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May 8, 2014

Commanding Officer
Attn: Ms. Elizabeth Moses
NAVFAC SE
Box 30 Building 903
NAS Jacksonville, FL 32212-0030

Reference: Contract Number N69450-13-D-0045
Contract Task Order Number 007

Subject: Final 2014 Pollution Prevention (P2) Management Plan Revision
NAS Corpus Christi, Texas

Dear Ms. Moses:

The TriEco Tetra Tech Joint Venture (TriEco-Tt JV) is pleased to submit the Final 2014 Pollution Prevention (P2) Management Plan Revision for Naval Air Station (NAS) Corpus Christi, Texas (1 hard copy, 2 CDs). This document was prepared by Potomac-Hudson Engineering, Inc. (PHE), subcontracted by TriEco-Tt JV, for the United States Navy, Naval Facilities Engineering Command Southeast. The deliverable is per Contract Task Order 007 for the Architect-Engineering Contract for Hazardous Material and Waste Management Environmental Engineering Services, Contract Number N69450-13-D-0045.

If you have any questions with regard to this submittal, please feel free to contact me at (904) 803-6353, or via e mail at dfears@trieco.net.

Sincerely,

Diane R. Fears
Project Manager

c: John Phillips, NAS Corpus Christi (4 hard copies, 4 CDs)
Christopher Fafard, PHE, Inc. (letter only)
Neil Talwar, TriEco-Tt (letter only)
Suzanne Arnzen, TriEco-Tt (letter only)
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May 6, 2014

Commanding Officer
Attn: Ms. Elizabeth Moses
NAVFAC SE
Box 30 Building 903
NAS Jacksonville, FL 32212-0030

Reference: Contract Number N69450-13-D-0045
Contract Task Order Number 007

Subject: Response to Navy Comments for Final Draft 2014 Pollution Prevention (P2) Management
Plan Revision for NAS Corpus Christi, Texas

Dear Ms. Moses:

The TriEco Tetra Tech Joint Venture (TriEco-Tt JV) is pleased to submit this Response to Comments Letter for the Final Draft 2014 Pollution Prevention (P2) Management Plan Revision for Naval Air Station (NAS) Corpus Christi, Texas. The questions and/or comments received by TriEco-Tt JV are addressed below.

NAVFAC SE Ms. Elizabeth Moses

-
- 1) For cover page of each appendix, please remove the phrase "Tab A", "Tab B" etc. and center the title of the appendix on the page.

Response – Change made as requested.

- 2) Most of the work flow diagrams were black and white, but a few were in color. Please make them all one or the other. I do not have a preference as to which.

Response – Change made as requested.

If you have any questions with regard to this submittal, please feel free to contact me at (904) 803-6353, or via e mail at dfears@trieco.net.

Sincerely,

Diane R. Fears
Project Manager

c: John Phillips, NAS Corpus Christi
Neil Talwar, TriEco-Tt
Christopher Fafard, PHE
Suzanne Arnzen, TriEco-Tt
File



NAVFAC Southeast

Building 903 Yorktown Avenue
Jacksonville, Florida 32212

FINAL

Pollution Prevention Management Plan Update

Naval Air Station Corpus Christi, Texas

May 2014



Environmental Projects Number: N69450-13-D-0045

Work Order Number: 0007

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Volume II

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- Appendix B. Environmental Media and Work Center Matrix
- Appendix C. Work Center Reports
- Appendix D. Points of Contact
- Appendix E. Work Center P2 Questionnaire
- Appendix F. Ranking of Potential P2 Initiatives
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ACRONYMS AND ABBREVIATIONS

AFFF.....	<i>Aqueous Film-Forming Foam</i>
AIMD.....	<i>Aircraft Intermediate Maintenance Division</i>
AMSA.....	<i>Area Maintenance Support Activity</i>
APR.....	<i>Annual Progress Report</i>
APU.....	<i>Aircraft Performance Unit</i>
AUL.....	<i>Authorized Use List</i>
CAS.....	<i>Chemical Abstracts Service</i>
C&D.....	<i>Construction and Demolition</i>
CCAD.....	<i>Corpus Christi Army Depot</i>
CFC.....	<i>Chlorofluorocarbon</i>
CFR.....	<i>Code of Federal Regulations</i>
CHRIMP.....	<i>Consolidated Hazardous Material Reutilization and Inventory Management Program</i>
CLP.....	<i>Cleaner, Lubricant, and Preservative</i>
CNATRA.....	<i>Chief of Naval Air Training</i>
CNIC.....	<i>Commander, Naval Installation Command</i>
CNO.....	<i>Chief of Naval Operations</i>
CNRSE.....	<i>Commander Navy Region Southeast</i>
CO.....	<i>Commanding Officer</i>
CPC.....	<i>Corrosion Prevention Compound</i>
DLA.....	<i>Defense Logistics Agency</i>
DoD.....	<i>Department of Defense</i>
DoDI.....	<i>Department of Defense Instruction</i>
Doss.....	<i>Doss Aviation, Inc.</i>
DRMO.....	<i>Defense Reutilization and Marketing Office</i>
DWTP.....	<i>Domestic Wastewater Treatment Plant</i>
ECE.....	<i>Environmental Compliance Evaluation</i>
EISA.....	<i>Energy Independence and Security Act</i>
EMS.....	<i>Environmental Management System</i>
EO.....	<i>Executive Order</i>
EPA.....	<i>Environmental Protection Agency</i>
EPCRA.....	<i>Emergency Planning and Community Right-To-Know Act</i>
EPR.....	<i>Environmental Project Requirement</i>
EQA.....	<i>Environmental Quality Audit</i>
FAR.....	<i>Federal Acquisition Regulation</i>
FY.....	<i>Fiscal Year</i>
GEMD.....	<i>Ground Electronics Maintenance Department</i>
GHG.....	<i>Green House Gas</i>
gpd.....	<i>Gallon per Day</i>

GPS	Global Positioning System
GSA	General Services Administration
GSE	Ground Support Equipment
HAP	Hazardous Air Pollutant
HAZMART	Hazardous Materials Pharmacy
HICS	Hazardous Inventory Control System
HMC&M	Hazardous Material Control and Management
HSMS	Hazardous Substance Management System
HVLP	High-Volume Low-Pressure
HWCB	Hazardous Waste Commodities Branch
HWMP	Hazardous Waste Management Plan
ISWMP	Integrated Solid Waste Management Plan
IWTP	Industrial Wastewater Treatment Plant
LED	Light-Emitting Diode
MEK	Methyl Ethyl Ketone
MGD	Million Gallons per Day
MIL	Military
MILCON	Military Construction
MIL-PRF	Military Performance Specification
MMBTU	One Million British Thermal Units
MPK	Methyl Propyl Ketone
MSDS	Material Safety Data Sheet
MWR	Morale, Welfare, and Recreation
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NDI	Non-Destructive Inspection
NEX	Navy Exchange
NOAP	Naval Oil Analysis Program
NWCF	Navy Working Capital Fund
O&M,N	Operation and Maintenance, Navy
OPN	Other Procurement – Navy
OPNAVINST	Office of the Chief of Naval Operations Instruction
OWS	Oil/Water Separator
P2	Pollution Prevention
PBR	Permit by Rule
PCB	Polychlorinated Biphenyl
PHE	Potomac-Hudson Engineering, Inc.
POC	Point of Contact
PODS	Portable Oil Diagnostic System
POL	Petroleum, Oil, and Lubricant

PPE.....	<i>Personal Protective Equipment</i>
ppm	<i>Part per Million</i>
PWD.....	<i>Public Works Department</i>
QRP.....	<i>Qualified Recycling Program</i>
RCRA.....	<i>Resource Conservation and Recovery Act</i>
RPM.....	<i>Revolution per Minute</i>
RRC.....	<i>Regional Readiness Command</i>
RSC.....	<i>Reserve Support Command</i>
TAC.....	<i>Texas Administrative Code</i>
TCEQ.....	<i>Texas Commission on Environmental Quality</i>
tpy	<i>Ton per Year</i>
TRI.....	<i>Toxic Release Inventory (EPCRA Section 313)</i>
USCBP.....	<i>United States Customs and Border Protection (e.g., Customs)</i>
USCG.....	<i>United States Coast Guard</i>
VOC.....	<i>Volatile Organic Compound</i>
WWTP	<i>Wastewater Treatment Plant</i>

CERTIFICATE OF COMPLETENESS

I hereby certify and affirm that, to the best of my knowledge, this Naval Air Station (NAS) Corpus Christi, Texas Pollution Prevention (P2) Plan meets the source reduction and waste minimization planning requirements of Title 30 of the Texas Administrative Code Sections 335.471-335.480, as well as Navy pollution prevention requirements; that the information contained herein is correct and complete; and that I have the authority to commit the NAS Corpus Christi resources necessary to implement this plan.

Dave Edgecomb
Captain, U.S. Navy
Commanding Officer
Naval Air Station Corpus Christi

Date

EXECUTIVE SUMMARY

This plan outlines the procedures for implementing pollution prevention (P2) throughout Naval Air Station (NAS) Corpus Christi on an on-going basis. It addresses all organizations and tenant commands on base except the Corpus Christi Army Depot (CCAD). The NAS Corpus Christi P2 Plan was originally developed in 1993 and updated in 2000 and 2008.

The plan is divided into two main elements: 1) a management system for the NAS Corpus Christi P2 Program, and 2) an implementation plan for specific P2 initiatives that will facilitate achievement of NAS Corpus Christi's P2 objectives over the next five years. Sections 2.0 and 3.0 present the P2 Program Management System and the P2 Implementation Plan, respectively. Detailed information is provided in Appendices A-G regarding processes, hazardous materials, wastes, and environmental issues specific to NAS Corpus Christi.

Chief of Naval Operations (CNO) Instructions 5090.1B Chapter 3 – Pollution Prevention, requires that every Navy facility develop and implement a P2 Plan. Additionally, the State of Texas Administrative Code (TAC) requires that all large and small quantity hazardous waste generators develop a source reduction and waste minimization plan as specified under 30 TAC 335, Subchapter Q (specifically §335.471 through §335.480). This P2 Management Plan meets both Navy and State of Texas requirements.

FACILITY INFORMATION

NAS Corpus Christi is one of the U.S. Navy's premier locations for aviation training. Located 11 miles southeast of downtown Corpus Christi, TX, the Station's primary mission is to train pilots for the United States Navy and Marine Corps. NAS Corpus Christi serves as the Headquarters of CNATRA, which coordinates all pilot training for the U.S. Navy. To accomplish its mission, NAS Corpus Christi is home to Training Air Wing Four and several tenant commands, military as well as civilian, with a total complement of approximately 1,900 military and 7,000 civilian/contract maintenance personnel. NAS Corpus Christi is also home to CCAD which occupies nearly 140 acres of the NAS Corpus Christi installation. CCAD is a major leader in the repair, overhaul and maintenance of helicopters for the Department of Defense (DoD), having approximately 5,000 military and civilian personnel.

The following NAS Corpus Christi information is presented as required by 30 TAC 335.474(J).

Facility Name

Naval Air Station Corpus Christi, Texas

Mailing Address

Naval Air Station Corpus Christi Commanding Officer (CODE N00)
 11001 D Street
 Suite 143
 Corpus Christi, TX 78419
 Nueces County

Physical Address

Naval Air Station Corpus Christi
 Environmental Department
 8851 Ocean Drive
 Corpus Christi, TX 78419
 Nueces County

Point of Contact

John Phillips
 Program Manager, Environmental Protection Specialist
 Phone: (361) 961-5356
 Email: john.phillips7@navy.mil
 Fax: (361) 961-3798

Applicable Identification Numbers

TCEQ Solid Waste Registration Number: 30479
 U.S. EPA identification Number: TX7170022787
 Toxic Release Inventory (TRI) Number: 78419NVLRS11001
 Standard Industrial Classification Code: 9711

Time Period Plan is in Effect

2014 through 2019

RCRA Hazardous Wastes Generated in 2012

See Table ES-1

Table ES-1: Hazardous Waste Generated in 2012 with Texas Waste Code (TWC)
(does not include CCAD waste)

Description of Waste	TWC	Quantity (pounds)
Batteries	Universal	25
	Universal	102
Corrosive Acid - Containerized Liquids/Multiphase	1000001H	1,289

Description of Waste	TWC	Quantity (pounds)
	1100103H	216
Corrosive Alkalines - Containerized Liquids/Multiphase	1000001H	378
	1122119H	1,064
Ignitable - Small Containers	1000001H	330
Ignitable - Aerosols	1323801H	94
Ignitable - Containerized Liquids/Multi-Phase	1000001H	1,445
	1202219H	616
	1203206H	2,691
	1205209H	978
	1206211H	1,232
	1208203H	1,118
	1210219H	316
Ignitable - Containerized Solids	1000001H	36
	Universal	210
Ignitable - Small Containers	1208203H	62
	1316319H	16
Ignitable Misc. - Chemical Defense Equipment Kits, Non-Bulk	1000001H	755
	1108119H	58
Metal-Bearing - Containerized Liquids/Multi-Phase	1104106H	320
	1111101H	912
	1203206H	826
	1208203H	3,767
Metal-Bearing - Containerized Solids, May Contain Mercury	1000001H	35
	1300309H	260
	1303310H	259
	1307316H	48
	1308319H	244
	1317409H	773
	1404409H	687
	1407489H	942
	1412403H	956
Metal-Bearing - Small Containers	1207202H	92
Non-Flammable - Small	08007011	10
	08018011	1
Oxidizer - Small	1323801H	5
Pesticides - Containerized Solids	1407489H	1,145
Reactive - Aerosols	1000001H	320
	1323801H	3,277
Reactive - Containerized Liquids/Multi-Phase	1000001H	48
Reactive - Containerized Solids	1000001H	18
Reactive Waste, Containerized Liquids / Isocyanates	1000001H	524
Small Capacitors 500 ppm & Over PCB (W/Ballasts)	03083971	284
Small Capacitors Less Than 50 ppm PCB	04143191	2,084
Solvent - Containerized Liquid/Multiphase	1000001H	57
	1202219H	640
	1210219H	261

Description of Waste	TWC	Quantity (pounds)
Solvent - Containerized Liquids/Multi-Phase	1208203H	3,955
	1209204H	420
Solvent - Containerized Solids	1312403H	430
	1404409H	135
	1407489H	5,428
State Regulated - Bulk Liquids (Pumpable)	01001191	3,870
State Regulated - Bulk Solids	03113011	338
	03193021	11,246
State Regulated - Containerized Liquids/Multi-Phase	00500011	5,081
	00601191	542
	01001191	23,958
	01031021	5,116
	02012961	1,262
	02052091	1,176
	02082031	1,350
	02092111	65
	02142191	2,886
	04104891	2,565
	05102191	226
State Regulated - Containerized Solids	00500011	1,025
	02002101	222
	03013091	190
	03053161	681
	03113011	5,061
	03123021	910
	03193021	110
	04034061	753
	04044091	132
	04054091	280
	04104891	3,306
	04114031	514
	04154031	609
State Regulated - Small Containers	06046061	196
	00612191	352
	02052091	304
U-Listed - Containerized Liquids/Multi-Phase	1000001H	10
Universal Waste Batteries With Lead	Universal	37
	Universal	22
Universal Waste Lamps	Universal	580
	Universal	4,512
Universal Waste Lithium Batteries	Universal	25
	Universal	24
Universal Waste Mercury Batteries	Universal	6
Universal Waste NiCad Batteries	Universal	105
	Universal	82

Description of Waste	TWC	Quantity (pounds)
Universal Waste/Paint/Paint Related (C.95); Liquids	1000001H	570
	Universal	809
	Universal	5,221
Universal Waste/Paint/Paint Related (C.95); Solids To Include Blast Media	Universal	3,513
	Universal	6,780
State Regulated-Other	01001191	180
	04104891	117
Universal Waste-Other	Universal	63
GRAND TOTAL		139,176

2012 Toxic Release Inventory (TRI) Reportable Releases
 See Table ES 2.

Table ES-2: 2012 TRI Reportable Releases with Chemical Abstracts Service (CAS) Number
(Includes CCAD Releases)

Chemical Name	CAS Number	Transfers/Releases (pounds)
Water Dissociable Nitrate Compounds	N511	78,453
n-methyl-2-pyrrolidone	872504	55,870
Naphthalene	91203	2
Ethylbenzene	100414	2
Toluene	108883	6,186.2
Lead	7439921	1,945.2

PAST P2 SUCCESSES AT NAS Corpus Christi

The NAS Corpus Christi P2 Program formally began operation in the mid-1990s. Since that time, great strides in hazardous waste reduction have been made along with improvements in hazardous material management, recycling, and stormwater pollution prevention. Some highlights from the program are briefly outlined below.

