FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES
FIT PROJECT

TASK REPORT TO THE ENVIRONMENTAL PROTECTION AGENCY
CONTRACT NO. 68-01-6056

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A Preliminary Assessment

of

Naval Ordnance Station
Indian Head, MD
TDD No. F3-8112-03
EPA No. MD-64

Preparation Date: May 25, 1982

Presented to: Linda Y. Boornazian, Acting DPO
EPA Region III

Prepared by: Susan Belski
Joseph G. McCavern, PHTL III

ecology and environment, inc.

International Specialists in the Environmental Sciences
Naval Ordnance Station  
Indian Head, MD  
TDD No. F3-8112-03  
EPA No. MD-64

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Summary

The Naval Ordnance Station (NOS) occupies roughly 1,800 acres of the Indian Head Peninsula in Indian Head, Maryland. The station provides material and technical support for the US Navy.

Site activities result in the annual generation of the following types and quantities of hazardous wastes:

- 461 tons of explosives.
- 1,645 tons of acid wastes.
- 4 tons of TCE.
- 5 pounds of lead.

Other wastes generated annually by the NOS are as follows:

- 65 cubic yards of paint sludge.
- 150 cubic yards of sewage sludge.

In addition, the site currently stores 4 tons of PCB's.

The NOS has filed an application for a Designated Hazardous Substance Permit (RCRA Generator and TSD facility). In addition, Charles County has issued a draft permit to the station allowing open burning of explosives. This permit was sanctioned by the State of Maryland Air Quality Programs. The final permit is being published.
Significant and relevant site activities are reported herein in two phases as follows:

Phase 1 - Inactive areas of waste disposal and storage:

The NOS operated a sanitary landfill in an abandoned gravel pit (not excavated to groundwater). The station disposed of 150 cubic yards of sewage sludge annually and a total of 6.5 cubic yards of containerized paint sludge. Analysis of sewage sludge indicated that it did not exhibit the characteristics of EP toxicity; paint sludge was not subjected to RCRA testing. The landfill was active for approximately 5 years. It has been inactive for almost 2 years. The landfill has not been capped and seeded.

A scrap yard was formerly utilized for storage of PCB transformers. Transformers containing > 50 ppm PCBs were removed to building 1440. Several transformers of <50 ppm PCBs remain in the scrap yard.

Phase 2 - Active areas of waste disposal and storage:

Currently the station burns explosive and lead contaminated wastes in three open burning grounds (the pyrotechnics, explosives and decontamination burning grounds). Previously, all hazardous wastes generated by the NOS were either returned to the vendor for recycling or burned in the open burning grounds.

The NOS stores roughly 4 tons of PCBs in building 1440 which reportedly is constructed in accordance with applicable regulations.
Currently the wastes generated at the station are disposed of as follows:

- explosive and lead contaminated wastes are burned in open burning grounds,
- TCE and waste acids are returned to the vendor for recycling,
- sewage sludge is applied as a soil conditioner on wildlife support areas,
- containerized paint sludge is stored on site.

The Navy Assessment and Control of Installation Pollutants (NACIP) has contracted Fred C. Hart to perform an assessment regarding previous waste handling practices at the site. If the assessment identifies problem areas, these areas will be investigated further by sampling and analysis. Remedial activity may be implemented as a final stage in the NACIP/Fred C. Hart assessment.

The Naval Ordnance Station utilizes groundwater from a network of 8 deep wells to supply roughly 2,000 employees and residents at the station. The nearest supply well to the landfill is located less than 1/4 mile upgradient. Two water supply wells for the Town of Indian Head are located approximately 1 1/2 miles northeast of the landfill.

The landfill is underlain by the permeable Aquia Greensand. Groundwater contamination may be occurring via leakage of containerized paint sludge at the landfill.

The NOS is bordered by the Mattawoman Creek to the east and the Potomac River to the west. All burning grounds border the Mattawoman Creek. Surface water contamination may be occurring via discharge of contaminated groundwater. In addition, the open burning of explosive and lead contaminated wastes may
result in the deposition of lead laden ash in surface waters. Increase in lead concentrations in surface waters represents a threat to the aquatic organisms, and the food chain, as lead displays bioaccumulation by aquatic organisms.

Recommendations

FIT Region III concludes that the NOS may be adversely impacting groundwater and surface water, and recommends a low priority Site Investigation/Sampling at the NOS to include the following:

- Wells in the vicinity of the landfill for organics and inorganics to determine possible presence of groundwater contamination.

- Possible fish study to determine if elevated levels of lead are present in aquatic organisms.

As the Navy has commissioned Fred C. Hart in this effort it is recommended that the EPA postpone action and review the forthcoming report to determine if potential surface water and groundwater contamination are properly addressed.
Naval Ordnance Station
Indian Head, MD
TDD No. F3-8112-03
EPA No. MD-64

BACKGROUND OF THE SITE

History

The Naval Ordnance Station (NOS) located in Indian Head, MD, began operations in 1890, and encompasses roughly 1,800 acres of the Indian Head Peninsula. The station provides a variety of material and technical support for the United States Navy. More specifically the facility provides material and technical support in all phases of weapons systems, propulsion, explosives development, cartridge and propellant activated devices and propellant and explosive chemistry.¹

The Naval Ordnance Station has been issued, or is in the process of obtaining, the following permits regarding waste disposal:²

- 6 NPDES (5 industrial waste, 1 sewage waste)
- Sewage sludge disposal permit and permission to apply sewage sludge as a soil conditioner at a rate of 6 tons/acre (sludge is generated on site).
- Seeking a Designated Hazardous Substance Permit (RCRA Generator and TSD) with the State of Maryland (See Attachment I).
- Draft permit from Charles County via consent of State of Maryland, Air Quality Programs for open burning of explosives (See Attachment II). Final permit is in publication.

In addition, the station notified the EPA under Superfund as:³ (See Attachment III)

- an interim storage area for PCBs.
- interim storage area for paint sludge and disposal of containerized paint sludge.
Four known areas of waste disposal exist at the NOS as noted below (See Figures 3 and 4).

- 3 open burning areas (pyrotechnics, explosives and decontamination open burning areas),
- an inactive sanitary landfill,

In addition, the site stores PCB's at the following locations:

- a scrap yard
- Building 1440

Previously, all hazardous wastes generated at the NOS were either recycled or burned on site at the open burning grounds. Presently only explosive and lead contaminated wastes are burned on site. Other hazardous wastes generated by the NOS (TCE and spent acids) are returned to vendors for recycling.²

The NOS began operating a sanitary landfill approximately 7 years ago in an on-site gravel pit. The sanitary landfill has been inactive for one to two years but was never formally closed, capped or seeded. During operations, the landfill accepted 150 cubic yards of sewage sludge annually (generated at the NOS) and a total of 1,100 gallons of containerized paint sludge.

Currently, sewage sludge is applied to wildlife support areas as a soil conditioner and paint sludge is stored on site.

The NOS previously stored all transformers containing PCBs in an on-site scrap yard. All transformers containing > 50 ppm PCBs were removed to building 1440 which is reportedly constructed according to applicable regulations. Several transformers of < 50 ppm PCBs remain in the scrap yard.
Recently, NACIP (Navy Assessment and Control of Installation Pollutants) has contracted Fred C. Hart to perform an assessment at the site in reference to waste handling practices. The assessment may be 1, 2 or 3 phases similar to those established by EPA's Dumpsite Program as defined below:

1. Initial assessment study.
   
   This is an extensive review of archives, and records, discussions with past and present employees, and an aerial survey of the site. The purpose is to identify areas of contamination at the station.

2. Confirmation study.
   
   If phase 1 identifies potential problem areas, these areas are investigated further through sampling and analysis.

3. Corrective action.
   
   The need to be determined by the confirmation study in phase 2.

Waste Types, Quantities and Characteristics

Site activities result in the annual generation of the following types and quantities of hazardous wastes:

- 461 tons of explosive wastes (RDX, nitroglycerine and ammonium perchlorate contaminated wastes)

- 1,645 tons of spent acid (50% conc. H₂SO₄ and 50% conc. HNO₃)
Background of the Site

Page Four

- 4 tons of TCE,

- 5 pounds of lead.

The station also stores 4 tons of PCBs.\textsuperscript{162}

Utilizing the Hazardous Rating (Mitre) Model ranking system these wastes are characterized below (3 indicating the most severe condition).\textsuperscript{5}

<table>
<thead>
<tr>
<th></th>
<th>Toxicity</th>
<th>Volatility</th>
<th>Infec.</th>
<th>Persistence</th>
<th>Reactivity</th>
<th>Ignition</th>
<th>Physical State</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDX (D001)</td>
<td></td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Ammonium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perchlorate (D001)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Nitroglycerin (D001)</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>H\textsubscript{2}SO\textsubscript{4} (D002)</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>HNO\textsubscript{3} (D002)</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>TCE (F001)</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Lead (D008)</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PCB</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

See Attachment IV for further information.

Other wastes generated on a yearly basis at the site are as follows:

- 150 cubic yards/year of sewage sludge (according to NOS personnel, testing indicates that sludge does not exhibit the characteristics of EP toxicity),

- 110 gallons of paint sludge (has not been subjected to RCRA testing to determine hazard),

- 40-80 cubic yards daily of general refuse.\textsuperscript{2}
Geology/Hydrology

The Indian Head Peninsula is bordered on the west by the Potomac River and on the east by the Mattawoman Creek. The burning grounds and scrap yard are adjacent to the Mattawoman Creek. These areas lie within the flood plain of the Mattawoman Creek. The landfill and building 1440 lie outside the flood plain area.

Surface waters in the vicinity of the NOS are designated class I waters. Surface waters are protected for water contact (recreation) and wildlife.

The NOS is underlain by the Aquia Greensand and is comprised of moderately glauconitic quartz sand with a few layers of clay. Depth to unconsolidated bedrock is greater than 5 ft. The groundwater table at the areas of concern is shallow (<3 feet) except at the landfill where depth to the groundwater table is >4 feet. Direction of shallow groundwater flow at the landfill, scrap yard and burning areas is towards the Mattawoman Creek. Deep groundwater runs southwesterly towards the Potomac River.

Groundwater is utilized for drinking water at the Naval Ordnance Station (See Figure 1 and Table 1 for well locations, depths and pumpage rates).

Municipal water supply from the Town of Indian Head is available to the NOS in case of emergency. The municipal water supplies arise from groundwater wells (See Figure 2 for locations, and pumpage rates).

The landfill occupies a former gravel pit. According to Naval Ordnance personnel, the gravel pit was not excavated to groundwater level. The soil of the landfill is comprised chiefly of lowland deposits of gravel and sand in which cobbles and boulders lie near the base. The permeability of these soils is medium to high.
The burning grounds are located in areas developed by cutting and filling. As such these soils are extremely variable in nature. (See Attachment V for more detailed information).

Demographics

The station employs a staff of 1,825 with some employees also residing at the site. Residential buildings at the site house roughly 1,000 people.

Critical Environments

Areas of tidal marshland lie within 1/4 mile of the burning areas. In addition, the Potomac River area in the vicinity of the NOS is a nesting area for bald eagles. Disposal areas and bordering property may, at times, be utilized by the eagle.

The Naval Ordnance Station supports a large deer population. No hunting is permitted at the station.
FOOTNOTES FOR BACKGROUND OF THE SITE

1. Hazardous Waste Permit Application (See Attachment I).

2. Telecons and meetings with NOS Personnel:
   
   Caryle Miller 202-433-3760
   Larry Sparks 202-433-3760
   Thomas Woo 301-743-4534
   Bob Steves 301-743-4343
   Ken Mooren 202-433-3760


4. EPA/State File Information.

5. Information From:
   

6. USGS Topographic Map, 7.5' Series, Indian Head Quad.


8. Contamination Potential, prepared by EPA Region III.


10. Betty Hammick, Employee of Town of Indian Head, 301-743-5511.

11. Martha Carlisle, Department of Fish and Wildlife, Annapolis, MD, 301-269-6324.
Introduction

The on-site reconnaissance by FIT Region III addressed the 4 major areas of concern identified in EPA/State file information: open burning area, explosives open burning, pyrotechnics open burning area and a sanitary landfill. In addition, FIT Region III investigated two PCB storage areas.

On January 25, 1982 at 1100 hours, FIT Region III met with State of Maryland and Naval Ordnance Station personnel for the purposes of confirming background information and conducting an on-site survey. The State of Maryland was assisted in performing a RCRA inspection.

Contacts

Present on date of inspection:

T.M. Woo, NAVORDSTA, NOS 301-743-4534
Larry Sparks, Chesdiv, NOS 202-433-3760
Caryle Miller, Chesdiv, NOS 202-433-3760
Bob Steves, PDO, NOS 301-743-4343
Peter Wigginton, State of Maryland, Department of Health & Mental Hygiene (present for RCRA Inspection only) 301-383-6650
Beth Gross, FIT Region III 601-665-1515
Susan Belski, FIT Region III 609-665-1515

Observations

- Weather conditions on date of inspection were cold, overcast and slightly breezy.

- Field observations were somewhat limited on date of site survey due to presence of approximately 4" of snow.

- No positive explosimeter or HNU readings were detected on date of inspection.

- The decontamination burning area borders the Mattawoman Creek and encompasses roughly 2-3 acres (See Figure 3). RDX, nitroglycerine and ammonium...
perchlorate contaminated equipment (tanks, pipes, wooden pallets, cardboard, bulk metal and fiberbound containers) are flashed every 2 weeks resulting in approximately 250 tons of reclaimed scrap metal per year.

The explosives open burning ground is roughly 1 acre in size and is located at the tip of the peninsula abutting the Mattawoman Creek. Missile propellants and warhead explosives are flashed every other day at a rate of approximately 215 tons/year.

The pyrotechnics disposal area is located a few hundred yards southwest of the explosives open burning ground and is the site of flashing of initiators, igniters, caps and various hardware. Burning is confined to a 5,000 gallon (approximate size) open ended tank noted on site. Pyrotechnics burning is carried out once a week at a rate of 200 pounds/week.

All burning activities are confined to restricted areas. Access roads to restricted areas are guarded by military personnel.

The landfill occupies a former gravel pit and encompasses roughly 15 acres. The landfill was partially surrounded by a low cliff. A general refuse dumpster was noted at the landfill which is reportedly emptied once or twice a day.

All PCBs were formerly stored on approximately 1/4 acre of the scrap yard. Transformers containing > 50 ppm PCB were removed to building 1440. Several transformers containing < 50 ppm PCB were noted in the scrap yard.

Building 1440 currently stores 4 tons of PCBs. Building 1440 is reportedly constructed in accordance with Regulation 40 CFR.761.

