thus itional confirmation study of this site is not needed at this time.

**SITE 5 - OLD STATIC ENGINE TEST CELL MERCURY SPILL.** The old static engine cell was located in Building 305 and was in use from 1965 to about 1973 (Figure 8-5). control room and material stored in it are visibly contaminated with metallic rcury, and there is a potential for the area outside the control room also to be taminated.

tallic mercury from manometers was released when these manometers were broken or rpressurized. Approximately one pound of metallic mercury is visible in cracks on floor of the test cell control room, and there is a potential for additional mercury in soils outside the control room. Since the old test cell was in operation about the ne length of time as the new test cells and since there is no record of mercury cleanup the old test cell, an upper limit of 10-50 (lbs) mercury spilled at the old test cell is imated.

tallic mercury present in the confined area of the control room presents a potential zard to human health due to inhalation of mercury vapors. Uncurbed paved surfaces side the control room are sloped toward a soil that could be contaminated.

**SITE 6 - NAVY EXCHANGE MAINTENANCE BUILDING WASTE OIL DISPOSAL AREA.** ing the 1970s, about 15 gallons per year of motor oil were dumped on the ground next a fence adjacent to the Navy Exchange Maintenance Building 518 (Figure 8-6). hough the site, running for 25 feet along the fence, is visually unpleasant, it does not e a significant threat to ground or surface waters due to the low total volume of oil oosed of and its distance to drainage ditches.

**SITE 7 - FIFTH GREEN LANDFILL.** The station landfill used between 1954 and 1961 s located on four acres of land where the fifth hole of the base golf course is today gure 8-7). The landfill was used to dispose of solvents, pesticides, mixed municipal stes, construction debris, electrical conductors and transformers, and sanitary, otolab and non-hazardous hospital wastes. Wastes were burned and the residual buried. the early 1960s, the landfill was covered, graded, and planted to be reclaimed for reational use as part of the station golf course. Table 8-3 lists amounts of hazardous stes likely to be in the landfill based on information in Table 5-1. The figures shown ume that 10% of flammable substances survived burning. Based on recent retirement es of PCB transformers — approximately four, 320-gallon capacity units per decade — s estimated that obsolete or damaged transformers containing about 1,000 gallons of Bs were placed in the landfull over its lifetime.

**SITE 8 - NORTH STATION LANDFILL.** A landfill that served the North Station area d the construction activity of the new facilities in the 1950s was located about lfway between the end of Runway 32R and the intersection of Oceana Boulevard and ith First Colonial Road, along a construction access road (Figure 8-8). It covered out an acre and its use was terminated in 1954. The area is presently covered with shes and trees. Based on aerial photographs of the period before and during its use it pears to have been the site of a farmhouse that was demolished in the early 1950s. on afterward it may have been used as a borrow pit, which created the water-filled pression into which debris and refuse from the base was placed.

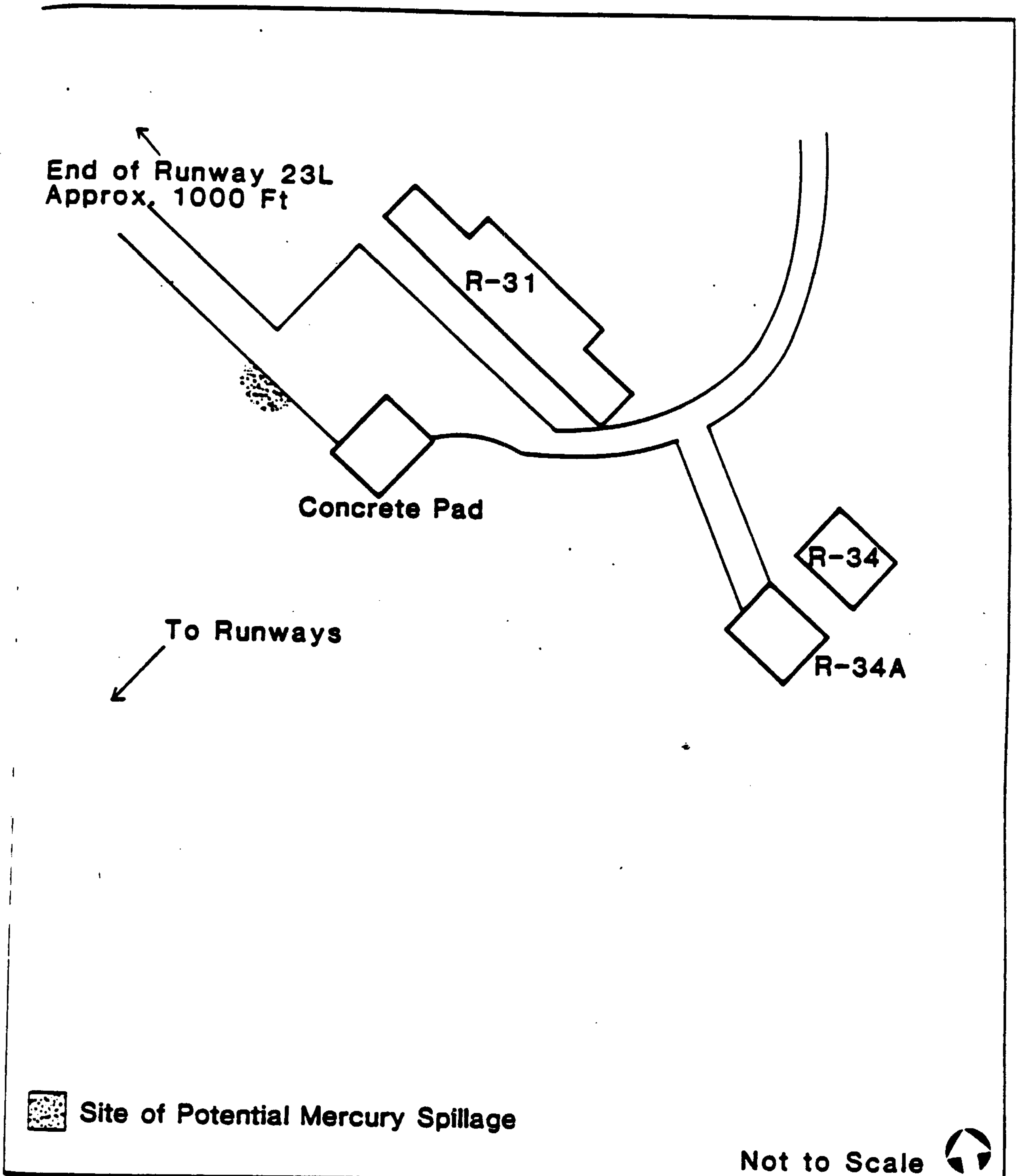



Figure 8-4
Site 4, Bougainville Mercury Spill

Rogers, Golden & Halpern

**Initial Assessment Study**
Naval Air Station Oceana
Virginia Beach, Virginia

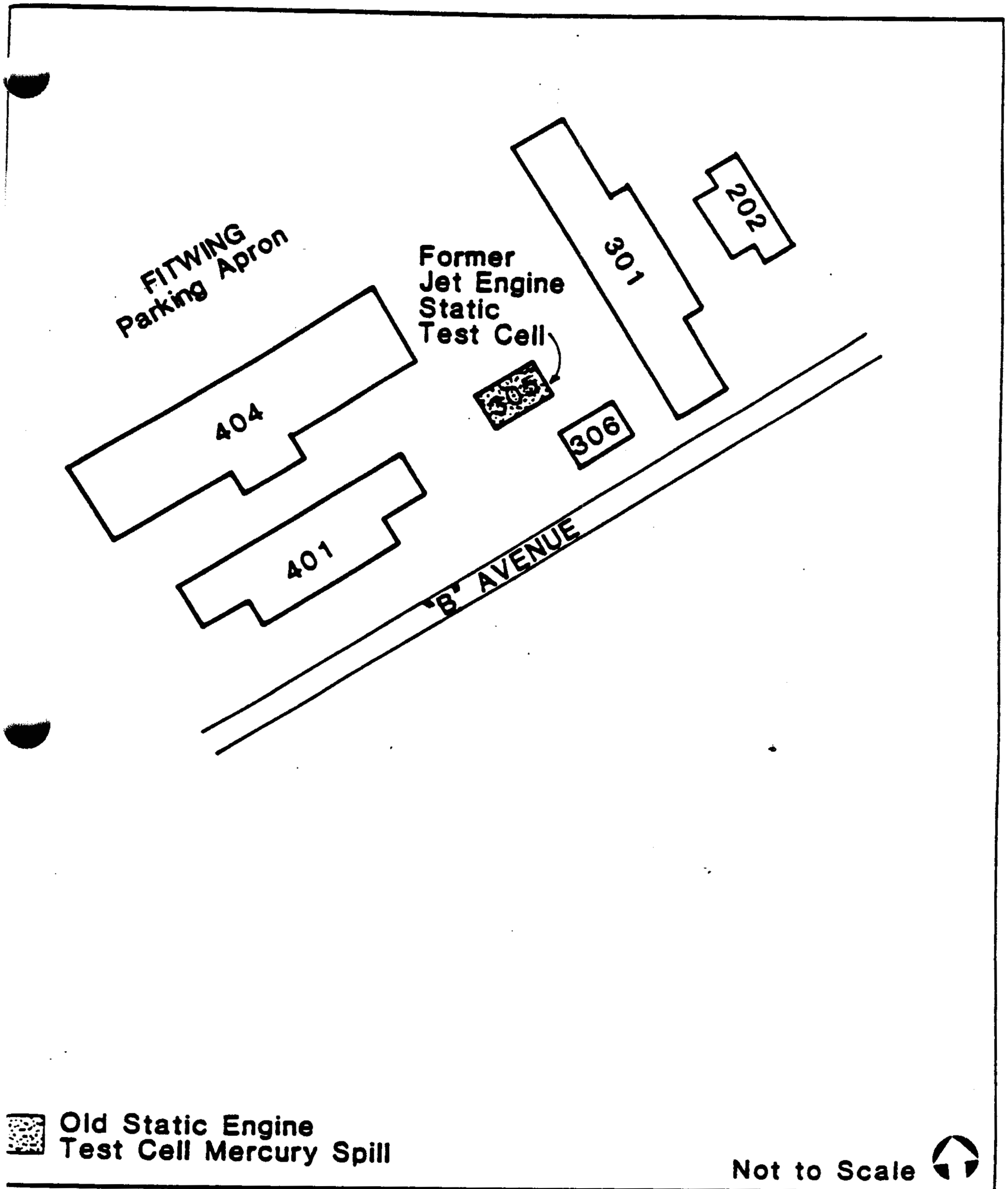



Figure 8-5
Site 5, Old Static Engine
Test Cell Mercury Spill

Rogers, Golden & Halpern

**Initial Assessment Study**
Naval Air Station Oceana
Virginia Beach, Virginia

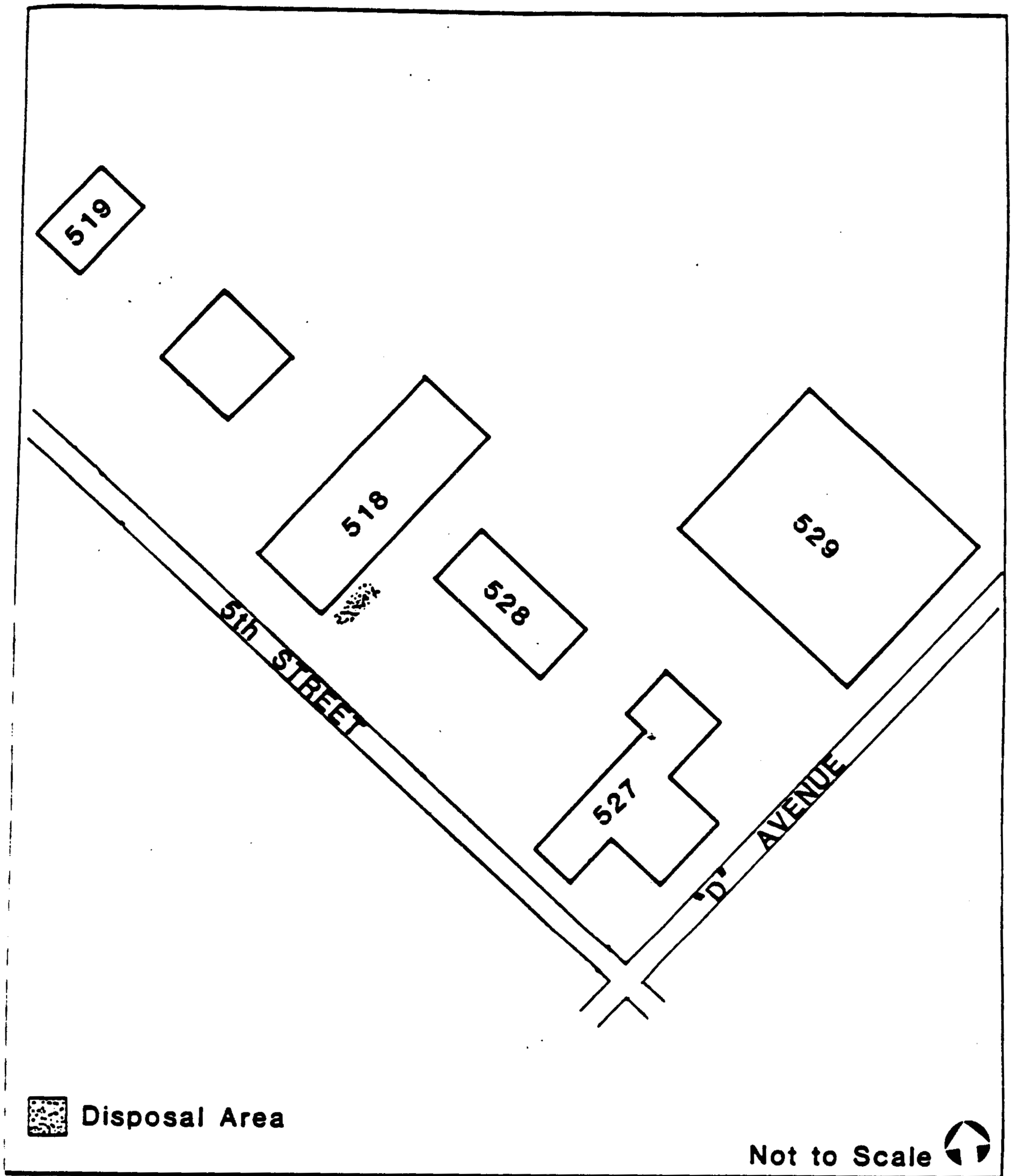



Figure 8-6

Site 6, Navy Exchange Maintenance Building Oil Disposal Area

Rogers, Golden & Halpern

**Initial Assessment Study**
**Naval Air Station Oceana**
**Virginia Beach, Virginia**

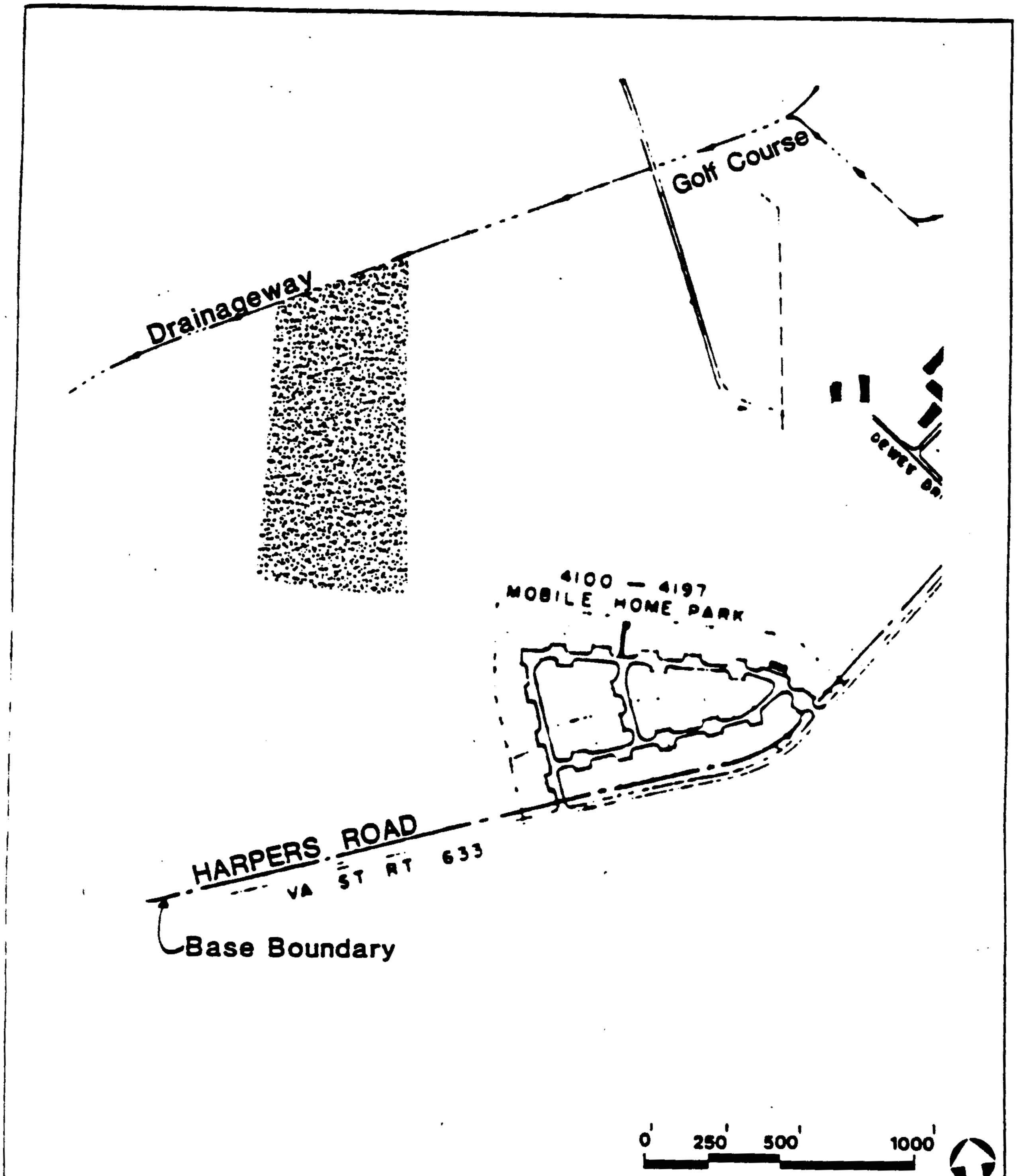



Figure 8-7
Site 7, Fifth Green Landfill

Rogers, Golden & Halpern

**Initial Assessment Study**
**Naval Air Station Oceana**
**Virginia Beach, Virginia**

Table 8-3

Hazardous Wastes Disposed in

the Fifth Green Landfill:

Residuals from Burning (1955-61)

| | |
|---|---|
| Asbestos | 1,400 lbs |
| Waste Paint and Thinner | 235 gal |
| Pesticide Residues | 11 lbs |
| Motor Oil | 51 gal |
| Dichlorodifluoromethane | 70 gal |
| PD 680 | 4 gal |
| Photo Lab Wastes (as Silver) | 4 lbs |

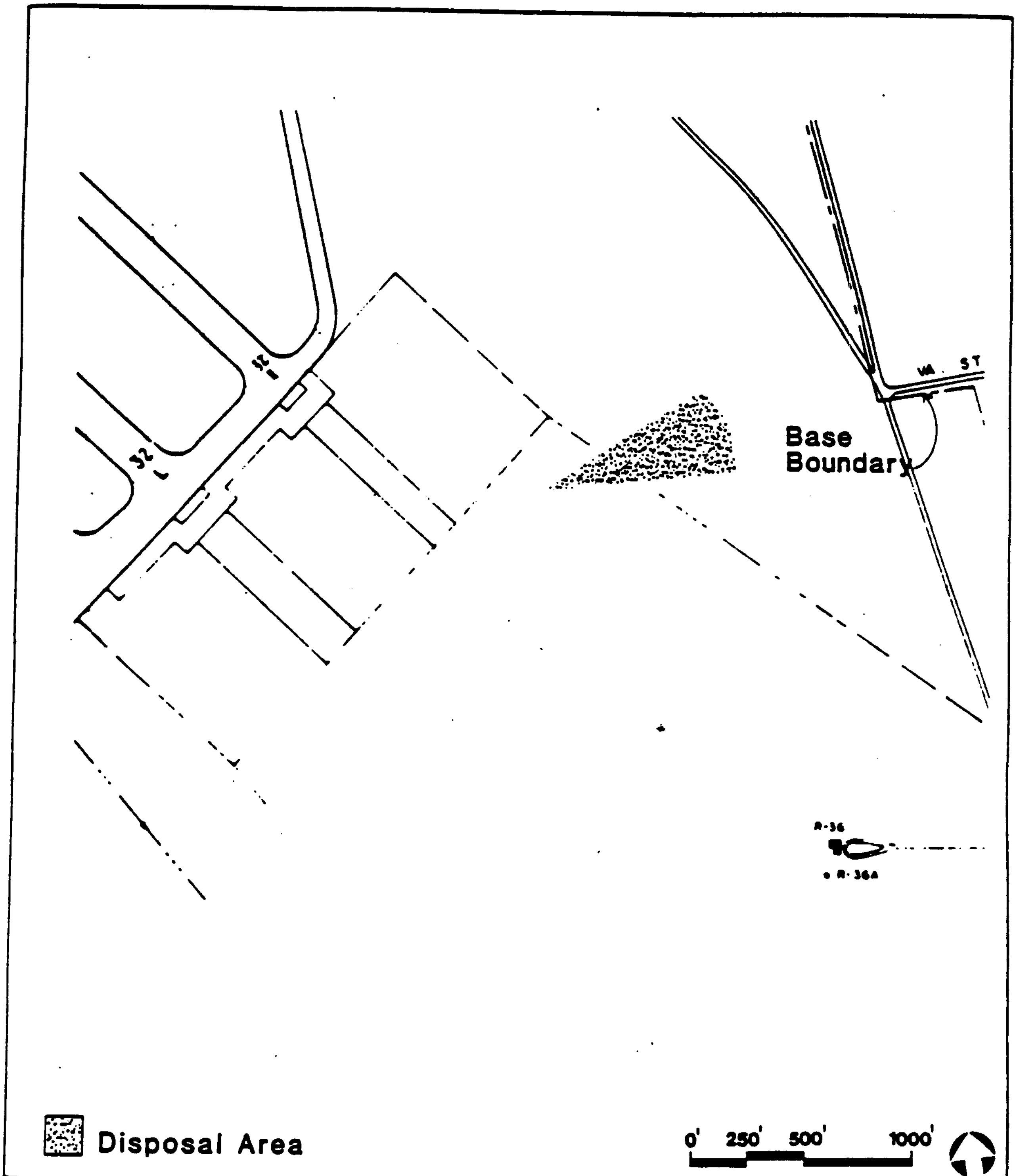



Figure 8-8
Site 8, North Station
Landfill

Rogers, Golden & Halpern

Initial Assessment Study
Naval Air Station Oceana
Virginia Beach, Virginia

Wastes thought to have been placed in the landfill include solvents, pesticides, construction debris, municipal wastes, electrical conductors and transformers, and sanitary, photolab, and non-hazardous hospital wastes. Table 8-4 lists the amount of hazardous wastes likely to be in the landfill based on information in Table 5-1. Based on recent retirement rates of PCB transformers — approximately four, 320-gallon capacity units per decade — it is estimated that obsolete or damaged transformers containing about 500 gallons of PCBs were placed in the landfill over its lifetime.

**8.9 SITE 9 - CONSTRUCTION STAGING AREA.** There is a one and one half acre area along London Bridge Road opposite the Weapons Department complex that has been used intermittently since the late 1950s as a construction staging area (Figure 8-9). Inspection revealed several hundred old bleached railroad ties, piles of large rusty iron plates, and buckets filled with iron plate fasteners. The old railroad ties were decayed and showed no signs of creosote. No hazardous wastes were noted.

**8.10 SITE 10 - AIR COMPRESSOR YARD.** Air compressors used for starting jet engines are operated and maintained by the Utilities Division of the Public Works Department. They are located across the taxiing lane from Line Shack 125 and were installed in 1973 (Figure 8-10). Until 1979, oil condensate from the compressed air was released to the ground just outside the compressor area. About 180 gallons per year of oil was disposed of in this manner. In 1979, a drain and oil separator was installed to catch the oil, but since the oil is released under pressure, oil in the separator was blown out. In 1981, a flow restrictor was installed to correct the blowout problem, but then the oil/water separator was found to have been installed with its tanks reversed. Finally, in 1983, the separator was reinstalled and is now functioning properly. Thus, about 1,800 gallons of oil were lost over a 10-year period. There is a JP-5 bowser resting on gravel just outside the compressor area. Overfilling and overflow due to fuel expansion in hot weather have resulted in the loss of fuel to the ground adjacent to the compressor yard.

**8.11 SITE 11 - FIRE FIGHTER TRAINING AREA.** The Fire Prevention Branch has used a part of abandoned Runway 18-36 on the west side of the base for fire fighting training exercises since the early 1960s (Figure 8-11). Two practice fires are lit each weekend, weather permitting. Until the mid-1970s, 50 to 75 gallons of waste fuel, oil, hydraulic fluid, and other aircraft maintenance chemicals including chlorinated and aromatic hydrocarbons were poured in the center of the runway, lit, then extinguished. Although a small fraction of the fuel remained unburned on the pad after the exercise, it was usually not enough to drain or be washed off the flat surface of the runway. In the mid-1970s, a fire pit was built consisting of an earthen berm, about 75 feet in diameter, resting directly on the runway. Due to the better containment provided by the fire pit, about 300 to 500 gallons of oily wastes per exercise is placed in the pit for burning. If the pit fills with water from the exercise or rainfall, it is pumped out from the pit bottom to prevent oil floating on its surface from escaping the confines of the berm.

The Fire Prevention Branch has used about 2,000 gallons or less of Aqueous Film Forming Fluid (AFFF) per year since 1969, mainly in its training exercises at the fire pit. Reportedly, most (over 80 percent) of the AFFF and the fuel is burned and/or swept into the air by updrafts created by the fire.

Based on the figures provided, it is estimated that 6,000 gallons of waste fuel and other chemicals per year were used in fire fighting training exercises between 1960 and 1975.

Table 8-4

Hazardous Wastes Disposed in the North Station Landfill (1951-54)

| | |
|---|---|
| Asbestos | 800 lbs |
| Waste Paint and Thinner | 1,000 gal |
| Pesticide Residues | 64 lbs |
| Motor Oil | 30 gal |
| Dichlorodifluoromethane | 10 gal |
| PD 680 | 5 gal |
| Photo Lab Wastes (as Silver) | 2 lbs |

d fiberglass. Conclusions of recently completed field investigations are provided low.

> The lens of fuel floating on the water table is somewhat mobile, gradually spreading outward from the Tank Farm area. Assuming that the leakage has been shut off, the lens will thin out, dispersing laterally. Lateral flow of floating fuel will continue until capillary forces equal those defined by the potential gradient. This equilibrium would be expected to occur within a few hundred feet of the perimeter fence under the observed conditions.
>
> It is possible that some of the pure fuel will discharge to the surface at some point downgradient from the Tank Farm before it achieves this equilibrium condition. Such discharge may be into the drainage ditch just south of the site, or into the swampy area immediately to the east. As of early 1984 there had not been any documented discharge of fuel.
>
> If it is not removed, the fuel in the ground at the Tank Farm will remain there for many years, gradually disipating as a result of natural volatilization, biodegradation, and dissolution. For the volume that apparently exists at the site, complete natural decomposition would probably take tens of years. During that period, the pure fuel will continue to be a source of dissolved fuel which will contaminate groundwater in the area. (R. E. Wright Associates, 1983)

**.14 SITE 14. FENTRESS LANDFILL.** At the Auxiliary Landing Field at Fentress, there as a three-acre landfill that was used from 1945 to 1970 (Figure 8-14). It is located ,500 feet north-northwest of the end of Runway 23. This landfill is thought to contain olvents, pesticides, construction debris, electrical conductors, and sanitary wastes. hese wastes were burned and then buried. The size and burn/bury disposal method are milar to that used at Oceana's Fifth Green Landfill and the waste generating activities re similar. Estimates of hazardous wastes in the Fentress Landfill (Table 8-5) are based n estimates snown in Table 8-3. It is estimated that less than 1,000 gallons of PCBs in iscarded transformers were placed in the Fentress Landfill.

**.15 SITE 15 - ABANDONED TANK FARM.** The Abandoned Tank Farm is located pproximately 300 yards east of the old CPO Club on the old North Station (Figure 8-15).

here are two concrete 50,000-gallon tanks (G5 and G6) that were formerly used to store viation gas during the operation of North Station. A number of smaller aboveground anks formerly stored kerosene and lube oils. At least two buried lines exist at the bandoned Tank Farm by which wash fluids from tanks and pipes were drained to waste. he 50,000-gallon tanks were emptied of fuel and filled with water with the decommisioning of North Station. Tank G-5 was later used to store waste oil and fuel which may ave included PD 680, naptha, and chlorinated and aromatic hydrocarbons, such as lichlorodifluoromethane, toluene, benzene, and their derivatives. It is no longer used for his purpose, but the tank is thought to still contain a foot of oily wastes, or about 5,000 jallons. Table 8-6 lists the estimated quantities of wastes in this tank.

Recent field investigations have shown that small amounts of fuel have leaked from either the tanks or buried pipeline and persist in the subsurface at the Abandoned Tank Farm (R. E. Wright Associates, 1983). There is no evidence, however, of any free

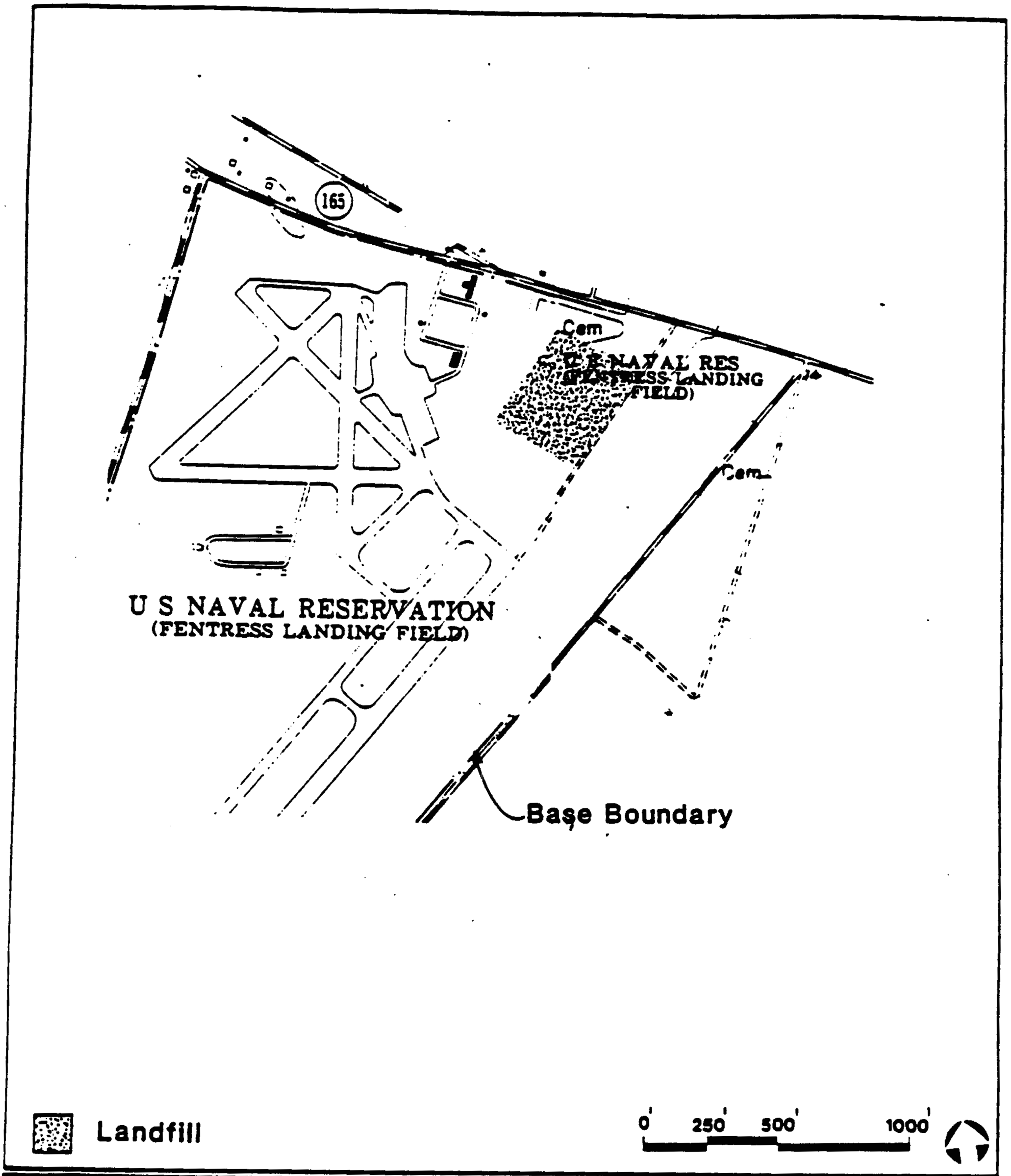



Figure 8-14
Site 14, Fentress Landfill

Rogers, Golden & Halpern

**Initial Assessment Study**
Naval Air Station Oceana
Virginia Beach, Virginia

**Table 8-5**

**Hazardous Wastes Disposed in the Fentress Landfill: Residuals from Burning (1945-70)**

| | |
|---|---|
| Asbestos | 1,050 lbs |
| Waste Paint and Thinner | 175 gal |
| Pesticide Residues | 10 gal |
| Lube Oils | 40 gal |
| Dichlorodifluoromethane | 55 gal |

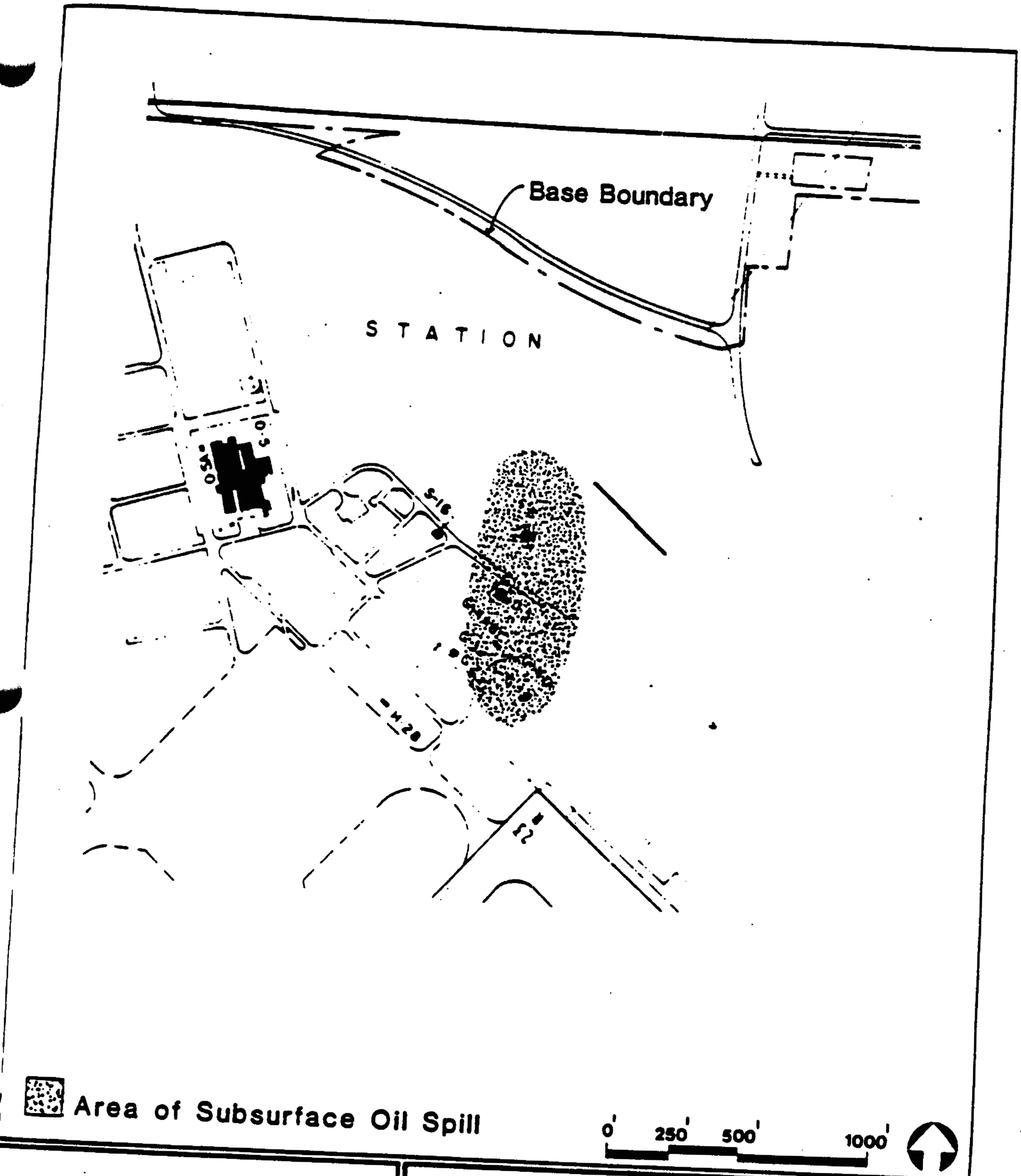



Figure 8-15
Site 15, Abandoned Tank Farm

Rogers, Golden & Halpern

**Initial Assessment Study**
Naval Air Station Oceana
Virginia Beach, Virginia

Table 8-6

Hazardous Wastes Disposed in

Tank A-5

| Hazardous Waste | Approximate Volume in Gallons |
|---|---|
| Waste Fuels, (JP-5, JP-3, AVGAS), Oils, and Hydraulic Fluid | 3,200 |
| Paints, Paint Thinners, Strippers, and Sludges | 320 |
| PD 680 | 1,000 |
| Naptha | 50 |
| B&D 3400 Engine Cleaner | 120 |
| Agitine | 10 |
| Trichlorotrifluoroethane | less than 1 |
| TOTAL | 5,000 |

roduct mobility. The relatively small amount of fuel which occurs in the subsurface ppears to be bound in the soil by capillary action. Fuel was observed both above and elow the water table and was probably dispersed in that manner by water table ıuctuations. Groundwater at the site generally flows north to northeast and discharges ıto nearby shallow drainage ditches that flow north toward Potters Road. It is likely nat ground water downgradient (north) from the site contains low levels of dissolved uel. However, in view of the small volume of subsurface fuel that was observed at the ite, the dissolved fraction in the groundwater is expected to be so low that it is probably ısignificant.

