

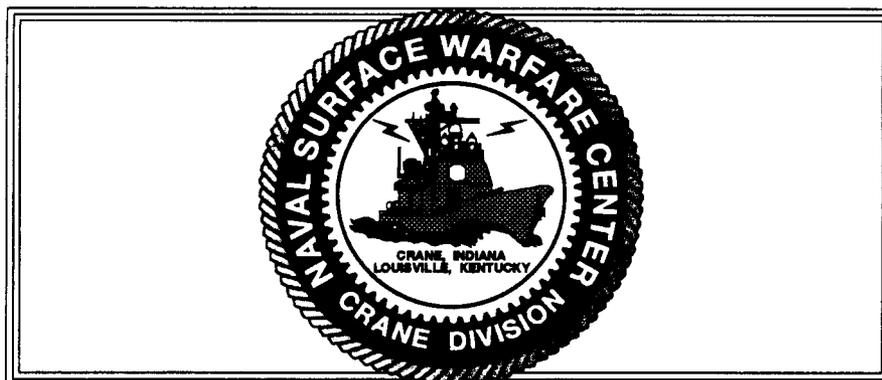


ENERGETICS CROSS SERVICE ANALYSIS

NAVAL SURFACE WARFARE CENTER

CRANE DIVISION

CRANE, INDIANA SITE



I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print)

Signature

Title

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

Dr. Ira M. Blatstein
NAME (Please type or print)

Ira M Blatstein
Signature

Technical Director
Title

10/20/94
Date

Title

Naval Surface Warfare Center
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

E. S. MCGINLEY, II
NAME (Please type or print)

[Signature]
Signature

(ACTING) COMMANDER
Title

10/20/94
Date

Title

NAVAL SEA SYSTEMS COMMAND

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

**DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)**

W. A. EARNER
NAME (Please type or print)

W Earner
Signature

Title

10/27/94
Date

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
DATA CALL #12 AMENDMENT ONE - ENERGETICS
BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

In accordance with policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in the BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

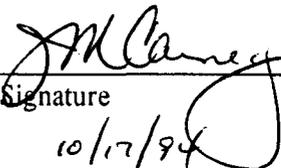
The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon, a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purpose of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to the package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

J. M. CARNEY
NAME (Please type or print)


Signature
10/17/94
Date

COMMANDER
Title

CRANE DIVISION, NSWC
Activity

1. This information is provided in response to the Base Structure Evaluation Committee Memorandum of 7 October 94.

RESPONSE TO: ENERGETICS CROSS SERVICE ANALYSIS

FROM: NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
CRANE, INDIANA SITE

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ATTACHMENT A MAPS OF ENERGETICS TECHNICAL CAPABILITY	
ATTACHMENT B INSTALLATION MAPS OF FACILITIES UTILIZED FOR ENERGETICS	

CAAA is designated as a Specified Mission Facility (SMF) with production capabilities in pyrotechnic production, Navy gun ammunition, bombs and propellant charges in support of production for all services. This designation is linked to the Army's Ammo Fast-21 facility strategy which is designed to **maintain a minimum essential industrial base and preserve the critical skills, capabilities and processes** that are necessary for readiness and contingency national emergency purposes.

CAAA is also designated as a Tier 1 Depot for munitions and energetics storage and distribution. As a Tier 1 Depot, CAAA provides routine and special purpose training munitions support as well as required short notice ordnance support to first strike forces of all services and pre-position ships, as well as war reserve munitions support during and beyond the first 30 days of multi-regional contingency support operations.

4. Program Manager Conventional Ammunition - The Program Manager for Conventional Ammunition (PMCA) is located at NSWC Crane. Conventional Ammunition includes surface and subsurface pyrotechnics, gun ammunition (small arms through 16 inch), demolition material and special warfare munitions. The PMCA program is summarized in Table 1 and includes: acquisition of munitions (annual effort of 100 commodities valued at 125-150 million dollars); funding and oversight of all engineering support efforts (approximately nine Navy engineering activities); and surveillance and maintenance of the Navy munitions inventory (approximately 1300 differently configured items valued at over 1.5 billion dollars).

5. **Interrelationship to CAAA and PMCA** - Crane Division is a **unique** Navy Activity in that Program Management (2T Cog) and engineering functions are co-located with a major ammunition producer, the Crane Army Ammunition Activity (CAAA). These co-located functions provide a synergism and efficiency for overall ammunition management. As a general example, Chart #2 depicts the life-cycle relationship of CAAA with the Navy Pyrotechnics TC to meet the requirements of a few flare programs. Other specific examples are that co-location provides:

- rapid response to engineering/production requirements throughout the life cycle under sudden emergency conditions of a major conflict such as Operation Desert Shield/Desert Storm.

- assists in developing specifications and data packages to allow the Single Manager for Conventional Ammunition to procure the devices and assists in introducing the devices into the Fleet by preparing technical and ordnance loading manuals.

- a close interaction between the development and production support engineers which provides the Navy with the ability to critically review and examine the items being developed and produced in the private sector.

- for Small Arms requirements to be more efficiently accomplished because of the availability of: facilities like environmental test and the ordnance test range; personnel expertise of the in-service engineering agent for small arms ammunition; and the CAAA magazines for ammunition storage, test support, and environmental support.

**CONVENTIONAL AMMUNITION PROGRAM OFFICE (PM4)
(2T COG) INTERFACE**

DESIGN AGENTS

ACTIVITY	COMMODITY
CRANE	PYROTECHNIC/DEMOLITION DEVICES, SMALL ARMS, LANDING PARTY AMMUNITION
DAHLGREN	CIWS, MEDIUM CALIBER, MAJOR CALIBER, FUZES
INDIAN HEAD	PROPELLANT, PROPELLING CHARGES, CADS/PADS
EOD TECHNICAL CENTER	EOD ITEMS
WPNSTA EARLE	PHS&T
YORKTOWN	EXPLOSIVES

ACQUISITION AGENTS

ACTIVITY	COMMODITY
CRANE	ALL AMMUNITION
INDIAN HEAD	CADS/PADS

IN-SERVICE AGENTS

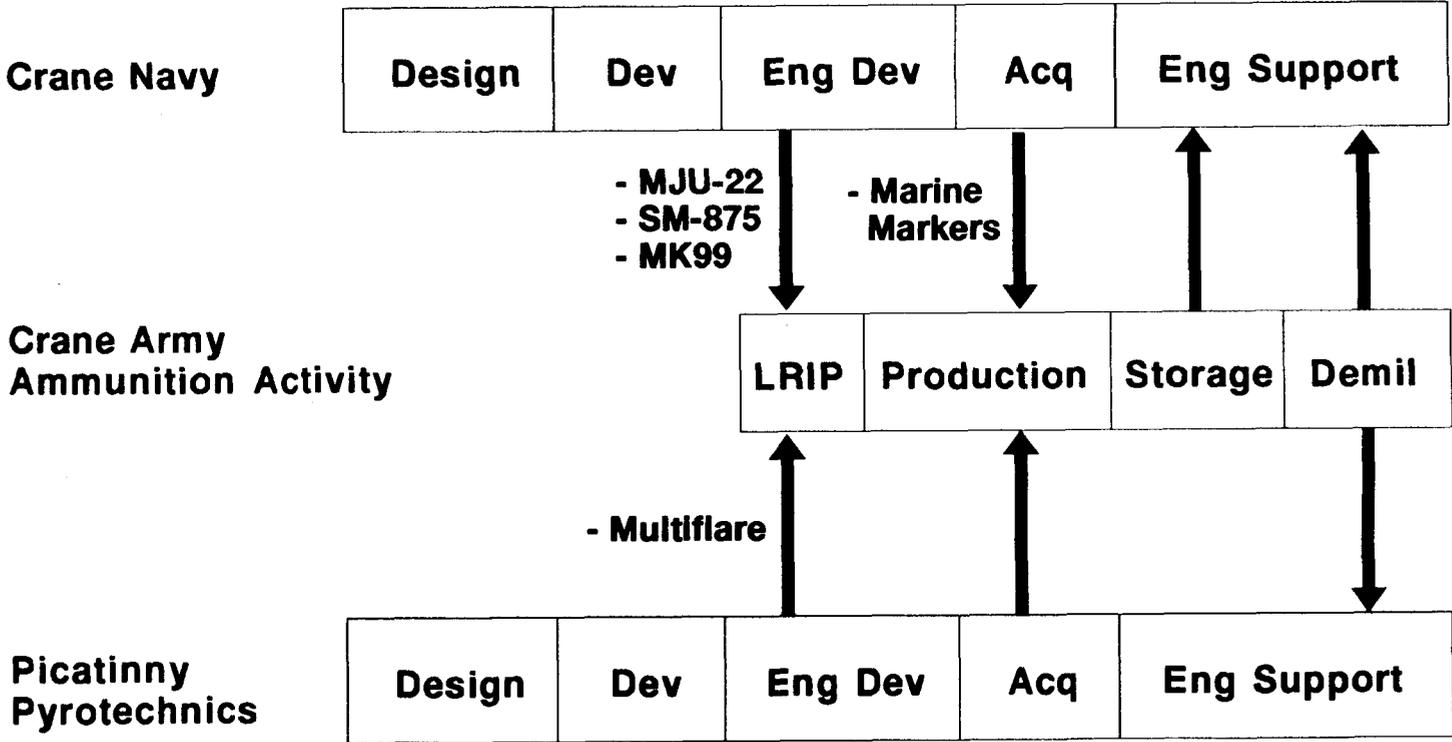
ACTIVITY	COMMODITY
CRANE	ALL AMMUNITION
INDIAN HEAD	CADS/PADS

OTHER ENGINEERING AGENTS

ACTIVITY	COMMODITY	FUNCTION
CRANE	DEMIL/DISPOSAL	TECHNICAL AGENT
WPNSTA CONCORD	ALL AMMUNITION	QUALITY/NDT
NOC IM-SD (SPCC)	ALL AMMUNITION	INVENTORY MNGT/MIPRS
DAHLGREN	ALL AMMUNITION	SYSTEMS INTEGRATION
NWAD CORONA	ALL AMMUNITION	GAGES

TABLE 1

NAVY/ARMY ACTIVITY LINK



1. ORGANIZATION CHARTS

A. **CRANE INSTALLATION** - As reported in BRAC95 Datacall #1, our mission is to provide responsive engineering and industrial base support for weapons systems, subsystems and components. On Crane's **nearly 100 square mile** property, we have combined skilled people, unique and capable facilities, product knowledge, and the ability to integrate engineering with "hands on" industrial processes to provide the broadest, deepest and most advanced industrial base capability in the Navy.

The top level Crane organization is depicted in Chart #1 and the Directorates involved in energetics are highlighted. Also highlighted are the significant tenant and program management functions, the Crane Army Ammunition Activity (CAAA) and the Program Manager for Conventional Ammunition (PMCA), which are co-located on the Crane installation.

B. **BACKGROUND** - In order to follow the information presented in this response, it is important to understand that Crane is managed and described in terms of Technical Capabilities (TC's). These are also shown on Chart #1. The Pyrotechnics, Conventional Ammunition Engineering and Small Arms TC's have **energetics** workload and are the focus of this data response.

1. **Technical Capabilities** - The Crane mission is accomplished by means of the unique synergy created by the interweaving of co-located facilities and people experienced in electronic and ordnance disciplines. The principal areas of expertise are managed and described in terms of the following twelve TC's.

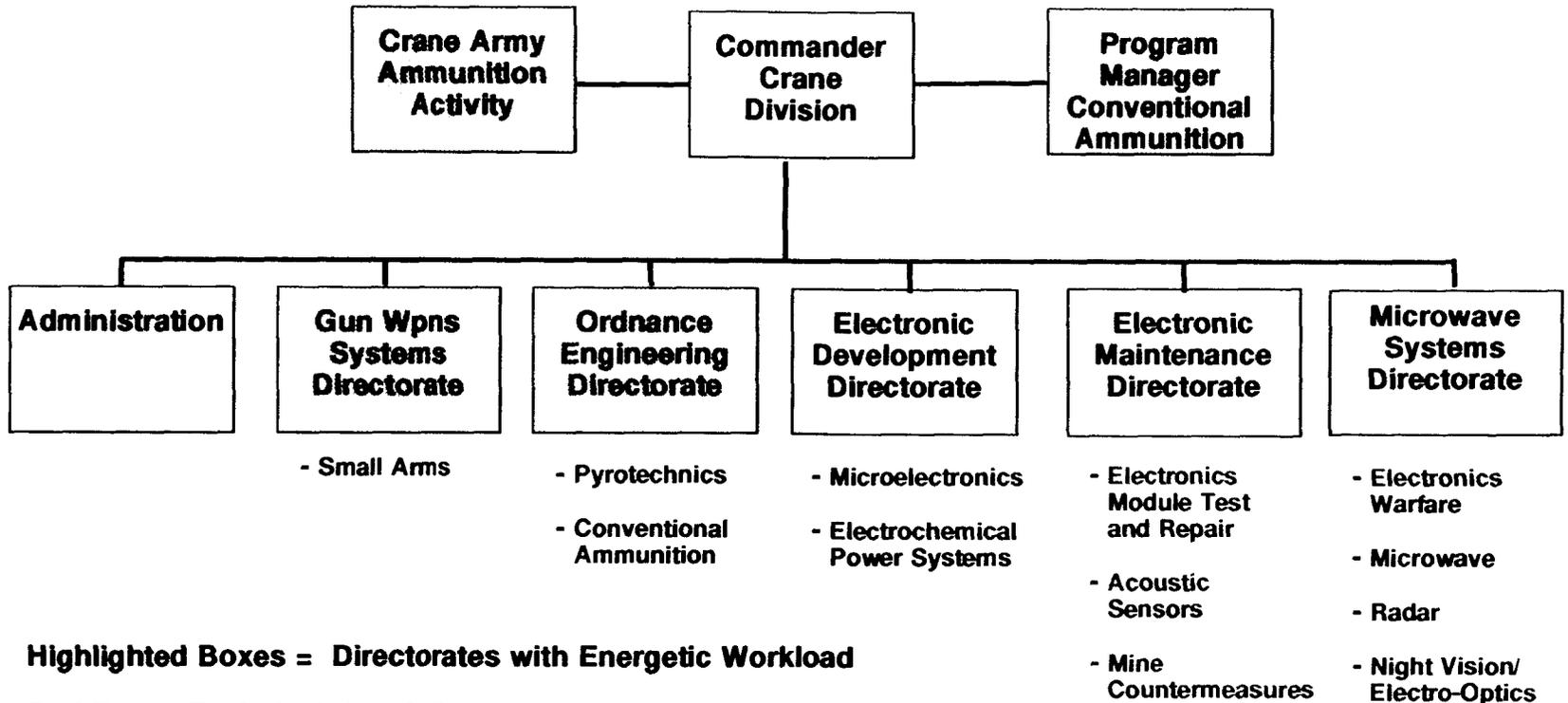
ENERGETICS TC's

- **PYROTECHNICS**
- **CONVENTIONAL AMMUNITION ENGINEERING**
- **SMALL ARMS**

ELECTRONICS TC's

- ELECTRONIC WARFARE
- MICROELECTRONIC TECHNOLOGY
- ELECTRONIC MODULE TEST AND REPAIR
- MICROWAVE COMPONENTS
- ELECTROCHEMICAL POWER SYSTEMS
- ACOUSTIC SENSORS
- NIGHT VISION/ELECTRO-OPTICS
- MINE COUNTERMEASURES
- RADAR

INSTALLATION ORGANIZATION ENERGETICS HIGHLIGHTED



2. **Installation Land Use Map** (Map A) - The diverse electronic and energetic operations at the installation have resulted in management and segregation of the Crane property into distinct areas. The Land Use Map provided in this section identifies ten functional areas of land use co-located at the Crane site. They are:

- Ordnance Engineering, Test, Evaluation, and Development;
- Inert Ordnance Engineering and Maintenance;
- Ordnance Pilot Production;
- Ordnance Full Scale Production;
- Explosive Storage;
- Inert Storage;
- Ordnance Laboratory;
- Ordnance Disposal;
- Small Arms Engineering, Development, Test and Evaluation; and
- Electronic Engineering, Development, Test, Evaluation, and Maintenance functions.

1.B. ORGANIZATIONAL RELATIONSHIPS. The following paragraphs describe the TC's involved in energetics, the CAAA and PMCA activities, and their relationship to each other.

1. **Conventional Ammunition Engineering and Pyrotechnics TC's** -

All of the work within the Conventional Ammunition Engineering and Pyrotechnics TC's is classified as energetics. The Crane Division provides total life-cycle support and is the Navy's **recognized expert** in pyrotechnics and in the production and engineering support of surface ship ammunition. These co-located functions, which support surface ship, air launcher and Marine Corps ammunition, provide a synergism and efficiency for overall ammunition management. These TC's are the Naval Sea Systems Command Design Agent for Pyrotechnics and Demolition Devices.

2. **Small Arms TC** - Energetics comprises 26.8 workyears, or 23%, of the 114.8 workyears in the Small Arms TC. This TC, organized within the Gun Weapon Systems Directorate at Crane Division, is the Naval Sea Systems Command Design Agent for small arms ammunition (up to 20mm), mortar ammunition, shoulder fired unguided ordnance, cartridge grenades, hand grenades, and land mines.

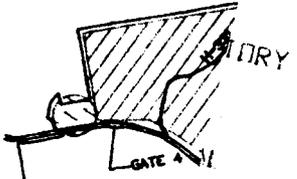
3. The **Crane Army Ammunition Activity (CAAA)** is a Joint Service Command which provides ordnance related support (munitions and energetics) to the armed services in several major functional areas under the mission guidance and control of the US AMCCOM. US AMCCOM is the DOD designated Executive Agent and Single Manager for Conventional Ammunition (SMCA).

...RING, TEST
DEVELOPMENT
ENGINEERING

RODUCTION

CALE

GE



ENGINEERING, TEST
EVALUATION

FARE ENGINEERING
TEST EVALUATION

WARFARE CENTER
INDIANA

MAP A
PAGE 4

2. DETAILED INFORMATION

2.A. FY 93 WORKEARS

2.A.1. The following Table 1 is the total direct workyears at the Crane Site for FY 93.

CRANE SITE TOTAL DIRECT WORKYEARS					
JOB CATEGORY	GOVT WKYRS	FFROC ON-SITE	FFRDC OFF-SITE	CONTRACT ON-SITE	CONTRACT OFF-SITE
S&T	151.6	0.0	0.0	67.4	17.7
Engineering Development	157.1	0.0	0.0	52.4	17.7
Production	102.3	0.0	0.0	14.9	5.1
In-Service Engineering	685.7	0.0	0.0	209.6	50.7
Other:					
Acquisition	1098.0	0.0	0.0	202.1	48.2
Maintenance & Repair	853.2	0.0	0.0	134.6	35.4
Test	19.3	0.0	0.0	0.0	0.0
Life Time Support	216.1	0.0	0.0	67.4	77.7
Training/Operational Support	4.3	0.0	0.0	0.0	0.0
TOTAL	3287.6	0.0	0.0	748.4	252.5

TABLE 1

Of the total direct workyears portrayed in Table 1, 80% of the work is performed on electronics products in the following areas: Electronic Warfare, Microelectronic Technology, Electronic Module Test and Repair, Microwave Components, Electrochemical Power Systems, Acoustic Sensors, Night Vision/Electro-Optics, Mine Countermeasures and Radar. Energetics comprises 17% of the direct workyears, which includes Pyrotechnics, Conventional Ammunition, and Small Arms Energetics workload; the remaining Small Arms workload represents 3%.

2.A.2. The total direct workyears for the Pyrotechnics Technical Capability are shown in Table 2 below.

PYROTECHNICS DIRECT WORKYEARS					
JOB CATEGORY	GOVT WKYRS	FFRDC ON-SITE	FFRDC OFF-SITE	CONTRACT ON-SITE	CONTRACT OFF-SITE
S&T	13.1	0.0	0.0	0.0	2.0
Engineering Development	20.4	0.0	0.0	0.0	8.0
Production	0.0	0.0	0.0	0.0	0.0
In-Service Engineering	9.4	0.0	0.0	0.0	0.5
Other:					
Acquisition	69.3	0.0	0.0	4.0	13.5
Life Time Support	0.0	0.0	0.0	0.0	0.0
TOTAL	112.2	0.0	0.0	4.0	24.0

TABLE 2

2.A.3. FY 93 workyears for the Conventional Ammunition Technical Capability are shown in the following Table 3.

CONVENTIONAL AMMUNITION DIRECT WORKYEARS					
JOB CATEGORY	GOVT WKYRS	FFRDC ON-SITE	FFRDC OFF-SITE	CONTRACT ON-SITE	CONTRACT OFF-SITE
S&T	1.0	0.0	0.0	0.0	0.0
Engineering Development	16.7	0.0	0.0	2.0	0.6
Production	0.0	0.0	0.0	0.0	0.0
In-Service Engineering	124.6	0.0	0.0	12.5	4.2
Other:					
Acquisition	193.4	0.0	0.0	22.6	7.0
Life Time Support	108.7	0.0	0.0	14.5	77.7
TOTAL	444.4	0.0	0.0	51.6	89.5

TABLE 3

2.A.4. FY 93 workyears for energetics portion of the Small Arms Technical Capability is shown in the following Table 4.

SMALL ARMS AMMUNITION DIRECT WORKYEARS					
JOB CATEGORY	GOVT WKYRS	FFRDC ON-SITE	FFRDC OFF-SITE	CONTRACT ON-SITE	CONTRACT OFF-SITE
S&T	2.3	0.0	0.0	0.0	0.0
Engineering Development	12.7	0.0	0.0	0.0	0.0
Production	11.8	0.0	0.0	2.0	0.0
TOTAL	26.8	0.0	0.0	2.0	0.0

TABLE 4

2.B. OCCUPIED SPACE BY CATEGORY

2.B.1. There is nearly 11 million square feet of government-owned building space on the Crane property. Table 5 is a summary of the total space by category.

CRANE SITE OCCUPIED SPACE

BUILDING TYPE	CATEGORY CODE	TOTAL (KSF)
Operational & Training	100	106.8
Maintenance & Production	200	2,362.2
RDT&E	300	12.9
Supply Facilities	400	7,742.5
Hospital & other Medical	500	15.5
Administrative Facilities	600	213.4
Housing & Community	700	332.2
Utilities & Grounds	800	<u>77.8</u>
TOTAL		10,865.7

TABLE 5

2.B.2 Pyrotechnics and Conventional Ammunition.

The Pyrotechnics and Conventional Ammunition Engineering product lines currently occupy 72 buildings with a total area of 349,000 square feet and valued at over \$69 million. There are another 93 structures used for explosive storage and 10 for inert storage. Tables 6 through 11 provide detailed information for the number of square feet of space for the ENERGETIC OPERATIONS at Crane. Table 12 shows the total size and the current plant value for these structures.

FACILITY ASSET INFORMATION
 FOR ENERGETIC OPERATIONS AT
 CRANE DIVISION, NAVAL SURFACE WARFARE CENTER
 OCTOBER 1994

ENGINEERING OFFICE SPACE

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
108	10,167	704
115	2,858	2,221
143	8,743	5,873
180	2,971	1,262
2521	1,296	8,238
2524	18,400	3,489
2540	29,483	3,189
2807	620	110
2932	3,776	59
2935	3,548	207
3031	23,976	750
3212	5,150	183
3217	3,500	196
TOTAL	114,488	TOTAL 26,481

TABLE 6

ORDNANCE LABORATORY SPACE

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
2707	9,062	809
2947	2,275	209
TOTAL	11,337	TOTAL 1,018

TABLE 7

ORDNANCE TEST AND EVALUATION SPACE

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
34	900	3,957
100	403	33
109	10,167	573
142	18,179	1,790
143	14,553	5,873
190	2,478	466
363	10,167	780
364	10,661	562
365	10,167	556
366	10,167	628
1441	2,106	120
2084	10,167	503
2125	378	68
2390	5,356	222
2507	1,889	749
2508	1,889	177
2510	1,391	345
2521	4,825	8,238
2547	783	441
2551	117	33
2670	324	71
2797	960	34
2805	19,714	2,537
2806	1,024	143
2807	619	110
2837	144	51
2869	1,733	346
2870	486	80
2888	144	16
2898	1,588	181
2911	1,928	235
2921	5,933	574
2923	960	91
2925	126	21
2945	960	47
2951	2,040	160
2963	960	31
2964	7,744	632
2986	1,040	115
2987	6,087	1,020
2989	140	12
2995	1,040	283
3007	2,048	64
3054	2,048	221
3087	900	369
3108	460	42
3115	2,120	147

ORDNANCE TEST AND EVALUATION SPACE - CONTINUED

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
3165	768	36
3176	256	9
3223	3,000	194
3227	5,000	166
3233	672	124
3254	840	190
3255	1,748	700
3256	961	370
3259	5,000	220
TOTAL	198,258	TOTAL 35,756

TABLE 8

ORDNANCE PILOT PRODUCTION SPACE

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
198	24,686	6,123
TOTAL	24,686	TOTAL 6,123

TABLE 9

EXPLOSIVE STORAGE SPACE

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
99	403	33
299	5,356	312
438	5,356	312
557	5,356	312
583	10,167	427
611	2,106	119
612	2,106	117
621	573	42
623	573	40
625	573	39
627	573	39
629	573	40
630	573	40
633	573	39
634	573	40
638	573	40
641	573	39
645	573	40
653	573	40
660	573	39
664	2,106	109
682	2,106	109
683	2,106	109
684	2,106	109
685	2,106	109
856	1,886	231
857	2,106	110
864	2,106	109
881	2,106	109
921	1,886	229
943	2,106	109
964	2,106	109
973	2,106	109
1019	2,106	110
1029	2,106	110
1041	2,106	110
1043	2,106	109
1044	2,106	109
1045	2,106	109
1140	2,106	109
1144	2,106	109
1150	2,106	109
1162	573	39
1163	573	39
1172	573	37
1184	573	37
1185	573	37

EXPLOSIVE STORAGE SPACE-CONTINUED

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
1192	573	37
1193	573	37
1195	573	37
1350	2,106	109
1356	2,106	109
1421	2,106	109
1750	2,106	104
1752	2,106	104
1759	2,106	104
1964	611	42
1965	611	42
1967	611	42
1974	611	42
1983	611	53
1984	611	62
2202	5,356	312
2208	5,356	312
2210	5,356	312
2265	5,356	312
2266	5,356	312
2370	5,356	222
2379	5,356	222
2380	5,356	222
2381	5,356	222
2382	5,356	235
2383	5,356	222
2384	5,356	222
2385	5,356	222
2386	5,356	222
2389	5,356	222
2407	5,356	222
2412	5,356	222
2414	5,356	222
2415	5,356	222
2417	5,356	222
2418	5,356	222
2419	5,356	222
3071	45	20
3075	45	15
3076	45	15
3077	45	15
3078	45	18
3079	45	18
3080	45	18
3081	45	18
3082	45	12
TOTAL	223,314	TOTAL 11,511

TABLE 10

INERT STORAGE SPACE

<u>BUILDING NO.</u>	<u>FUNCTIONAL AREA (SF)</u>	<u>CURRENT PLANT VALUE (\$000)</u>
185	178	12
186	178	12
472	7,625	427
2082	10,167	300
2509	178	13
2663	63	19
2849	144	7
2897	1,156	25
3107	1,000	23
3109	441	42
TOTAL	21,130	TOTAL 880

TABLE 11

<u>FACILITY TYPE</u>	<u># BUILDINGS</u>	<u>SQ FT</u>	<u>VALUE (\$K)</u>
ENGINEERING OFFICE	13	114,488	26,481
LABORATORY	2	11,337	1,018
ORDNANCE PILOT PRODUCTION	1	24,686	6,123
ORDNANCE T&E	56	198,258	35,756
EXPLOSIVE STORAGE	93	223,314	11,511
INERT STORAGE	10	21,130	880
TOTAL	175	593,213	81,769

TABLE 12

2.C. FY 93 FUNDS

2.C.1. Table 13 below lists the total FY 93 funds by customer for the Crane Site of the Naval Surface Warfare Center, Crane Division.

