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**HAZARDOUS WASTE TECHNICAL ASSISTANCE SURVEY,
MINOT AIR FORCE BASE, NORTH DAKOTA**

Chung H. Yen, Captain, USAF, BSC

**OCCUPATIONAL AND ENVIRONMENTAL
HEALTH DIRECTORATE
Brooks Air Force Base, TX 78235-5000**

December 1991

Final Report for Period 24-28 June 1991

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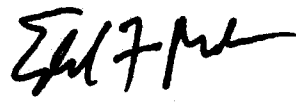
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The author wishes to thank the personnel at Minot AFB who provided information and logistic support during this survey. Maj A. J. Kwan (Chief, 857 CES/DEV), 1Lt Mark Smekrud (Environmental Engineer, 857 CES/DEVE), and Mr Gary Lonning (Environmental Engineer, 857 CES/DEVE) provided valuable information on the management of the Hazardous Waste Program and the Used Oil Program. Special thanks are given to Maj John Ellis (Chief, 857 SH/SGPB) and TSgt Leon Rushing (NCOIC, 857 SH/SGPB) who coordinated indispensable logistic support. The author appreciates the escort support by SSgt Roddray Walker and A1C Henry DeBose. Warm thanks are given to Sgt Steven Luttrull and Ms Linda Patterson who assisted in preparing the outbrief report at the "11th hour."

HAZARDOUS WASTE TECHNICAL ASSISTANCE SURVEY MINOT AIR FORCE BASE, NORTH DAKOTA

INTRODUCTION

The Minot Air Force Base (AFB) Bioenvironmental Engineering Services, 857 Strategic Hospital/SGPB, requested the Air Force Occupational and Environmental Health Directorate, Bioenvironmental Engineering Division (AL/OEB), to conduct a Hazardous Waste Technical Assistance Survey at Minot AFB (Appendix A). This survey will be used for waste minimization at Minot AFB. The survey was conducted by Capt Chung H. Yen and TSgt Mark Bishop during 24-28 June 1991.

BASE DESCRIPTION

Minot Air Force Base is located 12 miles north of the city of Minot in the state of North Dakota. The major units are the 5th Bombardment Wing (5 BW), 91st Strategic Missile Wing (91 SMW), and the 857th Combat Support Group (857 CSG). The mission of 5 BW is to deter war by flying highly visible long-range missions in conjunction with 24-hour nuclear alert. The 91 SMW is responsible for providing a ready Intercontinental Ballistic Missile force that contributes to the United States' deterrence of nuclear war. The 857 CSG is currently providing support and services to the 5 BW, 91 SMW, and 23 tenant organizations.

HAZARDOUS WASTE MANAGEMENT

The hazardous waste program at Minot AFB is managed primarily through the Environmental Engineering Branch (857 CES/DEV) in Civil Engineering. Bioenvironmental Engineering Services (857 SH/SGPB) provides technical assistance and helps monitor the program through industrial shop surveys. The 857 SH/SGPB is also responsible for waste sampling at the request of the 857 CES/DEV. Individual shops are responsible for identifying, segregating, handling, packaging, labeling, and transporting the wastes generated by their shop. When wastes require disposal, the generator completes an AF Form 2005 and submits it to Base Supply. Supply generates a DD Form 1348-1 using the information contained on the AF Form 2005.

At Minot AFB, ND, the unit cost of hazardous waste disposal had transitioned from a volumetric basis to weight basis. At the time of the survey, the hazardous waste disposal cost was in the range of \$2.50 to \$5.50 per pound, including the weight of the drum.

The Used Oil Management Program (UOMP) at Minot is also managed by DEV but separately from the Hazardous Waste Management Program (HWMP). Minot Defense Reutilization and Marketing Office (DRMO) operates a state permitted large quantity generator storage facility pursuant to Title 40 Code of Federal Regulations Part 264 (40 CFR 264) and chapter 23-20.3 (Hazardous Waste Management Act) of the North Dakota Century Code and Article 33-24 (Hazardous Waste Management Rules) of the North Dakota Administrative Code.

OBJECTIVES

The main objectives of this survey are to identify avenues of waste minimization and evaluate management of hazardous waste.

PROCEDURE

The first step of the survey was to review the base hazardous waste management plan and identify shops that are potential generators of hazardous waste streams. Next, the team visited Minot Defense Reutilization and Marketing Office (DRMO) hazardous waste storage facility, all satellite accumulation points and a majority of hazardous waste accumulation points, and used oils and fluids collection points to observe accumulation management practices. Then, 38 industrial shops were visited to observe industrial operations, to discuss chemical waste disposal practices with shop supervisors and personnel, and to complete interview forms (Appendix B). A master list of the 38 industrial shops is presented in Appendix C.

The Base HWMP was discussed with the following individuals:

Maj John Ellis	Chief, 857 SH/SGPB
Maj A. J. Kwan	Chief, 857 CES/DEV
Mr Gary Lonning	Environmental Engineer, 857 CES/DEVE
1Lt Mark Smekrud	Environmental Engineer, 857 CES/DEVE
Ms June Hoffer	Environmental Protection Specialist, Minot DRMO
TSgt Leon Rushing	NCOIC, 857 SH/SGPB

SUMMARY OF WASTE DISPOSAL PRACTICES AT MINOT AIR FORCE BASE

A shop-by-shop summary of disposal practices is contained in Appendix D. The waste disposal practices for different categories of wastes are summarized in this section and in Appendix E.

- Used oil and fluids are accumulated in 55-gal drums and above ground storage tanks at or near the points of generation. When full, the drums are transported to used oil collection points (UOCP) operated by unit managers. Currently, the used oil and fluids are pumped out of the storage containers and transported for energy recovery by a local firm under a Base Civil Engineering contract. The Base Used Oil Program Manager contacts the contractor to haul the used oils and fluids from UOCPs that are near full storage capacity.