**.16 SITE 16 - PESTICIDE SHOP.** Between 1968 and 1982, when the Public Works azardous waste pickup program began, pesticide mixing tank rinse water was discharged o the ground around pesticide storage building (821) at the rear of the Public Works ompound on London Bridge Road. Figure 8-16 shows the location of the ground ontaminated by pestides. The pesticides used and thus suspected to be in the soils round the shop are 2,4-D, 2,4,5-T, baygon heptachlor, malathion, dustban, nibaryl, ıldrin, chlordane, bromacil, warfarin, and DDT. Typically 2,000 pounds of active ngredients of these pesticides were mixed for application each year. It is estimated hat 1 percent or less of the pesticides remained in the mixing tanks and were rinsed out o the ground. Thus, during the 15-year period when this practice occurred, less than 30 ounds (collectively) of the pesticides listed were discarded to the ground around uilding 821 in tank rinse water.

# Final

# lministrative Record

# al Air Station Oceana
# ginia Beach, Virginia

Reference:
Contract
N62470-89-D-4814

CTO-0021

May 1994

Prepared For:

**artment of the Navy**
**Atlantic Division**
**Naval Facilities**
**gineering Command**
Norfolk, Virginia

Under the

**TDIV CLEAN Program**

Baker Environmental, Inc

FOSTER WHEELER
FOSTER WHEELER ENVIRESPONSE, INC.

WESTON

Chapter 4

# SITE INVESTIGATIONS

This section describes the history, environmental setting, and investigative results at both sites studied during this investigation. For the Fentress Landfill, the chemical data obtained during this current investigation are presented along with the 1986 data to support recommendations for future action at this site. Recommendations for future actions at Site 17 are also presented.



## SITE 14--FENTRESS LANDFILL

### SITE HISTORY

The Fentress Landfill is located on approximately 3 acres of land directly north of the northeast end of the principal runway at Fentress (Figure 2). According to the IAS, the wastes discarded at this landfill include asbestos, solvents, oils, pesticide residue, and transformers containing an unknown amount of PCBs (RGH, 1984). Although the landfill is considered to be inactive, the site continues to be a place where construction debris and landscaping wastes are occasionally discarded. ) what is this based on?

### ENVIRONMENTAL SETTING

The site is now largely overgrown with a natural vegetative cover including mature trees and shrubs. The topography is generally flat except where drainage ditches are incised along the eastern and northern edges of the landfill. Water in the ditches flows perennially toward the northeast, away from the landfill. Eventually, the water in these ditches flows into a lowland area adjacent to the Albemarle and Chesapeake Canal of the Intercoastal Waterway (Figure 2).

stagnant sometimes

## FIELD ACTIVITIES

Field activities conducted at this site during this investigation included the installation and sampling of two shallow groundwater monitoring wells (14-MW6 and 14-MW7) and three deep wells (14-MW2D, 14-MW6D and 14-MW7D). Additional fieldwork involved the sampling of five existing shallow monitoring wells (14-MW1 through 14-MW5), and the sampling of surface water from two locations in the drainage ditch (14-SW1 and 14-SW2). The locations of all sampling points at this site are shown in Figure 4. All samples of both surface water and groundwater were analyzed for Target Compound List (TCL) and Target Analyte List (TAL) constituents (Table 1), EDB, total organic carbon (TOC), hexavalent chromium, chloride, sulfate, and alkalinity.



## INVESTIGATION RESULTS

### Water-Level Data

The results of water-level measurements in all 10 wells made on November 5, 1990, are presented in Table 2. The table also includes the water-level data from 1986. The 1990 water-level elevations from the seven shallow wells are contoured in Figure 5 to create a map of the water-table surface over this site. Similarly, the water-level data from the three deeper wells are contoured in Figure 6 to create a piezometric surface map of groundwater in the Yorktown Aquifer.

The water-level data from the shallow wells indicate that the general direction of near-surface groundwater flow is locally toward the northeast and the drainage ditch located in that part of the site. Likewise, deeper groundwater in the uppermost portion of the Yorktown Aquifer also tends to flow generally in a northeasterly direction, but under the influence of a much lower hydraulic gradient than in the overlying sediments. The data indicate that well locations 14-MW1 and 14-MW2 are, in general, hydraulically upgradient of the landfill, and the 14-MW7 cluster is located furthest downgradient.

**Table 2**
**FENTRESS LANDFILL**
**WATER-LEVEL DATA**

| Well | May 22, 1986 | | November 5, 1990 | |
|---|---|---|---|---|
| | Depth to Water (feet below survey Datum) | Water-Level Elevations (feet above mean sea level) | Depth to Water (feet below survey Datum) | Water-Level Elevations (feet above mean sea level) |
| 14-MW1 | 7.89 | 5.44 | 7.91 | 5.46 |
| 14-MW2 | 6.79 | 5.20 | 7.04 | 5.45 |
| 14-MW2D | -- | -- | 8.94 | 4.33 |
| 14-MW3 | 5.99 | 4.53 | 6.14 | 4.68 |
| 14-MW4 | 2.98 | 0.86 | 6.30 | 4.18 |
| 14-MW5 | 3.52 | 2.03 | 6.62 | 5.13 |
| 14-MW6 | -- | -- | 7.98 | 4.11 |
| 14-MW6D | -- | -- | 8.46 | 3.98 |
| 14-MW7 | -- | -- | 6.22 | 3.09 |
| 14-MW7D | -- | -- | 3.04 | 3.92 |

(--) Not applicable

WDCR520/068.51

Groundwater discharge to the drainage ditch northeast of the landfill is supported by the water-level data from the 14-MW7 well cluster. The difference in water levels in the two wells at this location indicate that the vertical component of hydraulic gradient is upward locally. As a result, groundwater in the vicinity of these wells tends to flow upward as well as laterally toward the northeast. The difference in water levels at the other two well clusters (14-MW2 and 14-MW6) indicate that the vertical component of hydraulic gradient is locally downward. These results are consistent with the fact that there are no obvious areas of potential groundwater discharge (i.e., perennial surface-water features) in the vicinity of these two well clusters.

**Chemical Data**

The values of the groundwater parameters (i.e., temperature, electrical conductivity, and pH) which were measured in the field during sampling are presented for both sites in Appendix B. The results of organic analyses in both groundwater and surface water from 1986 and this study are presented in Table 3. The results of inorganic analyses for the same samples and studies are presented in Table 4. In general, only detected constituents are listed in these tables. Appendix C contains a complete listing of all of the laboratory data obtained during this investigation.

The data from both this investigation and the 1986 study (CH2M HILL, 1986) indicate that the concentrations of most of the analyzed parameters were, in general, either (1) not detected, (2) below accurately quantifiable detection limits, or (3) detected at levels not significantly different than the laboratory blank (i.e., a difference of less than a factor of ten). However, the analytical data suggest that the landfill contents have caused an increase in the dissolved concentration of some of the major ions in the shallow groundwater at the site. Groundwater downgradient from unlined landfills without leachate collection systems such as the Fentress Landfill, typically have elevated levels of dissolved ions as a result of precipitation percolating through buried refuse. The inorganic data (Table 4) indicate that the dissolved concentration of sulfate, chloride, potassium, manganese, and magnesium are generally higher in the shallow wells that are hydraulically downgradient of at least some portion of the landfill. The lowest concentrations of these ions were detected in the two most-upgradient wells (14-MW1 and 14-MW2). The data also indicate that with the exception of calcium, the increased concentration of these ions is generally limited to the shallow wells. Data from the deeper wells do not show an apparent trend in the concentration of dissolved ions between upgradient and downgradient wells.

In addition to the increased concentrations of some of the principal ions, it is important to note that the dissolved concentrations of zinc in five of the wells exceed the Virginia groundwater standard of 50 micrograms per liter ($\mu g/l$) set by the Virginia State Water Control Board (Virginia Code, Section 62.1-44.15(3)). However, all of these zinc concentrations are well below the national secondary drinking water standard of 5,000 $\mu g/l$ set under the federal Safe Drinking Water Act. There is no obvious trend in zinc concentrations between upgradient and downgradient wells, which suggests that the concentrations are independent of the landfill and may be attributed to natural background conditions.



## RECOMMENDATIONS

The chemical data from both groundwater and surface water sampling at this site suggest that past waste disposal at this landfill has not resulted in hazardous contaminants entering the groundwater at least since 1986. As a result, this site should not be included within the scope of work of future IRP activities at Fentress. In addition, both the Solid Waste and the Superfund Divisions of the Virginia Department of Waste Management have stated that they would not anticipate requesting further action at a site such as this one as long as the U.S. Environmental Protection Agency (EPA) is informed of the current conditions (Green, 1991; Modena, 1991). Meetings of the Technical Review Committee should be a suitable means of notifying the EPA.

However, in the absence of official concurrence by the EPA that no further action is warranted at this site, CH2M HILL recommends that the Navy continue to collect samples from each of the existing monitoring points annually for the next 2 years. Future monitoring would not need to include additional sampling points beyond those already established. If the results from each of the two sampling rounds indicate that the concentrations of detected chemicals have not increased significantly above the current data, then the sampling program should be terminated. The concentration that represents a significant increase should be determined for each constituent independently. If there is a significant increase in concentration of any analyzed constituent, then the continuation of the sampling program should be evaluated.

The Tidewater office of the State Water Control Board has stated that they do not have to be notified of the concentrations of dissolved zinc that exceed 50 $\mu g/l$ because the Department of Waste Management is the State agency with authority at a site such as this (Siduyla, 1991).



## SITE 17--FENTRESS FIREFIGHTING TRAINING AREA

### SITE HISTORY

Site 17 includes the Fentress firefighting training ring and its immediate surroundings. The site is located at the intersection of two abandoned runways in the northwestern corner of the facility (Figure 2). The ring is an active training area where jet fuel is ignited to teach firefighting skills to Navy personnel. Hasn't been used since March and is not planned to be used again.

### ENVIRONMENTAL SETTING

A new firefighting training ring has been designed all concrete oil water separator treatment of ~ before discharge.

The ring is situated on a concrete runway surface; as a result, the site is very flat. The ring has a diameter of approximately 50 feet, and is bounded by an earthen berm that

Construction complete in early 92

is roughly 18 inches high. Two of the four corners of the runway intersection where the ring is located are covered with grass: the other two corners are undeveloped and are generally wooded. Fires in the ring are extinguished with water, and it appears that following training exercises or heavy rain the ring may overflow toward the western corner. The soil in this portion of the site is visibly stained with an oily residue. At the northern corner, fuel has apparently been spilled directly onto the ground and hundreds of square feet of soil is heavily stained with petroleum-based products. Also, the vegetation is visibly stressed in this corner of the site.

## FIELD ACTIVITIES

The field activities conducted at this site consisted of the installation and sampling of four monitoring wells (17-MW1 through 17-MW4) and collecting six samples of near-surface soil (i.e., from approximately 12 to 18 inches below grade) immediately beneath areas visibly stained. The locations of all sampling points are shown in Figure 7. The groundwater samples were analyzed for VOCs, base neutral extractable organic compounds (BN), total petroleum hydrocarbons (TPH) and lead. The soil samples were analyzed for ignitability in addition to these parameters.

## INVESTIGATION RESULTS

### Water-Level Data

The results of the water-level measurements made in all four wells on August 10, 1990, are shown in Table 5. The water-level elevations in this table are contoured in Figure 8 to create a map of the water-table surface over this site. The data indicate that the principal direction of shallow groundwater flow at this site in August, 1990, was toward the west under the influence of a low hydraulic gradient. This conclusion is based on only the one round of water-level measurements in which the difference in water levels between wells is very low (i.e., the entire range is 0.19 feet). The absence of a large hydraulic gradient is consistent with the relatively flat local topography. Consequently, the direction of groundwater flow inferred by the water levels measured in August, 1990, is not necessarily representative of typical conditions at this site.

**Chemical Data**

The chemical data obtained from the four monitoring wells is presented in Table 6. Only those values that are above their respective detection limits are reported here. Complete chemical results are included in Appendix C. Where applicable, the concentrations of detected chemicals are compared against relevant federal and state water-quality standards in Table 7. The analytical results from the soil samples are presented in Table 8. As with the groundwater chemical data, only concentrations of detected chemicals in the soil are listed.

**Groundwater.** The data from 17-MW2 and 17-MW3 indicate that the concentrations of all of the analyzed parameters in these wells were either (1) not detected, (2) below accurately quantifiable detection limits, (3) detected at levels not significantly different from the laboratory blank, or (4) detected at levels not high enough to warrant concern (see Table 8). The water-level data indicate that neither of these two wells are currently downgradient from the fire ring or other obvious potential sources of contamination, and the chemical data are consistent with the locations of these two wells relative to the principal direction of the local hydraulic gradient in August 1990.

The data from both 17-MW1 and 17-MW4 indicate the presence of hydrocarbon contamination that has a chemical signature similar to fuel products. Although the contamination in these two wells is comprised of similar compounds at similar concentrations, the locations of these two wells relative to the direction of the local hydraulic gradient suggest that the contamination may originate from two different sources. Specifically, the water-level data indicate that 17-MW4 is directly downgradient of the fire ring, whereas 17-MW1 does not currently appear to be. The location of 17-MW1, however, is in the vicinity of the heavily oil-stained soil north of the fire ring. As a result, this stained soil is a potential source of the contamination in

Table 6
COMPOUNDS DETECTED IN GROUNDWATER AT FIREFIGHTING TRAINING AREA
(CONCENTRATIONS IN $\mu g/\ell$)

| Parameter | Detection Limit | 17-MW1 | 17-MW2 | 17-MW3 | 17-MW4 |
|---|---|---|---|---|---|
| Lead | 3 | $2.5^{J}$ | $1.6^{J}$ | 5.8 | $2.7^{J}$ |
| Total Petroleum Hydrocarbons | 60 | 770 | 190 | 240 | 640 |
| **Base Neutral Extractable Organics:** | | | | | |
| 2-Methylnapthalene | 10 | 110 | -- | -- | 55 |
| Napthalene | 10 | 120 | -- | -- | 70 |
| bis(2-ethylhexyl)phthalate | 10 | $12^{b}$ | $8^{b,J}$ | $26^{b}$ | -- |
| Di-N-buthylphthalate | 10 | -- | $3^{b,J}$ | -- | $4^{b,J}$ |
| **Volatile Organic Compounds:** | | | | | |
| Acetone | 10 | $41^{b}$ | $6^{b,J}$ | $8^{b,J}$ | $11^{b}$ |
| 2-butanone | 10 | 16 | -- | -- | -- |
| Ethylbenzene | 5 | 23 | -- | -- | 8 |
| Methylene Chloride | 10 | $3^{b,J}$ | $5^{b}$ | $5^{b}$ | $7^{b}$ |
| Carbon Disulfide | 5 | $2^{J}$ | -- | -- | -- |
| Toluene | 5 | 35 | -- | -- | 22 |
| 4-Methyl-2-Pentanone | 10 | $2^{J}$ | -- | -- | -- |
| Xylenes (total) | 5 | 140 | -- | -- | 44 |

J Estimated Value. Measured value was less than the accurately quantifiable detection limit.
b Compound found in laboratory blank as well as sample; sample concentration is less than 10 times blank concentration.
(--) Not detected

WDCR520/072.51

Table 7
CONTAMINANTS DETECTED IN GROUNDWATER AT FIREFIGHTING TRAINING AREA
COMPARED TO RELEVANT FEDERAL AND STATE WATER QUALITY STANDARDS
(Concentrations in $\mu g/l$)

| Chemical | Location Detected | Concentration Detected | MCL | MCLG | MCL (Proposed) | MCLG (Proposed) | Virginia Groundwater Standard |
|---|---|---|---|---|---|---|---|
| Lead | 17-MW3 | 5.8 | 50 | -- | 5 | Zero | 50 |
| Total Petrolum Hydrocarbons | 17-MW1 | 770 | -- | -- | -- | -- | 1,000 |
| | 17-MW2 | 190 | | | | | |
| | 17-MW3 | 240 | | | | | |
| | 17-MW4 | 640 | | | | | |
| Ethylbenzene | 17-MW1 | 23 | -- | -- | 700 | 700 | -- |
| | 17-MW4 | 8 | | | | | |
| Toluene | 17-MW1 | 35 | -- | -- | 2,000 | 2,000 | -- |
| | 17-MW4 | 22 | | | | | |
| Total Xylenes | 17-MW1 | 140 | -- | -- | 10,000 | 10,000 | -- |
| | 17-MW4 | 44 | | | | | |

MCL Safe Drinking Water Act. Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to any user of a public water system. Standards current as of April, 1990.
MCLG Safe Drinking Water Act. Maximum Contaminant Level Goal. A non enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety. Standards current as of April, 1990.
Virginia standards from Section 62.01-44.15(3) of the Code of Virginia as amended, effective June 12, 1986.
(--) No standard

WDCR520/073.51

OC-00134-03.13-03/01/91

Table 8
COMPOUNDS DETECTED IN SOIL AT THE FIREFIGHTING TRAINING AREA
(concentrations in $\mu g/kg$)

| Parameter | Detection Limit | 17-SS1 | 17-SS2 | 17-SS3 | 17-SS4 | 17-SS5 | 17-SS6 |
|---|---|---|---|---|---|---|---|
| Lead (mg/kg) | 9 | 65.6/15.2 | 12.8 | 10.5 | 12.5 | 16.9 | 12.2 |
| Total Petroleum Hydrocarbons (mg/kg) | 1.8-44 | 265/70 | 50.2 | 5.5 | 23 | 16.9 | 682 |
| Ignitability | NA | NI | NI | NI | NI | NI | NI |
| **Base Neutral Extractable Organics:** | | | | | | | |
| 1,4-Dichlorobenzene | 370 | $780^J/480^J$ | -- | -- | -- | -- | |
| 2-Methylnapthalene | 370 | --/-- | -- | -- | -- | $78^J$ | $7,900^J$ |
| Napthalene | 370 | --/-- | -- | -- | -- | -- | $5,700^J$ |
| **Volatile Organic Compounds:** | | | | | | | |
| Ethylbenzene | 6 | -- | -- | -- | -- | -- | $480^J$ |
| Bromomethane | 12 | -- | -- | -- | -- | -- | $660^{b,J}$ |
| Chloromethane | 12 | -- | -- | -- | -- | -- | $1,000^{b,J}$ |
| Toluene | 6 | -- | -- | 10 | -- | $2^J$ | 2,200 |
| Xylenes (Total) | 6 | -- | -- | $3^J$ | -- | -- | 4,100 |
| 1,1-Dichloroethane | 6 | -- | -- | $3^J$ | -- | -- | -- |
| 1,1,1-Trichloroethane | 6 | -- | -- | 7 | -- | $1^J$ | $270^J$ |

65.6/15.2 represents both sample value and field duplicate.

NA Not applicable
NI Non ignitable
J Estimated Value. Measured value was less than the accurately quantifiable detection limit.
b Compound found in laboratory blank as well as sample; sample concentration is less than 10 times blank concentration.
(--) Not detected

WDCR520/074.51

17-MW1; the fire ring and/or. its overflow are potentially responsible for the contamination detected in 17-MW4.

The comparison of detected contaminants against relevant water-quality standards in Table 8 indicates that the resulting concentrations are all within currently acceptable levels. The dissolved concentration of lead in 17-MW3, however, slightly exceeds the proposed Maximum Contaminant Level and the Maximum Contaminant Level Goal for this chemical.

**Soil.** In most of the soil samples very few of the analyzed compounds were detected. However, 17-SS6 did have significant levels of TPH, toluene, and total xylenes. This sample was collected beneath heavily oil-stained soil and the value of TPH in this sample (682 milligrams per kilogram, mg/kg) is almost 7 times the Virginia standard of guideline 100 mg/kg (Virginia Code, Section 62.1-44.15(3)). This sample was collected at a depth of at least 1 foot below the surface. The implication is that the TPH concentration from a sample at the ground surface directly within the visible contamination may be even higher. Currently, there are no federal standards applicable to the concentration of chemical constituents in soil.



## RECOMMENDATIONS

**Groundwater.** The water quality standards for the State of Virginia include an antidegradation policy for groundwater (VA 62.1-44.15(3)). The policy states that the concentration of all constituents which do not have a particular state standard (i.e., all chemicals except TPH, phenols, selected metals and certain pesticides) must be at or below natural occurring concentrations. In effect, any VOC or BN compounds reported above detection limits at this site violates this policy. Article 11 of the State Water Control Board Law, amended 1990, calls for the Board to be notified immediately when his policy is violated following the spill or discharge of oils to water. Accordingly, the Tidewater Regional office of the Water Control Board should be notified as soon as possible of the results of the groundwater sampling at this site

fuel spills in land or state waters
not fi...

(~~Siduyla~~ Sivdyla, 1991). CH2M HILL also recommends that a second round of samples be collected from all four monitoring wells at this site to confirm the values obtained in this study. The samples should be analyzed for lead, TPH, VOC, and BN compounds. The installation of additional monitoring wells is not recommended at this time.

**Soil.** The Tidewater Office of the State Water Control Board should be notified of the TPH concentrations detected at this site. A program to excavate all of the visibly contaminated soil should be developed and implemented. The excavated soil should be tested following the Toxicity Characteristic Leaching Procedure to establish whether it is a hazardous waste and to guide its proper disposal. The excavation program should also include confirmatory sampling to ensure that the TPH concentration within the remaining soil is within levels acceptable to the State.

WDCR520/060.51

However, in the absence of official concurrence by the EPA that no further action is warranted at this site, CH2M HILL recommends that the Navy continue to collect samples from each of the existing monitoring points annually for the next 2 years. Future monitoring would not need to include additional sampling points beyond those already established. If the results from each of the two sampling rounds indicate that the concentrations of detected chemicals have not increased significantly above the current data, then the sampling program should be terminated. The concentration that represents a significant increase should be determined for each constituent independently. If there is a significant increase in concentration of any analyzed constituent, then the continuation of the sampling program should be evaluated.

The Tidewater office of the State Water Control Board has stated that they do not have to be notified of the concentrations of dissolved zinc that exceed 50 $\mu$g/l because the Department of Waste Management is the State agency with authority at a site such as this (Siudyla, 1991).

## SITE 17--FENTRESS FIREFIGHTING TRAINING AREA

### SITE HISTORY

Site 17 includes the Fentress firefighting training ring and its immediate surroundings. The site is located at the intersection of two abandoned runways in the northwestern corner of the facility (Figure 2). At the time of this investigation, the ring was an active training area where jet fuel is ignited to teach firefighting skills to Navy personnel. According to LANTDIV personnel, the ring was closed in March 1991. A new ring with an oil-water separator was designed; however, the project had been cancelled as of June 1992.

### ENVIRONMENTAL SETTING

The ring is situated on a concrete runway surface; as a result, the site is very flat. The ring has a diameter of approximately 50 feet, and is bounded by an earthen berm that is roughly 18 inches high. Two of the four corners of the runway intersection where the ring is located are covered with grass; the other two corners are undeveloped and are generally wooded. Fires in the ring are extinguished with water, and it appears that following training exercises or heavy rain the ring may overflow toward the western corner. The soil in this portion of the site is visibly stained with an oily residue. At the northern corner, fuel has apparently been spilled directly onto the ground and hundreds of square feet of soil is heavily stained with petroleum-based products. Also, the vegetation is visibly stressed in this corner of the site.

## FIELD ACTIVITIES

The field activities conducted at this site consisted of the installation and sampling of four monitoring wells (17-MW1 through 17-MW4) and collecting six samples of near-surface soil (i.e., from approximately 12 to 18 inches below grade) immediately beneath areas visibly stained. The locations of all sampling points are shown in Figure 7. The groundwater samples were analyzed for VOCs, base neutral extractable organic compounds (BN), total petroleum hydrocarbons (TPH) and lead. The soil samples were analyzed for ignitability in addition to these parameters.

## INVESTIGATION RESULTS

### Water-Level Data

The results of the water-level measurements made in all four wells on August 10, 1990, are shown in Table 5. The water-level elevations in this table are contoured in Figure 8 to create a map of the water-table surface over this site. The data indicate that the principal direction of shallow groundwater flow at this site in August, 1990, was toward the west under the influence of a low hydraulic gradient. This conclusion is based on only the one round of water-level measurements in which the difference in water levels between wells is very low (i.e., the entire range is 0.19 feet). The absence of a large hydraulic gradient is consistent with the relatively flat local topography. Consequently, the direction of groundwater flow inferred by the water levels measured in August, 1990, is not necessarily representative of typical conditions at this site.

### Chemical Data

The chemical data obtained from the four monitoring wells is presented in Table 6. Only those values that are above their respective detection limits are reported here. Complete chemical results are included in Appendix C. Where applicable, the concentrations of detected chemicals are compared against relevant federal and state water-quality standards in Table 7. The analytical results from the soil samples are presented in Table 8. As with the groundwater chemical data, only concentrations of detected chemicals in the soil are listed.

**Groundwater.** The data from 17-MW2 and 17-MW3 indicate that the concentrations of all of the analyzed parameters in these wells were either (1) not detected, (2) below accurately quantifiable detection limits, (3) detected at levels not significantly different from the laboratory blank, or (4) detected at levels not high enough to warrant concern (see Table 8). The water-level data indicate that neither of these two wells are currently downgradient from the fire ring or other obvious potential sources of contamination, and the chemical data are consistent with the locations of these two wells relative to the principal direction of the local hydraulic gradient in August 1990.

OC-00179- 03.13- 06/01/92

**Table 6**
**COMPOUNDS DETECTED IN GROUNDWATER AT FIREFIGHTING TRAINING AREA**
**(CONCENTRATIONS IN $\mu g/\ell$)**

| Parameter | Detection Limit | 17-MW1 | 17-MW2 | 17-MW3 | 17-MW4 |
|---|---|---|---|---|---|
| **Lead** | 3 | $2.5^{J}$ | $1.6^{J}$ | 5.8 | $2.7^{J}$ |
| **Total Petroleum Hydrocarbons** | 60 | 770 | 190 | 240 | 640 |
| **Base Neutral Extractable Organics:** | | | | | |
| 2-Methylnapthalene | 10 | 110 | -- | -- | 55 |
| Napthalene | 10 | 120 | -- | -- | 70 |
| bis(2-ethylhexyl)phthalate | 10 | $12^{b}$ | $8^{b,J}$ | $26^{b}$ | -- |
| Di-N-buthylphthalate | 10 | -- | $3^{b,J}$ | -- | $4^{b,J}$ |
| **Volatile Organic Compounds:** | | | | | |
| Acetone | 10 | $41^{b}$ | $6^{b,J}$ | $8^{b,J}$ | $11^{b}$ |
| 2-butanone | 10 | 16 | -- | -- | -- |
| Ethylbenzene | 5 | 23 | -- | -- | 8 |
| Methylene Chloride | 10 | $3^{b,J}$ | $5^{b}$ | $5^{b}$ | $7^{b}$ |
| Carbon Disulfide | 5 | $2^{J}$ | -- | -- | -- |
| Toluene | 5 | 35 | -- | -- | 22 |
| 4-Methyl-2-Pentanone | 10 | $2^{J}$ | -- | -- | -- |
| Xylenes (total) | 5 | 140 | -- | -- | 44 |

J Estimated Value. Measured value was less than the accurately quantifiable detection limit.
b Compound found in laboratory blank as well as sample; sample concentration is less than 10 times blank concentration.
(--) Not detected

WDCR520/072.51

Table 7
**CONTAMINANTS DETECTED IN GROUNDWATER AT FIREFIGHTING TRAINING AREA COMPARED TO RELEVANT FEDERAL AND STATE WATER QUALITY STANDARDS**
**(Concentrations in $\mu g/l$)**

| Chemical | Location Detected | Concentration Detected | MCL | MCLG | MCL (Proposed) | MCLG (Proposed) | Virginia Groundwater Standard |
|---|---|---|---|---|---|---|---|
| Lead | 17-MW3 | 5.8 | 50 | -- | 5 | Zero | 50 |
| Total Petrolum Hydrocarbons | 17-MW1 | 770 | -- | -- | -- | -- | 1,000 |
| | 17-MW2 | 190 | | | | | |
| | 17-MW3 | 240 | | | | | |
| | 17-MW4 | 640 | | | | | |
| Ethylbenzene | 17-MW1 | 23 | -- | -- | 700 | 700 | -- |
| | 17-MW4 | 8 | | | | | |
| Toluene | 17-MW1 | 35 | -- | -- | 2,000 | 2,000 | -- |
| | 17-MW4 | 22 | | | | | |
| Total Xylenes | 17-MW1 | 140 | -- | -- | 10,000 | 10,000 | -- |
| | 17-MW4 | 44 | | | | | |

MCL Safe Drinking Water Act. Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to any user of a public water system. Standards current as of April, 1990.
MCLG Safe Drinking Water Act. Maximum Contaminant Level Goal. A non enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety. Standards current as of April, 1990.
Virginia standards from Section 62.01-44.15(3) of the Code of Virginia as amended, effective June 12, 1986.
(--) No standard

OC-00179-03.13-06/01/92

**Table 8**
**COMPOUNDS DETECTED IN SOIL AT THE FIREFIGHTING TRAINING AREA**
**(concentrations in μg/kg)**

| Parameter | Detection Limit | 17-SS1 | 17-SS2 | 17-SS3 | 17-SS4 | 17-SS5 | 17-SS6 |
|---|---|---|---|---|---|---|---|
| Lead (mg/kg) | 9 | 65.6/15.2 | 12.8 | 10.5 | 12.5 | 16.9 | 12.2 |
| Total Petroleum Hydrocarbons (mg/kg) | 1.8-44 | 265/70 | 50.2 | 5.5 | 23 | 16.9 | 682 |
| Ignitability | NA | NI | NI | NI | NI | NI | NI |
| **Base Neutral Extractable Organics:** | | | | | | | |
| 1,4-Dichlorobenzene | 370 | 780[J]/480[J] | -- | -- | -- | -- | |
| 2-Methylnapthalene | 370 | --/-- | -- | -- | -- | 78[J] | 7,900[J] |
| Napthalene | 370 | --/-- | -- | -- | -- | -- | 5,700[J] |
| **Volatile Organic Compounds:** | | | | | | | |
| Ethylbenzene | 6 | -- | -- | -- | -- | -- | 480[J] |
| Bromomethane | 12 | -- | -- | -- | -- | -- | 660[b,J] |
| Chloromethane | 12 | -- | -- | -- | -- | -- | 1,000[b,J] |
| Toluene | 6 | -- | -- | 10 | -- | 2[J] | 2,200 |
| Xylenes (Total) | 6 | -- | -- | 3[J] | -- | -- | 4,100 |
| 1,1-Dichloroethane | 6 | -- | -- | 3[J] | -- | -- | -- |
| 1,1,1-Trichloroethane | 6 | -- | -- | 7 | -- | 1[J] | 270[J] |

65.6/15.2 represents both sample value and field duplicate.

NA Not applicable
NI Non ignitable
[J] Estimated Value. Measured value was less than the accurately quantifiable detection limit.
[b] Compound found in laboratory blank as well as sample; sample concentration is less than 10 times blank concentration.
(--) Not detected

WDCR520/074.51

The data from both 17-MW1 and 17-MW4 indicate the presence of hydrocarbon contamination that has a chemical signature similar to fuel products. Although the contamination in these two wells is comprised of similar compounds at similar concentrations, the locations of these two wells relative to the direction of the local hydraulic gradient suggest that the contamination may originate from two different sources. Specifically, the water-level data indicate that 17-MW4 is directly downgradient of the fire ring, whereas 17-MW1 does not currently appear to be. The location of 17-MW1, however, is in the vicinity of the heavily oil-stained soil north of the fire ring. As a result, this stained soil is a potential source of the contamination in 17-MW1; the fire ring and/or its overflow are potentially responsible for the contamination detected in 17-MW4.

The comparison of detected contaminants against relevant water-quality standards in Table 8 indicates that the resulting concentrations are all within currently acceptable levels. **The dissolved concentration of lead in 17-MW3, however, slightly exceeds the proposed Maximum Contaminant Level and the Maximum Contaminant Level Goal for this chemical.**

**Soil.** In most of the soil samples very few of the analyzed compounds were detected. However, 17-SS6 did have significant levels of TPH, toluene, and total xylenes. This sample was collected beneath heavily oil-stained soil and the value of TPH in this sample (682 milligrams per kilogram, mg/kg) is almost 7 times the Virginia Guideline Standard of 100 mg/kg (Virginia Code, Section 62.1-44.15(3)). This sample was collected at a depth of at least 1 foot below the surface. The implication is that the TPH concentration from a sample at the ground surface directly within the visible contamination may be even higher. Currently, there are no federal standards applicable to the concentration of chemical constituents in soil.

## RECOMMENDATIONS

**Groundwater.** The water quality standards for the State of Virginia include an anti-degradation policy for groundwater (VA 62.1-44.15(3)). The policy states that the concentration of all constituents which do not have a particular state standard (i.e., all chemicals except TPH, phenols, selected metals and certain pesticides) must be at or below natural occurring concentrations. In effect, any VOC or BN compounds reported above detection limits at this site violates this policy. Article 11 of the State Water Control Board Law, amended 1990, calls for the Board to be notified immediately when his policy is violated following the spill or discharge of oils to water. Accordingly, the Tidewater Regional office of the Water Control Board should be notified as soon as possible of the results of the groundwater sampling at this site (Siudyla, 1991). CH2M HILL also recommends that a second round of samples be collected from all four monitoring wells at this site to confirm the values obtained in this study. The samples should be analyzed for lead, TPH, VOC, and BN compounds. The installation of additional monitoring wells is not recommended at this time.

OC-00179- 03.13 - 06/01/92

**Soil.** The Tidewater Office of the State Water Control Board should be notified of the TPH concentrations detected at this site. A program to excavate all of the visibly contaminated soil should be developed and implemented. The excavated soil should be tested following the Toxicity Characteristic Leaching Procedure to establish whether it is a hazardous waste and to guide its proper disposal. The excavation program should also include confirmatory sampling to ensure that the TPH concentration within the remaining soil is within levels acceptable to the State.

WDCR520/060.51

OC-00177-03.13-07/21/93

**DRAFT**

# SUPPLEMENTAL SITE INVESTIGATION REPORT
# SITE 14 - FENTRESS LANDFILL
# SITE 17 - FIREFIGHTING TRAINING AREA
# NAVAL AUXILIARY LANDING FIELD, FENTRESS, VIRGINIA

**CONTRACT TASK ORDER 0040**

**Prepared For:**

**NAVAL FACILITIES**
**ENGINEERING COMMAND**
**ATLANTIC DIVISION**
**Norfolk, Virginia**

**Under:**

**Contract N62470-89-D-4814**

**Prepared By:**

**FOSTER WHEELER ENVIRONMENTAL SERVICES**
**Livingston, New Jersey**

**Under the Direction of:**

**BAKER ENVIRONMENTAL, INC.**
**Coraopolis, Pennsylvania**

**JULY 21, 1993**

# EXECUTIVE SUMMARY

Foster Wheeler Enviresponse, Inc. (FWEI), as a member of the Baker Environmental, Inc. (BAKER) Team for the Navy CLEAN Program, conducted a Supplemental Site Inspection (SI) of Sites 14 and 17 at the Naval Auxiliary Landing Field (NALF), Fentress, Virginia. The specific objectives of the Supplemental SI were to: 1) collect and analyze a second round of groundwater samples from existing wells at Site 14; 2) delineate constituents of concern in soils at Site 17; 3) determine to what extent either site may pose a threat to human health and the environment; and, 4) determine the need for remedial action.

Data was obtained by execution of the Supplemental SI in accordance with the scope presented in the Implementation Plan and Fee Proposal (IP/FP) "Modification to CTO-0040 Additional Site Investigation Work", dated August 13, 1992 and the "Final Work Plan Addendum", dated April 26, 1993. Background information, which included results of previous investigations, was utilized to formulate the technical approach implemented during field activities.

During field activities groundwater samples were collected, soil gas samples were collected and analyzed in the field, and confirmatory soil samples were collected. Protocols for sample handling and management, laboratory quality assurance/quality control, and contaminated materials handling were employed in accordance with the site-specific work plans and are discussed in the technical approach section of the Supplemental SI report.

Results of the Supplemental SI were consistent with prior findings and conclusions. The second round of groundwater sampling and analysis at Site 14 revealed that constituents of concern were below federal and state maximum contaminant levels for groundwater quality. Soil screening at Site 17 revealed detectable vapor concentrations of volatile organic compounds (VOC) along the edges of the runway at that site. Confirmatory soil sampling analytical results at Site 17 indicated concentrations of total petroleum hydrocarbons (TPH) centered around soil gas samples with VOC concentrations, of up to 9,200 ug/g (parts per million).

Based on the results of the Baker Team investigation, it was recommended that a remedial action be conducted to remove soils contaminated with TPHs at Site 17. As part of this remedial action, a downgradient monitoring well should be monitored to measure the effectiveness of the remedial action in eliminating future impacts to the groundwater beneath Site 17. It was recommended that no further action be conducted at Site 14.

Final

# dministrative Record

# val Air Station Oceana
# rginia Beach, Virginia

Prepared For:

**partment of the Navy**
**Atlantic Division**
**Naval Facilities**
**gineering Command**
Norfolk, Virginia

Under the

**NTDIV CLEAN Program**

Reference:
Contract
N62470-89-D-4814

CTO-0021

May 1994

Baker
Baker Environmental, Inc.

FOSTER WHEELER
FOSTER WHEELER ENVIRESPONSE, INC.

WESTON

# 4.0 NATURE AND EXTENT OF CONTAMINATION

## 4.1 Nature of Contamination

### 4.1.1 Site 14-Fentress Landfill

Groundwater

Groundwater samples collected from ten monitoring wells were analyzed for VOCs, total metals, cyanide, alkalinity, chloride, hexavalent chromium, sulfate and total organic carbon (TOC). Samples were collected from seven shallow wells, MW-1 through MW-7, at depths ranging from 17 to 28 feet. Samples were collected from three deep wells, MW-2D, MW-6D, and MW-7D, at depths of 47, 55 and 56 feet, respectively. The analytical results for groundwater at Site 14 are presented in Tables 4-1, 4-2, and 4-3.

During data validation, the data qualifier indicated by the letter "J" was warranted indicating an estimated value. According to data validation guidelines there are several criteria for qualifying reported data as estimated which include: a compound being found in blanks, poor surrogate recoveries, compounds detected and reported below the Contract Required Detection Limit (CRDL), poor agreement of results between duplicate analysis and for all tentatively identified compounds (TICs). The letter "J" used next to a concentration indicates an estimated value, and that the analyte is present, but the reported value may not be accurate or precise.

Two VOCs, acetone and carbon disulfide were detected in the sample collected from monitoring well MW-2D. The maximum detected total VOC concentration in this sample was 58 ug/l which consisted of only acetone and carbon disulfide, two common laboratory solvents. Table 4-4 presents a summary of VOCs detected in groundwater at Site 14. Acetone was detected in groundwater sample MW-2D at a concentration of 47 ug/l. Carbon disulfide was detected in groundwater sample MW-2D at a concentration of 11.0 ug/l. At the present time there is no federal or Virginia Water Control Board (VWCB) groundwater standard for acetone or carbon disulfide. The presence of acetone maybe attributed to decontamination procedures, whereas carbon disulfide may have originated in the laboratory rather than an environmetal source.