CRANE SITE TOTAL FY 93 FUNDS (\$K)	
CUSTOMER	FUNDS
NAVSEA	\$255,777
NAVAIR	\$41,612
SPO	\$20,433
SPC	\$10,463
SPW	\$4,107
FAC	\$819
CCA	\$435
CCP	\$290
ARMY	\$29,408
USMC	\$27,287
NUWC	\$152
DOD	\$2,779
OTHER GOVT	\$3,894
OTHER	\$1,756
OTHER NAVY	\$74,617
NSWC	\$15,604
NAWC	\$3,016
DAF	\$8,408
TOTAL	\$500,857

TABLE 13

The main Crane Site programs (Product Areas and Product Area Elements) are:

Surface Ship Combat Systems

- Air & Surface Surveillance and Detection Systems
- Combat Control Systems
- Engagement Systems
- Electronic Warfare Systems
- Theater Air Defense Systems

Littoral Warfare Systems

- Special Warfare Systems

Navy Strategic Weapon Systems

- Targeting, Navigation, Fire Control, Missile and Launcher Subsystems

Ordnance

- Mines, Warheads, Rockets and Ammunition
- Energetic Chemicals, Pyrotechnics, Propellants, and Explosives

2.C.2. Pyrotechnics and Conventional Ammunition. Total funding for FY 93 was \$18.4M for Pyrotechnics and \$69.7M for Conventional Ammunition. The Business Base for Pyrotechnics is summarized on Table 14 and for Conventional Ammunition Engineering on Table 15.

Major work efforts included:

- PYROTECHNICS (MARKERS, SIGNALS, SMOKES)
- COUNTERMEASURES (IR DECOYS, OFF-BOARD COUNTERMEASURES)
- SPECIAL PURPOSE MUNITIONS/SPECIAL WARFARE
- CONVENTIONAL AMMUNITION LOGISTICS
- CONVENTIONAL AMMUNITION ENGINEERING
- DEMILITARIZATION/DISPOSAL
- MARINE CORPS SUPPORT (MISSILES, COMMAND & CONTROL)
- ORDNANCE EVALUATION (PYROTECHNICS, EXPLOSIVES, FUZES)

Major sponsors included:

- NAVAL SEA SYSTEMS COMMAND
- NAVAL AIR SYSTEMS COMMAND
- MARINE CORPS
- NAVAL RESEARCH LABORATORY
- SPECIAL OPERATIONS COMMAND
- AIR FORCE
- ARMY
- OTHER NAVY
 - Indian Head
 - Dahlgren
 - China Lake
 - Point Mugu
 - Warminster
- PRIVATE INDUSTRY
- FEDERAL BUREAU OF INVESTIGATION
- DEFENSE INTELLIGENCE AGENCY
- COAST GUARD

2.C.3. Small Arms Technical Capability.

Total FY 93 funding was \$2.2M.

Major sponsors included:

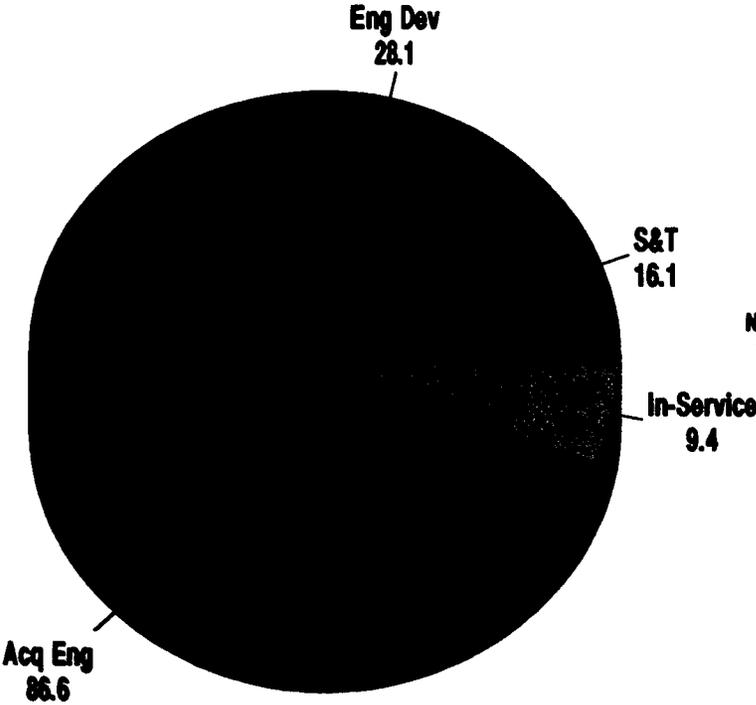
- NAVAL SEA SYSTEMS COMMAND
- NAVAL AIR SYSTEMS COMMAND
- MARINE CORPS
- ARMY

Major programs include:

- NAVY DESIGN AGENT FOR:
 - SMALL ARMS AMMUNITION (UP TO 20MM)
 - MORTAR-AMMUNITION
 - SHOULDER FIRED UNGUIDED ORDNANCE
 - CARTRIDGE GRENADES
 - HAND GRENADES
 - LAND MINES

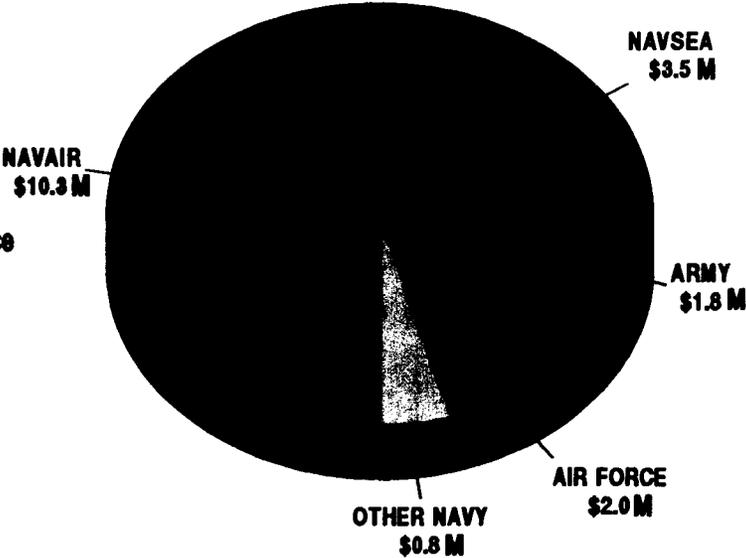
PYROTECHNICS - BUSINESS BASE

Workyears by Job Category



Total = 140.2 WY
(Includes 28 Contractor WY)

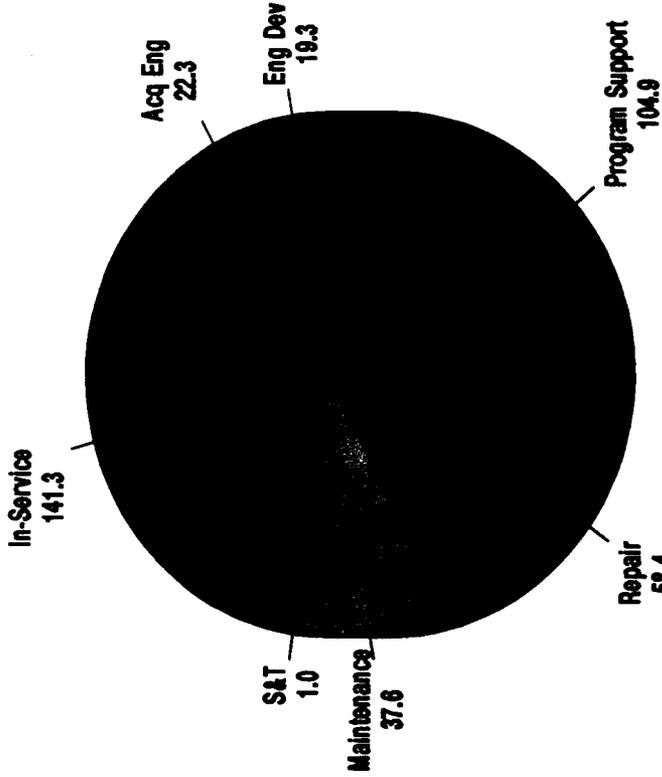
Dollars by Customer



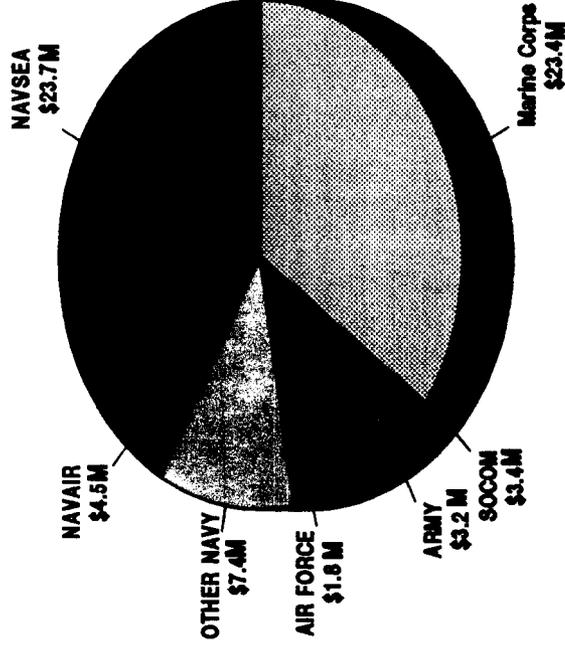
Total = \$18.4M

CONVENTIONAL AMMUNITION - BUSINESS BASE

Workyears by Job Category Dollars by Customer



**Total = 585.5 WY
(Includes 141.1 Contractor WY)**



Total = \$69.7M

3. NARRATIVE DESCRIPTIONS

3.A. Conventional Ammunition Engineering and Pyrotechnics.

The Conventional Ammunition Engineering and Pyrotechnics product lines provide total life-cycle support including program management, design and development, test and evaluation, product improvement, acquisition and production support, quality evaluation, fleet support, and demilitarization and disposal for Naval Sea Systems Command, Naval Air Systems Command and Marine Corps conventional ammunition and pyrotechnics. **The Crane Division is the Navy's recognized expert in pyrotechnics and in the production and engineering support of surface ship ammunition. This recognition comes from demonstrated experience for the past thirty-five years in the development, engineering, and production of conventional ammunition and demolition devices and the research, design, development, engineering and production of pyrotechnics.**

3.A.1. Pyrotechnics. Table 1 indicates the major products provided for each of the four Services by product line.

3.A.2. Conventional Ammunition Engineering. The major products provided by the Conventional Ammunition Engineering Technical Capability are identified in Table 2.

PYROTECHNICS MAJOR PRODUCTS

PRODUCT LINE	NAVY	AIR FORCE	ARMY	SOCOM
Countermeasures	ST, ED, TE, AE, IS	ST, ED, TE	ED, TE	TE,AE
Colored Smoke/Flares	ED, TE, AE, IS	*	TE	TE, AE, IS
Illuminating Flares	ED, TE,AE, IS	*	TE	TE, AE,IS
Obscurants/Markers	ED, TE, AE, IS	*	ED,TE	*
Submarine Signals	ED,TE,AE,IS	No Rqmt	No Rqmt	No Rqmt
Target Flares	ED,TE, AE,IS	*	ED,TE, AE	*

* = Capability Exists but no Current Work

ST = Science & Technology

ED = Engineering Development

AE = Acquisition Engineering

IS = In Service Engineering (includes demil/disposal)

TE = Test & Evaluation

CONVENTIONAL AMMUNITION MAJOR PRODUCTS

PRODUCT LINE	NAVY	AIR FORCE	ARMY	SOCOM	OTHER **
Major Caliber Gun Ammunition	PM, TE, AE,IS	No Rqmt	No Rqmt	No Rqmt	TE, AE, IS
Demolition Devices	PM,ED,TE, AE,IS	TE	TE	ED, TE, AE,IS	TE, AE, IS
Other Ammunition	PM,ED,TE, AE,IS	TE	TE	ED,TE, AE,IS	TE, AE, IS

* = Capability Exists but No Current Work

** = Coast Guard/FMS

ST = Science & Technology

ED = Engineering Development

AE = Acquisition Engineering

IS = In Service Engineering (includes demil/disposal)

TE = Test & Evaluation

MANPOWER & INTELLECTUAL/SKILLS CAPABILITIES

This total life cycle engineering support requires a knowledgeable technical staff of engineers, scientists, logisticians, and technicians. The experienced technical staff supporting the conventional ammunition engineering and pyrotechnics product lines totals 454 personnel and includes mechanical, industrial, aerospace, electronics and chemical engineers, chemists, physicists, safety and logistics specialists and a variety of technicians with experience in the design, manufacture and testing of conventional ammunition ordnance items. This technical staff is supported by an additional 62 administrative personnel. The skills mix is shown in Tables 3, 4 and 5.

TOTAL ORDNANCE PERSONNEL = 516 (includes 62 Admin personnel)

Engineers	Scientists	Technicians	Admin/Other Prof	Skilled Labor
29%	8%	32%	20%	11%

TABLE 3

PYROTECHNICS TECHNICAL PERSONNEL = 103

Engineers	Scientists	Technicians	Admin/Other Prof	Skilled Labor
33%	14%	33%	3%	17%

TABLE 4

CONVENTIONAL AMMUNITION ENGINEERING TECHNICAL PERSONNEL = 351

Engineers	Scientists	Technicians	Admin/Other Prof	Skilled Labor
33%	8%	36%	12%	11%

TABLE 5

The formal educational level of the staff includes 8 Ph.D.s, 38 Master's, 171 Bachelor's and 38 Associate degrees. The Pyrotechnics product line has 6 Ph.D.'s, 10 Master's, 36 Bachelor's and 8 Associate degreed personnel. The Conventional Ammunition product line has 2 Ph.D.'s, 28 Master's, 135 Bachelor's and 30 Associate degreed personnel.

The skills and knowledge required to develop and manufacture safe and reliable pyrotechnics and ordnance items cannot be obtained through an academic course of study. In addition to an understanding of the basic science and engineering involved in developing pyrotechnics and conventional ammunition ordnance items, experience and knowledge are required in the analysis of the end use effectiveness, safe manufacture, producibility, and testing of these items. **Basic scientific and engineering skills must be supplemented with hands-on work experience in the ordnance area.** This on-the-job training, coupled with the limited formal course work available, requires five to seven years working in the area to develop the required skill levels.

As shown on Table 6, there are over 8500 workyears of pyrotechnics and ordnance related experience at Crane. Crane Division's professional and technical workforce averages almost 19 years of ordnance related experience per person.

NUMBER OF PERSONNEL BY DISCIPLINE AND YEARS OF EXPERIENCE

YEARS OF ORDNANCE EXPERIENCE	1-5	5-10	10-20	20+
IND/MECH/AERO ENGINEERS (97)	4	23	28	42
ELECTRONICS ENGINEERS (32)	2	12	4	14
CHEMICAL ENGINEERS (20)	1	8	3	8
CHEMISTS/PHYSICISTS (18)	2	3	5	8
ENGR/MECH/IND TECHNICIANS (121)	1	16	32	72
ELECTRONICS TECHNICIANS (42)	4	8	17	13
MATH STAT/OPS RES ANALYSTS (24)	1	6	7	10
LOG MNGT/PROG ANALYST (45)	0	6	17	22
EXPLOSIVE OPERATORS (55)	2	5	23	25
TOTALS (454)	17	87	136	214

TABLE 6

Crane scientists and engineers are recognized nationally and internationally throughout defense establishments and the private sector as experts in the design, development and production of pyrotechnics and in the testing and analysis of the effectiveness of infrared pyrotechnics against a variety of domestic and foreign missile seekers.

Ammunition production, handling and usage provide many opportunities for catastrophic safety related incidents. A major turnover of personnel in this unique field would undoubtedly carry a high probability for increased occurrences of undesirable incidents. The maintenance of product expertise is the only means available to assure safe, reliable and effective ammunition to satisfy Fleet requirements.

Major portions of the conventional ammunition and pyrotechnics product lines are inherently governmental in nature and must be maintained by the Navy. Acquisition program management, engineering support for acquisition and production engineering **must be done as a government function.** The Crane Division is physically located within 750 miles of seventy five percent of the ammunition/end item production and within 500 miles of thirty eight percent. This close proximity allows Crane production engineers to provide almost same day response to resolve on-site production related problems.

FACILITIES & EQUIPMENT:

All ammunition/ordnance work at Crane is performed in government owned facilities. The facility assets comprise 72 engineering, operating and test buildings with a total of 349,000 square feet and a current plant value of \$69 million. Specialized equipment investments total \$33.9 million. Additionally there are 93 explosive storage magazines (including CAT I & II) with 223,000 square feet of space. Crane has 88 acres of unencumbered ordnance testing area with access to another 120 acres for ordnance disposal and reclamation efforts co-located with the Crane Army Ammunition Activity (CAAA). MILCON investments during the past five years total \$11.2 M.

It would be extremely difficult to replicate or relocate these facilities at another location. These facilities are located in areas that allow production, testing and storage of ammunition within accepted quantity-distance arcs for the safe use of ammunition. The remote location of test areas provides the ability to do all-up round testing within State and Federal guidelines. **The Division's unencumbered location with no encroachment considerations provides the ideal place to develop and test pyrotechnic and ordnance items both now and in the future.**

Table 7 below provides information on Crane Division and Crane Army Ammunition Activity facilities.

TYPE FACILITY	CRANE DIVISION FACILITIES			CAAA FACILITIES		
	NO. BLDGS	SPACE (K SQ FT)	PLANT VALUE (\$M)	NO. BLDGS	SPACE (K SQ FT)	PLANT VALUE (\$M)
Engring	11	95.3	18.1	2	73	8
Ord Oper*	53	216.7	33.6	158	713	126
Ord Storage	87	208.7	10.8	1552	4703	262
Inert Storage	10	21.1	0.9	199	1764	69
TOTAL	161	541.8	63.4	1911	7253	465

*Includes Production, Testing, Maintenance & Repair

TABLE 7

FACILITY DESCRIPTIONS

The **Conventional Ammunition Engineering and Pyrotechnics** product lines are supported by a variety of specialized facilities that are essential to the design, development, production and testing of pyrotechnics and conventional ammunition. These facilities are fully operational and are designed to meet future projected needs.

The **Automated Infrared Test Facility** is used for first article, lot acceptance, quality evaluation and qualification testing of infrared decoy flares. **This unique state-of-the-art facility is not duplicated anywhere in the United States and is the accepted Navy standard for acceptance and first article testing.** The facility is contained in a specially modified 10000 square foot building and consists of a chamber capable of burning decoy flares up to 1000 grams, a 70 meter radiometric tunnel with an environmentally controlled measurement room and several support rooms adjacent to the tunnel. The test facility has the capability to provide adjustable air velocity versus time profiles to simulate the launch of decoy flares from a moving aircraft. The profiles can be controlled such that air flow across either free fall devices or rocket powered devices can be simulated.

The **Transient Velocity Windstream Facility** is a free jet expansion windstream apparatus designed to provide adjustable air velocity versus time profiles to simulate the launch of decoy flares from a moving aircraft. The outdoor apparatus consists of several air compressors, a bank of air storage tanks, a computer controlled valve to control air flow and a nozzle and can produce air flows from 0.1 to 0.9 Mach at either a constant velocity or, under computer control, a variable velocity versus time profile to simulate the observed velocity versus time behavior experienced by a decoy flare when ejected from an aircraft. Radiant and spectral radiant intensity are measured at distances of 30, 80 and 500 meters and at angles from 10 - 300 degrees around the device. **This combination of space, facilities and measurement equipment is unique in the United States and is used by all of DOD and several private contractors to assess the performance of decoy flares and concepts in a test apparatus that is much less expensive to operate than an actual air-to-air test.**

The **Ordnance Prototype Manufacturing Facility** is contained in four buildings and occupies 28000 square feet. It is used for the development of prototype models of new designs and product improvements of pyrotechnic devices and explosive components. Mixing, blending and consolidation equipment allows the development and production of a large range of pyrotechnic compositions for infrared, colored and illuminating flares, colored smokes and other devices. **Virtually any pyrotechnic composition in the DOD inventory can be manufactured in this facility.**

Crane Division provides test ranges and facilities for first article, lot acceptance, surveillance, qualification and safety testing of pyrotechnic, demolition and conventional ammunition items at the **Ordnance Test Area**. The test areas have a total of 88 unencumbered acres and are supported by eleven buildings (5600 square feet). In addition to normal function testing the ranges also support Insensitive Munitions Testing on All-Up-Rounds (pyrotechnic, demolition and conventional ammunition) including Fast and Slow Cookoff, Bullet Impact and Sympathetic Detonation. This facility also supports the Crane Army Ammunition Activity.

The **Ordnance Material Characterization Laboratory** provides chemical and metallurgical laboratories for performing failure evaluations, thermal characterization analyses, physical and chemical properties of materials and materials selection/compatibility of explosives, propellants, pyrotechnics, metals, polymers, ceramics, adhesives, coatings and compositions. Accelerated aging studies of ordnance materials complete with temperature controlled environments for isothermal studies as well as temperature cycling studies are provided in an ordnance qualified facility. In addition to the normal quality evaluation and safety tests of ordnance materials such as impact, friction and electrostatic sensitivity, vacuum and thermal stability, self-heating and ignition the Division operates a complete thermal characterization laboratory. This facility also supports the Crane Army Ammunition Activity and the Public Works Directorate.

In the **Ordnance Environmental Test Facility** the Crane Division provides environmental testing of ordnance items for the three Services. In these facilities the design, selection and procurement of test equipment and facilities have been made with the test and evaluation of explosive and other hazardous materials in mind. Environmental test facilities and equipment are available to do vibration, shock, temperature, humidity, altitude, jolt, jumble, sunshine and rain, sand and dust, and salt spray. Environmental test facilities are contained in four buildings with 20,000 square feet. This facility also supports the Crane Army Ammunition Activity.

The **Ordnance Radiographic Facility** provides radiographic testing of ordnance items for the three Services. Radiographic inspection capabilities include both real time and conventional X-ray. A special high bay exposure room with a high energy accelerator is available for radiographic inspection of very large items, e.g. 2,000 pound bombs, that can be brought in on trucks/trailers and X-rayed without unloading. The radiographic facilities are in two buildings with 7,100 square feet. This facility also supports the Crane Army Ammunition Activity.

The **Demilitarization Evaluation Facility** is a recently completed facility that allows for remote disassembly of various ordnance devices up to 500 lbs. The facility has the capability of pilot operations for the demilitarization of conventional and hazardous ordnance items. The facility's design is such that all waste is contained and disposed of without escaping to the environment.

The **Ordnance Components Test Facility** provides lot acceptance and surveillance testing of numerous ordnance components and sub-assemblies as well as small explosives devices. The facility has test cells which provide capability for controlled and monitored function testing of components. Test cells are also equipped with capability for remote breakdown and dissection of ordnance components for failure analysis. Ordnance items tested in the facilities include demolition devices, fuzes, linear explosives, detonators and offboard countermeasures.

Fleet Ballistic Missile, Ordnance Components Test Facility provides support to the Fleet Ballistic Missile Strategic Weapons System ordnance evaluation programs throughout the life cycle of the Trident I and II Missiles. This is accomplished through the design manufacture of ordnance test systems and the test and evaluation of missile ordnance components utilized in the Launch, Missile Body and Reentry Systems. This facility is unique in respect to its design, construction and safety site approval which allows ordnance components and assemblies to be destructively tested safely. This building allows explosive operations and still meets the quantity-distance requirements of NAVSEA OP-5.

The **Missile Fuze Test Facility** provides for testing a wide variety of missile fuzing components (warhead section components). Equipment used includes centrifuge, burn rate/velocity tester, active optical test ranges, leak detectors and many specialized pieces of equipment. This test equipment supports production acceptance, surveillance, and maintenance of these fuzing components. Approximately 25 missiles are supported including STANDARD, TOMAHAWK and SIDEWINDER. This effort supports the Navy as well as joint programs with the Air Force, Army, Foreign Military Sales and private parties.

The **Proximity Fuze Free Space Facility** (10,000 ft reflectivity plane) is the **certified Navy Standard** used to establish the electronic values of Radio Frequency Fuze Standard Monitors. These Standard Monitors are used for correlation of systems used in production and testing of Proximity Fuzes by both the private and public sectors. Radio Frequency Proximity Fuzes are used on all the major caliber ammunition in the Navy stockpile.

Missile Maintenance Facility performs intermediate level maintenance on STINGER air defense missiles and TOW and DRAGON anti-armor missiles. Engineering support services are available for test equipment and test fixture design, maintenance line layout and missile configuration monitoring and control. The larger of two facilities is a 19,000 square foot reinforced concrete multi-bay structure designed to minimize personnel injuries and capability loss in the event of an explosive incident. A second smaller facility is a 5,000 square foot earth covered structure designed to allow performance of minor maintenance and double as a shipping and receiving facility. Both structures are protected by static and ordnance grounding systems and lightning protection systems. Both facilities are DOD safety site approved and with no explosive operating waivers or exemptions.

Marine/Corps Weapons Command and Control Systems Development and Production performs prototype development and low rate initial production of Command and Control electronics shelters. Engineering support services available for systems integration and configuration control. Three separate facilities comprise the prototype complex. A 5,000 square foot facility is used for subsystem assembly and checkout. Two 4,000 square foot facilities are used for complete system assembly and checkout. All three facilities are pre-engineered steel structures. No special equipment or utilities are required.

Missile Storage Facilities perform storage of preposition war reserve Navy and Marine Corps Stinger Missiles and Marine Corps Tow and Dragon Missiles. Perform receipt, storage, and issue of training missiles for the Marine Corps. Urgent missile delivery capability to operational areas worldwide is provided via Wright Patterson Air Force Base, Dayton, Ohio. Total storage space for Risk Category 1 arms, ammunition and explosives (AA&E) is 45,000 square feet. Total storage space for Risk Category 2 AA&E is 50,000 square feet.

Ordnance Ready Magazine Storage provides ordnance receiving, shipping and storage for the various programs of the two product lines. The facilities are used to receive a wide variety of ammunition and explosives, After receipt, the ordnance is either forwarded immediately to the user or placed in storage magazines temporarily until ready for evaluation. Total number of magazines is 37 with 57,400 square feet of storage space.

Major facilities are summarized in Table 8.

MAJOR FACILITIES

Facility	Sq Ft	CPV Bldg \$ M	ACE Eqpt \$ M
Automated Infrared Test Facility *	10,167	0.6	2.4
Transient Velocity Windstream	900	0.4	0.4
Ordnance Prototype Manufacture *	27,966	6.3	3.8
Ordnance Test Area * (88 Acres)	7,796	4.2	1.2
Ordnance Enviro & Radiographic *	28,782	12.7	7.6
Ord Material Characterization *	8,666	3.9	3.5
Demil Evaluation Facility *	4,480	3.0	3.0
Ordnance Components Test	28,346	2.4	1.7
FBM Ordnance Components Test	23,296	5.9	8.8
Missile Fuze Test	20,334	1.3	9.7
Missile Maintenance	26,094	2.9	3.1
Marine Corps Command & Control	13,150	0.5	0.0
TOTAL	199,977	44.1	45.2

* Dual Use with Pyro CAAA or Conventional Ammunition

PYROTECHNICS AND CONVENTIONAL AMMUNITION SPECIALIZED EQUIPMENT

Materials Sensitivity Analysis

- Impact
- Friction
- Electrostatic
- Vacuum Thermal Stability
- Henken Self Heating

Thermal Characterization

- Microcalorimeters
- Differential Scanning Calorimetry
- Thermal Gravimetric Analysis
- Adiabatic Calorimetry
- Thermal Conductivity

Materials Composition & Physical Analysis

- High Performance Liquid Chromatography
- Gas Chromatography/Mass Spectrometry
- UV/Vis/IR/AA Spectroscopy
- X-Ray Diffraction
- Scanning Electron Microscopy

Countermeasure Flare Analysis

- Optical Multichannel Analyzer (visible & IR)
- Calibrated Thermal Imager
- Fourier Transform IR Spectrometer
- Circular Variable Filter Spectrometer
- Missile Seeker Measurement Facility (9 seekers)
- Mobile IR Measurement Van & Tracking Mount
- Four Channel IR Radiometer
- MOSIAC, DISAMS, ESAMS Computer Models

Environmental & Radiographic Test

- Vibration
- Shock
- Temperature, Humidity & Altitude
- Sunshine & Rain
- Salt Spray
- Jolt & Jumble
- Real Time X-Ray (70-160 kv)
- Mid-energy X-Ray (80-420 kv)
- High Energy Accelerator (up to 10 mev)
- High Bay facility

Missile Fuze Test Consoles

Missile Fuze Test Chambers

3.B. Small Arms Technical Capability. The Small Arms Technical Capability (TC), located in the Gun Weapon Systems Directorate at Crane Division, is the Naval Sea Systems Command Design Agent for small arms ammunition (up to 20mm), mortar ammunition, shoulder fired unguided ordnance, cartridge grenades, hand grenades, and land mines.