- Irrigation for the Golf Course uses reclaimed water purchased from the City of Corpus Christi, replacing potable water as the irrigation water source.
- Reduced hazardous waste generation (non-CCAD) from over 90,000 pounds in 1999 to less than 40,000 pounds in 2005.
- Implemented a used oil recycling program. Used oil handled as hazardous waste was reduced from 37,233 pounds in 1999 to 1,343 pounds in 2005.
- Currently utilizing multiple electronic particle counters to perform hydraulic fluid testing in lieu of the solvent-intensive “patch test.”
- High-volume low-pressure paint spray equipment is in use in most painting shops on base to increase paint transfer efficiency.
- Used antifreeze and spent lead-acid batteries are recycled offsite.

- Nearly 4,900 tons of wood waste was recovered from base housing deconstruction activities in 2005 and 2006.
- Twelve electric utility vehicles were procured for use on base.

CURRENT POLLUTION PREVENTION OBJECTIVES

The following NAS Corpus Christi P2 Program objectives were developed after careful review of 1) issues specific to various environmental media on base (e.g., air, water, hazardous waste, energy, etc.); 2) the fate of waste materials generated at NAS Corpus Christi; and 3) the significant environmental aspects and the objectives and targets identified in the NAS Corpus Christi EMS.

- Air Emissions – Reduce fugitive and stack emissions from routine base operations.
- Hazardous Material Use – Reduce the amount of hazardous materials used.
- Hazardous Waste Generation - Reduce the possibility for unintended releases or spills of hazardous wastes.
- Hazardous Waste Disposal - Reduce hazardous waste disposal volumes.
- Non-Hazardous Waste Disposal – Reduce non-hazardous/sanitary waste disposal and increase diversion ratio.
- Recycling – Maximize recycling efforts and increase diversion ratio.
- Water Pollution – Reduce amount of point and non-point pollution entering stormwater drains and the wastewater treatment plants on base.
- Energy Conservation – Reduce the amount of energy consumed in order to meet Executive Order (EO) 13123 energy reduction goals.

CURRENT POLLUTION PREVENTION INITIATIVES AND SPECIFIC POLLUTANT REDUCTION GOALS

Table ES-3 lists the P2 initiatives that will be the focus of the NAS Corpus Christi P2 Program over the next five years. The initiatives were selected for implementation from among over fifty potential/suggested P2 initiatives identified from a review of NAS Corpus Christi environmental media issues and a methodical review of processes and wastes at all non-CCAD Work Centers at the installation. These initiatives were selected for implementation based on their high ranking versus the others in terms of the overall NAS Corpus Christi P2 Program objectives. Detailed descriptions of each of these initiatives are presented in Section 3.0 of this plan (titled Pollution Prevention Implementation Plan) along with detailed plans for implementation and metrics for tracking their success. The Quantitative Goals are draft goals for NAS Corpus Christi and were based on potential maximum reductions. The NAS Corpus Christi Program Manager should review and modify these goals to tie in with ongoing P2 priorities.

P2 INITIATIVES WITH CROSS POLLUTANT/MEDIA POTENTIAL

Of the P2 initiatives presented in Table ES-3, the following one may result in the release of a different pollutant or contaminant, or may shift a pollutant release to another medium.

- The *Shop Towel Laundering* initiative will transfer contaminants that are currently disposed of with rags as hazardous and Class 1 waste to an off-site wastewater media at an industrial laundering facility. The laundering wastewater must be treated and discharged in compliance with all applicable Clean Water Act regulations.

Table ES-3: NAS Corpus Christi Planned P2 Initiatives (2014-2019)

Project/Initiative	Description/Potential Benefit	Quantitative Goals	Implementation Timeframe
<i>Best Management Practices</i>			
Track Hazardous Material Use by the Naval Health Clinic	Track the amount of hazardous materials purchased and used by the Naval Health Clinic.	NA	2014-2019
Increase Oversight of Pesticide Application	Track the amount, type, and location of pesticide application at NAS Corpus Christi.	NA	2014-2019
Reuse Excess Paint	Reduce hazardous waste generation and hazardous material purchases by establishing a program that encourages shops to share excess paint.	NA	2014-2019
Improve the Environmental Management System (EMS)	Integrate P2 into the EMS.	NA	2014-2019
Include P2 Provisions in Contracts	Require the use of eco-friendly chemicals and recycled-content materials by contractors working at NAS Corpus Christi.	NA	2014-2019
Routine Cleaning Of Oil/Water Separators	Reduce petroleum, oils, and lubricant (POL) pollution of wastewater.	NA	2014-2019
Close and Seal Floor Drains	Reduce heavy metals, antifreeze, solvents, oil and grease, gasoline, and other pollutants in wastewater.	NA	2014-2019
<i>P2 Projects</i>			
Shop Towel Laundering	Reduce hazardous and solid waste generation by laundering shop towels for re-use.	Reduce the quantity of disposable shop towels by 50%	2014-2019
Antifreeze Recycling	Reduce hazardous material purchase and hazardous waste generation by recycling spent antifreeze.	Recycle 100% of spent antifreeze generated	2014-2019
Aerosol Can Recycling	Reduce hazardous waste generation and increase solid waste diversion by recycling empty aerosol cans.	Reduce the quantity of aerosol cans	2014-2019

Project/Initiative	Description/Potential Benefit	Quantitative Goals	Implementation Timeframe
		disposed of as hazardous waste by 50%	
Integrated Solid Waste Management Plan	Increase solid waste diversion rates by evaluating current waste management practices and creating specific solid waste disposal procedures.	Reduce solid waste disposal by 20%	2014-2019
Qualified Recycling Program	Maximize solid waste diversion through increased recycling.	Reduce solid waste disposal by 20%	2014-2019
Water Loss Audit	Reduce potable water consumption by identifying significant physical losses in the distribution system.	Reduce potable water loss by 50%	2014-2019

P2 PLAN CROSS REFERENCE TO STATE OF TEXAS P2 PLAN REQUIREMENTS

Table ES-4 presents a listing of the TAC Chapter 335, Subchapter Q, Rule 335.474 requirements for P2 plans along with the corresponding location(s) within this NAS Corpus Christi P2 Plan Update where they are addressed.

Table ES-4: Cross-Reference to State of Texas P2 Plan Requirements

TAC P2 Plan Requirement (Chapter 335, Subchapter Q, Rule 335.474)	NAS Corpus Christi P2 Plan Update Location
A - Initial Survey	Appendix A (Media Maps) Appendix C (Work Center P2 Reports)
B – Prioritized List of Projects	Table ES-3 Section 3.0, Table 3-1
C – Explanation of Projects Impact	Section 3.0
D – Estimate of Type and Amount of Reductions	Section 3.0 Table 3-1
E – Project Implementation Schedule	Section 3.0
F – Measurable Goals	Section 2.0 Section 3.0 Table 2-2
G – Awareness and Training Programs	Section 2.0 Section 3.0
H – ID of P2 Initiatives with Cross Pollutant/Media Potential	Executive Summary Section 3.0

I – Certification of P2 Plan	Page iii
J – Executive Summary	Page x

1.0 INTRODUCTION

This Pollution Prevention (P2) Management Plan was prepared for Naval Air Station (NAS) Corpus Christi by Potomac-Hudson Engineering, Inc. (PHE), under contract to TriEco-Tetra Tech JV (a joint venture) (contract Number N69450-13-D-0045, Task Order 0007). This plan addresses the necessary facility actions for reducing hazardous and non-hazardous waste generation and documents the P2 Program at NAS Corpus Christi. This plan was developed in accordance with the Guidance Manual for the Preparation of Navy Shore Installation Pollution Prevention Plan Updates (Naval Facilities Engineering Service Center, 2001), and in coordination with NAS Corpus Christi personnel and tenants. It addresses all organizations and tenant commands on Station except the Corpus Christi Army Depot (CCAD).

This plan was originally developed in 1993, and previously updated in 2000 and 2008. This P2 Management Plan covers the period from 2014 through 2019, or until the next update is completed. The P2 Management Plan outlines a proactive approach for managing NAS Corpus Christi's P2 Program and should be an integrated part of the installation's Environmental Management System (EMS).

The CNO Instruction (OPNAVINST) 5090.1B Chapter 3 – Pollution Prevention requires that every Navy facility “develop and implement an Activity Pollution Prevention Plan ...” and “Update the Pollution Prevention Plan on a regular basis.” Additionally, the State of Texas Commission on Environmental Quality (TCEQ) Waste Reduction Policy Act of 1991 requires that large quantity hazardous waste generators and persons reporting under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) develop a source reduction and waste minimization plan as specified under 30 Texas Administrative Code (TAC) 335, Subchapter Q (specifically §335.471 through §335.480). Under 30 TAC 335, TCEQ requires that NAS Corpus Christi prepare a five-year P2 Plan and submit an Executive Summary of the P2 Plan.

Section 2.0 of this P2 Management Plan (titled *Pollution Prevention Management System*) provides a process for NAS Corpus Christi to identify and track P2 program objectives and technical initiatives, and evaluate completed P2 initiatives. It also assigns NAS Corpus Christi P2 Program roles and responsibilities. It is the “plan, do, check, act cycle” that ensures the NAS Corpus Christi P2 Program is working effectively. This process ensures that the plan is sustainable by continuously evaluating progress made in executing the P2 Implementation Plan (Section 3.0 of this plan) and progress toward the NAS Corpus Christi P2 objectives. It also ensures that corrective actions are taken if a P2 initiative proves ineffective.

Section 3.0 of this plan (titled *Pollution Prevention Implementation Plan*) describes specific P2 initiatives to be taken over the next five years help meet the NAS Corpus Christi P2 Program objectives. A detailed description of each P2 initiative is provided along with specific

objectives, a listing of Work Centers affected, and a Plan of Action and Milestones (POA&M) specific to the implementation of each P2 initiative. The POA&Ms include the following:

- The actions necessary to implement the recommended initiative
- The person responsible for implementing each action
- The person responsible for ensuring that the action has been completed
- An estimated start and actual completion date for each action

Section 4.0 of this plan (titled *Pollution Prevention Project Funding*) details how funding may be obtained to execute P2 initiatives presented in the Implementation Plan.

Volume II of this plan (titled *Pollution Prevention Reference Document*) contains a compilation of forms and data used to develop this plan. It includes detailed information regarding processes, hazardous materials, and wastes specific to each NAS Corpus Christi work center. It also outlines programmatic and compliance issues related to various environmental media such as air, water, solid waste, and energy. Volume II should be reviewed, validated, updated as necessary, and used as a basis for future P2 Plan updates.

1.1 Installation Description

NAS Corpus Christi is the headquarters location for Chief of Naval Air Training (CNATRA). The principal mission of NAS Corpus Christi is pilot training. Under CNATRA's command are five training air wings, 16 training squadrons, approximately 8,900 Navy and civilian personnel, the Blue Angels Flight Demonstration Squadron, the Naval Aviation Schools Command, and the National Museum of Naval Aviation. NAS Corpus Christi is also home to the Training Air Wing Four (TRAWING Four), which is comprised of four individual units: Training Squadrons Twenty-Seven (VT-27), Twenty-Eight (VT-28), Thirty-One (VT-31), and Thirty-Five (VT-35).

The largest tenant command at NAS Corpus Christi is CCAD, which occupies nearly 140 acres leased from the station. CCAD is currently the Army's largest helicopter repair depot, and is the largest industrial employer in South Texas. Other major tenants at NAS Corpus Christi include the United States Coast Guard (USCG), the United States Marine Aviation Training Support Group, and the United States Customs and Border Protection (USCBP). In all, there are more than 50 tenant commands and activities located on Station.

Fixed-wing aircraft used and maintained onsite include the T-34C Mentor, the T-6B Texan II, T-44A King Air, TC-12B Huron, E-2C Hawkeye, C-2A Greyhound, and the P-3 Orion flown by USCBP,. Rotary-wing aircraft located at NAS Corpus Christi include various Army helicopters (part of CCAD), and Dauphine helicopters and jets flown by the USCG.

2.0 POLLUTION PREVENTION MANAGEMENT SYSTEM

The P2 Management System is the process by which the NAS Corpus Christi P2 Program shall be managed. Figure 2-1 and Figure 2-2 are flow charts that depict the individual steps in the process, the personnel responsible for performing each step, and the timing of each step. The steps highlighted in yellow should be added to the Internal Assessment Plan (IAP) portion of the NAS Corpus Christi EMS, as they represent critical steps of the P2 Management System. Adding them to the IAP will help ensure that the P2 Management System is implemented effectively.

The P2 Management System is designed to be a continuous, sustainable process and therefore the user may begin at any step in the process. Any steps in this process may be executed locally by the responsible party, or executed via contract. A detailed description of each step (steps A through O) depicted in Figure 2-1 is provided in Section 2.1. This is followed by a summary of P2 Program roles and responsibilities for NAS Corpus Christi personnel in Section 2.2.

Having followed the P2 Management System steps A through F outlined in Figure 2-1, having developed Figure 2-3 depicting the fate of waste materials generated at NAS Corpus Christi, and having evaluated the significant environmental aspects and the objectives and targets identified in the NAS Corpus Christi EMS, the following NAS Corpus Christi P2 Program objectives were developed:

- *Air Emissions* – Reduce fugitive and stack emissions from routine base operations
- *Affirmative Procurement* – Increase the amount of materials purchased with recycled content, as well as bio-based products
- *Hazardous Waste Generation* - Reduce the possibility for unintended releases or spills of hazardous wastes
- *Hazardous Waste Disposal* - Reduce hazardous waste disposal volumes
- *Non-Hazardous Waste Disposal* – Reduce non-hazardous/sanitary waste disposal and increase diversion ratio
- *Recycling* – Maximize recycling efforts and increase diversion ratio
- *Water Pollution* – Reduce amount of point and non-point pollution entering stormwater drains and the wastewater treatment plants on base
- *Nuisance* – Reduce the impacts of noise and odors from base operations
- *Energy Conservation* – Reduce the amount of energy consumed in order to meet EO 13423 energy reduction goals

These qualitative objectives shall be pursued by executing the P2 Implementation Plan presented in Section 3.0 of this document.

2.1 Identify and Track P2 Program Objectives and Technical Initiatives

The following paragraphs describe actions to be taken during each step (steps A through O) of the NAS Corpus Christi P2 Management System depicted in Figure 2-1. The discussion under step H describes actions to be taken during each step depicted in Figure 2-2 for evaluating completed P2 initiatives. Please note that steps A through F are taken every 5 years, while steps G through O are taken quarterly or annually. In addition, Section 2.2 lists the P2 roles of the responsible personnel identified in steps A through O.

A. Perform P2 Program Review

Prior to updating the P2 Management Plan every 5 years, the **P2 Program Manager** shall review the following regulations and technical guidance pertaining to the NAS Corpus Christi P2 Program, noting any changes or revisions.

- OPNAVINST 5090.1B
- Navy Shore Pollution Prevention Plan Updates (publication number NFESC UG-2046-ENV)
- Department of Defense Instruction (DoDI) 4210.15, Hazardous Material Pollution Prevention
- Tri-Service P2 Opportunity Handbook
- Hazardous and Solid Waste Amendments of 1984, Section 224
- The Pollution Prevention Act of 1990 and
- EO 13423 “Strengthening Federal Environmental, Energy, and Transportation Management.”