Inorganic metals, including aluminum, arsenic, barium, calcium, iron, lead, magnesium, manganese, potassium, sodium, vanadium, and zinc were detected in all groundwater samples. Table 4-5 presents a summary of total metals detected in the groundwater at Site 14, the Virginia Groundwater Standards (VGSs), and federal Maximum

Contaminant Levels (MCLs). Metals were not detected above the VGSs or federal MCLs. Aluminum was detected in all 10 groundwater samples in concentrations ranging from 177 ug/l in sample MW-2 to 4,860 ug/l in sample MW-7. Arsenic was detected at 5.4J ug/l in sample MW-7 and 9.6 ug/l in sample MW-6.

Barium was detected in all 10 groundwater samples in concentrations ranging from 11.0 ug/l in sample 14MW-2 to 173 ug/l in sample MW-7, all below VGSs and federal MCLs. Calcium was detected in all 10 groundwater samples in concentrations ranging from 748 ug/l in the duplicate of sample MW-1 to 43,100 ug/l in sample MW-3, however there are no VGSs or federal MCLs for this metal.

Iron was detected in all 10 groundwater samples in concentrations ranging from 1,087 ug/l in the duplicate of sample MW-1 to 126,000 ug/l in sample MW-3. Total lead was detected in 8 of 10 groundwater samples in concentrations ranging from 1.1 ug/l in sample MW-1 to 4.0 ug/l in sample MW-6. None of the groundwater samples exceeded either VGSs or the federal MCL of 50 ug/l for dissolved lead in groundwater. Generally, the concentration of metals in unfiltered samples (total metals) are usually higher than in filtered samples.

Magnesium was detected in all 10 groundwater samples in concentrations ranging from 1,052 ug/l in the duplicate of sample MW-1 to 19,100 ug/l in sample MW-3. Manganese was detected in all 10 groundwater samples in concentrations ranging from 25 ug/l in the duplicate of sample MW-1 to 849 ug/l in sample MW-3. Potassium was detected in 4 of 10 groundwater samples in concentrations ranging from 2,940 ug/l in sample MW-3 to 21,100 ug/l in sample MW6C (MW6 duplicate).

Sodium was detected in 9 of 10 groundwater samples in concentrations ranging from 5,380 ug/l in sample MW-2 to 22,800 ug/l in sample MW-6. Vanadium was detected in 1 of 10 groundwater samples in a concentrations of 26 ug/l in sample MW-3. Zinc was detected in 6 of the 10 groundwater samples in concentrations ranging from 22 ug/l in sample MW-3 to 72.0 ug/l in sample MW-7D which are all below the VGS of 50 ug/l.

Inorganic analytes were detected in all 10 groundwater samples. These include alkalinity, as calcium carbonate, chloride, hexavalent chromium, and sulfate. Table 4-3 presents the analytical results for inorganic analytes and TOC in the groundwater at Site 14. Alkalinity as calcium carbonate was detected in 9 of 10 groundwater samples ranging from 5.0 J mg/l in groundwater sample MW-6 to 135 J mg/l in groundwater sample MW-6D. None of the samples exceeded VWCB recommended standard range of 30 to 500 mg/l. Chloride was detected in all 10 ...ndwater samples in concentrations ranging from 4.0 mg/l in groundwater sample MW-2 to 19.0 mg/l in MW-3. None of the samples exceeded the VGS of 50 mg/l for chloride in the Coastal Plain Province. Sulfate was detected in 7 of 10 groundwater samples in concentration ranging from 10 mg/l in groundwater sample MW-2 to 114 ug/l in MW-3. Three samples exceeded the VGS standard of 50 mg/l for sulfate in the Coastal Plain Province.

TOC was detected in all 10 groundwater samples in concentrations ranging from 1.0 J mg/l in groundwater sample MW-1 to 4.0 mg/l in groundwater samples MW-6, MW-6D, and MW-7. None of the samples exceed the federal MCL and VGS of 10 mg/l for TOC.

The analytical results indicate constituents of concern were not detected in groundwater above levels of concern, except for sulfate in three samples.

Surface Water

Surface water samples collected from three locations were analyzed for VOCs, TOC, and inorganic analytes except metals. The analytical results for surface water at Site 14 are presented in Tables 4-6 and 4-7. VOCs were not detected in any of the surface water samples. Tentatively Identified Compounds (TICs) were detected in surface water sample SW-102, at a concentration of 20.0 J ug/l.

Inorganic analytes were detected in all three surface water samples. Alkalinity as calcium carbonate was detected in all three surface water samples ranging from 20.0 J mg/l in samples SW-101 and SW-103 to 21.0 mg/l in sample SW-102. Chloride was detected in all three surface water samples in concentrations ranging from 11.0 mg/l in sample SW-101 to 18.0 mg/l in SW-102. Sulfate was detected in all three surface water samples in concentration ranging from 35.0 mg/l in sample SW-103 to 39.0 mg/l in SW-101.

TOC was detected in all 3 surface water samples in concentrations ranging from 3.0 mg/l in sample SW-103 to 11.0 mg/l in samples SW-101. Sample SW-101 slightly exceeded the federal MCL and VWCB groundwater standard of 10 mg/l for TOC.

The analytical data for one round of sampling indicate that there are no volatile organic compounds of concern at or above federal MCLs or VGS. Metals of concern were not detected in the groundwater at or above the MCLs or VGS. Inorganic analytes were not detected above regulatory levels. The data for one round of sampling indicate no VOCs, TOC or inorganic analytes exceeding the regulatory levels, except TOC in one well. Based on one round of limited sampling, analytical results indicate that groundwater at site 14 does not contain any of the above identified parameters at or above the regulatory levels. Therefore, groundwater does not seem to be contaminated by any of the above parameters.

sample 17SB-118 to 3,600 ug/kg in sample SB-103. Dibenzofuran was detected in 5 of 20 soil samples in concentrations ranging from 48 J ug/kg in sample SB-102 to 270 J ug/kg sample SB-103.

Fluorene was detected in 2 of 20 soil samples in concentrations ranging from 94 J ug/kg in sample SB-110 to 140 J ug/kg in samples SB-112. Phenanthrene was detected in 2 of 20 soil samples in concentrations ranging from 56 J ug/kg in sample SB-112 to 118 J ug/kg in sample SB-103. Fluoranthene was detected in sample SB-114 at a concentration of 66 ug/kg. Pyrene was detected in 2 of 20 soil samples in concentrations ranging from 45 J ug/kg in the duplicate of sample SB-114 to 48 J ug/kg in sample SB-110. Bis(2-ethylhexyl)phthalate was detected in 16 of 20 soil samples in concentrations ranging from 46 J ug/kg in sample SB-119 to 16,000 J ug/kg in the duplicate of sample SB-110. Benzo(b)fluoranthene was detected in the duplicate of soil sample SB-115 at a concentration of 54 J ug/kg.

The analytical results for TPHs are presented in Table 4-10. In three of the samples SB-107, SB-108 and SB-120 TPHs were not detected. In the remaining samples the concentrations ranged from 46 mg/kg in sample SB-114 to 5,800 mg/kg in sample SB-103. The highest TPH concentrations were detected in the following samples: SB-101 at a concentration of 1,200 mg/kg (ppm), SB-103 at 5,800 mg/kg, SB-104 at 1,400 mg/kg, SB-110 at 1,600 mg/kg, SB-111 at 2,700 mg/kg and SB-112 at 1,700 mg/kg. A total of 14 soil samples exceeded the Commonwealth of Virginia Water Control Board action level guidance of 100 mg/kg for TPH. The highest concentrations were detected north of the fire training location with the highest detected concentration at SB-103 of 5,800 mg/kg. Figure 4-2 presents the distribution of TPH concentrations for both sampling intervals 0-2 ft and 2-4 ft and their locations. These data are comparable to total BNA TICs reported for soil at this site. The laboratory did not analyze samples collected from SB-121 and SB-122 for TPH, and samples were not collected east of the fire training location.

The analytical results for lead in soils at Site 17 are presented in Table 4-11. Total lead was detected in all 20 soil samples at concentrations ranging from 5.6 J mg/kg in sample SB-113 to 227 J mg/kg in the duplicate of sample SB-114. Lead concentrations reported in sample SB-114 (36.4 J mg/kg) and its duplicate SB-115 (227.0 J mg/kg) have a high variance in the duplicate analyses, therefore values have been designated as estimated concentrations.

Analytical data from one round of soil sampling indicates the presence of TPHs at concentrations above the VWCB soil action level. Concentrations of the TPH in some of the soil samples are several orders of magnitude above action levels. High concentrations indicate that the soil has been contaminated by TPHs to the north and west of the runway intersection. Neither the vertical or horizontal extent of contamination have been defined. Other constituents of concern were not detected at or above their regulatory levels.

Groundwater

Groundwater samples were collected from four monitoring wells and were analyzed for VOCs, BNAs, TPHs and lead. The analytical results for groundwater at Site 17 are presented in Tables 4-13, 4-14, 4-15, and 4-16. Total VOCs were detected in each of the two monitoring wells and their duplicates at concentrations ranging from 86 ug/l in samples MW-6 a duplicate of MW-1 to 150 ug/l in MW-4. Table 4-18 presents a summary of the VOCs detected in groundwater at Site 17. Acetone was detected in groundwater sample MW-4 at a concentration of 11 ug/l. At the present time there is no federal or VGS groundwater standard for acetone.

Toluene was detected in 2 of 4 samples at concentrations ranging from 9.0 ug/l in the duplicate of sample MW-1 to 35 ug/l in sample MW-4 and the duplicate of MW-4. None of the samples exceeded the federal MCL of 1,000 ug/l for toluene. Ethylbenzene was detected in 2 of 4 samples in concentrations ranging from 14.0 ug/l in sample MW-4 to 17.0 ug/l in sample MW-1. None of the samples exceeded the federal MCL of 700 ug/l for ethylbenzene. Total xylenes were detected in 2 of 4 samples in concentrations ranging from 61 ug/l in the duplicate of sa- MW-1 to 92 ug/l in the duplicate of sample MW-4. None of the samples exceeded the federal MC for total xylenes. TICs were detected in 2 of 4 samples in concentrations ranging from 185 J ug/l i 1 to 214 J ug/l in sample MW-4.

BNAs were detected in all 4 groundwater samples, with detectable total concentrations ranging from 5J ug/l in sample MW-3 to 90 ug/l in sample MW-4. These include isophorone, naphthalene, 2-methylnaphthalene, acenaphthalene, fluorene, and bis(2-ethylhexyl)phthalate. A summary of BNAs detected in groundwater at Site 17 are presented in Table 4-17.

Isophorone was detected in the duplicate of sample MW-4 at a concentration of 1.0 J ug/l. Naphthalene was detected in 2 of 4 samples in concentrations ranging from 14.0 ug/l in sample MW-1 to 59 ug/l in sample MW-4. In 2 of 4 samples, 2-methylnaphthalene was detected in concentrations ranging from 8 J ug/l in the duplicate of sample MW-4 to 22 ug/l in the duplicate sample MW-3. Acenaphthylene was detected in the duplicate of sample MW-4 at a concentration of 1.0 ug/l. In sample MW-1, fluorene was detected in the duplicate of sample MW-4 at a concentration of 1.0 J ug/l. Bis(2-Ethylhexyl)phthalate was detected in the four samples in concentrations ranging from 2.0 J ug/l in the duplicate of sample MW-4 to 16 J ug/l in sample MW-4. No federal MCLs exist for any of the detected BNAs. TICs were detected in 2 of 4 samples in concentrations ranging from 491 J ug/l in the duplicate of sample MW-4 to 639 ug/l in sample MW-1.

Four groundwater samples were analyzed for TPHs; only MW-1 was at a concentration of 2 mg/l which exceeds the VGS of 1 mg/l.

Total lead was detected in all 4 samples at concentrations ranging from 1.0 J ug/l in sample MW-1 to 9.70 ug/l in sample MW-3. None of the samples exceeded the federal MCL of 50 ug/l for dissolved lead in groundwater. Analytical results from one round of groundwater sampling indicate that VOCs were not detected above federal MCLs or VGS. Concentrations of BNAs detected in groundwater samples were low, indicating they are not a major environmental concern, although there are no federal MCLs or VGS for these compounds. One groundwater sample contained a TPH concentration of 2 mg/l which is above the VGS. Since the presence of TPHs in soil are significantly above action levels, soil may further contribute to contamination of groundwater. Lead was not detected above the MCL, indicating that groundwater may not be contaminated by this particular metal.

Analytical results from one round of groundwater sampling indicate that VOCs were not detected above federal MCLs or VGS. Concentrations of BNAs detected in groundwater samples were low, indicating they are not a major environmental concern, although there are no federal MCLs or VGS for these compounds. One groundwater sample contained a TPH concentration of 2 mg/l which is above VGS. Since the presence of TPH in soil are significantly above the action level, soil may further contribute to contamination of groundwater by these compounds. Other constituents of concern were not detected at or above levels of concern.

## 4.2 Extent of Contamination

### Site 14

Total VOCs, acetone and carbon disulfide were detected in groundwater samples collected from monitoring well 14-MW2D at concentrations of 47 ug/l and 11 ug/l, respectively. Both compounds are common laboratory solvents, plus acetone was used during decontamination. The presence of only these laboratory solvents in this sample may be attributable to either decontamination procedures or laboratory origin. Other constituents of concern were not detected at or above levels of concern.

### Site 17

The highest total VOCs were detected north of the fire training location. Concentrations are lower to the west, however samples to the east of the fire training area were not collected. Total VOCs were detected in soil samples at concentrations ranging from 2 J ug/kg to 921 J ug/kg. The highest levels of total VOCs were detected at SB-110. VOCs were detected at higher concentrations in the deep zone, 2 to 4 feet below land surface, than the shallow zone, which is 0 to 2 feet below land surface. Most of the VOCs were detected to the north of the runway intersection. Figure 4-1 provides the Total VOC Contour Map for the VOCs detected 2 to 4 feet below land surface. Total TICs were also found in soil samples at concentrations ranging from 178 J ug/kg to 24,700 J ug/kg. The highest levels of total VOC TIC's were detected at SB-103. Total VOC TICs were detected at higher concentrations in the shallow zone than the deeper zone. The highest concentration of total VOC TICs were also detected in the same area.

Total BNAs were detected in soil samples at concentrations ranging from 46 J ug/kg to 19,340 J ug/kg. The highest levels of total BNAs were detected at SB-110. BNAs were detected at higher concentrations in the deep zone than the shallow zone. TIC's detected during the BNA analysis were also found in soil samples at concentrations ranging from 9,100 J ug/kg to 312,700 J ug/kg. The highest levels of total BNA TIC's were detected at SB-103. Total BNA TIC's were detected at higher concentrations in the shallow zone than the deeper zone. Low level phthalate concentrations identified as a part of the BN compounds are attributed to sampling and laboratory contamination.

TPHs were detected in soil samples to the north and west of the intersection of the runway at concentrations above the Commonwealth of Virginia, Water Control Board action level guideline of 100 mg/kg. The highest concentrations were generally found in surficial soils which decreased with depth, except for samples SB-109/110 and SB-114/116. Figure 4-2 presents TPH concentrations in soils at site 17. The horizontal extent of TPH distribution cannot be determined without additional sampling. As indicated in Figure 4-2, sample SB-112/113 has a concentration of 1700/160 which would indicate that there is TPH in the surficial soils around that location. There is no TPH data available east or south of the fire training areas.

Lead was detected in all the soil samples. Lead was detected in the soil samples at concentrations ranging from 5.6J mg/kg to 227 J mg/kg. The highest level of lead was detected at SB-115. Lead was detected at higher concentrations in the shallow zone than the deeper zone.

Total VOCs were detected in the groundwater at concentrations ranging from 86 ug/l to 150 ug/l. None of the VOCs as indicated on Table 4-16 exceeded their respective federal MCLs. Total TIC's in the VOC fraction were found in the groundwater samples collected from 17MW-1 and 17MW-4 at concentrations of 185 J ug/kg to 214 J ug/kg, respectively.

Total BNAs were detected in the groundwater at concentrations ranging from 6 J ug/l to 90 ug/l. Total BNs were detected in all four wells. Low level phthalate concentrations identified as a part of the BN compounds are attributed to sampling and laboratory contamination.

Analytical data for soil samples indicate that the soil contains TPHs north and west of the runway intersection above levels of concern. TPHs were also detected in the well located north of the runway above the VGS. High TPH concentrations detected in the soil, specifically north of the runway intersection may eventually contribute to further groundwater contamination by TPHs.

Low level VOCs were detected north of the runway intersection. Other constituents of concern were not detected at or above levels of concern.

TPH were detected in three of the groundwater samples at a concentration of 2 mg/l each, which exceeded the VGS of 1 mg/l. Based on soil and groundwater analytical results, VOC, BNA, and TPH contaminants which are associated with petroleum distillates are present. TPHs are at high concentrations while the VOCs and BNAs are low.

Analytical data for one round of soil and groundwater sampling indicate that both media north of the runway intersection are contaminated with TPHs, and soil west of the runway intersection contains levels of TPHs above VWCB the soil action level. Low levels of VOCs and BNAs detected in the same area and the high levels of VOC TICs and BNA TICs are consistent with the findings of high TPH concentration in the soils.

Although the concentration of TPHs in groundwater (2mg/l) is only slightly above VGS, the high levels of TPHs in soil may eventually contribute to further groundwater contamination by TPH unless corrective actions are taken. To undertake corrective actions, the vertical and horizontal extent of TPH contamination will have to be delineated.

## 5.2 Recommendations

### Site 14

It is recommended that additional data be collected to determine the impact of the site to the surrounding environment. Additional data requirements are:

- Confirm the groundwater quality during the next round of groundwater sampling.
- Survey the existing monitoring well network so that the direction of groundwater flow can be verified.

### Site 17

Based on the analytical results for soil and the first round of groundwater sampling, VOCs and BNAs were detected at low levels, however TPHs in soil were found at significantly elevated concentrations. Additional data will be required to define the horizontal extent of VOC and TPH contamination in soils and their potential impact on groundwater. Round II of groundwater sampling will also be needed to confirm the first round. The following activities are recommended for this site:

- Survey the existing groundwater monitoring well network so that the direction of groundwater flow can be verified, and to construct groundwater contour maps.

# 5.0 CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Conclusions

### Site 14

Acetone and carbon disulfide were the only VOCs detected in groundwater samples, however their presence may be attributed to sources other than environmental such as decontamination of field equipment and laboratory use. Metals were not detected above their respective VWCB groundwater standards or federal MCLs where appropriate. Inorganic analytes did not exceed VWCB groundwater standards. TOC at 11 mg/l only exceeded the VWCB groundwater standard of 10 mg/l by 1 mg/l.

Based on the previous CH2M Hill, 1991 groundwater analytical data and limited groundwater sampling data during the SI at Site 14, groundwater does not contain any constituents of concern at or above federal MCLs or VGSs. In addition, it should be noted that several factors, such as groundwater transport of contaminants over time and leaching of soil contaminants could eventually contribute to groundwater contamination.

### Site 17

Low levels of VOCs were detected in soil samples to the north of the runway intersection. The highest levels of Total VOCs at 921 ug/l were detected at SB-110. VOCs were detected at comparatively higher concentrations in the deep zone, 2 to 4 feet below land surface, than the shallow zone, which is 0 to 2 feet below land surface. Total BNAs were also detected in the soil samples to the north of the runway intersection. The highest levels of Total BNAs were detected at SB-103. BNAs were also detected at higher concentrations in the deep zone than the shallow zone. TPHs were detected in soil samples to the north of the runway intersection at levels up to 5,800 mg/kg (SB-103). Thirteen soil samples had TPH concentrations above 100 mg/kg, the Commonwealth of Virginia Water Control Board action level guideline. Lead was detected in all soil samples, the highest being detected at SB-115. Lead was detected at higher concentrations in the shallow zone than the deeper zone.

VOCs were detected in and 17MW-4 at a concentration of 150 ug/l. These were acetone at 11 ug/l, toluene at 35 ug/l, ethylbenzene at 14 ug/l and total xylenes at 90 ug/l. VOCs were also detected in MW-1 at a concentration of 95 ug/l. These were toluene at 10 ug/l, ethylbenzene at 17 ug/l and total xylenes at 68 ug/l. The BTEX constituents are all below VWCB groundwater standards and federal MCLs.

Final

# ɫministrative Record

# ᷊al Air Station Oceana
# ·ginia Beach, Virginia

Reference:
Contract
N62470-89-D-4814

CTO-0021

May 1994

Prepared For:

**ɔartment of the Navy**
**Atlantic Division**
**Naval Facilities**
**ʒineering Command**
Norfolk, Virginia

Under the

**ɭTDIV CLEAN Program**

**ɪnprehensive Long-Term**

OC-00166-04.01- 11/03/93

CH2M HILL
Engineers
Planners
Economists
Scientists

November 3, 1993

HRO20368.P0.02

Mr. Jim Harris, P.E.
Atlantic Division, Code 1822
6500 Hampton Blvd.
Building A, Lafayette Annex
Norfolk, Virginia 23511-6287

Dear Jim:

Subject: Oceana Draft CMS Work Plan

Three draft Oceana CMS work plans addressing SWMUs 1, 2B, and 2C are enclosed. Two copies of this work plan have also been forwarded to Mr. Bullard at NAS Oceana.

This work plan contains a relatively detailed description of the nature and extent of contamination at each of the three SWMUs (Section 2). We felt this level of detail would allow the work plan to function more as a stand alone document and allow for an easier review by EPA. Please let me know what you think about this section.

If you have any questions with the information contained in the work plan please give a call at (703)471-6405 extension 4343.

Sincerely,

CH2M HILL

Stephen Romanow, P.E.
Project Manager

OC-00166-04.01-11/03/94



sr/

cc: Doug Dronfield, CH2M HILL (with enclosure)
Steven Brown, CH2M HILL (with enclosure)
Betsy Fristachi, LANTDIV (letter only)
Will Bullard, NAS Oceana (with enclosure)

OC-00162 - 04.01 - 11/23/93

CH2M HILL Engineers Planners Economists Scientists

November 23, 1993

HRO20368.P0.02

Mr. Jim Harris, P.E.
Atlantic Division, Code 1822
6500 Hampton Blvd.
Building A, Lafayette Annex
Norfolk, Virginia 23511-6287

Dear Jim:

Subject: Oceana Final Draft CMS Work Plan

Twenty final draft Oceana CMS work plans addressing SWMUs 1, 2B, and 2C are enclosed. Two copies of this work plan have also been forwarded to Mr. Bullard at NAS Oceana.

The comments received on the draft work plan have all been addressed in the document or discussed with you. If you have any questions with the information contained in the work plan please give a call at (703)471-6405 extension 4343.

Sincerely,

CH2M HILL

Stephen Romanow, P.E.
Project Manager

sr/
cc: Doug Dronfeld, CH2M HILL (with enclosure)
Steven Brown, CH2M HILL (with enclosure)
Betsy Fristachi, LANTDIV (letter only)
Will Bullard, NAS Oceana (with two enclosures)

OC-00160-04.01-12/14/93

(804) 322-4776

5090
1822:JFH:srw

DEC 14 93

Virginia Department of Environmental Quality
Attn: Ms. Erica Dameron
101 North Fourteenth Street
Richmond, Virginia 23219

Dear Ms. Dameron:

Enclosed please find four (4) copies of the Draft Final Work Plan Addendum for the Corrective Measures Study at Sites 1, 2B, and 2C at NAS Oceana, for your review and comment. We would like to receive comments by January 14, 1994. As discussed with Mr. Robert Stroud of the Environmental Protection Agency (EPA), this schedule is part of a joint effort by the Navy and the EPA to accelerate the RCRA process for sites where remedial action can be expedited. We invite the State to join in this effort to facilitate action at these sites.

Please call Mr. Jim Harris, RPM, at (804) 322-4776 if you have questions about the report or problems with the submittal date.

Sincerely,

N. M. JOHNSON, P.E.
Head
Installation Restoration Section
(North)
Environmental Programs Branch
Environmental Quality Division
By direction of the Commander

Enclosure

Copy to:
VDEQ (Mr. Steve Frazier)

Blind copy to:
1822 JFH
18S
F:\Admin\Typeout\STATELTR.JFH

CC-CC141-04.01-04/07/94

CH2M HILL Engineers Planners Economists Scientists

April 7, 1994

Mr. Jim Harris
LANTDIVFACENGCOM
Code 1822
1510 Gilbert Street
Norfolk, Virginia 23511-6299

MAE20368.L0.06

Navy contract number: N62470-90-C-7638, Delivery Order 19

Dear Jim,

Enclosed are five copies of the draft final Building 301 report. I also have sent two copies of the report to Will along with the IDW Management Plan that you received by Federal Express yesterday.. The draft final includes responses to the comments from you, Will, Sherri Eng of Code 1824, and NEHC. The construction personnel active with the BRAC program did not comment on the draft report, however, we added some important construction recommendations that I am sure they will want to consider.

Please call me at (703) 471-6405 extension 4322 when you have had a chance to review the report .

Sincerely,
CH2M HILL, Inc.

Steven R. Brown
Hydrogeologist

cc: Doug Dronfield/ CH2M HILL
Stephen Romanow/ CH2M HILL
Chris Bozzini/ CH2M HILL
Betsy Fristachi/ LANTDIV
Will Bullard/ NAS Oceana

301df-let

OC-00145-04.05-11/01/93

# Draft RCRA Work Plan Addendum for Corrective Measures Study at Sites 1, 2B, and 2C

## Oceana Naval Air Station
## Virginia Beach, Virginia



Prepared for

**ATLANTIC DIVISION NAVAL FACILITIES ENGINEERING COMMAND**
**Norfolk, Virginia**

Contract N62470-93-R-4072

Prepared by

CH2M HILL

November 1993

WDCR762/015.WP5/1

Section 2
# Facility Background

NAS, Oceana is located in the Tidewater region of Virginia as shown in Figure 2-1. The base lies southeast of Norfolk, immediately west of the Atlantic Ocean, and just south of the Chesapeake Bay in Virginia Beach. Oceana consists of approximately 6,000 acres within the city of Virginia Beach.

In November 1940, the U.S. Government purchased 328 acres of remote, swampy land for construction of a small auxiliary airfield. During World War II, asphalt runways were constructed and the base was expanded. By the fifties, the Navy Auxiliary Air Station had become too large to work as a subordinate to stations in the area, hence it was designated a Naval Air Station. Oceana then became an all-weather air station, and was eventually officially designated a master jet base. By 1976, five of the six Atlantic Fleet Carrier Air Groups were based at Oceana. The latter part of the 1970s also involved installation of numerous training operations at NAS, Oceana. Over the years, Oceana has grown to more than 16 times its original size and now encompasses 5,916 acres of land.

Several studies have been performed under the Installation Restoration (IR) program and the RCRA Corrective Action Program. For a summary of past studies, refer to the RFI (CH2M HILL, 1993) or RFI work plan (CH2M HILL, 1992).



## Site 1—West Woods Oil Pit

### Site Location and History

The West Woods Oil Pit is located in the northwest part of NAS Oceana, approximately 1,000 feet west of abandoned Runway 9 and the fire fighting training area (see Figure 2-2). According to the initial assessment study (IAS), the site was originally an open pit in which an estimated 110,000 gallons of waste oil, fuels (such as JP-5, JP-3, and AVGAS), PD 680, various chlorinated and aromatic hydrocarbons (trichlorotrifluoromethane, benzene, toluene, and naphtha), aircraft-maintenance chemicals, paints, paint thinners and strippers, and agitine were disposed of from the mid-1950s to the late 1960s (RGH, 1984). Drilling at this site has also shown that metal, concrete, and other debris were also disposed of in the pit or were included in the fill material. On the basis of a 1958 aerial photograph of the site, the pit appears to have been approximately 50 to 100 feet in diameter.

In the late 1960s, the pit flooded and its contents are believed to have washed into the drainage ditch 100 feet west of the oil disposal pit. As a result, waste disposal ceased and the pit was filled with soil (RGH, 1984). The NAS boundary is approximately 1,000 to

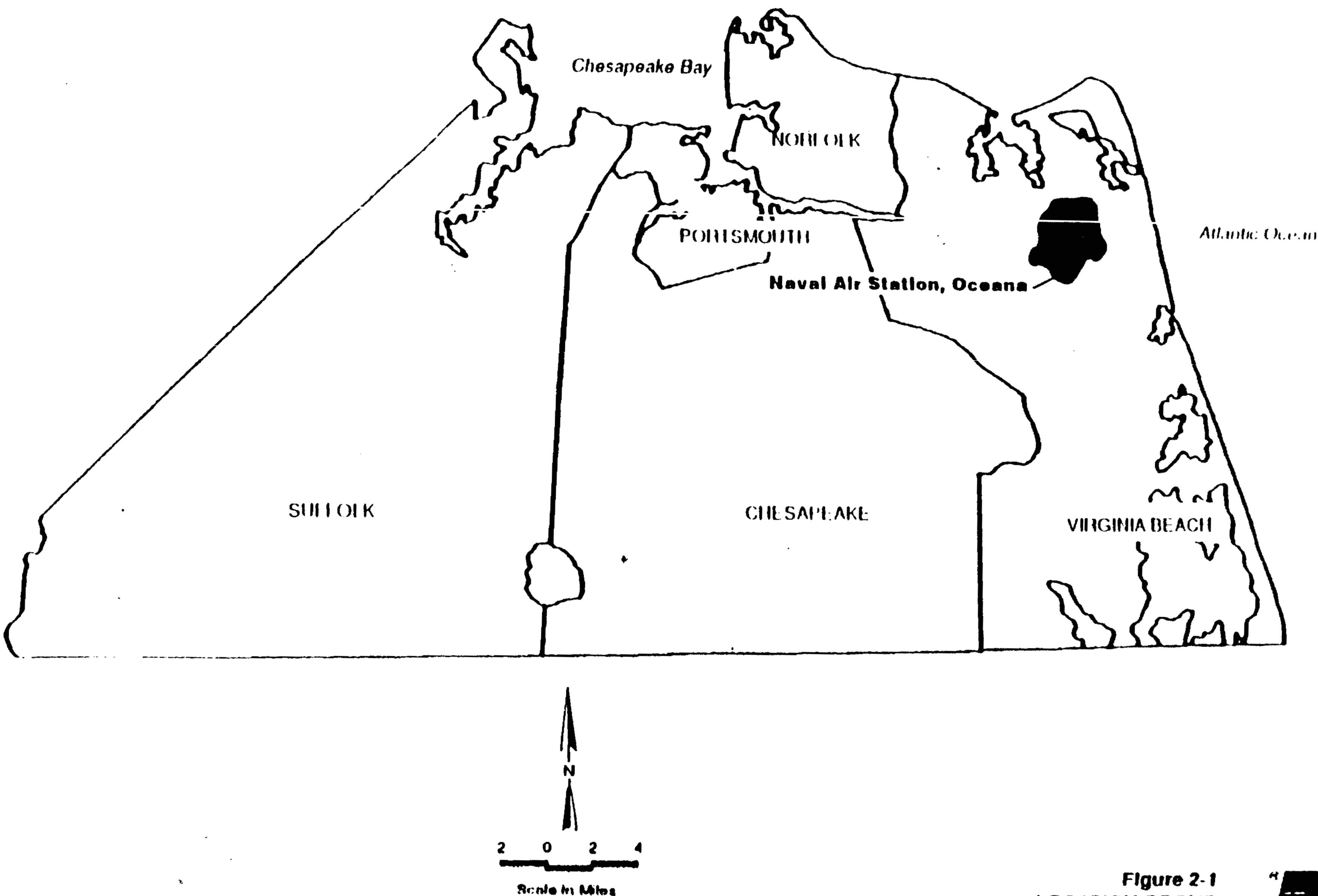



Figure 2-1
LOCATION OF THE
NAVAL AIR STATION, OCEANA

CH2M HILL

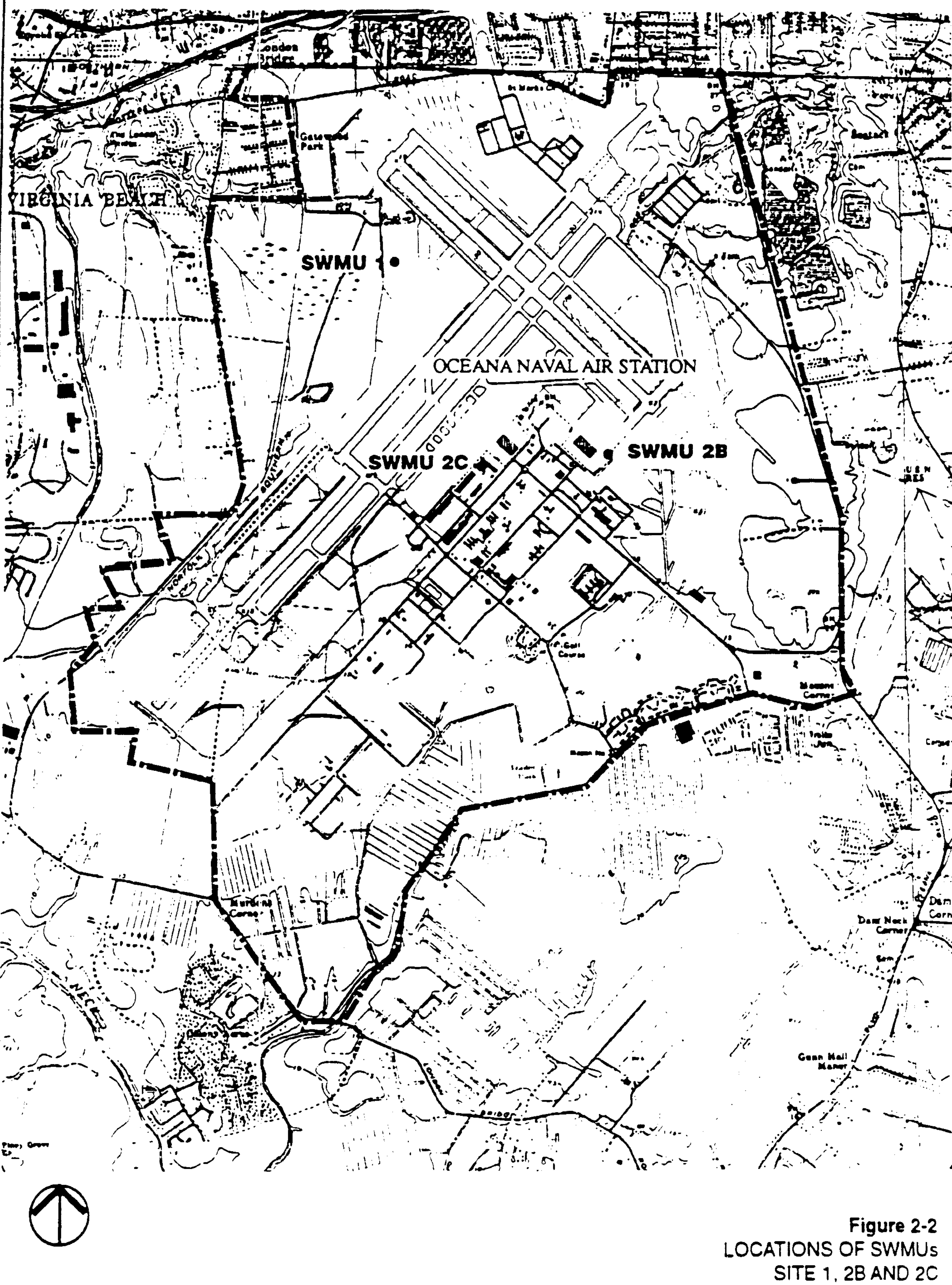



Figure 2-2
LOCATIONS OF SWMUs
SITE 1, 2B AND 2C
RCRA Facility Investigation–Naval Air Station, Oceana

2,000 feet west or northwest of the oil pit. The NAS Oceana Environmental Division monitors the ditch downstream of Site 1 as part of the station's Virginia Pollution Discharge Elimination system (VPDES) monitoring program.

The IAS describes another ditch which was approximately 1,000 feet long that connected Runway 9 to the oil disposal pit; however, this ditch was not visible in 1971 air photos and no evidence of the ditch was found in a 1984 field check or in later investigations. This ditch has not been located in subsequent investigations and no contamination associated with it has been identified.

## Past Investigations and RFI Activities

Site 1 has been investigated on three previous occasions prior to the RFI. The IAS conducted in 1984 identified this site and inventoried the types of waste liquids disposed in the pit. In 1986, CH2M HILL conducted a Phase I Verification Study, which was followed by the Interim RFI in 1991. These two investigations showed that the groundwater is primarily contaminated locally with compounds associated with petroleum hydrocarbons (TPH). Sediment samples taken from the drainage ditch to the west of the former West Woods Oil Pit contained petroleum constituents.

The purpose of the RFI field investigation was to determine the vertical and the lateral extent of groundwater contamination, and the hydraulic characteristics and flow regime of the shallow aquifer. This investigation also sought to characterize the type and extent of soil contamination in the vicinity of the pit, to confirm earlier data on the contamination of the surface water and sediment, and to determine if sediment and surface water contamination extends as far as the culvert 1,000 feet downstream from the area adjacent to the pit.



## Contamination and Extent

### *Soils*

During the RFI, fifteen soil borings were advanced to the depth of the water table and sampled on 2-foot intervals. The split spoon samples were screened with an OVA and samples from nine borings were submitted to the laboratory for analysis. No samples from the first six soil borings (1-SB1 to SB6) were submitted for laboratory analysis; instead, these borings were used for early qualitative characterization. Figure 2-3 displays the soil boring locations.