- Waste paints, thinners, and strippers are placed in 55-gal drums at the hazardous waste satellite accumulation points (HWSAP), transported to and secured at the unit hazardous waste accumulation points (HWAP), and transferred to Minot DRMO for final disposition by a transport/disposal company. Floor sweepings of paint dusts from the 857 Transportations (TRANS) Allied Trades Shop are disposed of as municipal waste.

- Waste emulsifiers and dye penetrants from Nondestructive Inspection (NDI) shops are drummed and disposed of as hazardous wastes.

- Waste fuels consisting of JP-4, mogas, diesel, etc., are accumulated in 55-gal drums and/or above ground tanks at or near the point of generation. Once full, they are transported to the unit UOCPs for contractor pickup.

- Soiled oily rags and towels are usually disposed of as municipal waste. However, waste rags and towels soiled or soaked with solvents and/or other hazardous wastes are collected and disposed of by Minot DRMO as hazardous waste. The disposal cost was at \$2.51 per pound.

- Most spent lead-acid batteries are turned-in to local vendors who supply the base with new batteries. The 91st Field Maintenance Squadron (FMS) Power Refrigeration and Electrical (PREL) Shop turn in their batteries to Minot DRMO for disposal.

- Chemicals used in the hospital laboratories are used in process and discharged to the sanitary sewer system.
- Empty aerosol paint cans are disposed of as municipal waste as authorized by state law. However, unspent aerosol paint cans are collected by shop personnel and disposed of through Minot DRMO.
- Waste fixers from 5 FMS NDI Shop and 857th Strategic Hospital (SH) Medical Radiology are processed through silver recovery systems and the effluents are discharged into the base sanitary sewer system.
- Paint filters from dry paint booths at corrosion control shops are collected by shop personnel and disposed of through Minot DRMO as hazardous wastes. However, the 857th Auto Hobby Shop, at the time of the survey, disposed of the paint filters as municipal wastes.
- Spent/waste antifreeze is washed down the drain to the sanitary sewer.
- An estimated 1.1 million gallons a year of rinsewater from the 5 FMS Aircraft Washrack Shop is discharged into the base sanitary sewer system.
- Wastestreams from 857th SH Dental Services are included on page 31 of Appendix D, Disposal Practices by Shop at Minot AFB.

OBSERVATIONS AND RECOMMENDATIONS

Waste Minimization Opportunities

Some shops are using effective means of waste minimization. Security Police Firing Range (857 SPS/SPC) is recycling PD-680 Type II degreasing solvent by filtering out suspended sludge. They currently generate less than 50 oz of sludge a year. The 857 TRANS General Purpose Shops operate 2 high pressure steam parts cleaning systems. This system employs a biodegradable detergent eliminating petroleum hydrocarbon distillates, a potential hazardous waste. This system normally costs about \$4,000. The 91 FMS PREL Shop is utilizing an excellent chromate rinse recovery system. Current chromate rinse has been reduced 90% compared to the nonrecovery method.

RECOMMENDATION: Wherever possible, employ these waste reduction techniques to applicable operations across base. Use these techniques in 857 TRANS shops, 857 CES vehicle and equipment maintenance shops, and 5 FMS aircraft maintenance shops. Advise to HQ SAC/DEV/SGPB. Emphasize cost savings in handling, disposal and transporting hazardous wastes.

Management of Hazardous Wastes and Used Oils Collection Points

There is a prevalence of unsecured collection containers at HW collection points and UOCs. This condition creates the potential for inadvertent mixing of hazardous wastes with nonhazardous used oils, fluids or fuels, a common and costly problem.

RECOMMENDATION: Install locking devices on each accumulation drum or tank at HW collection points and UOCs. Limit the access to collection point managers and unit program monitors. With analysis cost at about \$1,800/drum and disposal cost at \$2,000/drum, unnecessary expenditures resulting from inadvertent mixing of hazardous waste with used oil and fluids can be avoided.

Tracking of Waste Disposal Drums

The shops are doing an excellent job of identifying and segregating used oil, fluids and fuels from hazardous wastes. HW Accumulation Points (AP) are secured and controlled by site managers. Accumulation logs are implemented and extensively used. A noteworthy HW AP was formally managed by SSgt Thorpe of 5 FMS Aircraft Structural Repair, located near Bldg 862. This accumulation point is in immaculate condition. However, about half of the UOCs surveyed contain unidentified collection drums. Their shop of origin is difficult to track. At most of the HW collection points, the drums are marked and identified by content but not numerically stenciled and tracked. A system is needed to track disposal drums to prevent occurrence of abandoned drums at collection points.

RECOMMENDATION: A simple and proven method is currently used at other bases. A system is established to numerically code all drums used in shops for waste storage (hazardous and nonhazardous). The numbers must be centrally assigned and recorded by a responsible individual through the use of a master control log. This number is then verified at HW APs and UOCs.

Regulatory Compliance

The Base Auto Hobby Shop is currently disposing of paint booth filters as municipal waste. They have not made a waste determination as required in 40 CFR 261.

RECOMMENDATION: The Base Bioenvironmental Engineering Services should submit a sample of the paint booth filter for analysis of hazardous waste characteristics. Proper disposal procedures should be determined based upon analytical results.

Getting the Word Out

Minot AFB has several excellent elements in their Hazardous Waste Management Program. This program is one of the best large quantity generator programs in the Air Force.