In addition, the **P2 Program Manager** shall review relevant site-specific documents prior to the 5-year update of the P2 Plan. This will include multimedia environmental guidance and data (e.g., Management Plans, Permits, Surveys, Environmental Project Requirements (EPRs), Inventories and Studies) including, but not limited to the items listed below. This review will help define P2 objectives.

- EPCRA Data and Reports (including TRI releases)
- Environmental Management System documents, assessments, and annual reviews
- Annual Waste Summary
- Waste Stream Determinations
- Material Safety Data Sheets (MSDSs)
- Material Purchase Orders
- Spill Prevention Control and Countermeasures (SPCC) Plan

- Stormwater Pollution Prevention Plan
- Air Emissions Inventory
- Hazardous Waste Manifests
- Hazardous Substance Management System (HSMS) Database
- Pollution Prevention Management Plan
- Hazardous Waste Management Plan
- Integrated Natural Resources Management Plan (INRMP)
- Installation Restoration (IR)/Underground Storage Tank/Hazardous Waste (HW) Cleanup Program Documents
- Energy Survey
- Pesticides Management Plan
- Environmental Compliance Evaluations (ECEs)/Environmental Quality Audit (EQA) Reports

The **P2 Program Manager** shall use the above information every 5 years to create Environmental Media Maps. The Media Maps shall outline the following information for each environmental media area (see Volume II, Appendix A):

- Areas of Interest to the Media Being Evaluated – Record the physical location, building number, and or Shop/Work Center to be evaluated.
- Actual P2 Successes – Previous media initiatives accomplished that would qualify as P2 successes.
- Previous P2 Recommendations – Previous media recommendations made in media plans that would qualify as P2 recommendations.
- Opportunities for further P2 Initiatives – Any possible opportunities that “stand out” during the review of multimedia information that could merit consideration as future P2 initiatives.
- Effective Metrics – Metrics that are or could be used to identify successes and failures within the media being reviewed.
- Points of Compliance – Specific units, processes, or items that are controlled by the media being evaluated (i.e., vents, outfalls, tanks, etc.).
- Source documents used during review.

B. Develop Potential Qualitative Objectives

Every 5 years, the **P2 Program Manager** shall:

- Develop a matrix listing each Work Center and the associated environmental media areas of concern (see Volume II, Appendix B).

- Review/evaluate environmental Media Maps (see Volume II, Appendix A).
- Identify potential qualitative objectives for the P2 Plan based upon the review of the various environmental media programs, including an effective metric for each objective.

C. Review/Evaluate Existing Operations

Every 5 years the **P2 Program Manager** shall conduct field visits of all NAS Corpus Christi Work Centers and evaluate all existing operations to: 1) ensure process documentation and management procedures are accurate; 2) document P2 progress to date; and 3) identify the potential for additional P2 initiatives. The following actions should be taken to complete this step.

- Determine the Work Centers to be evaluated in the current update. Consider:
 - New operations
 - Significant changes in operation
 - Mission impact potential
 - Significant areas for potential release
 - Significant areas for worker exposure
 - Areas not reviewed during the last update of the P2 Plan
 - Any customer requested areas
- Prior to the Work Center field visits, create folders for each Work Center, to include the following information:
 - Media matrix (see Volume II, Appendix B)
 - Work Center HSMS Authorized User List (AUL)
 - Work Center P2 Reports from the previous P2 Plan (see Volume II, Appendix C).
 - Media maps that have information related to the Work Center (i.e., compliance points and areas of interest to the media being evaluated)
 - Materials issued, by Work Center, from HSMS
 - Waste streams generated by the Work Center, from HSMS or other waste tracking database
 - Work Center questionnaire (See Volume II, Appendix E)
- Develop a Work Center matrix listing all the Work Centers, each known process for each Work Center, and a schedule of when the field visit is to occur prior to going to the Work Centers. (See Volume II, Appendix D for Work Centers and points of contact.)
- Conduct Work Center field visits:
 - Complete Work Center questionnaire for each Work Center (Volume II, Appendix E).

- Look at all media points of compliance, noting any additional points of compliance not previously identified (i.e., tanks, vents, outfalls, monitoring wells).
 - Seek P2 ideas from shop workers.
 - Look at P2 equipment and determine its effectiveness based upon shop interviews.
 - Inspect hazmat lockers, note materials found, and materials without HSMS barcodes.
 - Determine if previous P2 recommendations have been implemented. If so capture as a success, and if not determine if recommendations are still valid. If recommendations are still valid, re-recommend.
 - Determine if quantitative goals have been met from the previous P2 Plan. If objectives were met, record them as a success, if not, determine what can be done to insure that the new objectives are met.
- Update the Work Center P2 Reports (Volume II, Appendix C)

D. Develop P2 Initiatives

Based on the 5-year review of NAS Corpus Christi operations, the **P2 Program Manager** shall develop new P2 initiatives and determine the effectiveness of previous P2 initiatives.

- Create a master list of potential technical (Work Center) and programmatic (management system) P2 initiatives. Use the Media Maps and Work Center P2 reports as the source of the initiatives.
- Rank potential P2 initiatives 1-5 (1 being negative impact, 3 being no effect, and 5 being positive impact), based on criteria (see Volume II, Appendix F). The criteria should include, at a minimum, primary qualitative goals for the NAS Corpus Christi P2 Program.
- Do a sanity check on the outcome of the ranking.
- Determine the cutoff score for P2 initiatives that will be implemented first (mark priority initiatives in yellow in Volume II, Appendix F).
- Perform an economic analysis for priority P2 initiatives that make the cut. Consider the following items as applicable:
 - Capital cost of equipment and installation
 - Life expectancy of equipment
 - Other upfront or investment costs associated with the initiative (e.g., training and awareness efforts)
 - Reductions and/or increases in material procurement and waste management and disposal costs
 - Reductions and/or increases in process labor and support labor costs
 - Revenue generated from sale of recycled materials

- Develop a POA&M for priority P2 initiatives that make the cut (see Section 3.0 - P2 Implementation Plan).

E. Identify Quantitative Objectives

Every 5 years, the **P2 Program Manager** shall determine the final, quantitative objectives of the P2 Program that will be presented in the updated P2 Plan (Step F).

- For each programmatic goal, sum all the reduction potential (numerical) from each contributing Work Center (technical P2 initiative). Technical P2 initiatives are targeted to a particular process.
- Evaluate the potential for each programmatic P2 initiative to contribute to each programmatic goal. Programmatic P2 initiatives are more global in nature.
- Develop a matrix (Figure 3-1) outlining the P2 Plan quantitative objectives by programmatic goal.
 - For programmatic P2 initiatives, check each affected programmatic goal.
 - For technical P2 initiatives, identify the quantitative objective.

F. Update the P2 Management Plan and Submit Executive Summary plus Certification of Completeness to TCEQ

Every 5 years, the **P2 Program Manager** shall update the P2 Plan. The updated plan shall contain the following information:

- P2 Management System (Section 2.0) revised as necessary.
- Implementation Plan (Section 3.0) for current programmatic and technical initiatives.
- Reference material documenting the process used to create the plan including, but not limited to, the following:
 - Work Center P2 reports (see Volume II, Appendix C)
 - Qualitative objectives
 - Quantitative objectives
 - Initiatives evaluated, with rankings (see Volume II, Appendix F)
 - Media Maps (see Volume II Appendix A)
- Quantitative objectives that have been met since the previous P2 Plan update. These objectives shall be captured as successes in the updated plan.
- All quantitative objectives that were not met and a discussion of why they were not met.

As part of each P2 Plan update, the Executive Summary and Certification of Completeness must be updated and submitted to TCEQ as per 30 TAC 335, Subchapter Q (specifically §335.474(1) (I and J). The format presented for these items in the front of this P2 Management Plan Update can be followed.

G. Update P2 Initiative POA&Ms

Although POA&Ms are executed on a day-to-day basis, quarterly the **P2 Program Manager** shall formally update the POA&Ms by:

- Documenting all actions that have been accomplished to date.
- Noting the slippages of the estimated completion dates by pen and ink changes to the Implementation Plans found in Section 3.

H. Evaluate Completed P2 Initiatives

The following paragraphs detail actions to be taken during each step of the process depicted in Figure 2-2.

Quarterly the **P2 Program Manager** shall visit the Work Centers where P2 initiatives (programmatic and technical) have been completed to ensure that the P2 recommendations are effective and working properly. If the equipment is not working properly, the **P2 Program Manager** shall determine why.

- If due to lack of maintenance, the **P2 Program Manager** shall provide the **Shop Supervisor** with the owner's manual and any needed assistance in developing a preventative maintenance (PM) schedule. After this PM schedule is developed, the **Shop Supervisor** shall quarterly sign-off on the document to insure that it is being conducted.
- If due to lack of training, the **P2 Program Manager** shall provide **Work Center Employees** with a training video of the initial start-up and installation demonstration, fact sheets, and/or owner's manual.
- If due to the fact that the equipment is broken, the **P2 Program Manager** shall obtain support from the **Procurement Agent**, the **Manufacturer**, or **Public Works** to correct the problem.
- If due to the fact that the piece of equipment is not appropriate for that Work Center, the **P2 Program Manager** shall contact the **Procurement Agent**, the **Manufacturer**, or **Public Works** to either relocate the piece of equipment or procure the appropriate equipment for the Work Center.
- If the P2 initiatives are not equipment related and are programmatic in nature, the **P2 Program Manager** shall determine why they are not effective and develop a POA&M to make them effective.

After P2 initiatives are determined to be effective, the **P2 Program Manager** shall record the initiative as a success and document the metrics and report to the **Environmental Director** during the next quarterly meeting.

I. Provide Media/Goal Progress

Annually the **Media Managers** shall assemble the data for their respective programs noting the progress toward the qualitative P2 Program objectives. The data shall be assembled and loaded into Excel[®] spreadsheets and graphed to track progress toward completing selected initiatives. This information shall be drawn from the Pollution Prevention Annual Data Summary (P2ADS) Reports and Work Center reports where appropriate.

J. Present P2 Objective and Initiative Progress to the Environmental Director

Quarterly the **P2 Program Manager** shall present the POA&Ms for each P2 initiative, along with the baseline and any slippages in schedule to the **Environmental Director**. On an annual basis, this quarterly update shall include the data received from the **Media Managers** on the progress towards the qualitative goals.

K. Submit Articles to the Public Affairs Officer (PAO)

Quarterly the **P2 Program Manager** shall submit the data prepared for the Environmental Director brief to the **PAO** to publish in the base newspaper. Quarterly the **P2 Program Manager** shall submit the data prepared for the Environmental Director brief to the **PAO** to promote awareness and visibility and give recognition to the Work Center with the most improvement.

L. Assess Progress and Identify Corrective Action with the Commanding Officer (CO)

Annually the **Environmental Director** and the **P2 Program Manager** shall meet with the **CO** to assess the progress toward the P2 objectives and identify any necessary corrective action measures. Because of this discussion the following should occur:

- The **P2 Program Manager** shall develop a POA&M of the corrective measures that result from this meeting.
- The POA&Ms shall be distributed to all parties involved in the corrective action with a cover letter from the **Commanding Officer** stressing the importance of meeting the dates and actions outlined in the POA&M.

M. Update P2 Plan (pen and ink changes)

Annually the **P2 Program Manager** shall review the P2 Plan and make “pen and ink” changes to ensure the plan is up to date, completed initiatives have been documented, and progress towards goals tracked. These changes are minor revisions – generally, changes to the name and phone number of points of contact (POCs).

N. Submit P2 Annual Progress Report to TCEQ

Annually the **P2 Program Manager** shall submit an annual P2 progress report as required under 30 TAC 335, Subchapter Q (specifically §335.476). This is required for all Texas facilities that are large quantity generators of hazardous waste and/or submit Form Rs under EPCRA TRI regulations. The State of Texas Annual Progress Report (APR) form is to be used (TCEQ form 00784).

A copy of the form is available at the following website:

<http://www.tceq.state.tx.us/assets/public/assistance/P2Recycle/tceq-00784.dot>

APR instructions are available at the following website:

http://www.tceq.state.tx.us/assistance/P2Recycle/wrpa/tceq-00784-inst_1282676.pdf

Online submittal of the APR form is an option at the following website:

<http://www.tceq.state.tx.us/assistance/P2Recycle/wrpa/onlineform.html>

More background on this report can be found at the following website:

<http://www.tceq.state.tx.us/assistance/P2Recycle/wrpa/p2planning.html>

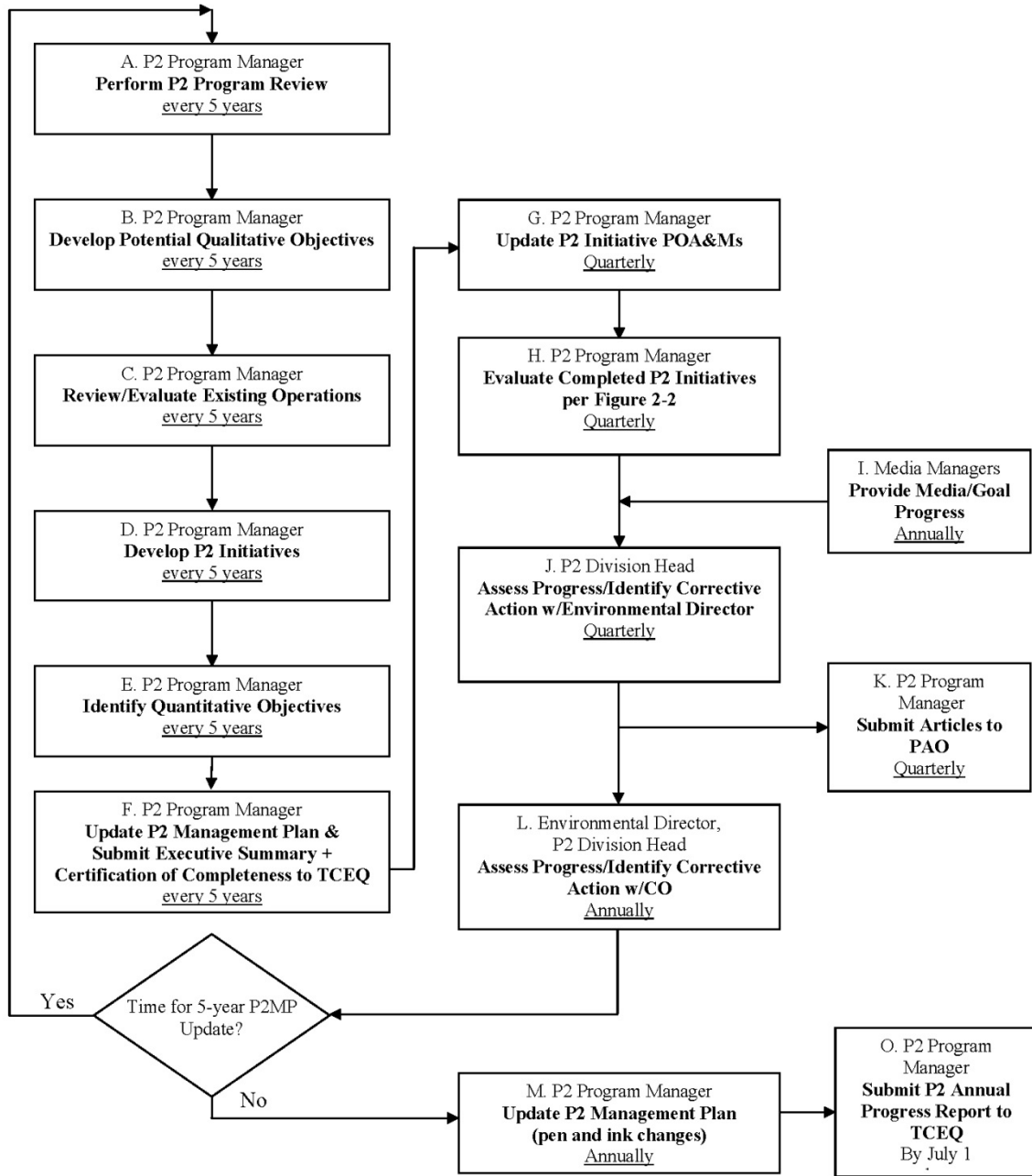


Figure 2-1: Identify and Track P2 Program Objectives & Initiatives

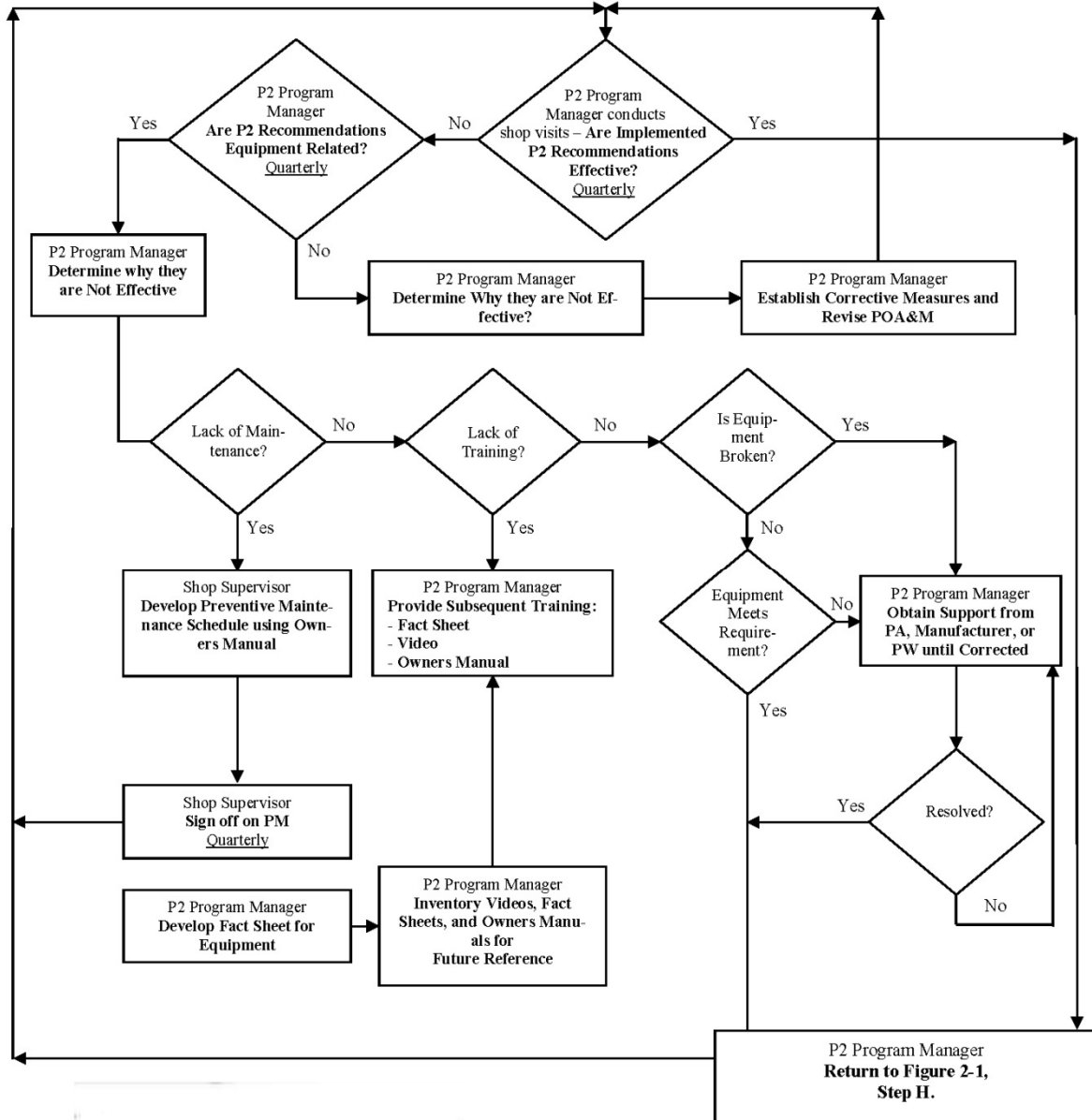


Figure 2-2: Evaluate Completed P2 Initiatives

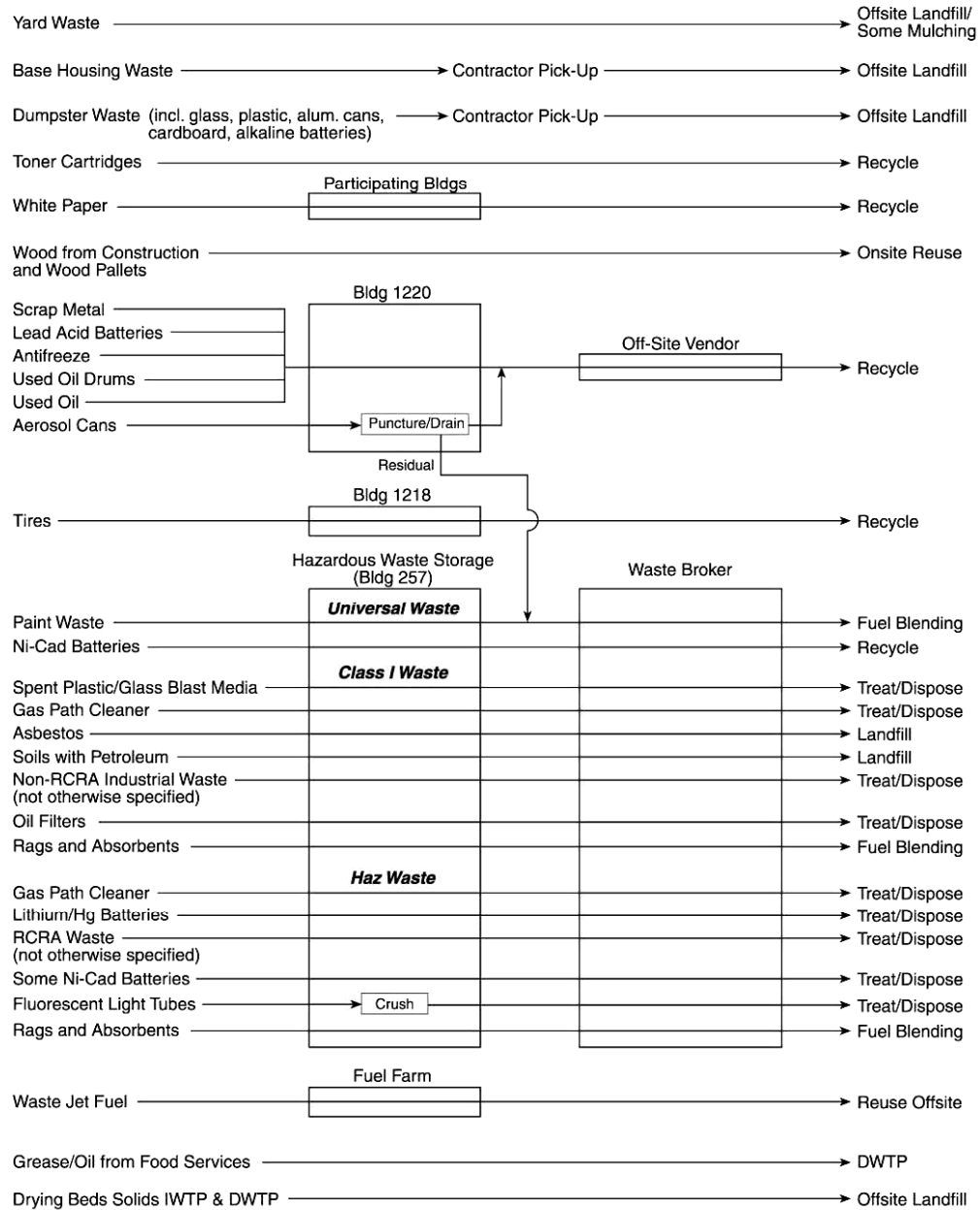


Figure 2-3: NAS Corpus Christi Unwanted Materials Disposition

2.2 P2 Program Roles and Responsibilities

2.2.1 Commanding Officer

- Ensure that NAS Corpus Christi has an assigned P2 Program Manager who has sufficient resources to implement this plan.
- Ensure Station-wide consolidation of P2 training and awareness resources.

- Ensure that construction and maintenance contracts awarded for work at NAS Corpus Christi incorporate P2 training and awareness for all workers.
- Maintain a signed P2 Command policy statement. A new P2 policy statement shall be issued by each new Commanding Officer of NAS Corpus Christi within 30 days after assuming command. Review, update, and issue NAS Corpus Christi P2 Policy Statement and ensure that all tenant commands have developed their own P2 policies and that these policies dovetail with the NAS Corpus Christi policy.
- Sign and fully endorse the finalized P2 Management Plan.

2.2.2 Environmental Director

- Ensure that NAS Corpus Christi has an assigned P2 Program Manager who has sufficient resources to implement this plan.
- Provide support to the P2 Program Manager and assigned media manager team members.
- Ensure that the Command meets all the requirements for the P2 Program outlined in state, federal, and DoD regulations.
- Obtain funding for NAS Corpus Christi P2 projects and equipment.
- Serve as strong environmental advocate to other departments.
- Annually meet with the P2 Program Manager to receive a status update on media-specific objectives.
- Assign responsibilities as required to support the activities described in the plan.

2.2.3 P2 Program Manager

- Perform long-range planning to meet P2 objectives.
- Identify and request appropriate funding for P2 initiatives.
- Provide P2 management support to all departments, commands, and tenants.
- Review and update local instructions/plans for P2 Program applicability/integration.
- Review, develop, and update Inter-Service Support Agreements, Memoranda of Agreement, and Memoranda of Understanding to ensure P2 objectives are addressed.
- Ensure that media projects, plans, etc., incorporate P2 initiatives and goals.
- Annually meet with the Environmental Director to assess progress toward the P2 goals and identify any necessary corrective action.
- Coordinate the collection, production, management, and dissemination of P2 training and information for the Activity and its tenant commands.
- Update training, as required to remain current with changing requirements of the P2 Management Plan and industrial trends, including new equipment and material substitutions.

- Work with the tenant/department POCs and/or Work Center to identify and implement P2 projects.
- Promote awareness of P2 and on-going and new initiatives on Station.
- Annually review the P2 Management Plan to identify and notate changes to administrative elements, station mission, and/or major activities and processes.
- Annually assemble data received from the Media Managers on the progress toward the media objectives and present it to the Environmental Director.
- Annual submittal of Texas Annual Progress Report (APR) forms by July 1.
- To be completed by Contractor with P2 Program Manager oversight every 5 years:
 - Review P2 related state, Federal, and Department of Defense (DoD) regulations
 - Review all media related plans for P2 initiatives
 - Create media maps
 - Develop qualitative objectives for each media area
 - Conduct field visits to review and evaluate all existing operations to insure no new processes or process changes
 - Review the Station's operations to evaluate the effectiveness of the previous P2 initiatives
 - Develop numeric goals for each media area
 - Update/revise the P2 Management Plan

2.2.4 Media Managers

- Manage training and awareness initiatives, and other activities, as assigned by the Environmental Director.
- Communicate to Environmental Director any equipment or specific training needed by personnel.
- Annually assemble data for respective programs using the metric identified for the media area.
- Provide P2 Program Manager with media plans and help develop quantitative and qualitative objectives.
- Provide media-specific recommendations to the P2 Program Manager to modify the P2 initiatives.

2.2.5 Occupational Safety and Health Manager

- Review and approve all AULs in HSMS.
- Ensure that all Contractors on base register materials through the Station's Hazardous Materials Pharmacy (HAZMART).

- Screen new Hazardous Material requests to determine hazard potential.
- Ensure that safety personnel and Work Center Hazardous Material Coordinators receive required P2 training.

2.2.6 Work Center Supervisors

- Provide input to the P2 Program Manager and the environmental Media Managers regarding specific training needs to aid with P2 initiatives.
- Develop preventive maintenance schedule for P2 equipment not functioning properly due to lack of maintenance.

2.2.7 Hazardous Material Manager/Authorized Credit Card User for each Work Center

- Assign the Hazardous Material Manager for each shop the dual responsibility of looking for P2 opportunities and ensuring equipment is functioning properly.
- Ensure credit card-purchased material arrives at the Work Center through the HAZMART.

2.2.8 Supply Officer

- Purchase hazardous materials over \$2,500 and input materials through HAZMART.

2.2.9 Public Affairs Officer

- Serve as conduit for P2 Program promotion.
- Quarterly, publish Work Center information and status toward program objectives and objectives.
- Quarterly, recognize the Work Center with the largest improvement toward the P2 objectives.

2.2.10 Contracting Officer

- Facilitate coordination between Contractors and applicable offices for P2 concerns.

3.0 POLLUTION PREVENTION IMPLEMENTATION PLAN

This P2 Implementation Plan shall be used to track and ensure that the priority P2 initiatives identified during the development of this 2014 NAS Corpus Christi P2 Plan are implemented over the next 5 years and meet their objectives relevant to the overall objectives of NAS Corpus Christi P2 Program.

Reviews of installation records, shop visits, and interviews with NAS Corpus Christi environmental staff have identified a number of pollution prevention initiatives that will contribute significantly towards meeting the Navy's pollution prevention goals. These initiatives have been grouped into two categories:

- Best Management Practices (BMPs) are programmatic initiatives that typically involve changes in administrative procedures, service contract modifications, changes in management practices, or minor process modifications. Examples of BMPs include substitution of a water-based cleaner for a chlorinated solvent, or improved housekeeping. BMPs typically do not require significant capital investment to implement.
- P2 Projects are initiatives that involve significant equipment, process, or technology modifications. Implementation of pollution prevention projects usually requires an initial capital expenditure.

Taken together, the recommended BMPs and pollution prevention projects represent the potential to significantly reduce hazardous and solid waste generation, air emissions, and wastewater discharges.

Seven BMPS were developed for NAS Corpus Christi that address hazardous material use, pesticide application, hazardous waste generation, and wastewater quality. In addition, six P2 projects were developed for hazardous waste generation, solid waste disposal, and potable water use. Table 3-1 lists the 13 P2 initiatives, their specific objectives, and the overall NAS Corpus Christi P2 Program objectives they will help meet. The list is divided into programmatic initiatives (e.g., those that are implemented via administrative means) and technical initiatives (e.g., those involving equipment installation or specific process modifications). Technical initiatives can be tracked and the quantitative progress achieved by measuring and recording actual reductions or purchases associated with the specific P2 initiative. This will assist the NAS Corpus Christi P2 Program to track the impact of the P2 projects against the current P2 Program objectives. For each programmatic initiative, the relevant NAS Corpus Christi P2 Program objectives anticipated to be positively affected are indicated qualitatively by a check mark. In this manner, progress towards the NAS Corpus Christi P2 Program objectives can be tracked and trended.

The remainder of this section contains the detailed Implementation Plans for each of the six P2 projects, including the following information:

- Objective
- Media affected
- Work centers affected
- Detailed description
- POA&M detailing the action that is to occur and who is responsible for the action

The P2 Program Manager will develop start and completion dates for each POA&M chosen for implementation.