The soil boring program demonstrated that there is soil contamination in the center of the site from boring 1-SB9 on the south to boring 1-SB12 on the north, but that contamination is limited on the east in 1-SB5 and 1-SB8 and in the south in 1-SB14 and 1-SB15. The primary contaminants detected were fuel-related semivolatiles and volatiles. Some trace amounts of PCBs and pesticides were also detected at some locations. The distribution of

OC-00145-04.05-11/01/93

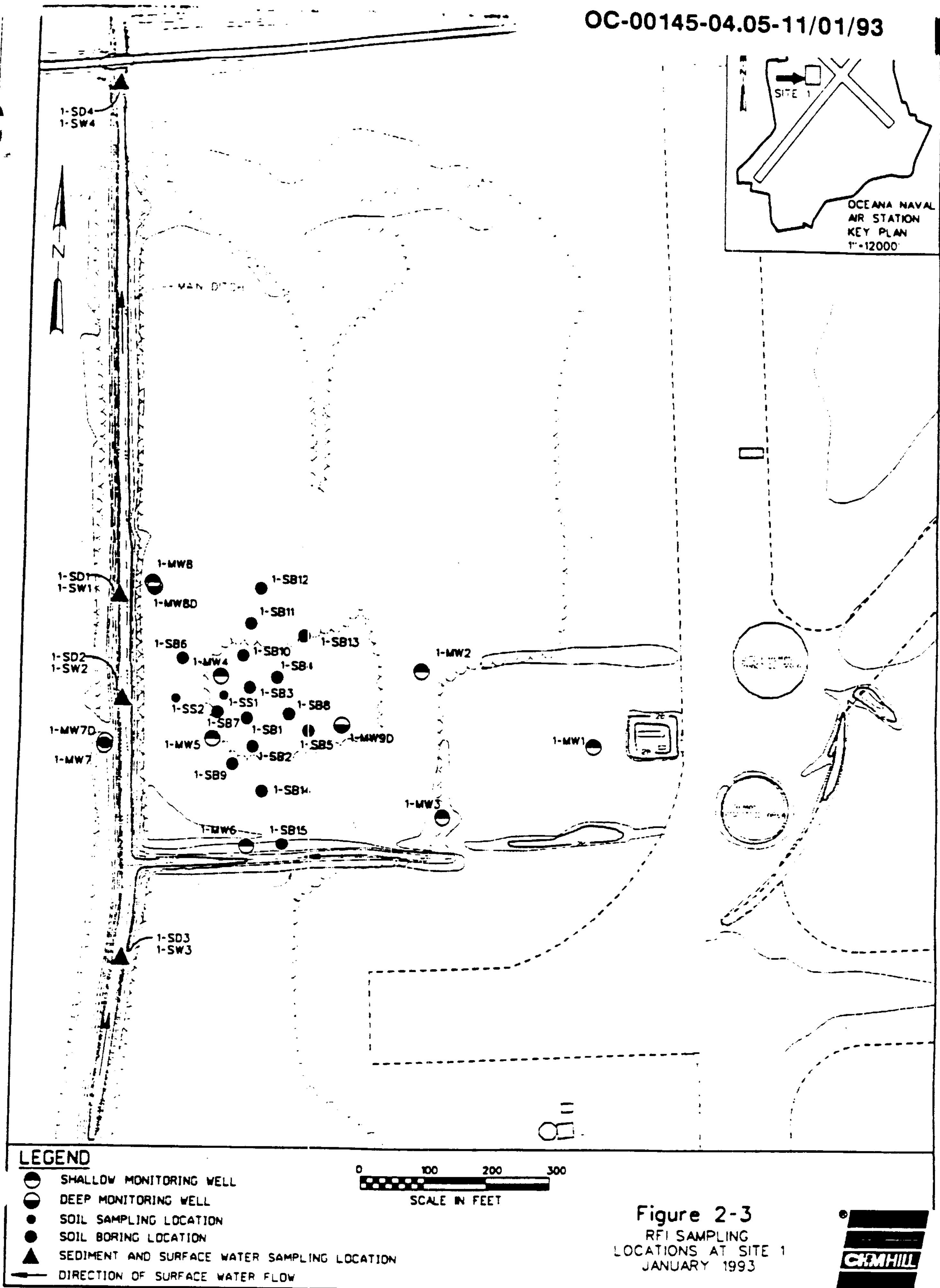



Figure 2-3
RFI SAMPLING LOCATIONS AT SITE 1
JANUARY 1993

CH2M HILL

0368o012.dgn
28-Oct-1993

contamination in borings 1-SB7 to 1-SB15 and in shallow soil samples 1-SS1 and 1-SS2 is illustrated in Figure 2-4. The total concentrations of benzene, toluene, ethylbenzene, and xylenes (called "BTEX" compounds) and the total concentrations of all detected semivolatiles or polynuclear aromatics (Semivoa/PAH) are shown next to each analytical sample location in Figure 2-4.

The first four soil borings (1-SB1 through 1-SB4) produced high organic vapor readings with some readings equaling or exceeding 1,000 ppm. The higher OVA readings typically came from the sampling intervals between 4 and 8 feet. These samples also had strong to very strong fuel odors and an oily sheen on the split spoons.

1-SB5 and 1-SB6 both delineate areas where organic contamination was low. The OVA readings from each 2-foot interval in 1-SB5 were substantially lower those previously recorded and no fuel odor was apparent. This low level was subsequently confirmed through laboratory analysis of a nearby soil boring (1-SB8), which did not contain BTEX and semivolatile/polynuclear aromatic compounds.

Analytical samples were collected from soil borings 1-SB7 through 1-SB15 after qualitative field screening for contamination. The highest organic vapor readings in each borehole were typically encountered from 4.0 to 8.0 feet, with readings exceeding 1,000 ppm at 2 locations (1-SB9 and 1-SB10). The laboratory results for organic analysis are listed in Table 2-1 and presented in Figure 2-4.

North of the central part of the site in 1-SB10, 1-SB11, 1-SB12, and 1-SB13, contamination by BTEX and Semivoa/PAH compounds as well as some PCBs was detected. Because contamination in 1-SB12 was the highest in all soil borings, it is clear that soil contamination extends an unknown distance north of 1-SB12.

Soil contamination was also found to a lesser degree in borings south of well 1-MW5 and was confirmed in boring 1-SB7 in the center of the site. Low concentrations of pesticides were detected along with Semivoa/PAH contamination in 1-SB7 in the center of the site. Low concentrations of carbon disulfide and hexachlorinated dibenzofurans were also detected in 1-SB7. At 1-SB9, some BTEX and Semivoa/PAH compounds were detected but pesticides were absent. Based on the low results in 1-SB14 and 1-SB15, it appears that there is little soil contamination south of 1-SB14.

Two additional soil samples (1-SS1 and 1-SS2) were collected at Site 1 from a depth of 3 to 9 inches. These samples were collected to determine whether shallow soil contamination occurred as a result of the reported flood in the late 1960s during which the oil disposal pit overflowed, and its contents washed downstream. The analytical results, which are included with the soil boring results in Table 2-1, indicate that minor BTEX contamination is present in 1-SS1 (41 ppb) and 1-SS2 (5 ppb). In addition, a total of 2,565 ppb of 11 PAH compounds was detected in 1-SS2.

The organic results for the Site 1 soil samples were present at concentrations found naturally in soils or were close to the instrument detection limit.

### *Groundwater*

The organic results for Site 1 groundwater are presented in Table 2-2. Contrary to the soil sampling results, PAH compounds were not detected in groundwater at Site 1. BTEX contamination was detected in 1-MW4 (67 ppb) and 1-MW5 (16 ppb) but was absent in all other wells. These concentrations are similar to those detected in previous investigations. Well 1-MW4 contained 2 ppb of 1,1-DCA. The two deep monitoring wells, 1-MW8D and 1-MW9D, were free of contamination with the possible exception of chloroform, which was detected in both wells at 5 ppb.

It is noteworthy that during sampling, floating free product was detected in 1-MW4 and 1-MW5. The thickness of free product in 1-MW4 and 1-MW5 was 0.12 and 0.84 feet, respectively. The free product in 1-MW4 was analyzed for VOCs, metals, PAHs, dioxin (2,3,7,8-TCDD), and PCBs. The analytical results, which are included in Table 2-2 under 1-MW4LN, indicate that the product contained xylene at 14,000 ppb and 3 PAH constituents at 1,200 to 2,000 ppb. There was no detectable dense free product in the well.

Site 1 monitoring wells were sampled for total and dissolved metals. All metals concentrations were low.

### *Surface Water and Sediment*

All surface water and sediment samples were submitted for analysis of volatiles, PAHs, PCBs, and total metals. No organic contaminants were detected in the four surface water samples (1-SW1 through 1-SW4). The organic results agree with the surface water results of previous investigations. Zinc, nickel, cobalt, barium and arsenic were the only metals detected. These concentrations were low and did not exceed any applicable federal or state standards.

Organic compounds were also largely undetected in sediments. No organic contaminants were detected in either 1-SD1 or 1-SD3. A very low concentration of total xylenes (5 ppb) was detected in 1-SD2. Only two polynuclear aromatic compounds, fluoranthene and pyrene, were detected, both in 1-SD4 at concentrations of 400 ppb. During the [illegible] RFI, 2-butanone, ethylbenzene and toluene were detected; however, these compounds were absent during this round of sampling. All metals on the analyte list except for [illegible] selenium and thallium were detected near the detection limits. These three metals were not detected.

# Site 2B—Line Shack 130-131 Disposal Area

## Site Location and History

Site 2B is located southeast of the main MATWING hangar 122. The site includes Line Shacks 130 through 134, the five aircraft cleaning stations northeast of Line Shack 130 and the meadow and forested area outside the flightline fence.

The IAS states that potential contaminants at Site 2B may include: oil, hydraulic fluid, turco, paint stripper and thinners, PD 680, and aromatic hydrocarbons (naphtha, benzene, toluene and derivatives), all of which were used in aircraft maintenance activities (RGH 1984). These waste oils and aircraft-maintenance chemicals were disposed of adjacent to the line shacks in unknown amounts beginning in 1963, when the line shacks were constructed, until the early 1980s (RGH, 1984). A hazardous waste collection and recycling program has been in force since 1981 throughout the base. During the 1980s an oil-water separator system was installed in the aircraft cleaning area northeast of Line Shack 130 to separate oil from wash water flowing from the aircraft cleaning area.

## Past Investigations and RFI Activities

Site 2B has been investigated in four previous studies prior to the RFI: (1) Initial Assessment Study in 1984, (2) the Round 1 Verification Step in 1986, (3) the Line Shack Site Inspection in 1988, and (4) the Interim RFI in 1990. Previous studies indicated that the groundwater is contaminated with chlorinated organics from two or more sources. In addition, minor contamination was identified in samples from the stream adjacent to the site and from the soil locations sampled in 1988.

The objectives of the RFI activities were: (1) to define and separate the sources of groundwater contamination through *in situ* groundwater sampling and the installation and sampling of additional monitoring wells, (2) to focus soil sampling on two probable source areas, and (3) to define the effect of groundwater discharge on the water and sediment in the stream. Because significant shallow contamination has been confirmed, the RFI was also designed to test for the presence of possible deep groundwater contamination in the Yorktown Formation.

Because previous broad-spectrum sampling had identified only chlorinated VOCs and some TPH in the stream, the groundwater and soil samples were analyzed for chlorinated VOCs, and the sediment and surface water in the stream were analyzed for chlorinated VOCs and TPH. The locations of all samples collected at Site 2B during the RFI are shown on Figure 2-5.

OC-00145-04.05-11/01/93

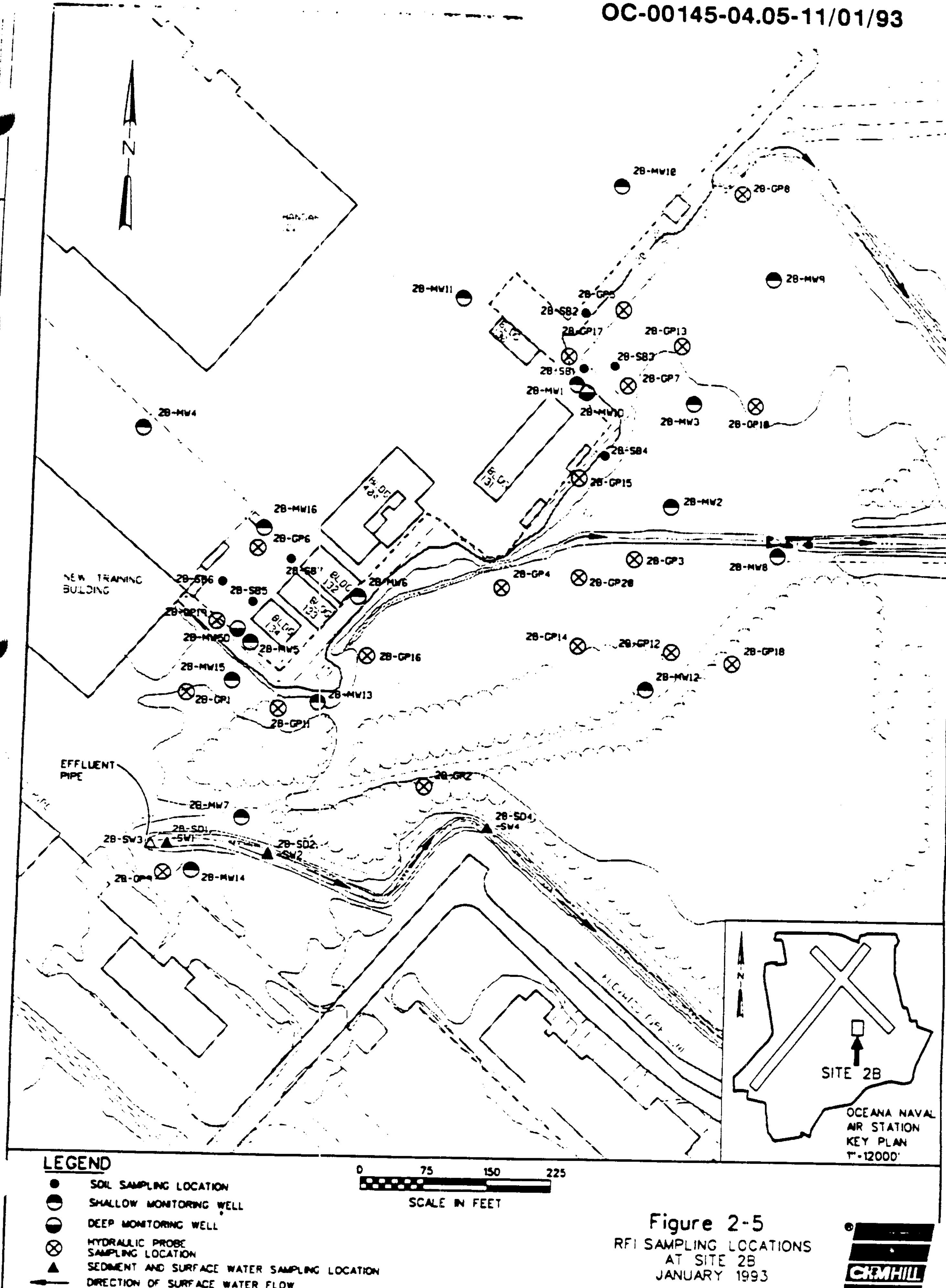



Figure 2-5
RFI SAMPLING LOCATIONS
AT SITE 2B
JANUARY 1993

CH2MHILL

8368m267.dgn

## Contamination and Extent

### *In Situ Groundwater Sampling*

Table 2-3 lists the analytical results of the *in situ* groundwater samples collected using the hydraulic probe. These samples were analyzed onsite for 11 volatiles and total petroleum volatiles (TPV) using a mobile laboratory. The results of the confirmatory sample splits sent to CH2M HILL's laboratory in Gainesville, Florida, are also listed. A discussion of the results of the 8010 chlorinated volatiles analysis of groundwater in the monitoring wells is included in the next section.

The distribution of total target chlorinated volatiles in the *in situ* groundwater samples is shown in Figure 2-6. The *in situ* data indicate that the groundwater is contaminated with chlorinated hydrocarbons in one area near Line Shack 134 and in another area near Line Shack 131. Some amount of fuel-related BTEX contamination was also detected in the groundwater at locations 2B-GP17 and 2B-GP5 east of Line Shack 130.

The primary contaminants detected were trichloroethylene (TCE), cis- and trans-1,2-dichloroethylene (1,2-DCE), vinyl chloride, 1,1-dichloroethylene (1,1-DCE), and 1,1-dichloroethane (1,1-DCA). These constituents are all common degreaser solvents or their associated breakdown products and are probably related to the aircraft cleaning and maintenance activities at this site.

The highest concentration of total VOCs was observed in 2B-GP15 southeast of Line Shack 131. The groundwater contamination in this area may be caused by chemical releases through the fenceline near the northeast corner of the line shack. A history of waste disposal in this area is known.

A vinyl chloride concentration of 92 ppb was detected in 2B-GP19 in the western source area. Further confirmation of vinyl chloride contamination in groundwater in this area was indicated by monitoring well data presented below.

Benzene, toluene, ethylbenzene, and total xylenes were also detected in 2B-GP17 and ethylbenzene was detected in 2B-GP5. In addition, total petroleum volatile (TPV) concentrations analyzed by the mobile laboratory were 5,400 ppb in 2B-GP17 and 980 ppb in 2B-GP5. These four individual aromatic volatile organics are fuel constituents and TPV is a summation of fuel-related volatiles. Both types of data suggest that fuels were spilled in or upslope of the grassy area east of Line Shack 130, possibly in the aircraft cleaning area.

*Monitoring Well Data*

The results from monitoring well sampling confirmed the results of the *in situ* groundwat sampling data. Of the 30 compounds on the chlorinated volatile list, 7 were detected groundwater from monitoring wells at Site 2B. Of these, only four compounds are wide distributed: TCE, vinyl chloride, 1,2-DCE, and 1,1-DCA.

The well data are listed in Table 2-4 and are illustrated in Figure 2-7. Figure 2-7 shov that both the eastern and western plumes consist of all four of these compounds, each wi somewhat different distributions. The composition of the chlorinated volatile contaminati is different in different areas. The contamination near Line Shack 134 is primarily vin chloride with low concentrations of 1,1-DCA and trans-1,2-DCE. The contaminati southeast of Line Shack 131 is primarily TCE, 1,1-DCE, and 1,2-DCE, with low conce trations of vinyl chloride, and the contamination east and southeast of Line Shack 130 primarily TCE with 1,1-DCA and 1,2-DCE. These differences may indicate that t releases from each area had a different history and composition; however, these variatio are not likely to have an effect on the remedial action at the site.

No contamination was detected in deep wells 2B-MW1D and 2C-MW5D. The lack deep contamination in the two source areas is probably due to the low vertical driving for and the low permeability of the silty sands and silts between the shallow and deep screen zones.

*Soils*

No chlorinated volatile organics were detected in the seven soil samples collected fr borings advanced to the water table.

*Sediment and Surface Water*

Concentrations of vinyl chloride, cis-1,2-DCE, and 1,1-DCA were detected at concent tions slightly above detection limits in surface water at Site 2B. Concentrations rang from 1.1 to 2.4 ppb in 2B-SW2 and 2B-SW4 but VOCs were absent in 2B-SW1 and 2 SW3. No polynuclear aromatic compounds were detected in any of the surface wat samples. Chlorinated volatile organic compounds were not detected in any sedim samples, but 15 PAH compounds were detected in 2B-SD2 and 2B-SD4. Concentratic were higher in the upstream sample 2B-SD2 than in the downstream sample 2B-SD4. T results of the sediment sampling are presented in Table 2-5.

As shown in Figure 3-1, most of the proposed soil borings will be north of soil sample 1-SB12 where contamination is uncharacterized. Two soil borings will also be placed between the pit and the ditch to determine whether the free product overlies the water table in this area and whether areas with a sheen observed against the east bank of the ditch may be caused by fuel seeps. The first soil boring will be 200 feet north of 1-SB12 to attempt to bracket the northern extent of fuel contamination early in the investigation. If contamination is found at this location, another location 200 feet farther north will be sampled. The remaining eight borings will be used to characterize the eastern and western extent of contamination in this northern area. The proposed locations are preliminary and will be adjusted interactively in the field based on instrument readings and field observations.

The soil samples will be analyzed for 8240 volatile organic compounds (VOCs) and 8100 polynuclear aromatic hydrocarbons (PAHs). 8240 VOCs will be analyzed to screen for a range of volatiles that may be present even though only volatiles associated with fuels, namely benzene, toluene, ethylbenzene, and xylene, were detected during the RFI. Method 8100 PAHs will be analyzed rather than full 8270 semivolatiles because all but two of the 16 semivolatiles detected during the RFI are in the 8100 PAH analytical group. (Refer to Table 3-5 in the RFI report for the constituents analyzed by each method.)

### *Groundwater*

One additional shallow well (1-MW10) will be installed at Site 1 based on the soil sampling results. It will be placed downgradient of the northern area of free product contamination and adjacent to the ditch.

The three deep wells (1-MW7D, 1-MW8D, and 1-MW9D) and two shallow wells (1-MW8 and 1-MW6) at the fringe of the contaminated area will be resampled during the CMS field investigation. The purpose of this sampling is to confirm that these wells are uncontaminated. The samples from the new and existing monitoring wells will be analyzed for 8240 VOCs and 8100 PAHs. The rationale for these parameters is described above.

The new well will be surveyed and a new round of water levels for all wells will be measured during the CMS field investigation. A benchmark will be established in the stream west of the former disposal pit to confirm the surface water/groundwater interconnection described in the RFI report.

### *Sediments*

Sediment samples will be collected at three locations. One sample will be collected and analyzed for total organic carbon (TOC) at the RFI location 1-SD4 at the culvert near the radar station. Samplers will attempt to collect the sample from the exact location sampled during the RFI. The purpose of this sample is to infer whether the two PAHs detected in 1-SD4 during the RFI exceeded EPA proposed sediment criteria, which are tied to the percent organic carbon in the sediment.

A second sediment sample (1-SD5) will be collected from the east-west ditch adjacent to well 1-MW6 and analyzed for TOC, PAHs, and 8240 VOCs. This ditch appears uncontaminated based on the clarity of the water and the lack of orange-brown precipitate common in other ditches. No contamination was detected in groundwater from well 1-MW6, so groundwater discharging to this ditch is also believed to be uncontaminated. This sediment sample will confirm the status of this ditch and help bound the Site 1 problem area.

A third sediment sample (1-SD6) will be collected upstream of the RFI sample 1-SD3 in the main ditch. Before this sample is collected, the sampling team will inspect the ditch from Site 1 upstream to the tank farm area to infer whether the tank farm release has effected the environmental quality of the ditch. The results of the Navy's investigation of the tank farm area will also be reviewed before beginning the CMS field investigation. The sample will be collected near the tank farm if ditch contamination is found there but will otherwise be collected 300 to 500 feet upstream of 1-SD3. The sample will be analyzed for TOC, PAHs, and 8240 VOCs.

## Site 2B—Line Shack 130-131 Disposal Area

The contamination at Site 2B has been characterized extensively; however, three areas need additional definition: (1) the extent of groundwater contamination downgradient of the western source area, (2) the severity of the contamination in the ditch sediments, and (3) confirmation of groundwater contamination south of the ditch and of the surface water/groundwater interconnection. Sediment and groundwater samples will be collected during the CMS field investigation to define these areas of uncertainty. Proposed sampling locations are illustrated in Figure 3-2 and a sampling summary is presented in Table 3-2.

### *Groundwater*

Two wells will be installed in the western area near Building 134. These wells are necessary because of high vinyl chloride in the hydraulic probe sample 2B-GP19 (92 ppb) and several VOCs in wells 2B-MW15 (162 ppb of total VOCs with 21 ppb of vinyl chloride) and 2B-MW16 (16.5 ppb of total VOCs with 6.4 ppb of vinyl chloride). Figure 4-2-3 in the RFI shows that groundwater flows southwest in this area. Well 2B-MW17 will be installed northwest of 2B-GP19 as close as possible to the new training building completed since the RFI sampling. Well 2B-MW18 will be installed west-southwest of 2B-MW15 in an area downgradient of both 2B-BP19 and 2B-MW15. Both wells will be installed using procedures described in the RFI work plan (CH2M HILL, 1992) and will be screened with 10-foot screens placed 5 to 15 feet below the water table. The wells will be sampled and analyzed for 8240 VOCs. A 2 ppb detection limit will be used for vinyl chloride during this investigation.

The two deep wells (2B-MW1D and 2B-MW5D) and the well south of the ditch (2B-MW14) will be resampled during the CMS field investigation. No contamination was

OC-00049 - 7.01 - 4/22/91

COMMONWEALTH of VIRGINIA

DEPARTMENT OF WASTE MANAGEMENT
11th Floor, Monroe Building
101 N. 14th Street
Richmond, VA 23219
(804) 225-2667

April 22, 1991

Ms. Nina M. Johnson, P.E.
Remedial Project Manager
Atlantic Division Naval
Facilities Engineering Command
Norfolk, VA 23511-6287

Attention: Code 1822

Dear Ms. Johnson:

A Defense State Memorandum of Agreement (DSMOA) between the Department of Defense and the Virginia Department of Waste Management concerning the Defense Environmental Restoration Program has recently been signed. A copy is attached for your information. Installations covered by this agreement are listed in Attachment A and include the Naval Air Station Oceana and Fleet Combat Training Center Dam Neck.

On March 18, 1991, the Corps of Engineers advised us that our Cooperative Agreement application has been approved. Therefore, we now expect to be working more closely with you concerning the environmental restoration program at this installation.

Anne Field will be the point of contact for Naval Air Station Oceana ~~and Fleet~~ Combat Training Center Dam Neck, and will be the Department's representative on the Technical Review committee. Ms. Field's phone number currently is (804) 225-3266. I understand that Ms. Field has already talked to you briefly about the program at this installation.

Ms. Field will be coordinating services we have agreed to provide under the DSMOA, except for those involving public education and public participation activities required under CERCLA. These will be handle by Jamie Walters, our Community Relations Officer. She can be reached at (804) 225-3268. We would appreciate it if you would make sure that the public relations officers the Surface Warfare Center are aware that Ms. Walters is

ENCL (1)

OC-00049- 7.01- 4/22/91

available to provide assistance in matters involving community relations.

We look forward to working with you in this important program. If you have any questions, call me at (804) 225-2811. Thank you.

Sincerely,

K. C. Das, Ph.D, P.E.
Director of Special Programs

cc: Arthur Schacter
Anne Field
Jamie Walters

KCD/AMF/rw

OC-00027- 8.01 - 01/01/01

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Captain M. N. Matton
Commanding Officer
Naval Air Station Oceana
Virginia Beach, Virginia 23460-5120

Re: Naval Air Station ("NAS") Oceana
VA2170024606

Dear Captain Matton:

Ground water sampling analysis results from your Navy Assessment and Control of Installation Pollutants ("NACIP") Program Verification Step Round One sampling performed at NAS Oceana during October 1986, indicated a release of hazardous waste or hazardous constituents from your facility. Your facility is currently operating pursuant to the RCRA interim status requirements (40 C.F.R. Part 265). Therefore, because of these reasons, your facility is subject to the corrective action authorities under Section 3008(h) of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6928(h).

Mr. Robert W. Stroud of my staff is currently preparing a corrective action Administrative Order on Consent ("Consent Order"). I have enclosed a copy of the pertinent sections of the Corrective Action Plan ("CAP") for your review. The CAP is a guidance document which describes the requirements of investigations and studies conducted pursuant to RCRA corrective action.

On August 4, 1989, Mr. Joseph Kotlinski, Chief of the Corrective Action RCRA Enforcement Section, spoke with Mr. Terry Berglund, an environmental engineer on your staff, regarding this matter. Mr. Kotlinski and Mr. Berglund also spoke about scheduling an initial meeting to discuss the CAP, its application to your

OC*00027- 8.01- 01/01/01



facility, and the terms and schedules for beginning corrective action negotiations. This meeting will be held Wednesday, August 30, 1989, 1:00 P.M. at EPA Region III, 841 Chestnut Building, Philadelphia, Pennsylvania.

Sincerely,

Robert E. Greaves, Chief
RCRA Enforcement/UST Branch

Enclosure

| | | |
|---|---|---|
| cc: | R. Stroud | (3HW61) |
| | J. Kotlinski | (3HW61) |
| | J. Nevius | (3HW62) |
| | D. Lausch | (3ES40) |
| | L. Southerland | (OS-530) |
| | L. Herwig | (OFA/A-104) |
| | S. Frazier | (VADWM) |
| | D. Elznic | (NAS Oceana) |
| | T. Berglund | (NAS Oceana) |
| | N. Staley | (DOD) |
| | D. Olson | (DOD) |
| | C. Thompson | (NAVFACENGCOM) |
| | N. Johnson | (NAVFACENGCOM) |

OC-00041 - 8.01 - 2/24/86

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

FEB 24 1986

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Commander L. F. Norton
Naval Air Station Oceana
Virginia Beach, VA 23460

Re: Naval Air Station Oceana
VA2 17 002 4606

Dear Commander Norton:

Sections 3004(u) and 3008(h) of the Hazardous and Solid Waste Amendments of 1984 (RCRA Reauthorization) give EPA the authority to require corrective action for all releases of hazardous wastes or constituents from any solid waste management unit ("SWMU") as defined on the enclosed sheet. This requirement applies to operating units, inactive units, as well as those that are closing or have been closed in the past.

EPA and the State must first determine the location of all SWMUs at your facility. Next, we must determine whether or not any "releases" (see definitions) originated at these units. In order to enable us to make these determinations, you must provide the following information:

(1) A topographic map showing the facility and a distance of 1,000 feet around it, at a scale of one-inch equal to not more than 200 feet. In addition to showing the location of the hazardous waste management facilities for which you are seeking a permit, it must locate all existing and former SWMU's at your facility.

(2) For each SWMU, provide a description of the unit's functions, material of construction, dimensions, capacity, ancillary systems (piping), etc. If available, provide engineering drawings of the units and their foundations. For closed facilities, also provide a copy of the closure plans, a description of how closure was performed and any relevant post-closure information you have available.

(3) For each SWMU, provide a description of all solid wastes including hazardous wastes and hazardous waste constituents received by the units. Also, provide information on quantities of hazardous wastes and hazardous waste constituents received by each SWMU and the dates during which these units operated.

OC-00041 - 8.01 - 2/24/86

(4) For each SWMU, describe any releases (or possible releases) originating at the unit. This should include information on the date of release, type of solid waste, hazardous waste or hazardous waste constituents released, quantity released, nature of the release, extent of migration, and cause of release, for example, an overflow, broken pipe, tank leak, etc. Also, provide any available data which would quantify the nature and extent of environmental contamination including the results of soil, surface water and/or ground-water sampling and analysis efforts. Likewise, any monitoring information that indicates releases are not present should also be submitted.

If some or all the above requested information has been previously submitted to this office, please reference this information in your reply.

We request under Section 3007 of the Act, 42 U.S.C. §6927, that you submit two copies of the above listed information within forty-five (45) days of your receipt of this letter to both EPA and the Virginia Bureau of Solid and Hazardous Waste Management.

All information you submit should be certified as required by regulation 40 C.F.R. 270.11(d). Should you have any questions concerning this letter, please contact Ms. Mary Beck, P.E., at (215) 597-7239.

Sincerely,

R.W. Schrecongost for

Stephen R. Wassersug, Director
Hazardous Waste Management Division

Enclosure

cc: Mr. Wladimir Gulevich, Ph.D., P.E.
Virginia Department of Health
Bureau of Hazardous Waste Management

Mr. Terry Berglund
Environmental Engineer
Naval Air Station Oceana

OC-00024- 8.01 - 12/19/90

19 December 1990

MEMORANDUM

From: CDR P.A. Genzler, CINCLANTFLT N02LE
To: DISTRIBUTION

Subj: NAS OCEANA/EPA REGION III RCRA 3008(H) CONSENT ORDER

Encl. (1) Final Order
(2) Negotiation Summary

1. Over the past fifteen months, personnel from NAS Oceana, LANTDIV, and CINCLANTFLT have been negotiating a RCRA 3008(h) Corrective Action Order with EPA Region III. This Consent Order will require technical studies that will ultimately lead to a requirement for certain remedial actions at Solid Waste Management Units (SWMUs) located at NAS Oceana. This order is the first received by a Navy activity, and the first received by DoD in Region III. Recipients are requested to review the Order, enclosure (1), as quickly as possible. Please note that the transmittal letter in enclosure (1) requests that the Navy sign the order by 31 December 1990. We have informed EPA that it is unlikely that this can be achieved, but that we would expedite the review process as much as possible. I have prepared enclosure (2), which summarizes important issues from the negotiations, as an aid in reviewing the Order.

2. A copy of this order has been forwarded directly to ASN(I&E) for review in parallel with the review at NAS Oceana, TACWINGSLANT, AIRLANT and CINCLANTFLT. This is not meant to preclude meaningful review in the chain of command, but rather to eliminate delays solely to transmission of the package. ASN(I&E) staff will require, at a minimum, informal concurrence by the chain of command before signing the Order.

3. This Order was originally intended to be negotiated and concluded within 90 days of delivery of the August 1989 original draft to CO, NAS Oceana. Due to personnel changes on both sides of the negotiation teams, but principally at EPA Region III, and other workload, negotiations were significantly delayed. EPA has tried to adhere to the EPA Model RCRA 3008(h) Consent Order as much as possible, but has been willing to accomodate numerous Navy requests for alternative language and provisions, particularly where required by our contracting and contract administration procedures. In general, EPA has been extremely cooperative throughout the negotiation.

OC-00024 · 8.01 · 12/19/90

4. I am available for discussion of this Order or explanation of its provisions at your convenience.

P.A. Genzler

Distribution:
CINCLANTFLT N44
COMNAVAIRLANT Code 60
COMTACWINGSLANT Legal
LANTDIV Code 18
LANTDIV Code 09C

requirements, including regulations and permit conditions pertaining to the management of hazardous waste, in the same manner and to the same extent as any person (as defined in Section 1004(15) of RCRA) is subject to such requirements.

Section 7002 of RCRA provides for citizens' suits against any person (including the United States) who is alleged to be in violation of any permit, standard, regulation, condition, requirement, prohibition or final order of RCRA. In addition, any person, as defined in Section 1004(15) of RCRA, including any individual that may be responsible for the hazardous waste management activities at the Facility, who has violated or is violating any requirement of Subtitle C of RCRA, or who knowingly violates any material condition or requirement of a RCRA permit or interim status regulation or standard, may be subject to administrative, civil and/or criminal sanctions under Section 3008 of RCRA.

## II. PARTIES BOUND/TRANSFER OF OWNERSHIP

1. This Consent Order shall apply to and be binding upon EPA, Respondent and their officers, employees, agents, successors and assigns.

2. Respondent shall provide a copy of this Consent Order to all Navy project management personnel and prime contractors retained to conduct or monitor any portion of the work performed pursuant to this Consent Order within one (1) week of the effective date of this Consent Order or within one (1) week of the date of such retention, whichever is later. All Navy personnel and prime contractors shall perform such work in accordance with the requirements of this Order. It shall not be a defense to any violation of this Consent Order that the supervisory personnel, contractor, subcontractor, laboratory or consultant committing the violation was not informed of the requirements of this Consent Order.

3. No change in ownership of all or part of the Facility will in any way alter Respondent's responsibility under this Consent Order. In the event of such change, Respondent agrees that it will:

(a) provide a copy of this Consent Order to the transferee-in-interest prior to any agreement for transfer;

(b) assure that compliance with the Consent Order by the new owner is a condition of the transfer of ownership;

(c) notify EPA in writing of the name and address of the transferee-in-interest at least thirty (30) days in advance of such transfer; and

(d) provide EPA with a copy of any indemnification agreement which may be executed, within five (5) days of its execution.

## III. STATEMENT OF PURPOSE

In entering into this Consent Order, the mutual objectives of EPA and Respondent are: (1) to perform (if appropriate) Interim Measures ("IM") at the Facility to prevent or relieve threats to human health or the environment; (2) to perform a RCRA Facility Investigation ("RFI") to determine fully the nature and extent of any release of hazardous waste and/or hazardous constituents at or from the Facility; and (3) to perform a Corrective Measure Study ("CMS") to identify and evaluate alternatives for the corrective action necessary to prevent or mitigate any migration or releases of hazardous wastes and/or hazardous constituents at or from the Facility.

## IV. RCRA-CERCLA INTEGRATION

The Facility has interim status and is subject to RCRA corrective action requirements. The Facility may, at some future time, be listed on the National Priorities List ("NPL") promulgated pursuant to Section 105 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. § 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613 (1986) ("CERCLA") and be required by statute to enter into an Interagency Agreement ("IAG") under CERCLA Section 120. EPA and Respondent intend that any RCRA corrective action selected, implemented and completed to remediate releases of hazardous waste or hazardous constituents at or from the Facility, will be protective of human health and the environment and will obviate the need for further remedial action for such releases under CERCLA. However, EPA reserves its right to require Respondent to perform additional remediation at the Facility under either RCRA or CERCLA.

## V. FINDINGS OF FACT

1. Respondent is a Department of the Executive Branch of the federal government and is subject to the requirements of Section 6001 of RCRA, 42 U.S.C. § 6961.

2. Respondent is a generator of hazardous waste and the owner and operator of a hazardous waste management facility located at Oceana Boulevard and Harpers Road in Virginia Beach, Virginia. Respondent engages in activities which result in the generation and storage of hazardous wastes at the Facility, as those terms are defined in Part 1 of the Virginia Hazardous Waste Management Regulations of 1986 ("VHWMR"), and is subject to interim status requirements under Section 3005(e) of RCRA, 42 U.S.C. § 6925(e), and Part 9 of the VHWMR.

3. Respondent owned and operated its Facility as a hazardous waste management facility on and after November 19, 1980, the applicable date which renders facilities subject to the interim status requirements or the requirement to have a permit under Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925.

4. On July 21, 1980, pursuant to Section 3010 of RCRA, 42 U.S.C. § 6930, Respondent notified EPA of its hazardous waste activity. In its notification, Respondent identified itself as a generator of hazardous waste and an owner/operator of a treatment, storage, and/or disposal facility.

5. In its Part A permit applications dated November 19, 1980 and November 17, 1987, Respondent identified itself as handling the following hazardous wastes at the Facility:

a. Hazardous wastes exhibiting the characteristic of ignitability (D001), corrosivity (D002), reactivity (D003), and EP toxicity (D004, D008, D009) which are identified at 40 CFR § 261.20-261.24 and VHWMR Part 3 §§ 3.6-3.9.

b. Hazardous wastes from non-specific sources identified at 40 CFR § 261.31 and VHWMR Part 3 Appendix 3.1 (F001-F003, F005 and F017).

c. Commercial chemical products, manufacturing chemical intermediates, off-specification commercial chemical products, or manufacturing chemical intermediates identified at 40 CFR § 261.33(e) and VHWMR Part 3 Appendix 3.1-10 (P015 and P115).

6. Respondent's Facility is a Naval Air Station covering approximately 5,000 acres and is located in Virginia Beach, Virginia. The Facility is a master jet base that maintains and provides services and materials to support Naval aviation and other activities. Currently, the Facility provides support to Naval aviation operations by maintaining jets and providing training facilities for Naval Aircraft. Bomber training and readiness exercises conducted at the Facility support Naval defenses for the entire East Coast. Operations at the Facility presently include machine shops, painting, washing, solvent degreasing, and engine repairs.

7. Respondent is currently conducting an Installation Restoration ("IR") program at the Facility. The objective of the IR program is to identify, assess, and control environmental contamination from historic hazardous waste operations. The first phase of the IR program, the Initial Assessment Study ("IAS"), identified suspect sites through a comprehensive record search, interviews with Facility personnel, and an on-site survey of the Facility. The IAS, published in December 1984, identified six sites for further investigation. Investigation activities, including installation of groundwater monitoring wells, and groundwater, surface water, soil and sediment sampling, were conducted at five sites in 1986 and two sites in 1988. A Technical Review Committee ("TRC"), comprised of representatives from EPA, Virginia Department of Waste Management, the city governments of Virginia Beach and Chesapeake, and citizen representatives from Virginia Beach and Chesapeake, was formed in early 1989. Respondent presented the results of all investigations and plans for future work to the TRC. Investigation at ten sites continued in 1990.