RECOMMENDATION: Recommend the Environmental Engineering Branch of the Base Civil Engineering prepare a briefing package on their program and submit it to HQ SAC/DEV/SGPB for a command-wide training guide. The package should highlight:

- the features of program initiative in managing hazardous wastes and recyclable materials separately.
- the effectiveness of waste accumulation logs.
- the management initiatives of tracking and disposing of oil/water separator sludge, oil and wastewater. This program is a first in the Air Force.
- their successes in managing a permitted storage facility as a large quantity generator.
- implementation features of the Environmental Abuse Program.
- management of shop cleaning articles.
- segregation and collection of regulated aerosol paint cans.

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3. United States Environmental Protection Agency, Samplers and Sampling Procedures for Hazardous Waste Streams, EPA/600/2-80-018, January 1980.
4. United States Environmental Protection Agency, Waste Minimization Opportunity Assessment Manual, EPA/625/7-88/003, July 1988.
5. United States Environmental Protection Agency, Guides to Pollution Prevention - Selected Hospital Waste Streams, EPA/625/7-90-009, June 1990.

APPENDIX A
Request Letter

DEPARTMENT OF THE AIR FORCE
857 STRATEGIC HOSPITAL (SAC)
MINOT AIR FORCE BASE ND 58765-5346

REPLY TO
ATTN OF : SGPE

7 Aug 1990

SUBJECT : Request for Hazardous Waste Technical Assistance Survey

TO : HQ SAC/SGPE
AF OEEL/EQE
IN TURN

1. Request a hazardous waste technical assistance survey at Minot AFB. The purpose of this survey would be to assess hazardous waste management practices and explore opportunities for hazardous waste minimization. The increasing cost of hazardous waste disposal, including sampling and analysis, make waste minimization an essential factor in improving the efficiency of our program. The results of this survey will be used to pinpoint ways in which we may improve methods of selecting materials and properly disposing them.

2. Please contact me at AUTOVON 453-3398 for further information.

Signed

JOHN C. ELLIS II, Major, USAF, BSC
Chief, Bioenvironmental Engineering

APPENDIX B

Hazardous Waste Technical Assistance Survey

Shop Supervisor Interview Form

HAZARDOUS WASTE TECHNICAL ASSISTANCE SURVEY
SHOP SUPERVISOR INTERVIEW FORM

SHOP & OFFICE SYMBOL _____ EXT _____
BUILDING _____ CONTACT _____
MISSION _____

WORKLOAD

WASTE STREAM	TYPE/NSN	QTY/MO.	DISPOSAL METHOD
FUEL			
7808 MOTOROIL			
SYNTHETIC OIL			
FLUIDS (B,T,or H)			
SOLVENTS			
WASTE PAINTS (TYPE)			
THINNERS (TYPE)			
STRIPPERS (TYPE)			
SOAPS (dil ratio)			
BATTERIES			
SPEEDY DRY			
SHOP RAGS			

O/W SEPARATORS (NO.,USE,CLEANOUT FREQ & DISPOSAL) _____
(ADD INFO ON BACK AS REQ'D)

RECOMMENDATIONS

OTHERS

PENETRANT	EMULSIFIER	ANTIFREEZE	CARBON REMOVER
MAG PARTICLE	DEVELOPER	O/W SLUDGE	ACIDS

TANKS

CHEMICAL	SIZE	CHANGE FREQ	DISPOSAL	MIS.
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UST'S

USE	SIZE	LOCATION	PUMP OUT FREQ	LEAK TESTED
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APPENDIX C
Master List of Shops

MASTER LIST OF SHOPS

SHOP	CONTACT	BUILDING	PHONE NUMBER
<u>857 Strategic Hospital</u>			
Dental X-Ray Lab	MSgt Morris	194	453-5606
Clinical Lab	Capt Sampang	194	453-5338
Radiology	TSgt Pullin	194	453-5315
<u>857 Transportation</u>			
General Purpose 1	Sgt Lewis	425	453-3986
General Purpose 2	SSgt Mickish	426	453-3170
D & QA	MSgt Lugo	460	453-4919
Heavy Equipment	Mr B. White	425	453-2607
Summer Rebuild	TSgt Nicholes	426	453-4784
Allied Trades	Sgt Hlavac	426	453-3732
Refueling Maint	Sgt Black	761	453-3221
Fire Truck Maint	TSgt Lewis	897	453-2280
Vehicle Operations	SMSGt Lapel	442	453-4797
<u>857 CSG</u>			
Entomology	SSgt Starcher	492	453-2393
Power Production	Mr Burbach	879	453-2452
Heavy Equipment	James Scott	521	453-3839
Grounds	Norman Nardliner	521	453-6007
Liquid Fuels	E.E. Wright	445	453-3061
<u>5 MMS</u>			
Support Section	SSgt McClendon	1107	453-3305
Maint & Inspection	TSgt French	1113	453-6799
MK-12A	MSgt Rosinski	1119	453-6823
ALMN	SSgt Wallace	1134	453-2020
Missile Maint	Sgt Reed	1134	453-3798
Equipment Maint	TSgt Blake	1144	453-3445
<u>5 FMS</u>			
AGE	Mr Earhart	995	453-2429
Wheel & Tire	SSgt Garfield	868	453-6669
Repair & Reclamation	SSgt Malone	868	453-6668
Pneudralulics	TSgt Chapa	857	453-3268
Nondestructive Insp	TSgt Cronwell	857	453-3682
Acft Structure	SSgt Thorp	857	453-3582
Fuel Systems Repair	MSgt Wagner	836	453-6506
Jet Engine	SSgt Wilson	756/748	453-6400
Acft Washrack	MSgt Frisly	837	453-2439

91 FMMS

Corrosion Control	Mr Sundsbak	763	453-2630
PREL Shop	Sgt Hanson	546	453-6196

857 SPS

Firing Range	MSgt Conklin	393	453-3195
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64 FTW