FIT Region III concluded the site survey and left the site by 1520 hours.
SECTION 4
**POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT**

**NOTE:** This form is completed for each potential hazardous waste site to help set priorities for site inspection. The information submitted on this form is based on available records and may be updated on subsequent forms as a result of additional inquiries and on-site inspections.

**ALL INSTRUCTIONS:** Complete Sections I and III through X as completely as possible before Section II (Preliminary Assessment). File this form in the Regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW, Washington, DC 20460.

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### I. SITE IDENTIFICATION

<table>
<thead>
<tr>
<th>A. SITE NAME</th>
<th>B. STREET (or other identifier)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naval Ordnance Station</td>
<td>Route 210</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. CITY</th>
<th>D. STATE</th>
<th>E. ZIP CODE</th>
<th>F. COUNTY NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indian Head</td>
<td>MD</td>
<td>20640</td>
<td>Charles</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G. OWNER/OPERATOR (If known)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NAME</td>
</tr>
<tr>
<td>US Navy/Fred S. Underwood, Captain, USN, Commanding Officer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H. TYPE OF OWNERSHIP</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 1. FEDERAL 2. STATE 3. COUNTY 4. MUNICIPAL 5. PRIVATE 6. UNKNOWN</td>
</tr>
</tbody>
</table>

### II. PRELIMINARY ASSESSMENT (complete this section last)

<table>
<thead>
<tr>
<th>A. INTENT SERIOUSNESS OF PROBLEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HIGH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. RECOMMENDATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NO ACTION NEEDED (no hazard)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. IMMEDIATE SITE INSPECTION NEEDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. TENTATIVELY SCHEDULED FOR:</td>
</tr>
</tbody>
</table>

| b. WILL BE PERFORMED BY: |

<table>
<thead>
<tr>
<th>3. SITE INSPECTION NEEDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. TENTATIVELY SCHEDULED FOR:</td>
</tr>
</tbody>
</table>

| b. WILL BE PERFORMED BY: |

| 4. SITE INSPECTION NEEDED (low priority) |

### C. PREPARER INFORMATION

<table>
<thead>
<tr>
<th>1. NAME</th>
<th>2. TELEPHONE NUMBER</th>
<th>3. DATE (mo., day, &amp; yr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susan Belski</td>
<td>(609) 665-1515</td>
<td>02-10-02</td>
</tr>
</tbody>
</table>

### III. SITE INFORMATION

<table>
<thead>
<tr>
<th>A. SITE STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if in relatively minor quantity).</td>
</tr>
</tbody>
</table>

| 2. INACTIVE (Those sites which no longer receive waste). |

<table>
<thead>
<tr>
<th>3. OTHER (specify):</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Those sites that include such incidents like &quot;midnight dumping&quot; where no regular or continuing use of the site for waste disposal is apparent).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. IS GENERATOR ON SITE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 1. NO</td>
</tr>
</tbody>
</table>

| 2. YES (specify generator's four-digit SIC Code): 2869, 2892, 8911, 3662 |

<table>
<thead>
<tr>
<th>C. SIZE OF SITE (in acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,742</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. IF APPARENT SERIOUSNESS OF SITE IS HIGH, SPECIFY COORDINATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LATITUDE (deg.-min.-sec.)</td>
</tr>
<tr>
<td>38° 33' 45&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E. ARE THERE BUILDINGS ON THE SITE?</th>
</tr>
</thead>
<tbody>
<tr>
<td>X 1. NO</td>
</tr>
</tbody>
</table>

| 2. YES (specify): |
| Buildings relevant to administration, R&D, manufacture of explosives and related devices, storage, housing, schools, etc |

---

*Continue On Reverse*
### IV. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

<table>
<thead>
<tr>
<th>A. TRANSPORTER</th>
<th>B. STORER</th>
<th>C. TREATER</th>
<th>D. DISPOSER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. MAIL</td>
<td>1. PILE</td>
<td>1. FILTRATION</td>
<td>1. LANDFILL</td>
</tr>
<tr>
<td>2. SHIP</td>
<td>2. SURFACE IMPOUNDMENT</td>
<td>2. INCINERATION</td>
<td>2. LANDFAR</td>
</tr>
<tr>
<td>3. BARGE</td>
<td>3. DRUMS</td>
<td>3. VOLUME REDUCTION</td>
<td>3. OPEN DUMP</td>
</tr>
<tr>
<td>RUCK</td>
<td>4. TANK, ABOVE GROUND</td>
<td>4. RECYCLING/RECOVERY</td>
<td>4. SURFACE IMPOUNDMENT</td>
</tr>
<tr>
<td>5. PIPELINE</td>
<td>5. TANK, BELOW GROUND</td>
<td>5. CHEM./PHYS. TREATMENT</td>
<td>5. MIDNIGHT DUMPING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. WASTE OIL REPROCESSING</td>
<td>7. UNDERGROUND INJECTION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. SOLVENT RECOVERY</td>
<td>8. OTHER (specify):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. SOLVENT RECOVERY</td>
<td>9. OTHER (specify):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. OTHER (specify):</td>
<td>10. OTHER (specify):</td>
</tr>
</tbody>
</table>

### E. SPECIFY DETAILS OF SITE ACTIVITIES AS NEEDED

Three burning areas are present at the site. Burning of explosives and explosive and lead contaminated wastes occur at these sites. Several years ago, all wastes generated on-site were recycled or burned in these areas. One landfill is present on-site and accepted only sewage and paint sludges.

### V. WASTE RELATED INFORMATION

#### A. WASTE TYPE

- [ ] 1. UNKNOWN
- [X] 2. LIQUID
- [X] 3. SOLID
- [X] 4. SLUDGE
- [ ] 5. GAS

#### B. WASTE CHARACTERISTICS

- [ ] 1. UNKNOWN
- [X] 2. CORROSIVE
- [X] 3. IGNITABLE
- [X] 4. RADIOACTIVE
- [X] 5. HIGHLY VOLATILE

- [ ] 6. TOXIC
- [X] 7. REACTIVE
- [X] 8. INERT
- [X] 9. FLAMMABLE

#### C. WASTE CATEGORIES

**1. Estimate the amount(specify unit of measure)of waste by category; mark 'X' to indicate which wastes are present.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. SLUDGE</td>
<td>~157 cu. yds./yr.</td>
<td></td>
</tr>
<tr>
<td>B. OIL</td>
<td>4</td>
<td>tons/yr.</td>
</tr>
<tr>
<td>C. SOLVENTS</td>
<td>~1,650</td>
<td>tons/yr.</td>
</tr>
<tr>
<td>D. CHEMICALS</td>
<td>461</td>
<td>tons/yr.</td>
</tr>
<tr>
<td>E. OTHER</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**2. Estimate the amount(specify unit of measure)of waste by category; mark 'X' to indicate which wastes are present.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>X. METALS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X. OTHER(specify):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Sewage sludge (~150 cubic yds./yr.)
- Paint sludge (~6.5 cubic yds./yr. landfilled on-site)
- ~65 cubic yds./yr. generated currently stored on-site
- Nitroglycerine, RDX, and ammonium perchlorate contaminated wastes
- PCB ~4 tons stored on-site
- ~5 lbs. of Pb/yr.
V. WASTE RELATED INFORMATION (continued)

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH MAY BE ON THE SITE (place in descending order of hazard):
   - Explosives (RDX, nitroglycerin, ammonium perchlorate)
   - Nitric and sulfuric acids
   - TCE
   - Lead
   - PCBs

ADDITIONAL COMMENTS OR NARRATIVE DESCRIPTION OF SITUATION KNOWN OR REPORTED TO EXIST AT THE SITE.

The site is in the process of being permitted by the State of MD as a DHS facility. Prior to application for permit, site wastes were recovered or burned in open burning areas.

VI. HAZARD DESCRIPTION

<table>
<thead>
<tr>
<th>A. TYPE OF HAZARD</th>
<th>B. POTENTIAL HAZARD (mark 'X')</th>
<th>C. ALLEGED INCIDENT (mark 'X')</th>
<th>D. DATE OF INCIDENT (mo, da, yr)</th>
<th>E. REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. NO HAZARD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. HUMAN HEALTH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. NON-WORKER INJURY/EXPOSURE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. WORKER INJURY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CONTAMINATION OF WATER SUPPLY</td>
<td>X</td>
<td></td>
<td></td>
<td>A water supply well for the NOS is located in the vicinity of the landfill. SEE PAGE 3A</td>
</tr>
<tr>
<td>6. CONTAMINATION OF FOOD CHAIN</td>
<td>X</td>
<td></td>
<td></td>
<td>SEE PAGE 3A</td>
</tr>
<tr>
<td>7. CONTAMINATION OF GROUND WATER</td>
<td>X</td>
<td></td>
<td></td>
<td>Potential groundwater contamination via leakage of containerized paint sludge.</td>
</tr>
<tr>
<td>8. CONTAMINATION OF SURFACE WATER</td>
<td>X</td>
<td>X</td>
<td>07-03-77</td>
<td>SEE PAGE 3A</td>
</tr>
<tr>
<td>9. DAMAGE TO FLORA/FAUNA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. FISH KILL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. CONTAMINATION OF AIR</td>
<td>X</td>
<td></td>
<td></td>
<td>See PAGE 3A</td>
</tr>
<tr>
<td>12. NOTICEABLE ODORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. CONTAMINATION OF SOIL</td>
<td>X</td>
<td></td>
<td></td>
<td>Potential contamination at the explosive and decontamination burning areas.</td>
</tr>
<tr>
<td>14. PROPERTY DAMAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. FIRE OR EXPLOSION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. SPILLS/LEAKING CONTAINERS/ RUNOFF/STANDING LIQUIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. SEWER, STORM DRAIN PROBLEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. EROSION PROBLEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. INADEQUATE SECURITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. INCOMPATIBLE WASTES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. NIGHT DUMPING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. OTHER (specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VI. 6. Aquatic organisms bioaccumulate lead.

VI. 8. Spill (12% caustic solution, 12% other salts - 130 ppm) entered the Mattawoman Creek.

Surface water contamination may be a potential problem as burning areas lie in flood prone area; also deposition of lead laden ash from open burning areas.

VI.11. Open burning of explosives.
VII. PERMIT INFORMATION

A. INDICATE ALL APPLICABLE PERMITS HELD BY THE SITE.

[ ] 1. NPDES PERMIT  [ ] 2. SPCC PLAN  [ ] 3. STATE PERMIT (specify)

[ ] 4. AIR PERMITS  [ ] 5. LOCAL PERMIT  [ ] 6. RCRA TRANSPORTER

[ ] 7. RCRA STORER  [ ] 8. RCRA TREATMENT  [ ] 9. RCRA DISPOSER

OTHER (specify): Sewage sludge disposal 57010460AFB/Seeking a Designated Hazardous

B. IN COMPLIANCE

[ ] 1. YES  [ ] 2. NO  [ ] 3. UNKNOWN

Effluent guidelines for NPDES permits have been exceeded.

VIII. PAST REGULATORY ACTIONS

[ ] A. NONE  [ ] B. YES (summarize below)

See below

IX. INSPECTION ACTIVITY (past or on-going)

[ ] A. NONE  [ ] B. YES (complete items 1, 2, 3, & 4 below)

1. TYPE OF ACTIVITY  2. DATE OF PAST ACTION  3. PERFORMED BY  4. DESCRIPTION
   (mon., day, & yr.)  (EPA/State)

NPDES inspection 01-18-82 EPA (CRL) Examined the facilities sampling strategy re NPDES, etc. Overall rating of satisfactory.

NPDES weekly daily N.O.S. Effluent exceeds guideline.

NPDES monthly State Effluent exceeds guideline.

X. REMEDIAL ACTIVITY (past or on-going)

[ ] A. NONE  [ ] B. YES (complete items 1, 2, 3, & 4 below)

See below

NOTE: Based on the information in Sections III through X, fill out the Preliminary Assessment (Section II) information on the first page of this form.

EPA Form T2070-2 (10-79) PAGE 4 OF 4

Due to sample results exceeding effluent guidelines: the N.O.S. on its own initiative has implemented the following:

1) Re sanitary waste outfalls - project has been awarded for upgrading and centralizing sewage treatment at the N.O.S.

2) Re industrial waste outfall: A feasibility study is being ensued to improve effluent conditions.
WORK SHEET FOR RATING DISPOSAL SITES

Name of Site: Naval Ordnance Station (CIRCLE ONE) active inactive abandoned
Location: Indian Head, MD
Owner/Operator: U. S. Navy

Comments: The landfill has been inactive for 1-2 years. Previously accepted STP ge generated on site (now utilized as fertilizer) and containerized paint sludge longer disposed of on site.