8. The Navy IR Program studies in 1986 found hazardous constituents in the groundwater at NAS in concentrations which exceeded a regulatory standard, criteria or guideline. These constituents included, but are not limited to:

| HAZARDOUS CONSTITUENT | CONCENTRATION parts per billion ("ppb") | MAXIMUM CONTAMINANT LEVEL ("MCL")* (ppb) |
|---|---|---|
| Vinyl Chloride | 99 | 2 |
| 1,1 Dichloroethane | 170 | N/A |
| 1,1 Dichloroethene | 25 | 7 |
| Trans-1,2-Dichloroethene | 800 | 70 (Recommended Maximum Contaminant Level)* |
| Trichloroethene | 1,300 | 5 |

* Maximum Contaminant Levels and Recommended Maximum Contaminant Levels can be found in the EPA Drinking Water Standard and Health Advisory Guidance document of December, 1988.

9. On June 27 through July 1, 1988, an EPA contractor, A.T. Kearney ("Kearney"), conducted a RCRA Facility Assessment ("RFA") at the Facility. In its subsequent RFA report dated March 30, 1989, Kearney recommended further investigation of sixty (60) Solid Waste Management Units ("SWMUs") or Areas of Concern ("AOCs") at the Facility because of either a documented release or the possibility of a release of one or more hazardous constituents. Respondent has subsequently submitted information in support of its position that not all of the SWMUs and AOCs listed in the RFA Report merit further investigation, and that some are being addressed under other regulatory programs. Respondent is also preparing a report of its investigation of the Facility under the IR program, which it will submit to EPA after the effective date of this Consent Order.

10. The substances referred to in paragraph 8, above, are hazardous wastes or hazardous constituents as defined by Section 1004(5) of RCRA, 42 U.S.C. § 6903(5). These are also hazardous wastes or hazardous constituents within the meaning of Section 3001 of RCRA, 42 U.S.C. § 6921, and VHWMR Part 3.

11. The hazardous wastes and/or hazardous constituents identified in paragraph 8, above, may pose a threat to human health and the environment. Included among these substances are a known carcinogen, mutagen, possible teratogen, and toxins, whose effects would be based on the type of exposure, the concentration of the contaminants, and other similar factors. The health effects for the substances listed in paragraph 8 above are described in "Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites" (EPA 1985), a copy of which is included in the Administrative Record supporting issuance of this Order. The presence of these substances in the groundwater at the Facility constitutes a basis for further investigation.

12. The primary potential pathway for migration of such hazardous wastes and/or hazardous constituents at the Facility is likely to be by groundwater transport. However, visible surface soil contamination at the Facility suggests that these constituents may also be transported via surface runoff during heavy storm events.

13. A series of drainage ditches at the Facility drain to West Neck Creek, the Great Neck Creek, the London Bridge Creek and the Wolfsnare Creek. A release of hazardous constituents to the drainage ditches could enter these creeks. Drainage from the northeast enters Great Neck Creek, which empties into the Broad Bay, then into the Lynnhaven Bay and eventually drains to the Chesapeake Bay. Drainage from the northwest enters London Bridge Creek and the Eastern Branch of the Lynnhaven River, which drains to the Lynnhaven Bay and the Chesapeake Bay. Drainage from the southeast enters West Neck Creek which drains to the North Landing River and eventually to the Currituck Sound.

14. Land in the Tidewater area surrounding the Facility is used primarily for farming, forestry and urban development, such as commercial facilities, light and heavy duty industrial complexes, and residential housing.

15. The city of Virginia Beach in which Oceana NAS is located had a population of 292,020 in 1982.

16. Surface water in the vicinity of the Facility is used for recreational purposes, such as boating, swimming and fishing. Surface streams and rivers are not used as sources for drinking water. The Facility is approximately 11 miles from the Chesapeake Bay.

17. The substances referred to in paragraph 8, above, may migrate further into the environment.

## VI. CONCLUSIONS OF LAW AND DETERMINATIONS

Based on the Findings of Fact set forth above, and after consideration of the Administrative Record supporting issuance of this Order, EPA Region III has made the following Conclusions of Law and Determinations:

1. Respondent is a Department of the executive branch of the federal government and is subject to the requirements of Section 6001 of RCRA, 42 U.S.C. § 6961.

2. Respondent is the owner and operator of a Facility authorized to operate under Section 3005(e) of RCRA, 42 U.S.C. § 6925(e).

3. The wastes referred to in Section IV, paragraph 8, above, are hazardous wastes as defined by Section 1004(5) of RCRA, 42 U.S.C. § 6903(5). These are also hazardous wastes within the meaning of Section 3001 of RCRA, 42 U.S.C § 6921, 40 C.F.R. Part 261 and VHWMR Part 3.

4. There is or has been a release of hazardous wastes into the environment from the Facility within the meaning of Section 3008(h) of RCRA, 42 U.S.C. § 6928(h).

5. The actions required by this Consent Order are necessary to protect human health or the environment.

## VII. WORK TO BE PERFORMED

EPA acknowledges that Respondent may have completed some of the tasks required by this Consent Order and that Respondent may have available some of the information and data required by this

Consent Order. This previous work may be used to meet the requirements of this Consent Order, upon submission to, and formal approval by, EPA.

Pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), Respondent agrees to perform the following acts in the manner and by the dates specified herein. [The standard § 3008(h) time frames have been extended to accommodate the contracting procedures which Respondent as a federal facility is required to engage in.] All work undertaken pursuant to this Consent Order shall, as EPA deems appropriate, be performed in accordance with: the Scope of Work for a RCRA Facility Investigation set forth in Attachment A; the Scope of Work for a Corrective Measures Study set forth in Attachment B; RCRA and its implementing regulations; and relevant EPA guidance documents. Both Scopes of Work attached to this Consent Order are incorporated herein by reference, but EPA and Respondent acknowledge that the Scopes of Work are standard-form documents intended to be tailored to each case, and that they have not been tailored to this case. Relevant guidance may include, but is not limited to, the "RCRA Facility Investigation (RFI) Guidance" (EPA 530/SW-87-001), "RCRA Ground Water Monitoring Technical Enforcement Guidance Document" (OSWER Directive 9950.1, September 1986), "Test Methods For Evaluating Solid Waste" (SW-846, November 1986), "Construction Quality Assurance for Hazardous Waste Land Disposal Facilities" (EPA 530/SW-85-031, July 1986), and "QWRS Guidance for Preparation of QA Project plans" (QWRS-QA-1, May 1984).

A. INTERIM MEASURES

If, at any time during the term of this Consent Order, Respondent discovers new or additional information concerning a release or a threat of release of hazardous waste or hazardous constituents at or from the Facility, which may present a threat or potential threat to human health or the environment, Respondent shall:

1. notify EPA as soon as practicable of the source, nature, extent, location and amount of such release, the endangerment posed by such release and the actions taken and/or to be taken to address such release;

2. unless otherwise directed by EPA, immediately take such actions as are necessary and appropriate to address such release, which are consistent with and integrated into any long-term remediation at the Facility;

3. confirm the notification to EPA in writing within three (3) calendar days of discovery of such release; and

4. report the actions taken and their results to EPA in writing within ten (10) calendar days of completion of said actions.

## B. RCRA FACILITY INVESTIGATION ("RFI")

5. Within one hundred and eighty (180) calendar days from the effective date of this Consent Order, Respondent shall submit to EPA for approval a Description of the Current Conditions at the Facility, a Pre-Investigation Evaluation of Corrective Measure Technologies, and Workplan for a RCRA Facility Investigation ("RFI Workplan"). These documents shall be developed, as EPA deems appropriate, in accordance with the RFI Scope of Work contained in Attachment A.

6. The RFI Workplan shall be designed to define the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes or hazardous constituents within and beyond the Facility boundary. The RFI Workplan shall document the procedures Respondent will use to conduct those investigations necessary to: (1) characterize the potential pathways of contaminant migration; (2) characterize the source(s) of contamination; (3) define the degree and extent of contamination; (4) identify actual or potential receptors; and (5) support the development of alternatives from which a corrective measure(s) may be selected by EPA. An expeditious schedule for implementation of all activities shall be included in the RFI Workplan.

7. In accordance with the provisions of Attachment A herein, the RFI Workplan shall include: (1) a Project Management Plan; (2) a Data Collection Quality Assurance Plan; (3) a Data Management Plan; (4) a Health and Safety Plan; and (5) a Community Relations Plan.

8. Upon receipt of EPA approval of the RFI Workplan, Respondent shall implement the EPA-approved RFI Workplan and submit to EPA for approval an RFI Draft Report in accordance with the terms and schedule contained in the RFI Workplan.

## C. CORRECTIVE MEASURES STUDY ("CMS")

9. After EPA approval of the RFI Final Report, Respondent shall conduct a Corrective Measures Study and submit a Draft CMS Report in accordance with the proposed schedule submitted concurrently with the RFI Final Report. The Draft CMS Report is subject to approval by EPA and shall be in accordance with the CMS Scope of Work contained in Attachment B.

D. PUBLIC COMMENT AND PARTICIPATION

10. Upon approval by EPA of a Corrective Measures Study Final Report, EPA shall make both the RCRA Facility Investigation Report (or summary of report) and the Corrective Measures Study Final Report (or summary of report) and a summary of EPA's proposed corrective measure(s) and EPA's justification for proposing selection of the corrective measure(s) available to the public for review and comment for at least thirty (30) calendar days.

11. Following the public review and comment period, EPA shall notify Respondent of the final corrective measure(s) selected by EPA. If the corrective measure(s) selected by EPA after consideration of public comments is not the corrective measure(s) originally proposed by EPA, EPA shall inform Respondent in writing of the reasons for such decision, and Respondent shall modify the RFI and/or CMS Final Reports if directed to do so by EPA, or refer any disagreement with the selected corrective measure(s) for Dispute Resolution in accordance with the provisions of this Order.

E. CORRECTIVE MEASURE(S) IMPLEMENTATION

12. Upon EPA's selection of the corrective measure(s), if Respondent has complied with the terms of this Consent Order, EPA shall provide a ninety (90) calendar day-period for negotiation of an administrative order on consent for implementation of the final corrective measure(s). The ninety (90) calendar day-negotiation period shall begin on the date Respondent receives EPA's notification of the final corrective measure(s). If agreement is not reached during this period, EPA reserves all rights it has to implement the corrective measure(s) or other remedial response and to take any other appropriate actions under RCRA, CERCLA, or any other available legal authority.

F. SUBMISSIONS/EPA APPROVAL/ADDITIONAL WORK

13. EPA will review Respondent's RFI Workplans, RFI and CMS Draft Reports and other submissions, and will notify Respondent in writing of EPA's approval or disapproval of such submissions, in whole or in part. When EPA-approved submissions are required to enable Respondent to obligate funds to complete work required herein under an expiring appropriation, the Respondent shall indicate on the submittal a time frame for approval which will allow compliance with contractual obligations. In the event of EPA's disapproval, EPA shall specify in writing any deficiencies in such submissions.

01/34/55

DEPARTMENT OF THE NAVY

ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511-6287

TELEPHONE NO.
(804) 444-9566
IN REPLY REFER TO:
6280
1143CFB

24 JAN 1985

From: Commander, Atlantic Division, Naval Facilities Engineering Command
To: Commanding Officer, Naval Air Station, Oceana

Subj: INITIAL ASSESSMENT STUDY OF NAVAL AIR STATION, OCEANA, VIRGINIA BEACH, VIRGINIA, NEESA 13-067

Ref: (a) Navy Environmental Protection Manual, OPNAVINST 5090.1 of 26 May 1983
(b) NAVENENVSA ltr 11100/1 Ser 112N/1707 of 28 Dec 1984

Encl: (1) Statement for media queries: NACIP Study, NAS Oceana

1. Reference (a) requires Commanders and Commanding Officers of Shore Activities to provide Navy Assessment and Control of Installation Pollutants (NACIP) Program final reports and data to the Environmental Protection Agency (EPA) Regional Office and appropriate state agencies.

2. Subject report was finalized and distributed by reference (b). Therefore, it is recommended that distribution be made to:

Environmental Protection Agency Region III
Sixth and Walnut Streets
Philadelphia, PA 19106
ATTN: Mr. F. Mulhern
Mail Stop 3WM51

Virginia State Department of Health
Division of Solid and Hazardous Waste Management
Madison Building 109 Government Street
Richmond, VA 23219
ATTN: Mr. W. Gilley

and

Virginia State Water Control Board
Tidewater Regional Office
Pembroke 2, Suite 310
Pembroke Office Park
Virginia Beach, VA 23462
ATTN: Mr. L. McBride

3. Because of media and public attention to former hazardous waste sites, you may desire to request assistance from COMNAVBASE Norfolk, Public Affairs Office to handle inquiries or requests for additional information. Additional technical assistance can be provided by LANTNAVFACENGCOM Code 114. A generalized standard response for media queries is provided as enclosure (1).

-- 00131-7.01-01/24/85

STATEMENT FOR RESPONSE TO MEDIA QUERIES ONLY
NOT FOR PUBLIC RELEASE
NACIP STUDY

The Department of the Navy began a comprehensive Installation Restoration (IR) Program in 1980 to control the possible migration of potentially hazardous environmental contamination from disposal sites. Under the Navy IR Program, the Navy Assessment and Control of Installation Pollutants (NACIP) Program was instituted to systematically identify, assess, and control contamination from suspected past hazardous material operations which may pose a threat to human health or the environment.

The NACIP Program consists of three separate and distinct phases:

(1) Initial Assessment Study (IAS) - collecting and evaluating evidence that may indicate the existence of pollutants that may have contaminated a site and that could pose a health hazard or an impact to the environment either on or off the installation.

(2) Confirmation Study (CS) - performing field investigations, including detailed physical and analytical monitoring, to confirm or deny the presence of contamination or a health hazard, and to quantify the extent of any problems that might exist.

(3) Corrective Measures - instituting needed remedial measures to control and mitigate contamination. The conduct and prioritization of Phases (2) and (3) is based on the findings of the preceding phase. Obviously, negative or insignificant findings result in termination of the NACIP Program for that particular site.

Enclosure (1)

STATEMENT FOR RESPONSE TO MEDIA QUERIES ONLY
NOT FOR PUBLIC RELEASE
NACIP INITIAL ASSESSMENT STUDY FOR NAVAL AIR STATION, OCEANA

The Initial Assessment Study (IAS) for Naval Air Station, Oceana has been completed. Based on information from historical records, aerial photographs, field inspections, and personnel interviews, a total of 16 potentially contaminated sites were identified at NAS Oceana. Each of the sites was evaluated with regard to possible contamination characteristics (chemical composition, physical state and quantities), potential migration pathways (surface and ground water characteristics, precipitation and soil data), and pollutant receptors (distances to areas of concern, population and surrounding environmental considerations).

The study concludes that while none of the sites poses an immediate threat to human health or the environment six warrant further investigation under the Navy Assessment and Control of Installation Pollutants (NACIP) Program to assess potential long-term impacts. A Confirmation Study, involving actual sampling and monitoring of the six sites, was recommended to confirm or deny the existence of the suspected contamination and to quantify the extent of any problems which might exist. The six sites recommended for confirmation are listed below in order of priority:

1. Site 14 Pentress Landfill
2. Site 2 Line Shack Oil Disposal Areas
3. Site 7 Fifth Green Landfill
4. Site 1 West Woods Oil Disposal Pit
5. Site 8 North Station Landfill
6. Site 5 Old Static Engine Test Cell Mercury Spill

The results of the Confirmaton Study will be used to evaluate the need to perform mitigating actions or cleanup operations.

QUESTIONS AND ANSWERS

1. What types of wastes are present at the six sites recommended for Confirmation Study (CS)?

Solvents, POL, pesticides, transformers, mercury, mixed municipal wastes, and construction debris.

2. Why were the other 10 sites not recommended for CS?

The sites were not recommended for further study because: (a) small volumes of materials were disposed; (b) materials disposed are not classified as a hazardous waste; (c) a previous investigation revealed no contamination; or, (d) a previous study recommended mitigative actions.

3. What types of wastes are present at the 10 sites not recommended for CS?

Construction debris, mercury, POL, & pesticides.

4. How much waste was disposed of at the six sites recommended for CS?

The IAS provides limited information and provides only estimations of past disposal quantities. Some of the information in the IAS report is based on current industrial generation rates or length of site use as a disposal area. The Confirmation Study is expected to identify the types of waste present in each area and further determine quantities.

5. Are any of the six sites still in use?

Site 7, a former landfill, is now part of the station golf course.

6. Are any sites adjacent to a waterway?

No.

7. Are any sites close to the station boundary?

No.

8. Is there any evidence of contamination at any of the six sites?

Visible evidence of contamination was noted by the IAS team at two sites: oil-soaked ground at Site 2 and metallic mercury at Site 5.

9. What is being done to clean up the sites?

Funding is being requested for a Confirmation Study for the sites. The work will assess the extent, if any, of the contamination's impact on the environment. The study is projected to start late in FY-85.

10. What is being done in the meantime?

Base directives mandate proper handling, storage, and disposal of hazardous materials and wastes.

18

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511-6287

OC-00055-9.01-11/4/87

TELEPHONE NO.
(804) 445-1814

IN REPLY REFER TO:
5090
1142CFB

4 NOV 1987

Regional Administrator
U.S. Environmental Protection Agency
Region III
841 Chesnut Street
Philadelphia, PA 19107

Re: Technical Review Committees

Gentlemen:

In accordance with SARA Section 211, we are establishing technical review committees to review and comment on our efforts under the Installation Restoration program. We are currently conducting RI/FSs at eleven installations within Region III; a list of these activities is enclosed. We request you designate a representative to these committees at this time. This representative should be able to review our reports in a timely manner, attend committee meetings at or near the installations and fulfill SARA requirements for consultation and coordination.

Please have your designated representative notify us by November 30, 1987 so we may initiate the review process. Our points of contact are Jerry Wallmeyer and Cherryl Barnett, (804) 445-1814.

Sincerely

J. R. Bailey

J. R. BAILEY, P.E.
Head, Environmental Quality Branch
Utilities, Energy and Environmental
Division
By direction of the Commander

Copy to:
NAVCAMS LANT Norfolk
COMNAVBASE Norfolk
WPNSTA Yorktown
NSC Cheatham Annex
NSC Norfolk
NAVSHIPYD Norfolk
NAS Oceana
FCTC Dam Neck
NAVPHIBASE Little Creek

Copy to: Con't.

Hercules Inc.
Aerospace Products Corp.
Allegany Ballistics Laboratory
P.O. Box 210
Rocket Center, WV 26726

CNTT Detachment
Base Closure Force
Port Deposit, MD 21904-1770

OC-00057- 9.01 -01/6/89

3926
COPIES

DEPARTMENT OF THE NAVY

NAVAL AIR STATION OCEANA
VIRGINIA BEACH, VIRGINIA 23460-5120

IN REPLY REFER TO
5280
Ser 182P/0055
6 January 1989

Mr. William J. Whitney, Jr.
Director
Office of Environmental Managment
City of Virginia Beach
Municipal Center Complex
Virginia Beach, Virginia 23456

Dear Sir:

The Navy has been conducting investigations of former waste disposal sites at NAS Oceana in Virginia Beach and at the Naval Auxiliary Landing Field (NALF) Fentress since 1983, under the guidelines of the Navy Installation Restoration (IR) (previously the Navy Assessment and Control of Installation Pollutants Program (NACIP)) Program.

In late 1986, Congress passed the Superfund Amendments and Reauthorization Act (PL 99-499) (SARA) which requires departments, agencies, and instrumentalities of the Federal Government to comply with the Act's procedural and substantive requirements. To meet these requirements, the Navy is modifying IR program to conform with the new SARA requirements.

One of the Act's requirements is to establish a Technical Review Committee (TRC) to review and comment on actions proposed to investigate and clean up sites of environmental contamination. The committee must include representatives from federal and state regulatory agencies along with local government and community representatives.

The initial TRC meeting is scheduled to take place on Wednesday, January 11, 1989 at 9:00 AM in the Public Works Department's Second Floor Conference Room here at NAS Oceana. The meeting agenda will include a brief background presentation, identification of areas of potential concern and a discussion of our current efforts and future plans for monitoring and possible remediation.

You are requested to contact Mr. Terry Berglund, Supervisory Environmental Engineer at (804) 433-2229 prior to the meeting in order to confirm your attendance so that Station access arrangements can be made through the Security and Pass Office.

UC-00037 - 4.01 - 01/6/89

Your interest in this matter of mutual concern is greatly appreciated.

Sincerely,

D. F. ELZNIC
Lieutenant Commander, CEC, USN
Assistant Public Works Officer
By direction of the
Commanding Officer

OC-00108 - 9.01 - 01/25/89

# City of Virginia Beach

DEPARTMENT OF PUBLIC LIBRARIES
CENTRAL LIBRARY

4100 VIRGINIA BEACH BOULEVARD
VIRGINIA BEACH, VIRGINIA 23452
(804) 431-3070

January 25, 1989

Public Affairs Office
NAS Oceana
Virginia Beach, Virginia 23460

ATTENTION: Ace Ewers

Dear Mr. Ewers:

I apologize for the delay in responding to your request to have materials concerned with the Installation Restoration Program for Hazardous Waste placed in the Virginia Beach Public Library.

I am pleased that you have thought of the public library for this purpose. The Central Library, in particular, is quite convenient for many citizens and your materials would be accessible. My concern has been that we are all apparently somewhat in the dark as to the format, extent and retention requirements of this information. If you continue to be interested in the library as a site, however, I am willing to initiate a process as follows:

1. You may send to my attention materials as they are received. We will place them in an information file whose drawer will be marked as to their contents. Staff will direct interested users to this information in the process of researching user requests.

2. Due to the type of material described in conversations with you and with Darlene at Dam Neck, I do not believe that the material will be cataloged.

3. If at any time, the staff load for filing or updating this material becomes prohibitive, the library may need to recontact you and discuss alternative storage.

4. I would appreciate as much information about the frequency of receipt, retention requirements, updating requirements, etc. as you can possibly provide.

Continued on Page 2

Letter to Mr. Ewers
January 31, 1989
Page 2

5. I recommend some publicity, or at least, letters to members of the press such as Dennis Hartog at the Virginia Beach Beacon, to alert them to the availability of this information within the library.

I hope that we will have an opportunity to work together on this project.

Sincerely,

Carolyn L Barkley

Carolyn L. Barkley,
Central Librarian

CLB:jw

cc: John Stewart, Assistant Library Director
Patricia Cook, Information Services Librarian
Toni Lohman, Collection Management Librarian

6280
Ser 182P/004
05 JAN 1989

U.S. Environmental Protection Agency, Region III
841 Chesnut Building
Attn: Mr. Drew Lausch
Philadelphia, PA 19107

Dear Mr. Lausch:

The Navy has been conducting investigations of former waste disposal sites at NAS Oceana and at the Naval Auxiliary Landing Field (NALF) Fentress since 1983, under the guidelines of the Navy Installation Restoration (IR) (previously the Navy Assessment and Control of Installation Pollutants Program (NACIP)) Program.

In late 1986, Congress passed the Superfund Amendments and Reauthorization Act (PL 99-499) (SARA) which requires departments, agencies, and instrumentalities of the Federal Government to comply with the Act's procedural and substantive requirements. To meet these requirements, the Navy is modifying the IR program to conform with the new SARA requirements.

One of the Act's requirements is to establish a Technical Review Committee (TRC) to review and comment on actions proposed to investigate and clean up sites of environmental contamination. The committee must include representatives from federal and state regulatory agencies along with local government and community representatives.

The initial TRC meeting is scheduled to take place on Wednesday, January 11, 1989 at 9:00 AM in the Public Works Department's Second Floor Conference Room, NAS Oceana. The meeting agenda will include a brief background presentation, identification of areas of potential concern and a discussion of our current efforts and future plans for monitoring and possible remediation.

You are requested to contact Mr. Terry Berglund, Supervisory Environmental Engineer, at (804) 433-2229 prior to the meeting in order to confirm your attendance and arrange for Station access.

Your interest in this matter of mutual concern is greatly appreciated.

Sincerely,

M. N. MATTON
Captain, U.S. Navy
Commanding Officer

NAS OCEANA INSTALLATION RESTORATION [illegible]

TECHNICAL REVIEW COMMITTEE (TRC) MEMBERS

1. Activity Program Coordinator - Mr. Terry Berglund

Commanding Officer
NAS Oceana
Public Works Department-Building 820
ATTN: Code 182PE
Virginia Beach, VA 23460-5120
(804) 433-2229

cc 2. Activity Public Affairs Officer - Mr. A. C. (ACE) Ewers

Commanding Officer
NAS Oceana
Public Affairs Office, Building 230
Virginia Beach, VA 23460
(804) 433-3131

Areawide Navy Program Coordinators

cc 3. LANTNAVFACENGCOM EIC's - Ms. Nina Johnson/Ms. Sheila Ashton

Commander, Atlantic Division, Naval Facilities Engineering Command
ATTN: Code 1152
Norfolk, VA 23511-6287
(804) 444-8045; 445-1814

Federal Regulatory Agency Representative

* 4. U.S. Environmental Protection Agency, Region III - Mr. Drew Lausch

U.S. EPA, Region III
841 Chesnut Bldg.
ATTN: (3ES40)
Philadelphia, PA 19107
(215) 597-3634

Commonwealth of Virginia Regulatory Agency Representatives

* 5. Virginia Department of Waste Management - Mr. Gerould McCoy/Mr. Glenn Metz
Commonwealth of Virginia
Department of Waste Management
18th Floor, Monroe Building
101 N. 14th Street
Richmond, VA
(804) 225-3264; 225-3260

City of Virginia Beach Representative

* 6. Mr. R. Lee Eskey, Director
Office of Emergency Management
City of Virginia Beach
Municipal Center Princess Anne Executive Park
Virginia Beach, VA 23456-9082
(804) 427-4192

City of Chesapeake Representatives

* 7. Fire Chief Michael Bolac/Stephen Best
City of Chesapeake Fire Department
304 Albemerle Drive
Chesapeake, VA 23320
(804) 547-6497

Virginia Beach Community Representative

* 8. Walter Vargo
2409 Sadler Court
Virginia Beach, VA 23454
(804) 481-1857

* James O. Hertz
4408 Muddy Creek Road
Virginia Beach, VA 23457
(804) 426-7034

Chesapeake Community Representative

* 9. John Keffer
335G Centerville Turnpike, South
Chesapeake, VA 23322
(804) 482-2179 or (804) 466-9145

---

py Rol ders
ADDITION
TRC MEMBERS

cc 10. Commander Naval Air Force, U.S. Atlantic Fleet (COMNAVAIRLANT)
Ms. Sara Johnson, ATTN: Code 67
Naval Air Station
Norfolk, VA 23511-5188
(804) 444-3971

cc 11. Commander, Naval Facilities Engineering Command (COMNAVFACEGCOM)

Mr. Ted Zagrobelny, Code 1121
Mr. Brian Higgins, Code 1121B
AV 221-8176; Comm (202) 325-8176

cc 12. Chief of Naval Operations
OP-453
Mr. David Olson
(202) 692-5583
AV 222-5580

13. Commander in Chief, U.S. Atlantic Fleet (CINCLANTFLT)
    Mr. Sam Robinson, ATTN: Code [illegible]
    Norfolk, VA 23511-5001
    (804) 444-5805

14. Mr. William J. Whitney, Jr., Director
    Office of Environmental Management
    City of Virginia Beach
    Municipal Center Complex
    Virginia Beach, VA 23456
    (804) 427-4801

* - letter addressee

cc - copy holders

OC-00129 - 9.03 - 01/01/01

My name is Jesse and Will and I have been working together to set up this TRC (Technical Review Committee)

We thought it would be a good idea if I went over the past environmental history at Oceana under the Installation Restoration (IR) program.

Environmental Investigation began at Oceana in 1984. The Initial assessment study (IAS) was conducted from april thru December 1984.In the report it discussed 16 sites at oceana. these discussion were based on :

personnel interviews
site inspections
and any type of historical data available

at the conclusion of the IAS it was recommended that 5 of these sites be further investigated at Oceana.

between 1986 and 1988 our technical consultant, CH2MHILL, performed two separate rounds of investigation.

The results of these investigations were presented to the last Technical Review Committee (TRC) in Jan of 1989

up to this point, all work was completed under the requirements of the **comprehensive Environmental Response, Compensation and liability Act of 1980** better known as CERCLA.

Between 1988 and 1989, an EPA contractor performed a base wide environmental investigation at OCeana. This investigation is called a **RCRA FAcilities Assessment** or RFA.

in MAR of 1990, based on the results of the RFA, EPA issued the NAVY a **preliminary RCRA Consent Order** which listed 60 potential areas of concern known as **Solid Waste Management Units** or SWMUS under the RCRA Corrective Action process.

Subsequent to this order, EPA, Oceana, and LANTDIV exchanged additional information at various meetings and it was agreed that only 17 of the SWMUs needed to be further investigated at NAS OCeana.

Based on these meeting, a Final Consent Order was signed by the EPA and the NAVY in June of 1991.

The consent Order requires us to perform all future investigations and reports at OCEANA under the requirements of the **Resource Conservation and Recovery Act (RCRA) of 1976**

The **RCRA corrective action process** lists **specific requirements** and **timeframes** which must be met.

While the requirements contained in RCRA and CERCLA are very similar, the terminology is somewhat different.

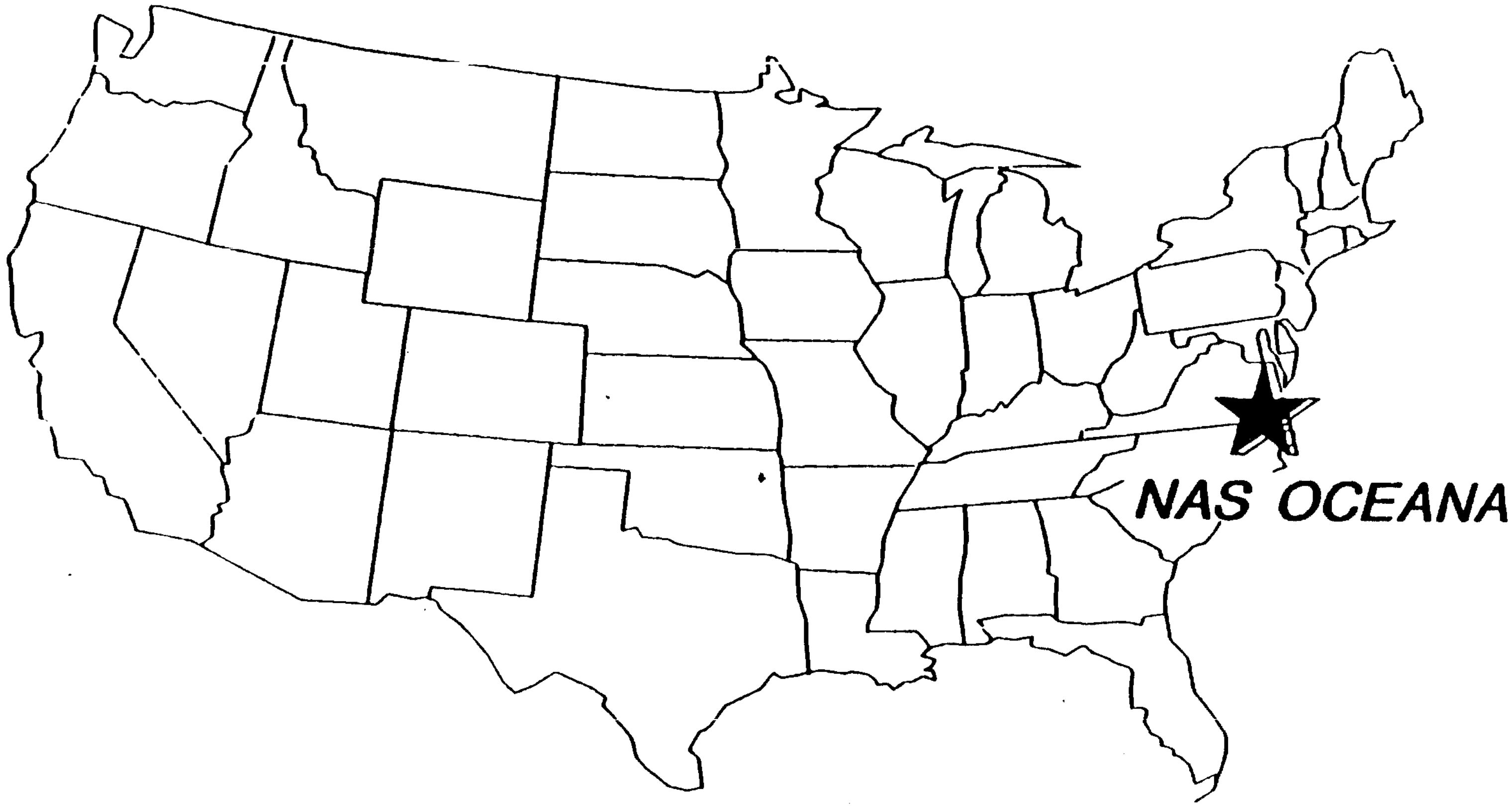
I have copied for your use and information a chart which compares the processes for CERCLA and RCRA.

After the Time of the last TRC it was decided it would be better to perform a Interim Rcra Facilities Investigation (RFI) in lieu of the next step in the process which is a complete RFI. This was decided since many of the SWMU had only had limited sampling at the sites. Some of the sites only had historical information and no sampling completed.

Frank Lewis of CH2MHILL will present the finding of this report in a few minutes.

In october of 1991 the final report of the interim RFI and the proposed work plan was submitted to EPA for their Review.
Frank will present the findings to date at each of the sites and the proposed action for our comments.