ACE	Mark Raven	718	453-6340
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857 Supply

Fuels Management	TSgt Vella	780/420	453-6505
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OOLAC

Rivet Mile	Robert Miller	Minot City	453-4079
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APPENDIX D

Disposal Practices by Shop at Minot AFB

DISPOSAL METHODS BY SHOP FOR MINOT AFB

Shop: 5 FMS AGE Heater

Building 995

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Safety Kleen	280	CD	GAL/YR
Oily Rags	600	MT	LBS/YR
Spray Paint Cans - Empty	48	MT	COUNT/YR

Shop: 5 FMS Aircraft Structural

Building 857

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Waste Paint	820	DRMO	GAL/YR
Aircraft Soap	48	OWSSS	GAL/YR
Speedy Dry	600	DRMO	LBS/YR
Waste Plastic Beads	1200	DRMO	LBS/YR
Paint Rags	1200	DRMO	LBS/YR
Carbon Remover Rinse	29000	SS	LBS/YR
Epoxy Stripper	1100	DRMO	LBS/YR
Oily Rags	600	MT	LBS/YR

Shop: 5 FMS Aircraft Washrack

Building 837

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Synthetic Oil	60	OWSSS	GAL/YR
Aircraft Soap	1100000	OWSSS	GAL/YR

Shop: 5 FMS Fuel Systems

Building 836

WASTE PRODUCT	QTY	DISPOSAL UNITS	
JP-4 Fuel	7200	REC	GAL/YR
MEK	24	UIP	LBS/YR
4 Part Cleaner	110	UIP	LBS/YR
Speedy Dry	40	DRMO	LBS/YR
MEK Rags	120	DRMO	LBS/YR

Shop: 5 FMS NDI

Building 857

WASTE PRODUCT	QTY	DISPOSAL UNITS	
Magnetic Particle Oil	550	DRMO	GAL/YR
Trichloroethane Rags	200	DRMO	LBS/YR
Penetrant	300	DRMO	LBS/YR
Developer	300	DRMO	LBS/YR
Trichloroethane	300	DRMO	LBS/YR

Shop: 5 FMS Non-Powered AGE

Building 766

WASTE PRODUCT	QTY	DISPOSAL UNITS	
5606 Fluids	5	CD	GAL/YR
Soap	5	SS	GAL/YR
Safety Kleen	240	CD	GAL/YR
Speedy Dry	120	MT	LBS/YR
Oily Rags	840	MT	LBS/YR
Paint Spray Cans	300	MT	COUNT/YR

Shop: 5 FMS Pneudraulics

Building 857

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Fluids	660	CD	GAL/YR
Safety Kleen	420	CD	GAL/YR
Oily Rags	1200	MT	LBS/YR

Shop: 5 FMS Propulsion

Building 756/748

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Fuel & Hydraulic Fluid	288	CD	GAL/YR
Stripper	12	DRMO	LBS/YR
Carbon Remover	120	DRMO	LBS/YR
PD-680 Type I	400	DRMO	LBS/YR

Shop: 5 FMS Repair & Reclamation

Building 868

WASTE PRODUCT	QTY	DISPOSAL	UNITS
5606 Hydraulic Fluid	10	CDER	GAL/YR
Speedy Dry - Oil Spills	2400	MT	LBS/YR
Oily Rags	1800	MT	LBS/YR
MEK	2	UIP	LBS/YR
Spray Paint Cans - Empty	190	MT	COUNT/YR

Shop: 5 FMS Wheel & Tire

Building 868

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Soap	800	SS	GAL/YR
Safety Kleen	3600	CD	GAL/YR
Spray Paint Cans - Empty	1	MT	COUNT/YR
Oily Rags	1200	MT	LBS/YR
PD-680 Type II	1	UIP	LBS/YR

Shop: 5 MMS ALMN

Building 1134

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Fluorocarbon Spray Cans	12	MT	COUNT/YR

Shop: 5 MMS Equipment Maintenance

Building 1144

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Brake & Hydraulic Fluids	7200	CD	GAL/YR
Safety Kleen	180	CD	GAL/YR
Floor Soap	60	SS	GAL/YR
General Purpose Oil	780	CD	GAL/YR
Speedy Dry	960	MT	LBS/YR
Oily Rags	6000	MT	LBS/YR

Shop: 5 MMS MK - 12A

Building 1119

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Nitrophenol	2	UIP	LBS/YR

Shop: 5 MMS Maintenance & Inspection

Building 1113

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Thinner	1	DRMO	LBS/YR

Shop: 5 MMS Missile Check-Out

Building 1134

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Hydraulic Fluid	36	CD	GAL/YR
Naptha	60	MT	LBS/YR
MEK	60	DRMO	LBS/YR
Tricholoethane	60	DRMO	LBS/YR
Isocyanate Spray Cans	120	MT	COUNT/YR

Shop: 5 MMS Support

Building 1107

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Motor Oil	10	CD	GAL/YR
Hydraulic Fluid	10	CD	GAL/YR
Thinner	60	DRMO	LBS/YR
Oily Cheese Cloth	120	MT	LBS/YR
Isopropanol Soiled Rags	5	CD	LBS/YR

Shop: 64 FTW ACE LSSI

Building 718

WASTE PRODUCT	QTY	DISPOSAL	UNITS
JP-4	150	CD	GAL/YR
Oils And Fluids	50	CD	GAL/YR
Oily Rags	300	MT	LBS/YR