Table 3-1: NAS Corpus Christi P2 Initiatives and Anticipated Impact on P2 Objectives

Initiative	Specific Objective	Reduce Use of Hazardous Materials	Reduce Air Emissions	Reduce Possibility of Hazardous Spills/Releases	Reduce Hazardous Waste Disposal	Reduce Non-Hazardous Waste Disposal	Reduce Energy Consumption	Maximize Recycle/Reuse	Reduce Water Pollution
BMPs / Programmatic Initiatives									
BMP-1 Track Hazardous Material Use By The Naval Health Clinic	Track the amount of hazardous materials purchased and used by the Naval Health Clinic.	✓			✓				
BMP-2 Increase Oversight Of Pesticide Application	Track the amount, type, and location of pesticide application at NAS Corpus Christi.			✓	✓				✓
BMP-3 Reuse Excess Paint	Reduce hazardous waste generation and hazardous material purchases by establishing a program that encourages shops to share excess paint.	✓			✓				
BMP-4 Improve the EMS	Integrate P2 into the EMS.	✓	✓	✓	✓	✓	✓	✓	✓
BMP-5 Include P2 Provisions In Contracts	Require the use of eco-friendly chemicals and recycled-content materials by contractors working at NAS Corpus Christi.	✓			✓	✓			
BMP-6 Routine Cleaning Of Oil/Water Separators	Reduce petroleum, oils, and lubricant (POL) pollution of wastewater.			✓					✓
BMP-7 Close And Seal Floor Drains	Reduce heavy metals, antifreeze, solvents, oil and grease, gasoline, and other pollutants in wastewater.			✓					✓
P2 Projects / Technical Initiatives									
Shop Towel Re-Use	Reduce hazardous and solid waste generation by laundering shop towels for re-use.				✓				
Antifreeze Recycling	Reduce hazardous material purchase and hazardous waste generation by recycling spent antifreeze.	✓			✓			✓	
Aerosol Can Recycling	Reduce hazardous waste generation and increase solid waste diversion by recycling empty aerosol cans.		✓		✓	✓		✓	
Integrated Solid Waste Management Plan	Increase solid waste diversion rates by evaluating current waste management practices and creating specific solid waste disposal procedures.					✓		✓	
Qualified Recycling Program	Maximize solid waste diversion through increased recycling.					✓		✓	
Water Loss Audit	Reduce potable water consumption by identifying significant physical losses in the distribution system.						✓		✓

3.1 BMP-1: Track Hazardous Material Use by The Naval Health Clinic

The Naval Health Clinic uses a system for material purchases that is not integrated into the HAZMART system in use at NAS Corpus Christi. The Naval Health Clinic does not otherwise report hazardous material use to the HAZMART or Environmental Department. By tracking hazardous material use, the Naval Health Clinic will be able to report releases of non-exempt chemicals for the purposes of EPCRA reporting, and identify additional opportunities for material substitution or reduction. The Clinic's material tracking system has a function to mark whether material materials used are hazardous, so no capital costs would be incurred.

Table 3-2: POA&M for BMP-1

Action	Responsibility	Actual Start	Actual Completion
Meeting between the P2 Program Manager, the Safety and Occupational Health Manager, and the Clinic procurement representative to discuss using the tracking function of the purchasing system.	P2 Program Manager		
Implementation of the Naval Health Clinic hazardous material tracking system.	Safety and Occupational Health Manager		

3.2 BMP-2: Increase Oversight of Pesticide Application

Currently, contractors applying pesticides enter the quantity and location of pesticide (including herbicide) application into the Naval Facilities Engineering Command (NAVFAC) Online Pesticide Reporting System, but it is unclear whether there is sufficient oversight of this process. Although AULs have been developed for pesticide application, materials are purchased directly by the three pesticide contractors and are not tracked through HAZMART.

Table 3-3: POA&M for BMP-2

Action	Responsibility	Actual Start	Actual Completion
Develop a standard operating practice for reviewing pesticide application at NAS Corpus Christi.	IPMP Manager		

3.3 BMP-3: Reuse Excess Paint

In 2012, NAS Corpus Christi disposed of 6,600 pounds of universal waste paint at a cost of \$3,432. The NAS uses very few shades of paint for interior and exterior architectural surfaces. It is recommended that leftover paints be re-mixed for use on other projects rather than disposing of the paint as waste.

Table 3-4: POA&M for BMP-3

Action	Responsibility	Actual Start	Actual Completion
Meeting between the P2 Program Manager, HAZMART, and the Public Works Officer to develop a system for reusing paint.	P2 Program Manager		
Develop a standard operation procedure for reusing excess paint.	P2 Program Manager		

3.4 BMP-4: Improve the EMS

Improve the EMS developed for NAS Corpus Christi, including documentation and personnel training. Environmental Department personnel have developed an EMS for NAS Corpus Christi, and conduct monthly Environmental Coordinator meetings in support of the EMS. However, certain required elements of the EMS were unavailable and are considered to be missing or outdated. Missing elements include the Commanding Officer policy, objectives/targets, environmental standard operating procedures, an internal assessment plan, and training for work center personnel. In addition, P2 goals have not been developed for NAS Corpus Christi, and have not been integrated into the EMS objectives and targets.

Table 3-5: POA&M for BMP-4

Action	Responsibility	Actual Start	Actual Completion
Evaluate the EMS to identify missing or outdated elements.	EMS Manager		
Develop objectives/targets that integrate P2 goals	EMS Manager		
Conduct routine (i.e., monthly) Environmental Coordinator meetings to review progress on EMS objectives/targets.	EMS Manager		

3.5 BMP-5: Include P2 Provisions in Contracts

Include provisions for P2 (such as green purchasing, material re-use, recycling) into NAS Corpus Christi contracts for goods and services. Currently, the only environmental stipulations included in contracts with service and material providers are those required by Federal Acquisition Regulation. However, NAS Corpus Christi has the opportunity to require additional Station-specific requirements through the contracting mechanism. For example, most custodial and food services are provided under service contracts, but the contract does not require the use of eco-friendly chemicals (the contractors purchase and dispose of their own chemicals) or recycled-content materials. The purchase of such products is at the discretion of the contractor. In addition, contractors are responsible for grounds keeping (except the Morale, Welfare, and Recreation (MWR) golf course), but are not required to incorporate sustainable practices such as composting, use of biofuels, or use of low water landscaping (e.g., xeriscaping).

Navy guidance document UG-2084-ENV “Integrated Solid Waste Management Plan Guide” (April 2009) includes sample contract language that can be included in contracts to incorporate source reduction, recycling, affirmative procurement, and pollution prevention activities. Also included is sample language for Construction and Demolition (C&D) contracts.

The Director of Contracting has developed a project review form that is intended to allow input on projects by the Environmental Department. The use of this form is encouraged. In addition, it is recommended that the Contracting Department, in conjunction with the Environmental Department, use the priorities developed in the EMS (BMP-4) to develop Station-specific requirements for major service and supply contracts.

Table 3-6: POA&M for BMP-5

Action	Responsibility	Actual Start	Actual Completion
Meeting between P2 Program Manager and Director of Contracting to review environmental provisions that should be included in contracts.	P2 Program Manager		
Integrate P2 provisions in new contracts executed for NAS Corpus Christi.	Director of Contracting		
Begin using the project review form.	Director of Contracting		

3.6 BMP-6: Routine Cleaning Of Oil/Water Separators (OWS)

During the site visit, it was noted that the 17 OWS maintained by the Public Works Department (PWD) had apparently not been cleaned since 2009. Concrete vault OWSs like the ones found at NAS Corpus Christi operate on the principle of gravity separation. Heavy solids and sediments sink to the bottom of the OWS while oils and grease float to the top. A key parameter of gravity separation is hydraulic retention time, meaning that water that enters an OWS must have sufficient hydraulic retention time for gravity separation to occur. As an OWS fills with accumulated sediment and oil, the effective volume of various chambers of the OWS is reduced, resulting in decreased hydraulic retention time and a corresponding decrease in removal efficiency. Accordingly, OWS manufacturers recommend a minimum of annual routine cleaning. In addition, as a general rule, the longer sediment has been present in an OWS, the greater the likelihood that the sediment has been contaminated with metals and must then be managed as a hazardous waste. Thus, increased cleaning frequency can result in decreased generation of hazardous waste sediment.

Cleaning an OWS requires the removal of floating oils and grease as well as the removal of sediment from the bottom of the OWS and the process can generate significant amounts of waste. PHE was provided with a spreadsheet from 2007 that estimated the amount of waste liquids (presumably oils and grease) and solids from the Station’s 17 OWS to be 12,516 gallons and 2,345 gallons respectively.

Rather than disposing of the diesel fuel oil and water mixture as hazardous waste, the Station should treat the mixture to separate the diesel fuel, oil, and other liquids from the water. The treated water can then be put back into the OWS. It may be possible to recycle the extracted diesel fuel and oil. Even if the extracted diesel fuel, oil, and coolant has to be disposed as hazardous waste, the volume of the waste stream will have been significantly reduced. This process, which uses a permitted, mobile on-site treatment system, is currently being used aboard Marine Corps Base Camp Pendleton and numerous other DoD installations to clean OWSs, recycle water from OWSs and underground storage tanks, and to remediate the sediment from those OWSs to make it suitable for disposal in a landfill.

Table 3-7: POA&M for BMP-6

Action	Responsibility	Actual Start	Actual Completion
Meeting between P2 Program Manager and Public Works Officer to develop a schedule and process for inspecting OWS.	P2 Program Manager		
Assign responsibility for inspecting the OWS per the schedule developed.	Public Works Officer		
Establish a contract to clean the OWS on an annual or semi-annual basis.	P2 Program Manager		

3.7 BMP-7: Close and Seal Floor Drains

Wastewater from the work centers may contain heavy metals, antifreeze, solvents, oil and grease, gasoline, and other materials that could be hazardous. Because of the presence of these contaminants, floor drains in work centers should not be connected to the stormwater system or drain directly to the surface under any conditions. In addition, floor drains that are connected to the sanitary sewer system have the potential to contaminate the wastewater treatment plant. NAS Corpus Christi conducted an Illicit Discharge Study in 2011 (AH Environmental Consultants, 2011). As part of that survey, dye testing was conducted to determine where floor drains in various buildings discharge. Dye testing was conducted at the following buildings:

- Building 8 (CCAD)
- Hangar 41 (USCG)
- Hangar 42 (Navy)
- Hangar 43 (CCAD)
- Hangar 44 (CCAD)
- Hangar 45 (CCAD)
- Hangar 46 (CCAD)
- Hangar 47 (CCAD)
- Hangar 55 (Navy)
- Hangar 56 (Navy)
- Hangar 57 (Navy)
- Hangar 58 (Navy)
- Building 252 (storm drain inlet)
- Building 359 (CCAD – Washrack)
- Building 372/1188 (CCAD – Washrack)

- Hangar 50 (Navy)
- Hangar 51 (Navy)
- Building 1808 (CCAD)
- Building H-100 (Hospital)

The study provided a number of recommendations to reduce the flow of pollutants into the industrial and sanitary sewer systems such as capping or plugging floor drains. At the time of the November 2013 site visit, it did not appear that these recommendations had been implemented. In addition to the buildings included in the study, floor drains in maintenance bays were observed in a number of work centers such as the MWR Auto Hobby Shop (Building 1737). Personnel at the Auto Hobby Shop stated that they clean POL spills on the floor using Simple Green and water to wash the spills into the drain. Similarly, floor drains were also observed in the maintenance bays at Area Maintenance Support Activity #7 (AMSA-7) (Building 1722). This practice has the potential to introduce significant amounts of POLs to the sanitary sewer system.

Initiate a program to close all floor drains in industrial spaces by capping or plugging them with cement. In concert with this effort, personnel in these workspaces should be trained on BMPs for cleaning-up spills and floor cleaning (i.e., use of dry sweep or similar absorbent materials). Work center personnel throughout NAS Corpus Christi should receive training to reinforce BMPs for preventing harmful discharges to the wastewater treatment plant, including the following practices:

- Use dry floor cleaning methods such as sweeping and vacuuming
- Prevent drips and spills from reaching the floor
- If a small spill does occur, clean it immediately with shop towels or mops
- Never clean spills by hosing them down with water or soap
- Perform vehicle maintenance work in areas where there are no floor drains
 - If floor drains are present, seal them with spill mats during work to prevent spills from entering the drains
- Close floor drains where hazardous materials are stored
- Do not use degreasing solvents to clean engines¹

Table 3-8: POA&M for BMP-7

Action	Responsibility	Actual Start	Actual Completion
Meeting between P2 Program Manager, Public Works Officer, and plumbing shop to identify work centers that have unsealed floor drains.	P2 Program Manager		

¹ Most engine degreasers are hazardous and should not be discharged into a wastewater treatment facility. Even if nonhazardous degreasers are used, the oil and grease concentration may exceed the limit allowed by the wastewater treatment plant.

Develop a priority list for sealing the floor drains based on use of the building and potential for chemical releases.	Public Works Officer		
Seal floor drains based on the prioritized list of open floor drains.	Public Works Officer		

3.8 Shop Towel Re-Use

The 2008 P2 Plan describes a successful shop towel laundering program (also known as a “red rag” program because laundered rags are dyed red to differentiate them from disposable rags) utilized by AIMD, HM-15, the USCG, MWR, L2 C-12, and L3-Vertex. Used shop towels were picked up by a commercial laundering service for offsite cleaning, and clean rags were then returned to the work center. However, this program has since been discontinued.

The program was discontinued reportedly due to the laundered rags being returned to NAS Corpus Christi contaminated with metals (additional details are not available). At the time, this program was halted instead of searching for an alternate vendor that could ensure delivery of uncontaminated rags. Only one work center (AMSA-7) continues to operate a rag re-use program that they operate themselves. (It is unknown whether laundered rags from AMSA-7 have been sampled and determined to be uncontaminated).

When hazardous materials are adsorbed by a towel, the towel can become a hazardous waste. Shop towels are used with various hazardous materials, including oil, paint, solvent, and non-hazardous materials. As an alternative to disposing of the towel as hazardous waste, however, towels cleaned by a qualified industrial laundry service are exempt from the full burden of hazardous waste management rules. Disposable towels are solid waste and subject users to the costs of compliance with hazardous waste handling and disposal rules. Laundered shop towels are exempt from hazardous waste regulation as long as the laundering facility is discharging the spent cleaning water in full compliance with the Clean Water Act and associated regulations.

There is some cross pollutant potential with laundering shop rags. Some pollutants are discharged into the public wastewater system during laundering as well as emitted into the air. However, the wastewater from permitted laundries is treated to be within local wastewater discharge limits.

3.8.1 Economic Analysis

Currently, only eight work centers specifically track used shop towel waste. The remaining shops combine them with other materials, which are manifested as “State Reg. – Containerized Solids” (boss description 04104891), “Solvent – Containerized Solids” (boss description 1407489H), Pesticides – Containerized Solids (boss description 1407489H), and “Metal-Bearing – Containerized Solids, May Contain Mercury” (boss description 1407489H). Although these waste descriptions include other debris (such as plastic and oil filters), NAS Corpus Christi

personnel stated that these waste streams are largely comprised of shop rags. For the purpose of this analysis and because the quantity of shop rags is not specifically known, it is assumed that these waste streams are comprised solely of used shop rags.

Based on information provided by a local commercial textile service, the cost for reusable shop towels is approximately \$0.049 per towel for laundering and an 8 percent energy and environmental fee. The cost of replacement for lost/damaged towels is \$0.044. A facility the size of NAS Corpus Christi is assumed to need 1,000 towels per week (500 of which will be onsite at any one time and the remainder will be at the laundry for cleaning), and typically lose/damage 7 percent of shop towels used (70 towels). Using these cost assumptions, the weekly cost is estimated to be a total of \$56 (\$49 for towels, \$3.92 for an energy/environmental fee, and \$3.08 for replacement of lost/damaged towels).

In 2012, approximately 8,591 pounds of used shop towels were disposed of as hazardous waste. Based on 2012 hazardous waste generation data provided by NAS Corpus Christi, the NAS pays an average cost for hazardous waste disposal of \$1.23/pound. The price for disposable shop towels is approximately \$102.00 for a box of 150 disposable towels². The cost for 1,000 disposable towels is estimated to be \$680.

Lint-free “white rags” (used in processes such as cleaning fuel sample bottles and cleaning parts during Non-Destructive Inspection (NDI) testing) cannot be laundered and are one-time use items. It is assumed that some shops will continue to need disposable shop towels for certain functions, estimated to be 25 percent of shop towel use.

Many commercial textile services own the shop rags that they provide for use, which means that NAS Corpus Christi would not have initial capital costs for the purchase of shop rags. In addition, local vendors offer a “premium” shop towel service that can provide NAS Corpus Christi with only new towels, eliminating the previous problem with metal-contaminated shop towels. (Under the “premium” service, the used shop towels are laundered and provided to other facilities.) Costs for the premium service are used in the economic analysis.