Prepared By: Susan Belski On February 9, 1982

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>OBSERVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population within 1000 feet</td>
<td>0</td>
</tr>
<tr>
<td>Distance to Nearest Drinking Water Well</td>
<td>&lt; 1/4 mile (Well #18)</td>
</tr>
<tr>
<td>Distance to Nearest Off-Site Building</td>
<td>&lt; 1/8 mile</td>
</tr>
<tr>
<td>Land Use/Zoning</td>
<td>restricted area, utilized only by N.O.S. personnel</td>
</tr>
<tr>
<td>Critical Environment</td>
<td>may be used by bald eagle tidal flats and tidal marsh-</td>
</tr>
<tr>
<td>Use of Site by Residents</td>
<td>not used</td>
</tr>
<tr>
<td>Use of Nearest Buildings</td>
<td>unknown</td>
</tr>
<tr>
<td>Presence of Public Water Supplies</td>
<td>Well #18 is one of the supply wells that services a population of 1,000 residents &amp; approx. 1825 employees at the site</td>
</tr>
<tr>
<td>Presence of Aquifer</td>
<td>no - site is an aquifer discharge area</td>
</tr>
<tr>
<td>Discharge Area</td>
<td>roads utilized by facility personnel</td>
</tr>
<tr>
<td>Presence of Important Natural Resources</td>
<td>none</td>
</tr>
<tr>
<td>Other</td>
<td>none</td>
</tr>
</tbody>
</table>

PATHWAYS

Evidence of Contamination | none noted |
Type of Contamination | potential for groundwater contamination |
Level of Contamination | unknown |
Distance to Nearest Surface Water | < 1/2 mile |
Depth to Ground Water | > 4 ft. |
Net Precipitation | 6" |
Soil Permeability | medium to high |
Bedrock Permeability | |
Depth to Bedrock | > 5 ft. to unconsolidated bedrock |
Erosion and Runoff Problems | none noted |
Susceptibility to Flooding | mild susceptibility |
Slope Instability | not noted |
Seismic Activity | zone 2 (minor earthquake damage may be expected) |
Other | |

PAGE 1 OF 2
WORK SHEET FOR RATING DISPOSAL SITES

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>OBSERVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>*<em>WASTE CHARACTERISTICS  (SEE NOTE <em>)</em></em></td>
<td></td>
</tr>
<tr>
<td>Toxicty</td>
<td>varies according to type of metal</td>
</tr>
<tr>
<td>Persistence</td>
<td>metals are persistent</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>--</td>
</tr>
<tr>
<td>Ignitability</td>
<td>--</td>
</tr>
<tr>
<td>Reactivity</td>
<td>--</td>
</tr>
<tr>
<td>Corrosiveness</td>
<td>--</td>
</tr>
<tr>
<td>Solubility</td>
<td>metals are soluble at low pH</td>
</tr>
<tr>
<td>Volatility</td>
<td>--</td>
</tr>
<tr>
<td>Physical State</td>
<td>particulate</td>
</tr>
<tr>
<td>Infectiousness</td>
<td>--</td>
</tr>
<tr>
<td>Bioaccumulation Potential</td>
<td>bioaccumulation</td>
</tr>
<tr>
<td>Carcinogenicity, Teratogenicity and Mutagenicity</td>
<td>--</td>
</tr>
<tr>
<td>Other</td>
<td>--</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WASTE MANAGEMENT PRACTICES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Security</td>
<td>adequate</td>
</tr>
<tr>
<td>Hazardous Waste Quantity</td>
<td>0-1100 gal. (paint sludge not subjected to RCRA testing)</td>
</tr>
<tr>
<td>Total Waste Quantity</td>
<td>approx. 600 cu. yds STP sludge, 6 cu. yds paint sludge</td>
</tr>
<tr>
<td>Waste Incompatibility</td>
<td>not noted</td>
</tr>
<tr>
<td>Use of Liners</td>
<td>not lined</td>
</tr>
<tr>
<td>Use of Leachate Collection Systems</td>
<td>no leachate collection system</td>
</tr>
<tr>
<td>Use of Gas Collection Systems</td>
<td>no gas collection system</td>
</tr>
<tr>
<td>Use and Condition of Containers</td>
<td>unknown (paint sludge containerized)</td>
</tr>
<tr>
<td>Lack of Safety Measures</td>
<td>none noted</td>
</tr>
<tr>
<td>Evidence of Open Burning</td>
<td>none</td>
</tr>
<tr>
<td>Dangerous Heat Sources</td>
<td>none</td>
</tr>
<tr>
<td>Inadequate Waste Records</td>
<td>adequate</td>
</tr>
<tr>
<td>Inadequate Cover</td>
<td>unknown</td>
</tr>
<tr>
<td>Other</td>
<td>--</td>
</tr>
</tbody>
</table>

* NOTE: Site accepted containerized paint sludges and STP sludge. Paint sludge was not subjected to RCRA analysis. STP sludge testing indicates that sludge does not exhibit the characteristics of EP toxicity.

PAGE 2 OF 2
### WORK SHEET FOR OPEN BURNING AREAS

**Location:** Naval Ordnance Station  
**Owner/Operator:** Indian Head, MD  
**Comments:** U.S. Navy

**Prepared By:** Susan Belski  
**On:** February 9, 1982

#### FACTOR | OBSERVATION

| Population within 1000 feet | 0 |
| Distance to Nearest Drinking Water Well | approximately 1/4 mile from explosive and pyrotechnics burning grounds (Well 15) |
| Distance to Nearest Off-Site Building | pyrotechnics & open burning areas approx. 1/4 mile, decontamination burning area approximately 1 mile |
| Land Use/Zoning | restricted area/used by U.S. Navy for burning only |
| Critical Environment | used by bald eagle, TM in the vicinity |
| Use of Site by Residents | not used |
| Use of Nearest Buildings | control building utilized during flashing |
| Presence of Public Supplies | Well 15 is one of the supply wells that services a population of 1,000 residents and approx. 1825 employees |
| Presence of Aquifer | No, area is an aquifer discharge area |
| Recharge Area | |
| Presence of Transportation Routes | access road to site |
| Presence of Important Natural Resources | none |
| Other | |

#### PATHWAYS

| Evidence of Contamination | not noted |
| Type of Contamination | unknown, potential for surface water contamination |
| Level of Contamination | unknown |
| Distance to Nearest Surface Water | borders surface waters |
| Depth to Ground Water | <3 feet |
| Net Precipitation | 6" |
| Soil Permeability | variable |
| Bedrock Permeability | -- |
| Depth to Bedrock | >5 ft. to unconsolidated bedrock |
| Erosion and Runoff Problems | not noted |
| Susceptibility to Flooding | burning areas lie in flood prone area |
| Seismic Instability | no |
| Earthquake Activity | zone 2 (minor earthquake damage may be expected) |
| Other | -- |
### WORK SHEET FOR RATING OPEN BURNING AREAS

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>OBSERVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WASTE CHARACTERISTICS</strong></td>
<td></td>
</tr>
<tr>
<td>RDX, nitroglycerine, ammonium perchlorate, lead</td>
<td></td>
</tr>
<tr>
<td>Toxicity</td>
<td>high</td>
</tr>
<tr>
<td>Persistence</td>
<td>medium to high</td>
</tr>
<tr>
<td>Radioactivity</td>
<td>no</td>
</tr>
<tr>
<td>Ignitability</td>
<td>highly ignitable</td>
</tr>
<tr>
<td>Reactivity</td>
<td>highly reactive</td>
</tr>
<tr>
<td>Corrosiveness</td>
<td>not applicable (acid wastes are not flashed)</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>lead-pH dependent; explosives—slightly to moderately</td>
</tr>
<tr>
<td>Volatility</td>
<td>low soluble</td>
</tr>
<tr>
<td>Physical State</td>
<td>crystalline, liquid, particulate</td>
</tr>
<tr>
<td>Infectiousness</td>
<td>--</td>
</tr>
<tr>
<td>Bioaccumulation Potential</td>
<td>lead is bioaccumulate</td>
</tr>
<tr>
<td>Carcinogenicity, Teratogenicity and Mutagenicity</td>
<td>RDX is an experimental carcinogen</td>
</tr>
<tr>
<td>Other</td>
<td>--</td>
</tr>
</tbody>
</table>

### WASTE MANAGEMENT PRACTICES

| Site Security                          | adequate                                        |
| Hazardous Waste Quantity               | approximately 461 tons/year                     |
| Total Waste Quantity                   | approximately 461 tons/year                     |
| Waste Incompatibility                  | no                                              |
| Use of Liners                          | no                                              |
| Use of Leachate                        | no                                              |
| Collection Systems                     | no                                              |
| Use of Gas Collection Systems          | no                                              |
| Use and Condition of Containers        | not applicable                                  |
| Lack of Safety Measures                | unknown                                         |
| Evidence of Open Burning               | yes                                             |
| Dangerous Heat Sources                 | not evidenced                                   |
| Inadequate Waste Records               | inadequate records                              |
| Inadequate Cover                       | not applicable                                  |
| Other                                  | --                                              |
FIGURE 1
Location of drinking water wells for the NOS
TDP No. F3-8112-03, EPA No. MD-64
TABLE 1

Depths and pumpage rates of wells located at the NOS
TDD No. F3-8112-03
EPA No. MD 64

<table>
<thead>
<tr>
<th>WELL NUMBER</th>
<th>LOCATION</th>
<th>DEPTH</th>
<th>PUMP RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Building 1534</td>
<td>unknown</td>
<td>88 gpm</td>
</tr>
<tr>
<td>6</td>
<td>Building 899</td>
<td>398 ft.</td>
<td>50 gpm</td>
</tr>
<tr>
<td>7</td>
<td>Building 899</td>
<td>395 ft.</td>
<td>50 gpm</td>
</tr>
<tr>
<td>15</td>
<td>Building 726</td>
<td>280 ft.</td>
<td>150 gpm</td>
</tr>
<tr>
<td>17</td>
<td>Building 788</td>
<td>295 ft.</td>
<td>125 gpm</td>
</tr>
<tr>
<td>18</td>
<td>Building 789</td>
<td>302 ft.</td>
<td>125 gpm</td>
</tr>
<tr>
<td>A (23)</td>
<td>Building 782</td>
<td>290 ft.</td>
<td>100 gpm</td>
</tr>
<tr>
<td>B (24)</td>
<td>Building 782</td>
<td>294 ft.</td>
<td>30 gpm</td>
</tr>
</tbody>
</table>
Well locations denoted in red.

Pumpage Rate:
#1 - 150
#2 - 150
#3 - 250
#4 - 100

FIGURE 2
Location of drinking water wells
for the Town of Indian Head
TDD No. F3-8112-03, EPA No. MD-64
FIGURE 3
Location of disposal areas
Courtesy of EPA files
TDD No. F3-8112-03, EPA No. MD-64

1. Pyrotechnics Burning Area
   Longitude 77° 12' 27"
   Latitude 38° 33' 50" (Approx.)
   Area - 120,000 Sq. Ft.

2. Explosives Burning Area
   Longitude 77° 12' 3"
   Latitude 38° 33' 45" (Approx.)
   Area - 48,000 Sq. Ft.

3. Decontamination Burning Area
   Longitude 77° 11' 48"
   Latitude 38° 33' 58" (Approx.)
   Area - 40,000 Sq. Ft.

4. Sludge Disposal Site and Landfill Area
   Longitude 77° 10' 5"
   Latitude 38° 34' 8" (Approx.)

SCALE: 1 INCH = 1,000 FE
1. Pyrotechnics Burning Area
   Area - 120,000 Sq. Ft.

2. Explosives Burning Area
   Area - 48,000 Sq. Ft.

3. Decontamination Burning Area
   Area - 40,000 Sq. Ft.

4. Sludge Disposal Site and Landfill Area
FIT Region III was requested by NOS personnel not to photograph the site. Photographs were taken by Bob Steves, N.O.S., on January 25, 1982 in the presence of FIT Region III.

Photograph #1

Decontamination burning area - Contaminated scrap pile awaiting flashing at the site.

Photograph #2

Decontamination burning area - Decontaminated scrap pile to be reclaimed.

Photograph #3

PCB storage area - Building 1440 stores approximately 4 tons of PCBs. The building is constructed according to applicable regulations (according to N.O.S. personnel) and labeled with EPA approved stickers. Photograph shows one transformer outside of the building.

Photograph #4

Pyrotechnics burning area - Burning of caps, initiators, etc. confined to 5,000 gallon drum (estimated size) at left in photograph. Pyrotechnics burning area, and other burning areas are not bermed due to the nature of the activities.

Photograph #5

Explosive open burning ground - Utilized for burning of missile propellants and warheads.
Landfill - Inactive for 1-2 years. Previously sewage sludge and containerized paint sludge were landfilled in this area. A 40 cubic yard dumpster is located at the fringe of fill for general refuse generated at the site. Refuse is removed daily by a private contractor and disposed of in Charles County Landfill.

Scrap yard - Previously utilized for all PCB storage. Transformers of 50 ppm or greater PCBs were removed to building 1440. Transformers less than 50 ppm PCB were visible at the left in the picture.
Photograph #1

Photograph #2
Photograph #3

Photograph #4
State of Maryland
Department of Health and Mental Hygiene
Office of Environmental Programs
201 W. Preston St., Balto. MD 21201

DHS Inspection Form
Generators/TSD Facilities

EPA ID Number
MD 717 002 468 Y

Owner/Operator: NAVAL ORDNANCE STATION
Facility Name: NAVAL ORDNANCE STATION
Address: INDIAN HEAD, MD. 20640

Description of Work Activity: MAN, OF EXPLOSIVES AND PROPELLANTS

I. Generators
A. Description (10.51.02.01.03)
1) Does the Facility generate or has it accumulated those quantities of hazardous waste described in 10.51.02.05 C.? Yes, No.
2) Has the facility obtained an EPA identification number? Yes, No.
3) Does the facility generate DHS? Yes, No.
4) Does facility have an EPA identification number? Yes, No.
5) Does facility have a waste analysis plan? Yes, No.
6) Are the procedures of that plan being followed? Yes, No.
7) Does facility personnel identify DHS being handled? Yes, No.
8) Can facility personnel confirm that DHS received are those on manifest? Yes, No.
9) Is there a 24-Hour surveillance system to monitor active portion of facility? Yes, No.
10) Is there an artificial or natural boundary? Yes, No.
11) Is there a means to control entry? Yes, No.
12) Is there a restricted access sign posted? Yes, No.
13) Is there an emergency equipment inspection log? Yes, No.
14) Are records maintained of: Job Titles/Names of employees, job descriptions, Type/amount of training.
15) Are general requirements for Ignitable, Reactive, or Incompatible Wastes as required in 10.51.05.02 D addressed?

B. Manifest (10.51.02.04)
1) Is Maryland manifest system in operation for off-site shipment? Yes, No.
2) Is TSD Facility to receive DHS identified by Name, Address, EPA ID Number? Yes, No.
3) Is alternate facility identified? Yes, No.
4) Is generator identified by Name, Address, Telephone Number, EPA ID Number? Yes, No.
5) Is each transporter identified by Name, Address, EPA ID Number, Maryland Certification Number? Yes, No.
6) Is waste property described? Yes, No.
7) Is shipment date marked? Yes, No.
8) Is waste disposed of at a Unit of Weight, Volume? Yes, No.
9) Are containers to be loaded identified by Type, Number? Yes, No.
10) Is proper certification noted and signed by generator? Yes, No.
11) Are copies available for transporters? Yes, No.

C. Pre-Transport Requirements (10.51.03.05)
1) Are containers identified with proper labels? Yes, No.
2) Are containers in good condition? Yes, No.
3) Are containers properly labeled? Yes, No.
4) Are generators have approved emergency contingency plan? Yes, No.

D. Recordkeeping and Reporting (10.51.03.06)
1) Does the generator have copies of all signed manifests from the previous three years? Yes, No.
2) Has the generator retained, for a period of three years, all waste analyses? Yes, No.
3) Has the generator filed Exception Reports as required by 10.51.03.05 C.? Yes, No.

II. Treatment, Storage, Disposal (TSD)

A. Characterization (10.51.05.02)

Thermal Treatment
Chemical Treatment
Recycling/Recovery
Landfill Operation
Biological Treatment
Incorporation
Physical Treatment
Drums
Surface Impoundment
Above Ground Tank(s)

B. Treatment

Incineration
Landfill Operation
Land Treatment
Dry Storage
Other

C. Treatment, Storage, Disposal (TSD)

1) Facility has the following equipment? Yes, No.
2) Facility has the following equipment? Yes, No.
3) Facility has the following equipment? Yes, No.
4) Facility has the following equipment? Yes, No.
5) Facility has the following equipment? Yes, No.
6) Facility has the following equipment? Yes, No.
7) Facility has the following equipment? Yes, No.
8) Facility has the following equipment? Yes, No.
9) Facility has the following equipment? Yes, No.
10) Facility has the following equipment? Yes, No.
11) Facility has the following equipment? Yes, No.