As the Design Agent, this TC performs test and evaluation, design and development, performance specification development, Technical Data Package development (specification and drawings), acquisition, limited production (in-house), production support, first article and lot acceptance testing, and malfunction investigation of the above ordnance items.

In addition to the above Design Agent assignment, this TC is assigned as the Technical Direction Agent, Acquisition Engineering Agent and In-Service Engineering Agent for similar ammunition items under a classified program in support of the NAVSEA Naval Special Warfare Program Office. This TC has also provided Research and Development services for ammunition to the Joint Service Small Arms Program (JSSAP), the USMC Ground Weapons Office, and US Army Small Arms Program Office, and has provided acquisition support to the USMC Ammunition Acquisition Office, and the USAF Ammunition Logistics Division.

Energetics comprises 27.3 workyears, or 23%, of the total workload of the Small Arms Technical Capability. The remaining 87.5 workyears are dedicated to the comprehensive life cycle support of small arms weapons and mounts, including design, development, acquisition, engineering, T&E, logistics management and maintenance functions. While this work falls outside of the categories of energetics or electronics, the unique synergy created through the integration of workload supporting small arms weapons, mounts and ammunition (energetics) provides the Navy with unmatched technical knowledge and capabilities in the area of small arms weaponry, and enhances a systems approach to meeting the needs of DOD.

MANPOWER & INTELLECTUAL/SKILLS CAPABILITIES

To support the above activities, the energetics work within this TC is manned by eight engineers and one mathematician/statistician (with baccalaureate degrees), eight mechanical engineering technicians (some with associate or baccalaureate degrees; others with significant military ordnance experience), one equipment specialist (ordnance), one program analyst (with public management certificate) and several engineering co-op students. Over 210 work-years of total experience with small arms ammunition and ordnance exist in the area of energetics.

These personnel are skilled in ammunition design engineering, ballistic analysis, test and evaluation, acquisition support and field analysis. This is in conjunction with over 1000 workyears of experience in small arms weapons and mounts which comprises the remainder of this Technical Capability and which forms a complete system oriented organization sharing resources and facilities.

FACILITIES & EQUIPMENT

Energetics programs utilize three ranges located within the Small Arms Technical Capability (100-meter underground range, 10-meter indoor range, and 1000-yard outdoor range), as well as the Outdoor Test Area operated by the Conventional Ammunition TC, and other government/contractor ranges.

A total of 16,000 square feet of magazine storage space is maintained as well as a 120 square foot ammunition loading room.

Specialized loading equipment utilized by energetics programs includes electronic and mechanical powder scales, precision dies, and single stage and multiple stage loading presses.

Specialized test equipment (which is shared with weapon and mount programs within the TC) includes Doppler Radar and Analyzer, Impulse Photometer, Ballistic Computers, Velocity Chronographs, Flash X-ray, Electronic Targeting Systems, Temperature Conditioning Equipment, Digital Oscilloscopes, Electronic Pressure Transducers, and over 350 each ammunition test barrels.

3.C. CRANE ARMY AMMUNITION ACTIVITY. Crane Army Ammunition Activity (CAAA) is a Joint Service Command which provides ordnance related support (munitions and energetics) to the armed services for DoD wholesale energetics and munitions load, assemble and pack (LAP) operations, manufacture and production, renovation and maintenance, storage, distribution, and demilitarization of: Naval gun ammunition; pyrotechnics; bombs; and propellant charges. The Activity is also designated as a Tier 1 Depot for munitions and energetics storage and distribution. As a Tier 1 Depot, CAAA provides routine and special purpose training munitions support as well as required short notice ordnance support to first strike forces of all services and pre-position ships, as well as war reserve munitions support during and beyond the first 30 days of multi-regional contingency support operations. The functions are conducted under the mission guidance and control of the US AMCCOM, the DoD designated Executive Agent and Single Manager for Conventional Ammunition.

MANPOWER & INTELLECTUAL/SKILLS CAPABILITIES

CAAA is supported by an knowledgeable staff of engineers, scientists, technicians and explosive ordnance workers experienced in ordnance manufacturing operations. The staff is 11% engineers and scientists, 82% skilled labor and 7% administrative personnel.

FACILITIES AND EQUIPMENT

CAAA has the demonstrated capability, facilities and equipment to perform the following energetics manufacturing functions:

CAST LOAD

Lines have total melt-pour capacity of 64,640 pounds per hour utilizing 12-160 gallon kettles, 2-180 gallon kettles, and 12-300 gallon kettles. Compositions such as HBX, H-6, Tritonol, Composition B, TNT, Minol and Octol are used in the casting of Low Drag Bombs, Naval Mines, Shock Test Charges, Demolition Charges, Rocket Warheads, Underwater Sound Signals and Cluster Bombs. Three Plants (Rockeye, Mine Fill A and Mine Fill B) have cast capability with total manufacturing area of 171,573 square feet.

PRESS LOAD

Forty two presses ranging from 6 to 500 tons are available in seven different locations to press tetryl, Composition A-3 and Plastic Bonded Explosives. Capabilities include 3", 76mm and 5" conventional projectiles as well as 165mm thin wall projectiles. The Press Loading Facility is the major facility at CAAA with 23,462 square feet of manufacturing area.

PYROTECHNICS

Typical pyrotechnic items produced are smoke, colored and illuminating flares, illuminating projectiles, marking devices, IR decoy flares. Capabilities also exist for extrusion of IR grains. The pyrotechnic plant consists of 52,086 square feet of manufacturing area and 15,294 square feet of support buildings. Equipment includes pulverizing machines, drying ovens, sand mullers, barrel tumblers as well as previously mentioned presses.

ACTUATING DEVICES

Two production plants with 30,094 square feet of manufacturing area make up the Explosive Actuating Device Area. Actuating devices such as detonators, squibs, boosters, bursters, cartridge actuating devices, primers, leads, relays, delays and electrically initiated components can be loaded. Explosives used in these lines include lead azide, tetryl, CH-6, black powder, and other highly sensitive initiating explosives. This area is also used for the production of the Mk 56 Sheet Charges and the Mk 57 Kit and the pressing of pellets for various items.

ORDNANCE DEMILITARIZATION

Ammunition Burning Grounds (ABG) - This approved and permitted open burning site includes:

- (1) 18 clay-lined steel burning pans.
- (2) 7 unlined steel burning pans.
- (3) 3 explosive sludge dewatering units.
- (4) 2 primer burning pits.
- (5) Daily capacity of 54,000 pounds of smokeless powder or 9,000 pounds of high explosives.
- (6) Capable of disposing small arms, pyrotechnic items, explosive contaminated material.
- (7) At an alternate site - 3 large pads (clay and gravel lined for flashing trace contaminated projectiles), 3 clay-lined steel pans.

Open Detonation - 72 sites with explosive limit of 500 pounds or less per site with earth cover.

3.D. SUMMARY

In summary, the functional integration of the knowledge-based experience and the unique facilities and capabilities now allows the Navy to provide the Fleet with the lowest cost, highest quality and maximum performance ordnance devices in the most efficient manner. This integration provides a synergistic effect that makes the Crane organization unique in all DOD and private industry in the pyrotechnics and conventional ammunition fields. Crane engineers and scientists routinely provide assistance to both Army and Air Force personnel in the development, testing and acquisition areas.

The described Navy personnel, facilities and equipment co-located with the Crane Army Ammunition Activity provides unique capability for pyrotechnics and ordnance. Crane Army is a tenant activity and has significant production capability and workload as a Single Manager for Conventional Ammunition government owned, government operated activity. The availability of access to the Crane Army Ammunition Activity also provides a training ground for design and development engineers and scientists in the complexities of ordnance and pyrotechnic manufacture.

With its state-of-the-art laboratories, test ranges, prototype manufacturing facility and co-location with the Crane Army Ammunition Activity, Crane is able to design, develop, test and manufacture many different types of ordnance devices and virtually any pyrotechnic device for the Navy, DOD or private concerns.

4. MAPS OF THE INSTALLATION

Maps of the installation depicting the activity's energetic operations are provided in Attachment A. Building asset information for buildings associated with energetic operations is provided on the maps as well as buildings that are difficult to move or replicate at another site. On many of the individual maps there is a designation of "H" (Highway) or "R" (Railroad). The following paragraphs are provided to further describe the maps.

A. ATTACHMENT A, MAP A - The northwest portion of the installation has been identified for use by inert ordnance operations. These include: 1) Small Arms engineering, development, and test operations; 2) Conventional Ammunition Engineering; and 3) Marine Corps engineering, prototype development, and low rate initial production of Command and Control electronic shelters. Also located in this area is the Naval Sea Systems Command Program Management office for Conventional Ammunition (2T COG) acquisition and disposal.

The Small Arms Facility in Building 2521 includes an underground 100 meter firing range capable of conducting tests on ammunition up to 25mm. This test facility was constructed in 1988 and would be difficult to move or replicate. The remaining facilities supporting energetic functions in this area are not unique and can be moved or replicated at another location.

B. ATTACHMENT A, MAP B - In addition to the testing capability at the underground firing range at Building 2521, testing of larger caliber small arms and long distance tests can be accomplished at the outdoor firing range at Building 2911. This facility, which has a capability for testing small arms at 600 and 1,000 yard targets, would be difficult to move or replicate.

C. ATTACHMENT A, MAP C - Environmental testing of ordnance items is accomplished in a four building complex. These pre-engineered metal buildings, which were constructed in the 1970's, support ordnance items from all three services. Environmental test equipment, valued at over \$5.5 million is available to do vibration, shock, temperature, humidity, altitude, jolt, jumble, sunshine and rain, sand and dust, and salt spray tests. Ordnance items ranging from Class 1, Division 1 explosives to inert items can be tested in these facilities.

D. ATTACHMENT A, MAP D - The activity's Ordnance Radiographic Facility consists of a two building complex. Building 2986 and 2987 are reinforced concrete buildings constructed in 1974 and 1975 respectively. These facilities allow radiographic inspection of ordnance items in real time or by conventional x-ray. Very large items such as 2,000 pound bombs can be inspected right on the trailer in a high bay exposure room with a high energy accelerator. Due to the massive reinforced concrete walls to provide operator protection and the \$2.1 million x-ray equipment contained in the facilities, this complex would be very difficult and expensive to replicate or move.

E. ATTACHMENT A, MAP E - The intermediate level maintenance of STINGER air defense missiles and TOW and DRAGON anti-armor missiles are performed in Buildings 2805 and 2390. These facilities are capable of handling Class 1, Division 1 explosive material and with their multi-bay design, minimizes personnel exposure and equipment loss in the event of an accidental explosion. These reinforced concrete facilities are protected with ordnance grounding grid systems and lightning protection. Due to their explosive design features and \$3.1 million of installed equipment, these facilities would be difficult and expensive to replicate or move.

F. ATTACHMENT A, MAP F - Testing and evaluation of pyro and conventional ammunition items are conducted in the Ordnance Components Test Facility. Building 142 provides lot acceptance and surveillance testing of numerous ordnance components and sub-assemblies as well as small explosive devices. Explosive test cells within this facility provide the capability for controlled and monitored function testing of components and also remote breakdown and dissection capability of ordnance components for failure analysis. Demolition devices, fuzes, linear explosives, detonators and offboard countermeasures are samples of the ordnance items tested in this facility.

The ordnance evaluation program of the Fleet Ballistic Missile Strategic Weapons Systems is also supported by the Ordnance Components Test Facility at Building 143. The testing and evaluation support is provided through the life cycle of the Trident I and II Missiles. The design and construction of this facility is unique in that it allows ordnance components to be destructively tested safely.

Also located within the Ordnance Components Test Facility complex is Building 2707. This facility serves as a chemical sciences laboratory. Basic and applied research in the fields of physical and natural sciences in such areas as energy transfer phenomena, solid state mechanism, chemical kinetics, polymer synthesis and applications, organic/inorganic synthesis and laser studies are conducted in this facility. Constructed in the early 1940's and modified and improved over the past several years, these reinforced concrete facilities are protected with ordnance grounding grid systems and lightning protection. Due to their explosive design features and \$13.45 million of unique and installed equipment, these facilities would be difficult and expensive to replicate or move.

G. ATTACHMENT A, MAP G - The development of prototype models of new designs and product improvements of pyrotechnic devices and explosive components is accomplished in a four building complex consisting of Building 198, 2507, 2508, and 2510. The \$3.8 million of mixing, blending, and consolidation equipment installed in the facility allows for the development and production of a large range of pyrotechnic compositions for infrared, illuminating and colored flares, colored smokes and other devices. Any pyrotechnic composition in the Department of Defense inventory can be manufactured in this facility. These reinforced concrete facilities are protected with ordnance grounding grid systems and lightning protection. Due to their explosive design features and installed equipment, these facilities would be difficult and expensive to replicate or move.

H. ATTACHMENT A, MAP H - The Missile Fuze Test Facility in Buildings 363 and 364 provides for testing of a wide variety of missile fuzing components (warhead section components). Equipment used includes centrifuge, burn rate/velocity tester, active optical test ranges, leak detectors and many other specialized pieces of equipment. Approximately 25 missiles are supported in this facility including STANDARD, TOMAHAWK, and SIDEWINDER. The Navy as well as joint programs with the Air Force, Army, Foreign Military Sales and private parties is supported by these facilities.

Building 366 is an Automated Infrared Test Facility. This facility is used for the first article, lot acceptance, quality, evaluation and qualification testing of infrared decoy flares. Flares up to 1,000 grams can be burned within the facility. This unique state-of-the-art facility is not duplicated anywhere in the United States and is the accepted Navy Standard for acceptance and first article testing.

I. ATTACHMENT A, MAP I - A new 22,174 square foot explosive test facility and a 7,830 square foot engineering support building will be constructed and operational by December 1996 at this site. The new facility will contain eight test cells capable of handling ten pounds of Class 1, Division 1 explosives in each cell, two cells rated at 50 pounds each and one cell rated at 100 pounds of Class 1, Division 1 material. In the event of an accidental explosion, adjacent test cells and its associated equipment and ordnance will be protected to insure continued test capability. A 1,800 square foot remote 3,000 pound Class 1, Division 1 test cell will also be constructed for larger explosive devices and components.

J. ATTACHMENT A, MAP J - First article, lot acceptance, surveillance, qualification and safety testing of pyrotechnic, demolition, and conventional ammunition items are accomplished at the ranges and facilities located at the Ordnance Test Area. This 88 acre, unencumbered site is supported by eleven test buildings. In addition to normal function testing, the ranges also support Insensitive Munitions Testing on All-Up-Rounds (pyrotechnic, demolition, and conventional ammunition) including Fast and Slow Cookoff, Bullet Impact and Sympathetic Detonation. This facility also supports Crane Army Ammunition Activity. The installation is located in an Air Attainment area which allows for the flexibility to conduct open air tests. This ability carries over into the open burning and detonation of ordnance which can also be accomplished at other sites at the installation.

In addition, Crane Army Ammunition Activity has twelve separate ordnance production sites and two ammunition demilitarization functions located on the installation. These sites are utilized by Pyrotechnics and Conventional Ammunition Engineering and are depicted on Attachment B.

ATTACHMENT B, MAP 3: Constructed in the early 1940's, this full scale pyrotechnic production plant produced a majority of the pyrotechnics used in the Vietnam War. The plant contains a large, 67,519 square foot machine shop in Building 125 which is used to produce small metal parts used in the production of flares and other pyrotechnic devices. A plating shop to plate these metal parts is located in Building 1884. An Industrial Wastewater Treatment Facility was constructed in 1978 to treat the wastewater from the plating shop. Buildings 122, 126, 2697, and 2698 are the primary pyrotechnic production facilities.

ATTACHMENT B, MAP 4: Buildings 136 and 138 are the two primary production facilities in this production complex. Small actuating devices such as detonators, squibs, boosters, bursters, and primers using sensitive materials such as lead azide and tetryl are produced in this complex.

ATTACHMENT B, MAP 6: This is the third of the three large cast load production plants mentioned in map 5. This facility is currently used to renovate ammunition.

ATTACHMENT B, MAP 7: Building 104, which is a reinforced concrete structure constructed in 1942, is the primary facility used to press load 5 inch, 76 mm, and other medium caliber ammunition. Building 101, shown in Attachment B, map 10, also supports medium caliber production operations.

ATTACHMENT B, MAP 10: Buildings 102 and 103 are used for BAG Filling Prop Charges. These facilities contain 5 cells which can be used to produce ignition ends. Building 101 is used for the production of 76mm/3"/50 medium caliber ammunition.

ATTACHMENT B, MAP 12: This 28,532 square foot two building cast loading ordnance complex is used for the production of insensitive munitions such as the 5"/54 IM projectile.

ATTACHMENT B, MAP 14: The Ammunition Burning grounds is an open burning site that includes 18 clay lined steel burning pads, 7 unlined burning pans, 3 explosive sludge dewatering units, and 2 primer burning pits. The site has the capacity to open burn 54,000 pounds of smokeless powder or 9,000 pounds of high explosives. The site is also capable of disposing of small arms, pyrotechnic items and explosive contaminated material. At the Demolition Range (not shown in the detail map), 72 sites with an explosive limit of 500 pounds each is used to detonate ammunition unable to be renovated. Since the installation is an air attainment area, open burning and detonation is a effective, efficient and viable method of ordnance disposal. Groundwater monitoring wells are located throughout these two sites to ensure groundwater contamination is not occurring.

5. CAPACITY

5.A. CAPACITY TO ABSORB WORKLOAD WITHOUT MODIFICATION

Pyrotechnics and Conventional Ammunition Engineering. As a result of several military construction projects, declining workload and the loss of a significant number of personnel through incentive retirements, the Crane Division has a significant capacity to take on additional work in the pyrotechnics and conventional ammunition product lines. This capacity exists for all phases of energetics work including energetic laboratory work, design and development, prototype manufacture, test and evaluation, and demilitarization and disposal. Table 1 shows the additional workyears that could be accepted at the Crane Division and at the Crane installation with little or no modification of facilities. The additional workyears of laboratory and manufacturing space come from the use of two buildings now in use by the Crane Army Ammunition Activity.

Type of Space	Activity Workyears	Installation Workyears
Laboratory/Development (1.1 & 1.3)	27	42
Prototype Manufacture/Scale-up	13	81
Pyrotechnics/Ordnance Test	21	21
Engineering Office/Laboratory	150	150
Total	211	294

TABLE 1

Small Arms. The Small Arms Technical Capability can absorb up to 15 workyears of energetics workload with virtually no modification to facilities. Adequate office space, range and magazine capacity, and engineering T&E equipment exists to support this level of workload acquisition.

5.B. CAPACITY TO ABSORB WORKLOAD WITH MAJOR MODIFICATIONS

Conventional Ammunition Engineering and Pyrotechnics. Table 2 shows the additional space that could be accommodated at the Crane Division and the Crane installation with major modifications. In most cases the extent of the modifications would simply be renovation of existing structures to make them more habitable or to convert them from their original purpose to the required use.

- The laboratory space would be obtained by converting two buildings originally used for loading major caliber gun ammunition to laboratory space at a cost of \$50 per square foot.

- The ordnance operation space could be obtained by converting a building now used to recondition missiles. Since this building already has the appropriate structure and explosive cells and fixtures to accommodate ordnance prototype operations the cost to convert to prototype operations is estimated to be \$20 per square foot.

- The test space would be obtained by converting three inert storage warehouses to ordnance test operations. This has been done at Crane in the past for a number of buildings. The cost is estimated at \$100 per square foot.

Type of Space	Activity Square Feet	Cost \$K	Installation Square Feet	Cost \$K
Laboratory	14,000	720	14,000	720
Ordnance Operation	20,000	400	70,000	1,900
Test	30,000	3,000	30,000	3,000
Engineering Office	61,000	720	61,000	720
Total	125,000	4,840	175,000	6,340

TABLE 2

Small Arms. With the addition of a \$4 million MILCON which provides additional test facilities for energetics (controlled indoor firing ranges, production areas, and engineering T&E areas) an additional 10-30 workyears can be added to the Small Arms Technical Capability.

CRANE SITE EXPANSION CAPACITY MAP - Map A shows potential sites available at the Crane Site for expansion. In 1994, a study was conducted to identify potential sites for future development of all classes of explosives operating facilities. The study was restricted to the north portion of the installation due to proximity to the installation's water, electric, and sewer infrastructure. Site selection was based on the following rationale:

- Sites should have flexibility to accommodate all classes of operating facilities.
- Sites may accommodate large and small facilities. Large sites are defined as 30-40 acre sites which could accommodate large ammunition production lines. Small sites consist of approximately 10 acres for single building explosive production or testing operations.
- Sites were identified in unencumbered areas or on sites to minimize impacts on existing explosive operating or storage facilities.
- Sites were identified away from the electronics operation areas to allow further development of the electronic programs.

From this criteria, 10 potential sites were identified for explosive operations. An in-depth analysis of each site was conducted to investigate conditions that could limit the site's potential to accommodate explosive operations. Criteria used to for site selection included flexibility, adjacency, environmental impacts, and infrastructure impacts.

- Flexibility refers to the capacity of a particular site to readily accommodate future explosive operating facilities. Unencumbered sites receive a high rating, sites impacted by one to four facilities or magazines receive a moderate rating, and sites encumbered by six or more facilities or magazines receive a low rating.

- Adjacency refers to the impact of a prospective site on adjacent facilities and land use. It is rated by determining the compatibility between explosive operations and adjacent land uses. Sites located within or adjacent to existing operating areas were assigned a high rating, sites adjacent to storage areas or undisturbed/natural resource areas received a moderate rating, and sites adjacent to other land use have a low compatibility rating.

- Sites unaffected by major environmental factors or requiring minor modifications such as vegetation clearing were given a high rating from an environmental impact criteria. Moderate sites consisted of sites which required moderate modifications such as sites which contain slopes greater than 5% and low rated sites require mitigation of environmental factors such as wetlands.

- Infrastructure impacts refer to the infrastructure improvements such as highways, utilities, and railroad required to serve a site. Sites received a high rating if they were adjacent or contained highways and utilities. Sites were given a moderate rating if extension of the infrastructure would require extension up to 1,000 feet. Low rated site were sites which required extension of the infrastructure greater than 1,000 feet.

Sites A through J are described in the following paragraphs.

SITE A: Site A is a wooded ridge site of approximately 17 acres. The site is unencumbered by existing explosive operating facilities or explosive storage magazines. It is adjacent to the Mine Fill A and B operating plants. There are no known environmental impacts associated with the development of this site. Infrastructure support to this site is within 1,000 feet.

SITE B: Site B is a wooded ridge containing approximately 17 acres. The site is unencumbered with no known environmental impacts associated with development of the site. Due to its close proximity to other explosive operations, the supporting infrastructure is nearby.

SITE C: The use of this site would require the relocation of the existing salvage yard. This 17 acre site is unencumbered and the extent of any contamination from the scrapyards is unknown. Infrastructure support is fair with water, electricity, rail and road access good, however, the sanitary sewer is between 1,000 and 2,000 feet away.

SITE D: Use of this 40 acre site would require relocation of the existing demolition grounds. With the relocation of the demolition grounds, this site is unencumbered and access to the existing infrastructure is fair. This site is given a moderate expansion potential due to its size and close proximity to existing infrastructure at Mine Fill B.

SITE E: This site contains 11 acres and would require eight magazines to be downloaded or emptied. Due to its close proximity to streams, spill containment would be required. Access to existing infrastructure is poor. The overall rating for this site is poor for expansion capability.

SITE F: This 13 acre wooded site is encumbered by four magazines. There are no known environmental impacts from development of this site. Due to its close proximity to the existing Rockeye Facility, access to the existing infrastructure is excellent. The overall rating for this site for expansion capability is high.

SITE G: Located north of the Rockeye facility, this 34 wooded acre site is encumbered by four magazines and has no known environmental impacts from its development with the exception of a small wetland area in a corner of the site. Access to the existing infrastructure is excellent. This site has an overall high rating for expansion capability.

SITE H: This 38 acre wooded site would require the downloading of five storage magazines. Sites are available to construct many more magazines if required. Access to existing infrastructure is poor.

SITE I: With the relocation of the Ammunition Burning Grounds, a large 40 acre site becomes available for expansion. Access to existing infrastructure is poor. This site has an overall rating of poor.

Site J: This site is a small 3.5 acre site which could accommodate a small ordnance function. It is located adjacent to a wetland, therefore, spill containment would be required. Access to the existing infrastructure is poor, however, the site has good road access. The site is given an overall rating of low for expansion capability.

As was mentioned in the opening paragraph, specific criteria was used in this study. Final site selection will require a case by case analysis to determine the feasibility of a site to accommodate a specific ordnance operation. Additional sites, for example, are available for operations other than Class 1 Division 1 or Class 1 Division 2 operations. Other sites are also available for Class 1 Division 1 material if small quantities are involved as in the case of test and evaluation operations.

In conclusion, five of the ten potential sites are thirteen to seventeen acres in size. Four sites identified are between thirty five and forty acres. The total land area available for building in accordance with established quantity-distance arcs prescribed for handling large quantities of hazard classification 1.1 material is over eight million square feet. Up to ten separate facilities or test ranges could be constructed on this land. The current cost of new construction for an ordnance test or operation building is estimated to be \$200-400 per square foot.

6. IMPACT OF BRAC 91 AND BRAC 93

A. This activity was impacted directly by BRAC 91 and indirectly by BRAC 93.

1) BRAC 91 - The BRAC 91 decision consolidated this command with the Naval Ordnance Station, Louisville, Kentucky and established the Crane Division as an element of the Naval Surface Warfare Center. Mechanical workload was consolidated at the Louisville site and electronics workload was consolidated at the Crane site. In addition, underwater acoustic In-service Engineering responsibility was realigned from Crane to the Naval Undersea Warfare Center, Newport Division.

As a result of the BRAC 91 actions, the general and administrative support services for the Crane Division were consolidated at the Crane site with a savings of 203 indirect G&A workyears. This savings was 73 workyears beyond the 130 figure required by the BRAC 91 decision. In addition, many of the management information systems supporting the two sites have been consolidated into Crane Division or Naval Surface Warfare Center wide systems. Finally, this activity also received the printed wiring production fabrication function which transferred to Crane Division from the Dalghren Division of the Naval Surface Warfare Center.

2) BRAC 93 - The BRAC 93 decision to close Mare Island Naval Shipyard resulted in the Crane site receiving additional workload associated with its technical capability in electrochemical power systems. This work includes pre-installation testing of batteries for submarines and the installation of those batteries into submarines.

B. EFFECT UPON OPERATIONS - The outcome of the combined BRAC decisions has been to establish for the Navy a unique "one stop" defense technology industrial base activity. Electronic, mechanical, and electrochemical functions have been consolidated to better utilize special skills and knowledge of product area experts gained through years of education and experience in support of numerous Navy, other DoD, and private sponsors. The Crane Division is capable of design, prototype, production validation, in-service support and maintenance of electronics, mechanical and ordnance systems.

Another outcome of the combined BRAC decisions has been to increase the role this activity performs in assuring that DoD is a "smart buyer" of the components of combat weapons systems through validation of technical requirements; establishment of Navy safety standards for electrochemical power systems; and increased productivity through reduction of indirect expenses. Finally, with the transfer of electrochemical power systems work from Mare Island Naval Shipyard to Crane, unique state-of-the-art battery test facilities are being developed to support experienced personnel at the Crane site in the testing of submarine batteries to enhance Fleet readiness.