Shop: 857 Auto Hobby

Building 583

WASTE PRODUCT	QTY	DISPOSAL	UNITS
30w Oil & Waste Fluids	2250	CDER	GAL/YR
Safety Kleen	160	CD	GAL/YR
Lead-Acid Batteries	12	VE	COUNT/YR
Oily Rags	120	MT	LBS/YR

Shop: 857 CES Entomology

Building 492

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Phosphine	150	UIP	GAL/YR
Equipment Rinse	360	UIP	GAL/YR
Spray Paint Cans - 11 oz	72	MT	COUNT/YR
Rags	50	MT	LBS/YR

Shop: 857 CES Grounds

Building 521

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Waste Oils	55	CD	GAL/YR
Spray Paint Cans	2	MT	COUNT/YR
Easy Clean	60	CD	LBS/YR

Shop: 857 CES Heavy Equipment

Building 521

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Aircraft Soap	20	OWSSS	GAL/YR
Degreaser	15	OWSSS	GAL/YR
Speedy Dry	36	MT	LBS/YR
Oily Rags	50	MT	LBS/YR

Shop: 857 CES Liquid Fuels Maintenance

Building 445

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Waste Fuels	3	UIP	GAL/YR
Rags	150	MT	LBS/YR
Speedy Dry	480	MT	LBS/YR
Enamel Spray Paint Cans	3	MT	COUNT/YR

Shop: 857 CES Power Production

Building 879

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Fuel	60	CDER	GAL/YR
Motor Oil	600	CDER	GAL/YR
Safety Kleen	360	CD	GAL/YR
Spray Paint Cans - Partially Filled	72	DRMO	COUNT/YR
Lead-Acid Batteries	24	VE	COUNT/YR
Oily Rags	600	MT	LBS/YR

Shop: 857 CSG Golf Course Maintenance

Building 1179

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Motor Oil	240	CD	GAL/YR
Transmission Fluid	2	CD	GAL/YR
Spray Paint Cans - 11oz	6	MT	COUNT/YR

Shop: 857 Fuel Management

Building 780/420

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Fuel	600	CD	GAL/YR
Oily Rags	600	MT	LBS/YR
Speedy Dry	120	MT	LBS/YR

Shop: 857 Hospital Clinical Lab

Building 194

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Methanol	40	SS	GAL/YR
Acetone	3	SS	GAL/YR

Shop: 857 Hospital Radiology

Building 194

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Developer Starter	18000	SS	GAL/YR
Developer	12000	SS	GAL/YR
Fixer	15000	SRSS	GAL/YR

Shop: 857 Dental X-Ray/Lab

Building 194

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Acetone	1	UIP	GAL/YR
Fixer	13	SRSS	GAL/YR
Developer	300	SS	GAL/YR
Methanol	6	UIP	GAL/YR

Shop: 857 Security Police Firing Range

Building 393

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Spray Paint Cans - Empty	12	MT	COUNT/YR
Oily Rags	100	DRMO	LBS/YR
PD-680 Sludge	10	DRMO	LBS/YR

Shop: 857 TRANS Summer Rebuild

Building 426

WASTE PRODUCT	QTY	DISPOSAL	UNITS
30w Oil	240	CD	GAL/YR
Oily Rags	130	MT	LBS/YR

Shop: 857 TRANS Allied Trades

Building 426

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Waste Paint	1200	DRMO	GAL/YR
Kimtex Wipes	84	MT	LBS/YR
Paint Dusts	180	MT	LBS/YR

Shop: 857 TRANS D & QA

Building 460

WASTE PRODUCT	QTY	DISPOSAL	UNITS
30w Oil	2640	CD	GAL/YR
Aircraft Soap	12	SS	GAL/YR
Lead-Acid Batteries	420	REC	COUNT/YR
Oily Rags	240	MT	LBS/YR
Carburator Cleaner Spray Cans - 10oz	24	UIP	COUNT/YR

Shop: 857 TRANS Fire Truck Maintenance

Building 897

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Synthetic Oil	80	CDER	GAL/YR
Alkaline Soap	10	SS	GAL/YR
Safety Kleen	120	CD	GAL/YR
Spray Paint Cans	10	MT	COUNT/YR
Oily Rags	350	MT	LBS/YR

Shop: 857 TRANS General Purpose 1

Building 426

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Motor Oil	600	CD	GAL/YR
Transmission Fluid	12	CD	GAL/YR
Safety Kleen	840	CD	GAL/YR
Steam Detergent Residue	600	OWSSS	GAL/YR
Spray Paint Cans - 11oz	12	MT	COUNT/YR

Shop: 857 TRANS General Purpose 2

Building 426

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Oils And Fluids	900	CD	GAL/YR
Safety Kleen	450	CD	GAL/YR
Steam Detergent Residue	400	OWSSS	GAL/YR
Carburetor Cleaner Soiled Rags	120	MT	LBS/YR
Carburetor Cleaner Spray Cans	12	MT	COUNT/YR

Shop: 857 TRANS Heavy Equipment

Building 425

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Motor Oil	3600	CD	GAL/YR
Safety Kleen	2520	CD	GAL/YR
Spray Paint Cans - 11oz	72	MT	COUNT/YR
Speedy Dry	1800	MT	LBS/YR
Kimtex Wipes	600	MT	LBS/YR
Carbon Remover	54	UIP	LBS/YR

Shop: 857 TRANS Refueling Maintenance

Building 761

WASTE PRODUCT	QTY	DISPOSAL	UNITS
JP-4 Fuel	120	REC	GAL/YR
Oils & Fluids	200	CD	GAL/YR
Orange Eddy	600	SS	GAL/YR
Kimtex Wipes - Oil Soiled	180	MT	GAL/YR
Safety Kleen	420	CD	GAL/YR
Oily Rags	180	VE	LBS/YR
Carbon Remover	1	SS	LBS/YR