D. Manifest System, Recordkeeping, and Reporting (10.51.05.05)

1) Facility has a written operating record which contains the following information:
2) Facility has a written operating record which contains the following information:
3) Facility has a written operating record which contains the following information:
4) Facility has a written operating record which contains the following information:
5) Facility has a written operating record which contains the following information:
6) Facility has a written operating record which contains the following information:
7) Facility has a written operating record which contains the following information:
8) Facility has a written operating record which contains the following information:

Y R M O D Y
8 29 12
E. Groundwater Monitoring (10.51.05.06)
1. Has facility implemented a groundwater monitoring program? Yes, No, N/A.
2. Are samples from the groundwater monitoring system being analyzed according to the groundwater sampling and analyses plan? Yes, No.
3. Is this plan set up in accordance with 10.51.05.06 C? Yes, No.
4. Has groundwater quality assessment program been prepared? Yes, No.
5. Are proper groundwater sampling and analyses records kept? Yes, No.
6. Are the necessary reports on groundwater monitoring information being forwarded to the Secretary? Yes, No.
7. Do the reports match the facility records? Yes, No.

F. Closure, Post-closure, and Financial Requirements (10.51.07 & 08)
1. Does the facility have an approved closure plan that meets the financial requirements? Yes, No.
2. For surface impoundments, land treatment, and landfills, does the facility have an approved post-closure plan that meets the financial requirements? Yes, No.
3. Does facility maintain liability insurance? Yes, N/A.

G. Container Management (10.51.05.09)
1. Are all containers: (a) in good condition, i.e., no signs of leakage, corrosion, or any other deterioration or deformation? Yes, No.
2. Are storage areas for hazardous waste containers separated by dikes, berms, or other devices? Yes, No.
3. Are incompatible wastes stored in separate containers? Yes, No.
4. Are ignitable or reactive wastes stored in a surface impoundment? Yes, No.
5. Are samples from the groundwater monitoring system being analyzed according to the groundwater sampling and analyses plan? Yes, No.

H. Tanks (10.51.05.10)
1. Are all tanks in good condition, i.e., no signs of leakage, corrosion, or any other deterioration? Yes, No.
2. Are uncovered tanks operated to ensure a minimum of two feet of freeboard? Yes, No.
3. Are tanks with continuing inflow of hazardous waste equipped with a means to stop this inflow (e.g., waste feed cut-off system or by-pass to a standby tank)? Yes, No.
4. Are waste analyses conducted or written documentation obtained before placing a substantially different hazardous waste into tank used for storage or treatment? Yes, No.
5. Are daily inspections conducted for discharge control equipment (e.g., by-pass systems, waste feed cut-off systems, and drainage systems)? Yes, No.
6. Is data gathered from monitoring equipment (e.g., pressure and temperature gauges) at least once each operating day? Yes, No.

I. Surface Impoundments (10.51.05.11)
1. Is run-on diverted away from the active portion of the facility? Yes, No.
2. Are additions to the pile being analyzed prior to adding them to the pile? Yes, No.
3. Is hazardous waste leachate or runoff collected? Yes, No.
4. Has the proper waste analyses been performed? Yes, No.
5. Are ignitable or reactive wastes protected from materials or conditions that might cause it to ignite or react? Yes, No.

J. Waste Pile (10.51.05.12)
1. Is wind dispersal of the pile controlled? Yes, No.
2. Are food chain crops to be grown on the active portion of the facility? Yes, No.
3. Is run-on diverted away from the facility's active portions? Yes, No.
4. Are incompatible wastes segregated in separate surface impoundments so that spontaneous reactions are avoided? Yes, No.

K. Land Treatment (10.51.05.13)
1. Will the use of land treatment result in the waste being less hazardous or non-hazardous? Yes, No.
2. Is run-on diverted away from the active portion of the facility? Yes, No.
3. Has the proper waste analyses been performed? Yes, No.
4. If food chain crops are to be grown on the active portion of the facility has the necessary documentation required been provided? Yes, No.
5. Has the owner/operator written and implemented an unsaturated zone monitoring plan? Yes, No.
6. Have the additional requirements for a closure and post-closure plan been addressed? Yes, No.
7. Are ignitable or reactive wastes immediately incorporated into the soil? Yes, No.
8. Are incompatible wastes hauled in a manner as to assure separation? Yes, N/A.

L. Landfills (10.51.05.14)
1. Is run-on diverted away from the facility's active portions? Yes, No.
2. Is run-on collected from the facility's active portions? Yes, No.
4. Is the landfill managed so as to control wind dispersal? Yes, No.
5) Are the following items maintained in the operating record:
- on a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks? _____ contents of each cell and approximate location of each hazardous waste within the cell? _____ 
- Are bulk, non-containerized or waste containing free liquids placed in the landfill? _____ Yes, _____ No. If Yes: ______ is leachate collection system available to remove leachate? and _____ is the liquid stabilized or treated physically or chemically prior to disposal? 
- Are empty containers crushed flat or shredded before burial in the landfill? _____ Yes, _____ No. If Yes, ______ describe containers on comments below. 
- Are ignitable or reactive wastes placed in a landfill? _____ Yes, _____ No. If Yes: _______ is the waste treated, rendered, or mixed before or immediately after placement in the landfill so that the resulting waste mixture or dissolution of material no longer meets the definition of ignitable or reactive waste? _____ Are incompatible wastes segregated in different landfill cells? 

M. Incinerator/Thermal Treatment (10.51.05.15 & 16)
1) Prior to burning waste not previously incinerated or thermally processed, does the operator conduct waste analysis for the following:
- heating value of the waste; _____ halogen content and sulfur in the waste; _____ concentrations of lead and mercury unless documented data is available which show these elements not to be present. 
2) Are instruments related to combustion and emission control monitored at least every 15 minutes? _____ Yes, _____ No. If Yes: ______ the stack plume observed visually at least hourly for color/opacity? _____ Yes, _____ No, N/A. 
- is the incinerator or thermal process and associated equipment inspected daily for leakages and fugitive emissions? _____ Yes, _____ No, N/A. 
5) is all of the above information documented in the facility's operating record? _____ Yes, _____ No. 

N. Chemical, Physical and Biological Treatment (10.51.05.17)
1) Are all treatment processes or equipment in good condition, i.e., no signs of leakage, corrosion or any other deterioration? _____ Yes, _____ No. 
2) Are treatment processes or equipment with continuous inflow of hazardous waste equipped with a means to stop the inflow? (e.g., waste feed cutoff system or bypass system to a standby containment device) _____ Yes, _____ No. 

3) Are waste analyses performed or written documentation obtained before placing a substantially different hazardous waste into treatment processes or equipment? _____ Yes, _____ No. 
4) is this information recorded in the facility's operating record? _____ Yes, _____ No. 
5) Are daily inspections conducted for discharge control equipment (e.g., bypass systems, waste feed cutoff systems, drainage systems and pressure relief systems)? _____ Yes, _____ No. 
6) Is data gathered from monitoring equipment (e.g., pressure and temperature gauges) daily? _____ Yes, _____ No. 
7) Are construction materials of the treatment process or equipment and the immediate surrounding area inspected weekly for signs of leakage, corrosion or any other deterioration? _____ Yes, _____ No. 
6) Are the results of these inspections recorded in an inspection log or summary? _____ Yes, _____ No. 
9) Are ignitable or reactive wastes placed in a treatment process? _____ Yes, _____ No. If Yes: _______ are wastes treated, rendered, or mixed before or immediately after placement in the treatment process or equipment so that the resulting waste mixture or dissolution of material no longer meets the definition of ignitable or reactive wastes under Section 261.21 or 261.23 of the RCRA Regulations? _____ Are wastes treated in such a way that they are protected from any material or conditions which may cause the waste to ignite or react? 
10) Are incompatible wastes kept from being placed in the same treatment process or equipment? _____ Yes, _____ No. 

O. Permits Requirements (10.51.07)
1) Does the facility have a DHS permit for its activity? _____ Yes, _____ No. 
- If No, has the facility submitted an application for a DHS permit? _____ Yes, _____ No. 
2) List any special permit requirements that are not in full compliance. 

Comments:
**NOTIFICATION OF HAZARDOUS WASTE ACTIVITY**

Please place label in this space

---

**FOR OFFICIAL USE ONLY**

<table>
<thead>
<tr>
<th>Comments</th>
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<tbody>
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<td></td>
</tr>
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**INSTALLATION'S EPA I.D. NUMBER**

<table>
<thead>
<tr>
<th>Approved</th>
<th>Date Received</th>
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</thead>
<tbody>
<tr>
<td>8000039</td>
<td>05/05/81</td>
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</table>

**I. NAME OF INSTALLATION**

**NAVAL ORDNANCE STATION**

**II. INSTALLATION MAILING ADDRESS**

<table>
<thead>
<tr>
<th>STREET OR F.O. BOX</th>
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</thead>
<tbody>
<tr>
<td>ROUTE 210 MARYLAND</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>CITY OR TOWN</th>
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<th>ZIP CODE</th>
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<tbody>
<tr>
<td>INDIAN HEAD</td>
<td>MD</td>
<td>20640</td>
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**III. LOCATION OF INSTALLATION**

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</thead>
<tbody>
<tr>
<td>INDIAN HEAD</td>
<td>MD</td>
<td>20640</td>
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</tbody>
</table>

**IV. INSTALLATION CONTACT**

**NAME AND TITLE (last, first, & job title)**

<table>
<thead>
<tr>
<th>PHONE NO. (area code &amp; no.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>240-301-7434</td>
</tr>
</tbody>
</table>

**V. OWNERSHIP**

**US NAVY**

**A. NAME OF INSTALLATION'S LEGAL OWNER**

**VI. TYPE OF HAZARDOUS WASTE ACTIVITY**

<table>
<thead>
<tr>
<th>ENTER “X” IN THE APPROPRIATE BOX(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. GENERATION</strong></td>
</tr>
<tr>
<td><strong>B. TRANSPORTATION</strong></td>
</tr>
<tr>
<td><strong>C. TREAT/STORE/DISPOSE</strong></td>
</tr>
<tr>
<td><strong>D. UNDERGROUND INJECTION</strong></td>
</tr>
</tbody>
</table>

**VII. MODE OF TRANSPORTATION**

<table>
<thead>
<tr>
<th>TRANSPORTERS ONLY—ENTER “X” IN THE APPROPRIATE BOX(es)</th>
</tr>
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<tbody>
<tr>
<td><strong>A. AIR</strong></td>
</tr>
<tr>
<td><strong>B. RAIL</strong></td>
</tr>
<tr>
<td><strong>C. HIGHWAY</strong></td>
</tr>
<tr>
<td><strong>D. WATER</strong></td>
</tr>
<tr>
<td><strong>E. OTHER (SPECIFY)</strong></td>
</tr>
</tbody>
</table>

**VIII. FIRST OR SUBSEQUENT NOTIFICATION**

**A. FIRST NOTIFICATION**

**B. SUBSEQUENT NOTIFICATION (COMPLETE ITEM C)**

**IX. DESCRIPTION OF HAZARDOUS WASTES**

Please go to the reverse of this form and provide the requested information.

---

EPA Form 8720-12 (6-90)
IX. DESCRIPTION OF HAZARDOUS WASTES (continued from front)

A. HAZARDOUS WASTES FROM NON-SPECIFIC SOURCES. Enter the four-digit number from 40 CFR Part 261.31 for each listed hazardous waste from non-specific sources your installation handles. Use additional sheets if necessary.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
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<td>2</td>
<td>3</td>
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<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
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</tbody>
</table>

B. HAZARDOUS WASTES FROM SPECIFIC SOURCES. Enter the four-digit number from 40 CFR Part 261.32 for each listed hazardous waste from specific industrial sources your installation handles. Use additional sheets if necessary.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
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<tr>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
</tbody>
</table>

C. COMMERCIAL CHEMICAL PRODUCT HAZARDOUS WASTES. Enter the four-digit number from 40 CFR Part 261.33 for each chemical substance your installation handles which may be a hazardous waste. Use additional sheets if necessary.

<p>| | | | |</p>
<table>
<thead>
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<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
</tr>
</tbody>
</table>

D. LISTED INFECTIOUS WASTES. Enter the four-digit number from 40 CFR Part 261.34 for each listed hazardous waste from hospitals, veterinary hospitals, medical and research laboratories your installation handles. Use additional sheets if necessary.

<p>| | | | |</p>
<table>
<thead>
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<th></th>
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<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
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<tr>
<td>29</td>
<td>30</td>
<td>31</td>
<td>32</td>
</tr>
</tbody>
</table>

E. CHARACTERISTICS OF NON-LISTED HAZARDOUS WASTES. Mark "X" in the boxes corresponding to the characteristics of non-listed hazardous wastes your installation handles. (See 40 CFR Parts 261.21 – 261.24.)

- X1. IGNITABLE
- X2. CORROSIVE
- X3. REACTIVE
- X4. TOXIC

X. CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

SIGNATURE

FRED S. UNDERWOOD, CAPTAIN, USN

NAME & OFFICIAL TITLE (type or print)

NAVAL ORDNANCE STATION

DATE SIGNED

EPA Form 8700-12 (5-80) REVERSE

INDIAN HEAD, MD
I L.

POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any question, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no," if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

<table>
<thead>
<tr>
<th>SPECIFIC QUESTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARK &quot;X&quot; NO ATTACHED</td>
</tr>
</tbody>
</table>

A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S. (FORM 2A) YES NO ATTACHED X

B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation on a quorum animal production facility which results in a discharge to waters of the U.S. (FORM 2B) NO

C. Is this facility currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C) YES NO X

D. Is this facility (other than those described in A or B above) which results in a discharge to waters of the U.S. (FORM 2D) NO

E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3) YES NO X

F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4) YES NO X

G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface by conventional oil or natural gas production, fluid used for hydraulic fracturing, or storage of hazardous or toxic waste? (FORM 4) NO

H. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5) NO

III.

NAME OF FACILITY

NAVAL ORDNANCE STATION

IV.

FACILITY CONTACT

A. NAME & TITLE (last, first, & title)

B. PHONE (area code & no.)

V.

FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

B. CITY OR TOWN

C. STATE & ZIP CODE

VI.

FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

B. COUNTY NAME

C. CITY OR TOWN

D. STATE & ZIP CODE

E. COUNTY CODE

F. EPA Form 3610-1 (6-80)
Provides material and technical support for assigned weapons systems, weapons or components, and performs additional tasks as directed by the Naval Sea Systems Command. These tasks include research and development, engineering, production, and quality surveillance in the fields of weapons systems, propulsion, unconventional explosives, cartridge- and propellant-actuated devices and chemicals.
Additional NPDES Permits for Discharges to Surface Water

MD0020893
MD0020907
MD0020915
MD0020885
MD0025135

Cancelled due to remaining Septic Tank
II. FIRST OR REVISED APPLICATION

Please select "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application or you are submitting for your last application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter both above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date)

B. REVISED APPLICATION (place an "X" below and complete Item 1 above)

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided. If more are needed, enter the code(s) in the space provided. If less than 10 processes will be used, that is not included in the list of codes below, describe the process (including its design capacity) in the space provided on the form (Item III C).

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount in gallons or liters, cubic yards or cubic meters, tons, etc., as specified in column B below.

2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

UNIT OF MEASURE

GALLONS
LITERS
CUBIC YARDS
CUBIC METERS
GALLONS PER DAY
LITERS PER DAY
METERS CUBIC
METERS
GALLONS PER HOUR
LITERS PER HOUR

UNIT OF MEASURE

G
L
U

D. EXAMPLE FOR COMPLETING ITEM III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.
T04 Open Burning (Explosives Burning Area) Design Capacity - 9,000 lbs/day.
T04 Open Burning (Pyrotechnics Burning Area) Design Capacity 800 lbs/day.
T04 Open Burning (Decontamination Burning Area) Design Capacity 3,000 lbs/day.

**NOTE:**

The above figures are converted to Tons/hr on page 1 based on on 8 hr. day of burning the amounts mentioned above.

**V. DESCRIPTION OF HAZARDOUS WASTES**

1. **EPA HAZARDOUS WASTE NUMBER** — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

2. **ESTIMATED ANNUAL QUANTITY** — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed wastes that will be handled, which possess that characteristic or contaminant.

3. **UNIT OF MEASURE** — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate code are:

<table>
<thead>
<tr>
<th>ENGLISH UNIT OF MEASURE</th>
<th>CODE</th>
<th>METRIC UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>POUNDS</td>
<td>P</td>
<td>KILOGRAMS</td>
<td>K</td>
</tr>
<tr>
<td>TONS</td>
<td>T</td>
<td>METRIC TONS</td>
<td></td>
</tr>
</tbody>
</table>

If you enter any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account appropriate density or specific gravity of the waste.

**II. PROCESSES**

1. **PROCESS CODES:**

   a. For listed hazardous waste: For each listed hazardous waste entered in column A, select the code(s) from the list of process code(s) contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

   b. For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process code(s) contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter “000” in the extreme right box of Item IV (D)(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. **PROCESS DESCRIPTION:** If a code is not listed for a process that will be used, describe the process in the space provided on the form.

**III. HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER** — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.

2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.

3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

**SAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below)** — A facility will treat and dispose of an estimated 500 pounds per year of chrome sludges from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and they will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 800 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

<table>
<thead>
<tr>
<th>A. EPA HAZARD. WASTE NO. (enter code)</th>
<th>B. ESTIMATED ANNUAL QUANTITY OF WASTE</th>
<th>C. UNIT OF MEASURE (enter code)</th>
<th>D. PROCESSES</th>
</tr>
</thead>
<tbody>
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<td>P</td>
<td></td>
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<tr>
<td>40</td>
<td>800</td>
<td>P</td>
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*included with above*
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<tr>
<th>A. EPA Hazard Wasteno.</th>
<th>B. Estimated Annual Quantity of Waste</th>
<th>C. Unit of Measure (Enter Code)</th>
<th>1. Process Code (Enter)</th>
<th>2. Process Description (If a code is not entered in D(2))</th>
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<tbody>
<tr>
<td>U 001</td>
<td>461</td>
<td>T04</td>
<td>T04</td>
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<td>1,645</td>
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<tr>
<td>D 008</td>
<td>5</td>
<td>P04</td>
<td>T04</td>
<td>Open Burning</td>
</tr>
</tbody>
</table>

*Changed & Added as per 1/14/81 Letter 11/30/81 Phone Record.*
FACILITY DRAWING

II existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

II. PHOTOGRAPHS

II existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures, existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

II. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)  38°33'04.5"

LONGITUDE (degrees, minutes, & seconds)  77°12'00.3"

II. FACILITY OWNER

A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER

2. PHONE NO. (area code & no.)

3. STREET OR P.O. BOX

4. CITY OR TOWN

5. ST.

6. ZIP CODE

OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME (print or type)  Fred S. Underwood

B. SIGNATURE  [Signature]

C. DATE SIGNED  11/7/80

OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME (print or type)  Fred S. Underwood

B. SIGNATURE  [Signature]

C. DATE SIGNED  11/7/80
1. Pyrotechnics Burning Area
   Longitude 77° 12' 27" W  Latitude 38° 33' 50" N (Approx.)
   Area - 120,000 Sq. Ft.

2. Explosives Burning Area
   Longitude 77° 12' 3" W  Latitude 38° 33' 45" N (Approx.)
   Area - 48,000 Sq. Ft.

3. Decontamination Burning Area
   Longitude 77° 11' 48" W  Latitude 38° 33' 58" N (Approx.)
   Area - 40,000 Sq. Ft.

4. Sludge Disposal Site and Landfill Area
   Longitude 77° 10' 5" W  Latitude 38° 34' 8" N (Approx.)

SCALE: 1 INCH = 1,000 FEET
July 6, 1981

Mr. William Purvis, Director
Environmental Health Services
Box 777
La Plata, Maryland 20646

Dear Mr. Purvis:

I have reviewed the material you transmitted to Bill Chicca on June 19, 1981 concerning the open burning of waste munitions at the Naval Ordnance Station, Indian Head. As in the past, the final decision to issue an open burning permit rests with the county in which the activity will occur. Be advised that we have no problem with the burning as proposed, provided no nuisance condition will be created.

Enclosed is a copy of RCRA subpart 265.382 which was published in the Federal Register, May 19, 1980. You will note that the open burning of waste explosives is excluded from the regulation governing the open burning of hazardous wastes, provided distance requirements are met.

The Navy has recently withdrawn its permit to construct application for the process intended for use in the disposal of these wastes. As far as I am aware, they have made no additional plans at this time. In light of this, it is apparent that the open burning of these materials is the most safe and practical solution for the present time.

I trust this information is helpful to you in making your decision. If I can be of further service, feel free to contact me directly.

Yours truly,

Frank D. Whitehead, Head
Field Services Section
Air Management Administration
Re: Open Burning of Waste Munitions at the Naval Ordnance Station, Indian Head, Maryland

Dear Mr. Purvis:

This letter is a follow-up to the discussion of 16 April 1981 between Captain Fred S. Underwood, Commanding Officer, Naval Ordnance Station, Indian Head, Maryland (NAVORDSTA) and yourself concerning continued open burning of ordnance scrap material. In view of the difficulties encountered in the Station's attempts to develop a viable alternative, it is critical that the Station be allowed to continue the present practice of open burning utilizing current quantities until a practical alternative is found. Be aware that no near term alternatives appear viable.

NAVORDSTA currently disposes of waste munitions by open burning at three locations on station property. Enclosure (1) shows the location of each burning point. Enclosure (2) lists materials burned, quantities of each burned, where they are being burned, and the frequency of burning at each location.

State of Maryland Air Regulation 10. 18. 07. 03 states that the control officer may grant approval for open burning if the following conditions are met:

1.) No practical alternative to open burning exists;

2.) No hazardous, air pollution or nuisance condition will be created;

3.) Fire control laws or regulations of other government agencies will not be violated;

4.) Materials which produce dense smoke will not be burned;

5.) The material to be burned originates on the premises on which it is to be burned.

Open burning of munitions waste at the NAVORDSTA meets all of the above conditions.

Because of the nature of the waste, no safe alternative to open burning currently exists. The Environmental Protection Agency (EPA) has reflected its situation in Hazardous Waste Regulation 40 CFR 265.382, exempting the disposal of munitions waste from their ban on open burning of hazardous waste. Specifically, they state: "The Agency agrees that open burning and open detonation are currently the only alternatives for disposal of most munitions." Transportation of these wastes for disposal off-station is not practical.
As of this date, no hazardous or nuisance conditions have been proven to be created by the subject burning. A citizen complaint was registered against the NAVORDSTA in connection with the burning; however, after investigation by monitoring, no nuisance was substantiated and the complaint was dropped.

All burning of munitions waste is conducted in accordance with strict Department of Defense and NAVORDSTA safety regulations. Only munitions waste will be burned, and of that, all will be generated on-station.

In view of the above, it is requested that a permit be issued to continue open burning of munitions waste at the NAVORDSTA.

Please send your reply to the attention of Code 114 of this Command. If you require additional information, please contact Mr. Frank Peters of this Command at (202) 433-3761.

Sincerely,

R. Scott Markert
Manager/Environmental Branch
Maintenance/Utilities Division

Enclosures: (1) Location Map, NAVORDSTA
(2) Open Burning of Waste Munitions Data, NAVORDSTA
<table>
<thead>
<tr>
<th>Material Disposed of</th>
<th>Annual Weight Disposed of</th>
<th>Days/Week</th>
<th>Duration of Burn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrotechnics Burning Point:</td>
<td>25,000</td>
<td>Friday</td>
<td>15 min.</td>
</tr>
<tr>
<td>Pyrotechnics, squibs, ignitors, CAD/PAD's</td>
<td>25,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Propellant Burning Point:</td>
<td>832,300</td>
<td>Monday</td>
<td>30 min.</td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single and double based propellants:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrocellulose</td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Casting powder</td>
<td>120,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grain end trims and slabs</td>
<td>227,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shavings and chips from machining operations</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpet rolls</td>
<td>12,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrusion flashings</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrier booster &amp; sustainer grains</td>
<td>272,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite propellants and ingredients:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard ARM sustainer &amp; booster scrap (cured)</td>
<td>27,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard ARM propellant heels (uncured)</td>
<td>43,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standard ARM booster grains (rejects)</td>
<td>14,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 JATO scrap &amp; grains (cured)</td>
<td>7,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 JATO propellant heel (uncured)</td>
<td>8,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium perchlorate scrap</td>
<td>9,700</td>
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<td></td>
</tr>
<tr>
<td>CTBN (carboxyl-terminated polybutadiene nitrile)</td>
<td>3,000</td>
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</tr>
<tr>
<td>HMX and RDX</td>
<td>2,400</td>
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</tr>
<tr>
<td>BBNO (high bulk nitroguanidine)</td>
<td>500</td>
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<td></td>
</tr>
<tr>
<td>HTPB (hydroxyl-terminated polybutadiene)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powdered aluminum scrap</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorocarbon Propellants</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plastic Bonded Explosives</td>
<td>1,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammable Liquids (acetone, heptane, OTU fuel)</td>
<td>11,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nitrate Ester Slumps</td>
<td>69,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrusion Wax-out Material</td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decontamination Point:</td>
<td>517,000</td>
<td>Friday</td>
<td>4 hours</td>
</tr>
<tr>
<td>Contamination production material</td>
<td>17,000</td>
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<td></td>
</tr>
<tr>
<td>Explosive contaminated equipment</td>
<td>500,000</td>
<td></td>
<td></td>
</tr>
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</table>

Enclosure (2)
ATTACHMENT III
<table>
<thead>
<tr>
<th>NOTIFICATION ID NO.</th>
<th>SITE NAME</th>
<th>NOTIFIER STREET</th>
<th>NOTIFIER CITY</th>
<th>NOTIFIER ZIP</th>
<th>NOTIFIER STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HW/DOH/OH-CHAMBER ATION</th>
<th>CAPT, PHRM &amp; UNDERWRITTEN</th>
<th>RFC, 160</th>
<th>INDIAN HEAD</th>
<th>20640</th>
<th>PRES. OF PUBLIC HEALTH</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>OTHER (SEE COMMENTS)</th>
<th>OTHER WASTES</th>
<th>SOURCES OF WASTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANDFILL</td>
<td>PAINT SLUDGE</td>
<td></td>
</tr>
<tr>
<td>CONTAINERIZED PAINT SLUDGE</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SPRAY BOOTH</td>
<td>55 GALLON JUGS</td>
</tr>
</tbody>
</table>

WASTE AMOUNT: 1,100 GALLONS  AREA: 21,780 SQ FT  MAJ. PRESENT: NO  FORM TYPE: 8900-1
# Environmental Protection Agency

**NOTIS REPORT #4**

**NOTIFICATION**

- **SITE NAME**: Naval Ordnance Station
- **SITE STREET**: Indiantown Rd
- **SITE CITY**: Indian Head
- **SITE COUNTY**: St Mary's
- **EPA-SITE-ID NO.**: 210
- **CONTACT NAME/TITLE**: Captain Fred S. Underwood
- **CONTACT PHONE**: (301) 446-4814

**DATE OF WASTE HANDLING**: 1960 TO 1980

**WASTE AMOUNT**: 0

**ACRES**: 1.712

**MAP PRESENT**: Yes

**FORM TYPE**: 1900-1

**NOTIF.-PUBLISHED-DATE**: 81/06/11

**SIGNATURE PRESENT**: Yes

**DATE OF LAST UPDATE**: 81/09/09

**TYPE OF FACILITY**

**TYPES OF WASTES**

- Scrap Yard used to hold PCB
- Suspected Transformers
- This part of yard—not used today
- Building 1440 is used for storage
- PCB suspected transformers
- Transformers above-ground

**SOURCE OF WASTE**

**COMMENTS**

**SEQ NO.**

1. Scrap Yard used to hold PCB
2. Suspected Transformers
3. This part of yard—not used today
4. Building 1440 is used for storage
5. PCB suspected transformers
6. Transformers above-ground
ATTACHMENT IV
Cyclopentanone

**To Fight Fire:** Dry chemical, alcohol foam, water spray, mist.

**Cyclopentanone.** Syns: dumasin, ketocyclopentane. Liquid. C₅H₇O, mw: 84.1, mp: -58.2°C, bp: 130.6°C, flash p: 79°F, d: 0.9509 @ 20°C, vap. d: 2.3. Acute tox data: ip LD₅₀ (mouse) = 1950 mg/kg; thr = MOD via ip and probably oral and inhal routes also.

Fire Hazard: Dangerous, when exposed to flame; can react with oxidizing materials.

To Fight Fire: Alcohol foam, foam, CO₂, dry chemical.

**Cyclopentanone Oxime.** Solid. C₅H₁₀NOH, mw: 99.13, mp: 57.5°C.

 THR = U.

Fire Hazard: Slight.