# INSTALLATION RESTORATION
## TECHNICAL REVIEW COMMITTEE



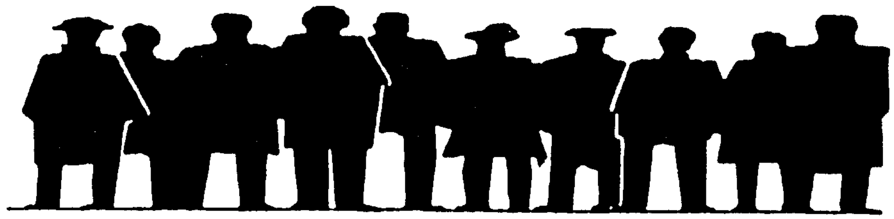

11 JANUARY 1989

OC-00126 - 9.03 - 01/11/89

OC-00126- 7.03 - 01/11/89

# NAS OCEANA
# PERSONNEL STATISTICS

- 21,930 Navy Personnel & Dependents
  - 2,880.....Active Duty Assigned to NASO
  - 7,050.....Air Squadrons, Wings & CVW'S
  - 12,000....Dependents



- 1,818 Civilians
  - 764.......Civil Service
  - 640.......Non-Civil Service
  - 414.......Contractors

# NAS OCEANA
## FACILITIES STATISTICS

- 40+ Miles of Roadway
- 1 - 12,000 foot Runway
- 3 - 8,000 foot Runways
- 6 - Hangars
- 3 - Jet Engine Test Cells
- Ramp Space for over 350 Aircraft
- Full AIMD Capability

OC-00126 - 9.03- 9/11/89

OC-00126- 7.05-01/11/87

# NAS OCEANA
## ALF FENTRESS FACILITIES

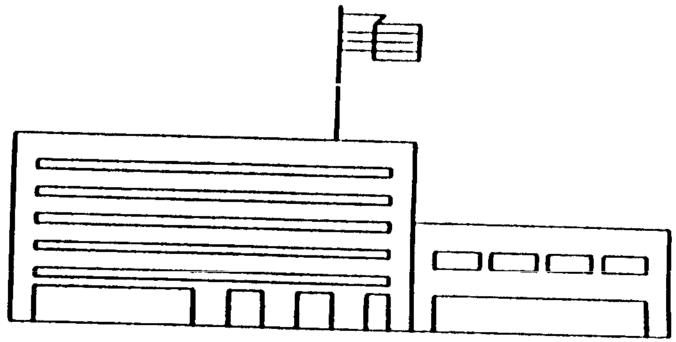
- 10 Buildings
- 1 - 8,000 foot Runway
- Refueling Capability

OC-00126 - 1.05 - 07/17/87

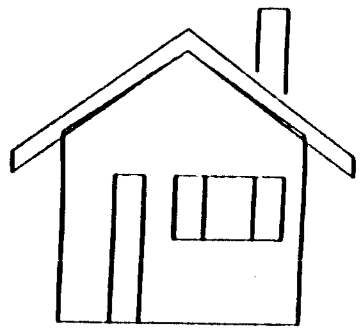
# NAS OCEANA ASSETS

15,000 Acres

440 Buildings

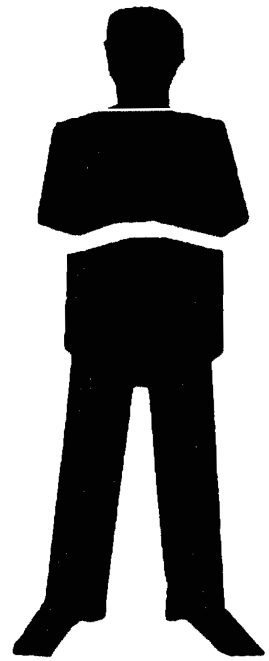


1,225 Housing Units



$823 Million Total Value

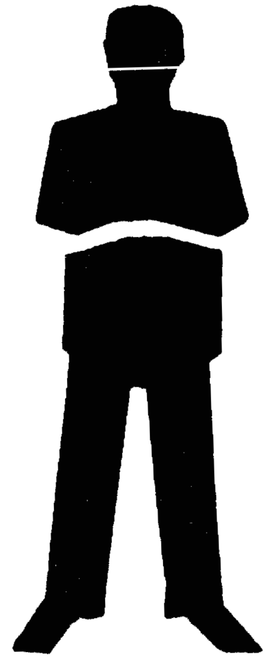
# ENVIRONMENTAL PROGRAMS
# C.O.'s ROLE



## RESPONSIBILITIES

- Establishes Program Policy
- Chairs the Policy Council
- Provides Program Resources
- Reviews Inspection Compliance
- Monitors Progress on Action Items
- Maintains Positive Proactive Community Awareness Program

# ENVIRONMENTAL PROGRAMS
# PWO's ROLE



## RESPONSIBILITIES

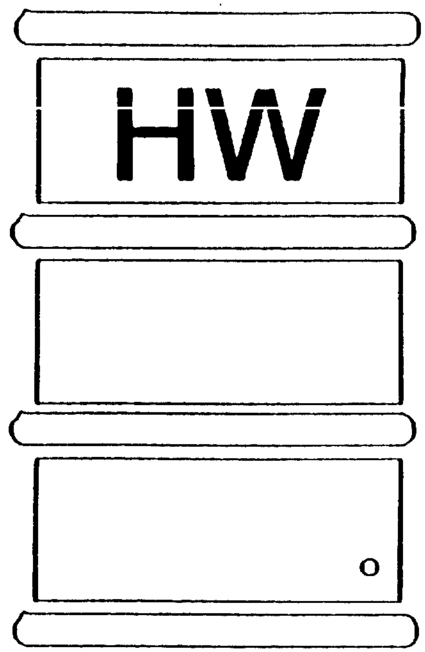
- Implements Program Policy
- Provides Technical Advice
- Insures Program Compliance
- Interfaces with Regulators
- Coordinates with other Technical Agencies

OC-00126 · 7.03 · 01/11/87

OC-00126 - 7.05 - 0/1/81

# RCRA REQUIREMENTS

## HAZARDOUS WASTE

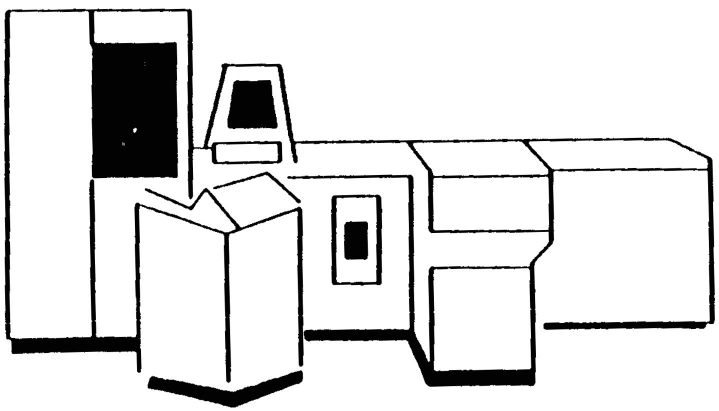


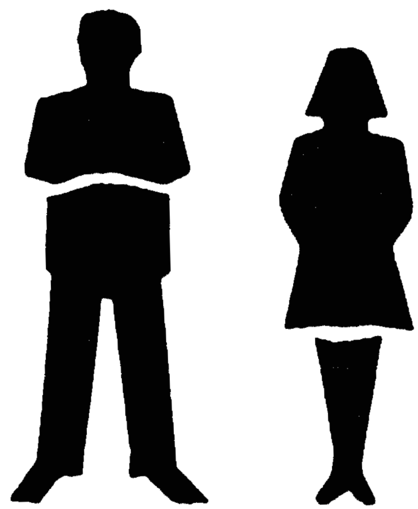

## REQUIREMENTS

- Interim Status
- Waste Analysis
- Security
- Personnel Training
- Ignitable, Reactive and Incompatible Wastes
- Emergency Preparations and Spill Prevention
- Recordkeeping, Manifests, and Reporting

# HW MANAGEMENT

- POLICY COUNCIL ON ENVIRONMENTAL ISSUES
- HW TRACKING SYSTEM PROGRAM
- HW PROGRAM ORGANIZATION
- MANAGEMENT PERSONNEL

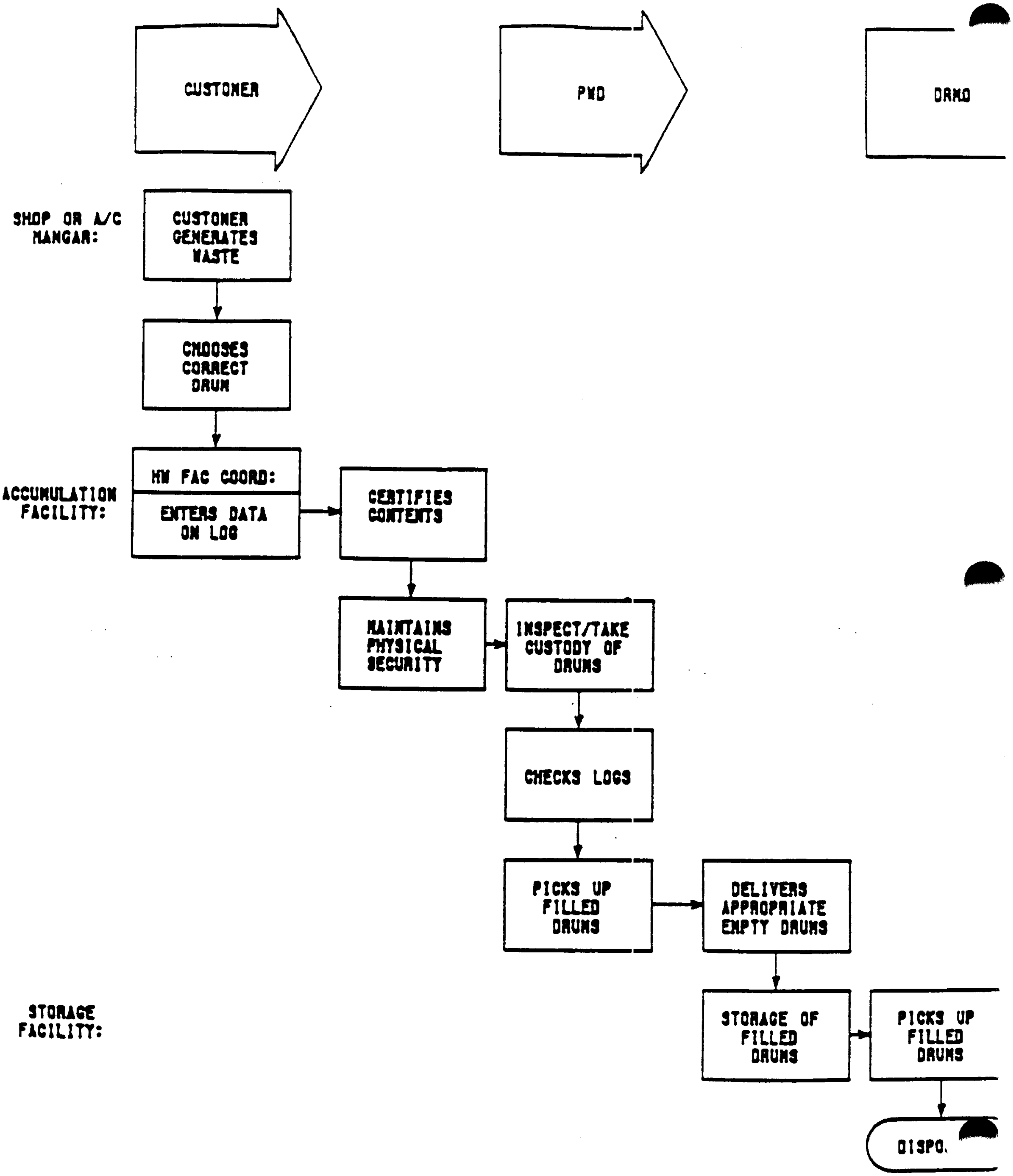




OC-00126- 9.03- 01/11/89

OC-00126 - 9.03 - 01/11/89

HAZARDOUS WASTE HANDLING PROCEDURES



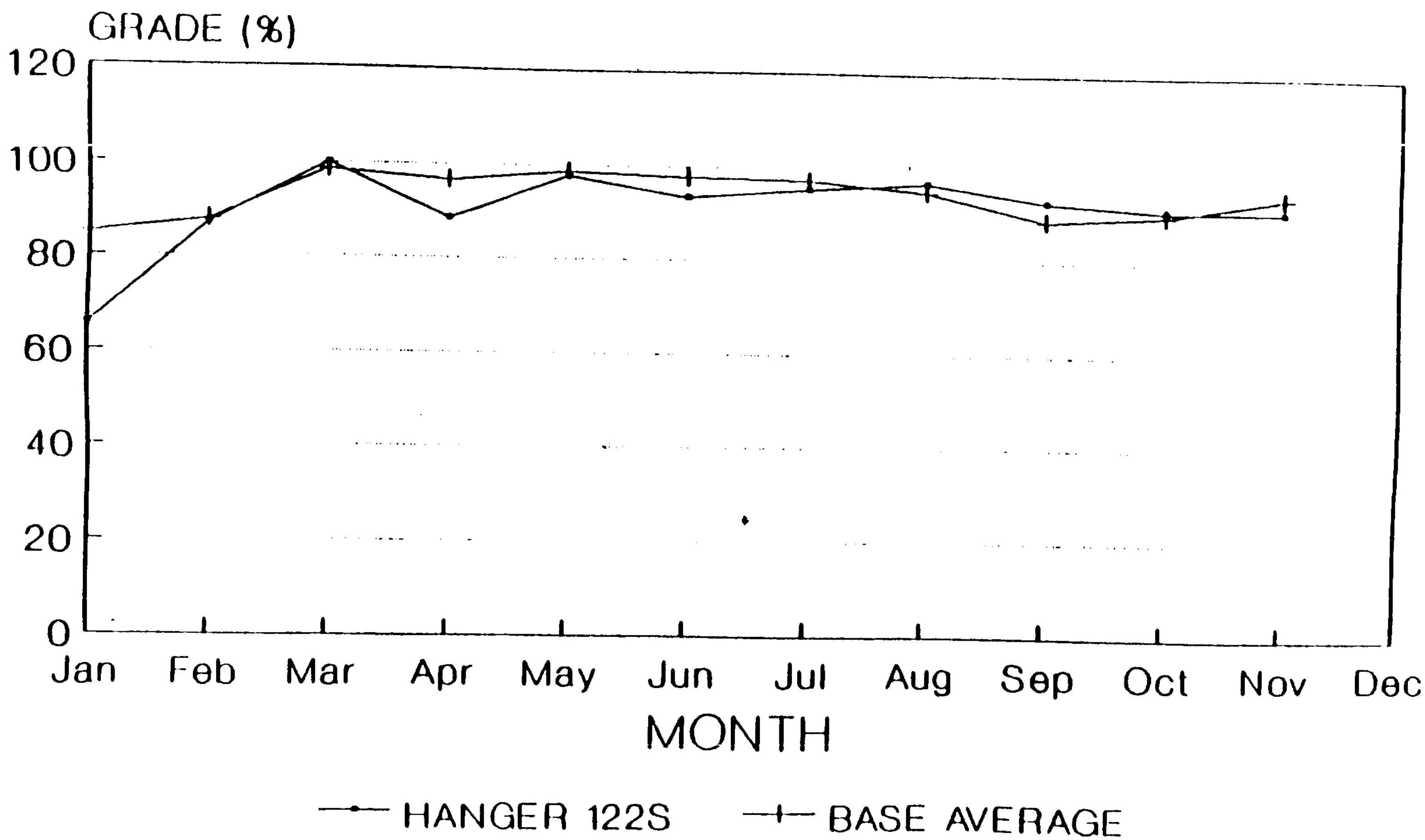
# HW GENERATOR
## INITIATIVES

- MONTHLY INSPECTION FEEDBACK
- INCREASED OPERATOR TRAINING
- HW INSTRUCTIONS
- COMMAND INTEREST
- HW MANAGEMENT PLAN UPDATE
- HW MINIMIZATION/RECYCLING

OC-00126- 9.03 - 01/11/84

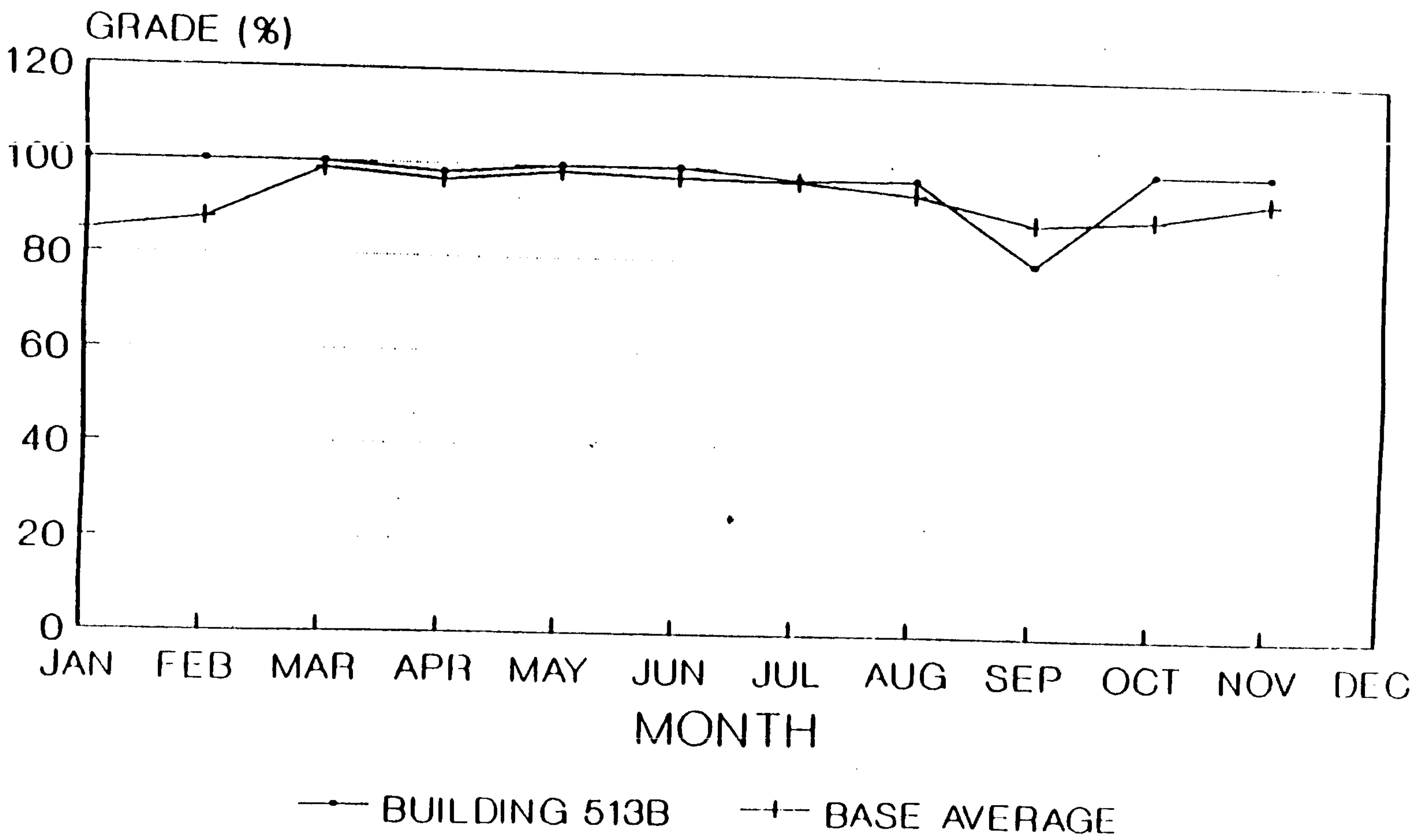
OC-00126 - 9.03 - 01/11/87

# HAZ. WASTE INSPECTION
## 122S VS BASE AVERAGE




WBD 8/12/88

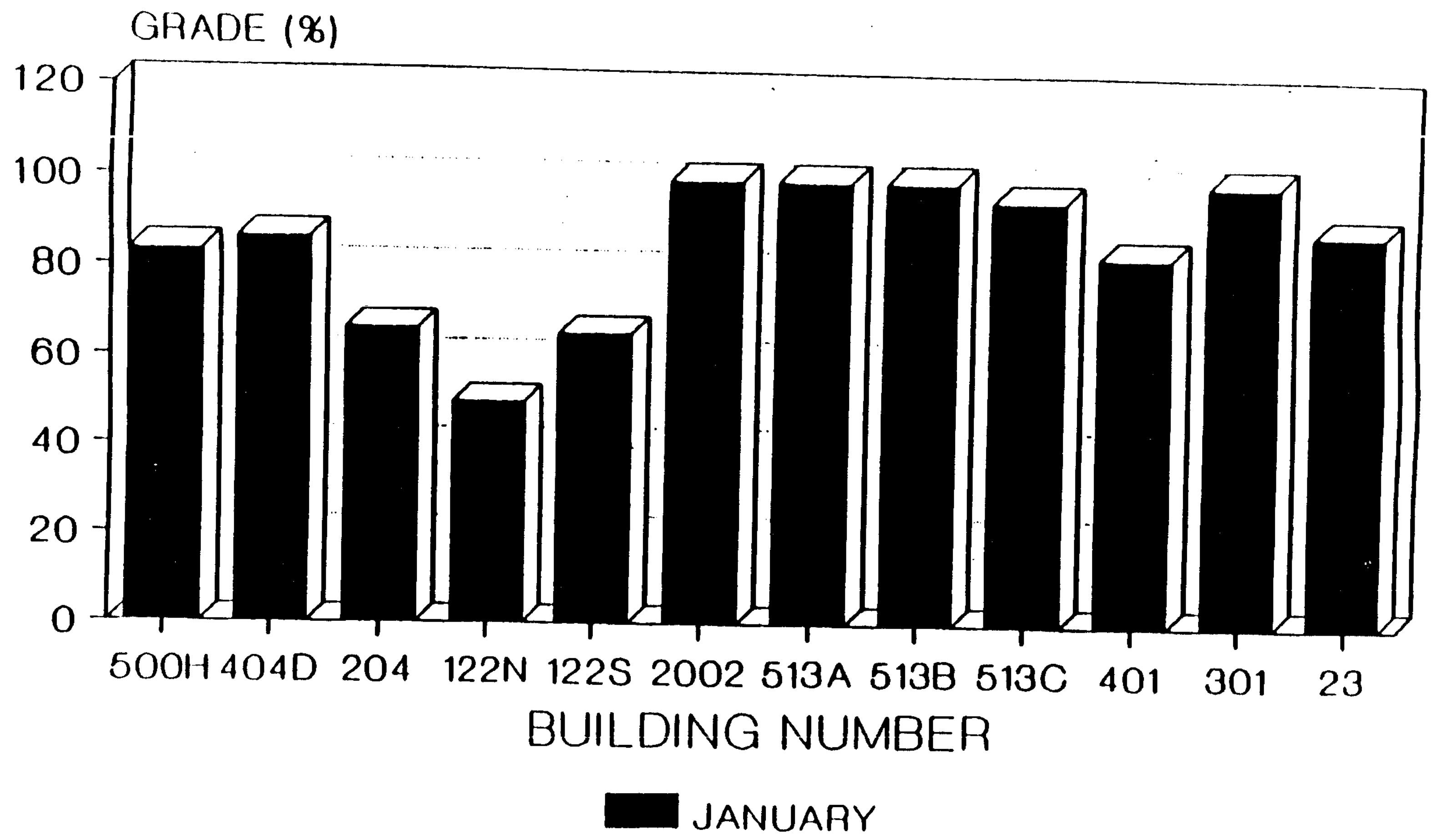
# HAZ. WASTE INSPECTION
## 513B VS BASE AVERAGE




WBD 8/12/88

OC-00126 - 9.03 - 01/11/89

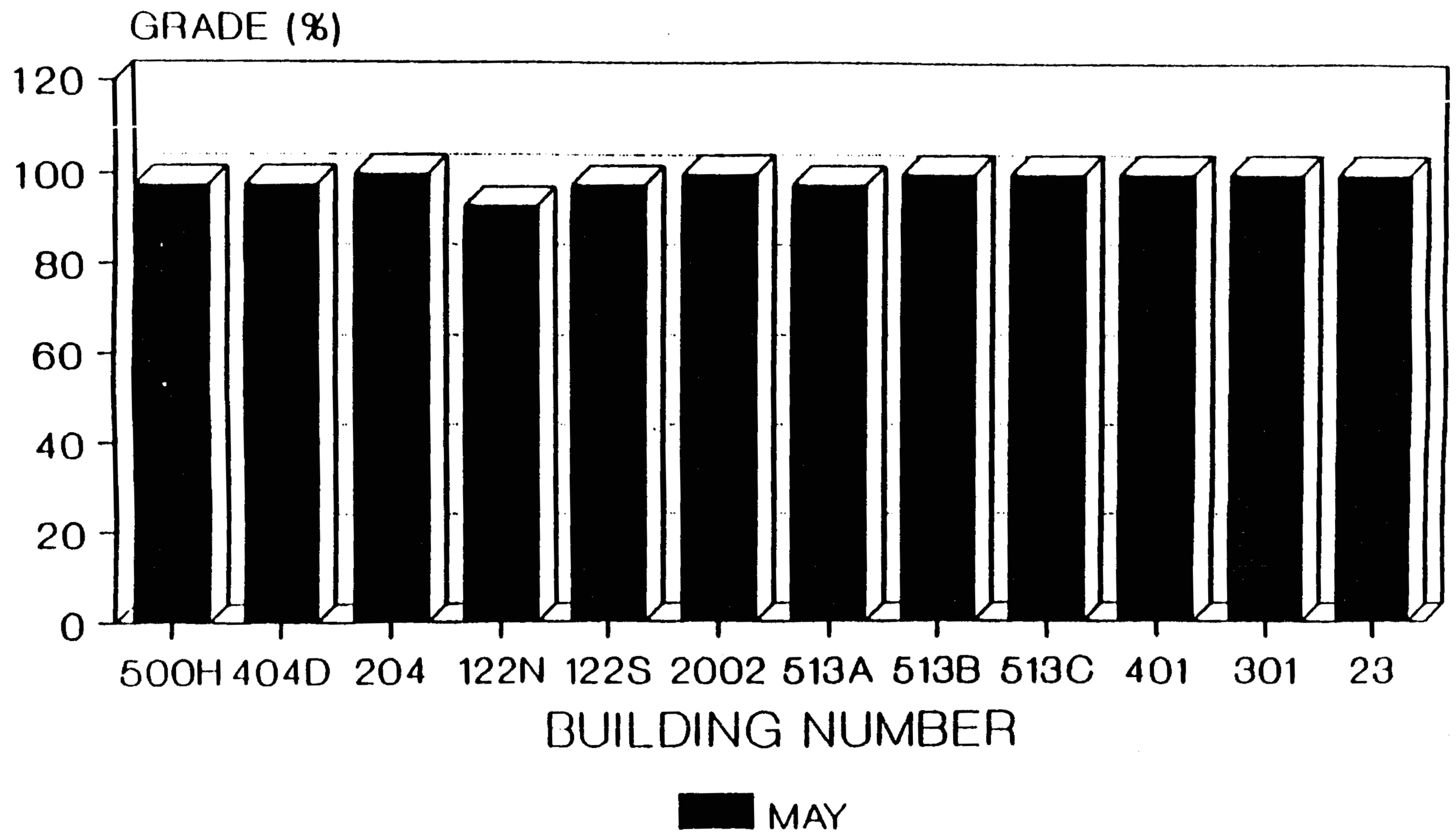
# HAZ. WASTE INSPECTIONS
## JANUARY




10/13/88

OC-00126 - 9.03 - 01/11/89

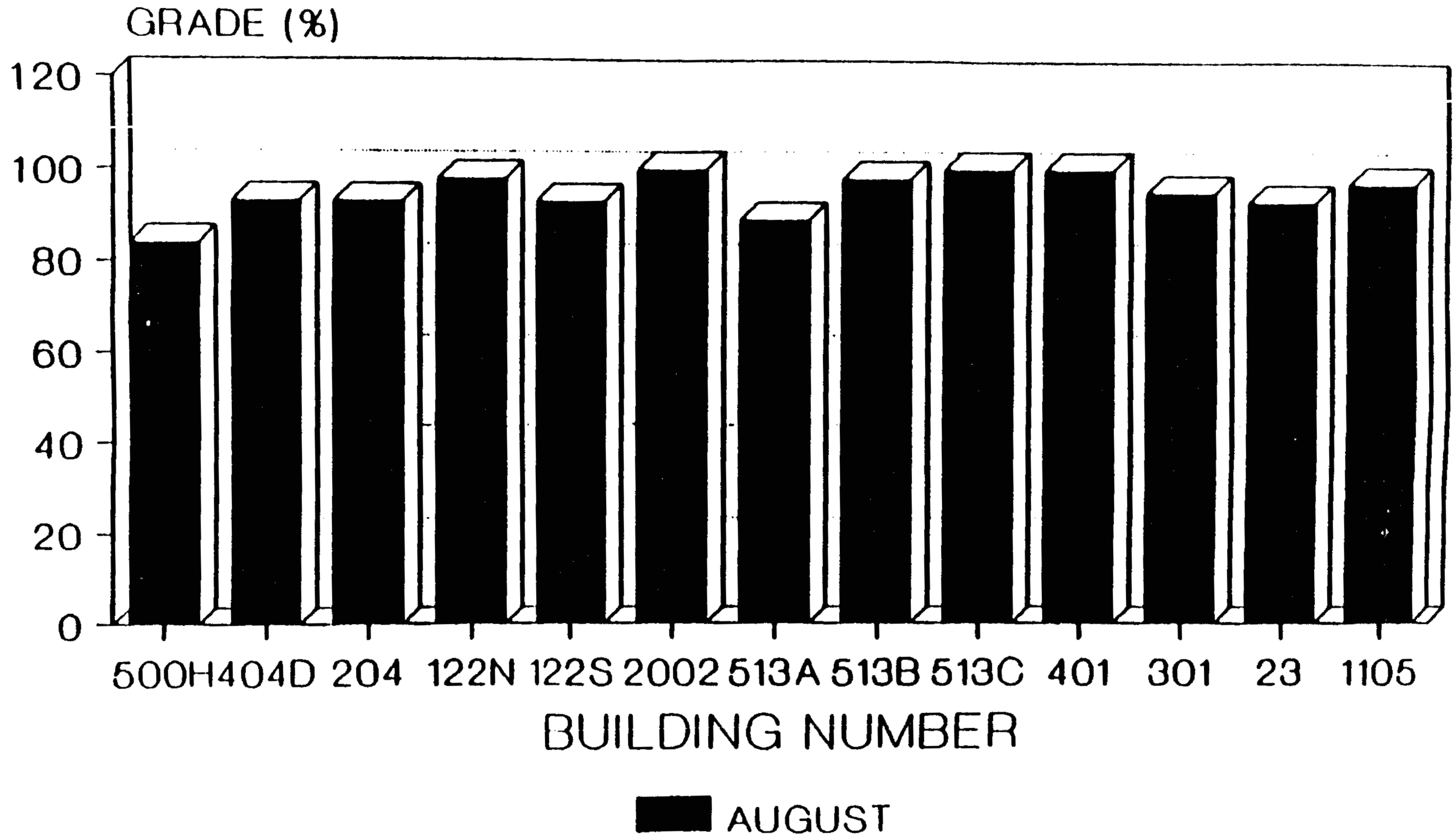
# HAZ. WASTE INSPECTIONS
## MAY




OC-00126 - 9.03 - 01/11/89

10/13/88

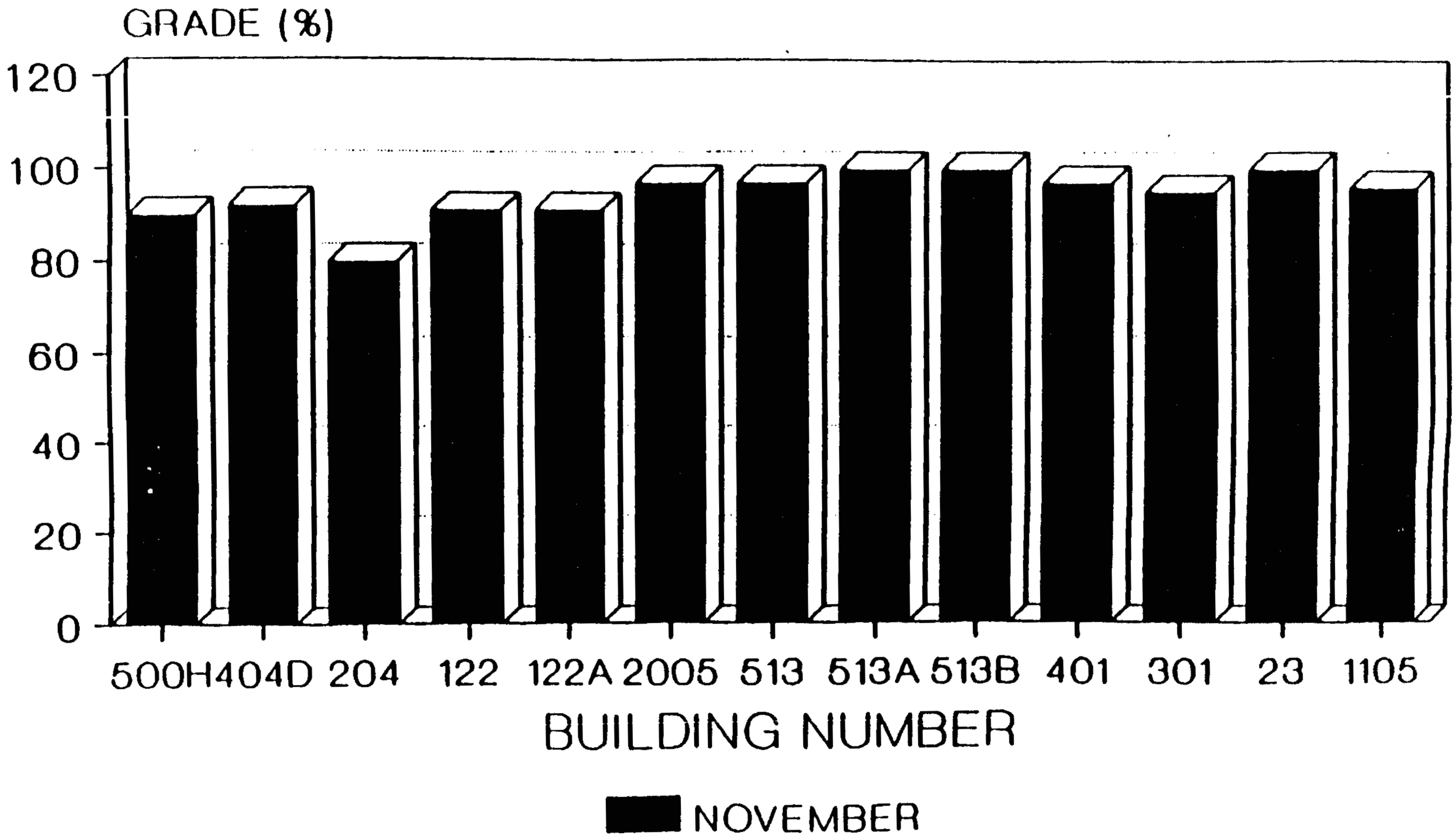
# HAZ. WASTE INSPECTIONS
## AUGUST




10/14/88

OC-00126 - 9.03 - 01/11/89

# HAZ. WASTE INSPECTIONS
## NOVEMBER

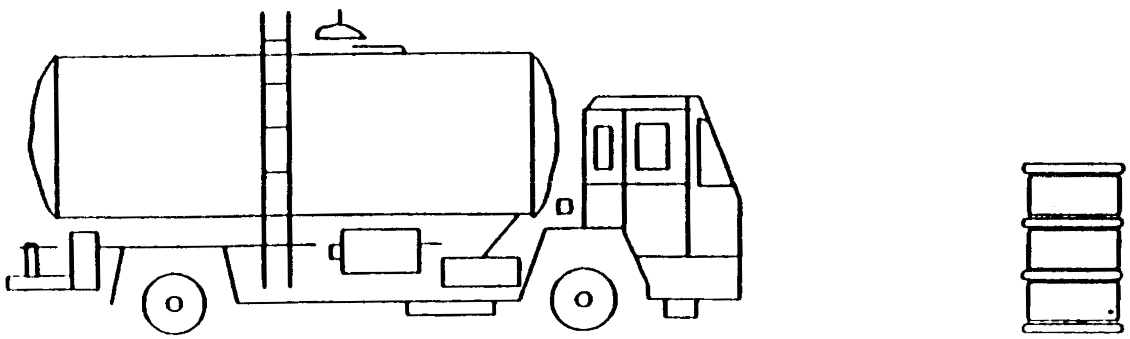



10/14/88

OC-00126 · 9.03 · 01/11/89

# STORAGE FACILITY
## INITIATIVES

- SUBMITTED PART "B" PERMIT APPLICATION
- PLANNING POTENTIAL FACILITY IMPROVEMENTS
- OBTAINING ADDITIONAL HW STAFFING
- HW MANAGEMENT PLAN UPDATE



0C-00126 - 9.03 - 01/11/87

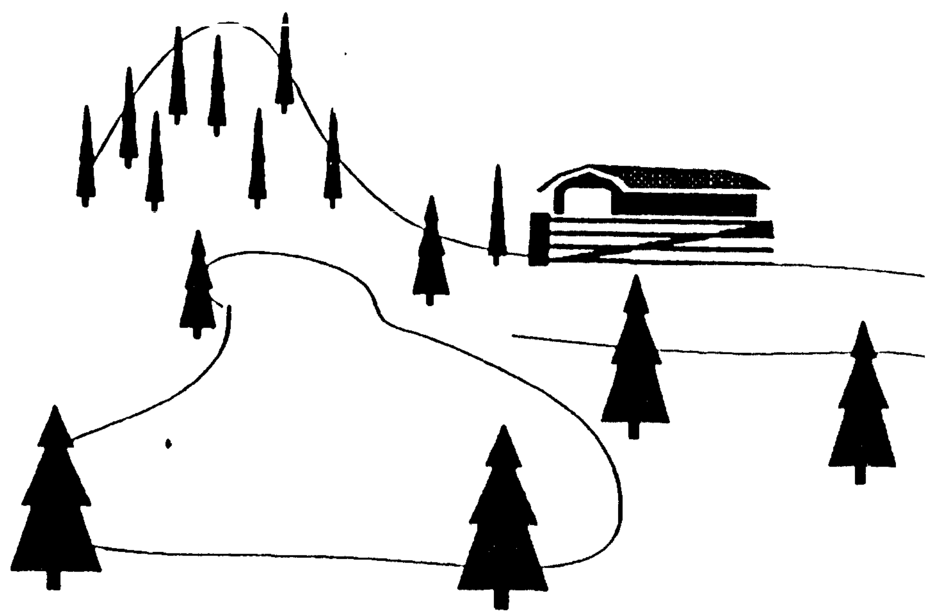
# HW CONTAINER MANAGEMENT

- LABELING AND COLOR CODES
- DRUM LOGS VS ANALYSIS
- PROPER CHARACTERIZATION
- MANIFESTING
- DRMO AND CONTRACTORS

OC-00126- 9.03- 01/11/89

# NAS OCEANA GOAL

- ACHIEVE AND SUSTAIN 100% COMPLIANCE



- PROTECT OUR ENVIRONMENT

OC-00126 - 9.03 - 01/11/89

ABBREVIATIONS IN THE
INSTALLATION RESTORATION PROGRAM

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act: original 1980 Act setting up "SUPERFUND" for hazardous waste (HW) site cleanups nationwide

DERA - Defense Environmental Restoration Account: established by Congress, under SARA, to fund DoD HW site cleanups, building demolition, and HW minimization projects

HRS - Hazard Ranking System; data from PA/SI is scored by EPA using this methodology

IAS - Initial Assessment Study; Phase I under the old NACIP program, equivalent to the IR program's PA/SI

IR - Installation Restoration; DoD's program to assess and clean up old HW sites; funded by DERA

NACIP - Navy Assessment and Control of Installation Pollutants Program; old terminology equivalent to IR program

NPL - National Priorities List; sites with HRS scores above 28.5 are considered of national concern and are eligible for SUPERFUND if no "responsible party" can be found; DERA funds apply to cleanup efforts at Navy sites

PA/SI - Preliminary Assessment/Site Investigation; first phase in the DoD IR and EPA SUPERFUND programs; consists of record searches, interviews, initial data collection for scoring purposes

RCRA - Resource Conservation and Recovery Act; amended the old Solid Waste Disposal Act and established the nation's HW management program; includes requirements for Leaking Underground Storage Tanks (LUST)

RD/RA - Remedial Design/Remedial Action; third phase of DoD IR and EPA SUPERFUND programs; consists of design and cleanup phase; emerging technologies for decontamination required where "practicable"

RI/FS - Remedial Investigation/Feasibility Study; second phase of DoD IR and EPA SUPERFUND programs; consists of groundwater profiles, site sampling, pollutant characterization and detailed analysis of remedial alternatives

SARA - Superfund Amendments and Reauthorization Act; makes major changes to CERCLA and RCRA; sets requirements for DERA and TRCs

TRC - Technical Review Committee; made up of representatives of the activity, federal, state and local agencies and the community at large to review and comment on actions taken under the IR program

OC-00174-09.03- 10/14/93

DEPARTMENT OF THE NAVY
NAVAL AIR STATION OCEANA
VIRGINIA BEACH, VIRGINIA 23460-5120

IN REPLY REFER TO
5090
Ser 189/2284

14 OCT 1993

Mr. Chase Sargent
Battalion Chief
Special Operations
Va Beach Fire Department
Municipal Center
Va Beach, Va 23456-9065

Dear Mr. Sargent:

A Technical Review Committee (TRC) meeting has been scheduled for 9 A. M. on October 21, 1993, in conference room A of the Administration Building (No. 230) at Naval Air Station (NAS) Oceana. Enclosure (1) shows location on the base. You or a representative is invited to attend.

The meeting will focus on the findings and recommendations of the recently completed RCRA Facilities Investigation (RFI). The investigative report was mailed to you earlier. If you have any questions, NAS Oceana's point of contact is Will Bullard at 433-2328.