7. DEPARTMENT APPROVED PLANS

7.A. Small Arms Technical Capability. Since the standup of the United States Special Operations Command in 1987, the Small Arms TC has grown to become a primary weapon/armament developer for Special Operations programs. The unique co-location of functions and facilities capable of providing full life-cycle support for small arms weapons, mounts and ammunition, coupled with unmatched responsiveness to the special operations community, has contributed significantly to this growth.

Evidence of this is the Offensive Handgun Program (Crane Division acts as the Program Manager and engineering activity), the M4A1 Carbine SOPMOD Program (Program Manager and engineering activity), the Carl Gustaf Recoilless Rifle (primary engineering support activity for the program manager located at the US Army Armament Research, Development and Engineering Center), and numerous rapid response sniper support efforts (weapons, ammunition, personnel protection vests) and other mobilization support efforts. The decision by USSOCOM to utilize the Navy's Small Arms Technical Capability as a primary source of programmatic and engineering support has had and will continue to have significant impacts on both workload and acquisition levels.

8. REMAINING TENANTS

A. Defense Finance & Accounting Service Cleveland 28.0 workyears

Mission: Provide effective and efficient finance and accounting services during times of peace and conflict.

B. Defense Reutilization & Marketing Office 20.0 workyears

Mission: Provides for the receipt, segregation, inspection, and storage of excess and scrap material turned in by all organizations at the Crane Site and other organizations in this geographical area. Disposes of property through reutilization, transfer, donation, and sale. Provides technical assistance to the generating activities on proper disposal methods. Provides for the demilitarization of small arms and various other ordnance items. Average yearly receipts: 30,000 line items, 20 million pounds of scrap material.

C. Explosive Ordnance Disposal Group 2 Detachment 5.0 workyears

Mission: Provides Crane Division the capability for surface and underwater detection, identification, rendering safe, recovery, field and laboratory evaluation, and disposal of explosive ordnance which constitutes a hazard to operations, installations, personnel or material. The mission includes the rendering safe, and/or disposal of any ordnance which has intentionally or inadvertently become hazardous by damage or deterioration when the disposal is beyond the capabilities of personnel normally assigned the responsibility for routine disposition. EOD assistance and/or advice to civil authorities may be provided upon request if the service is in the interest of public safety.

D. Customer Service Branch Personnel Support Activity Detachment Indianapolis 2.0 workyears

Mission: Provides passenger transportation and military service record management.

E. Engineering Field Activity Contracts Office, Crane, IN
18.0 workyears

Mission: Provides pre-award and post-award contract management for construction, facility support, and architect/engineer contracts for Crane, assigned tenants and the following Reserve Centers: Evansville, IN, Terre Haute, IN, St. Louis, MO, Cape Girardeau, MO, Danville, IL, Decatur, IL, and Springfield, IL.

F. Defense Commissary Agency
6.0 workyears

Mission: Enhances the quality of Navy life by responding to customer demand for food and household products at significant overall savings in a convenient shopping environment.

G. Navy Exchange Detachment
1.0 workyear

Mission: Enhances the quality of Navy life by responding to customer demand for food and household products at significant overall savings in a convenient shopping environment.

H. Naval Criminal Investigative Service Resident Unit
1.0 workyear

Mission: Conducts criminal and security investigations encompassing all felony crimes under the Uniformed Code of Military Justice and those property crimes with a loss value greater than \$500. Actively involved with criminal, fraud, and counterintelligence investigative support to Crane and maintains liaison with appropriate local and federal law enforcement agencies throughout southern Indiana.

I. Naval Security Group Detachment
54.0 workyears

Mission: Performs duties pertaining to the storage and retrieval of information and material in support of Naval Security Group and other Navy and DoD elements. Includes maintaining and operating the Naval Security Group Command Central Depository for archival materials and to provide storage of certain records for other Navy and DOD elements.

J. U. S. Coast Guard Small Arms Repair Facility
4.0 workyears

Mission: Responsible for the depot level maintenance/repair of all Coast Guard owned small arms and equipment. Maintains an adequate supply of parts for depot maintenance and support of district armories. Provides Code "A" weapons to all Coast Guard units and provides weapons and support to the Coast Guard rifle and pistol teams.

9. OVERALL MISSION

A. CRANE MISSION - The Crane mission is to provide responsive engineering and industrial base support for weapons systems, subsystems and components. On Crane's nearly 100 square mile, rural and midwestern location, we have combined: skilled people; unique and capable facilities; product knowledge; and the ability to integrate engineering with "hands on" industrial processes; to provide the broadest, deepest and most advanced industrial base capability in the Navy. In summary:

NAVY CIVILIANS - CRANE SITE

Civ. FTP - 3500, Scientists/engrs/tech 1878, Military 32
Total Wkyrs - 3990, Dir/Indir ratio 65.3%, Business Base \$464.6M

TENANTS - CRANE SITE

Activities: Crane Army Ammunition Activity
Engineering Field Activity Contracts Office
Navy Exchange Detachment
Defense Commissary Agency
Naval Security Group Detachment
Explosive Ordnance Disposal Group 2 Detachment
Naval Criminal Investigative Service
Customer Service Branch, Personnel Support Activity
Detachment Indianapolis
U. S. Coast Guard Small Arms Repair Facility
Defense Finance & Accounting Services Cleveland
Defense Reutilization & Marketing Office

Total Wkyrs - 717 Civilians, 75 Military

CUSTOMERS: Crane site supports the Navy across all Warfare Centers. Navy customers include NAVSEA, NAVAIR, DRPM, PEO's, SPECWAR, Labs, ASO, SPCC). Other customers are the Coast Guard, Army, Airforce, Marine Corp, FMS, NASA, FAA and Private Industry.

NAVY CIVILIANS - LOUISVILLE SITE

Civ. FTP - 2101, Scientists/engrs/tech 1732, Military 13

Total Wkys - 2561, Dir/Indir ratio 61.5%, Business Base \$224.9M

TENANTS - LOUISVILLE SITE

Activities: Defense Printing Service Branch Office
Defense Finance and Accounting Service
Engineering Field Activity Contracts Office
Naval Criminal Investigative Service
Customer Service Branch, Personnel Support Activity
Detachment Indianapolis
Naval Phalanx Training Unit

Total Wkys - 41 Civilians, 1 Military

CUSTOMERS: Louisville Site Navy customers include NAVSEA, NAVAIR, DRPM, PEO's, SPCC. Other customers are Army, Marine Corps, Air Force, DoD and Private Industry

B. MISSION EXECUTION - The Crane mission is accomplished by means of a unique synergy created by the interweaving of co-located facilities and people experienced in electronic, mechanical, and ordnance disciplines.

1) **CO-LOCATED TECHNICAL CAPABILITIES** - Our principal areas of expertise are managed and described in terms of the following seventeen Technical Capabilities.

ENERGETICS TC's

- PYROTECHNICS
- SMALL ARMS
- CONVENTIONAL AMMUNITION ENGINEERING

MECHANICAL TC's

Louisville, KY site

- NAVAL GUN WEAPONS
- SURFACE MISSILE SYSTEMS
- MECHANICAL MANF.
- MANAGEMENT NAVAL DRAWINGS
- SHIPBOARD PHYSICAL SECURITY

ELECTRONICS TC's

- ELECTRONIC WARFARE
- MICROELECTRONIC TECHNOLOGY
- ELECTRONIC MODULE TEST AND REPAIR
- MICROWAVE COMPONENTS
- ELECTROCHEMICAL POWER SYSTEMS
- ACOUSTIC SENSORS
- NIGHT VISION/ELECTRO-OPTICS
- MINE COUNTERMEASURES
- RADAR

2) **CO-LOCATED FUNCTIONS** - Many of the functions performed at the Crane Division, Naval Surface Warfare Center **require access to other facilities and capabilities co-located on the base in order to accomplish their missions.** These include:

- Environmental simulation facilities such as humidity, temperature cycling, vibration, shock, altitude, sun/rain, sand/dust, salt spray, jolt, and jumble;
- X-ray facilities including real-time capability;
- Ordnance materials analysis lab;
- Cable engineering, repair and manufacturing support;
- Battery engineering and test support;
- Failure Analysis of components;
- Acquisition (contracting) of repair parts, complete equipment, and support materials and equipment;
- Firing Ranges and Range Support for Lasers and/or Weapon Sights/Fire Control Testing;
- Equipment Calibration Support;
- Defense Reutilization and Marketing Office for recycling and disposal of test and analysis samples.

3) **CO-LOCATED WITH ARMY TENANT** - The Crane Division is a unique Navy activity in that significant Single Manager for Conventional Ammunition (SMCA) production is performed by CAAA, the Army tenant, located at Crane. **Fifty-eight percent of CAAA's ordnance magazine storage (1.9 million square feet) contains Navy/Marine Corps Ammunition assets.** Co-location of the Program Management and engineering functions with a major DOD ammunition production, storage, maintenance and disposal activity provides rapid response capability throughout the life cycle to major regional conflicts such as Operation Desert Shield/Desert Storm.

C. FUTURE MISSION: The future mission of Crane will be the integration of the DOD requirements for electronic/mechanical/energetic products with the private commercial industrial base supplier. This future mission is enhanced not only by the co-location benefits of the current mission but by our remote midwestern location. **The nearly 100 square mile, remote site and unencumbered location with no encroachment considerations provide the ideal place to develop and test ordnance and pyrotechnics which require high safety measures under environmental compliance regulations.**

1) **REMOTE LOCATION** - Although Crane Division is set in the rolling hills of southwestern Indiana, it is conveniently located with respect to major urban areas, with good access to rail, highway, and air transportation. **With nearly 100 square miles inside its boundaries, Crane has the space to locate several unique facilities within a single organization with significant unused area remaining for growth.**

2) **ENVIRONMENTAL COMPLIANCE** - From an environmental standpoint, the geographic location of this facility is key to its successful operation and the continuation of missions which other facilities are being forced to close. Crane Division is remote, with little encroachment from residential or private industry. The facility occupies land which, due to the topography and soil types, is of little value for farming, residential development, or private industry.

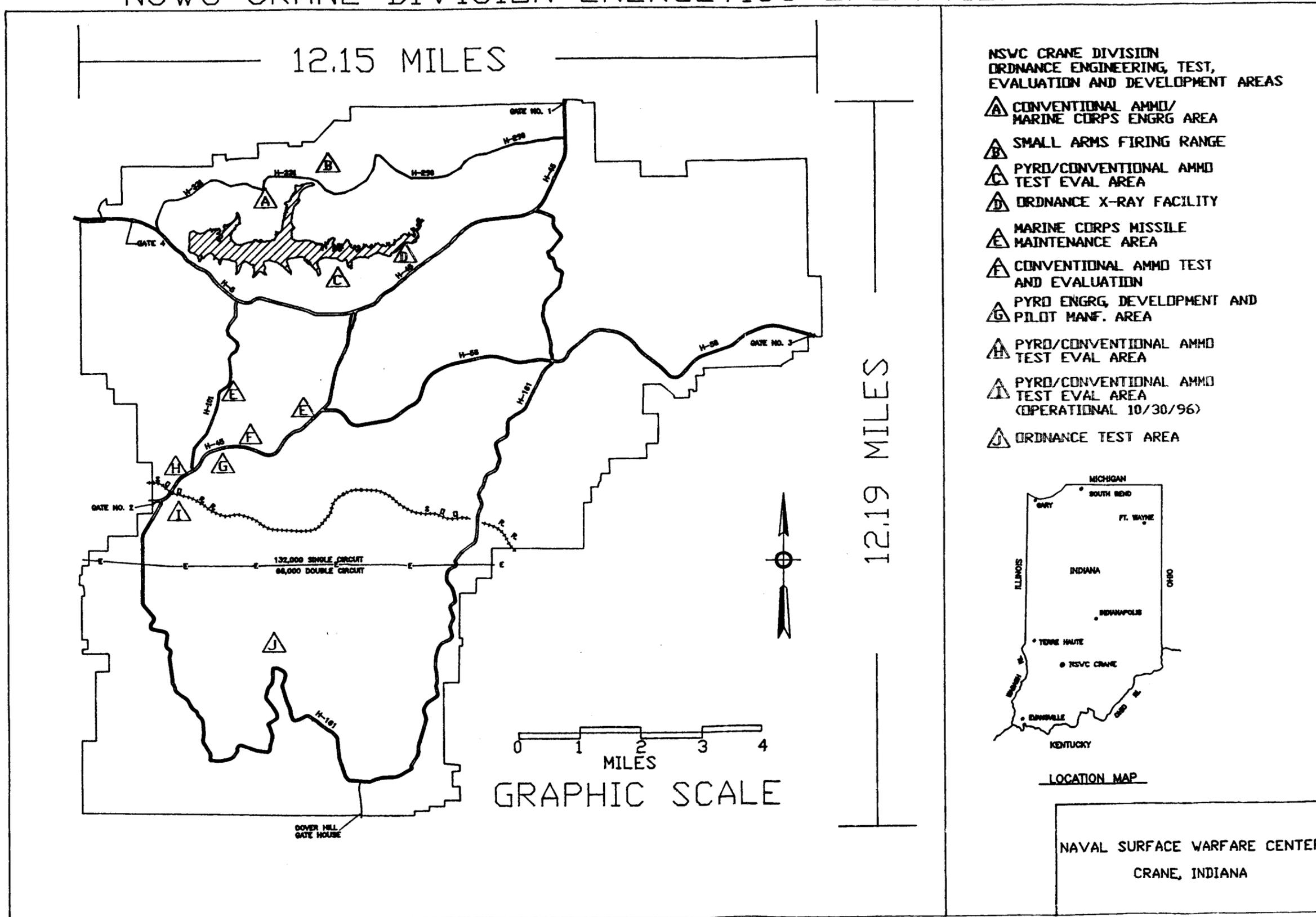
EPA Region V and the Indiana Department of Environmental Management work well with the people and operations at Crane. Furthermore, the communities surrounding the Division are extremely supportive of the facility and its programs. In other words, there is almost no antagonistic opposition from the public or regulators to environmental permits and related activities. This favorable relationship is extraordinary among Department of Defense facilities.

Crane Division is also located in an attainment area for criteria pollutants under paragraph 107 of the Clean Air Act. The nearly 64,000 acres which the base occupies provide an excellent natural laboratory in which to conduct studies to determine and monitor the impacts and risks to the environment associated with mission activities. A considerable amount of money has been spent doing environmental assessment and installing monitoring equipment (e.g. over 400 groundwater monitoring wells). All of this combines to allow a wide diversity of operations rarely available anywhere else. The location of Crane Division ideally situates it for different types of test, demolition, and firing ranges, as well as manufacturing and munitions storage.

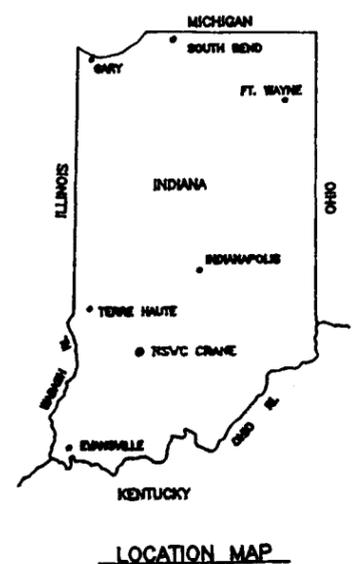
3) **CENTRAL LOCATION** - Crane Division's central geographic location makes travel to either coast relatively equally convenient. Suppliers are dispersed throughout the country and travel to their locations is also made with greater ease. This results in lower average time and costs for personnel travel and material shipments. This advantage, combined with the on-site synergetic effects previously discussed, present customers with the opportunity of utilizing a maintenance and engineering resource that can provide superior cost controlled services and project them throughout the country with similar ease.

For example, 75 percent of ammunition component and end item production by both industry and government is within 750 miles (38 percent within 500 miles) of Crane Division, allowing almost same-day response to resolve on-site production related problems. The maintenance of product expertise is the only means available to assure safe, reliable and effective ammunition to satisfy Fleet requirements.

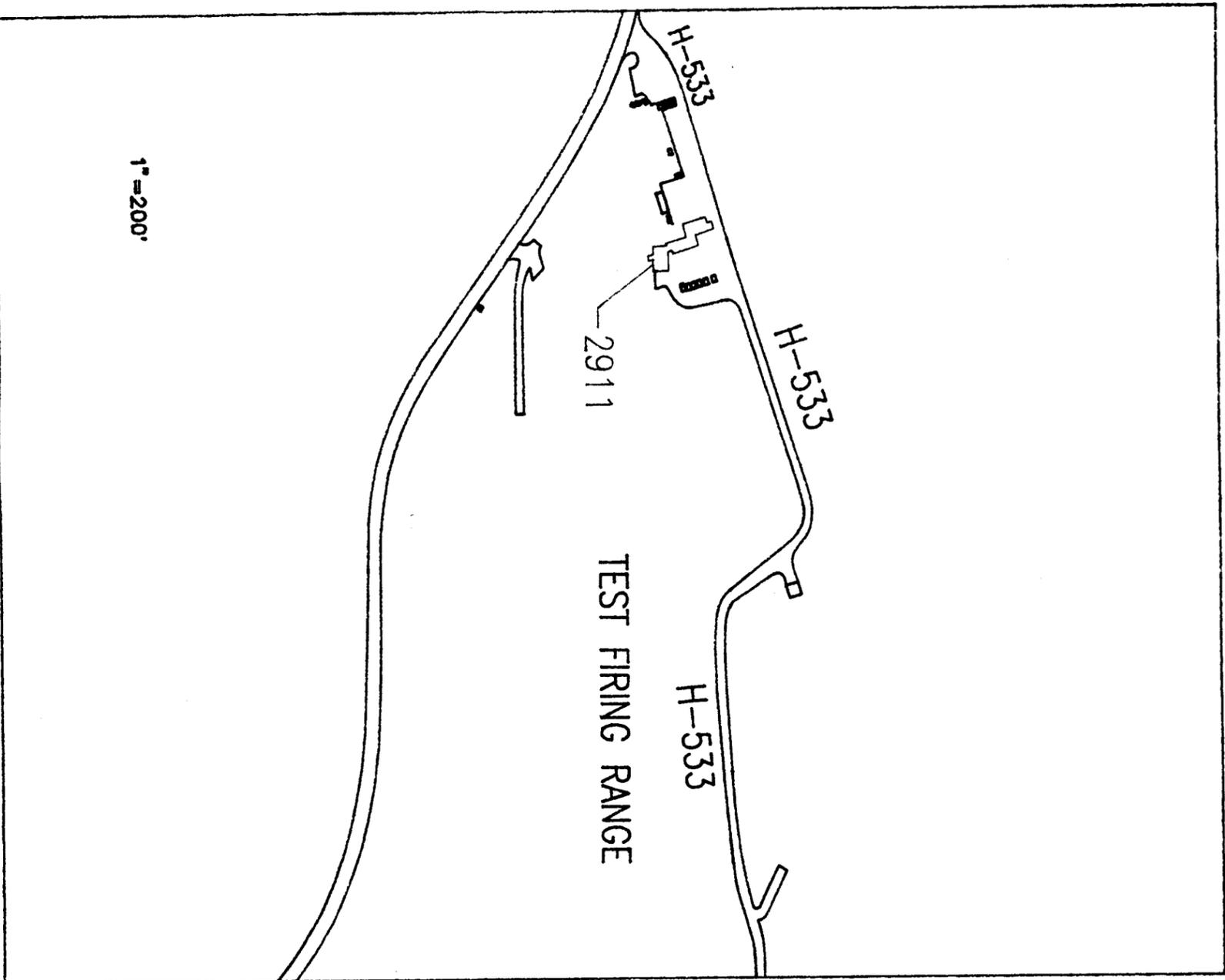
NSWC CRANE DIVISION ENERGETICS OPERATIONS SITES



- NSWC CRANE DIVISION
ORDNANCE ENGINEERING, TEST,
EVALUATION AND DEVELOPMENT AREAS
- △ CONVENTIONAL AMMO/
MARINE CORPS ENGRG AREA
 - △ SMALL ARMS FIRING RANGE
 - △ PYRO/CONVENTIONAL AMMO
TEST EVAL AREA
 - △ ORDNANCE X-RAY FACILITY
 - △ MARINE CORPS MISSILE
MAINTENANCE AREA
 - △ CONVENTIONAL AMMO TEST
AND EVALUATION
 - △ PYRO ENGRG, DEVELOPMENT AND
PILOT MANF. AREA
 - △ PYRO/CONVENTIONAL AMMO
TEST EVAL AREA
 - △ PYRO/CONVENTIONAL AMMO
TEST EVAL AREA
(OPERATIONAL 10/30/96)
 - △ ORDNANCE TEST AREA

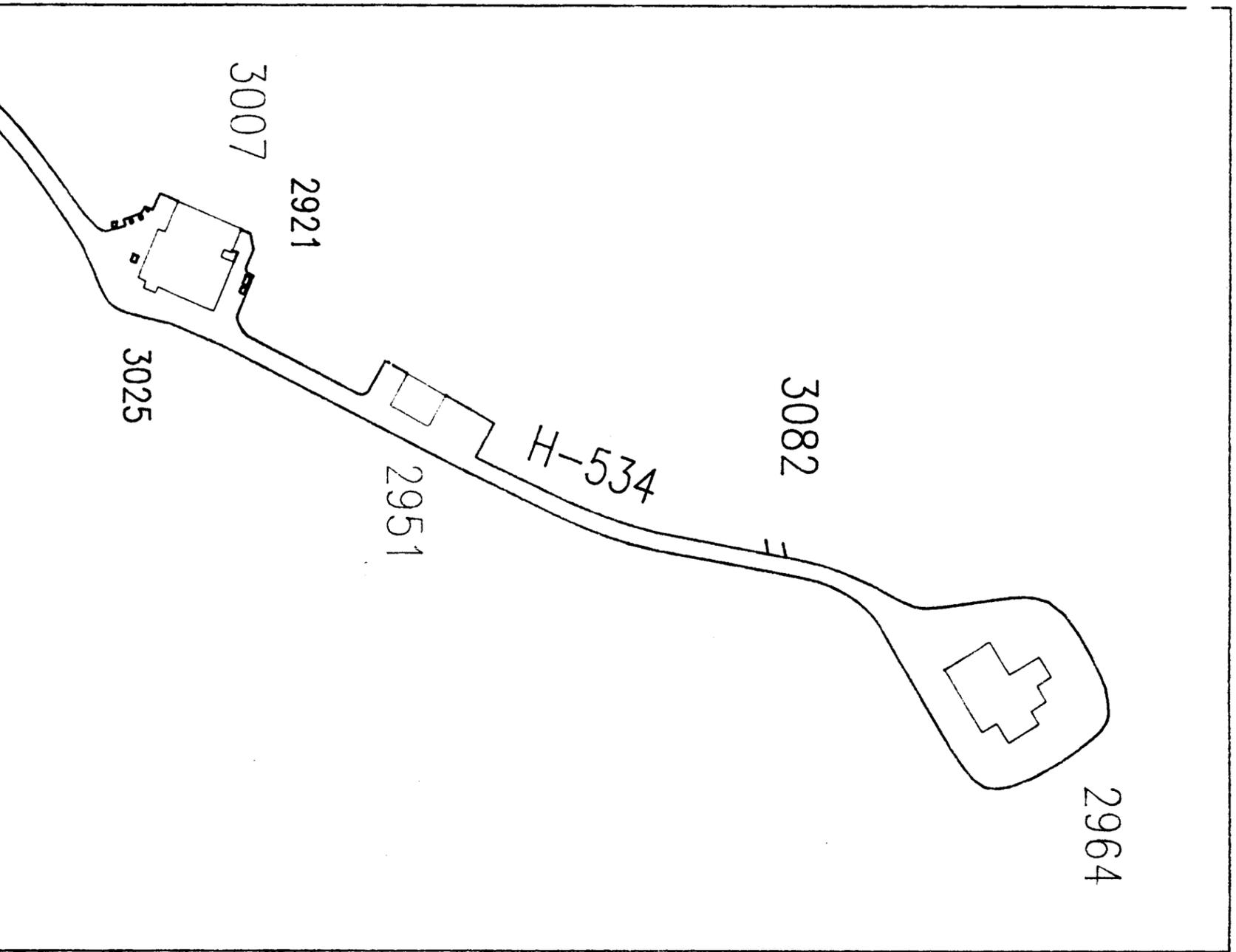


NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

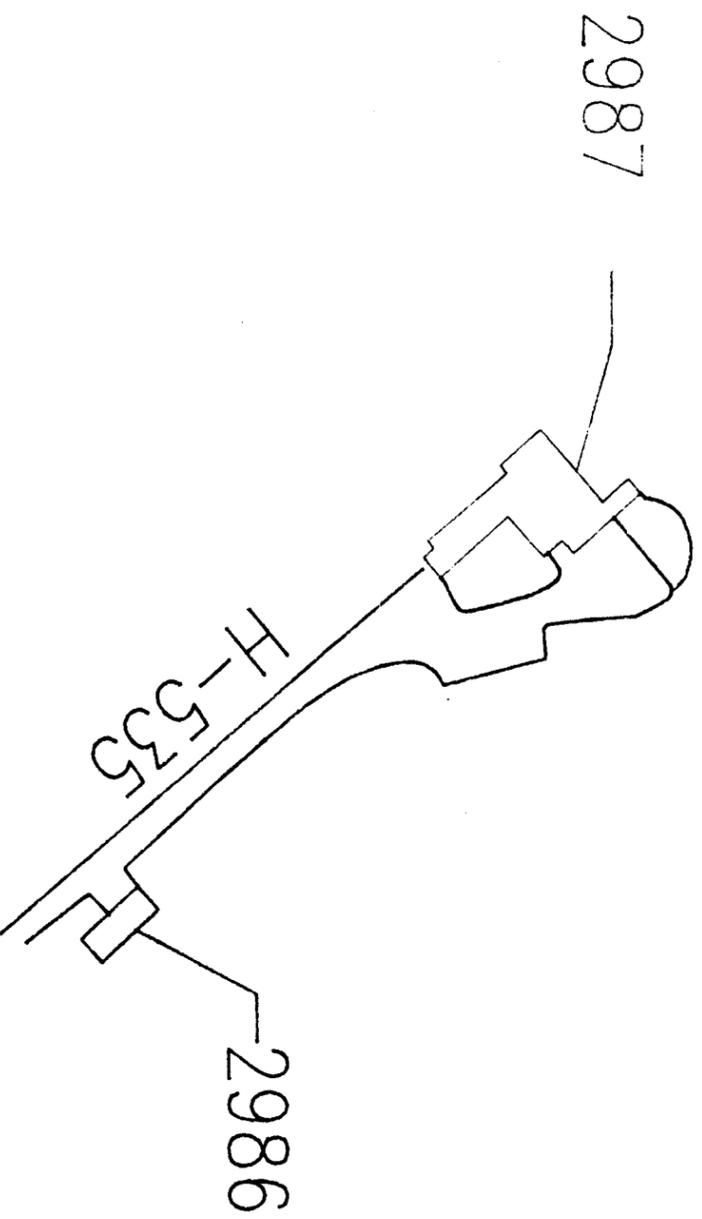


SMALL ARMS FIRING RANGE					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2911	Ord. T&E	1,928	Y	Y	235,000