**4H-Cyclopentadecaphenanthrene.** C₃₅H₁₉, mp: 190.3°C.

 THR = An exper care. [3]

**Cyclopenta(ede)pyrene.** C₁₃H₁₀, mw: 226.3.

 THR = An exper neo. [3]

**Cyclopentene.** Liquid. C₅H₈, mw: 68.1, mp: -93.3°C, bp: 44.242°C, fp: -135.2°C, flash p: -20°F, d: 0.77199 @ 20°C, vap. d: 3.5.

Acute tox data: Oral LD₅₀ (rat) = 2140 mg/kg; dermal LD₅₀ (rabbit) = 1810 mg/kg. [3]

THR = MOD via oral and inhal; MOD via dermal routes. Probably via inhal route too.

Fire Hazard: Dangerous, when exposed to flame or heat; can react with oxidizing materials.

Disaster Hazard: Dangerous. Keep away from heat and open flame.

To Fight Fire: Foam, CO₂, dry chemical.

**2-Cyclopentene-1-ol.** OHCHCH:CHCH₂CH₃, mw: 84.

Acute tox data: Oral LD₅₀ (rat) = 470 mg/kg; inhal LC₅₀ (rat) = 1000 ppm for 4 hrs; dermal LD₅₀ (rabbit) = 180 mg/kg. [3]

THR = HIGH via oral and inhal routes.

**1,2-Cyclopenteno-5,10-aceanthrene.** C₁₅H₁₄, mw: 244.4.

 THR = An exper neo. [3]

**3-(2-Cyclopentenyl)-2-methyl-4-oxo cyclopentenyl ester of chrysanthemum monocarboxylic acid.** Syn: cyclusperein. THR = See pyrethrin I.


THR = See bromides.

Fire Hazard: Mod, when exposed to heat or flame.

Disaster Hazard: Dangerous; can react with oxidizing materials.

**Cyclopentyl chloride.** Liquid. C₅H₇Cl, mw: 104.58, bp: 113.5°C, flash p: 60°F, d: 1.0024 @ 25°C, vap. d: 3.5.

THR = See chlorinated hydrocarbons, aliphatic and aromatic.

Fire Hazard: Dangerous; when exposed to heat or flame.

Explosion Hazard: U.

Disaster Hazard: Dangerous; can react with oxidizing materials.

**Cyclopentyl ether.** (C₅H₁₀)₂O, mw: 154.

Acute tox data: Oral LD₅₀ (rat) = 470 mg/kg; inhal LC₅₀ (rat) = 250 ppm for 4 hrs; dermal LD₅₀ (rabbit) = 1410 mg/kg. [3]

THR = HIGH via oral and inhal; MOD via dermal routes. See also ethers.

Disaster Hazard: U. See ethers.

**Cyclophosphamide.** See endoxan.

**Cyclopropane.** Syn: trimethylene. Colorless gas. CH₃=CH=CH₂, mw: 42.08, mp: -126.6°C, bp: -33.3°C, ld = 2.4%,uels = 10.4%, d: 1.879 g/l @ 0°C, autoinflammable temp.: 932°F.

THR = MOD via oral route. High cone have narcotic action. Used as a surgical anesthetic.

Fire Hazard: Very dangerous, when exposed to heat or flame; can react with oxidizing materials.

Spont Heating: No. Explosion Hazard: Mod, in the form of vapor when exposed to heat or flame.

Disaster Hazard: Dangerous. Keep away from heat and open flame.

To Fight Fire: Stop flow of gas. CO₂, dry chemical or water spray.

**Cyclopropyl ethyl ether.** Liquid. C₅H₁₀OC₂H₅, mw: 86.1.

THR = See ethers.

**Cyclopropyl methyl ether.** Syn: cyprormethylene. Liquid C₅H₇OCH₃, mw: 72.1, mp: 119°C, bp: 44.7°C, d: 0.786 @ 25°C, vap. d: 0.786.

THR = See ethers.

**Cyclopropyl propyl ether.** Liquid. C₅H₁₀OC₃H₇, mw: 100.2.

THR = See ethers.

**Cycloretetramethylene oxide.** See tetrahydrofuran.
(mouse) = 19 mg/kg; dermal LDLo (guinea pig) = 465 mg/kg. [J]

THR = HIGH via oral, dermal and iv routes. An exper
carc. [23] Cases of epileptiform convulsions
have been reported from exposure.

Fire Hazard: See nitrates.

Explosion Hazard: It is one of the most powerful high explosions in use today. See explosives, high. Has
more shattering power than TNT and is often mixed
with TNT as a bursting charge for aerial bombs,
mines and torpedoes. Because it is easily initiated by
mercury fulminate it may be used as a booster.

Disaster Hazard: See nitrates.

CYMENE. Syn: isopropyl toluene. Liquid.

CI,CH,CH(CH)2), mw: 134.21, mp: −68.2°, bp:
176°, lol = 0.7%, @ 100°, uc: 30–35, flash p: 117°F
(CC), d: 0.86, autoign. temp.: 817°F, vap. d: 4.62, vap.
press: 1 mm @ 17.3°, flash p: (technical) 127°F, uel
(technical) = 5.6%.

Acute tox data: Oral TDLo (humans) = 86 mg/kg
(affects the CNS), oral LDSo (rat) = 4750
mg/kg. [J]

THR = MOD via oral route, although humans sustain
CNS effects at low dose rates.

Fire Hazard: Mod, when exposed to heat, flame or
oxidizers.

Spont Heating: No.

Explosion Hazard: Slight, in the form of vapor.

Disaster Hazard: Mod dangerous; can react with
organic materials.

To fight: Foam, CO2, dry chemical.

YMOGENE. See liquefied petroleum gas.

YPRFX. See n-dodecyl guanidine acetate.

YPROMID.

Acute tox data: Oral LD50 (rat) = 215 mg/kg. [J]

THR = HIGH via oral and probably inhalal routes. An
herbicide.

CYPRONIC ETHER. See cyclopropyl methyl ether.

CYPROSTERONE ACETATE. C7H12O4Cl, mw: 417.

THR = An exper teratogen to rats. [J]

CYSTEINE. Syns: α-amino-β-thiolpropionic acid, β-
mercaptoalanine. An amino acid derived from cystine,
 occurring naturally in the L-form, which will be con-
sidered here. Colorless crystals, sol in water, amino
monium hydroxide and acetic acid, insol in ether,
acetone, benzene, carbon disulfide and carbon tetra-
chloride. HSCH2CH(NH2)COOH, mw: 121.

THR = U. Probably not toxic. A nutrient and/or
dietary supplement food additive. [109]

CYSTINE. Syn: β,β'-dthiobisalanine, di-α-amino-β-
thiolpropionic acid). The chief sulfur-containing
amino acid of protein. White crystalline plates, sol in
water, insol in alcohol. Occurs in dl, l and d form. We
consider the l and dl forms here.

HOCOCH(NH2)CH2SSHCH2CH(NH2)COOH, mw:

THR = U. Probably not toxic. A nutrient and/or
dietary supplement food additive. [109]

CYTARABINE. C9H12O3N5, mw: 243.3.

THR = An exper teratogen. [J]

CYTISUS. A wood dust.

THR = MILD IRR and allergen.

Fire Hazard: Mod, when exposed to heat or flame.

Disaster Hazard: Slight, when exposed to flame.

CYTOTASAN.

THR = An exper carc. [J]

CZA. See citrazinic acid.
AMMONIUM MAGNESIUM CHROMATE. Yellow crystals. \((\text{NH}_4)_2\text{Cr}_2\text{O}_7 \cdot \text{MgCr}_2\text{O}_7 \cdot 6\text{H}_2\text{O}\), mw: 400.5, mp: decomposed, d: 1.84.

**THR** = See Chromium compounds.

Fire Hazard: Mod, as a result of chemical reaction with reducing agents. An oxidizer.

uter Hazard: Mod dangerous; when heated, can explode.

AMMONIUM MOLYBDATE. Colorless or slightly greenish or yellowish crystals. \((\text{NH}_4)_6\text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}\), mw: 1236.0, mp: -120°, bp: decomposed, d: 2.398.

Acute tox data: Oral LD50 (rat) = 333 mg/kg. [3]

**THR** = HIGH via oral, inhalation routes. An irritant. No cases of human poisoning have been reported. Animal exper indicate relatively LOW systemic tox but MOD severe local irrit of skin, eyes and mucous membranes. Large doses have produced kidney damage in exper animals. See molybdenum compounds.

AMMONIUM MOLYBDENUM TELLURATE. Colorless crystals. \((\text{NH}_4)_6\text{TeMo}_6\text{O}_{24} \cdot 7\text{H}_2\text{O}\), mw: 1390.7, mp: 550° (decomp), d: 2.78.

**THR** = See tellurium compounds.

AMMONIUM MONOHYDROGEN ARSENATE. White crystals or powder. \((\text{NH}_4)_2\text{HAsO}_4\), mw: 176, mp: decomposed, d: 1.989.

**THR** = See arsenic compounds.

AMMONIUM MONOSULFIDE. See ammonium sulfide.

AMMONIUM NICKEL CHLORIDE. Green crystals. \(\text{NH}_4\text{Cl} \cdot \text{NiCl}_2 \cdot 6\text{H}_2\text{O}\), mw: 291.2, d: 1.654.

**THR** = See nickel compounds and chlorides.

AMMONIUM NICKEL SULFATE. Syn: double nickel salt. Black to green crystals. \((\text{NH}_4)_2\text{SO}_4 \cdot \text{NiSO}_4 \cdot 6\text{H}_2\text{O}\), mw: 395, d: 1.923.

**THR** = See nickel compounds and sulfates.

AMMONIUM NITRATE. Colorless crystals. \(\text{NH}_4\text{NO}_3\), mw: 80.05, mp: 169.6°, bp: 210° @ 11 mm, d: 1.725 @ 25°.

**THR** = LOW via irritant, allergen. There have been reports of faintness and low blood pressure in workers exposed. These symptoms could be due to nitrates present as impurities. See also nitrates.

Fire Hazard: See nitrates; can ignite when mixed with acetic acid. [19]

To Fight Fire: Use water in large amounts. It is important that the mass of materials be kept cool and that burning be extinguished promptly. Ventilate well.

Explosion Hazard: May explode under confinement and high temperatures. Explosions have occurred in ships’ holds, etc. There have been warehouse fires that did not detonate. See also nitrates. This material explodes more readily if contaminated, and must be kept cool and unconfined. Can react violently or explode when mixed with powdered metals, \((\text{NH}_4\text{Cl} + \text{heat}), (\text{C} + \text{heat})\), chlorides, organic matter, \(\text{P} + (\text{NH}_4\text{HSO}_4)\), \(\text{NaOCl}, \text{NaClO}_3, (\text{NaK} + (\text{NH}_4\text{HSO}_4))\), S. [19] See also explosives, high.

Disaster Hazard: Dangerous; heat and confinement may explode it; when heated to decompose, emits highly toxic fumes of oxides of nitrogen; can react vigorously with reducing materials.

AMMONIUM NITRATE, FERTILIZER. See ammonium nitrate.

AMMONIUM NITRIDE OSMATE. \(\text{NH}_4\text{OsNO}_5\), mw: 270.3.

**THR** = Explodes @ 150°. [19] See also osmium.

AMMONIUM NITRITE. White to yellow crystals. \(\text{NH}_4\text{NO}_2\), mw: 64, mp: explodes @ 60°-70°, bp: sublimes at 30° in vacuo, d: 1.69.

**THR** = See nitrates.

Fire Hazard: See nitrates.

Explosion Hazard: Severe, when shocked or exposed to heat.

Disaster Hazard: See nitrates.

AMMONIUM OXALATE. Colorless crystals. \((\text{NH}_4)_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}\), mw: 142.12, mp: decomposed, d: 1.50.

**THR** = See oxalates. Can react violently with \((\text{NaOCl} + \text{ammonium acetate})\). [19]

AMMONIUM PENTABORATE. Syn: ammonium decaborate. White solid. \(\text{NH}_4\text{B}_5\text{O}_9\cdot 4\text{H}_2\text{O}\), mw: 272.20.

**THR** = See boron compounds.

AMMONIUM PERCHLORATE. White crystals. \(\text{NH}_4\text{ClO}_4\), mw: 117.50, mp: decomposed, d: 1.95.

**THR** = See perchlorates.

Fire Hazard: MOD, when exposed to heat or flame or by spont chemical reaction with reducing materials. A very powerful oxidizer. Ignores violently with combustibles.

Explosion Hazard: Severe, decomposed @ 130° and explodes @ 380°. When contaminated by powdered carbon, ferrocene, S, organic matter, powdered metals it becomes impact sensitive. [19] See also perchlorates.

Disaster Hazard: See perchlorates and explosives, high.

AMMONIUM PERCHROMATE. See ammonium peroxychromate.

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For Countermeasure Information and Abbreviations see the Directory at the Beginning of this Section.
THR = Details U. See iodine, ammonia.

Explosion Hazard: Severe. This material is extremely unstable when dry. The slightest shock or heat will cause it to decompose explosively. It should be kept moist.

Disaster Hazard: Dangerous; on decom, emits highly toxic fumes of iodine and ammonia.

NITROGEN TRIOXIDE. Syn: NO₃. Bluish gas. NO₃, mw: 62.01, mp: decomps slightly at ordinary temp.

THR = See nitric oxide. Even a trace can cause PHi to self-ignite. [9]

NITROGEN TRIOXYFLUORIDE. See fluorine nitrate.

NITROGLYCYerin. Syns: glycerol trinitrate, blasting off, soupe. Colorless to yellow liquid, sweet taste. C₃H₅(ONO₂), mw: 227.09, mp: 13°, bp: explodes @ 218°, d: 1.601, vap. press: 1 mm @ 127°, vap. d: 7.84, autoign. temp.: 518°F.

Acute tox data: Oral LD₅₀ (rat) = 80 mg/kg; iv LD₅₀ (rabbit) = 40 mg/kg; im LD₅₀ (rabbit) = 450 mg/kg; sc LD₅₀ (cat) = 150 mg/kg. [9]

THR = HIGH via oral, iv, im and sc routes. The symptoms of nitroglycerin poisoning are headaches and reduced blood pressure, excitement, vertigo, fainting, respiratory rales and cyanosis. If this material is taken internally, it causes respiratory difficulties and death due to respiratory paralysis. Severe poisoning often manifests itself at first by confusion, pugnaciousness, hallucinations, and maniacal manifestations. The most common complaint is headache which is noted upon commencing work but soon passes off. A break in the work interrupts this acclimatization and workers sometimes resort to the device of moistening their hat bands with nitroglycerin when they are off the job so as to maintain this effect during absence from their occupation. Furthermore it can be absorbed through uninjured skin and may produce eruptions on the palms and intradigital spaces of the hands. In normal manufacture and use of dynamite, the physiological effects of nitroglycerine cause only temporary discomfort and are not injurious to health.