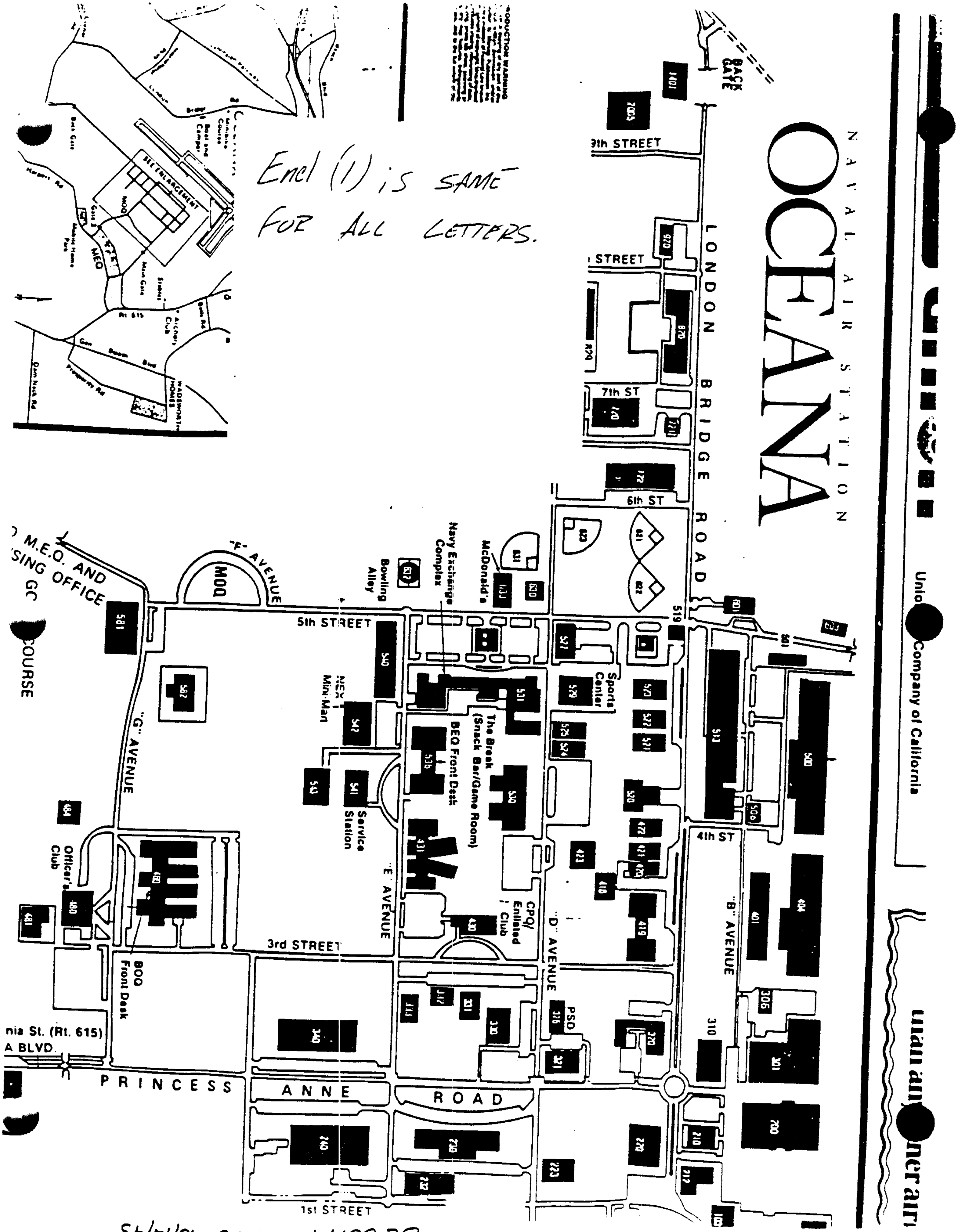
Sincerely,

J. W. CRAINE, JR.
Captain, U. S. Navy
Commanding Officer

Encl:
(1) Location Map

Copy to:
LANTNAVFACENGCOM (Code 1822)

Encl (1) is same for all letters.




OC-00174-09.03-10/14/93

OC-00059 - 9.04 - 01/11/89

TECHNICAL REVIEW COMMITTEE
MINUTES FOR JANUARY 11, 1989

NAVAL AIR STATION, OCEANA, VIRGINIA BEACH, VIRGINIA

**ATTENDEES:**

| | |
|---|---|
| CAPT M.N. Matton | CO, NAS |
| Mr. Ace Ewers | PAO, NAS |
| CDR H.S. Stevenson | PWO, NAS |
| Mr. Terry Berglund | PWD, NAS |
| LCDR Mark Terreii | NAS |
| Ms. Nina Johnson | LANTDIV |
| Mr. David Daly | LANTDIV |
| Mr. John Peters | PAO, LANTDIV |
| Ms. Sara Johnson | COMNAVAIRLANT |
| Mr. Doug Dronfield | CH2M HILL |
| Mr. Frank Lewis | CH2M HILL |
| Mr. Drew Lausch | U.S. EPA |
| Mr. Gerould McCoy | VA Div. of Waste Management |
| Mr. Glenn Metzler | VA Div. of Waste Management |
| Mr. William Journigan | Virginia Beach Fire Dept. |
| Ms. Mary Morris | Env. Mgmt., Virginia Beach |
| Mr. Walter Vargo | Community Rep., Virginia Beach |
| Mr. James Hertz | Community Rep., Virginia Beach |

CAPT Matton welcomed the attendees and expressed his concerns for the purpose of the meeting and stressed his desire for community awareness of the environmental program at NAS.

Each member of the TRC introduced themselves.

CDR Stevenson presented a short computer-aided program which described the current environmental practices at NAS. Emphasis was placed on the current procedures regarding the handling and processing of hazardous materials.

Ms. N. Johnson explained the purpose of the TRC and its legislative origins.

Ms. N. Johnson explained how the Navy began to investigate hazardous waste sites on their bases through the NACIP program. She explained the differences/similarities between the NACIP and the EPA RI/FS program.

Ms. N. Johnson stated that at NAS, the current status is the beginning stages of an RI. The contractors will produce a report following the second round of sampling. The report will contain recommendations that will either rule out further investigation because no contamination was detected, or propose conducting a risk assessment and/or further field investigations depending on the level of contamination found.

Ms. N. Johnson said that there is no set meeting schedule for the TRC. The TRC will convene at appropriate times when decisions require input from the committee.

Ms. N. Johnson explained the role of LANTDIV in the management of the IR program. Funding comes from the Defense Environmental Restoration Account (DERA), and currently plenty of money is available to cover the legislative requirements concerning these sites.

Ms. N. Johnson reviewed the responsibility of the Activity (NAS) with respect to the IR program.

CDR Stevenson stated that the TRC was a working group, and stressed participation from the attendees. He identified the Public Works Department as a point of contact for technical questions or concerns.

Mr. Hertz asked if there was any runoff from NAS facilities to Back Bay. Mr. Berglund said that there was drainage at Fentress that led to the North Landing River. This drainage has never exceeded its permit requirements, with the exception of pH. A study was conducted with the Virginia Water Control Board regarding the pH problem. The problem has been corrected, and the investigation is a matter of public record.

CDR Stevenson stated that nothing goes off the base as far as they know. Booms are located on all ditches flowing from the aircraft storage and maintenance areas. Both EPA and State officials have inspected the drainage ditches, and Navy personnel conducted daily inspections.

Mr. Lausch asked where the ditches were located. CDR Stevenson reviewed the network of drainage ditches at NAS and pointed out on a map the exit point for all ditches leaving the base.

Ms. N. Johnson said that the next round of sampling will include the installation of wells at the Fentress fire fighting facility. The IAS did not include this facility.

Mr. Dronfield discussed the work performed by the contractor at each of the sites. The scope of work was strictly to determine if contamination was present or not. No attempt was made to quantify the extent of contamination or to conduct any form of risk assessment either to human health or to the environment. He stated that the water quality standards, MCLs, and CWA (human health) were being presented only as points of data comparison, and that they were not the only standards available or necessarily the most appropriate if a risk assessment were to be performed.

Mr. Dronfield stated that the wells were located where they were most likely to detect contamination. If contaminated areas were not obvious, the site was surrounded with the number of wells recommended in the IAS. The depths of the wells are shallow, typically 20 feet or less.

Mr. Dronfield gave a brief overview of all seven sites (six at NAS, and one at Fentress), and then proceeded to discuss each one individually. Site summaries had been prepared and distributed to all members of the committee. Mr. Dronfield used these summaries as reference for his presentation.

Mr. Dronfield stated that during the first round of sampling the wells were not properly located around the west woods oil disposal area (Site 1). New information indicates that the IAS incorrectly identified the location of this site. The second round of sampling will include the installation of three wells closer to the old disposal area.

The following discussion occurred concerning Site 2A. Mr. Metzler asked why EDB was included in the chemical analyses. Mr. Dronfield said that it was recommended in the IAS, and that it is a component of some oil products. LCMR Terreii said that a lot of synthetic oils are used on the base and EDB could be a component of this of product.

Ms. Morris asked what the depth of the wells were. Mr. Dronfield said that they were approximately 20 feet deep.

Mr. Hertz asked how long before the volatile compounds break down in the environment. Mr. Dronfield said that it depended on several factors such as the initial concentration, the native chemistry of the soil and groundwater, and the presence of the right micro-organisms. Currently, there is insufficient data to answer that question at NAS.

The following discussion occurred concerning Site 2B. CDR Stevenson stated that the work in 1988 was the result of construction plans at the site. The purpose was to determine if contamination was present in the immediate vicinity of the proposed building.

Mr. McCoy asked why the 1988 chemical analyses were different from the first round. Mr. Dronfield said that the first round followed the recommendations of the IAS. One objective of the 1988 work was to determine if the soil could be classified as a hazardous waste. As a result, EP toxicity analyses were performed.

No questions were asked specifically concerning Sites 2C, 7, 8, or 14.

Mr. Dronfield reviewed five sites in which field work will be conducted for the first time (during the next round of sampling at the other seven sites). These new sites (2D, 2E, 6, and the fire fighting facilities at the NAS and Fentress) were not included in the first round because they were given a lower priority in the IAS.

Mr. Ewers described the role of the Public Affairs Office. He stated that he would release approved information at the appropriate time, and work closely with CAPT Matton, CDR Stevenson, and Mr. Berglund.

Mr. Ewers stated he would draft a pro-active community relations plan. The timetable on this draft was flexible. He invited comments on this plan, and stressed the public communities right to be informed. He solicited input from the committee to identify the appropriate public communities.

Mr. Ewers stated that CINLANTFLEET will hold a briefing to discuss the IR program. He also stated that he will prepare a news release to explain the IR program, and to announce the establishment of the TRC. An information repository will be established at the Virginia Beach Public Library on Virginia Beach Blvd.

CDR Stevenson stated that the next TRC meeting will tentatively be in 6 months, or when key decision points arise.

CDR Stevenson specifically asked the EPA and State representatives if they had any questions. Mr. Lausch said that the EPA will comment as appropriate. Because none of the sites are on the NPL, the priority is not as great. Mr. McCoy said the State is waiting for a report to be released before comments will be made.

Mr. Berglund said that technical questions should be directed to either him or CDR Stevenson, and that the point of contact for the public is Mr. Ewers.

The meeting adjourned.

WDM56/034

OC-00105- 9.04 - 10/31/91

# MINUTES OF THE TECHNICAL REVIEW COMMITTEE MEETING ON OCTOBER 31, 1991 OCEANA NAVAL AIR STATION

ATTENDEES:

| | |
|---|---|
| Capt. Larry Urbik | Commanding Officer, NAS Oceana |
| Commander C. N. Salmond | Public Works Office, NAS Oceana |
| Lt. Commander Gary Pirtle | Public Works Office, NAS Oceana |
| Ace Ewers | Public Affairs Office, NAS Oceana |
| Will Bullard | Public Works Department, NAS Oceana |
| Steven H. DeBerry | Public Works Department, NAS Oceana |
| John Peters | LANTDIV - Public Affairs Office |
| Nina M. Johnson | LANTDIV - Environmental |
| Jesse Waltz | LANTDIV - Environmental |
| Marvin Barnes | COMNAVAIRLANT |
| Chuck Maguire | CINCLANTFLT |
| Bob Stroud | U.S. EPA - Region III, RCRA |
| Robert Thomson | U.S. EPA - Region III, Superfund |
| Anne M. Field | Virginia Dept. of Waste Management |
| Erica Dameron | Virginia Dept. of Waste Management |
| Mary Heinricht | Virginia Beach Environmental Management |
| Ed Kube, Jr. | City of Chesapeake community representative |
| James Hertz | Virginia Beach community representative |
| Walt Vargo | Virginia Beach community representative |
| Frank Lewis | CH2M HILL |
| Steven Brown | CH2M HILL |

Captain Urbik opened the meeting by welcoming the attendees and expressing his hope that the meeting would be a productive exchange of views and information between those in attendance. He pointed out that environmental consciousness in society in general and at the base in particular has increased over the years and that they were actively working to increase awareness of environmental issues at Oceana. Commander Urbik acknowledged that there had been some inadequate disposal practices at the air station in the past, but emphasized that NAS Oceana is committed to dealing aggressively with these problems and welcomes the interaction and input of the committee.

Mr. Will Bullard, the meeting moderator, introduced himself and suggested that each person introduce himself or herself. After the introductions, Mr. Bullard expressed the Navy's desire that the meeting be an informal exchange of information, and then reviewed the agenda. He stated that there are three main players in the ongoing work at Oceana: (1) LANTDIV, whose role is to provide contractual, legal, and technical support to NAS Oceana, (2) NAS Oceana, whose role is to coordinate the work, and (3) CH2M HILL, the contractor performing the environmental studies.

Mr. Jesse Waltz explained the history of environmental investigations at NAS Oceana and related them to the ongoing work. The investigative history involves work conducted under both the Installation Restoration Program (IRP) and RCRA. The IRP work consisted of: (1) the 1984 Initial Assessment Study (IAS), which consisted primarily of a records search and personal interviews and did not include environmental sampling (5 of 16 sites were recommended for confirmation sampling); and (2) two investigations conducted under CERCLA (Superfund) format, in 1986 and 1988. Following a RCRA Facility Assessment (RFA) completed in 1988, environmental investigations have been conducted following RCRA format and guidelines. The Navy received a consent order in March 1990, which identified close to 100 RCRA Solid Waste Management Units (SWMUs). An interim RCRA Facility Investigation (RFI) was conducted in 1990, which addressed most of the IRP sites included in the consent order. In June 1991 the consent order was signed by the Navy following negotiations that reduced the number of SWMUs to 17, based on additional information collected during the interim RFI work and the identification of existing environmental programs at NAS Oceana that currently oversee waste handling practices at many of the previously identified SWMUs. A work plan for the RFI was submitted to the EPA for approval in October 1991. Mr. Waltz stated that work on the RFI will begin soon after final approval of the work plan by the EPA.

Mr. Waltz then passed out a fact sheet showing a comparison of the RCRA corrective action and CERCLA response action programs and briefly discussed the differences.

Mr. Frank Lewis then began his presentation describing the environmental investigation of each of the sites by passing out a comprehensive package of site summaries of the 21 sites included in either the interim RFI or the future RFI. Mr. Lewis encouraged the attendees to ask questions during the presentation. He then proceeded to describe the background, the results from the interim RFI and other previous studies, and the work proposed during the RFI for each site. (The sites included in the presentation were 1, 2a, 2b, 2c, 2d, 2e, 6, 7, 8, 11, 15, 16, 18, 19, 20, 21, 22, 23, 24, and 25.)

Mr. Marvin Barnes asked if the 5 sites recommended for confirmation sampling in the IAS are included in the 17 sites to be studied during the RFI. Mr. Lewis explained that some are, such as the line shacks, because previous investigations have either detected a release to the environment or have been inconclusive, and other sites are not, such as the fifth green landfill and the north station landfill, because the results of previous investigations indicate that a hazardous release has not apparently occurred.

Mr. Rob Thomson asked if the IAS was based on only interviews or whether air photos were reviewed. Mr. Lewis said he was not sure but that he believed that air photos may have been used. Ms. Nina Johnson stated that some air photos were used during subsequent investigations, especially of Site 1. Mr. Bullard emphasized that the IAS was based primarily on interviews and records searches.

Site 1. Mr. Lewis stated that the location of the oil pit was not adequately specified in the IAS, and that the three monitoring wells installed in 1986 on the basis of these descriptions turned out to be placed a few hundred feet too far to the east. These wells were found to be clean. A 1958 air photo was consulted prior to the interim RFI work, and the two wells installed in 1990 were in or near the pits, judging from debris in the subsurface, soil staining, and odors. The wells contained an immiscible free phase liquid. Mr. Lewis reviewed the contamination found during the interim RFI. (The complete details of the site presentations at the meeting will not be presented in these minutes. Refer to the written site summaries handed out in the TRC meeting for more complete details.)

Anne Fields asked why metals were not included in the analyses at Site 1 considering that some paints may have been disposed in the pit. Mr. Lewis agreed that the presence of metals might be worth considering; however, he was not aware that paints may have been disposed of in the pit. Ms. Johnson pointed out that Appendix IX constituents will be analyzed at downgradient locations at this site during the RFI, which will cover metals.

Mr. Thomson asked if the wells were purged before sampling and whether the thickness of the free product had been measured. Mr. Lewis stated that the wells had been purged but that the thickness of the free product had not been measured.

Mr. Ed Kube asked if the drainage near Site 1 was natural. Mr. Lewis responded that the drainage was natural but that it had been channelized into a straight ditch.

Mr. Walt Vargo stated that the city of Virginia Beach is going to levy a tax to pay for the storm-water control system. He asked whether the contamination in the ditch next to Site 1 would pose a problem. Mr. Lewis responded that potential storm-water impacts of the contamination in the ditch may be worth considering but pointed out that much more would be known about contamination in the ditch after the RFI. He also stated that water in the ditch flows perennially.

Mr. Vargo asked if the contamination at Site 1 can be prevented from entering the Yorktown aquifer. Mr. Lewis explained that it is not yet known how deep contamination may have migrated, but that the source has been there a long time, and therefore contamination may have had time to reach the Yorktown. He also stated that site remediation will remove the source of contaminants.

Ms. Mary Heinricht asked whether additional downstream sampling of sediments in the ditch had been considered in light of the contamination found during the interim

RFI. Mr. Lewis responded that downstream sediment sampling had not been proposed but considering that contamination in the most downstream sediment sample had been high, sampling sediments farther downstream would be a good idea.

Following the presentation and discussion of Site 1, the group took a fifteen minute break.

Site 2a. After the break, Mr. Lewis presented the results of investigations at Site 2a, which will not be included in the RFI. There were no questions.

Site 2b. Mr. Lewis described past results, which show contamination in what appear to be two separate areas at this site. Plans are to install one deep well and five shallow wells during the RFI. Mr. Lewis also explained that multiple in situ groundwater samples are planned to be collected using a Geoprobe device. This strategy would help define the shape of the separate plumes and to optimize the placement of the four proposed shallow wells. Mr. Lewis also explained that the source of the TPH found in the ditch may be upstream of, and unassociated with past disposal practices at, Site 2b.

Mr. Ron Thomson noted that wash water from cleaning airplanes went to a floor drain and then to underground piping and asked if this had any relation to contamination at Site 2b. Mr. Lewis explained that there is an oil-water separator system tied into this cleaning area. Mr. Bullard explained the valving of the oil-water separator system and how it functioned generally. Mr. Thomson asked if there could be cracks or leaks in the piping that might be a source of contamination. Mr. Lewis responded that it was possible. Mr. Barnes clarified that the term "source" used repeatedly by Mr. Lewis did not refer to ongoing poor disposal practices at the various sites. It was further stated that "source" referred to contamination already in the soil as a result of past practices.

Captain Larry Urbik asked that the terms "shallow well" and "deep well" be clarified. Mr. Lewis explained that most of the monitoring well screens were 10 feet long and that the tops of the screens in the shallow wells were generally 10 to 13 feet deep and the bottoms were generally 20 to 23 feet deep. Deep wells are generally screened over a depth interval of 50 to 60 feet. The geoprobe samples expected to be 2 to 3 feet below the water table.

Ms. Johnson pointed out that several soil samples were collected at Site 2b during the 1986 investigation and that the results do not indicate that there is significant soil contamination.

Site 2c. Mr. Lewis described the results of past investigations, noting that this site had not been recommended for confirmation study in the IAS and therefore had not been studied in 1986, but that contamination had been discovered in the 1988 line shack investigation. Five more wells were installed in 1990. Data from these wells indicated that significant volatile organic contamination was present in groundwater near Building 400 and in well 2C-MW9 in the woods. During the RFI, several more wells will be installed following in situ groundwater sampling in the woods and near Building 400 using the Geoprobe.

Commander Salmond asked if we can be sure of the identity and concentration of contaminants reported in the analytical results. He also asked how the analyses are performed and what the term "detection limit" signified. Mr. Lewis explained that we are sure of the identity of the contaminants and explained that concentrations of specific chemicals are calculated from the height of the response peak. He explained that many of the analyses are done using a gas chromatograph but said he was not familiar enough with analytical procedures and equipment to elaborate further. Mr. Lewis stated that some concentrations were low enough that their presence could be identified but that their precise concentration could not be measured accurately. These concentrations are listed as below the (quantitative) "detection limit". He made a comparison to relative humidity data, which are difficult to quantify accurately at very high and very low humidities.

Ms. Johnson asked if the plan is to remove a section of the concrete slab near Building 400 during the RFI. Mr. Lewis explained that a large slab would not be removed; instead, the Geoprobe sampling would use a bit that would create a hole of 2-inch diameter or less. This approach will be better for everyone involved and would minimize the amount of dust generated.

Site 2d. Concentrations of analyzed constituent in the three wells installed in 1990 were below federal and Virginia standards. During the RFI, the existing wells will be resampled but no new wells are planned. There were no questions.

Site 2e. Total petroleum hydrocarbon (TPH) concentrations in soil were detected above state standards at some locations, but no groundwater contamination was found. The wells will be resampled and additional soil samples will be collected during the RFI to determine the extent of the TPH-contaminated soil. There were no questions.

Sites 6, 7, 8. Mr. Lewis described the history and past analytical results from these three sites. He explained that the Navy and the EPA had agreed that these sites would not be included in the RFI because concentrations of all analyzed parameters were near or below detection limits. There were no questions.

Site 11. Mr. Lewis described the results of the soil and groundwater sampling near the old fire fighting training pit during the interim RFI. He showed the position of the three shallow wells to be installed during the RFI and explained that these wells are also intended to detect potential contamination associated with the "new" training pit.

Mr. Barnes asked if the Site 11 samples would be analyzed for metals. Mr. Lewis responded that only lead would be analyzed.

Site 15. Mr. Lewis described the abandoned tank farm site and stated that groundwater is assumed to flow to the northwest. Monitoring wells are proposed at locations which take into account this presumed direction of groundwater flow. He stated that he saw no evidence of the tank farm during a visit to the site.

Mr. Barnes noted that the tanks were said to have been removed after 1974 and asked if CH2M HILL had consulted air photos to confirm the locations of the tanks. Mr. Lewis explained that the investigation has not advanced to the stage of confirming these locations, but that CH2M HILL planned to do so as part of the RFI. He repeated that no physical evidence of the tanks had been observed during a site visit in early 1991.

Site 16. Mr. Lewis described the anticipated RFI sampling activities at the pesticide storage area.

The group broke for lunch after the presentation of Site 16.

Sites 18, 19, and 20. Anticipated RFI sampling activities at these three sites were presented. There were no questions.

Site 21. After Mr. Lewis had finished describing the transformer storage site, and the future RFI sampling, Mr. Bullard pointed out that the transformers stored at this site had been recently removed.

Site 22. After Mr. Lewis had described the construction debris landfill and the anticipate RFI activities, Ms. Anne Fields asked if there was any standing water or wetlands surrounding the site. Mr. Lewis stated that surrounding lowland areas are seasonally wet, but he was not knowledgeable enough to say whether or not these areas could be designated wetlands.

Sites 23 and 24. Mr. Lewis explained that these two sites were areas where small tank trailers used to transport waste liquids were parked and that soil staining seen on the ground at these sites led to their inclusion in the RFI. Mr. Barnes expressed some surprise that such apparently minor features were included as sites in the RFI.

Site 25. Mr. Lewis explained that this northern site was first operated as a borrow pit, then as a local dump, and then was bought by the Navy to dispose of inert material, especially concrete. Ms. Fields asked if these pits, including the one to the east not owned by the Navy, were entirely contained or whether there were outlets that allowed water to flow off site. Mr. Lewis said that he was unsure about whether, and in what direction, water flowed from the site, but did describe flow directions he had observed in nearby streams.

Site 26. Mr. Lewis concluded the technical presentations by describing the future RFI sampling at this small former fire fighting training pit. There were no questions concerning Site 26.

The presentations were followed by a general question and answer period. Mr. Jim Hertz asked where wastes generated by NAS Oceana are disposed and whether or not the current landfill posed a potential environmental threat. Mr. Bullard responded that the current landfill was located near the public works building in the central part of the station and that NAS Oceana is currently in the process of closing the landfill. He explained that the current landfill is under the jurisdiction of the Virginia Department of Waste Management, whose regulations and closure requirements include groundwater monitoring provisions. Mr. Hertz asked what was done with petroleum products produced by NAS Oceana. Mr. Bullard answered that waste petroleum products are segregated and stored temporarily at 13 holding areas around NAS Oceana. Following temporary storage, the ultimate destination of the petroleum wastes depends on its composition. Much of the petroleum wastes are shipped offsite (to a licensed waste handler), however, JP-5 fuel is either recycled or used for fire-fighting training.

Mr. Bullard clarified that each of the SWMUs included in the draft consent order (March 1990) is mentioned in the final consent order (June 1991); however the final consent order calls for the investigation of only 17 SWMUs under RCRA. The RFI work plan discusses the reasons for the reduction in the number of SMWUs in the final consent order. The work plan also describes each SWMU and, if the SWMU was dropped in the final consent order, presents the basis for its exclusion in the RFI. Ms. Johnson emphasized that the Navy did not reduce the number of SWMUs to 17 unilaterally; they did so in collaboration and agreement with the EPA.

Mr. Hertz asked about the status of investigations at the Fentress Naval Auxiliary Landing Field. Ms. Johnson explained that the work at Fentress is being done separately because the facility is not included in the consent order and that a separate TRC would be organized to discuss that facility. Mr. Bullard added that there were two sites that has been investigated at Fentress: the landfill and the fire fighting training pit.

Anne Fields asked how the RCRA Appendix IX list compared to the Target Analyte List and the Target Compound List. Mr. Lewis explained that Appendix IX is considerably more exhaustive than the TAL and TCL lists and that a complete listing of the Appendix IX constituents was contained in the RFI work plan.

Mr. Will Bullard closed the meeting by thanking everyone for coming. He stated that the next TRC would be approximately 9 months after the RFI began, which depended on when final EPA approval of the RFI work plan came through. He reminded the committee members that he is the main contact for the base and that they should feel free to contact him with any questions and requests.

The meeting was adjourned.

OC-00167- 09.04- 11/04/93

**MEMORANDUM** CH2M HILL

**TO:** Jim Harris/LANTDIV

**COPIES:** Nina Johnson/LANTDIV
Bob Stroud/EPA Region III
Erica Dameron/Virginia Department of Environmental Quality
Will Bullard/NAS Oceana
Doug Dronfield/CH2M HILL

**FROM:** Steve Brown/CH2M HILL

**DATE:** November 4, 1993

**SUBJECT:** Minutes for the Technical Review Committee meeting to discuss the Oceana RFI and RCRA process, October 21, 1993

**PROJECT:** HRO20368.K0.09

The TRC meeting to discuss the Oceana RFI report and future activities at each RCRA site was held at NAS Oceana on October 21, 1993. The meeting was attended by representatives of EPA Region III, the state DEQ headquarters and regional offices, NAS Oceana, LANTDIV, and CH2M HILL. An attendance list is enclosed. The meeting format consisted of introductions followed by a presentation of the RFI results and proposed activities.

Captain Crane, the commanding officer of Oceana, opened the meeting by thanking the participants and expressing the Navy's interest in moving as quickly as possible in doing the right thing to address contamination problems at Oceana. All participants then introduced themselves and their affiliation.

Will Bullard of the Oceana Environmental Division went over the meeting agenda and goals for the meeting. He also emphasized that the contamination problems at Oceana are the result of past practices and that current programs handle hazardous constituents appropriately.

Jim Harris of LANTDIV noted that the Navy has been pursuing contamination problems at Oceana since 1984 and mentioned specific investigations in 1984, 1986, 1988 and 1990 that preceded the RFI. He expressed the joint hope that the group could move forward quickly in solving contamination problems at Oceana.

Steve Brown of CH2M HILL began the presentation of results by reviewing the history of the RCRA corrective action process at Oceana. He proposed that the discussion follow the groupings proposed in the executive summary of the RFI report, that is, (1) CMS sites 1, 2B, and 2C, (2) RFI Phase II sites 2D, 2E, 15, and 25, (3) POL sites 11, 18, 19, 20, and 24, and (4) no action sites 16, 21, 22, 23, and 26. He explained that proposed work would be presented immediately following results for continuity in the discussion.

CMS Sites

Site 1. Soil problem still undercharacterized. Will be the focus of the CMS investigation. Also some remaining issues related to ditch sediments. Some discussion of need for background metals, a point which applies to all sites.

Site 2B. Groundwater well characterized except for minor clarification needed near the western source area. Also some remaining issues related to ditch sediments. The need to clarify that the ditch behind the line shack is shallow, ephemeral and does not receive groundwater was pointed out.

Site 2C. Good characterization but need to find the downgradient extent of VOC contamination. Should clarify that ditches near 2C-MW3 and 2C-MW2 are very shallow. No substantial comments.

RFI Phase II Sites

Site 2D. Some discussion of a historical account that an area of soil was saturated and did not support a building adequately. CH2M HILL agreed to work with Oceana personnel to clarify these facts and, if possible, the location.

Site 2E. Explained quandary of free product fuel in well and proposed investigation to determine its source. We agreed to keep the state informed about our progress and plans.

Site 15. Good spread of characterization data from the hydraulic probe sampling program. Future plans will characterize the site extensively and leave permanent sampling points. One of the state representatives asked how much free product was present. Steve Brown said there was clear evidence of free product but we did not know how thick the layer was.

Will Bullard asked if Sites 2E and 15 needed to be handled under the state UST program. Amy Webster of the DEQ Tidewater office stated that the DEQ was satisfied if Sites 2E and 15 were covered under the RCRA program and did not see the need for this site to shift to DEQ jurisdiction. The key was to coordinate with the state and address all state requirements. They feel their concerns are being addressed currently. Erica Dameron of DEQ headquarters agreed.

OC-00167-09.04-11/04/93



Site 25. Some remaining question about metals and pesticides in sediments. Levels are not high but are worthy of additional sampling and review. The state questioned whether the site was used for fishing. Steve Brown and Will Bullard pointed out that the access to the site was limited by a gate across the access road and posted signs. Base personnel are not allowed in the area and Will did not know if there are fish in the pond.

POL Sites

Site 11. Some discussion about the future abandonment of the two existing rings after their planned replacement with a propane-fired training ring. Will said that the soil and concrete would be disposed of properly. Bob Stroud requested a groundwater sample downgradient of the southern pit. Steve Brown and Bob Stroud agreed to finalize the location of the sample later.

Site 18. Some contamination near newer storage unit. POL investigation will address both the storage units. No substantial comments.

Site 19. Single point near Citco station had contamination by TPH. Future work will look at contamination outward from this point. CH2M HILL will review data from the investigation at the Citco station for depth to water and groundwater flow direction.

Site 20. Some TPH contamination near shed and along strip behind auto hobby shop. Investigation will probably lead to excavation and disposal using Navy RAC program.

Site 24. Bowser site with some TPH and PAH contamination that will be characterized further during the POL investigation.

No Action Sites

Site 16. Low concentrations of pesticides at both Site 16 and Site 16GC. Clarified where the edge of the concrete slab was under the covered area at Site 16GC.

Site 21. No PCBs at this site, which was the major concern. Steve Brown clarified that the detection limits for PCBs were approximately 10 to 100 ppb, so the nondetect results are meaningful.

Site 22. The state commented that they believed some of the levels in groundwater were above the MCLs. Steve Brown pointed out that the constituents they mentioned

OC-00167- 09.04 - 11/04/93



were actually not detected. The issue is that the detection limits were above the MCL in some cases, therefore, it is not possible to say whether the groundwater exceeded the MCLs or not. We used standard SW-846 detection limits and the presumption of a contamination problem in the face of nondetects for full Appendix IX analyses seemed inappropriate. Doug Dronfield explained that antimony and thallium have new MCLs that were not in place when the work plan was approved with the standard detection limits. Nina Johnson of LANTDIV pointed out that these detection limits are used nationwide by the environmental industry and that the Navy may want to discuss the applicability of these detection limits versus MCLs with the EPA. Both Bob Stroud and Steve Brown mentioned that Betty Ann Quinn, the EPA toxicologist involved with the Oceana RFI did not seem to have a problem with this gap between detection limits and MCLs and seemed comfortable with the no-action recommendation.

Site 23. The state raised the question about arsenic concentrations in soil being above the risk-based concentrations tabulated by EPA Region III. Steve Brown discussed the fact that Site 23 concentrations were below non-carcinogenic RBCs for commercial/industrial soil. Erica Dameron commented that the state generally looks at residential soil standards. Regarding the lower carcinogenic standards for arsenic, beryllium and others, Steve Brown cautioned that the mean soil concentrations were above these standards, so we are probably looking at a standard natural hazard rather than "contamination". Doug Dronfield pointed out that many of these issues will be addressed by the background soil samples that will be collected during the Phase II investigations. We need to wait for those results to draw final conclusions.

Site 26. Will Bullard stated that a 55-gallon drum was cut in half and buried in the ground to form the fire-fighting training ring. It was removed 10 years ago. We agreed to clarify whether the long axis of the drum was buried horizontally or vertically. Bob Stroud said that a deeper sample would need to be collected if the drum was deeper than 2.5 feet.

trcmin.mem

OC-00167-09.04-11/04/93

TRC MEETING - NAS OCEANA OCT 21, 93

| | | |
|---|---|---|
| CAPTAIN CRAINE | CO NAS OCEANA | 433- |
| Will Bulford | NAS OCEANA | 433-2328 |
| Nina Johnson | LANTDIV 1822 | 322-4775 |
| Michele Monti | Va Superfund - Fed. Fac. | 225-2927 |
| ERICA DAMERON | VDEQ WASTE DIVISION SUPERFUND FED FAC | 225-3257 |
| Amy Webster | DEQ-WATER-TRO | 552-1157 |
| Steve Brown | CH2M Hill | (703) 471-1441 |
| LT Bob LeRoi | NAS Oceana | 3-3321 |
| LT Brian Moore | NAS oceana | 3-3321 |
| Mark Marchbank | Va Beach Fire | 427-4228 |
| JAMES F. HARRIS | LANTDIV 18225 | 322-4776 |
| Robert W. Stroud | U.S. EPA Region III | (215)597-66 |
| RICHARD STRYKER | NAB LITTLE CREEK | 363-4571 |
| Stephanie McManus | CINCLANTFLT N4423F | 445-9119 |

00069-09.05-12/16/91

# COMMUNITY RELATIONS PLAN
# NAVAL AIR STATION, OCEANA
# VIRGINIA BEACH, VIRGINIA

**DECEMBER 1991**

**Prepared for**

**Atlantic Division**
**Naval Facilities Engineering Command**
**Norfolk, Virginia**

WDCR556/061.51

CONTENTS

CONTENTS (Continued)

# Chapter 1
# OVERVIEW OF COMMUNITY RELATIONS PLAN

## INTRODUCTION

The Department of the Navy plans to conduct a community relations program to address community concerns regarding past hazardous waste disposal sites corrective-action measures to be implemented at the Oceana Naval Air Station (NAS Oceana). The Navy's intent is to promote two-way communication by presenting to the community factual and timely information and by encouraging feedback from the community, thereby promoting understanding between the base command and the community.

NAS Oceana has reached an agreement (known as a Consent Order) with the U.S. Environmental Protection Agency (EPA), Region III, under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA) to continue investigating potentially hazardous waste-disposal sites. Initial investigations on several sites had already begun under the Navy's Installation Restoration Program (IRP), in accordance with the Comprehensive, Environmental, Resource, Compensation and Liability Act (CERCLA).

## CONTENT OF COMMUNITY RELATIONS PLAN

This community relations plan (CRP) describes community concerns about the investigation and potential remediation of contaminated sites at NAS Oceana. It also outlines community relations activities to be conducted during investigations required by the 3008(h) Consent Order. These investigations will be referred to as the RCRA Facility Investigations or RFI.

Information in this CRP is based on community interviews conducted in June 1991. Interviews were held with enlisted personnel, civilians employed by NAS Oceana, residents of NAS Oceana housing, residents of neighborhoods surrounding NAS Oceana, the director of the City of Virginia Beach Office of Environmental Management, representatives of two local environmental groups, a local representative of the Virginia Department of Health, and a businessman who owns a mobile-home park near NAS Oceana. In all, interviews were conducted with 20 people. Each interview lasted approximately 30 to 45 minutes. A list of sample interview questions is in Appendix A.

This CRP has been prepared in accordance with all guidance in *Community Relations in Superfund: A Handbook* (EPA, 1988), *Region III RCRA Corrective Action Community Relations Guide* (EPA, 1990), and *Installation Restoration: Public Affairs Plan* (Department of the Navy, 1989). In addition, the oversight of all activities will be handled by EPA and the Virginia Department of Waste Management. The Virginia

Department of Waste Management has entered into an agreement with EPA known as the "Defense and State Memorandum of Agreement" (DSMOA). The agreement establishes cooperation between the state and the Department of Defense (DOD) in addressing hazardous waste issues at federal facilities in Virginia.

## COMMUNITY INTEREST

In general, local community interest regarding environmental investigations at NAS Oceana can be described as low to moderate. However, interest in other activities at NAS Oceana is much higher, especially in activities that are perceived as affecting the local communities directly, such as aircraft noise and flight patterns. Interest can be expected to remain low to moderate as long as the known contamination areas do not pose a threat to public health or the environment. However, if contamination is found to be migrating off the site, a high level of community interest should be expected. Also of note is that residents of the Tidewater area (the name of the region) are aware of environmental issues, particularly because of the community's location at the mouth of Chesapeake Bay.

## GOALS OF COMMUNITY RELATIONS PROGRAM

The purpose of the community relations program is to create an environment for public understanding. The primary goals of the community relations program are (1) to promote and encourage citizen participation; (2) to establish two-way communication between the Navy and concerned citizens, including local residents on and off the base, environmental groups, and state and local officials; and (3) to keep the public informed of actions taken in response to major findings and of opportunities for commenting on decisions.

The specific objectives of the program are:

- Furnish accurate, timely, and easily understandable information to affected and interested parties.
- Establish an effective mechanism for incorporating public comments and for considering public concerns in the decision-making process.
- Establish a means of monitoring public concerns and information needs throughout the study.
- Identify additional groups and individuals who may become interested in the site as work progresses.

- Modify the program as necessary to meet the changing needs of the local community.

## IMPLEMENTATION OF CRP

This CRP will be implemented by NAS Oceana. An overview of the roles and responsibilities of each organization is presented in Chapter 5.

WDCR556/044.51

# Chapter 3
# LOCAL COMMUNITY

Virginia Beach reached its present configuration in 1963. The city has grown rapidly as a military community and a summer resort, attracting thousands of summer tourists to its 6 miles of sandy beaches along Chesapeake Bay and the Atlantic Ocean. Virginia Beach has a year-round population of over 300,000.

Virginia Beach once could be considered a "bedroom community" of people commuting to Norfolk. As the city has grown, it has become a center of economic activity, and many of those who live in Virginia Beach also work there. NAS Oceana, in conjunction with the other military bases in the Hampton Roads area, furnishes strong economic support to the community in the form of tax dollars and jobs, making the military the largest industry in Virginia Beach. NAS Oceana's annual payroll exceeded $286 million in 1990.

Virginia Beach operates under a mayor and city council form of government. The city council has 11 members.

## RELATIONSHIP BETWEEN NAS OCEANA AND VIRGINIA BEACH COMMUNITY

The relationship between the NAS and the community can be described as neighborly. Residents recognize NAS Oceana as an important and necessary part of the Virginia Beach community. Many of those interviewed stated that NAS Oceana works well with the community and tends to be more open with the community than are other military installations in the Tidewater area.

The attitude of the public toward NAS Oceana and toward the military in general is at an all-time high because of the recent events in the Persian Gulf. Many of the interviewed residents mentioned that there is an obvious and direct link between training at home and performance abroad. Therefore, the attitude of acceptance toward NAS Oceana may be stronger now than it would have been otherwise. Despite this generally accommodating attitude toward NAS Oceana, community members have concerns about the base.