The following local vendors offer shop rag laundering services in Corpus Christi:

G&K Services
2427 Rand Morgan Rd
Corpus Christi Texas 78419
Main: (361) 242-1260
Direct: Patrick Lopez, (214) 478-2969
Patrick.lopez@gksservices.com
<http://www.gksservices.com>

² http://www.grainger.com/product/GEORGIA-PACIFIC-Disposable-Towels-WP118805/_/N-lck?s_pp=false

Cintas
 301 Junior Beck Dr.
 Corpus Christi, TX 78405
 Main: (361) 289-1781
<http://www.cintas.com>

3.8.2 Cost Breakdown

Annual cost for hazardous waste disposal: \$ 10,567

Annual cost of material purchases: \$50,115

Estimated annual cost for laundering service: \$510

Estimated waste reduction: 75% (\$7,925)

Estimated material use reduction: \$680

3.8.3 Payback Period

Formula: = Annual Initial Investment/Annual Cost Savings

$$= \$2,912 / (\$7,925 + \$680)$$

$$= \$2,912 / \$8,605$$

$$= 0.33 \text{ Years}$$

Table 3-9: POA&M for Shop Towel Re-Use

Action	Responsibility	Actual Start	Actual Completion
Set-up meetings with the shop towel laundering providers, a contracting department representative, and any other NAS Corpus Christi interested parties.	P2 Program Manager		
Identify funding for the shop towels laundering program in conjunction with the contracting department.	P2 Program Manager		
Work with the HAZMART to establish a shop towel pick-up and return station.	P2 Program Manager		
Monitor activity and issues with shop towel laundering programs established at NAS Corpus Christi.	P2 Program Manager		

3.9 Antifreeze Recycling

Antifreeze usually contains ethylene or propylene glycol, corrosion inhibitors, and foam controllers, and is usually diluted to 50 percent concentration with water in vehicles. Antifreeze

may become hazardous when contaminants such as heavy metals, fuel, and solvents are mixed in when circulating through the engine and cooling systems of the vehicle. Recycling antifreeze saves money on disposal fees and purchase of new antifreeze. Antifreeze recycling includes such processes as distillation, refining/filtering, ion exchange, reverse osmosis, chemical treatment, or a combination of these methods.

Several work centers (i.e., Hangar 51 Ground Support Equipment Shop, AMSA-7) have antifreeze-recycling units that are not in use. This includes an antifreeze-recycling unit located at AMSA-7 that has never been used and is still in the original shrink-wrapping (Finish Thompson Inc. Coolant Reclaimer Antifreeze Recycler). AMSA-7 personnel stated that they have no plans to use this equipment. However, almost all of the antifreeze purchased in 2012 was by the AMSA-7 work center. It is recommended that the HWCB evaluate the feasibility of obtaining this system from AMSA-7 and using it to recycle antifreeze from all commands and tenants across the installation.

Recycled antifreeze performs as well as new antifreeze as long as the inhibitors are replaced and the antifoaming agent is added. Currently, NAS Corpus Christi is purchasing recycled antifreeze manufactured by Recycling Fluid Technologies.

Recycling spent antifreeze has the following benefits:

- Reduces coolant storage, transportation, and purchasing requirements
- Minimizes production and storage of hazardous waste
- Protects the environment by reducing the amount of hazardous waste produced
- Saves generators hazardous waste disposal costs
- Reduces hazardous material cleanup costs or soil and groundwater contamination associated with spills and leaks from stored hazardous waste

Recycling spent antifreeze may have the following disadvantages:

- Controlled blending of additives is required for recycled antifreeze to meet military specifications
- May require a hazardous waste treatment permit

3.9.1 Economic Analysis

According to the manufacturer of the AMSA-7 antifreeze-recycling unit, there are no filters, resin beds, freeze point adjusters, flocculants, and other chemicals to purchase and inventory in order for the process to work.³ All that is required is the distillation system, inhibitor, and waste coolant. Vacuum distillation can produce coolant (50/50 mixture of clean inhibited glycol and water) for about \$1.25 per gallon.

³ <http://www.finishthompson.com/downloads/engine-coolant-antifreeze-recyclers/flyers>

In 2012, 2,390 pounds or 266 gallons (based on a weight of 9 pounds per gallon of antifreeze) were purchased. Although HAZMART could not provide the cost of hazardous material purchases, antifreeze is available from local suppliers for a cost of \$16 per gallon.⁴ Based on local prices, it is estimated that NAS Corpus Christi spent approximately \$4,256 on antifreeze in 2012. Based on 2012 hazardous waste generation data provided by NAS Corpus Christi, the NAS pays an average cost for hazardous waste disposal of \$1.23/pound. Assuming that all antifreeze purchased also required disposal, NAS Corpus Christi spent approximately \$2,939 for disposal of waste antifreeze (the quantity of antifreeze disposed of in 2012 was not available). A reduction of 90 percent in this waste stream is assumed. It is estimated that a 50 percent reduction in material purchase will result from the use of recycled antifreeze.

3.9.2 Cost Breakdown

<i>Annual cost for hazardous waste disposal:</i>	<i>\$1.23 per pound (\$2,939 for 2012)</i>
<i>Annual cost of new product:</i>	<i>\$16 per gallon (\$4,256 for 2012)</i>
<i>Estimated cost to recycle product:</i>	<i>\$1.25 per gallon</i>
<i>Estimated cost for new unit:</i>	<i>\$0 (already purchased)</i>
<i>Estimated waste reduction:</i>	<i>90% (\$2,645 for 2012)</i>
<i>Estimated material use reduction:</i>	<i>50% (\$2,128 for 2012)</i>

3.9.3 Payback Period

Formula: = Startup Cost/[(Cost Savings For Waste Disposal) + (Cost Of New Materials – (Cost For Reduced New Material Purchases + Cost For Recycled Material)]

$$= \$0 / (\$2,645) + (4,256 - \$2,128 + \$166)$$

$$= \$0 / \$2,645 + \$1962$$

$$= 0 \text{ Years}$$

3.10 Aerosol Can Recycling

Personnel in some work centers (i.e., Hangar 51 Ground Support Equipment Shop, AIMD-050 Material Control, USCBP, T-44 Scheduled Maintenance) own or operated a puncture unit for waste aerosol cans. The product recovered during can puncturing is disposed of as hazardous waste, and the metal can is recycled. HWCB personnel reported that they do not receive any

⁴http://www.autozone.com/autozone/accessories/Prestone-Antifreeze-and-coolant/ /N-25ha?itemIdentifier=525501_0_0

waste aerosol cans, and it is assumed they are disposed of as general solid waste. It is recommended that personnel turn in all aerosol cans to HWCB for puncturing.

As empty aerosols are still pressurized containers and are likely to contain residual amounts of flammable liquid and/or gas, they may be considered hazardous waste. Aerosol can puncturing, crushing, and recycling are ways to avoid disposing of aerosol cans as solid or hazardous waste. Aerosol can puncture devices rupture and empty the cans to make them classifiable as “empty,” as per U.S. Environmental Protection Agency (USEPA) requirements. The processed cans are then no longer considered a hazardous waste and can be sold as scrap metal.

Aerosol can puncturing devices safely puncture the cans, capturing their contents for easy recycling or disposal. Spray nozzles are removed as well. A simple, low-capacity can puncturing unit does not require power and is manually operated. With the can secured inside a cylinder, the operator presses a handle, which causes a puncture pin to pierce the aerosol can. The can’s contents are then collected in a drum.

Proper design, operation, and maintenance of the equipment are required for its safe use. There are minimal health concerns regarding this process, but care must be taken when pre-loading these cans for manual processing. Precautions must be taken and proper personal protective equipment is recommended.

Recycling spent aerosol cans has the following benefits:

- Reduces the volume of waste disposed in the landfill by up to 1.3 percent (U.S. EPA 1994)
- Renders a potentially hazardous waste non-hazardous
- Revenue is generated from the sale of the cans as scrap metal
- Typically requires only simple processing equipment

Recycling spent aerosol cans may have the following disadvantages:

- Training of equipment operators and waste generators will be required, so they can process the cans and separate the wastes properly
- Aluminum must be segregated from steel

3.10.1 Economic Analysis

In 2012, 3,691 pounds of aerosol can waste was disposed of at a cost of \$11,349. Several work centers already have can puncture units, so by utilizing this equipment Station-wide initial capital costs are \$0. Replacement color-changing carbon filters cost approximately \$170.⁵ The

⁵http://www.globalindustrial.com/p/outdoor-grounds-maintenance/parking-lot/traffic-line-markers/replacement-combination-coalescing-carbon-filter-pack-of-2?infoParam.campaignId=T9A&gclid=CMuSkOGB6bsCFeN_QgodqG4AvA

activated carbon in the air filter reaches maximum adsorption and will need replacement after 45-60 days OR after puncturing 1,200 spent aerosol cans. Assuming that the filter will need to be changed every 2 months, the annual cost of replacement filters is approximately \$1,020.

The current market price for scrap metal is conservatively \$0.40 per pound.⁶

3.10.2 Cost Breakdown

<i>Annual cost for hazardous waste disposal:</i>	<i>\$11,349</i>
<i>Estimated cost for new unit:</i>	<i>\$0 (already purchased)</i>
<i>Estimated cost for filters:</i>	<i>\$1,020</i>
<i>Estimated waste reduction:</i>	<i>100% (\$11,349 for 2012)</i>
<i>Estimated profit from recycled metal:</i>	<i>\$0.40 per pound (\$1,476 for 2012)</i>

3.10.3 Payback period

Formula:

$$\begin{aligned} &= \text{Startup Cost} / [(\text{Cost Savings For Waste Disposal}) + (\text{Estimated Profit From Recycled Metal}) - \\ &\quad (\text{Maintenance Costs})] \\ &= \$0 / (\$11,349) + (\$1,476) - (\$1,020) \\ &= 0 \text{ Years} \end{aligned}$$

3.11 Solid Waste Management Plan

Per OPNAVINST 5090.1C Chapter 16 Section 16-5.3, all Navy installations worldwide that generate one ton or more of solid waste per day shall develop and implement a solid waste management plan and a qualified recycling program (QRP). NAS Corpus Christi does not have a solid waste management plan and does not currently operate a QRP.

DoDI 4715.4, "Pollution Prevention," requires establishment of cost-effective waste prevention and recycling programs to reduce non-hazardous solid waste (including paper, newspaper, cardboard, plastic, metal cans, glass, used oil, batteries, and tires). Furthermore, EO 13423, "Strengthening Federal Environmental, Energy, and Transportation Management," established solid waste diversion goals to be achieved by 2010, and required cost-effective waste prevention and recycling programs. DoD Integrated Solid Waste Management Policy established goals to reduce non-hazardous solid waste by 40 percent and reduce C&D debris by 50 percent.

⁶ <http://www.americanrecyclinginc.com/pricing.htm>

Navy installations face multiple challenges regarding non-hazardous solid waste management. Landfills (both on and off station) are reaching capacity, disposal costs are increasing, and stricter solid waste and recycling regulations are being promulgated at all levels of Government (including the DoD). In accordance with DoD policy, and to more effectively address these challenges, the Navy has adopted the philosophy of “integrated” solid waste management (ISWM). ISWM is a comprehensive approach to managing non-hazardous solid waste that encompasses waste prevention, recycling, composting, and disposal programs. ISWM Plans are required by OPNAVINST 5090.1C for all Navy installations that generate one ton or more of solid waste per day.

The Navy guidance document titled “UG-2084-ENV, Integrated Solid Waste Management Plan Guide” (April 2009) provides the user a guide that addresses all elements of ISWMP development including diversion goals, ISWM strategies, plan development and implementation, waste stream analysis, awareness programs, and potential impediments to implementation.

As part of the ISWMP, it is also recommended that NAS Corpus Christi conduct a Solid Waste Characterization Study. Characterization of collected solid waste is fundamental to the IWSM to identify the types of waste generated, estimate the quantity of solid waste, and determine the overall effectiveness of the recycling program.

3.11.1 Economic Analysis

Principles of ISWM are designed not only to limit waste disposal, but also to reduce costs associated with solid waste disposal. For example, one of the first waste management options is source reduction (the elimination of waste before it is created). Source reduction cuts waste disposal and handling costs because it prevents/lessens expenses associated with recycling, composting, landfilling, and incineration.

Specific cost savings cannot be estimated for this project.

3.12 Qualified Recycling Program

Per OPNAVINST 5090.1C Chapter 16, all Navy installations that generate one ton or more of solid waste per day must develop and implement a QRP. Although NAS Corpus Christi no longer operates a QRP, CCAD (the Station’s largest tenant) operates its own recycling program. CCAD operates a single-stream collection program for recyclables that is managed by CCAD personnel and hauled offsite by contractor. CCAD personnel estimate that approximately 70 percent of the solid waste stream is diverted for recycling. CCAD is open to joining with NAS Corpus Christi to run a joint QRP using the existing infrastructure.

Prior to implementation of the QRP, it is recommended that NAS Corpus Christi develop an ISWMP that includes an estimate of types and quantities of recyclable waste generated.

3.12.1 Economic Analysis

Non-hazardous solid waste generation for Fiscal Year (FY) 2012 provided by NAS Corpus Christi personnel is summarized below:

<i>Recycled Solid Waste</i>	<i>1,174 (average of 98 tons/month)</i>
<i>Solid Waste Sent to Landfill</i>	<i>3,473 (average of 289 tons/month)</i>

A contractor (CC Disposal) picks up solid waste from dumpsters at NAS Corpus Christi for disposal at the municipal landfill. The charge is approximately \$40 per ton. At a cost of \$40 per ton, NAS Corpus Christi spent approximately \$11,577 per month for waste disposal.

Without a solid waste management plan (described in Section 3.11), the amount of recyclable material disposed in the landfill as solid waste is unknown. However, EPA conducted a study that found recycling programs reduce the solid waste stream by approximately 50 percent⁷.

3.13 Water Loss Audit

The Energy Department has begun to calculate the amount of water lost through the Station's inefficient and outdated distribution system. Personnel have determined that approximately 15 to 20 percent of potable water usage is lost through leaks in the lines, and approximately 15 percent of potable water (60 million gallons) used at NAS Corpus Christi goes to flushing the distribution system dead ends to maintain chlorine residual. As the integrity of the aging infrastructure decreases, the loss of finished water in the distribution system increases. The loss of finished water in the distribution system results in direct loss of revenue and affects the ability for the NAS to meet water conservation goals.

A project to remove the dead ends by installing water loops has been developed (but not funded) by the Energy Department. The Energy Department has also proposed a project to build a desalination plant on NAS to provide 800,000 gallons per day (gpd) of potable water. However, prior to implementation of these projects, a water audit is recommended to assess the distribution and metering system to identify how much (and where) water is lost. Through the water audit process, options can be developed as to how to proceed with further identifying where losses are occurring or where efforts to control or eliminate the losses should be concentrated.

The purpose of a water loss audit is to identify significant physical losses in a distribution system (e.g. water lost through distribution system leakage and excessive pressure), and can identify apparent losses (e.g. water that was not read accurately by a meter, unauthorized consumption, data analysis errors). Identifying losses will allow NAS Corpus Christi to determine long-term infrastructure needs and save money by establishing an efficient repair and maintenance

⁷ EPA-530-F-99-017, October 1999. <http://www.epa.gov/http://www.epa.gov/osw/conserves/downloads/f99017.pdf>

program. Water loss audits conserve the state's water resources by reducing water losses from the systems of drinking water utilities. Typical steps in an audit include the following:

- Gathering information
- Determining flows into and out of the distribution system based on estimates or metering
- Assessing where water losses appear to be occurring based on available metering and estimates
- Analyzing data gaps (e.g. determining if more information is necessary to make comparisons and an informed decision)
- Considering options and making economic and benefit comparisons of potential actions
- Developing an appropriate plan of action.

3.13.1 Economic Analysis

Specific cost savings cannot be estimated for this project.