Fire Hazard: Dangerous, when exposed to heat or flame.

Spont Heating: No.

Explosion Hazard: Severe, when shocked or exposed to Oₓ, heat or flame. Nitroglycerine is a powerful explosive, very sensitive to mechanical shock. Small quantities of it can readily be detonated by a hammer blow on a hard surface, particularly when it has been absorbed in filter paper. Frozen nitroglycerine is somewhat less sensitive than the liquid.

However, a half or partially thawed out mixture is more sensitive than either one. See also explosives, high and dynamites.

Disaster Hazard: Highly dangerous; shock, heat and flame will explode it, and toxic fumes evolve on decom.

NITROGLYCerin, LIQUID, DESENSITIZED. See nitroglycerin.

NITROGLYCerin, SPIRITS OF. See nitroglycerine.

NITROGUANidINE. Yellow solid, high explosives, H₂N=C(NH)NH₂, mw: 104.1, mp: 246°.

Acute tox data: Oral LD₅₀ (rat) = 500 mg/kg. [103, 3]

THR = HIGH via oral route. See also nitroglycerine.

Fire Hazard: Dangerous, when exposed to heat, or by chemical reaction with oxidizers.

Explosion Hazard: Severe, when shocked or exposed to heat or flame. Nitroguanidine is known as a flashless or cool explosive. It is about as powerful as TNT and is normally used mixed with cellulose nitrate in which form it yields a propel powder which gives no flash from the muzzle gun, thus serving as a great advantage to the operator. It has also been used mixed with ammonium nitrate and paraffin wax as a trench mortar munition.

Disaster Hazard: Dangerous; shock will explode when heated to decom, emits highly toxic fumes can react vigorously with oxidizing materials.

3-NITRO-3-HExENe. CH₃C(CH₃)CH₂ONO₂, mw: 129.2.

Acute tox data: Oral LD₅₀ (rat) = 420 mg/kg; iv LD₅₀ (rat) = 80 mg/kg; dermal LD₅₀ (rab) = 940 mg/kg, [103, 3]

THR = HIGH via ip and MOD via oral and der routes. An exper noted to mice via inhal route.

Disaster Hazard: Dangerous; see nitrates, organic.

2-NITRO-2-HExANe.

Acute tox data: Oral LD₅₀ (rat) = 420 mg/kg; iv LD₅₀ (rat) = 120 mg/kg; dermal LD₅₀ (rab) = 1400 mg/kg, [3]

THR = HIGH via ip and MOD via oral and der routes.

4-NITRO-6-Hexylquinoline-1-oxide.

THR = An exper carcin. [23]

NITROHYDRENE. An oil. Composition: nitroglycerine + nitrosucrose.

THR = U. See nitroglycerine.

Fire Hazard: Dangerous, when exposed to heat, flame or by chemical reaction.

Explosion Hazard: Severe, when shocked or exp...
SULFURETTED HYDROGEN. See hydrogen sulfide.

SULFUR HEXAFLUORIDE. Colorless gas. SF₆, mw: 146.06, mp: −51° (sublimes @ −64°), vap. d: 6.602, d(liquid): 1.67 @ −100°.

THR = HIGH irri by inhal route and to skin, eyes and mucosa.

Disaster Hazard: Dangerous, when heated to decomposition emits highly toxic fumes of SO₂; can react with reducing materials.

To Fight Fire: CO₂, dry chemical.

SULFURIC ACID. Syns: oil of vitriol, dipping acid.

Colorless, oily liquid. H₂SO₄, mw: 98.08, mp: 10.4°, bp: 338°, d: 1.834, vap. press. 1 mm @ 145.8°.

Acute tox data: Oral LD₅₀ (rat) = 176.11 mg/kg. [3]

THR = MOD via oral route. Extremely irri., corrosive, and poisonous. In high conc. can cause an inflammation of the upper respiratory tract and the bronchi. It may cause edema of the lungs or glottis, and can produce respiratory paralysis. Conc. of <1 ppm are believed to be injurious to plant foliage.

This material is so irri. that it provides its own warning of toxic conc. 400–500 ppm is immediately dangerous to life and 50–100 ppm is considered to be the maximum permissible conc. for exposures of 30–60 min. Excessive exposures to high enough conc. of this material can be fatal. Its toxicity is comparable to that of hydrogen chloride. However, less than fatal conc. can be borne for fair periods of time with no apparent permanent damage. It is used as a fumigant, insecticide and fungicide, and as a chemical preservative for food and preserves. [109] It is a common air contaminant. It reacts violently with acrolein, Al, CaCl₂, CaO, chlorates, CIF₃, Cr, FeO, Fe₃, Mn, KClO₃, KClO₄, MnO₂, Na, Na₂CO₃, SnO₂, lithium acetylene carbide, diammonia. [19]

Disaster Hazard: Dangerous; will react with water or steam to produce toxic and corrosive fumes.

Treatment and Antidotes: Personnel who have shown toxicity symptoms when exposed to this material should immediately be removed to fresh air. If the eyes are involved they should be irrigated with copious quantities of warm water. If the symptoms persist, call a physician.

SULFURETTED HYDROGEN. See hydrogen sulfide.

SULFUR FLOUR. See sulfur.

SULFUR FLUORIDE. Syn: sulfur monofluoride. Colorless gas. SF₃, mw: 102.12, mp: −104.5°, bp: −99°; d(liquid): 1.5 @ −100°.

THR = LOW irri via oral route. May be detected by the average individual passing in a dilute fog of <1 ppm of SF₃.

Disaster Hazard: Dangerous; when heated to decomposition emits highly toxic fumes of SF₆; can react with reducing materials.

To Fight Fire: CO₂, dry chemical.

SULFUR HEXAFLUORIDE. Colorless gas. SF₆, mw: 146.06, mp: −51° (sublimes @ −64°), vap. d: 6.602, d(liquid): 1.67 @ −100°.

THR = HIGH irri by inhal route and to skin, eyes and mucosa.

Disaster Hazard: Dangerous; when heated to decomposition emits highly toxic fumes of SO₂; can react with reducing materials.

To Fight Fire: CO₂, dry chemical.
acute fire hazards and easily oxidized materials. Ammonium nitrate must not be confined, because if a fire should start, confinement can cause detonation with extremely violent results. Also reacts violently with Al, BP, cyanides, esters, PN₁H, P, NaCN, SnCl₂, sodium hypophosphate, thiourea, and azodicarbonamide. [12]

Disaster Hazard: Dangerous, due to fire and explosion hazard. On decomposing, they emit toxic fumes. They are powerful oxidizing agents which cause violent reaction with reducing materials. Nitrates should be protected carefully, as discussed in detail in Section 7.

NITRATINE. See sodium nitrate.

NITRATING (MIXED) ACID. See nitric acid and sulfuric acid.

NITRE. See potassium nitrate.


THR = VERY HIGH in to skin, eyes and mucous mem. Can affect the teeth. It destroys tissue, causes upper respiratory irritations which may seem to clear up only to return in a few hours and more severely. [88] The exact composition of the "fumes" or vapor produced by nitric acid depends upon such factors as temp., humidity and whether or not the acid comes in contact with other materials, such as heavy metals or organic compounds. Depending upon these factors, the vapor will consist of a mixture of the various oxides of nitrogen and of nitric acid vapor. Nitric acid vapor is high irrit to the skin and respiratory tract and to the skin. It is corrosive to the teeth. Because of its irrit properties, chronic exposure to dangerous cone of the acid vapor seldom occur.

Fire Hazard: Mod, by chemical reaction with reducing agents. It is a powerful oxidizing agent. Explosion Hazard: Reacts violently with acetic acid, acetic anhydride, (acetone + acetic acid), (acetone + H₂SO₄), acetylene, acrolein, acrylonitrile, allyl alcohol, allyl chloride, 2-amino ethanol, NH₃, NH₂OH, aniline, anion exchange resins, (dichromate + anion exchange resins), Sb, AsH₃, Bi, B, boron decahydride, BP, BrF₃, n-butylaldehyde, Ca hypophosphate, C, Cs₂C₅, 4-Chloro-2-nitroaniline, CIF₃, chlorosulfonic acid, cresol, cumene, Cu₂N₂, CuN₃, cyanides, cyclic ketones, cyclohexanol, cyclohexanone, diborane, 2,6-di-tert-butyl phenol, diisopropyl ether, epichlorohydrin, ethanol, m-ethyl-aniline, ethylene diamine, ethylene imine, S-ethyl-2-methyl pyridine, 5-ethyl-2-picoline, C₆H₅NH₂, FeO, NiO, fumigual alcohol, G, glyoxal, hydrazine, HI, H₂O₂, H₂Se, H₃, H₂Te, (indane + H₂SO₄), isoprene, (ketones + H₂O), (lactic acid + H₂O), Li₂Si₄, Mg, Mg₂P₂, Mg₂Ti alloy, Mn, m- mesityl oxide, 2-methyl-5-ethyl pyridine, 4-methylcyclohexane, Nd, Nitrobenzene, oleum, t matter, PH₃, PH₃, P, P₂, PCl₃, phthalic, phthalic anhydride, K₂HPO₄, β-propionacrylonitrile, pyrene oxide, pyridine, RB₃C₅, Se, selenium, plusphide, (Ag + ethanol), Na, Na₂S, NH₂, NH₃, SbH₃, sulfamic acid, (H₂SO₄ + glycercides), penes, B₃H₆, thiocyanates, thiophene, Ti, 11Ti-Mg alloy, (H₂SO₄ + Cs₂H₂CH₃), toluidine, Zn, uns-dimethyl hydrazine, U, U-Nd alloy, Zr alloy, vinylacetate, vinylidene chloride, Zr-U alloys. [19]

Disaster Hazard: Dangerous, when heated to decomposes, it emits highly toxic fumes of NO₃ and hydrogen nitrate; will react with water or steam to produce heat and toxic and corrosive fumes.

To Fight Fire: Water.

NITRIC ACID, ANHYDROUS.

See nitric acid, fuming.

NITRIC ACID, FUMING WHITE. Syn: nitric acid, hydrous. Colorless to yellow to red corrosive liquid. HNO₃ + N₂O₅, d: > 1.480.

Acute tox data: Inhal LC₅₀ (rat) = 65 ppm for 4 hrs. [3]

THR = VERY HIGH in to skin, eyes and mucous mem. A corrosive poison.

Fire Hazard: Dangerous, very powerful oxidizing agent.

Explosion Hazard: Mod; can react explosively with many reducing agents.

Disaster Hazard: Dangerous; when heated to decomposes, it emits highly toxic fumes of NO₂; will react with water or steam to produce heat and toxic and flammable vapors.

NITRIC ACID, FUMING WHITE. Syn: nitric acid, hydrous. Colorless to yellow to red corrosive liquid. HNO₃ + N₂O₅, d: > 1.480.

Acute tox data: Inhal LC₅₀ (rat) = 244 ppm for 30 min. [3]

THR = VERY HIGH in to skin, eyes and mucous mem. A corrosive poison.

NITRIC ANHYDRIDE. See nitrogen pentoxide.

NITRIC ETHER. See ethyl nitrate.

NITRIC OXIDE. Syn: NO₃. Colorless gas, blue fumes and solid. NO, mw: 30.01, mp: -161°C, bp: 15°C, d: 1.3402 g/liter, liquid: 1.269 @ -150°C.

Acute tox data: Inhal LD₅₀ (mouse) = 320 ppm for 30 min. [3]

THR = VERY HIGH in to skin, eyes and mucous mem. A corrosive poison.
TRICHLOROETHYLENE. Syns: ethinyl trichloride, ethylene trichloride. Stable, colorless, heavy, mobile liquid, chloroform-like odor. CHCICl₂, mw: 131.40, mp: –73°, bp: 87.1°, fp: –68.8°, d: 1.45560 @ 25°/4°, autoign. temp.: 788°F; vap. press: 100 mm @ 32°, ν₂: 4.53, flash p: none, lel = 12.5%, uel = 90%.

Tox data: Oral LD₅₀ (human) = 857 mg/kg; 83 ppm for 83 min → human CNS effects; 110 ppm for 8 hrs → inhal human irr effects; oral LD₅₀ (rat) = 4920 mg/kg; ip LD₅₀ (dog) = 1900 mg/kg; iv LD₅₀ (dog) = 150 mg/kg. [J]

THR = HIGH via iv; MOD via ip, inhal, oral routes. An exper (S) care. [3, 13] Inhal of high conc causes narcosis and anesthesia. A form of addiction has been observed in exposed workers. Prolonged inhal of mod conc causes headache and drowsiness. Fatalities following severe, acute exposure have been attributed to ventricular fibrillation resulting in cardiac failure. There is damage to liver and other organs from chronic exposure. Cases have been reported but are of questionable validity. Determination of the metabolites trichloracetic acid and trichloroethanol in urine reflects the absorption of trichloroethylene. A food additive permitted in food for human consumption. [109] A common air contaminant.

Fire Hazard: Low, when exposed to heat or flame. High conc of trichloroethylene vapor in high-temp. can be made to burn mildly if piled with a strong. Though such a condition is difficult to produce, flames or areas should not be used in closed equipment which contains any solvent residue or vapor. Can react violently with Al, Ba, N₂O₅, Li, Mg, liquid O₂, O₂, KOH, KNO₃, Na, NaOH, TL. [19]

Spont Heating: No.

Disaster Hazard: Dangerous; see chlorides.

TRICHLOROETHYL SILANE. C₃H₃SiCl₃, mw: 163.5.

TIIR = Reacts violently with water. [19]


TIIR = See fluorides, germanium compounds and chlorides.

1,1,1-TRICHLOROFLUOROETHANE. C₃H₂ClF, mw: 151.4.

THR = No data. See fluorides. Violent reaction with Ra. [19]

TRICHLOROFUOROMETHANE. See fluorotrichl methane.
Fire Hazard: Slight, when exposed to heat or flame.
Disaster Hazard: Mod dangerous, when heated to denopm, emits toxic fumes; can react with oxidizing materials.
To Fight Fire: Foam, CO₂, dry chemical.

LAUROYL QUINALDINUM BROMIDE. U. See also bromides.
Fire Hazard: U.
Disaster Hazard: Dangerous. See bromides.

LAUROYL QUINOLINIUM CHLORIDE. U. A fungicide.
Fire Hazard: U.
Disaster Hazard: Dangerous. See chlorides.

LAUROYL THIOCYANATE. CH₃(CH₂)₆CH₂SCN, mw: 227.3, mp: 70°C, d: 1.25
Acute tox data: Oral LD₅₀ (rat) = 1250 mg/kg, Oral LD₅₀ (mouse) = 100 mg/kg, Oral LD₅₀ (rabbit) = 125 mg/kg. [3]
THR = HIGH via oral routes. See also lead acetas. A poison.