### NOISE

The primary community concern is jet noise. Residents realize that jet noise is unavoidable, and many neighbors even have learned to identify the patterns of noise associated with various flight activities. However, many people also seem to think that there is excessive noise at certain times, such as at night, that could be prevented with more-careful planning by the base. Many interviewed residents stated that although jet noise is expected, some of it could be reduced if the base were more sensitive to the concerns of the community in this matter.

### JET FUEL

Neighbors of NAS Oceana are also concerned about the possibility that jet fuel is being released from the planes on a regular basis. Although no one in the community seems to know for certain if or how often jet fuel is released, people have noticed the odor of fuel underneath flight patterns and believe that fuel/exhaust residues are present on property kept outdoors.

### CONTAMINATION

When asked whether they are aware that NAS Oceana might have some areas of contamination that need to be addressed, nearly all of those interviewed said that they were not aware of it. Most also said that if they had stopped to think about it, they certainly would have assumed that NAS Oceana, like other military installations around the country, has some areas of contamination. The news that NAS Oceana might have some contaminated areas did not surprise anyone interviewed. Those interviewed did not seem extremely concerned about contamination sites on the base as long as contaminants did not reach the groundwater or surface streams that might transport the contamination off the base. Most of the respondents were interested but were not significantly concerned.

## OTHER KEY COMMUNITY CONCERNS

Other community concerns that are not directly related to NAS Oceana tend to be associated with the growth and development of Virginia Beach and the additional problems brought on by growth, such as water supply.

Growth is a significant concern. The city has grown rapidly over the last 20 years. Open space still exists in and around the city, but it is vanishing rapidly. Most of the open space is on farms south of the city, and the land is being considered for development. The residents of Virginia Beach seem to realize that growth is necessary to the economic well-being of the city, but they also seem to be concerned with maintaining open space and controlling the rate of development.

Associated with rapid growth has been the issue of water supply. Virginia Beach will soon outgrow its existing water-supply capacity. Plans are well underway for constructing a pipeline that would carry water from the western part of the state, but the project is being challenged by North Carolina. Water supply therefore has been a significant issue in local politics and the media.

WDCR556/046.51

# Chapter 4
# HIGHLIGHTS OF COMMUNITY RELATIONS PROGRAM

## TARGET GROUPS

The Virginia Beach community can be divided into target groups for keeping people informed about, and involved in, remedial activities at NAS Oceana. Keeping the leaders of these target groups apprised of activities enables interested members of the community to receive information without difficulty. Five target groups have been identified:

- Local officials
- Civic associations
- NAS Oceana residents and employees
- The media
- Environmental organizations

## HIGHLIGHTS

On the basis of key community concerns identified during the community relations interviews, the community relations program for NAS Oceana should take the following approaches.

### ENLIST SUPPORT OF LOCAL OFFICIALS

Local officials are visible members of the community and are often the first point of contact for anyone who has questions and concerns about developments in the community. Giving local officials timely and complete information will enable them to communicate with concerned community members. A cooperative effort between NAS Oceana and the officials of Virginia Beach will encourage a two-way flow of information and will help prevent surprises for both the city and the Navy.

### INVOLVE LOCAL CIVIC AND ENVIRONMENTAL ORGANIZATIONS

Leaders of local environmental and civic organizations, particularly of residents' organizations surrounding NAS Oceana, should be kept informed of activities so that they can inform their constituents.

The Tidewater area has a strong environmental network, focused primarily on issues involving Chesapeake Bay. Members of local environmental organizations get together informally every month and exchange information. Involving the leaders of several environmental organizations in community relations activities not only enables them to keep the members of their respective organizations informed but also enables them to exchange information among themselves.

In addition, many of the residential areas surrounding NAS Oceana have established civic organizations. Many of the groups belong to the Virginia Beach Council of Civic Organizations, a coalition of neighborhood groups. Keeping the leaders of these civic organizations informed enables them to apprise members of their groups of site activities.

**INFORM BASE PERSONNEL AND RESIDENTS**

People living and working at NAS Oceana are also involved in various activities in the community and frequently come in contact with people who have no direct ties to the base. Therefore, base personnel and residents need to be kept informed of site activities and results so that they can discuss these issues accurately with others who may be interested. Rumors tend to start when people are uninformed or are only partially informed and are left to draw their own conclusions. Keeping the NAS community informed about site activities is vital to the goal of minimizing rumors.

**ESTABLISH SENSE OF COOPERATION WITH THE MEDIA**

Several reporters in the Tidewater area specialize in environmental issues. In addition, the Virginia Beach newspaper, ***The Beacon***, tends to run articles about NAS Oceana whenever possible. Therefore, NAS Oceana has an excellent opportunity to work cooperatively with the press and to give them timely, accurate information about site activities. There should be little need for investigative journalism because the intent of community relations activities under RCRA corrective measures is to keep the public as informed and involved as they would like to be.

**LET THE COMMUNITY SET THE PACE**

Local communities often do not react to issues in ways that can be predicted. What is important is tailoring the level of community relations activities to the specific needs of the community. This CRP is designed to do that, but information needs and interest levels may change during the course of the investigation. Therefore, this CRP should be reviewed and revised as issues change.

WDCR556/047.51

# Chapter 5
# SPECIFIC COMMUNITY RELATIONS ACTIVITIES

## REQUIRED ACTIVITIES

Certain community relations activities are required during specific technical phases of the RCRA corrective-action program. All activities required under RCRA corrective measures will be implemented by NAS Oceana. Table 5-1 outlines the roles and responsibilities of each party in implementing these community relations activities.

Because there are 17 sites to be investigated, technical activities will be phased. Therefore, each technical milestone will not occur simultaneously for every site. However, many sites can be expected to be in approximately the same stage of activity. Because of this phased approach, some of the following community relations activities may have to be duplicated for sites in different phases. For instance, one fact sheet describing the proposed corrective measures for all 17 sites may not be sufficient because progress at the sites will not reach this technical milestone at the same time.

The following activities are required under the RCRA corrective-measures program. The timing between community relations activities and technical activities is shown in Table 5-2.

**DURING RFI**

- Prepare a CRP.

  This document fulfills all the requirements for a CRP under RCRA corrective action. It includes an initial mailing list, which will be updated according to comments received and attendance at public meetings.

- Establish and maintain a public-information repository.

  An information repository has already been established at the Central Library in Virginia Beach. The results of the community relations interviews suggest that this is an appropriate location. The library's address and hours of operation are listed in Appendix C.

- Prepare and distribute a fact sheet on the draft RFI work plan.

  A fact sheet describing the scope of activities to be performed during the RFI will be prepared and will be distributed to those on the mailing list.

**Table 5-1**
**OVERVIEW OF COMMUNITY RELATIONS ROLES AND RESPONSIBILITIES**

**Page 1 of 2**

| Basic Community Relations Activities | Facility Role | EPA Role |
|---|---|---|
| Community Relations Plan (CRP) | Draft CRP and supporting information.<br>Submit with RCRA facility investigation (RFI) work plan.<br>Incorporate EPA's comments. | Review and comment on draft CRP and supporting information.<br>Determine when CRP is final. |
| Information Repository (IR) | Research possible locations.<br>Draft notice of IR location(s).<br>Select IR location(s).<br>Research information for public notice.<br>Select newspaper in which notice will appear.<br>Publish notice in local newspaper. | Review and comment on draft notice.<br>Determine when public notice is final. |
| Fact Sheet on RFI Work Plan | Draft fact sheet.<br>Incorporate EPA's comments.<br>Distribute to mailing list. | Review and comment on draft fact sheet.<br>Determine when fact sheet is final. |
| Kickoff Meeting on RFI Work Plan | Research meeting locations.<br>Select location and date.<br>Make logistical arrangements.<br>Invite Speakers.<br>Hold meeting.<br>Prepare meeting summary. | Provide information on equipment needs, agenda items, etc.<br>Review and comment on meeting summary.<br>Determine when meeting summary is final. |
| Public Notice of Proposed Corrective-Action Measure | Draft public notice.<br>Select newspaper in which notice will appear.<br>Publish notice in local newspaper. | Review and comment on draft notice.<br>Determine when notice is final. |
| Fact Sheet on Proposed Corrective Measure | Draft fact sheet.<br>Incorporate EPA's comments.<br>Distribute to mailing list. | Review and comment on draft fact sheet.<br>Determine when fact sheet is final. |
| Public-Comment Period | None | Determine dates for 30-day comment period.<br>Receive and review comments. |
| Responsiveness Summary (RS) | Submit transcript of public meeting to EPA. | Draft RS.<br>Finalize RS. |

| Table 5-1<br>OVERVIEW OF COMMUNITY RELATIONS ROLES AND RESPONSIBILITIES<br>Page 2 of 2 | | |
|---|---|---|
| **Basic Community Relations Activities** | **Facility Role** | **EPA Role** |
| Opportunity for Public Meeting | Determine if meeting will be held.<br>Determine meeting date and location.<br>Make logistical arrangements.<br>Invite Speakers.<br>Hold meeting.<br>Hire court reporter.<br>Publicize meeting if necessary. | Provide information on equipment needs, agenda items, etc. |
| Public Notice of Corrective Measure | None | Write public notice.<br>Publish notice in local newspaper. |
| Fact Sheet on Design of Corrective Action | Draft fact sheet.<br>Incorporate EPA's comments.<br>Distribute to mailing list. | Review and comment on draft fact sheet.<br>Determine when fact sheet is final. |
| Bimonthly Progress Reports | Submit progress reports every 2 weeks. | Review reports. |

WDCR556/054.51

67- 9.10 - 6/25/91

# NEWS RELEASE
from Naval Air Station Oceana
Virginia Beach, Virginia

5ND NAS(OC) 5720/1 (7/78)

TELEPHC ic Affairs Office 433-3131

**RELEASE . . . . .** immediate.

June 25, 1991
Release No. 18-91

NAVAL AIR STATION OCEANA
SUCCESSFULLY NEGOTIATES AGREEMENT

NAVAL AIR STATION OCEANA, VIRGINIA BEACH, VIRGINIA. Navy and the Environmental Protection Agency (EPA) entered into an ag June 3, 1991, known as a Resource Conservation and Recovery Act (RCRA) 3008(h) Order. Under the agreement, various sites at Naval Air Station (NAS) Ocea be studied to determine if contamination exists, sampled and, if neces ne sites will be remediated within specific time frames.

The sites include old landfills and areas where sp solvents and fuel/oil are suspected. Initial investigations have been complet er half of the NAS Oceana sites. There is no evidence that pollutants have ed off the station or that a public health hazard exists. Several sites are to be exempted from further study pending EPA review of recent reports docu insignificant contamination.

CH2M Hill, Inc. has been contracted by the Navy to e the additional studies required by the agreement.

All studies will be reviewed by a Technical Review ee (TRC) comprised of representatives from the air station, State and Federal ory agencies, the City of Virginia Beach, and the local community. In additio munity Relations Plan is being developed to promote factual and timely dissem of study findings to the general public.

\# \# \#

# Eastern North Carolina Chamber of Commerce

# Resolution

**WHEREAS, decisions of the Base Realignment and Closure (BRAC) Commission in 1993 were founded in and based on military value, return on investment and economic impact on communities; and**

**WHEREAS, those decisions transferred F-18 Aircraft from Naval Air Station Cecil Field to Marine Corps Air Station (MCAS) Cherry Point; and**

**WHEREAS, the decisions of BRAC 93 and the Secretary of Defense (SECDEF) recommendations/conclusions based on the aforementioned criteria were:**

- **MCAS Cherry Point has higher "Military Value"**
- **MCAS Cherry Point selection would alleviate concerns regarding future environmental and land use problems**
- **MCAS Cherry Point selection dovetails with and enhances joint Navy/Marine Corps doctrine of employment of Navy/Marine Corps aircraft carriers**
- **NAS Oceana has a lower military value; and**

**WHEREAS, those decisions are now being challenged apparently for political reasons not associated with the objective criteria established for the BRAC decisions; and**

**WHEREAS, the BRAC and SECDEF recommendations clearly establish the greater military value of MCAS Cherry Point; and**

**WHEREAS, the environmental and land use problems of such a transfer are minimized by transfer of F-18's to MCAS Cherry Point as opposed to transfer to NAS Oceana thus enhancing future return on investment; and**

**WHEREAS, the remaining objective criteria, *Economic Impact*, is the apparent reason politics has entered into the decision making process; and**

**WHEREAS, Eastern North Carolina's economy would be far more positively affected by transfer of the F-18's to MCAS Cherry Point than would the economy of Eastern Virginia due to the extreme lack of industry in Eastern North Carolina; and**

**WHEREAS, the positive effects on local economies would be greater for the same reason; and**

**WHEREAS, the Eastern North Carolina Chamber of Commerce is a regional development organization working to bring economic self-sufficiency to the 43 counties of Eastern North Carolina;**

**NOW BE IT THEREFORE RESOLVED, that the Congressional Delegates representing those same 43 counties of Eastern North Carolina be and they are requested to utilize the auspices of their respective offices in every way conceivable to ensure the bedding down of F-18 Squadrons at MCAS Cherry Point.**

**BE IT FURTHER RESOLVED, that a copy of this resolution be spread upon the minutes of the Executive Committee of the Eastern North Carolina Chamber of Commerce and that copies be provided to the aforesaid Congressional Delegates and to the Governor of North Carolina.**

**IN WITNESS WHEREOF, this Resolution is duly adopted by the Eastern Chamber at a regular meeting of its Executive Committee on the 6th day of April, 1995 in Raleigh, North Carolina, and is signed by its President and attested by its Secretary.**

Terri B. Phykitt

**Terri B. Phykitt**
**President**

**Robert S. Hackney**
**Secretary**

CITY HALL REPORT

# Navy site restrictions dash Seatack's plans

BY SHERRELL EVANS
STAFF WRITER

Back to square one for Seatack residents fighting for a recreation center on par with others in the city. Ironically, square one is exactly where most residents have said they wanted to go.

Seven sites in the neighborhood had been identified as possible locations for an 83,000-square-foot, $10 million recreation center.

But every single one has been ruled out because the Navy either owns the site, or owns restrictive easements over the site, or the site is an accident potential zone. That means, city officials told residents last week, that a full-sized center is out of the question. Such a place would require eight open acres, and there aren't any others in Seatack.

The only possibility left, they said, is to expand the current Seatack Community Center. The parking lot out front and about 70 feet of empty space in the back might be enough to build a gym and a swimming pool.

Bingo! Rosa Norman, second vice president of the Seatack and Surrounding Areas Civic League, said this was what she and other established members of the community had been requesting all along. Norman said they didn't want a huge facility, especially if it had to be located somewhere else in the neighborhood instead of at the current conveniently located site at 141 S. Birdneck Road.

But not every Seatack resident agrees with Norman. They point to the Seatack Community Center's having only two basic rooms. Here, in this neighborhood that is home to one of the largest black populations in the city, there is no swimming pool. No tennis courts. No gymnasium. No racquetball courts. No weight room. No showers. No basketball courts. No entertainment center. No nothing except two small, basic rooms where kids and sometimes adults crowd together for meetings.

And just a basketball hoop outside in the parking lot. So why, residents say, shouldn't they have all the amenities included in recreation centers in other city neighborhoods? So what if building a $10 million, full-sized center means putting the issue on a referendum for taxpayers to decide if they will foot the bill?

This, said Beverly Woodhouse, an emerging Seatack leader, has been the inspiration to push on and demand the whole kit and caboodle. After all, no other neighborhood cooked, cleaned and sold fund-raising dinners and dedicated land to the city just so it could have a recreation center like residents say they did to get their current center.

For Woodhouse, and the few dozen residents who testified at a City Council meeting several months ago, discovering that the Navy owned the restrictive easements was a major setback.

But in convoluted tales like this one that extend over years and generations, nothing is ever simple. The setback for Woodhouse is also a bonus. She too wanted to go back to square one. She too wanted a recreation center, albeit full-sized, built at the current site or nowhere else. And now, if miracles occur, she and others who share her sentiments may have their wish.

Woodhouse and Norman have formed an ad hoc coalition with Councilman Linwood O. Branch III to look into just how large of a facility can be built at the current site. From here on the tangled web gets denser.

The Navy has said it will allow a parking lot to be built on the empty land next door to the Seatack Community Center, land over which the Navy owns restrictive easements. If residents took the Navy up on its offer, the tale might end here. An expanded facility with a gym and a swimming pool and a $2 million price tag could likely be built at the current site, with parking space provided next door. It likely would not have to go to referendum and the City Council could approve funding this spring when it votes on the city's budgets.

But if a full-sized center is to be had at the current site, the Navy will have to agree to release some of the restrictive easements it owns over the land next door. Then the city could buy the land next door and use it to construct the 83,000-square-foot center. Residents have asked the city to band with them and appeal to the Navy to release the easements.

The Navy bought the easements, fair and square (although residents said they didn't know anything about it). The City Council these days is reluctant to challenge the Navy on development decisions for fear it would signal a lack of support to a federal base closure advisory commission, which will decide in 1995 whether to recommend closing Oceana Naval Air Station, which pumps more than $450 million a year into the city's economy.

So now, back at square one, Seatack residents are asking some very serious questions.

## No rec center a 'brick down our throats'

It was a rock 'em, sock 'em, duck for cover night. Residents of Seatack had just been told they could not have the full-sized recreation center for which they had campaigned many years.

"I'm telling you right now this is appalling, (that) you would come in here and jam this brick down our throats," said E. George Minns, president of the Virginia Beach chapter of the NAACP.

It was only one of the first in a series of verbal punches thrown last Thursday evening at a shouting-match-rife meeting held at the Seatack Community Center. About 50 residents came to hear the news, presented by Susan D. Walston, Virginia Beach director of Parks and Recreation, Councilman Linwood O. Branch III and Navy Lt. Cmdr. Brian Murphy.

The seven possible sites that had been identified for the center were all ruled out because the Navy either owned the site, owned restrictive easements over the site, or the site lies in an accident potential zone. Minns said that "once we've overcome all the excuses the city has put on us, then they put the Navy on us as an excuse."

Beverly Woodhouse, an emerging Seatack leader who pushed for a full-sized center, said they were never before told anything about the Navy's ownership of restrictive easements.

Woodhouse said later that she didn't want it to appear that Seatack residents don't support Oceana Naval Air Station. But they are suspicious of the Navy's objections cropping up now.

There was even talk Thursday of holding daily marches at the Oceanfront this summer to protest the recreation center situation. Residents also said they would make it a campaign issue in the upcoming elections May 3.

Minns got a large round of applause when he said the city is doing everything it can to help attract a horse race track to Virginia Beach, but won't help Seatack residents.

Branch said there are neighborhoods in need across the city, and that everywhere he goes people tell him they are not getting their fair share. (Virginia Beach also has spent some money in recent years to rehabilitate parts of Seatack.)

Those residents who said they were willing to settle for just adding on a gym and a swimming pool instead of a full-sized center weren't appeased either.

For residents like Rosa Norman, a vice president of the civic league, the battle has gone on long enough.

"I'll probably be dead and gone, and we'll still be sitting up here arguing," Norman said. "Stop all this rigmarole."

Sherrell Evans



WILD WEST SHO...
West show featur... stunt man on "The... television show a... tional Wild West S... ciation, will be Satu... Sound Around at... Highway.

The show featu... bank robbery an... shoot out.

Participants also... sage teaching chil... drugs and alcohol... them about gun saf...

The event is spo... Around at Provi... Center, the Days... Road, Homestyle... American Outlet... front Limousine.

SENIOR ID CA... zens can obtain S... good for discoun... chants on Jan. 25,... and 1 p.m. at Sea... ter, 141 S. Birdnec...

Applicants mus... The cost is $5 an... birth and a Social... required.

HEALTH CARE... tional Issues For... Care Cost Explor...

DEFENSE BASE CLOSURE AND REALIGNMENT COMMISSION
1700 NORTH MOORE STREET SUITE 1425
ARLINGTON, VA 22209
703-696-0504



July 1, 1993

The President
The White House
Washington, D.C. 20500

Dear Mr. President:

We are pleased to submit the 1993 Defense Base Closure and Realignment Commission report containing the Commission's findings and conclusions based on a review and analysis of the recommendations made by the Secretary of Defense, together with the Commission's recommendations for closure and realignment of military installations inside the United States.

The Commission scrutinized thousands of pages of testimony and written documentation. We held 17 hearings across the United States, visited over 125 military activities, and met with hundreds of community representatives. The Commission heard from many expert witnesses, including Members of Congress and officials representing the Department of Defense, the General Accounting Office, the Environmental Protection Agency, and the Congressional Budget Office. Our hearings, deliberations, and records were open to the public.

Every installation recommended for closure or realignment enjoys a proud history of service to the nation. We recognize that closing a base creates economic hardship for communities that have offered our nation a priceless service by hosting a military facility. Nevertheless, continuing budget constraints mandated by Congress along with changing national security requirements compel the United States to reduce and realign its military forces. This report reflects the fiercely independent judgment of the Commission's seven members. While not one of our decisions was easy, we are convinced our recommendations were not only fair but will strengthen this country's ability to meet its domestic and international responsibilities with more limited resources.

Respectfully yours,

Jim Courter

Jim Courter
Chairman

Peter B Bowman — CAPT Peter B. Bowman, USN (Ret), Commissioner

Beverly Byron — Beverly B. Byron, Commissioner

Rebecca G. Cox — Rebecca G. Cox, Commissioner

H T Johnson — GEN H. T. Johnson, USAF (Ret), Commissioner

Harry McPherson — Harry C. McPherson, Jr., Commissioner

Robert D. Stuart — Robert D. Stuart, Jr., Commissioner

# Defense Base Closure and Realignment Commission

1993
Report
to the
President

# Major Base Closures and Realignments

1. Plattsburgh Air Force Base, New York
2. Griffiss Air Force Base, New York
3. Naval Education and Training Center Newport, Rhode Island
4. Naval Station Staten Island, New York
5. Naval Air Warfare Center - Aircraft Division, Trenton, New Jersey
6. Defense Clothing Factory Philadelphia, Pennsylvania
7. National Capital Region (NCR) Activities
   - Naval Electronics Security Systems Engineering Center, Washington, DC
   - Bureau Navy Personnel, Arlington
   - Military Manpower Management Arlington
   - Naval Air Systems Command, Arlington
   - Naval Facilities Engineering Command, Alexandria
   - Naval Recruiting Command, Arlington
   - Naval Sea Systems Command, Arlington
   - Defense Printing Office, Alexandria
   - Security Group Command, Potomac, Washington, DC
   - Security Group Station and Detachment Potomac, Washington, DC
   - Tactical Support Office, Arlington
8. Naval Surface Warfare Center– White Oak Detachment, Maryland
9. Vint Hills Farm, Virginia
10. Fort Belvoir, Virginia
11. Norfolk Area, Virginia
    - Naval Aviation Depot Norfolk
    - Naval Undersea Warfare Center Norfolk
    - Naval Electronics Engineering Center Portsmouth
    - Naval Surface Warfare Center Virginia Beach
12. Naval Station Charleston, South Carolina<br>Naval Shipyard Charleston, South Carolina
13. Naval Air Station Cecil Field, Florida
14. Naval Training Center Orlando, Florida<br>Naval Hospital Orlando, Florida
15. Homestead Air Force Base, Florida
16. Naval Aviation Depot Pensacola, Florida
17. Naval Station Mobile, Alabama
18. Naval Air Station Dallas, Texas
19. Naval Air Station Memphis, Tennessee
20. Gentile Air Force Station, Ohio<br>Defense Electronics Supply Center, Ohio
21. Newark Air Force Base, Ohio
22. Naval Air Facility Detroit, Michigan
23. O'Hare International Airport Air Force Reserve Station Chicago, Illinois
24. Naval Air Station Glenview, Illinois
25. K.I. Sawyer Air Force Base, Michigan
26. Tooele Army Depot, Utah
27. San Francisco Bay Area, California
    - Mare Island Naval Shipyard, Vallejo
    - Naval Air Station Alameda
    - Naval Aviation Depot Alameda
    - Naval Hospital Oakland
    - Public Works Center, San Francisco
    - Naval Station Treasure Island, San Francisco
28. Presidio of Monterey Annex, California
29. Naval Civil Engineering Laboratory Port Hueneme, California
30. Marine Corps Air Station Tustin, California
31. March Air Force Base, California
32. Naval Training Center San Diego, California

Naval Air Station Barbers Point, Hawaii<br>
Naval Air Station Agana, Guam

# Executive Summary

On November 5, 1990, President George Bush signed Public Law 101-510, which established the Defense Base Closure and Realignment Commission "to provide a fair process that will result in the timely closure and realignment of military installations inside the United States." Public Law 101-510 (Title XXIX, as amended) required the Secretary of Defense to submit a list of proposed military base closures and realignments to the Commission by March 15, 1993 (see Appendix A). The statute also required the Secretary of Defense to base all recommendations on a force-structure plan submitted to Congress with the Department's FY 1994 budget request and on selection criteria developed by the Secretary of Defense and approved by Congress.

Upon the Commission's receipt of the Secretary of Defense's recommendations, PL 101-510 required the Commission to hold public hearings to discuss the recommendations before it made any findings. To change any of the Secretary's recommendations, the law required the Commission to find substantial deviation from the Secretary's force-structure plan and the final criteria approved by Congress.

The Commission's process was a model of open government. Its recommendations resulted from an independent review of the Secretary of Defense's recommendations, absent political or partisan influence. As part of its review and analysis process, the Commission solicited information from a wide variety of sources. Most important, communities were given a seat at the table. The Commission held investigative hearings, conducted over 125 fact-finding visits to activities at each major candidate installation, held 17 regional hearings nationwide to hear from affected communities, listened to hundreds of Members of Congress and responded to the hundreds of thousands of letters from concerned citizens from across the country. The Commission staff members maintained an active and ongoing dialogue with communities, and met throughout the process with community representatives at the Commission offices, during base visits, and during regional hearings.

The Commission also held seven investigative hearings in Washington, DC, to question Military Department representatives directly responsible for the Secretary's recommendations. Several defense and base closure experts within the federal government, private sector, and academia provided an independent assessment of the base closure process and the potential impacts of the Secretary of Defense's recommendations. All of the Commission's hearings and deliberations were held in public. Most were broadcast on national television (see Appendices F and G).

Based on the Commission's review and analysis, alternatives and additions to the Secretary's list were considered and voted upon. On March 29, 1993, and on May 21, 1993, the Commission voted to add a total of 73 installations for further consideration as alternatives and additions to the 165 bases recommended for closure or realignment by the Secretary of Defense (see Appendix E).

Communities that contributed to our country's national security by hosting a military facility for many years should rest assured their pleas were heard, and did not go unnoticed. The Commission would also like to reassure communities there can be life after a base is closed. However, economic recovery is in large part dependent upon a concerted community effort to look towards the future. The same dedicated effort expended by communities over the last several months to save their bases should be redirected towards building and implementing a reuse plan that will revitalize the community and the economy.

The Department of Defense Office of Economic Adjustment (OEA) was established to help communities affected by base closures, as well as other defense program changes. The OEA's principal objective is to help the communities

### Operational Air Stations

(C) Marine Corps Air Station El Toro, CA (major)
(C) Naval Air Station Barbers Point, HI (major)
(C) Naval Air Station Cecil Field, FL (major)
(C) Naval Air Station Agana, GU (major)
(C) Naval Air Facility Midway Island (minor)

### Training Air Stations

(R) Naval Air Station Memphis, TN (major)
(O) Naval Air Station Meridian, MS (major)

### Reserve Air Stations

(C) Naval Air Facility Detroit, MI (major)
(C) Naval Air Facility Martinsburg, WV (minor)
(C) Naval Air Station Dallas, TX (major)
(C) Naval Air Station Glenview, IL (major)
(O) Naval Air Station South Weymouth, MA (major)
(R) Joint Armed Forces Aviation Facility Johnstown, PA (minor)

### Naval Bases

(R) Naval Education and Training Center, Newport, RI (major)
(C) Naval Station Charleston, SC (major)
(C) Naval Station Mobile, AL (major)
(C) Naval Station Staten Island, NY (major)
(O) Naval Submarine Base, New London, CT (major)
(C) Naval Air Station Alameda, CA (major)
(C) Naval Station Treasure Island, San Francisco, CA (major)

### Training Centers

(C) Naval Training Center Orlando, FL (major)
(C) Naval Training Center San Diego, CA (major)

### Inventory Control

(O) Aviation Supply Office, Philadelphia, PA (major)

### Depots

(C) Naval Aviation Depot Alameda, CA (major)
(C) Naval Aviation Depot Norfolk, VA (major)
(C) Naval Aviation Depot Pensacola, FL (major)

### Naval Weapons Stations

(R) Naval Weapons Station Seal Beach, CA (minor)

### Technical Centers (SPAWAR)

(C) Naval Air Warfare Center–Aircraft Division, Trenton, NJ (major)
(O) Naval Air Technical Services Facility, Philadelphia, PA (minor)
(C) Naval Civil Engineering Laboratory, Port Hueneme, CA (major)
(R) Naval Electronic Systems Engineering Center, St. Inigoes, MD (minor)
(C) Naval Electronic Security Systems Engineering Center, Washington, DC (major)
(O) Naval Electronic Security Systems Engineering Center, Charleston, SC (major)
(C) Navy Radio Transmission Facility, Annapolis, MD (minor)
(C) Navy Radio Transmission Facility, Driver, VA (minor)
(C) Naval Electronic Systems Engineering Center, Portsmouth, VA (major)

### Technical Centers (NAVSEA)

(R) Naval Surface Warfare Center–Dahlgren, White Oak Detachment, White Oak, MD (major)
(O) Naval Surface Warfare Center–Carderock, Annapolis Detachment, Annapolis, MD (major)
(R) Naval Surface Warfare Center–Port Hueneme, Virginia Beach Detachment, Virginia Beach, VA (major)
(R) Naval Undersea Warfare Center–Norfolk Detachment, Norfolk, VA (major)
(C) Planning, Estimating, Repair and Alterations (CV), Bremerton, WA (minor)

**NAVAL RESERVE FACILITIES AT:**

(C) Alexandria, LA (minor)
(C) Midland, TX (minor)

**NAVY/MARINE CORPS RESERVE CENTERS AT:**

(C) Fort Wayne, IN (minor)
(C) Lawrence, MA (minor)
(O) Billings, MT (minor)
(C) Abilene, TX (minor)

**READINESS COMMAND REGIONS AT:**

(C) Olathe, KN (Region 18) (minor)
(C) Scotia, NY (Region 2) (minor)
(C) Ravenna, OH (Region 5) (minor)

**HOSPITALS**

(O) Naval Hospital Charleston, SC (major)
(C) Naval Hospital Oakland, CA (major)
(C) Naval Hospital Orlando, FL (major)

**CHANGES TO PREVIOUSLY APPROVED BRAC 88/91 RECOMMENDATIONS**

(R) Hunters Point Annex to Naval Station Treasure Island, CA (Retain no facilities, dispose vice outlease all property) (minor)
(R) Marine Corps Air Station Tustin, CA (Substitute Naval Air Station Miramar for Marine Corps Air Station 29 Palms as one receiver of Marine Corps Air Station Tustin's assets) (major)
(R) Naval Electronics Systems Engineering Center, San Diego, CA (Consolidate with Naval Electronics Systems Engineering Center, Vallejo, CA, into available Air Force space vice new construction) (major)
(R) Naval Mine Warfare Engineering Activity, Yorktown, VA (Realign to Panama City, FL vice Dam Neck, VA) (minor)
(R) Naval Weapons Evaluation Facility, Albuquerque, NM (Retain as a tenant of the Air Force) (minor)

## DEPARTMENT OF THE AIR FORCE

### *Large Aircraft*

(R) Griffiss Air Force Base, NY (major)
(C) K.I. Sawyer Air Force Base, MI (major)
(R) March Air Force Base, CA (major)
(C) Plattsburgh Air Force Base, NY (major)
(O) McGuire Air Force Base, NJ (major)

### *Small Aircraft*

(R) Homestead Air Force Base, FL (major)

### *Air Force Reserve*

(C) O'Hare International Airport Air Force Reserve Station, Chicago, IL (major)

### *Other Air Force*

(C) Gentile Air Force Station, OH (minor)

### *Air Force Depot*

(C) Newark Air Force Base, OH (major)
(R) Ogden Air Force Logistics Center, Hill Air Force Base, UT (minor)

### *Changes to Previously Approved BRAC 88/91 Recommendations*

(O) Bergstrom Air Force Base, TX (Requested redirect rejected) (minor)
(R) Carswell Air Force Base, TX (Fabrication function of the 436th Training Squadron redirected from Dyess AFB to Luke AFB, maintenance training function redirected from Dyess AFB to Hill AFB) (minor)
(R) Castle Air Force Base, CA (B-52 Combat Crew Training redirected from Fairchild AFB to Barksdale AFB and KC-135 Combat Crew Training from Fairchild AFB to Altus AFB) (major)
(R) Chanute Air Force Base, IL (Metals Technology and Aircraft Structural Maintenance training courses from Chanute AFB to Sheppard AFB redirected to NAS Memphis) (minor)

(C) Naval Computer & Telecommunications Station, Washington, DC (minor)
(C) Naval Computer & Telecommunications Station, New Orleans, LA (minor)
(C) Naval Computer & Telecommunications Station, Pensacola, FL (minor)
(C) Navy Regional Data Automation Center, San Francisco, CA (minor)
(C) Naval Supply Center, Charleston, SC (minor)
(C) Naval Supply Center, Norfolk, VA (minor)
(C) Naval Supply Center, Pearl Harbor, HI (minor)

### Navy Data Processing Centers

(C) Naval Supply Center, Puget Sound, WA (minor)
(C) Navy Data Automation Facility, Corpus Christi, TX (minor)
(C) Navy Recruiting Command, Arlington, VA (minor)
(C) Trident Refit Facility, Bangor, WA (minor)
(C) Trident Refit Facility, Kings Bay, GA (minor)

### Marine Corps Data Processing Centers

(C) Marine Corps Air Station Cherry Point, NC (minor)
(C) Marine Corps Air Station El Toro, CA (minor)
(C) Regional Automated Services Center, Camp Lejeune, NC (minor)
(C) Regional Automated Services Center, Camp Pendleton, CA (minor)

### Air Force Data Processing Centers

(C) Air Force Military Personnel Center, Randolph AFB, TX (minor)
(C) Computer Service Center, San Antonio, TX (minor)
(C) 7th Communications Group, Pentagon, Arlington, VA (minor)
(O) Regional Processing Center, McClellan AFB, CA (minor)

### Defense Logistics Agency Data Processing Centers

(C) Information Processing Center, Battle Creek, MI (minor)
(C) Information Processing Center, Ogden, UT (minor)
(C) Information Processing Center, Philadelphia, PA (minor)
(C) Information Processing Center, Richmond, VA (minor)

### Defense Information Systems Agency (DISA) Data Processing Centers

(C) Defense Information Technology Service Organization, Columbus Annex Dayton, OH (minor)
(C) Defense Information Technology Service Organization, Indianapolis Information Processing Center, IN (minor)
(C) Defense Information Technology Service Organization, Kansas City Information Processing Center, MO (minor)
(C) Defense Information Technology Services Organization, Cleveland, OH (minor)

LEGEND
(C) = Installation recommended for closure
(R) = Installation recommended for realignment
(O) = Installation recommended to remain open

### SECRETARY OF DEFENSE RECOMMENDATION

Close the Naval Air Station (NAS) Barbers Point and relocate its aircraft along with their dedicated personnel, equipment and support to Marine Corps Air Station (MCAS), Kaneohe Bay, Hawaii and NAS Whidbey Island, Washington. Retain the family housing as needed for multi-service use.

### SECRETARY OF DEFENSE JUSTIFICATION

The NAS Barbers Point is recommended for closure because its capacity is excess to that required to support the reduced force levels contained in the DoD Force Structure Plan. The analysis of required capacity supports only one naval air station in Hawaii. NAS Barbers Point has a lower military value than MCAS Kaneohe Bay and its assets can be readily redistributed to other existing air stations. By maintaining operations at the MCAS, Kaneohe Bay, we retained the additional capacity that air station provides in supporting ground forces. With the uncertainties posed in overseas basing MCAS Kaneohe Bay provides the flexibility to support future military operations for both Navy and Marine Corps and is of greater military value. In an associated move the F-18 and CH-46 squadrons at MCAS Kaneohe Bay will move to NAS Miramar to facilitate the relocation of the NAS Barbers Point squadrons. Finally the Department of the Navy will dispose of the land and facilities at NAS Barbers Point and any proceeds will be used to defray base closure expenses.

### COMMUNITY CONCERNS

The State of Hawaii supports the closure of NAS Barbers Point because it is interested in reusing the land currently occupied by the Navy.

### COMMISSION FINDINGS

The Commission found retention of the Naval Air Reserve Center, in view of force structure reductions, was not consistent with operational requirements. It also found these reductions indicate the need for only one major Naval Air Station in Hawaii, and that MCAS Kaneohe Bay, with significantly higher military value and no ground-encroachment problems, was clearly the base warranting retention. The Commission found that relocation of many of the Marine Corps air assets at Kaneohe Bay which were planned for relocation to other air stations, was required to make room for the aviation assets from NAS Barbers Point.

The Secretary of Defense suggested a revision to his original March 1993 recommendation. The Commission found the revised proposal had a higher military value and should be adopted.

### COMMISSION RECOMMENDATION

The Commission finds the Secretary of Defense deviated substantially from the force-structure plan and criteria 1 and 2. Therefore, the Commission recommends the following: Close Naval Air Station (NAS) Barbers Point and relocate its aircraft along with their dedicated personnel and equipment support to other naval air stations, including Marine Corps Air Station (MCAS), Kaneohe Bay, Hawaii, and NAS Whidbey Island, Washington. Disestablish the Naval Air Reserve Center. Retain the family housing as needed for multi-service use. The Commission finds this recommendation is consistent with the force-structure plan and final criteria.

## Naval Air Station Cecil Field, Florida

*Category: Operational Air Station*
*Mission: Support Naval Aviation Operations*
*One-time Cost: $ 312.1 million*
*Savings: 1994-99: $ -189.1 million (Cost)*
*Annual: $ 48.9 million*
*Payback: 13 years*

### SECRETARY OF DEFENSE RECOMMENDATION

Close Naval Air Station, Cecil Field and relocate its aircraft along with dedicated personnel, equipment and support to Marine Corps Air Station, Cherry Point, North Carolina; Naval Air Station, Oceana, Virginia, and Marine Corps Air Station, Beaufort, South Carolina. Disposition of major tenants is as follows: Marine Corps Security Force Company relocates to MCAS Cherry Point; Aviation Intermediate Maintenance Department relocates to MCAS Cherry Point; Air Maintenance Training Group Detachment, Fleet Aviation Support Office Training Group Atlantic, and Sea Operations Detachment relocate to MCAS Cherry Point and NAS Oceana.