Shop: 857 TRANS Vehicle Operations

Building 442

WASTE PRODUCT	QTY	DISPOSAL UNITS	
Spray Paint Cans - Empty	24	MT	COUNT/YR
Speedy Dry	160	MT	LBS/YR

Shop: 91 FMMS Corrosion Control

Building 763

WASTE PRODUCT	QTY	DISPOSAL UNITS	
Safety Kleen	315	CD	GAL/YR
Waste Glass Beads	1200	DRMO	LBS/YR
Alodine	150	DRMO	LBS/YR
Paint Waste	120	DRMO	LBS/YR
MEK Rags	100	DRMO	LBS/YR

Shop: 91 FMS Mechanical

Building 546

WASTE PRODUCT	QTY	DISPOSAL UNITS	
Motor Oil	5	CD	GAL/YR
Hydraulic Fluid	29	CD	GAL/YR
Spray Paint Cans - 11oz	12	MT	COUNT/YR
Speedy Dry	250	MT	LBS/YR
Oily Rags	600	MT	LBS/YR
PD-680 Type II	1	UIP	LBS/YR

Shop: 91 FMS PREL Shop

Building 546

WASTE PRODUCT	QTY	DISPOSAL UNITS	
Shop Rags - Chromate	70	DRMO	LBS/YR
Lead-Acid Batteries	20	DRMO	COUNT/YR
Sodium Chromate - Liquid	120	DRMO	LBS/YR

Shop: 91 FMS Pneudraulics

Building 546

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Hydraulic Fluid	100	CD	GAL/YR
Oily Rags	200	MT	LBS/YR
PD-680 Type II	1	UIP	LBS/YR

Shop: OOLAC Rivet Mile

Building Off-Base

WASTE PRODUCT	QTY	DISPOSAL	UNITS
Diesel Fuel	110	CD	GAL/YR
Motor Oil	400	CD	GAL/YR
Hydraulic Fluid	110	CD	GAL/YR
Citrikleen	45	CD	GAL/YR
PCB Filters	280	DRMO	GAL/YR
Cadmium Rinse	3	CD	GAL/YR
Speedy Dry	600	MT	LBS/YR
Oily Rags	600	MT	LBS/YR
Cadmium Rags	60	CD	LBS/YR
MEK Rags	36	CD	LBS/YR
Trichlorotrifluoroethane	3	CD	LBS/YR
Cleaning Solvent	15	CD	LBS/YR
Natrakleen Solvent	60	CD	LBS/YR

LEGEND: DRMO denotes Defense Reutilization and Marketing Office
 SS denotes Sanitary Sewer
 CD denotes Contractor Disposal
 MT denotes Municipal Trash
 REC denotes Recycled
 UIP denotes Used In Process
 CDER denotes Contractor Disposal for Energy Recovery
 VE denotes Vendor Exchange
 OWSSS denotes Oil/Water Separator then down Sanitary Sewer

APPENDIX E

Summary of Waste Disposal Practices for Each Waste Category

Category: Oils And Fluids

Shop	Product	QTY(GAL/YR)	Disposal
857 CES Power Production	Motor Oil	600	CDER
5 FMS Repair & Reclamation	5606 Hydraulic Fluid	10	CDER
857 TRANS Fire Truck Maintenance	Synthetic Oil	80	CDER
857 Auto Hobby	30w Oil & Waste Fluids	2250	CDER
857 CES Grounds	Waste Oils	55	CD
5 FMS Propulsion	Fuel & Hydraulic Fluid	288	CD
5 FMS Aircraft Washrack	Synthetic Oil	60	OWSS
857 TRANS Refueling Maintenance	Oils & Fluids	200	CD
5 MMS Equipment Maintenance	Brake & Hydraulic Fluids	7200	CD
5 MMS Equipment Maintenance	General Purpose Oil	780	CD
5 FMS Non-Powered AGE	5606 Fluids	5	CD
5 FMS Pneudraulics	Fluids	660	CD
5 FMS NDI	Magnetic Particle Oil	550	DRMO
5 MMS Support	Motor Oil	10	CD
5 MMS Support	Hydraulic Fluid	10	CD
OOLAC Rivet Mile	Motor Oil	400	CD
OOLAC Rivet Mile	Hydraulic Fluid	110	CD
5 MMS Missile Check-Out	Hydraulic Fluid	36	CD
857 CSG Golf Course Maintenance	Motor Oil	240	CD
857 CSG Golf Course Maintenance	Transmission Fluid	2	CD
857 TRANS D & QA	30w Oil	2640	CD
857 TRANS Heavy Equipment	Motor Oil	3600	CD
857 TRANS General Purpose 1	Motor Oil	600	CD
857 TRANS General Purpose 1	Transmission Fluid	12	CD
857 TRANS General Purpose 2	Oils And Fluids	900	CD
91 FMS Pneudraulics	Hydraulic Fluid	100	CD
64 FTW ACE LSSI	Oils And Fluids	50	CD
857 TRANS Summer Rebuild	30w Oil	240	CD
91 FMS Mechanical	Motor Oil	5	CD
91 FMS Mechanical	Hydraulic Fluid	29	CD
TOTAL:		21722	

Category: Paint Wastes

Shop	Product	QTY(GAL/YR)	Disposal
5 FMS Aircraft Structural	Waste Paint	820	DRMO
857 TRANS Allied Trades	Waste Paint	1200	DRMO
TOTAL:		2020	