Acute tox data: ip LD₅₀ (rat) = 204 mg/kg; iv LD₅₀ (rat) = 120 mg/kg. [3]

LEAD ACETATE, BASIC. White powder. Pb₂(OH(C₂H₃O₂)), mw: 608.6. THR = An exper (+) care. [3, 9] See also lead acetate. A poison.

LEAD ACETATE (III) TRIHYDRATE.
THR = An exper (+) care. [3, 9] See also lead acetate.

LEAD ANTIMONATE. Syns: naples yellow, antimony yellow. Orange yellow powder. Pb₂(SbO₃), mw: 993.2
THR = See lead and antimony compounds.

Acute tox data: Oral LD₅₀ (human) = 14 mg/kg; oral LD₅₀ (rat) = 100 mg/kg. [3]
THR = HIGH via oral routes. See also lead and arsenic compounds. A poison. An exper care. [3, 9]
Disaster Hazard: Dangerous; on heating, emits highly toxic fumes.

LEAD ARSENITES. See lead arsenates.


LEAD ARSENITE. See lead arsenite.

LEAD ARSENITE. See lead arsenite.

Fire Hazard: U.
Explosion Hazard: Severe, when shocked or exposed to heat or flame. Explodes at 250°C. Violent reaction with brass, calcium stearate. CS₂, Ca, Zn. [19] Disaster Hazard: Highly dangerous; shock and heat
CHLORINATED DIPHENYL (AROCLOR 1221).

Acute tox data: Oral LD₅₀ (rat) = 3980 mg/kg; dermal LD₅₀ (rabbit) = 3169 mg/kg. [3]

THR = MOD via oral and dermal routes. An exper (+)/carc. [1, 3]

For Countermeasure Information and Abbreviations see the Directory at the Beginning of this Section.
CHLORINATED DIPHENYL (ACROCL 1232).
Acute tox data: Oral LD_{50} (rat) = 4470 mg/kg; dermal LD_{50} (rabbit) = 2000 mg/kg. [3]
THR = MOD via oral and dermal routes. An exper (+) carc. [1, 3]

CHLORINATED DIPHENYL (ACROCL 1242).
Acute tox data: Oral LD_{50} (rat) = 4250 mg/kg; inhal TCL\_ (humans) = 10 mg/m\(^3\) -> irr; dermal LD_{50} (rabbit) = 794 mg/kg. [3]
THR = MOD via oral, inhal and dermal routes. An exper (+) carc. [1, 3]

CHLORINATED DIPHENYL (ACROCL 1248).
Acute tox data: Oral LD_{50} (rat) = 11000 mg/kg; dermal LD_{50} (rabbit) = 1269 mg/kg. [3]
THR = MOD via dermal and LOW via oral routes.

CHLORINATED DIPHENYL (ACROCL 1254).
Acute tox data: Oral LD_{50} (rat) = 1315 mg/kg; dermal LD_{50} (rabbit) = 2000 mg/kg. [3]
THR = MOD via oral and dermal routes. An exper (+) carc. [1, 3]

CHLORINATED DIPHENYL (ACROCL 1262).
Acute tox data: Oral LD_{50} (rat) = 11300 mg/kg; dermal LD_{50} (rabbit) = 3160 mg/kg. [3]
THR = MOD via dermal and LOW via oral routes.

CHLORINATED DIPHENYL (ACROCL 1268).
Acute tox data: Oral LD_{50} (rat) = 19090 mg/kg; dermal LD_{50} (rabbit) = 2500 mg/kg. [3]
THR = MOD via dermal and LOW via oral routes.

CHLORINATED DIPHENYL (ACROCL 2565).
Acute tox data: Oral LD_{50} (rat) = 6310 mg/kg; dermal LD_{50} (rabbit) = 3160 mg/kg. [3]
THR = MOD via oral and dermal routes. An exper (+) carc. [1, 3]

CHLORINATED DIPHENYL (ACROCL 4465).
Acute tox data: Oral LD_{50} (rat) = 1600 mg/kg; dermal LD_{50} (rabbit) = 3160 mg/kg. [3]
THR = MOD via dermal and LOW via oral routes.

CHLORINATED DIPHENYL (KANECLOR 300).
THR = An exper (S) carc via oral route. [1, 3]

CHLORINATED DIPHENYL (KANECLOR 400).
THR = An exper (S) carc via oral route. [1, 3]

For Countermeasure Information and Abbreviations see the Directory at the Beginning of this Section.
Soil Survey Map of the N.O.S. Station
Courtesy of Soil Survey of Charles Co., MD
U.S. Department of Agriculture
Soil Conservation Service
Issued July 1974
Gravel and Borrow Pits

Gravel and borrow pits (Gp) consist of excavations from which gravel and other materials have been or are being removed. These materials are used mainly for road fill or for other kinds of construction. Most pits are exploited for gravel, others for sand, and still others for both gravel and sand. In some pits soil material is removed. The total area of these pits is increasing. Possible uses of these pits must be determined after onsite investigation. Capability unit VIIe-1; woodland subclass 3a.

Gravelly Land

Gravelly land, steep, (Gw) consists of gravelly deposits of soil material. Some of these represent areas that may have once been profiles of the Aura and Groom soils, but if so the profiles have been so severely eroded that they cannot be identified. Other areas are mostly relatively unaltered deposits of gravelly materials that have some similarity to the underlying material of various soils in the county.

The gravel content of this mapping unit ranges from about 20 to 50 percent, by volume. Most of the gravel is quartz pebbles that are smooth, rounded to subangular, and mostly less than 2 inches in diameter. Slopes range from about 15 to 50 percent.

Gravelly land is not suitable for crops or for grazing. Many areas are idle or in woodland. It is best suited to woodland, watershed protection, wildlife habitat, and a

source of gravel. Capability unit VIIe-2; woodland class 4f.

Iuka Series

The Iuka series consists of nearly level to gently undulating alluvial deposits. These soils formed in reworked alluvium that was washed mainly in the uplands in the county. Where these soils occur, they are subject to flooding from streams. They are good low-water for short periods. The native vegetation includes wetland hardwoods.

In a representative profile, the surface layer is about 8 inches thick. It is dark yellowish-brown fine sandy loam in the upper part and is yellowish-brown fine sandy loam in the lower part. The upper part of the subsoil, about 10 inches thick, is pale-brown fine sandy loam, about 8 inches thick, that is more brown or dark brown. Below this layer, 6 inches, is gray or light-gray fine sandy loam tinged with yellowish-brown in places.

Iuka soils are easy to work at a favorable moisture capacity. They have a high water table late in spring, and are slowly to very slowly to warm. Seasonal wetness, impeded and the hazard of flooding are moderate to severe on these soils for nearly all purposes. They have an available moisture capacity. Permeability on the moderate to moderately slow.

Representative profile of Iuka fine sandy loam, cultivated area on the flood plain of Port Tobacco River about 21/2 miles northwest of La Plata:

Ap--0 to 9 inches, dark yellowish-brown (10YR 4/4) loam; weak, medium, granular structure; many roots; medium acid (limed); clear, smooth boundary.

A1--9 to 18 inches, yellowish-brown (10YR 5/4) loam; weak, medium, granular structure; friable, sticky; many roots; medium acid; clear, smooth boundary.

C1--18 to 28 inches, pale-brown (10YR 5/3) loam; weak, medium, granular structure; friable, sticky; many roots; medium acid; clear, smooth boundary.

C2g--28 to 36 inches, grayish-brown (2.5Y 6/2) light clay loam, fine, distinct mottles of light gray (10YR 7/2) brown, 10YR-2/2; medium, very slightly sticky; a few roots; very smooth, abrupt, smooth boundary.

C3g--36 to 42 inches, gray (5Y 6/1), variagated with (5Y 6/1) fine sandy loam; medium, distinct mottles of yellow (10YR 5/6); magnetic; very friable; extreme.

Iuka soils do not have a B horizon. The C horizons differ from the C1 in having less than 2 inches of gravel, and in having a horizon of fine sandy loam the matrix color is 2.5Y in hue, 2 to 3 in value, and 3 to 6 in chroma. The C2 horizon is medium, 10YR 2/2; medium, very slightly sticky; a few roots; very smooth, abrupt, smooth boundary.

Gravels of Iuka fine sandy loam are used for road fill, gravel, and other materials have been or are being removed. These materials are used mainly for road fill or for other kinds of construction. Most pits are exploited for gravel, others for sand, and still others for both gravel and sand. Some gravel pits are being used for road fill or for other purposes. Capability unit VIIe-1; woodland subclass 3a.
are present. Included in mapping are areas where the exposed subsoil is not so dense and hard as described in the representative profile. Even under very good management, crops are seldom grown. Woodland improvement is competitive, and will provide important watersheds protection. Capability unit IV-e; woodland subclass 4d.

Cut and Fill Land

Cut and fill land (Co) consists, in part, of land areas where the soil has been cut away by grading and similar operations. Most of the remaining areas generally are filled with soil and other materials to a depth of many feet, but others are filled only to a depth of 1 or 2 feet. Included in mapping are small areas where the fill is garbage or other solid wastes. Also included are a few shopping plazas and other paved areas.

Cut and fill land is never farmed. Where used, it is chiefly for commercial or residential purposes. It is so variable in nature that the suitability of any area for a specific use must be determined by onsite investigation. Capability unit and woodland subclass not assigned.

Elkton Series

The Elkton series consists of nearly level, poorly drained soils in areas bordering major rivers and on higher upland flats. These soils have a fine subsoil that is slowly permeable to very slowly permeable. They formed in old deposits of very clayey marine and alluvial sediment. The native vegetation is wetland hardwoods, mainly red or swamp maple, willow oak, and birch. In other areas are star, loblolly and other pines.

I representative profile the surface layer, about 6 inch...nick, is gray silt loam. The upper part of the subsoil, about 6 inches thick, is light-gray, friable heavy silt loam mottled with pale brown and yellowish brown. The lower part of the subsoil, about 28 inches, is gray or light-gray silty clay that is firm, sticky and plastic and mottled with brighter colors. The underlying material, to a depth of about 70 inches, is light-gray, mottled fine sandy loam. If cultivated, Elkton soils must be worked when the moisture content is favorable. When dry, these soils are rough and hard and when wet, they do not support heavy machinery. These soils have high available moisture capacity. They have a high water table and are wet for long periods. Permeability in these soils generally is slow, but it is slow to very slow in the lower part of the subsoil. Artificial drainage is necessary if these soils are farmed. Poor drainage and the high water table are severe limitations for most nonfarm uses.

Representative profile of Elkton silt loam, in a level re-haired area about 1½ miles west of Riverside:

| Ap  | 0 to 6 inches, gray (5Y 5/1) silt loam; very weak, fine, granular structure; friable, slightly sticky; many roots; extremely acid; abrupt, smooth boundary. |
| Big | 0 to 12 inches, light-gray (7.5Y 7/1) heavy silt loam; common, medium, distinct mottles of pale brown (10YR 6/3) and a few fine, prominent mottles of yellowish brown (10YR 5/3); weak, fine, granular structure; friable, sticky and slightly plastic; a few roots; extremely acid; clear, very weak boundary. |
| Bk  | 12 to 21 inches, gray or light-gray (5Y 6/1) silty clay; common, medium, prominent mottles of brownish yellow (10YR 6/6); moderate, coarse, blocky structure; very firm, plastic and sticky; a few roots; distinct, almost continuous, gray (5Y 6/1) clay films; very strongly acid; gradual, smooth boundary. |

Elkton silt loam (Sk)—This is the only Elkton soil mapped in the county. Included in mapping are small areas where the surface layer has a little more sand or clay and is more sticky than that of this soil. Also included are scattered small areas where the surface layer, to a depth of about 4 inches, is very dark gray or black. If this soil is artificially drained, it is well suited to corn and soybeans. It is not suitable for tobacco. Most undrained areas are wooded. Capability unit III-w; woodland subclass 5w.

Eroded Land

This land type is represented by one mapping unit, Eroded land, steep (Sr). It consists of steep areas that have been so severely eroded that the soil profile largely has been destroyed. Slopes range from about 15 to more than 40 percent. Adjacent soils commonly are of the Sassafras and Westphalia series, but included with this unit in mapping are areas of Woodstown, Beltsville, Bourne, Exum, Wickham, Marr, Keyport, Mattapeak, Mattapeak, and Chillum soils. In most places the surface layer and the subsoil have been lost, have been severely gullied, or both. In some places, soil has been left between the gullies. These gullies, however, are either very close together or very deep, or both.

This unit is not suitable for crops or grazing. Many areas are in woodland that has been regenerated on what was once open cropland or pasture. Erosion caused by runoff on this land results in damage to surrounding areas. The soil lost from this land can clog ditches and drainageways and cause silting-in of ponds or other bodies of water. Keeping the areas of this land under a cover of protective vegetation helps to control erosion. The vegetation should be so selected that it will cover the ground well and retard the movement of water. The following cover crops are recommended:

- Alfalfa
- Rye grass
- Timothy
- Red clover
- White clover
- Peas
- Vetches
- Mustard
- Buckwheat
- Buckwheat
- Winter rye
- Winter wheat
- Winter rye
Hazardous Waste Site

NAME/LOCATION: US Naval Propellant Plant (Indian Head)

ADDRESS: Indian Head, MD Charles Co.

NPDES #: SIC 3439 LAT. 38 33 45 LONG. 77 12 03

The contamination potential is

LOW MODERATE HIGH

THE CONTAMINATION POTENTIAL IS

VERY HIGH

NO. OF SITES 1 AGE ___ LINER ___ THICKNESS ___ AREA ___

UNSATURATED ZONE 9H-B WATER QUALITY 5-B GROUND WATER AVAILABILITY 5-A-B

HAZARD OF CONTAMINANT 8-A TOTAL GROUND WATER CONTAMINATION POTENTIAL 27

ENDANGERMENT TO CURRENT WATER SUPPLIES 8-B-C MONITORING WELLS 0

FREQUENCY OF MONITORING ___ SIGNIFICANT CHANGES IN GROUND WATER ___

ADVERSELY ___

REMARKS:

Reference: "Ground-water Aquifers and Mineral Commodities of Maryland"

The site is underlain by the Aquia Greensand, which consist of moderately glauconitic quartz sand with a few clay layers. The water table is near the surface and the saturated thickness in approximately 70 feet.

Ground water is expected to flow in the direction of the Potomac River. Generally, the water quality is very good.

The hazard of contaminant is based on the waste identification number, 2103, Heavy Metals.

There do not appear to be any surface impoundments or injection wells in the area. The population which relies on groundwater, within 3 miles, is less than 1,000.

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Date: January 6, 1982