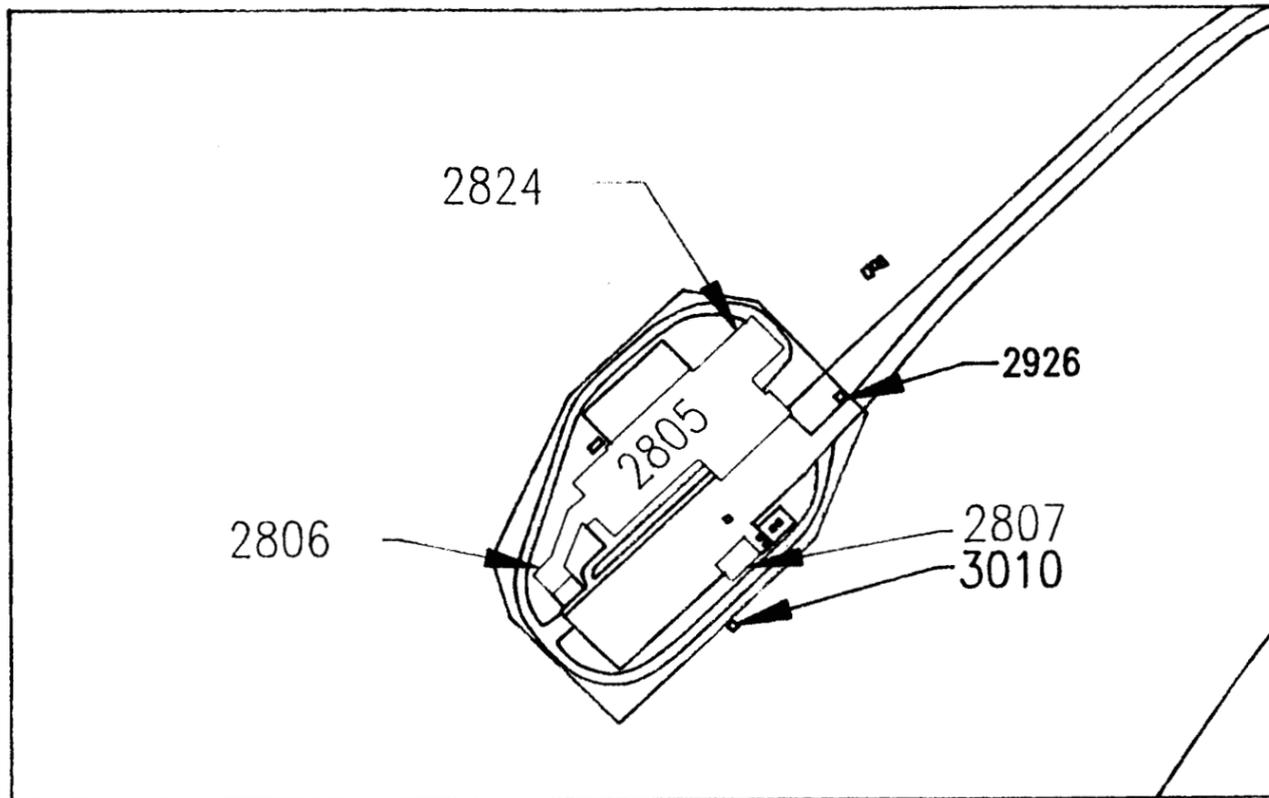
ATTACHMENT A, MAP B



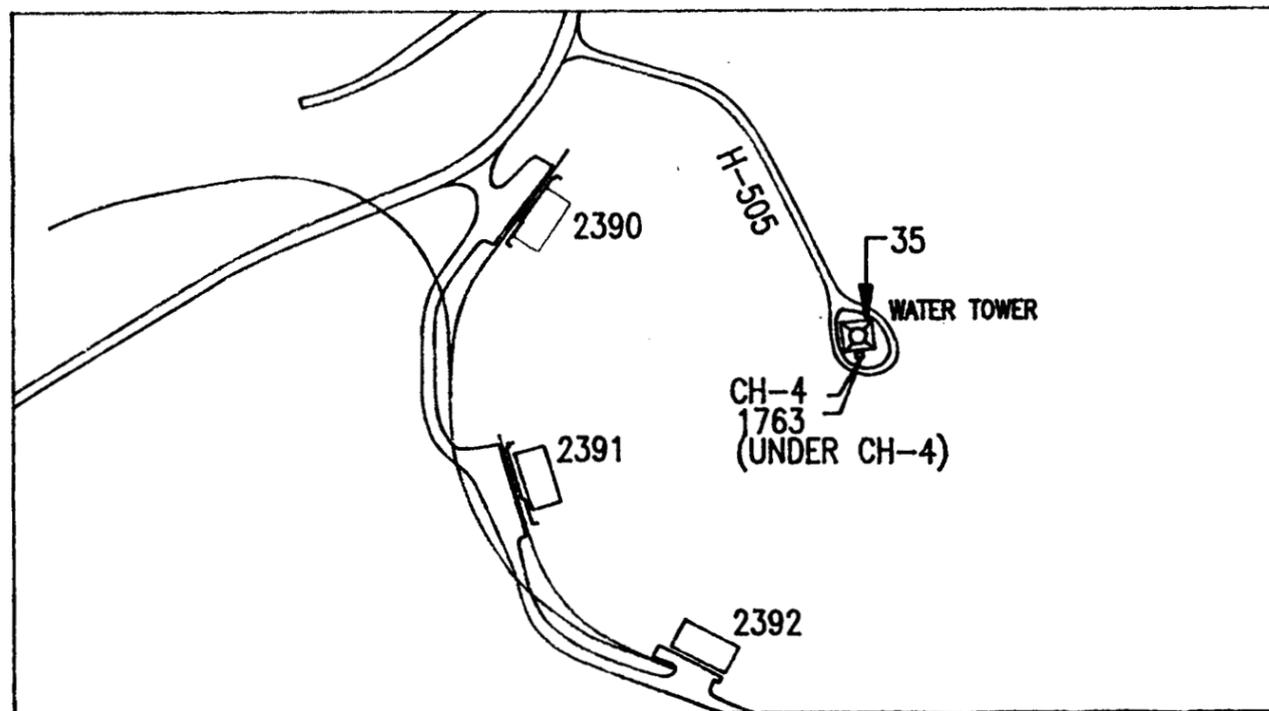
PYRO/CONVENTIONAL AMMUNITION TEST AND EVALUATION AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2964	Ord. T&E	7,744	Y	N	632,000
3082	Expl Storage	45	Y	N	12,000
2951	Ord. T&E	2,040	Y	N	160,000
2921	Ord. T&E	5,933	Y	N	574,000
3007	Ord. T&E	2,048	Y	N	64,000

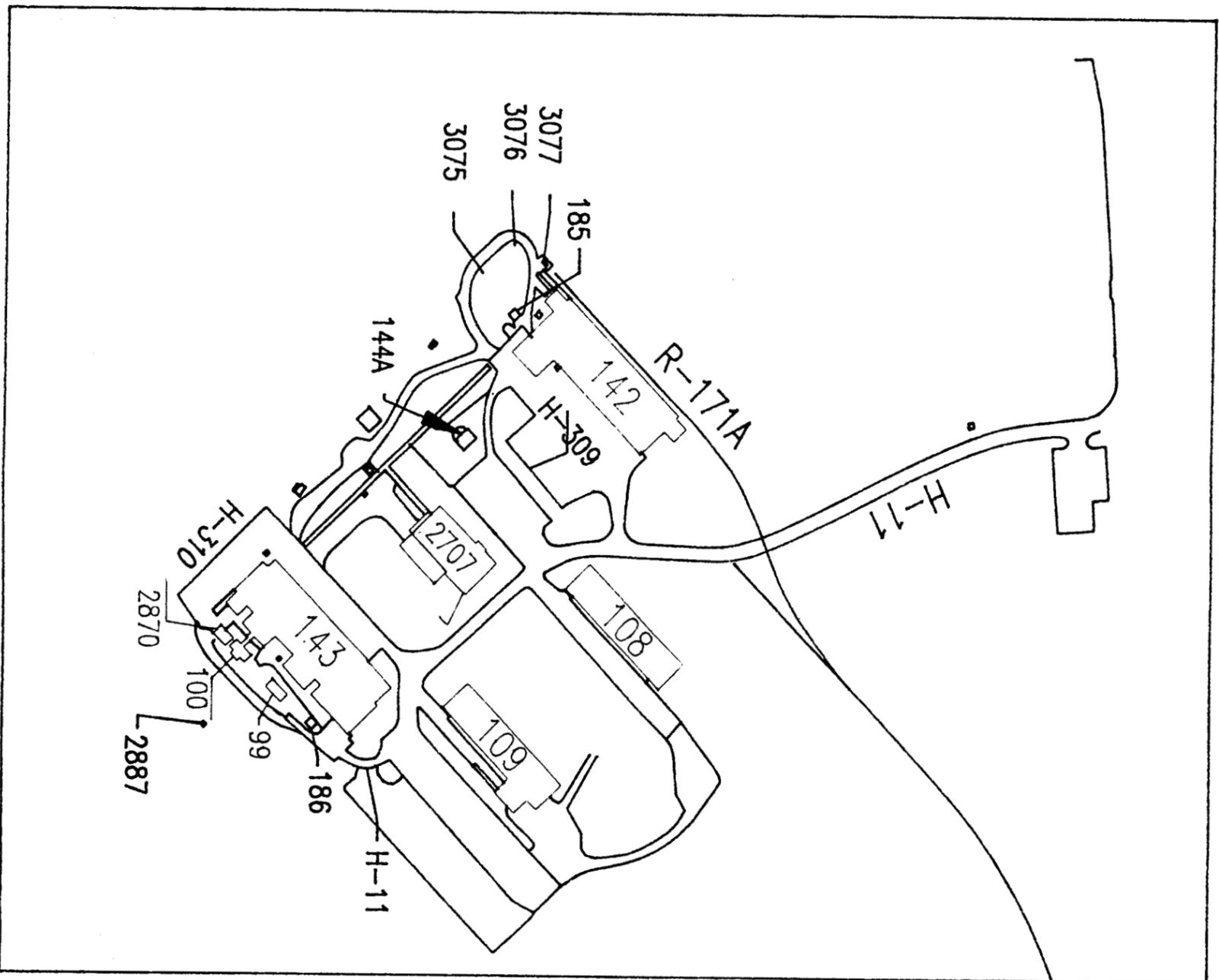


ORDNANCE X-RAY FACILITY					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2987	Ord. T&E	6,087	Y	Y	1,020,000
2986	Ord. T&E	1,040	Y	Y	115,000

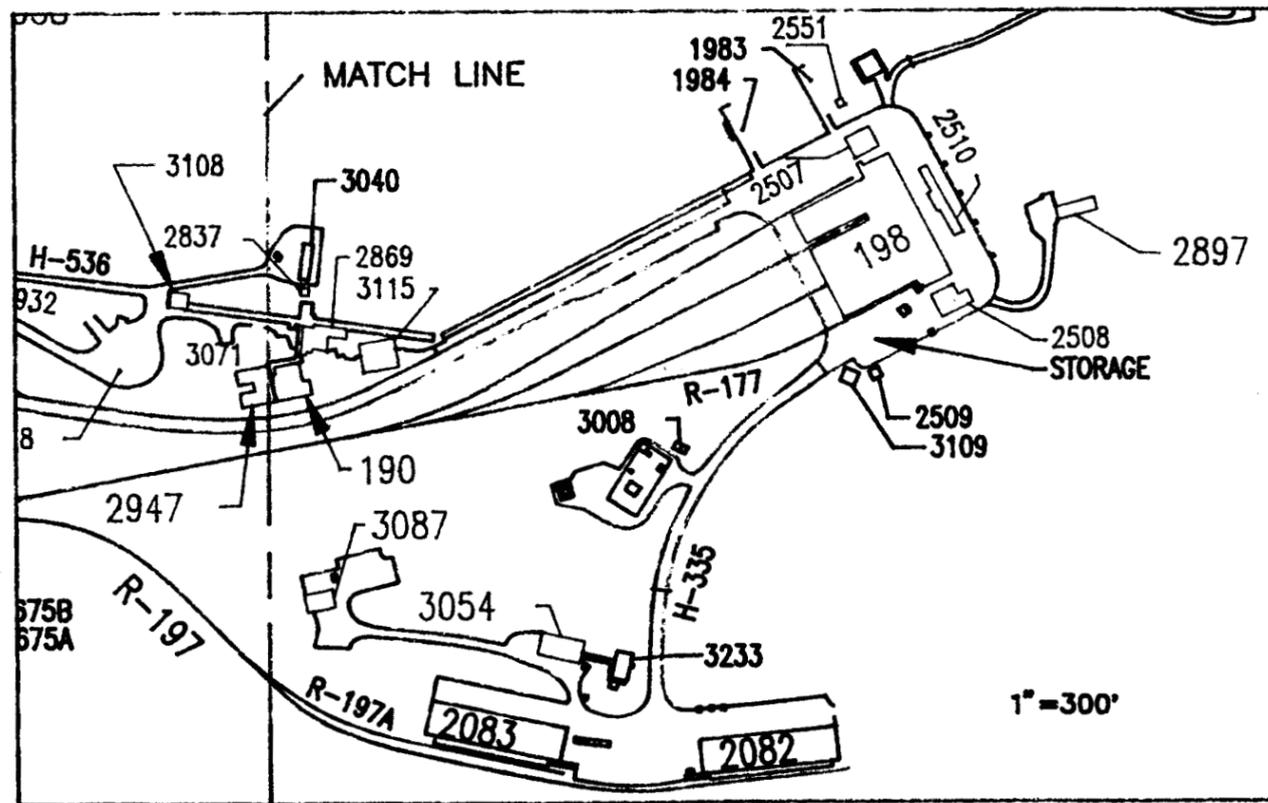
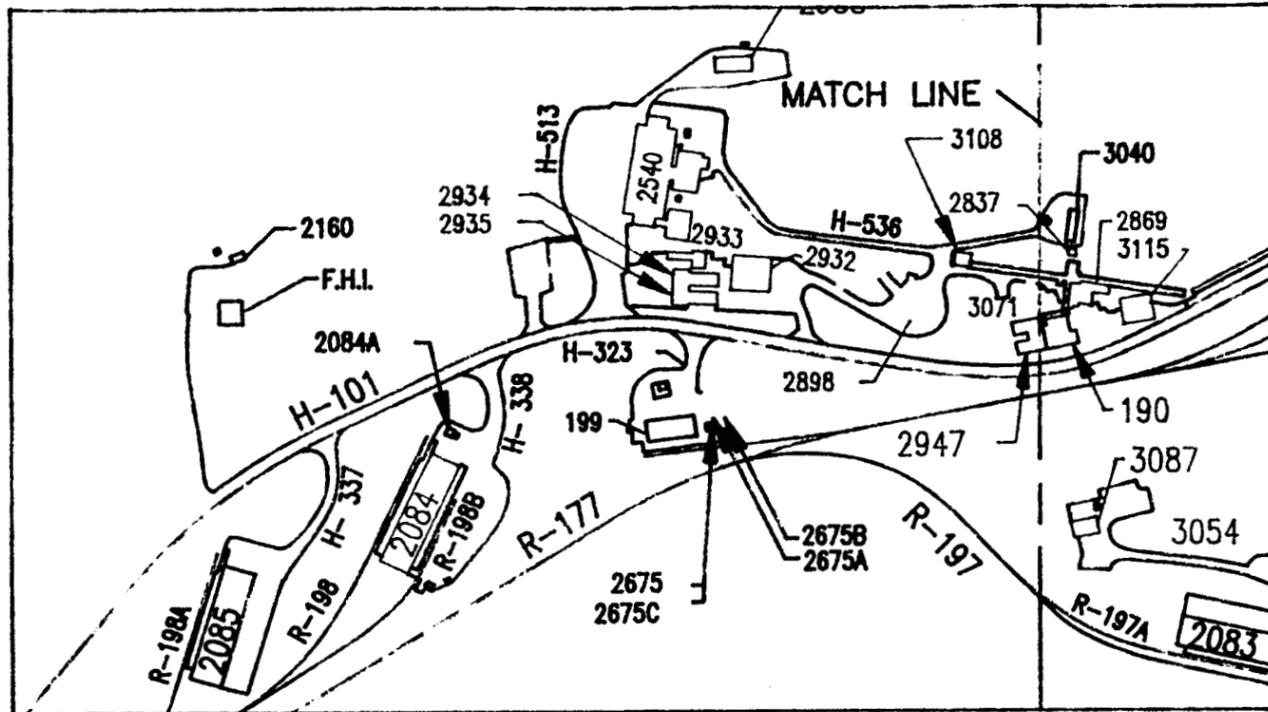


MARINE CORPS MISSILE MAINTENANCE AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2390	Ord. T&E	5,356	Y	Y	222,000
2805	Ord. T&E	19,714	Y	Y	2,537,000
2806	Ord. T&E	1,024	Y	Y	143,000
2807	Office	620	Y	N	110,000



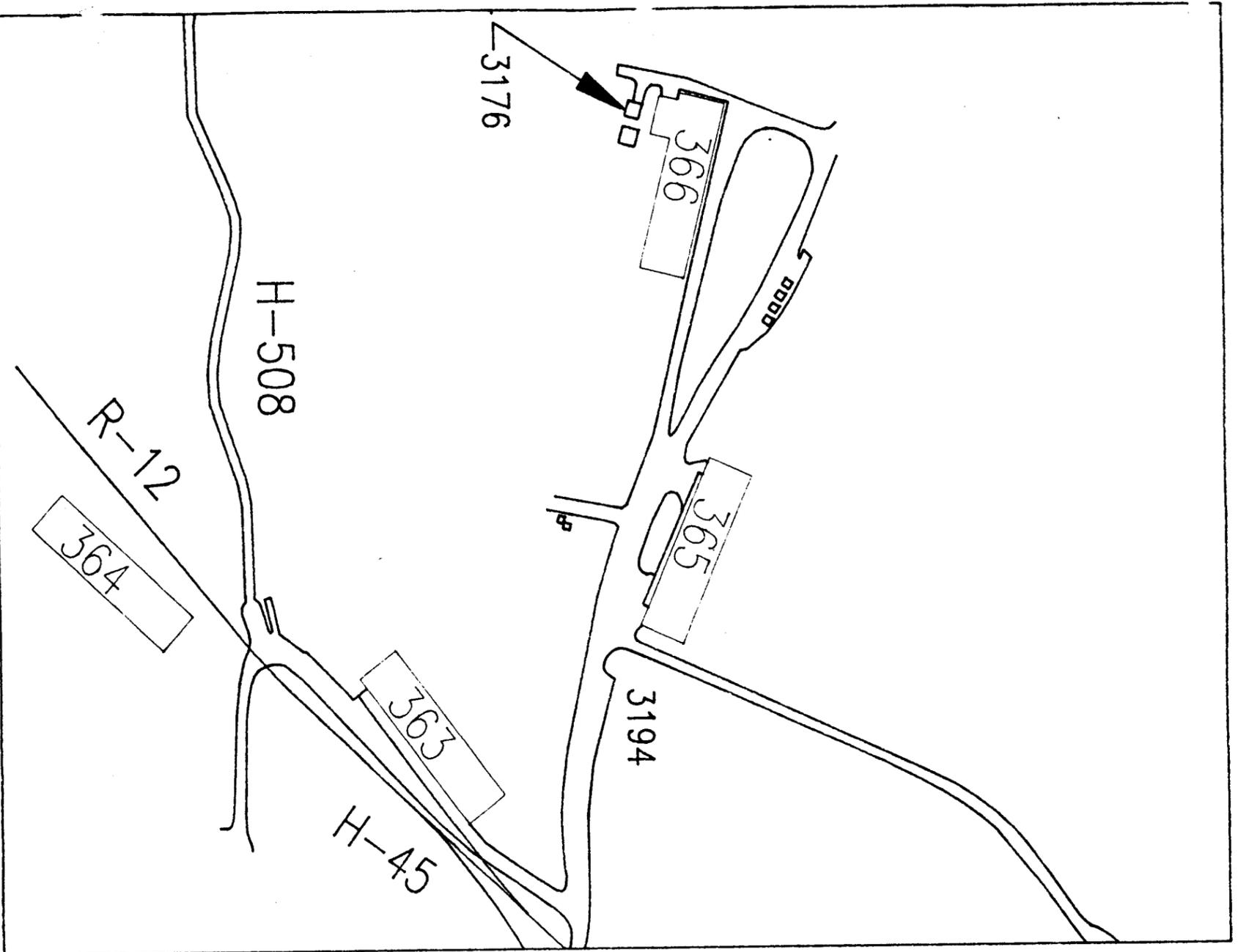


PYRO/CONVENTIONAL AMMUNITION TEST & EVALUATION AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Repl icate	Building Replacement Cost (CPV)
142	Ord. T&E	18,179	Y	Y	1,790,000
108	Office	10,167	Y	N	704,000
109	Ord. T&E	10,167	Y	Y	573,000
143	Office/Ord T&E	23,296	Y	Y	5,873,000
186	Inert Storage	178	Y	N	12,000
99	Expl Storage	403	Y	Y	33,000
100	Ord. T&E	403	Y	Y	33,000
2887	Tower	N/A	Y	N	3,000
2870	Ord. T&E	486	Y	Y	80,000
2707	Laboratory	9,062	Y	Y	809,000
3075	Expl Storage	45	Y	Y	15,000
3076	Expl Storage	45	Y	Y	15,000
3077	Expl Storage	45	Y	Y	15,000
185	Inert Storage	178	Y	N	12,000

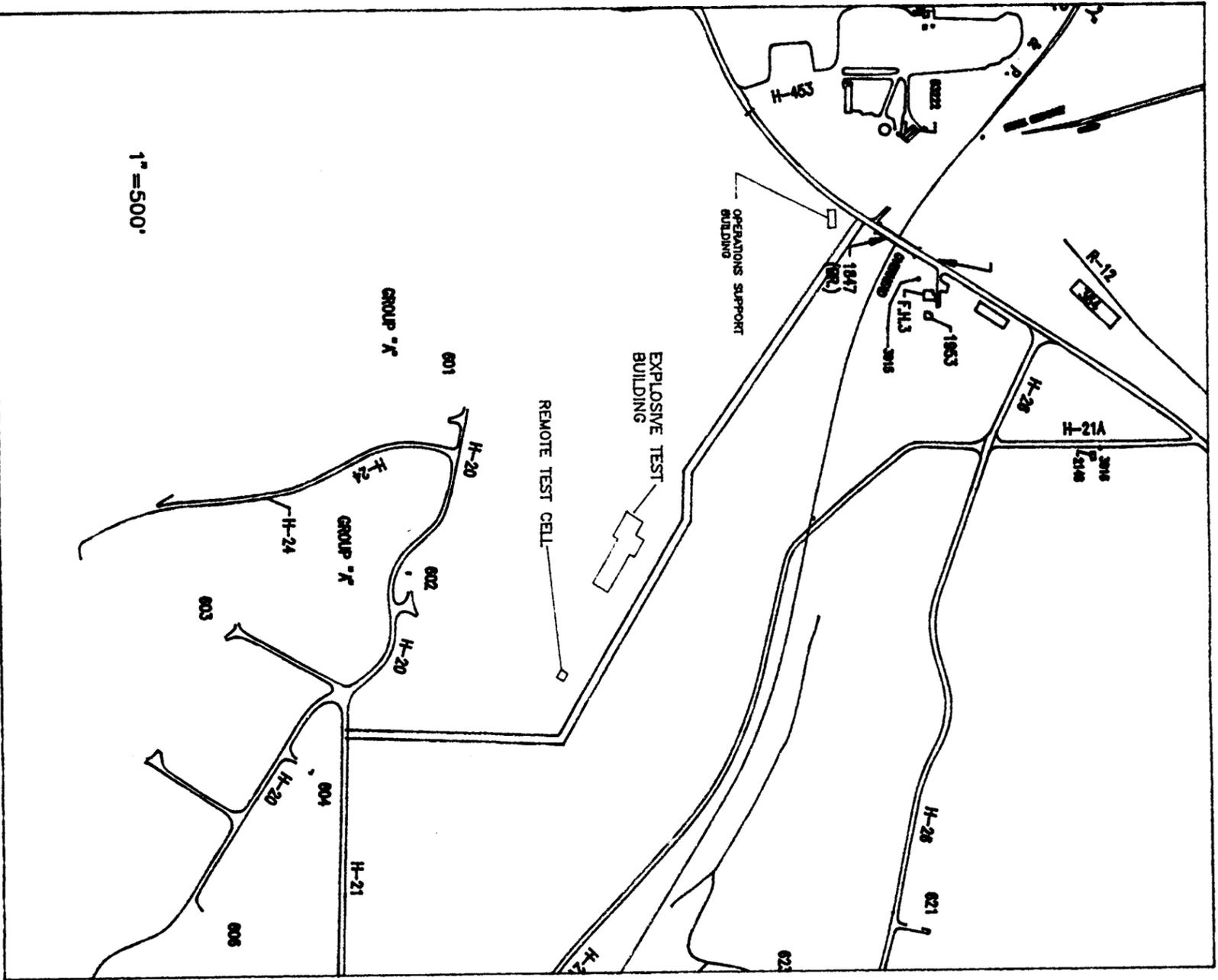


PYRO ENGINEERING, DEVELOPMENT, AND PILOT MANUFACTURING AREA

Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2540	Office	29,483	Y	N	3,189,000
2935	Office	3,548	Y	N	207,000
2932	Office	3,776	Y	N	59,000
2898	Ord. T&E	1,588	Y	Y	181,000
3108	Ord. T&E	460	Y	Y	42,000
2947	Laboratory	2,275	Y	Y	209,000
190	Ord. T&E	2,478	Y	Y	466,000
2837	Ord. T&E	144	Y	Y	51,000
2869	Ord. T&E	1,733	Y	Y	346,000
3071	Expl Storage	45	Y	Y	20,000
3115	Ord. T&E	2,120	Y	Y	147,000
1984	Expl Storage	611	Y	Y	62,000
1983	Expl Storage	611	Y	Y	53,000
2551	Ord. T&E	117	Y	Y	33,000
2507	Ord. T&E	1,889	Y	Y	749,000
2510	Ord. T&E	1,391	Y	Y	345,000
2897	Inert Storage	1,156	Y	N	25,000
198	Ord Production	24,686	Y	Y	6,123,000
2508	Ord. T&E	1,889	Y	Y	177,000
2509	Inert Storage	178	Y	N	13,000
3109	Inert Storage	441	Y	N	42,000
3008	Tower	N/A	Y	N	24,000
3054	Ord. T&E	2,048	Y	Y	221,000
3087	Ord. T&E	900	Y	Y	369,000
2084	Ord. T&E	10,167	Y	Y	503,000

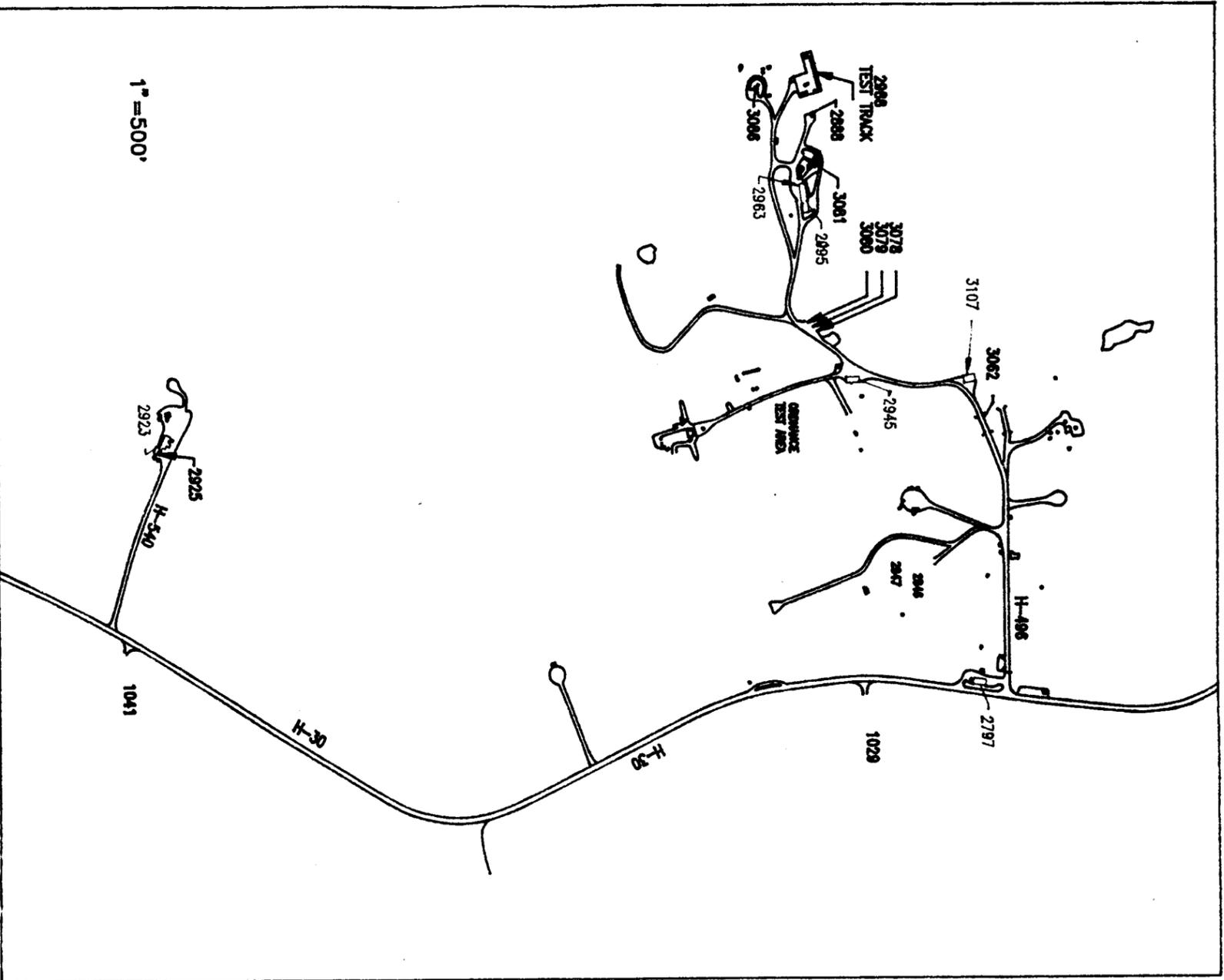


CONVENTIONAL AMMUNITION TEST AND EVALUATION AREA						
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)	
363	Ord. T&E	10,167	Y	Y	780,000	
364	Ord. T&E	10,661	Y	Y	562,000	
365	Ord. T&E	10,167	Y	Y	556,000	
366	Ord. T&E	10,167	Y	Y	628,000	
3176	Ord. T&E	256	Y	Y	9,000	