Although it requires an investment in time and financial resources, management of water loss can be cost effective. Principles of water loss auditing are designed not only to conserve potable water, but also to reduce costs associated with physical and apparent water loss. (If NAS Corpus Christi constructs a desalination plant as planned, costs from physical water loss will also include the additional energy and chemical usage required to treat lost water.)

Several published water auditing software packages are available for free or at a low cost. The Texas Water Development Boards' Water Loss Audit Manual is available online at the following location:

http://www.twdb.state.tx.us/publications/brochures/conservation/doc/WaterLossManual_2008.pdf

American Water Works Association (AWWA) offers water auditing software, available online at the following location:

<http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx>

4.0 POLLUTION PREVENTION PROJECT FUNDING

The primary source of P2 funding at NAS Corpus Christi is Environmental Program Requirements Website (EPRWeb). The NAS Corpus Christi P2 Program Manager and the Environmental Director identify, evaluate, and approve a P2 project. The P2 project is entered into the EPR system and given an EPR number. The funding request is then reviewed by the Commander Navy Region Southeast (CNRSE) and CNO for approval using the EPR system. Approved P2 project funding requests are initiated and tracked through EPRWeb for the subsequent two-to-four years.

The EPR for a new requirement typically must be submitted at least three years (current FY plus two) prior to the anticipated need for the resources. The Environmental Director will prioritize requirements for funding. Requirements with higher priority generally require identification over less critical projects (with programmed funding) to serve as off-sets; if no such sacrificial projects are available within NAS Corpus Christi, CNRSE will determine if resources can be made available from resources originally programmed for some other installation within the CNRSE area of responsibility. If the requirement is critical and cannot be met by funds available within the region, the major claimant will examine funding priorities across its entire area of responsibility. Persistent critical requirements can be elevated to CNO for worldwide funding priority consideration. The level of scrutiny and demand for detailed supporting information typically increases with each escalation in command level at which resources must be sought. Status of project funding is monitored through the EPR system and, when funding is approved and the project is implemented, the NAS Corpus Christi P2 Program Manager must update the EPR system to indicate that the project has been completed.

The “EPR Guidebook” is available to assist with data entry and protocol for using the system. The EPR Guidebook provides guidance for use by Navy staff in preparing environmental budget submissions for consideration during the annual Program Review and Program Objective Memorandum (POM) process. The Guidebook assists installations in identifying the nature and scope of environmental program requirements and, where possible, provides cost estimating guidance for specific requirements. This portal module allows users to add, edit, and if appropriate, approve changes to the Navy Environmental Requirements Guidebook.

EPRWeb is located at <https://eprdev.dandp.com/eprwebnet/NewUserRegistration.aspx>, and is accessed by using a Common Access Card or a Public Key Infrastructure digital certificate.

APPENDIX A. MEDIA MAPS

AIR MEDIA MAP

A full description of air emissions sources, emissions calculations, and permit compliance is found in the latest “Air Emission Inventory Report” completed by MACTEC in July 2011. Currently, all units at NAS Corpus Christi are authorized under TCEQ Permit by Rule (PBR) regulations (30 TAC Chapter 106), except for surface coating activities, which are permitted by TCEQ (Permit Number 77242). Emissions from CCAD are not counted towards NAS Corpus Christi’s emissions calculations since they have a separate air account with the TCEQ.

There are seven categories of emission units at NAS Corpus Christi:

- Abrasive Blasting Operations
- External Combustion Equipment
- Internal Combustion Equipment
- Miscellaneous Emission Units
- Surface Coating Operations
- Storage Tanks/Loading Rack
- Solvent Use Operations

The summary of emission units found during the last air emission inventory completed in 2010 is presented in Table 0-1: Summary of Emission Units at NAS Corpus Christi.

Table 0-1: Summary of Emission Units at NAS Corpus Christi

Category	Type	Number	Pollutants of Concern
Abrasive Blasting Operations	Blasting Glove Boxes	5	PM
	Blasting Rooms	1	
External Combustion Equipment	Furnaces	5	Criteria Pollutants, VOC, HAP
	Space Heaters	7	
	Water Heaters	15	
	Boilers	31	
Internal Combustion Equipment	Backup Generators	26	Criteria Pollutants, VOC, HAP
	Water Pumps	1	
	Fire Pumps	4	
Miscellaneous Emission Units	Woodworking	4	PM
	Welding	2	
	Sanding / Grinding	3	
	Operations	1	
	Fluorescent Tube Crushers	5	
	Aerosol Can Drainers		
Surface Coating Operations	Spray Booths/Open Painting	6	VOC, HAP, PM

Category	Type	Number	Pollutants of Concern
Storage Tanks / Loading Rack	Loading Rack	1	VOC, HAP
	Jet Fuel F-24 Tanks ⁸	24	
	Diesel Tanks	4	
	Gasoline Tanks	5	
Solvent Use Operations	Aqueous Parts Washers	1	VOC, HAP
	Cold Solvent Cleaners	6	
	Remote Reservoirs	10	
Total		167	
Note: VOC: Volatile Organic Compound HAP: Hazardous Air Pollutant PM: Particulate Matter			

Current P2 Initiatives

As required by TCEQ, the following air pollution P2 activities are currently practiced at NAS Corpus Christi:

- Abrasive blasting operations are conducted in enclosed abrasive cleaning units. Emissions are evacuated through a fabric filter, and there should be no visible emissions from any of the units.
- External combustion equipment (i.e., boilers) is fueled by natural gas, low sulfur diesel is used only as backup fuel.
- Internal combustion equipment (i.e., emergency generators) is used only for portable, emergency, and/or standby services. The annual operating hours of each unit cannot exceed 10 percent of the normal annual operating schedule of the primary equipment being backed up.
- Emissions from surface coating operations are maintained below the limits established in the TCEQ permit. High-volume low-pressure (HVLP) paint guns are used at open painting operations, which reduce overspray, materials consumption, and air pollution. The three paint booths are fully enclosed, and emissions are filtered.
- Emissions from cold solvent cleaners are controlled by covering the solvent tank when not in use, and use of an enclosed parts draining rack. In addition, solvent tanks cannot be heated. An aqueous parts washer (assigned to Hangar 51) uses water to clean parts, which does not result in any emissions.

Method for Tracking Air Emissions

Work centers track the amount of surface coatings used, and provide this data to NAS Corpus Christi's environmental department. Data is entered into the HAZMART's Enterprise Resources Planning (ERP) system, and emissions are calculated based on this usage data.

⁸ Since the emission inventory in 2010, DLA Energy has directed a supply chain conversion from JP-8 to F-24 as the primary kerosene based aviation turbine fuel procured in the contiguous U.S.

Air Emissions Data

Emissions were calculated for Calendar Year (CY) 2010, which identify the largest sources of actual VOC and HAP emissions to be surface coating (VOC) and storage tanks (HAP). Surface coating operations emitted 4.89 tons per year (tpy) of VOC, and storage tanks emitted 1.09 tpy of HAP. The chemicals that were identified to emit the most HAP were xylene and toluene.

According to the surface coating use data entered in ERP, the work centers that use toluene are Hangar 55 (96 pounds), Hangar 56 (88 pounds), and Hangar 57 (1,112 pounds).

ENERGY USE

As documented in the 2008 P2 Plan, an estimated a 30 percent reduction in kilowatt hour usage was realized through lighting retrofits in 1992, 1993, 1996, and 2004. Most of the NAS was retrofitted with T-8 energy efficient electronic ballasts with low mercury content. Personnel installed compact fluorescent bulbs in T-8 electronic ballasts and motion sensors in many areas across the Air Station. In addition, natural gas reductions were achieved by eliminating losses through the steam distribution lines by decentralization of the steam plant. Satellite boilers were installed at the main facilities and the old steam plant was demolished in 2004.

Energy conservation is required by EOs, congressional mandates, and departmental directives. The NAS Corpus Christi energy manager has identified the following baselines and goals for energy use.

EO 13423 requires facilities to reduce energy intensity by either 3 percent per year or 30 percent by 2015 relative to 2003 baseline. The energy manager reports that NAS Corpus Christi has already reduced energy consumption by 48 percent compared to the 2003 baseline.

EO 13514 requires federal facilities to reduce scope 1 and 2 Greenhouse Gas (GHG) emissions by 2020 relative to FY2008 baseline.

The Energy Independence and Security Act (EISA) of 2007 requires federal facilities to reduce energy consumption of federal buildings by either 3 percent per year or 30 percent by 2015 relative to 2003 baseline, and audit 25 percent of NAS Corpus Christi facilities every year. Additionally, new and renovated federal buildings must reduce fossil fuel use by 55 percent (from 2003 levels) by 2010, and 80 percent by 2020. All new federal buildings must be carbon-neutral by 2030.

OPNAVINST 4100.5E requires Navy facilities to reduce energy consumption by 50 percent by 2020, source 50 percent of energy consumption from alternative sources by 2020, transition 50 percent of the facilities on the installation to net-zero consumers by 2020, and reduce petroleum use by the commercial vehicle fleet by 50 percent by 2015.

Current P2 Initiatives

NAS Corpus Christi has completed the following P2 initiatives in FY2013 for energy consumption:

- Retrofitted more than 7,000 light fixtures in office spaces at 15 facilities (expected to result in a 35 percent reduction in electricity usage)
- Equipped more than 7,000 light fixtures in office spaces with motion sensors
- Replaced 774 45-watt taxiway lights on the flight lines with 12-watt light-emitting diodes (LEDs)

- Replaced/redistributed the regulator load on the flight lines
- Replaced 10 customized airfield quartz lighted signs with LED lighting
- Installed a 1.2-megawatt solar panel array
- Require all new facilities with a capital cost of more than \$50,000 to be Leadership in Energy and Environmental Design-certified

In addition, NAS Corpus Christi has funded the following P2 initiatives, but they have not yet been completed:

- Replace 144 400-watt streetlights with 90-watt LED lights
- Replace 192 400-watt high bay lights in hangar 42 with 320-watt LED lights
- Replace 400-watt recreation lights with 200-watt LED lights
- Retro-commissioning⁹ buildings station-wide to reduce energy use

Method for Tracking Energy Consumption

NAS Corpus Christi uses electricity supplied from Constellation New Energy and natural gas supplied from the City of Corpus Christi. FY2013, an additional 220 electrical meters, and 77 natural gas meters, were installed at NAS Corpus Christi to improve tracking of energy consumption. Prior to FY2013, NAS Corpus Christi measured electricity at 87 meters, and natural gas was measured at 34 meters. Energy consumption by individual shops and processes at NAS Corpus Christi were not routinely monitored.

NAS Corpus Christi personnel report energy consumption (as megawatts (MW)) annually to NAVFAC, which uses this information to track progress toward energy reduction goals and to calculate GHG emissions for NAS Corpus Christi. This report does not include CCAD, as they report their own energy usage to the US Army.

Energy Use Data

Energy consumption by individual work centers was not tracked prior to FY2013. Total energy consumption from FY2003 to FY2013 is available, but includes the entire Station property. Without data for individual work centers, shop, or processes, consumption data does not provide sufficient detail to develop P2 opportunities.

Energy use at NAS Corpus Christi (including CCAD) has remained relatively static, increasing from 134,537 MW in 2003 to 138,733 MW in FY2013. Natural gas usage has decreased overall, from 268,844 thousand British thermal units (MBTU) to 147,674 MBTU in FY2013.

⁹ Retro-commissioning is a process for identifying improvements that can boost the efficiency and performance of an existing building.

HAZARDOUS MATERIALS MEDIA MAP

Most hazardous materials used at NAS Corpus Christi are purchased or tracked through a hazardous material pharmacy system referred to as HAZMART. The Navy's HAZMART program is based on CHRIMP, and is operated as a "one stop shop" for ordering, storage, and distribution of hazardous materials. HAZMART at NAS Corpus Christi is operated by Fleet and Industrial Supply Centers as a detachment of CNRSE.

HAZMART supplies most organizations on Station with hazardous materials. Neither CCAD nor the Naval Health Clinic use HAZMART; although most long-term contractors use HAZMART, short-term contractors are not required to track their hazardous materials through the HAZMART. In addition, Navy regional guidance allows for the purchase of certain chemicals (e.g., pesticides, household items) directly from suppliers, which are not tracked by HAZMART.

The following EPCRA Section 313-reportable chemicals exceeded reporting thresholds based on the amount of non-exempt use or other activities (Aerostar SES LLC, 2013):

- Naphthalene and ethylbenzene exceeded the chemical reporting threshold (10,000 pounds per year) primarily as a result of non-exempt use of JP-8 for depot-level maintenance activities and as fuel for transient aircraft;
- Toluene exceeded the chemical reporting threshold (10,000 pounds per year) primarily as a result of non-exempt use of paints, thinners, and adhesives for depot-level maintenance activities;
- Nitrate Compounds exceeded the (25,000 pounds per year) reporting threshold due to the wastewater treatment process; and
- Reporting for Lead and n-Methyl-2-pyrrolidone was required due to chemical use by CCAD.

Current P2 Initiatives

HAZMART issues a 30-day supply of hazardous materials to work centers to limit excessive stocks of hazardous materials. By maintaining an accurate inventory of the hazardous materials issued to units, HAZMART limit excess and expired materials.

The AUL is the list of all hazardous materials authorized for use in each work center. HAZMART maintains AULs for each work center, and personnel are only authorized to use and store hazardous material listed on their AUL.

The shelf life of some hazardous materials can be extended after the item has been inspected or tested and restored to its initial characteristics. HAZMART inspects hazardous materials near shelf life expiration and extends the shelf life if possible.

HAZMART accepts returns from work centers of unused or partially used containers of hazardous material, which are placed back into the materials inventory for reuse. This hazardous

material must be serviceable and have sufficient shelf life remaining to be useable to other work centers.

The USCG developed a “corrosion control team” that is used exclusively when corrosion work is needed, such as sand or bead blasting or painting. Members of this team have been trained to mix paint correctly to reduce the amounts of paint purchased and used and they have been trained on the proper techniques for corrosion control. The number of waste streams in the USCG’s satellite accumulation area has been reduced from 20 to eight since the introduction of this specialized team. Cost savings have been calculated at \$12,500 from reduced waste management costs and reduced material purchases from all of the USCG shops.

In addition, the USCG initiated an inventory control program featuring the “ready issue locker” to reduce the amount of hazardous material purchased and used and to reduce the amount of excess hazardous material in flam lockers. The 7-day cart was eliminated. The new ready issue lockers have been equipped with dividers and labels to hold materials used to conduct everyday activities and for ease of control. Seven- day materials are color-coded to correspond with each aircraft. A hand-held metal basket is then loaded each morning with the necessary materials to complete the day’s work. The materials are returned to the locker at the end of each day. If the material has been completely used, a new can is issued from the overflow inventory. Empty cans are punctured, crushed, and recycled. By holding the user accountable for empty can management, the hazardous waste coordinator can track material usage and maintain a smaller inventory of hazardous material. The storing of unauthorized and incompatible hazardous material has been eliminated.

Method for Tracking Hazardous Material Use

HAZMART uses ERP to track material purchases, distribution, and use. From a central warehouse, HAZMART supplies all organizations on Station with hazardous materials except for CCAD and the Naval Health Clinic. Items procured by NAS Corpus Christi credit-card holders directly from vendors are tracked through the HAZMART database, and HAZMART personnel conduct inspections of hazardous material storage locations to ensure that all hazardous material containers are marked with an HAZMART barcode.

Work centers are supposed to inform HAZMART of the barcoded items that are empty so that the quantity can be marked as “used” in ERP, but there is no enforcement of this requirement. However, HAZMART personnel will not issue additional material to a work center that shows sufficient on-hand stock.

Major Chemical Usage

Hazardous material usage data was provided for CY2012 by the ERP database manager. The largest categories of hazardous materials issued to work centers are cleaning compounds (i.e., aircraft cleaning compounds, solvent cleaning compounds), engine oil (i.e., lubricating oil, aircraft turbine engine oil), and surface coatings (i.e., primer paint, aerosol paint, polyurethane

coating). Approximately 114,823 pounds of cleaning compounds, 34,246 pounds of engine oil, and 20,155 pounds of surface coating were issued in 2012. The individual hazardous materials issued in CY2012 that represent 5 percent or more of the total, and the work centers to which the materials were issued, are provided below in Table 0-2: CY2012 Hazardous Materials Issues That Represent 5 Percent or More of the Total.