Shop	Product	QTY	Disposal
91 FMMS Corrosion Control	Waste Glass Beads	1200	DRMO
5 FMS Aircraft Structural	Waste Plastic Beads	1200	DRMO
91 FMMS Corrosion Control	Paint Waste	120	DRMO
5 MMS Support	Thinner	60	DRMO
5 MMS Maintenance & Inspection	Thinner	1	DRMO
857 TRANS Allied Trades	Paint Dusts	180	MT
TOTAL:		2761	

Category: Fuels

Shop	Product	QTY(GAL/YR)	Disposal
857 CES Power Production	Fuel	60	CDER
857 CES Liquid Fuels Maintenance	Waste Fuels	3	UIP
5 FMS Fuel Systems	JP-4 Fuel	7200	REC
857 TRANS Refueling Maintenance	JP-4 Fuel	120	REC
OOLAC Rivet Mile	Diesel Fuel	110	CD
64 FT ACE LSSI	JP-4	150	CD
857 Fuel Management	Fuel	600	CD
TOTAL:		8243	

Category: Strippers

Shop	Product	QTY	Disposal
5 FMS Propulsion	Stripper	12	DRMO
5 FMS Aircraft Structural	Epoxy Stripper	1100	DRMO
TOTAL:		1112	

Category: Aerosol Cans

Shop	Product	QTY Disposal
5 FMS Wheel & Tire	Spray Paint Cans - Empty	1 MT
5 FMS AGE Heater	Spray Paint Cans - Empty	48 MT
857 CES Power Production	Spray Paint Cans - Parti	72 DRMO
857 Security Police Firing Range	Spray Paint Cans - Empty	12 MT
5 FMS Repair & Reclamation	Spray Paint Cans - Empty	190 MT
857 TRANS Fire Truck Maintenance	Spray Paint Cans	10 MT
857 CES Grounds	Spray Paint Cans	2 MT
857 TRANS Vehicle Operations	Spray Paint Cans - Empty	24 MT
857 CES Liquid Fuels Maintenance	Enamel Spray Paint Cans	3 MT
5 FMS Non-Powered AGE	Paint Spray Cans	300 MT
5 MMS ALMN	Fluorocarbon Spray Cans	12 MT
5 MMS Missile Check-Out	Isocyanate Spray Cans	120 MT
857 TRANS General Purpose 2	Carburetor Cleaner Spray	12 MT
857 CSG Golf Course Maintenance	Spray Paint Cans - 11oz	6 MT
857 TRANS D & QA	Carburator Cleaner Spray	24 UIP
857 TRANS Heavy Equipment	Spray Paint Cans - 11oz	72 MT
857 TRANS General Purpose 1	Spray Paint Cans - 11oz	12 MT
857 CES Entomology	Spray Paint Cans - 11 oz	72 MT
91 FMS Mechanical	Spray Paint Cans - 11oz	12 MT
TOTAL:		1004

Category: Battery Waste

Shop	Product	QTY Disposal
857 CES Power Production	Lead-Acid Batteries	24 SE
857 Auto Hobby	Lead-Acid Batteries	12 SE
857 TRANS D & QA	Lead-Acid Batteries	420 REC
91 FMS PREL Shop	Lead-Acid Batteries	20 DRMO
TOTAL:		476

Category: Soaps

Shop	Product	QTY(GAL/YR) Disposal
5 FMS Wheel & Tire	Soap	800 SS
857 TRANS Fire Truck Maintenance	Alkaline Soap	10 SS
857 CES Heavy Equipment	Aircraft Soap	20 OWSS
5 FMS Aircraft Washrack	Aircraft Soap	110000 OWSS
857 TRANS Refueling Maintenance	Orange Eddy	600 SS
5 MMS Equipment Maintenance	Floor Soap	60 SS
5 FMS Non-Powered AGE	Soap	5 SS
5 FMS Aircraft Structural	Aircraft Soap	48 OWSS
857 TRANS D & QA	Aircraft Soap	12 SS
857 TRANS General Purpose 1	Steam Detergent Residue	600 OWSS
857 TRANS General Purpose 2	Steam Detergent Residue	400 OWSS
TOTAL:		1102555

Category: Rags

Shop	Product	QTY(GAL/YR) Disposal
857 TRANS Refueling Maintenance	Kimtex Wipes - Oil Soile	180 MT
TOTAL:		180

Shop	Product	QTY Disposal
857 Fuel Management	Oily Rags	600 MT
5 FMS Repair & Reclamation	Oily Rags	1800 MT
5 FMS Wheel & Tire	Oily Rags	1200 MT
5 FMS AGE Heater	Oily Rags	600 MT
857 CES Power Production	Oily Rags	600 MT
857 CES Liquid Fuels Maintenance	Rags	150 MT
857 Security Police Firing Range	Oily Rags	100 DRMO
857 TRANS Fire Truck Maintenance	Oily Rags	350 MT
857 Auto Hobby	Oily Rags	120 MT
857 CES Heavy Equipment	Oily Rags	50 MT
5 FMS Fuel Systems	MEK Rags	120 DRMO
857 TRANS Refueling Maintenance	Oily Rags	180 LE
91 FMMS Corrosion Control	MEK Rags	100 DRMO
5 FMS Aircraft Structural	Paint Rags	1200 DRMO
5 MMS Equipment Maintenance	Oily Rags	6000 MT
5 FMS Non-Powered AGE	Oily Rags	840 MT
5 FMS Pneudraulics	Oily Rags	1200 MT
5 FMS NDI	Trichloroethane Rags	200 DRMO
5 FMS Aircraft Structural	Oily Rags	600 MT
857 TRANS General Purpose 2	Carburetor Cleaner Soile	120 MT
5 MMS Support	Oily Cheese Cloth	120 MT
5 MMS Support	Isopropanol Soiled Rags	5 CD
OOLAC Rivet Mile	Oily Rags	600 MT
OOLAC Rivet Mile	Cadmium Rags	60 CD
OOLAC Rivet Mile	MEK Rags	36 CD
857 TRANS D & QA	Oily Rags	240 MT
857 TRANS Heavy Equipment	Kimtex Wipes	600 MT
91 FMS Pneudraulics	Oily Rags	200 MT
64 FTW ACE LSSI	Oily Rags	300 MT
857 CES Entomology	Rags	50 MT
857 TRANS Allied Trades	Kimtex Wipes	84 MT
857 TRANS Summer Rebuild	Oily Rags	130 MT
91 FMS Mechanical	Oily Rags	600 MT
91 FMS PREL Shop	Shop Rags - Chromate	70 DRMO
TOTAL:		19225