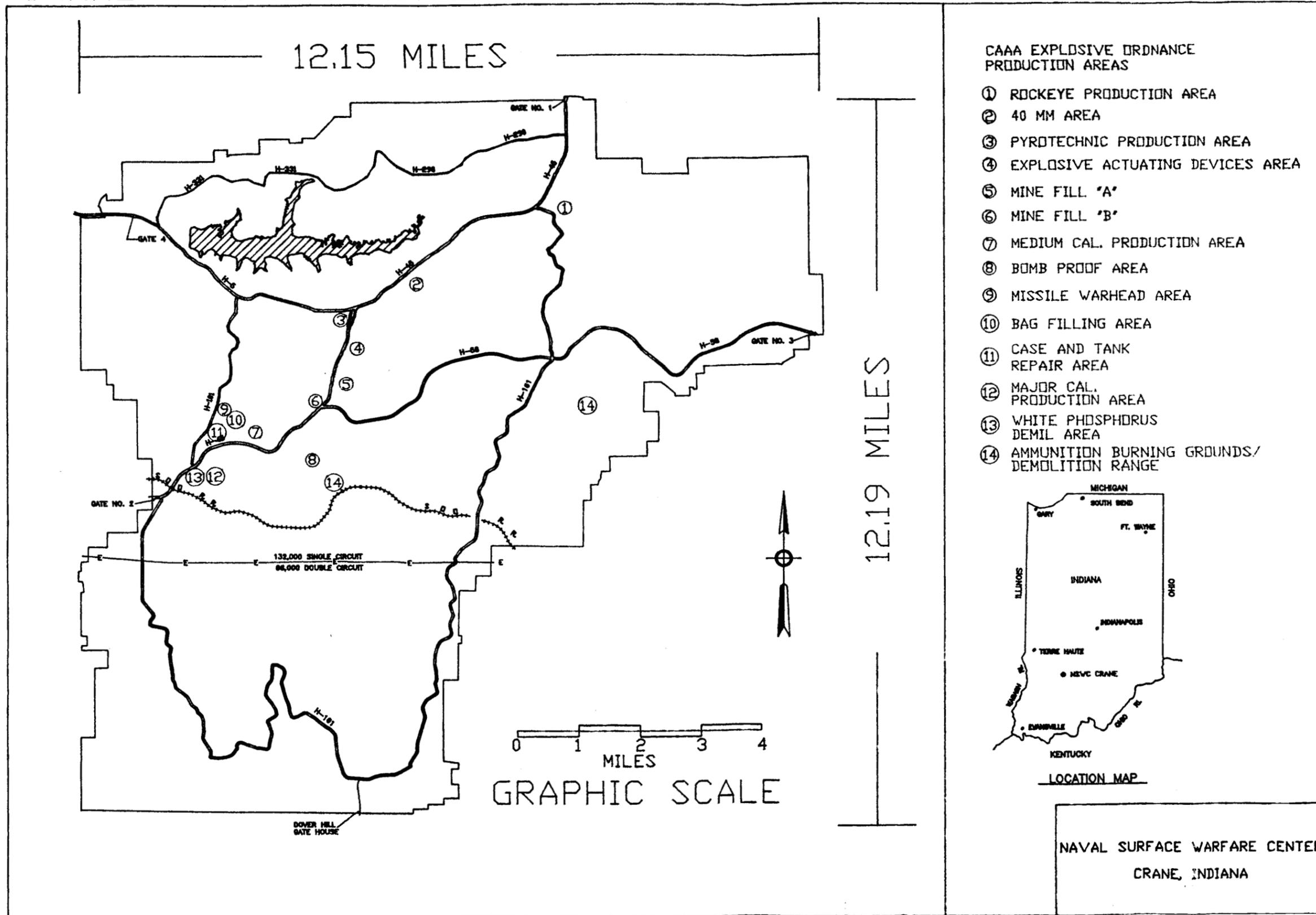
PYRO/CONVENTIONAL AMMUNITION TEST ANDEVALUATION AREA (OPERATIONAL 10/30/96)					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
	Office	7,830	Y	Y	978,000
	Ord. T&E	22,174	Y	Y	7,197,000
	Ord. T&E	1,800	Y	Y	225,000

ATTACHMENT A, MAP I



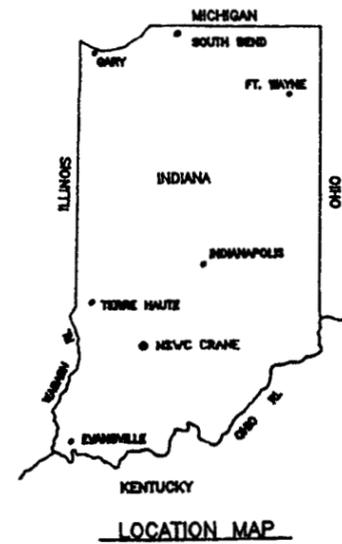
ORDNANCE TEST AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2797	Ord. T&E	960	Y	N	34,000
2846	Tower	N/A	Y	N	7,000
2847	Tower	N/A	Y	N	7,000
3107	Inert Storage	1,000	Y	Y	23,000
2945	Ord. T&E	960	Y	Y	47,000
3078	Expl Storage	45	Y	Y	18,000
3079	Expl Storage	45	Y	Y	18,000
3080	Expl Storage	45	Y	Y	18,000
2995	Ord. T&E	1,040	Y	Y	283,000
2963	Ord. T&E	960	Y	Y	31,000
3081	Expl Storage	45	Y	Y	18,000
2888	Ord. T&E	144	Y	Y	16,000
3086	Tower	N/A	Y	N	20,000
2923	Ord. T&E	960	Y	Y	91,000
2925	Ord. T&E	126	Y	Y	21,000

CRANE ARMY AMMUNITION ACTIVITY ENERGETICS OPERATIONS SITES

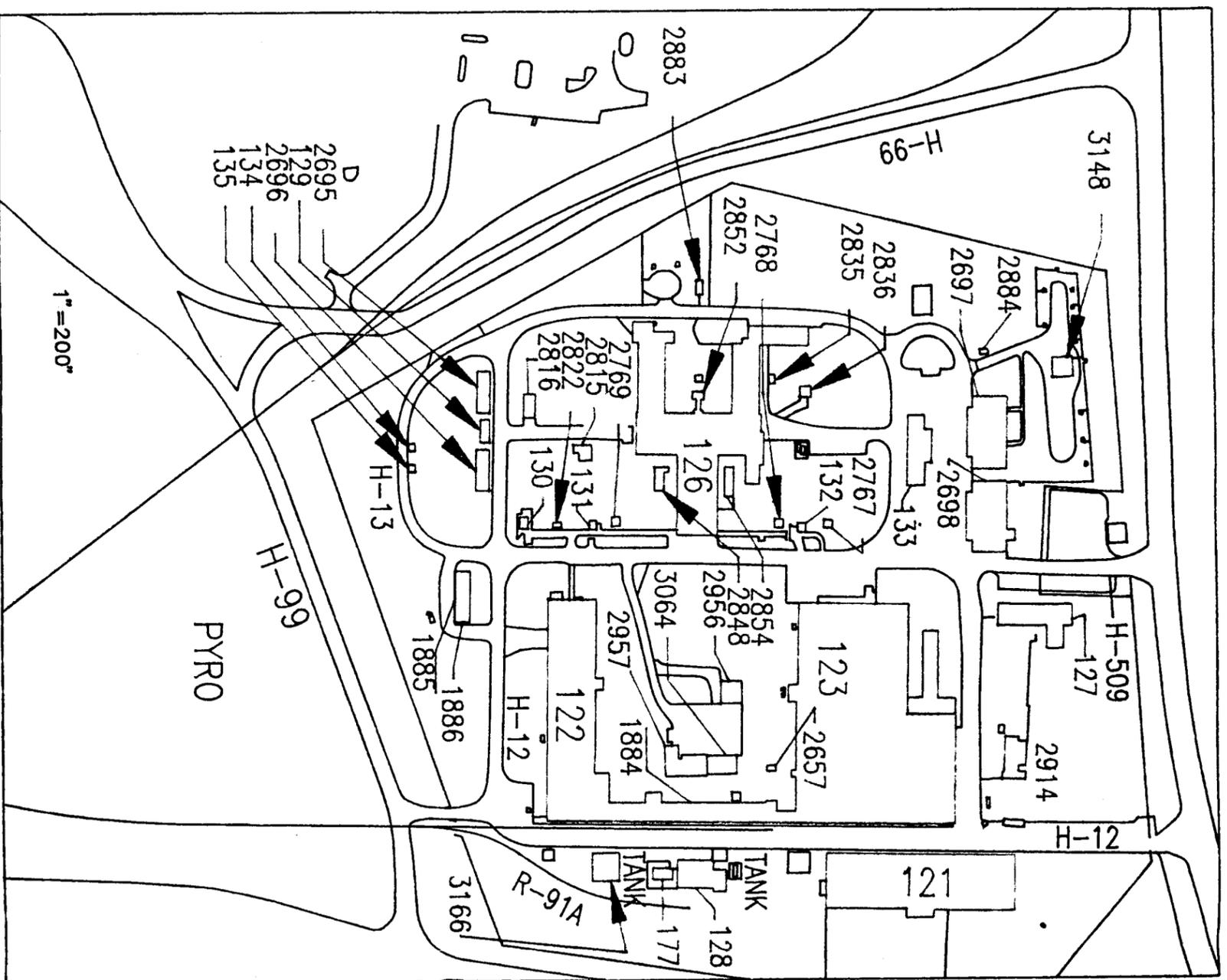


CAA EXPLOSIVE ORDNANCE PRODUCTION AREAS

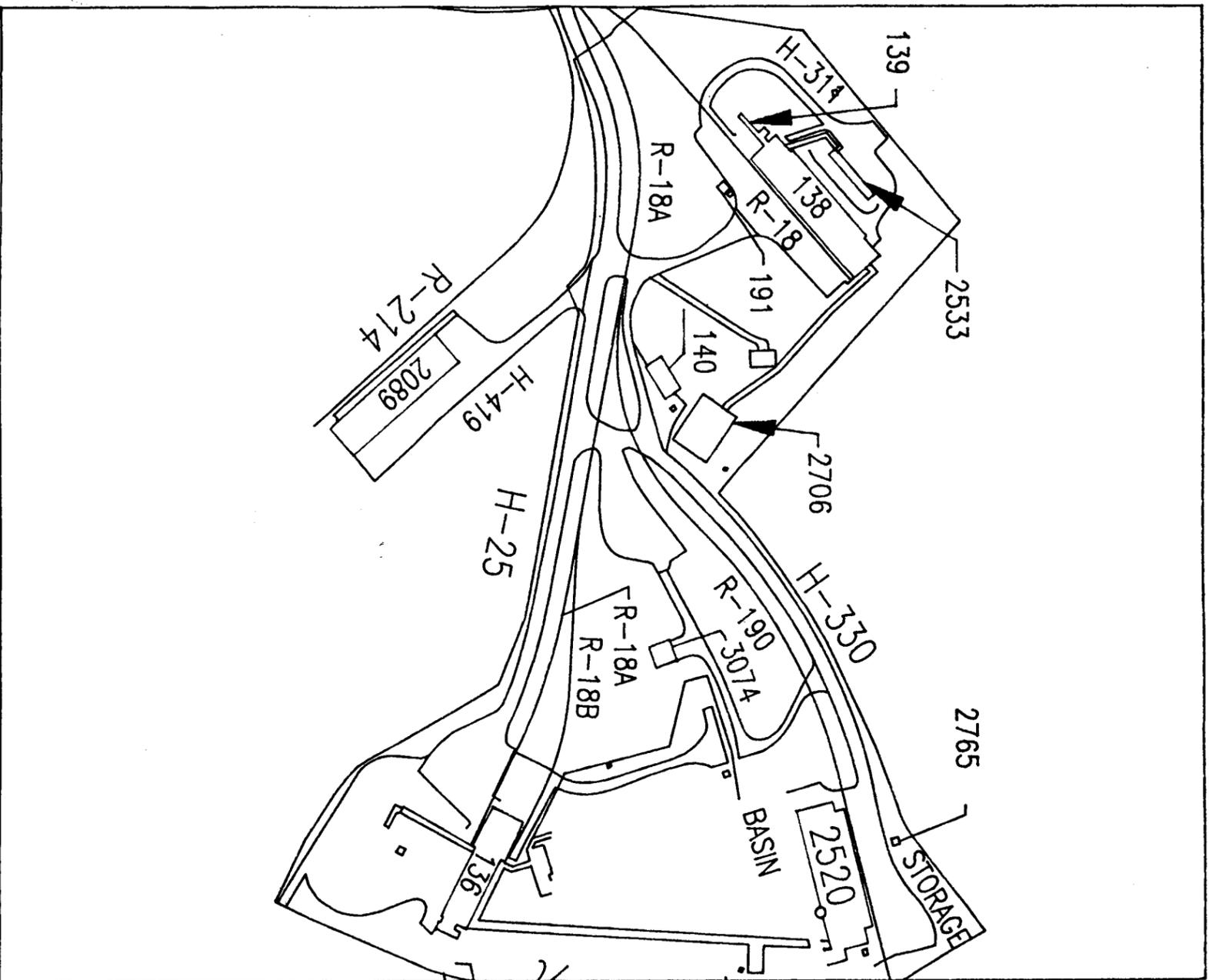
- ① ROCKEYE PRODUCTION AREA
- ② 40 MM AREA
- ③ PYROTECHNIC PRODUCTION AREA
- ④ EXPLOSIVE ACTUATING DEVICES AREA
- ⑤ MINE FILL 'A'
- ⑥ MINE FILL 'B'
- ⑦ MEDIUM CAL. PRODUCTION AREA
- ⑧ BOMB PROOF AREA
- ⑨ MISSILE WARHEAD AREA
- ⑩ BAG FILLING AREA
- ⑪ CASE AND TANK REPAIR AREA
- ⑫ MAJOR CAL. PRODUCTION AREA
- ⑬ WHITE PHOSPHORUS DEMIL AREA
- ⑭ AMMUNITION BURNING GROUNDS/DEMOLITION RANGE



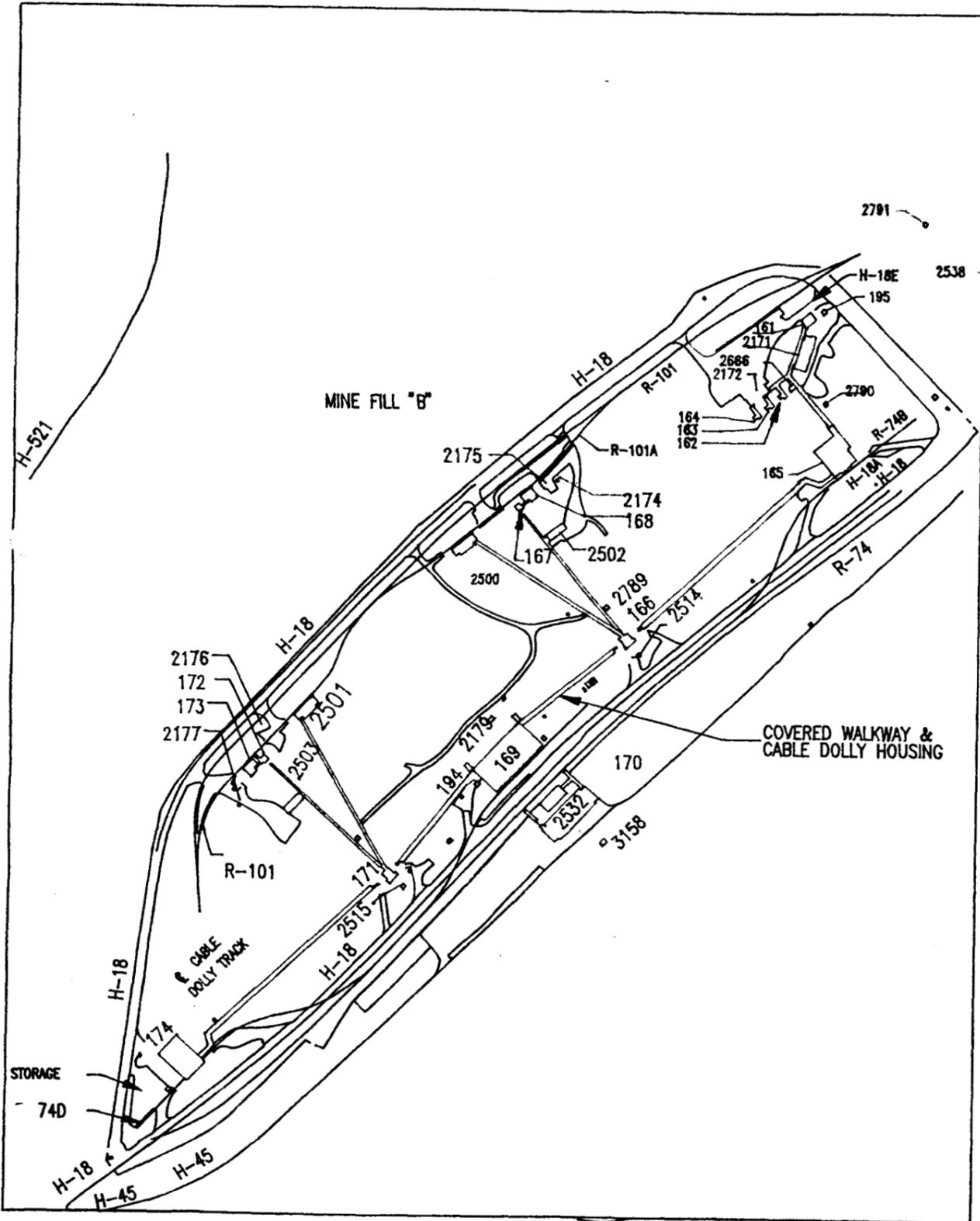
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA



PYROTECHNIC PRODUCTION AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
127	Ord. Production	4,338	Y	Y	711,000
2914	Inert Storage	1,026	Y	N	49,000
123	Ord. Production	64,511	Y	Y	2,499,000
2657	Expl Storage	54	Y	Y	8,000
1884	Ord. Production	4,800	Y	Y	643,000
122	Ord. Production	30,638	Y	Y	2,516,000
1886	Ord. Production	424	Y	Y	68,000
1885	Ord. Production	424	Y	Y	68,000
130	Ord. Production	267	Y	Y	139,000
131	Expl Storage	151	Y	Y	86,000
2848	Ord. Production	504	Y	Y	30,000
126	Ord. Production	38,437	Y	Y	8,853,000
2854	Ord. Production	504	Y	Y	56,000
2768	Inert Storage	196	Y	N	9,000
132	Expl Storage	151	Y	Y	68,000
2767	Inert Storage	196	Y	N	9,000
133	Ord. Production	2,784	Y	Y	455,000
2698	Ord. Production	5,125	Y	Y	957,000
2697	Ord. Production	5,125	Y	Y	584,000
2884	Inert Storage	84	Y	N	4,000
3148	Inert Storage	783	Y	N	173,000
2836	Inert Storage	140	Y	N	6,000
2852	Inert Storage	144	Y	N	7,000
2883	Inert Storage	84	Y	N	4,000
2769	Inert Storage	196	Y	N	9,000
2815	Inert Storage	458	Y	N	89,000
2822	Inert Storage	135	Y	N	9,000
2816	Inert Storage	642	Y	N	121,000
2695	Inert Storage	1,200	Y	N	88,000
129	Ord. Production	435	Y	Y	111,000
2696	Inert Storage	1,200	Y	N	88,000
134	Expl Storage	59	Y	Y	23,000
135	Expl Storage	59	Y	Y	23,000

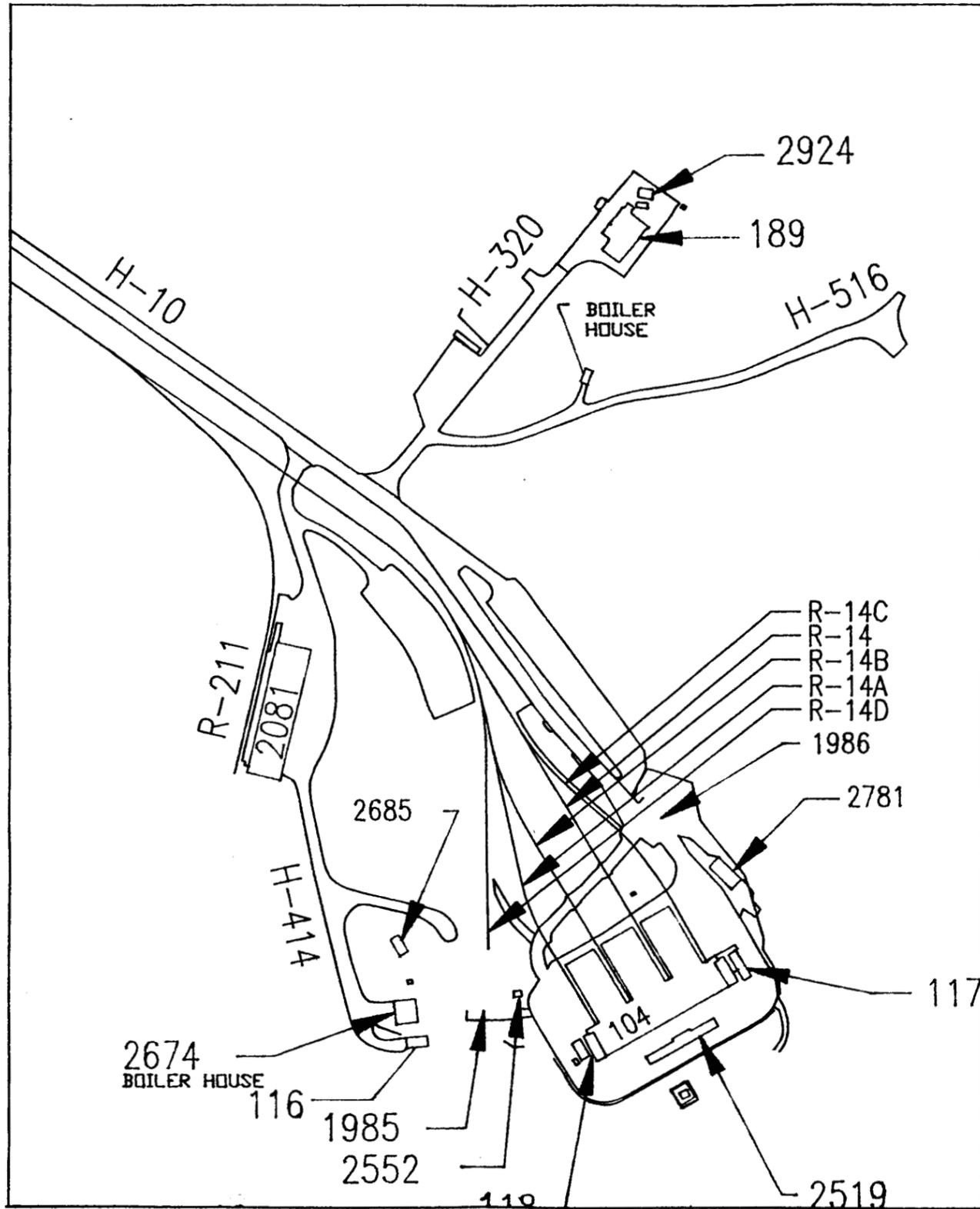


EXPLOSIVE ACTUATING DEVICES AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2533	Ord. Production	924	Y	Y	268,000
139	Expl Storage	63	Y	Y	52,000
138	Ord. Production	9,579	Y	Y	2,140,000
191	Ord. Production	178	Y	Y	12,000
2706	Ord. Production	4,196	Y	Y	331,000
2089	Inert Storage	10,167	Y	N	300,000
2764	Inert Storage	100	Y	N	5,000
2526	Expl Storage	689	Y	Y	74,000
2525	Ord. Production	117	Y	Y	91,000
137	Expl Storage	121	Y	Y	64,000
136	Ord. Production	6,613	Y	Y	1,731,000
2863	Ord. Production	671	Y	Y	205,000
2862	Ord. Production	80	Y	Y	89,000
2861	Ord. Production	80	Y	Y	89,000
2859	Ord. Production	202	Y	Y	84,000
2860	Ord. Production	202	Y	Y	84,000
2858	Ord. Production	269	Y	Y	86,000
2857	Ord. Production	269	Y	Y	86,000
2856	Ord. Production	152	Y	Y	93,000
2855	Ord. Production	136	Y	Y	103,000
2520	Ord. Production	5,538	Y	Y	613,000
2765	Inert Storage	100	Y	N	5,000
3074	Ord. Production	961	Y	Y	261,000



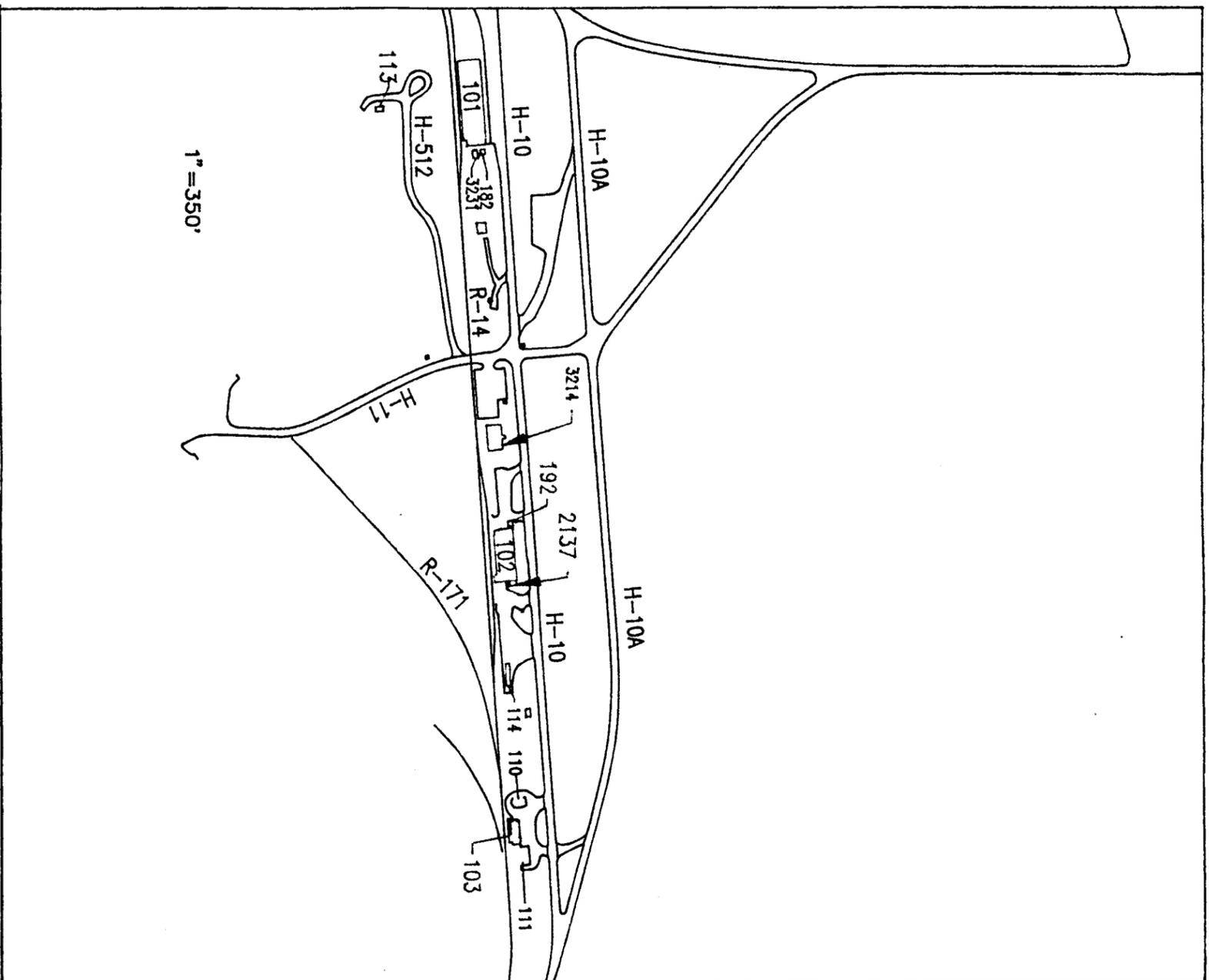
MINE FILL "B"

Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
165	Ord. Production	8,330	Y	Y	2,526,000
2514	Ord. Production	96	Y	Y	9,000
166	Ord. Production	1,596	Y	Y	2,224,000
169	Ord. Production	20,301	Y	Y	3,003,000
2532	Ord. Production	24,588	Y	Y	1,518,000
170	Ord. Production	3,697	Y	Y	487,000
2179	Ord. Production	233	Y	Y	5,000
194	Ord. Production	178	Y	Y	12,000
2515	Ord. Production	96	Y	Y	9,000
171	Ord. Production	1,596	Y	Y	2,180,000
174	Ord. Production	8,330	Y	Y	2,402,000
193	Ord. Production	178	Y	Y	12,000
2177	Expl Storage	N/A	Y	Y	11,000
173	Ord. Production	1,394	Y	Y	268,000
172	Ord. Production	660	Y	Y	302,000
2176	Expl Storage	N/A	Y	Y	13,000
2503	Ord. Production	1,478	Y	Y	364,000
2501	Ord. Production	2,312	Y	Y	977,000
2500	Ord. Production	2,312	Y	Y	1,008,000
167	Ord. Production	660	Y	Y	304,000
2789	Ord. Production	128	Y	Y	23,000
2502	Ord. Production	1,478	Y	Y	365,000
168	Ord. Production	1,360	Y	Y	267,000
2175	Expl Storage	N/A	Y	Y	13,000
2174	Expl Storage	N/A	Y	Y	11,000
162	Ord. Production	121	Y	Y	97,000
163	Ord. Production	121	Y	Y	97,000
164	Ord. Production	121	Y	Y	97,000
2172	Ord. Production	2,100	Y	Y	20,000
2666	Ord. Production	248	Y	Y	18,000
2171	Ord. Production	3,678	Y	Y	251,000
161	Ord. Production	882	Y	Y	229,000
195	Ord. Production	178	Y	Y	12,000
2790	Ord. Production	128	Y	Y	23,000



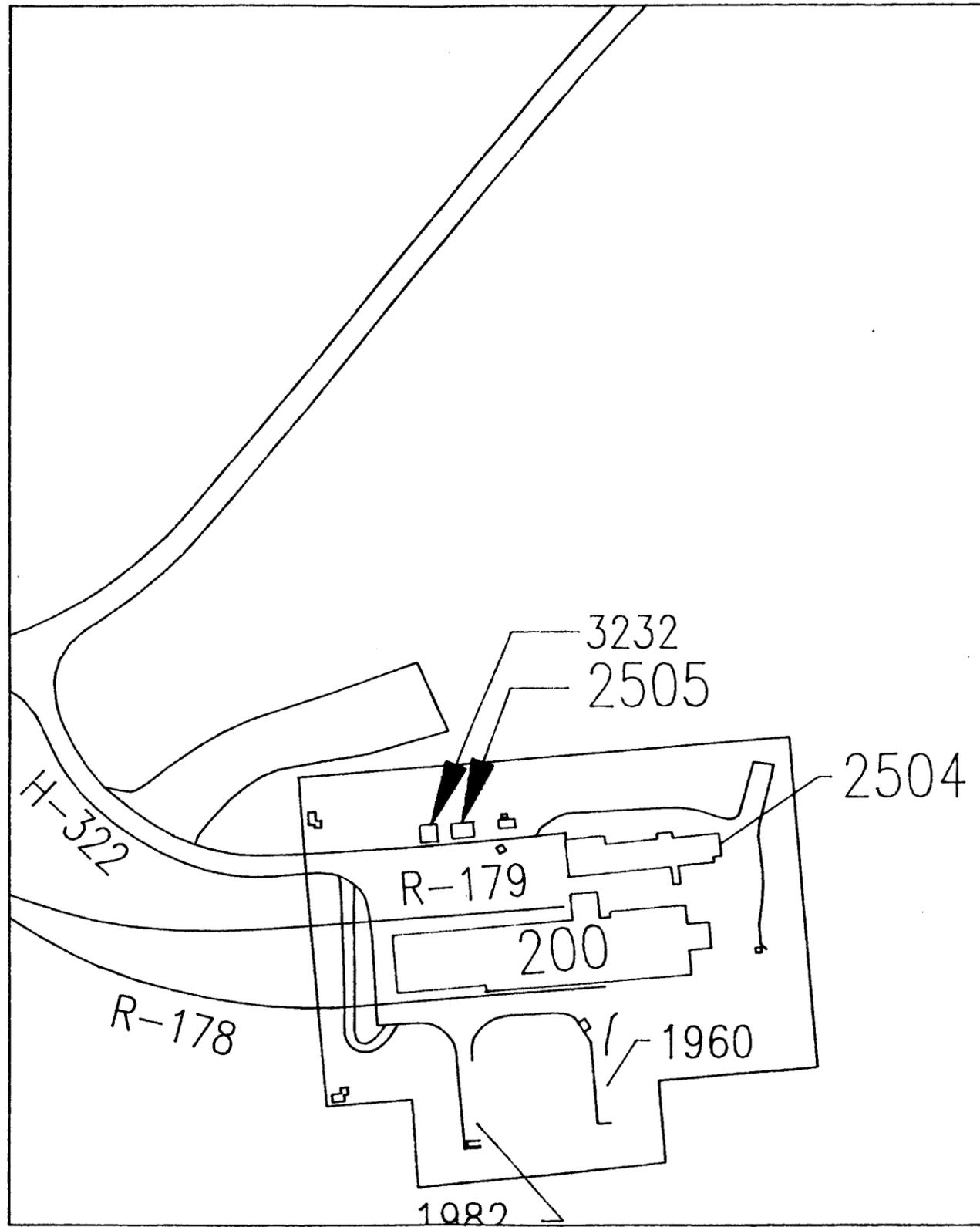
MEDIUM CALIBER PRODUCTION AREA

Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2924	Ord. Production	310	Y	Y	66,000
189	Ord. Production	2,088	Y	Y	400,000
1986	Expl Storage	611	Y	Y	62,000
2781	Ord. Production	960	Y	Y	25,000
117	Ord. Production	450	Y	Y	48,000
2519	Ord. Production	1,363	Y	Y	244,000
118	Ord. Production	20	Y	Y	26,000
104	Ord. Production	23,374	Y	Y	4,395,000
2552	Ord. Production	117	Y	Y	30,000
1985	Expl Storage	611	Y	Y	53,000
2081	Inert Storage	10,167	Y	N	300,000

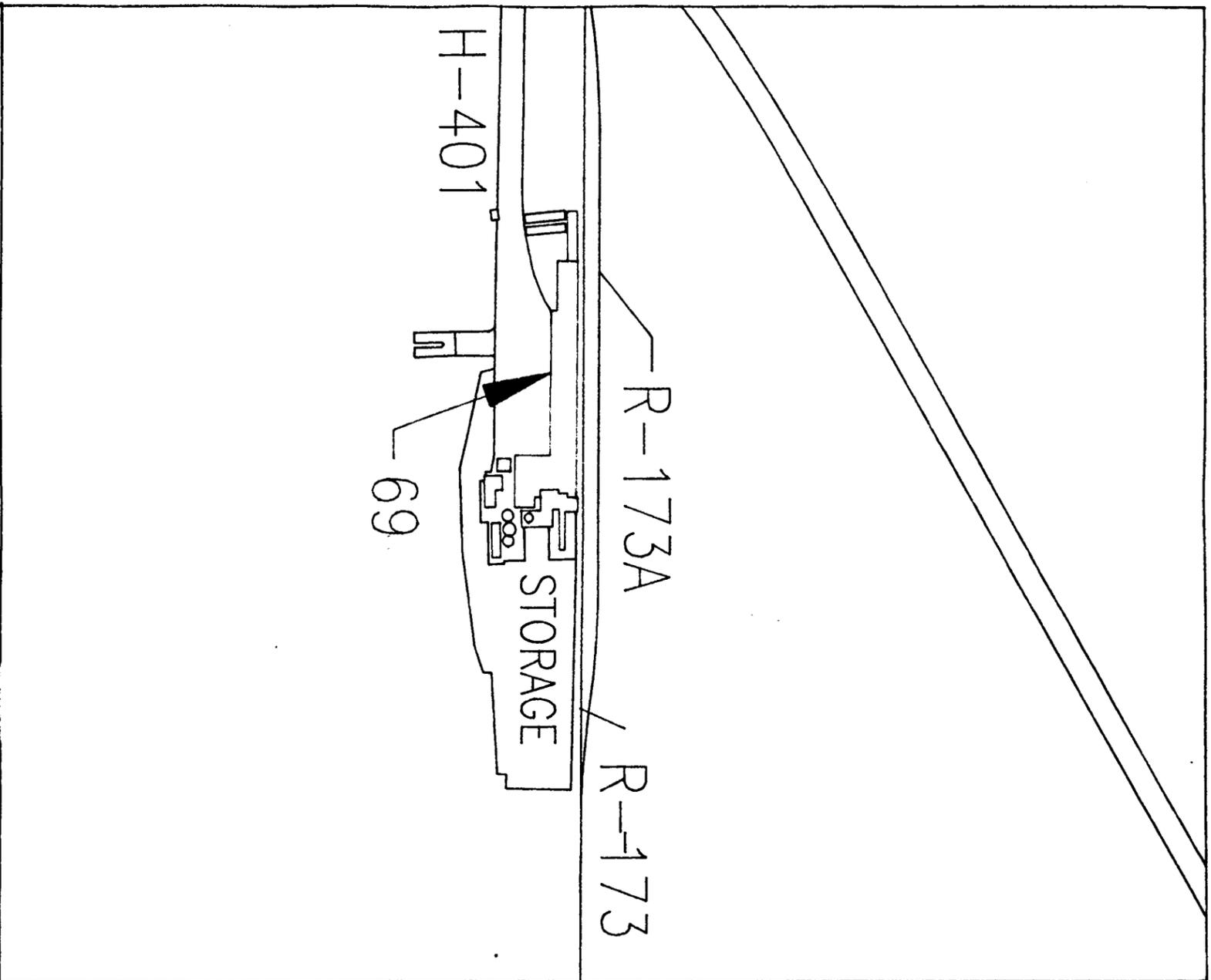


BAG FILLING AREA

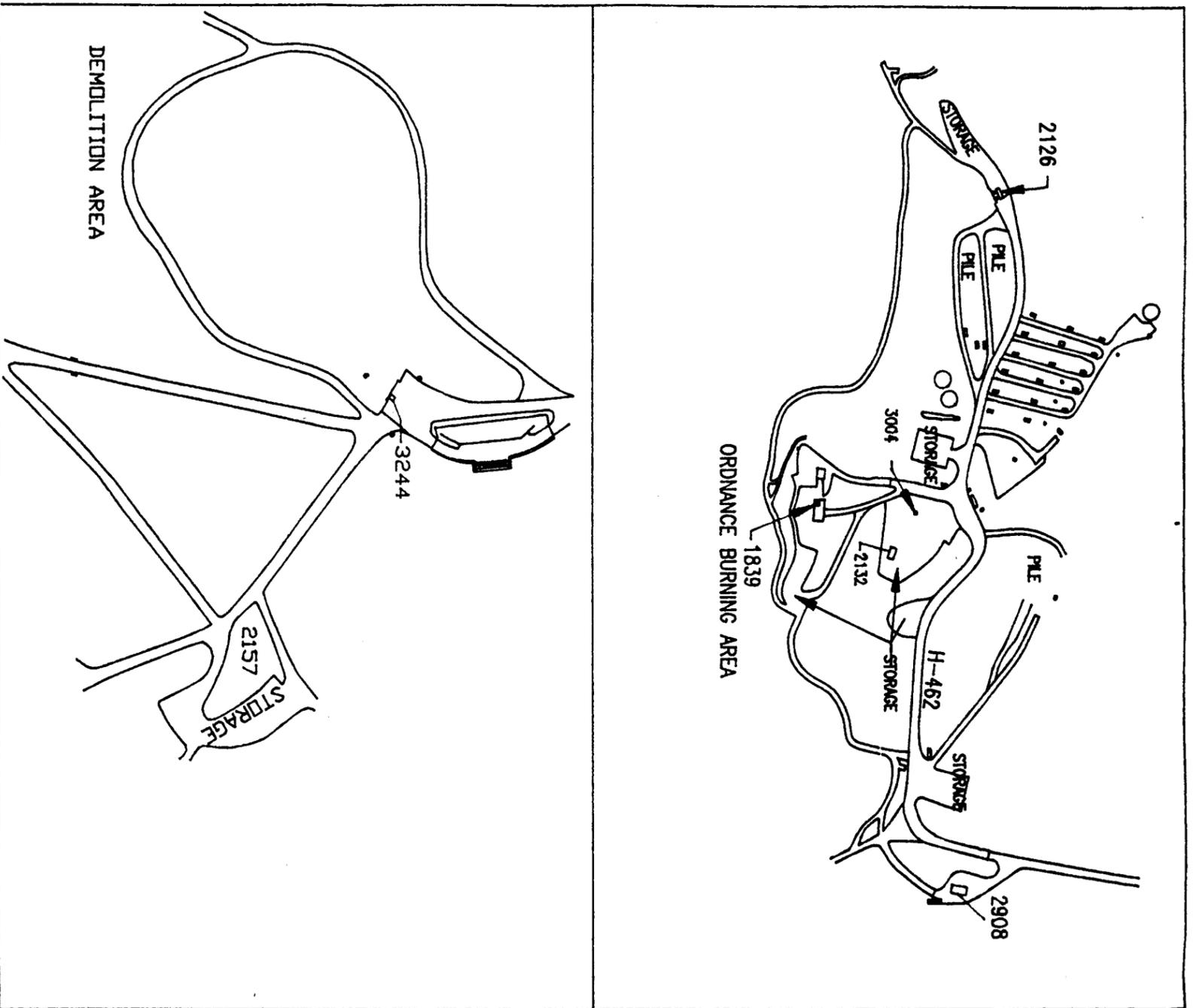
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
101	Ord. Production	12,502	Y	Y	1,930,000
182	Ord. Production	178	Y	Y	12,000
3214	Ord. Production	2,097	Y	Y	199,000
192	Ord. Production	178	Y	Y	12,000
102	Ord. Production	7,990	Y	Y	1,275,000
2137	Ord. Production	205	Y	Y	8,000
110	Ord. Production	49	Y	Y	15,000
111	Expl Storage	49	Y	Y	15,000
103	Ord. Production	1,030	Y	Y	612,000



MAJOR CALIBER PRODUCTION AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
2505	Inert Storage	178	Y	N	15,000
2504	Ord. Production	3,599	Y	Y	340,000
200	Ord. Production	14,765	Y	Y	2,654,000
1960	Expl Storage	165	Y	Y	31,000
1982	Expl Storage	611	Y	Y	62,000



WHITE PHOSPHORUS DENIL AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
69	Ord. Disposal	2,304	Y	Y	230,000



AMMUNITION BURNING GROUNDS					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
1839	Ord. Disposal	N/A	Y	Y	101,000
2908	Ord. Disposal	800	Y	Y	78,000
2126	Ord. Disposal	272	Y	Y	18,000

OPEN DETONATION AREA					
Bldg. No.	Type Space	Square Footage	Gov't Owned	Difficult to Move/ Replicate	Building Replacement Cost (CPV)
3244	Ord. Production	N/A	Y	Y	126,000
2157	Ord. Production	49	Y	Y	328,000

BRAC 1995 ENVIRONMENTAL DATA CALL:
All Navy/Marine Corps Host Activities

INDEX

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ENVIRONMENTAL COMPLIANCE	18
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WRAP-UP	30

ENVIRONMENTAL DATA CALL

NAVAL SURFACE WARFARE CENTER
CRANE DIVISION
CRANE, INDIANA SITE
UIC: N00164

Responses to the following questions provide data that will allow an assessment of the potential environmental impact associated with the closure or realignment of a Navy shore activity. This criterion consists of:

- Endangered/Threatened Species and Biological Habitat
- Wetlands
- Cultural Resources
- Environmental Facilities
- Air Pollution
- Environmental Compliance
- Installation Restoration
- Land/Air/Water Use

As part of the answers to these questions, a source citation (e.g., 1993 base loading, 1993 base-wide Endangered Species Survey, 1993 letter from USFWS, 1993 Base Master Plan, 1993 Permit Application, 1993 PA/SI, etc.) must be included. It is probable that, at some point in the future, you will be asked to provide additional information detailing specifics of individual characteristics. In anticipation of this request, supporting documentation (e.g., maps, reports, letters, etc.) regarding answers to these questions should be retained. Information needed to answer these questions is available from the cognizant EFD Planning and Real Estate Divisions, and Environment, Safety, and Health Divisions; and from the activity Public Works Department, and activity Health Monitoring and Safety Offices.

For purposes of the questions associated with land use at your base is defined as land (acreage owned, withdrawn, leased, and controlled through easements); air (space controlled through agreements with the FAA, e.g., MOAs); and water (navigation channels and waters along a base shoreline) under the control of the Navy.

Provide a list of tenant activities with UIC's that are covered in this response.

<u>TENANT COMMAND NAME</u>	<u>UIC</u>
Defense Finance & Accounting Service Cleveland	HQ0103
Defense Reutilization & Marketing Office	SX1395
Crane Army Ammunition Activity	39ZAA
Explosive Ordnance Disposal Group 2 Detachment	30702
Customer Service Branch, Personnel Support Activity Detachment Indianapolis	43050
Engineering Field Activity Contracts Office Crane IN	44204
Defense Commissary Agency	49109
Navy Exchange Detachment	60660
Naval Criminal Investigative Service Resident Unit	63285
Naval Security Group Detachment, Crane IN	63904
U.S. Coast Guard Small Arms Repair Facility	70098

1. ENDANGERED/THREATENED SPECIES AND BIOLOGICAL HABITAT

1a. For federal or state listed endangered, threatened, or category 1 plant and/or animal species on your base, complete the following table. Critical/sensitive habitats for these species are designated by the U. S. Fish and Wildlife Service (USFWS). A species is present on your base if some part of its life-cycle occurs on Navy controlled property (e.g., nesting, feeding, loafing). Important Habitat refers to that number of acres of habitat that is important to some life cycle stage of the threatened/endangered species that is not formally designated.

SPECIES (PLANT OR ANIMAL)	Designation (Threatened/ Endangered)	Federal/ State	Critical / Designated Habitat (Acres)	Important Habitat (acres)
<u>example - Haliaeetus leucocephalus - bald eagle</u>	<u>threatened</u>	<u>Federal</u>	<u>25</u>	<u>0</u>
Haliaeetus leucocephalus - bald eagle	endangered	Federal	0	850
Myotis sodalis - Indiana bat	endangered	Federal	0	0
Pandion haliaetus - Osprey	endangered	State	0	0
Crotalus horridus - Timber Rattlesnake	endangered	State	*	*

*The timber rattlesnake was recently added to the state listing and critical and important habitat have not been researched.

Source Citation: Fish and Wildlife Management Section Of The Crane Division, Naval Surface Warfare Center, Natural Resources Management Plan - 1991

1b.

Have your base operations or development plans been constrained due to: - USFWS or National Marine Fisheries Service (NMFS)? - State required modifications or constraints? If so, identify below the impact of the constraints including any restrictions on land use.	NO
Are there any requirements resulting from species not residing on base, but which migrate or are present nearby? If so, summarize the impact of such constraints.	NO

1c. If the area of the habitat and the associated species have not been identified on base maps provided in Data Call 1, submit this information on an updated version of Data Call 1 map.

Identified in Data Call #1.

1d.

Have any efforts been made to relocate any species and/or conduct any mitigation with regards to critical habitats or endangered/threatened species? Explain what has been done and why.	NO
--	----

1e.

Will any state or local laws and/or regulations applying to endangered/threatened species which have been enacted or promulgated but not yet effected, constrain base operations or development plans beyond those already identified? Explain.	NO
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2. WETLANDS

Note: Jurisdictional wetlands are those areas that meet the wetland definitional criteria detailed in the Corps of Engineers (COE) Wetland Delineation Manual, 1987, Technical Report Y-87-1, U.S. Army Engineer Waterway Experiment Station, Vicksburg, MS or officially adapted state definitions.

2a.

Does your base possess federal jurisdictional wetlands?	YES
Has a wetlands survey in accordance with established standards been conducted for your base?	YES
When was the survey conducted or when will it be conducted? / /1991	1991
What percent of the base has been surveyed?	99%
What is the total acreage of jurisdictional wetlands present on your base?	3,365

Source Citation: Wetlands Map prepared by Geonex Martel

NOTE: 3,262 acres of wetlands identified at the Crane site and 103 acres estimated at Glendora Lake remote site.

2b. If the area of the wetlands has not been identified on base maps provided in Data Call 1, submit this on an updated version of Data Call 1 map.

Identified in Data Call #1.

2c. Has the EPA, COE or a state wetland regulatory agency required you to modify or constrain base operations or development plans in any way in order to accommodate a jurisdictional wetland? XX (NO) _____ If YES, summarize the results of such modifications or constraints.

3. CULTURAL RESOURCES

3a.

Has a survey been conducted to determine historic sites, structures, districts or archaeological resources which are listed, or determined eligible for listing, on the National Register of Historic Places? If so, list the sites below.	YES
--	-----

The following districts, buildings and structures have been identified as being potentially eligible for listing on the National Register of Historic Places (NRHP):

Industrial/Administrative District - Buildings 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 22, 45, 56, 77, 2098, 2539 and structures 2121 and 2444.

Industrial Building Complex - Buildings 34, 36, 37, 38, 40 and Mine Fill A.

Bridge - 1945.

SOURCE: Cultural Resources Survey of June 1992 and Indiana State Historical Preservation Office (SHPO) site visit of 23 February 1993.

3b.

Has the President's Advisory Council on Historic Preservation or the cognizant State Historic Preservation Officer required you to mitigate or constrain base operations or development plans in any way in order to accommodate a National Register cultural resource? If YES, list the results of such modifications or constraints below.	NO
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3c.

Are there any on base areas identified as sacred areas or burial sites by Native Americans or others? List below.	*NO
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*There are 29 cemeteries located at the Crane site. The cemeteries have been surveyed for eligibility for listing in the National Register of Historical Places, and none are considered eligible.

4. ENVIRONMENTAL FACILITIES

Notes: If your facility is permitted for less than maximum capacity, state the maximum capacity and explain below the associated table why it is not permitted for maximum capacity. Under "Permit Status" state when the permit expires, and whether the facility is operating under a waiver. For permit violations, limit the list to the last 5 years.

4a.

Does your base have an operating landfill?					YES
ID/Location of Landfill	Permitted Capacity (CYD)		Maximum Capacity (CYD)	Contents ¹	Permit Status
	TOTAL	Remaining			
NSWC Crane 51-2	*			Numerical, special construction demolition	Research permit submitted currently pending at State. See no reason for not being issued new permit

¹ Contents (e.g. building demolition, asbestos, sanitary debris, etc)

*Total 70 acres; currently have 15 acres permitted. Current estimated life of the landfill is 23 years based upon current operations.

Are there any current or programmed projects to correct deficiencies or improve the facility?

To improve the facility and meet new compliance requirements, the Crane Site will use area fill versus trench fill technology.

4b. If there are any non-Navy users of the landfill, describe the user and conditions/agreements.

All Tenants identified in the introduction are served by the landfill. The limitations are the same as for the Navy and are documented in the Interservice Support Agreements with the Tenants.

4c.

Does your base have any disposal, recycling, or incineration facilities for solid waste?					YES
Facility/Type of Operation	Permitted Capacity	Ave Daily Throughput	Maximum Capacity	Permit Status	Comments
DRMO Scrap Yard	NONE	75 tons/day	@As much as can be turned in	Not Reqd.	*Dependent on demil requirements
B-107 Solvent Recovery Still	NONE	Batch	30 gal/4 hr	Not Reqd.	
B-174 Solvent Recovery Still	NONE	Batch	55 gal/4 hr	Not Reqd.	
B-200 Solvent Recovery Still	NONE	Batch	55 gal.4 hr	Not Reqd.	
B-2716 Cardboard Recycling	NONE	0.7 tons	Unknown	Not Reqd.	Contractor operated
Base Wide	NONE	Batch	Unknown	Not Reqd.	Contractor operated
B-69 Wp-PAC	NONE	10.9 tons/day	28.3 tons/day	Not Reqd.	Recycle WP munitions into phosphoric acid

List any permit violations and projects to correct deficiencies or improve the facility. None

4d.

Does your base own/operate a Domestic Waste Water Treatment Plant (WWTP) ?					YES
ID/Location of WWTP	Permitted Capacity	Ave Daily Discharge Rate	Maximum Capacity	Permit Status	Level of Treatment /Year Built
B-3049	1.2 MGD	0.516	1.2 MGD	NPDES IN0021539	Tertiary/1978

List permit violations and discuss any projects to correct deficiencies.

The NPDES limit for copper has been violated every month in the past year. Cadmium violations have occurred in 7 of the last 12 months. Other parameters violating on a less frequent basis are: ammonia, BOD, total suspended solids, silver, lead, nickel, hex chrome, mercury, cyanide and zinc.

The WWTP is undergoing a \$3.4M modification to upgrade the plant to provide better treatment of ammonia. Some additional metals reduction may be realized. A \$300K sewer system sampling project is being undertaken to locate and document industrial contributions to WWTP which are responsible for metals violations.

4e. If you do not have a domestic WWTP, describe the average discharge rate of your base to the local sanitary sewer authority, discharge limits set by the sanitary sewer authority (flow and pollutants) and whether the base is in compliance with their permit. Discuss recurring discharge violations.

Not applicable, See 4d

4f.

Does your base operate an Industrial Waste Treatment Plant (IWTP)?					YES
ID/Location of IWTP	Type of Treatment	Permitted Capacity	Ave Daily Discharge Rate	Maximum Capacity	Permit Status
B-3110	Explosive waste water	.06 MGD	.02 MGD	.06 MGD	NPDES IN0021539
B-3074	Explosive waste water	.06 MGD	.003 MGD	.06 MGD	NPDES IN0021539
B-3064	Metals	.02 MGD	0.005 MGD	.02 MGD	NPDES IN0021539
B-38	Metals	.06 MGD	0.002 MGD	.06 MGD	NPDES IN0021539
B-3044	Explosive waste water	.06 MGD	Waste treated & reused normally	.06 MGD	NPDES IN0021539

List any permit violations and projects to correct deficiencies or improve the facility.