Category: Solvents And Degreasers

Shop	Product	QTY(GAL/YR)	Disposal
5 FMS Wheel & Tire	Safety Kleen	3600	CD
5 FMS AGE Heater	Safety Kleen	280	CD
857 CES Power Production	Safety Kleen	360	CD
91 FMMS Corrosion Control	Safety Kleen	315	CD
857 TRANS Fire Truck Maintenance	Safety Kleen	120	CD
857 Auto Hobby	Safety Kleen	160	CD
857 CES Heavy Equipment	Degreaser	15	OWSS
857 TRANS Refueling Maintenance	Safety Kleen	420	CD
5 MMS Equipment Maintenance	Safety Kleen	180	CD
5 FMS Non-Powered AGE	Safety Kleen	240	CD
5 FMS Pneudraulics	Safety Kleen	420	CD
OOLAC Rivet Mile	Citrikleen	45	CD
857 TRANS Heavy Equipment	Safety Kleen	2520	CD
857 TRANS General Purpose 1	Safety Kleen	840	CD
857 TRANS General Purpose 2	Safety Kleen	450	CD
TOTAL:		9965	

Shop	Product	QTY	Disposal
5 FMS Wheel & Tire	PD-680 Type II	1	UIP
857 Security Police Firing Range	PD-680 Sludge	10	DRMO
5 FMS Repair & Reclamation	MEK	2	UIP
857 CES Grounds	Easy Clean	60	CD
5 FMS Fuel Systems	MEK	24	UIP
5 FMS Fuel Systems	4 Part Cleaner	110	UIP
5 FMS Propulsion	Carbon Remover	120	DRMO
5 FMS Propulsion	PD-680 Type I	400	DRMO
857 TRANS Refueling Maintenance	Carbon Remover	1	SS
91 FMMS Corrosion Control	Alodine	150	DRMO
5 FMS Aircraft Structural	Carbon Remover Rinse	29000	SS
5 MMS Missile Check-Out	Naptha	60	MT
5 FMS NDI	Trichloroethane	300	DRMO
OOLAC Rivet Mile	Trichlorotrifluoroethane	3	CD
OOLAC Rivet Mile	Cleaning Solvent	15	CD
OOLAC Rivet Mile	Natrakleen Solvent	60	CD
5 MMS MK - 12A	Nitrophenol	2	UIP
5 MMS Missile Check-Out	MEK	60	DRMO
5 MMS Missile Check-Out	Tricholoethane	60	DRMO
857 TRANS Heavy Equipment	Carbon Remover	54	UIP
91 FMS Pneudraulics	PD-680 Type II	1	UIP
91 FMS Mechanical	PD-680 Type II	1	UIP
TOTAL:		30494	

Category: Photo And Ndi

Shop	Product	QTY(GAL/YR)	Disposal
857 Hospital Radiology	Developer Starter	18000	SS
857 Hospital Radiology	Developer	12000	SS
857 Hospital Radiology	Fixer	15000	SRSS
857 Hospital X-Ray/Lab	Fixer	13	SRSS
857 Hospital X-Ray/Lab	Developer	300	SS
TOTAL:		45313	

Shop	Product	QTY	Disposal
5 FMS NDI	Penetrant	300	DRMO
5 FMS NDI	Developer	300	DRMO
TOTAL:		600	

Category: Chromium Waste

Shop	Product	QTY	Disposal
91 FMS PREL Shop	Sodium Chromate - Liquid	120	DRMO
TOTAL:		120	

Category: Absorbants

Shop	Product	QTY Disposal
5 FMS Repair & Reclamation	Speedy Dry - Oil Spills	2400 MT
857 CES Heavy Equipment	Speedy Dry	36 MT
857 TRANS Vehicle Operations	Speedy Dry	160 MT
857 CES Liquid Fuels Maintenance	Speedy Dry	480 MT
5 FMS Aircraft Structural	Speedy Dry	600 DRMO
5 FMS Fuel Systems	Speedy Dry	40 DRMO
5 MMS Equipment Maintenance	Speedy Dry	960 MT
5 FMS Non-Powered AGE	Speedy Dry	120 MT
OOLAC Rivet Mile	Speedy Dry	600 MT
857 TRANS Heavy Equipment	Speedy Dry	1800 MT
857 Fuel Management	Speedy Dry	120 MT
91 FMS Mechanical	Speedy Dry	250 MT
TOTAL:		7566

Category: Laboratory Waste

Shop	Product	QTY(GAL/YR)	Disposal
857 Hospital Clinical Lab	Methanol	40	SS
857 Hospital Clinical Lab	Acetone	3	SS
857 Hospital X-Ray/Lab	Acetone	1	UIP
857 Hospital X-Ray/Lab	Methanol	6	UIP
TOTAL:		50	

Category: Entomology

Shop	Product	QTY(GAL/YR)	Disposal
857 CES Entomology	Phosphine	150	UIP
857 CES Entomology	Equipment Rinse	360	EOC
TOTAL:		510	