At B-3064 the NPDES limit for cadmium was violated once in the past 12 months. At B-38 the NPDES limit for cyanide was violated once in the past 12 months.

At B-38, a printed circuit board manufacturing operation, a closed-loop system has been designed and is to be constructed this year. This will eliminate the routine discharge of waste water from the B-38 facility.

A MILCON project, planned for 1998, addresses the CAAA B-1884 plating shop that discharges waste water to the B-3064 IWTP. The project would provide a new IWTP along with a new plating facility. Additionally, the CAAA is considering closed-looping of the plating shop which would eliminate the routine discharge of waste water from the operation.

4g. Are there other waste treatment flows not accounted for in the previous tables? Estimate capacity and describe the system.

There are four sedimentation ponds that surround the Demolition Range and are used to trap sediment which erodes from the range. The four ponds are permitted outfalls under NPDES IN0021539. The discharge from the ponds is rainfall dependent. The parameters monitored at the ponds have met permit limitations in the past 12 months.

<u>Facility/Type of Operation</u>	<u>Permitted Capacity</u>	<u>Ave Daily Throughput</u>	<u>Maximum Capacity</u>	<u>Permit Status</u>
Open Burning	12,740 ton/year	27,000 lbs	12,740 ton/year	Interim status
Sludge Dewatering Open Burning	6,000 gal/day	500 gal/day	6,000 gal/day	Interim status
Open Detonation	5,460 ton	17,500 lbs	5,460 tons	Interim status

4h.

Does your base operate drinking Water Treatment Plants (WTP)?					YES
ID/Location of WTP	Operating (GPD)		Method of Treatment	Maximum Capacity	Permit Status
	Permitted Capacity	Daily Rate			
B-4	Not Reqd.	850,000	Disinfection, filtration	2.1 MGD	Not Reqd.

List permit violations and projects/actions to correct deficiencies or improve the facility.

The Crane site has no permit violations at the WTP, however, a project is planned for new piping, filters and clarifier upgrade.

4i. If you do not operate a WTP, what is the source of the base potable water supply. State terms and limits on capacity in the agreement/contract, if applicable. Not applicable.

4j.

Does the presence of contaminants or lack of supply of water constrain base operations. Explain.	NO
--	----

4k.

Other than those described above does your base hold any NPDES or storm water permits? If YES, describe permit conditions.	YES
If NO, why not and provide explanation of plan to achieve permitted status.	

Storm water - Notice of Intent Letter for construction activity. Compliance with erosion control plans filed by the contractor with U.S. Soil Conservation Service.

4l.

Does your base have bilge water discharge problem?	NO
Do you have a bilge water treatment facility?	NO

Explain: not applicable

4m.

Will any state or local laws and/or regulations applying to Environmental Facilities, which have been enacted or promulgated but not yet effected, constrain base operations or development plans beyond those already identified? Explain.	NO
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4n. What expansion capacity is possible with these Environmental Facilities? Will any expansions/upgrades as a result of BRACON or projects programmed through the President's budget through FY1997 result in additional capacity? Explain.

The Environmental Facilities have expansion capacity at current usage rates without requiring facility modifications. However, additional capacity could be provided with facility/process modifications. There is no expansion of capacity as a result of BRACON or the President's budget.

4o. Do capacity limitations on any of the facilities discussed in question 4 pose a present or future limitation on base operations? Explain.

No.

5. AIR POLLUTION

5a.

What is the name of the Air Quality Control Areas (AQCA) in which the base is located? Attainment
Is the installation or any of its OLFs or non-contiguous base properties located in different AQCA? not applicable. List site, location and name of AQCA.

5b. For each parcel in a separate AQCA fill in the following table. Identify with and "X" whether the status of each regulated pollutant is: attainment/nonattainment/maintenance. For those areas which are in non-attainment, state whether they are: Marginal, Moderate, Serious, Severe, or Extreme. State target attainment year.

Site: Glendora Site
AQCA: N/A

Pollutant	Attainment	Non-Attainment	Maintenance	Target Attainment Year ¹	Comments ²
CO	X				
Ozone	X				
PM-10	X				
SO ₂	X				
NO ₂	X				
Pb	X				

Site: Crane Site
AQCA: N/A

Pollutant	Attainment	Non-Attainment	Maintenance	Target Attainment Year	Comments ²
CO	X				
Ozone	X				
PM-10	X				
SO ²	X				
NO ²	X				
Pb	X				

¹ Based on national standard for Non-Attainment areas or SIP for Maintenance areas.

² Indicate if attainment is dependent upon BRACON, MILCON or Special Projects. Also indicate if the project is currently programmed within the Presidents FY1997 budget.

5c. For your base, identify the baseline level of emissions, established in accordance with the Clean Air Act. Baseline information is assumed to be 1990 data or other year as specified. Determine the total level of emissions (tons/yr) for CO, NOx, VOC, PM10 for the general sources listed. For all data provide a list of the sources and show your calculations. Use known emissions data, or emissions derived from use of state methodologies, or identify other sources used. "Other Mobile" sources include such items as ground support equipment.

Pollutant	Emission Sources (Tons/Year)				Total
	Permitted Stationary	Personal Automobiles	Aircraft Emissions	Other Mobile	
CO	210	*N/A	NONE	NONE	210
NOx	66	N/A	NONE	NONE	66
VOC	90	N/A	NONE	NONE	90
* PM10	31	N/A	NONE	NONE	31

*Pollutants PM (i.e., diameter<100 micrometers).

Source Document: Engineering Air Pollution Study at NSWC Crane IN
 NORTHNAVFAC Contract No. N62472-90-D-1298
 Contract Task Order 0052

* Since the Crane Site is in an Attainment area, regulations pertaining to mobile sources under Title II of the Clean Air Act Amendments are not applicable.

SOURCE OF PERMITTED STATIONARY

Building 3 - Rehab Center/Drugs & Alcohol;
 Building 5 - Civilian Personnel;
 Building 7 - Railroad Equipment Maintenance Shop;
 Building 10 - Fire Department Security Building;
 Building 36 - Auto Vehicle Maintenance;
 Building 37 - Communication Equipment RD&T Building
 Building 38 - Quality Evaluation Lab-Electrical Systems Engineering;
 Building 41 - General Warehouse-Underwater Equipment RD&T;
 Building 45 - Controlled Humidity Warehouse;
 Building 49 - Flammable Storehouse, R.I.;
 Building 56 - Public Works Shop;
 Building 64 - Supply Administration-Data Processing;
 Building 69 - Transfer Depot;
 Building 101 - Case Filling House;
 Building 104 - Projectile Loading Building;
 Building 106 - Case D/M Tank Repair Facility;
 Building 107 - Case D/M Tank Repair Facility;
 Building 109 - Quality Evaluation Lab;
 Building 121 - Cafeteria/Communication Equipment RD&T;
 Building 122 - Flare Assembly Building;
 Building 125 - Inside Machine Shop;
 Building 126 - Illuminant Building;
 Building 136 - Rocket Motor Assembly;

Building 138 - Booster Loading Area;
Building 142 - Cartridge Assembly;
Building 151 - Cooling-Temp Storage Building;
Building 155 - Storage Building Empty Mine;
Building 165 - Cooling-Temp Storage Building;
Building 169 - Storage Building Empty Mine;
Building 174 - Cooling-Temp Storage Building;
Building 181 - Demilitarization Building;
Building 190/336 - Flare Test Building/Storage Building, Inert;
Building 198 - R&D Test Facility;
Building 200 - Projectile Load Building;
Building 224 - Car Blockers Building;
Building 226 - Inert Storehouse;
Building 363 - Storage Building, Inert;
Building 1818 - Maintenance Shop-Automotive;
Building 1820 - Maintenance Shop-Construction Equipment;
Building 1884 - Inside Machine Shop;
Building 1885/1886 - Mixing Buildings;
Building 2036 - Storage Building, General;
Building 2044 - Electrical Systems Engineering;
Building 2074 - Ship/Pack/Receive Facility;
Building 2176 - Storage Bin Minefill "B";
Building 2517 - Mechanical Maintenance Building;
Building 2520 - Missile Assembly Plant;
Building 2521 - General Warehouse/Small Arms Shop;
Building 2524 - Warehouse General/Communication Equipment RD&T;
Building 2707 - Lunch & Locker Building;
Building 2713 - Warehouse General/Vehicle Maintenance Noncmb.;
Building 2720 - Car Repair Building;
Building 2760 - Boiler House;
Building 2805 - Test Building;
Building 2869 - Flare Test Cell;
Building 2906 - Module Test Lab;
Building 2917 - Tech Service;
Building 2931 - Semi-Conductor Storage & Test;
Building 2940 - Combat Systems Engineering Division;
Building 2984 - Naval Exchange Annex;
Building 3008 - Flare Test Facility;
Building 3087 - Windstream Test Facility;
Building 3234;
Gasoline Station;
DRMO;
Rock Eye;
Demo Range;
Firing Range;
OTA; and
ABG.

5d. For your base, determine the total FY1993 level of emissions (tons/yr) for CO, NOx, VOC, PM10 for the general sources listed. For all data provide a list of the sources and show your calculations. Use known emissions data, or emissions derived from use of state methodologies, or identify other sources used. "Other Mobile" sources include such items as ground support equipment.

1993 data not yet available.

Emissions Sources (Tons/Year)					
Pollutant	Permitted Stationary	Personal Automobiles	Aircraft Emissions	Other Mobile	Total
CO	Not Available				
NOx					
VOC					
PM10					

Source Document: _____

5e. Provide estimated increases/decreases in air emissions (Tons/Year of CO, NOx, VOC, PM10) expected within the next six years (1995-2001). Either from previous BRAC realignments and/or previously planned downsizing shown in the Presidents FY1997 budget. Explain.

None. No expected increases/decreases due to known BRAC realignments or President's budget.

5f. Are there any critical air quality regions (i.e. non-attainment areas, national parks, etc.) within 100 miles of the base?

Yes. Evansville IN - Marginal nonattainment for Ozone.
 Indianapolis IN - Marginal nonattainment for Ozone (Marion County). Nonattainment for CO in downtown area.
 Louisville KY - Moderate nonattainment for Ozone.

5g. Have any base operations/mission/functions (i.e.: training, R&D, ship movement, aircraft movement, military operations, support functions, vehicle trips per day, etc.) been restricted or delayed due to air quality considerations. Explain the reason for the restriction and the "fix" implemented or planned to correct. None

5h. Does your base have Emission Reduction Credits (ERCs) or is it subject to any emission offset requirements? If yes, provide details of the sources affected and conditions of the ERCs and offsets. Is there any potential for getting ERCs?

No.

6. ENVIRONMENTAL COMPLIANCE

Revised pg

6a. Identify compliance costs, currently known or estimated that are required for permits or other actions required to bring existing practices into compliance with appropriate regulations. Do not include Installation Restoration costs that are covered in Section 7 or recurring costs included in question 6c. For the last two columns provide the combined total for those two FY's.

Program	Survey Completed ?	Costs in \$K to correct deficiencies					
		FY94	FY95	FY96	FY97	FY98-99	FY00-01
Air	Yes	80	0	100	100	200	200
Hazardous Waste	Yes	1239	732	724	775	1550	1550
Safe Drinking Water Act	Yes	200	200	400	0	400	400
PCBs	Yes	125	150	200	200	100	100
Other (non-PCB) Toxic Substance Control Act	No	0	0	0	0	0	0
Lead Based Paint	No	0	0	0	0	0	0
Radon	No	0	0	0	0	0	0
Clean Water Act	Yes	420	640	350	350	700	700
Solid Waste	No	0	0	0	0	0	0
Oil Pollution Act	Yes	30	0	450	0	0	0
USTs	Yes	430	130	0	0	0	0
Other Asbestos	Yes	300	300	300	300	600	600
Total		2824	2152	2524	1725	3550	3550

Provide a separate list of compliance projects in progress or required, with associated cost and estimated start/completion date.

6b.

Does your base have structures containing asbestos? Yes What % of your base has been surveyed for asbestos? * 70% Are additional surveys planned? No What is the estimated cost to remediate asbestos (\$K) 12.9 million. Are asbestos survey costs based on encapsulation, removal or a combination of both? Removal

* In 1990/1991 all inhabited buildings that were built before 1971 were surveyed for asbestos which accounts for 70% of all assets' square footage.

6. ENVIRONMENTAL COMPLIANCE

6a. Identify compliance costs, currently known or estimated that are required for permits or other actions required to bring existing practices into compliance with appropriate regulations. Do not include Installation Restoration costs that are covered in Section 7 or recurring costs included in question 6c. For the last two columns provide the combined total for those two FY's.

Program	Survey Completed ?	Costs in \$K to correct deficiencies					
		FY94	FY95	FY96	FY97	FY98-99	FY00-01
Air	Yes	80	0	100	100	200	200
Hazardous Waste	Yes	1239	732	724	775	1550	1550
Safe Drinking Water Act	Yes	200	200	400	0	400	400
PCBs	Yes	125	150	200	200	100	100
Other (non-PCB) Toxic Substance Control Act	No	0	0	0	0	0	0
Lead Based Paint	No	0	0	0	0	0	0
Radon	No	0	0	0	0	0	0
Clean Water Act	Yes	420	640	350	350	700	700
Solid Waste	No	0	0	0	0	0	0
Oil Pollution Act	Yes	30	0	450	0	0	0
USTs	Yes	430	130	0	0	0	0
Other Asbestos	Yes	300	300	300	300	600	600
Total		2824	2152	2524	1725	3550	3550

Provide a separate list of compliance projects in progress or required, with associated cost and estimated start/completion date.

6b. Does your base have structures containing asbestos? Yes What % of your base has been surveyed for asbestos? * 20%. Are additional surveys planned? No What is the estimated cost to remediate asbestos (\$K) 12.9 million. Are asbestos survey costs based on encapsulation, removal or a combination of both? Removal

* In 1990/1991 all inhabited buildings that were built before 1971 were surveyed for asbestos which accounts for 20% of all assets' square footage.

6c. Provide detailed cost of recurring operational (environmental) compliance costs, with funding source.

Funding Source	FY92	FY93	FY94	FY95	FY96	FY97	FY98-99	FY00-01
O&MN	0	0	0	0	0	0	0	0
HA	0	0	0	0	0	0	0	0
PA	16055	0	0	0	0	0	0	0
Other O&MN (specify) 1832	0	493701	0	0	0	0	0	0
Other (specify) DBOF	646	646	621	907	868	883	1766	1766
TOTAL	16701	494347	621	907	868	883	1766	1766

6d. Are there any compliance issues/requirements that have impacted operations and/or development plans at your base. No.

7. INSTALLATION RESTORATION

7a.

Does your base have any sites that are contaminated with hazardous substances or petroleum products?	YES
Is your base an NPL site or proposed NPL site?	NO

7b. Provide the following information about your Installation Restoration (IR) program. Project list may be provided in separate table format. Note: List only projects eligible for funding under the Defense Environmental Restoration Account (DERA). Do not include UST compliance projects properly listed in section VI.

Site Name	Type Site	Ground water Contaminated	Extends off Base?	Drinking Water Source?	Cost to Complete (\$M)/Est Compl. Date	Status
ABG	CA	YES	NO	NO	\$7	RFI/IM
Rockeye	CA	YES	NO	NO	\$3	RFI
Demo	CA	YES	NO	NO	\$3	RFI/IM
Old Rifle Range	CA	YES	NO	NO	\$2	RFI
Dye Burial	CA	YES	NO	NO	\$1	RFI/IM
Pesticide	CA	Unconf	NO	NO	\$2	RFI
Old Burn Pit	CA	Unconf	NO	NO	\$1	RFI
McComish Gorge	CA	Unconf	NO	NO	\$1	RFI
Mustard Gas	CA	YES	NO	NO	\$1	RFI
Old Storage	CA	Unconf	NO	NO	\$1	RFI
Load and Fill	CA	Unconf	NO	NO	\$2	RFI
Mine Fill A	CA	Unconf	NO	NO	\$1.5	RFI/IM
Mine Fill B	CA	Unconf	NO	NO	\$1.5	RFI/IM
San. LF &	CA	Unconf	NO	NO	\$2	RFI/IM
Roads and	CA	Unconf	NO	NO	\$2	RFI
Cast High Expl.	CA	Unconf	NO	NO	\$2	RFI/IM
PCB Capacitor	CA	Unconf	NO	NO	\$2	RFI/IM
Load and Fill	CA	Unconf	NO	NO	\$2	RFI
Pyro. Test Area	CA	Unconf	NO	NO	\$3	RFI
CAAA OA/OC Test	CA	Unconf	NO	NO	\$2	RFI
DRMO Storage	CA	Unconf	NO	NO	\$2	RFI
Lead Azide	CA	Unconf	NO	NO	\$2	RFI
Battery Shop	CA	Unconf	NO	NO	\$2	RFI/IM
Sludge Drying	CA	Unconf	NO	NO	\$2	RFI/IM
Sludge Drying	CA	Unconf	NO	NO	\$2	RFI/IM
Highway 58 Dump	CA	Unconf	NO	NO	\$2	RFI/IM
Highway 58 Dump	CA	Unconf	NO	NO	\$2	RFI/IM
Illuminant	CA	Unconf	NO	NO	\$2	RFI
Maintenance	CA	Unconf	NO	NO	\$2	RFI
PCP Dip Tank,	CA	Unconf	NO	NO	\$2	RFI
Land Farm	CA	Unconf irmed	NO	NO	\$3 Million/ 1999	RFI

¹ Type site: CERCLA, RCRA corrective action (CA), UST or other (explain)

² Status = PA, SI, RI, RD, RA, long term monitoring, etc.

7c. Have any contamination sites been identified for which there is no recognized/accepted remediation process available? List.

No.

7d.

Is there a groundwater treatment system in place?	NO
Is there a groundwater treatment system planned?	YES

State scope and expected length of pump and treat operation.

A pump and treat system is planned as an interim measure at the Ammunition Burning Ground (ABG) starting with well installation in 1995. Wells 03C03P2, 03C20, 03C11 and 03C08AP2 show the highest levels of contamination by RDX and TCE. All of these wells are in the granular or Darcian flow portion of the primary aquifer where seepage velocities are believed to be low relative to the high conduit flow velocities of wells in the southeast quadrant of the ABG. These four wells may be "feeding" contaminants to the aquifer through a flow release or through sporadic release during periods of high rainfall. The four wells will be treated as "sources" and pumped to remove contaminants concentrated in the ground water and rock in their vicinity. Pumping should lower the concentration of contaminants lingering in this relatively low permeability of the primary aquifer. Pumped water would have to be treated to remove contaminants (explosives, solvents and metals). Length of operation has not been determined.

7e.

Has a RCRA Facilities Assessment been performed for your base?	YES
--	-----

7f. Does your base operate any conforming storage facilities for handling **hazardous materials**? If YES, describe facility, capacity, restrictions, and permit conditions.

The Supply function stores its hazardous materials in concrete structures with spill containment, temperature controls, fire suppression and explosion-proof fixtures. Approximately 25,600 square feet.

DRMO stores its hazardous materials in isolated concrete structures with spill containment. The structures are not temperature controlled, but are thick walled concrete or are concrete bunkers built into the earth. Approximately 7,800 square feet.

The remaining hazardous material storage consists of a few manufactured portable structures built at Crane which meet all storage standards and several hundred metal storage lockers that have spill containment, ventilation, shelving and meet OSHA and NFPA requirements. Approximately 18,000 square feet.

7g. Does your base operate any conforming storage facilities for handling **hazardous waste**? If YES, describe facility, capacity, restrictions, and permit conditions.

Yes

CAPACITY: Liquid storage capacity not to exceed 56,540 gallons. Solid waste storage not to exceed 1900 55-gallon drums or the equivalent of 106,920 gallons in open storage at the facility.

RESTRICTIONS: Must conform to all hazardous waste permitted storage regulations. The only primary restrictions are: (1) The permittee shall not receive hazardous waste from a foreign source and (2) The permittee may not receive hazardous waste from an off-site source, with the exception of a special condition to aid local law enforcement agencies if needed (this may include bringing shock-sensitive items on-site for emergency detonation).

7h. Is your base responsible for any non-appropriated fund facilities (exchange, gas station) that require cleanup? If so, describe facility/location and cleanup required/status.

No

7i.

Do the results of any radiological surveys conducted indicate limitations on future land use? Explain below.	NO
--	----

7j. Have any base operations or development plans been restricted due to Installation Restoration considerations?

No.

7k. List any other hazardous waste treatment or disposal facilities not included in question 7b above. Include capacity, restrictions and permit conditions.

Does your base have any disposal, recycling, or incineration facilities for solid waste?					YES
Facility/Type of Operation	Permitted Capacity	Ave Daily Throughput	Maximum Capacity	Permit Status	Comments
Open Burning	12,740 ton/year	27,000 lbs	12,740 ton/year	Interim status	
Sludge Dewatering Open Burning	6,000 gal/day	500 gal/day	6,000 gal/day	Interim status	
Open Detonation	5,460 ton	17,500 lbs	5,460 tons	Interim status	

8. LAND / AIR / WATER USE

8a. List the acreage of each real estate component controlled or managed by your base (e.g., Main Base - 1,200 acres, Outlying Field - 200 acres, Remote Range - 1,000 acres, remote antenna site - 5 acres, Off-Base Housing Area - 25 acres).

Parcel Descriptor	Acres	Location
Main Base - NWSC Crane	62,467	Martin, Co., Indiana
Remote Range - Glendora Lake	365	Sullivan, Co., Indiana

8b. Provide the acreage of the land use categories listed in the table below:

LAND USE CATEGORY		ACRES
Total Developed: (administration, operational, housing, recreational, training, etc.)		19,885.2
Total Undeveloped (areas that are left in their natural state but are under specific environmental development constraints, i.e.: wetlands, endangered species, etc.)		Wetlands: 3,365
		All Others: 1,310
Total Undeveloped land considered to be without development constraints, but which may have operational/man caused constraints (i.e.: HERO, HERF, HERP, ESQD, AICUZ, etc.) TOTAL		32,921.38
Total Undeveloped land considered to be without development constraints		5,170.42
Total Off-base lands held for easements/lease for specific purposes		0
Breakout of undeveloped, restricted areas. Some restricted areas may overlap:	ESQD	32,921.38
	HERF	none
	HERP	none
	HERO	none
	AICUZ	none
	Airfield Safety Criteria	none
	Other	none

8c. How many acres on your base (includes off-base sites) are dedicated for training purposes (e.g., vehicular, earth moving, mobilization)? This does not include buildings or interior small arms ranges used for training purposes.

No dedicated training areas exist.

8d. What is the date of your last AICUZ update? Not applicable. Are any waivers of airfield safety criteria in effect on your base? No. Summarize the conditions of the waivers below.

Crane has no AICUZ restraints since there is no airfield.

8e. List the off-base land use types (e.g, residential, industrial, agricultural) and acreage within Noise Zones 2 & 3 generated by your flight operations and whether it is compatible/incompatible with AICUZ guidelines on land use.

Acreage/Location/ID	Zones 2 or 3	Land Use	Compatible/ Incompatible
Not Applicable			

8f. List the navigational channels and berthing areas controlled by your base which require maintenance dredging? Include the frequency, volume, current project depth, and costs of the maintenance requirement.

Navigational Channels/ Berthing Areas	Location / Description	Maintenance Dredging Requirement			
		Frequency	Volume (MCY)	Current Project Depth (FT)	Cost (\$M)
Not Applicable					

8g. Summarize planned projects through FY 1997 requiring **new channel or berthing area** dredged depths, include location, volume and depth.

Not applicable. There are no channels or berthing areas at the Crane site.

8h.

Are there available designated dredge disposal areas for maintenance dredging material? List location, remaining capacity, and future limitations.	Not Applicable
Are there available designated dredge disposal areas for new dredge material? List location, remaining capacity, and future limitations.	Not Applicable
Are the dredged materials considered contaminated? List known contaminants.	Not Applicable

8.i. List any requirements or constraints resulting from consistency with **State Coastal Zone Management Plans**.

Not applicable. Crane site is not located in a costal zone.

8j. Describe any **non-point source pollution problems affecting water quality** ,e.g.: coastal erosion.

Not applicable. We are not located in a costal zone.

8k.

If the base has a cooperative agreement with the US Fish and Wildlife Service and/or the State Fish and Game Department for conducting a hunting and fishing program, does the agreement or these resources constrain either current or future operations or activities? Explain the nature and extent of restrictions.	NO
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81. List any other areas on your base which are indicated as protected or preserved habitat other than threatened/endangered species that have been listed in Section 1. List the species, whether or not treated, and the acres protected/preserved.

Johnson Hollow Woods Significant Natural Area. (128 acres) Rock outcrops are habitat to several rare and uncommon species, namely Goldie's fern (*Dryopteris goldiana*), pussytoes (*Antennaria solitaria*), and the rock clubmoss (*Lycopodium porophyllum*).

Chestnut Oak Slopes Significant Natural Area (170 acres). Site is of interest because of the occurrence of Chestnut Oak (*Quercus prinus*). This may be the northernmost population of Chestnut Oak in the natural region in Indiana.

Furst Creek Woods Significant Natural Area (97 acres). Several species of ferns are present, particularly on the rocky slopes and sandstone cliffs. The latter is the only locations encountered to have the uncommon cinnamon fern (*Osmunda cinnamomea*) and the spinulose wood fern (*Dryopteris intermedia*) at Crane.

Great Blue Heron Ecological Reserve Area (5 acres). Site of the second largest great blue heron rookery in Indiana. Over 400 nests in 1994.

9. WRAPUP

9a. Are there **existing or potential environmental showstoppers** that have affected or will affect the accomplishment of the installation mission that have not been covered in the previous 8 questions?

No

9b. Are there any **other environmental permits** required for base operations, include any relating to industrial operations.

None

9c. Describe any **other environmental or encroachment restrictions** on base property not covered in the previous 8 sections.

None

9d. List any **future/proposed laws/regulations or any proposed laws/regulations** which will constrain base operations or development plans in any way. Explain.

None

DATA CALL # 33
CRANE SITE

BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

In accordance with policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in the BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon, a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

S. HOWARD
NAME (Please type or print)

Signature

COMMANDER
Title

Date

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
Activity

8/25/94

REPRODUCED AT GOVERNMENT EXPENSE

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print)

Signature

Title

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print)

Signature

Commander

6/3/94

Title

Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

G. R. STERNER

NAME (Please type or print)

Signature

Commander
Title Naval Sea Systems Command

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

P.W. DROWNON
NAME (Please type of print)

Signature

ACTING
Title

Date

6/24/94

205

DATA CALL # 33
CRANE SITE

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief. -

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print)

Signature

Title

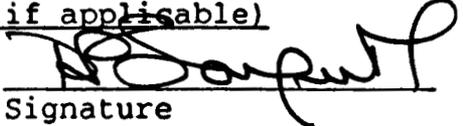
Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

RADM (Sel) D. P. Sargent, Jr.
NAME (Please type of print)


Signature

Commander
Title

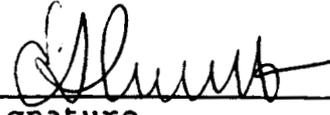
8/17/94
Date

Naval Surface Warfare Center
Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

E. S. MCGINLEY, II
Rear Admiral, U.S. Navy
NAME (Please type or print)


Signature

ACTING
Title

8/21/94
Date

Naval Sea Systems Command
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

W. A. EARNER

NAME (Please type of print)


Signature

Title

8/25/94
Date

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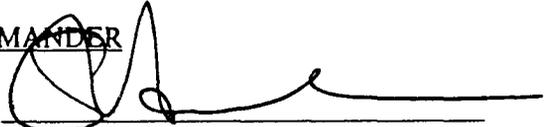
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I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

S. HOWARD
NAME (Please type or print)


Signature

COMMANDER
Title

8/12/94
Date

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
Activity

1. Question 6b - Source used 4,000,000 sq ft of asbestos sample and divided by 20,527,443 total Crane Facility sq ft., yielding 20% sample coverage. However, the correct total Crane sq footage is 5,642,508. This yields about 70% sample coverage.