Table 0-2: CY2012 Hazardous Materials Issues That Represent 5 Percent or More of the Total

Chemical Name	Weight Transacted (pounds)	Percent Of Total
Aircraft Surface Cleaning Compound	Total: 62,575.45	Total: 26.2117%
<i>Hangar 56 (BAE)</i>	<i>51,072.38</i>	<i>21.3933%</i>
<i>Building #1217, T6 Trainer</i>	<i>6,557.97</i>	<i>2.7470%</i>
<i>USCBP</i>	<i>4,336.02</i>	<i>1.8163%</i>
<i>Hangar 58 (BAE)</i>	<i>462.43</i>	<i>0.1937%</i>
<i>AIMD (L3-Vertex)</i>	<i>100.79</i>	<i>0.0422%</i>
<i>C-12</i>	<i>45.85</i>	<i>0.0192%</i>
Sky-Rite 3-30 Aircraft Cleaner	Total: 31,828.92	Total: 13.3326%
<i>C-12</i>	<i>31,828.92</i>	<i>13.3326%</i>
Aircraft Turbine Lubricating Oil	Total: 29,654.68	Total: 12.4218%
<i>Hangar 56 (BAE)</i>	<i>22,397.42</i>	<i>9.3819%</i>
<i>C-12</i>	<i>3,382.41</i>	<i>1.4168%</i>
<i>USCBP</i>	<i>3,026.33</i>	<i>1.2677%</i>
<i>AIMD (L3-Vertex)</i>	<i>375.54</i>	<i>0.1573%</i>
<i>GEMD</i>	<i>239.56</i>	<i>0.1003%</i>
<i>Hangar 58 (BAE)</i>	<i>196.09</i>	<i>0.0821%</i>
<i>Hangar 50, Predator</i>	<i>37.33</i>	<i>0.0156%</i>
Solvent Cleaning Compound	Total: 17,858.02	Total: 7.4804%
<i>Hangar 51 (BAE)</i>	<i>14,401.27</i>	<i>6.0324%</i>
<i>AIMD (L3-Vertex)</i>	<i>1,313.27</i>	<i>0.5501%</i>
<i>USCBP</i>	<i>861.69</i>	<i>0.3609%</i>
<i>Hangar 56 (BAE)</i>	<i>826.20</i>	<i>0.3461%</i>
<i>Hangar 55 (BAE)</i>	<i>245.11</i>	<i>0.1027%</i>
<i>AMSA</i>	<i>191.83</i>	<i>0.0804%</i>
<i>Building #1217, T6 Trainer</i>	<i>10.55</i>	<i>0.0044%</i>
Notes: based on material issued by HAZMART.		

Based on this data, the largest amount of hazardous material used is aircraft surface cleaning compound (63,511 pounds), which represents 26.6 percent of the material used in CY2012. The work center that uses the most aircraft surface cleaning compound is the T-34 aircraft Wash Crew Shop operated by BAE (a contractor) in Hangar 56.

The second largest amount of hazardous material used is Sky-Rite 3-30 Aircraft Cleaner (31,829 pounds), which represents 13.4 percent of the material used in CY2012. The only user of this material is the C-12 Maintenance Shop operated by L-3 Vertex (a contractor) in Hangar 55.

The third largest amount of hazardous material used is aircraft turbine lubricating oil (29,655 pounds), which represents 12.5 percent of the material used in CY2012. The work center that uses the most aircraft turbine lubricating oil is the T-34 aircraft Wash Crew Shop operated by BAE (a contractor) in Hangar 56.

HAZARDOUS WASTE MEDIA MAP

NAS Corpus Christi operates under Hazardous Waste Permit 50038 and EPA generator identification number TX7170022787. Personnel on Station follow the procedures outlined in the Hazardous Waste Management Plan (HWMP) on file at the NAS Corpus Christi Environmental Office.

Current P2 Initiatives

- Hazardous Waste Services for NAS Corpus Christi operate under the Navy Working Capital Fund (NWCF) business model as of FY2014; and
- Effort is made to determine if a hazardous material is usable before it may be disposed of as a waste.

Operating under the NWCF business model improves cost awareness and cost consciousness, encourages waste reduction and allows for more flexibility in use of resources to provide the best service for the lowest cost to the customer.

Although NAS Corpus Christi previously operated a “red rag” program for re-using contaminated rags by laundering them, this program has been discontinued. NAS Corpus Christi personnel stated that the laundry facility could not adequately clean the rags, and testing revealed that the clean rags returned to NAS Corpus Christi were contaminated with metals. The exception is the AMSA-7 work center (Building 1722), which continues to have its own separate contract for rag recycling. Clean rags are delivered by Admiral Linen Service and the contaminated rags are picked up for offsite laundering.

Method for Tracking Hazardous Waste Generation

Personnel in the NAS Corpus Christi Hazardous Waste Commodities Branch (HWCB) track hazardous waste generation from most tenants on station using a system called HW Track. HW Track database includes waste billing, storage, shipment, and container issuance and receiving.

Major Hazardous Waste Generation Data

NAS Corpus Christi personnel provided CY2011 and CY2012 data showing generation of hazardous waste, universal waste, and State regulated hazardous waste. Hazardous waste generation comprising 5 percent or more of the total amount (in pounds) is presented in

Table 0-3.

Table 0-3: Hazardous Waste Comprising Five Percent or More of The Total Amount, CY2011-2012

Hazardous Waste Description	Amount Generated (pounds)	Percent of Total Weight Manifested	Percent of Total Cost for Disposal
CY2011	Total: 276,325	75%	77%
<i>State Regulated - Bulk Solids</i>	154,441	41.89%	59.87%
<i>State Regulated - Containerized Liquids/Multi-Phase</i>	43,719	11.86%	4.00%
<i>Metal Bearing - Bulk Solids</i>	42,100	11.42%	8.98%
<i>Metal-Bearing - Containerized Liquids/Multi-Phase</i>	36,065	9.78%	4.22%
CY2012	Total: 88,489	64%	35%
<i>State Regulated - Containerized Liquids/Multi-Phase</i>	44,227	31.78%	15.12%
<i>State Regulated - Containerized Solids</i>	13,989	10.05%	4.80%
<i>State Regulated - Bulk Solids</i>	11,584	8.32%	0.99%
<i>Universal Waste/Paint/Paint Related (C.95); Solids To Include Blast Media</i>	10,293	7.40%	11.50%
<i>Ignitable - Containerized Liquids/Multi-Phase</i>	8,396	6.03%	2.43%

The amount of hazardous waste disposed of decreased from CY2011 (355,796 pounds) to CY2012 (133,076 pounds). As shown in

Table 0-3, 75 percent of the CY2011 hazardous waste generated was comprised of four waste streams:

- State Regulated - Bulk Solids (41.89 percent). Primarily comprised of investigative-derived waste from soil sampling by Public Works.
- State Regulated - Containerized Liquids/Multi-Phase (11.86 percent). Primarily comprised of soapy water from the aqueous parts washers, testing of facilities fire suppression systems, and expired/off-specification cleaning compound.
- Metal Bearing - Bulk Solids (11.42 percent)
- Metal-Bearing - Containerized Liquids/Multi-Phase (9.78 percent)

Likewise, 64 percent of the CY2012 hazardous waste generated was comprised of the following five waste streams:

- State Regulated - Containerized Liquids/Multi-Phase (31.78 percent). Primarily comprised of soapy water from the aqueous parts washers, testing of facilities fire suppression systems, and expired/off-specification cleaning compound.
- State Regulated - Containerized Solids (10.05 percent) Primarily comprised of oily PPE and debris (i.e., bubble wrap, plastic bags, nitrile gloves, containers, rubber fittings) from equipment maintenance, and spill cleanup material (absorbent debris). Also includes fire extinguishing equipment, media, and AFFF spill cleanup material spill cleanup material.
- State Regulated - Bulk Solids (8.32 percent). Primarily comprised of investigative-derived waste from soil sampling by Public Works.
- Universal Waste/Paint/Paint Related (C.95); Solids to Include Blast Media (7.40 percent)
- Ignitable - Containerized Liquids/Multi-Phase (6.03 percent). Primarily comprised of unused, discarded hazardous materials, excess paint & thinners (acetone, ethylbenzene, toluene, xylene, naphthalene, MEK), and used oil.

Table 0-4 identifies the work centers listed as the generators of the hazardous waste streams that comprise 5 percent or more of the total hazardous waste generated during CY2011 and CY2012. The largest generators of hazardous waste at NAS Corpus Christi are NAVFAC, PWD, and T-34/T-44.

Table 0-4: Work Centers That Generated the Largest Hazardous Waste Streams

Description of Hazardous Waste	Amount Generated During CY2011-2012 (pounds)
Bulk Solids (State Regulated)	Total: 166,025
<i>NAVFAC</i>	<i>145,040</i>
<i>PWD</i>	<i>12,710</i>
<i>Defense Logistics Agency (DLA) Distribution</i>	<i>5,233</i>
<i>T-34/T-44</i>	<i>3,042</i>
Containerized Liquids/Multi-Phase (State Regulated)	Total: 87,946
<i>T-34/T-44</i>	<i>38,315</i>

Description of Hazardous Waste	Amount Generated During CY2011-2012 (pounds)
<i>PWD</i>	18,618
<i>USCBP</i>	11,265
<i>AIMD</i>	5,273
<i>DLA Distribution</i>	3,973
<i>MWR</i>	3,576
<i>C-12</i>	3,200
<i>AMSA-7</i>	2,250
<i>Air Operations</i>	690
<i>Doss</i>	536
<i>Naval Health Clinic</i>	250
Metal Bearing - Bulk Solids	Total: 42,100
<i>PWD</i>	42,100
Metal-Bearing - Containerized Liquids/Multi-Phase	Total: 36,065
<i>T-34/T-44</i>	21,724
<i>USCBP</i>	12,056
<i>C-12</i>	2,122
<i>PWD</i>	155
<i>DLA Distribution</i>	8
Containerized Solids (State Regulated)	Total: 13,989
<i>T-34/T-44</i>	4,036
<i>PWD</i>	3,082
<i>USCBP</i>	1,660
<i>AIMD</i>	1,441
<i>AMSA-7</i>	1,127
<i>USCG</i>	867
<i>DLA Distribution</i>	812
<i>Doss</i>	568
<i>C-12</i>	396
Universal Waste/Paint/Paint Related (C.95); Solids To Include Blast Media	Total: 10,293
<i>T-34/T-44</i>	5,788
<i>AIMD</i>	2,547
<i>C-12</i>	1,128
<i>USCBP</i>	830
Ignitable - Containerized Liquids/Multi-Phase	Total: 8,396
<i>PWD</i>	3,921
<i>USCBP</i>	2,150
<i>T-34/T-44</i>	1,022
<i>AIMD</i>	616
<i>USCG</i>	541
<i>DLA Distribution</i>	146

PESTICIDES MEDIA MAP

NAS Corpus Christi has developed an Integrated Pesticide Management (IPM) program covering all pest management and pesticide-related activities conducted by civilian and military personnel and commercial contractors. A Pest Management Coordinator (PMC) implements, coordinates, and executes the IPM plan. The PMC uses an AUL that was developed for all Navy facilities, and operates under an IPM Plan dated June 2012. NAS Corpus Christi maintains a general permit to discharge biological and chemical pesticides over water (General Permit #TXG870000).

General pest control is conducted by a contracted service (currently Big M Pest Control Service, LLC). Another contractor (currently TRDI and its subcontractor, TruGreen) provides grounds maintenance services including herbicide application. Landscaping services are by a contracted service (currently Roger's Gardens). Pesticide services are provided to the bowling alley and USCBP by a contracted service (currently Terminix). Pest control at the Navy Health Clinic is provided by a contracted service (currently Pest Fog, Inc.). The golf course is serviced by in-house grounds maintenance staff.

Current P2 Initiatives

- Integrated pest management is utilized which promotes the use of scheduled monitoring for pests and selective treatment in lieu of pre-scheduled application of chemicals.
- Utilizing a CDC Light Trap to track increases in insect (e.g. mosquito) activity.
- Best management practices include using a good fertilizer, mowing, aeration, and use of native and weed-resistant plants instead of herbicides and other pesticides.

Method for Tracking Pesticide Use

Licensed applicators at NAS Corpus Christi enter pesticide application records into the Navy's online reporting system called NAVFAC Online Pesticide Reporting System. Personnel at NAVFAC and the PMC review pesticide application records periodically.

Major Pesticide Use Data

Pesticide use data is tracked separately under the IPM program and not included in this plan.

POTABLE WATER QUALITY

Potable water is purchased from the City of Corpus Christi. It is stored in a two million-gallon underground reservoir prior to being pumped to the distribution system that contains a 500,000-gallon elevated storage tank. Potable water disinfection is practiced by adding gaseous Cl_2 and NH_3 (“chloramination”) to municipal water just after it enters the underground reservoir. This “booster” disinfection of the city water is necessary to maintain the chlorine residual level in NAS Corpus Christi distribution system. The chlorine residual level at the exit of the reservoir is measured six times per day while the incoming city water residual level is measured once per day. These data are used to control the rate of Cl_2 and NH_3 addition. Typically, between December and March, no booster chlorination is required.

In the past few years, personnel operating the water treatment system have had trouble meeting the minimum chlorine residual concentration of 0.5 mg/l in some portions of the facility. As a solution, personnel periodically flush the lines to eliminate “dead spots” in the distribution system where flow is relatively stagnant.

The NAS Corpus Christi golf course uses reclaimed water provided by the City for irrigation.

Water conservation is required by EO 13423. The NAS Corpus Christi Energy Manager has identified the following goals for reducing water consumption:

- Reduce water use by either 2 percent per year beginning in FY2008 and continuing through FY2015, or by 16 percent by the end of 2015 relative to the 2007 baseline

Current P2 Initiatives

NAS Corpus Christi has completed the following P2 initiatives in FY2013 for reducing potable water consumption:

- Landscaping has been transitioned to native, drought-tolerate plants that require less irrigation water
- The golf course is irrigated with reclaimed water instead of potable water

In addition, NAS Corpus Christi has developed the following P2 projects, which have not yet been funded:

- Construct an 800,000-gallon-per-day desalination plant to process seawater into potable water
- Install water loops air station-wide that would eliminate dead-ends in the lines¹⁰

¹⁰ Dead ends require periodic flushing to maintain appropriate chlorine residual in the distribution system.

Method for Tracking Potable Water Use

In FY2013, 147 additional water meters were installed at NAS Corpus Christi. The Energy Manager tracks the amount of water purchased from the City of Corpus Christi on a monthly basis.

Water Use Data

Potable water use data was provided for FY2013. The Energy Manager calculates monthly water loss by comparing the amount of water purchased and the amount of wastewater processed. The water loss calculation includes an estimate for evaporative loss, irrigation, and process loss (10 million gallons per month), and water used to flush dead spots. The Energy Manager reported from 5 to 20 million gallons per month (dependent on season) is unaccounted for based on the water loss calculations.

A total of 380.5 million gallons of potable water was used in FY2013. The largest use of potable water at NAS Corpus Christi is flushing lines to eliminate dead spots in the distribution system. In FY2013, flushing lines consumed 76 million gallons of potable water. The next largest consumer of potable water is CCAD (which is not included as part of this plan), and then the Naval Health Clinic, which used 10.8 million gallons of potable water.

SOLID WASTE MEDIA MAP

DoDI 4715.4, “Pollution Prevention,” requires establishment of cost-effective waste prevention and recycling programs to reduce non-hazardous solid waste (including paper, newspaper, cardboard, plastic, metal cans, glass, used oil, batteries, and tires.) Furthermore, EO 13423, “Strengthening Federal Environmental, Energy, and Transportation Management,” established solid waste diversion goals to be achieved by 2010, and required cost-effective waste prevention and recycling programs. DoD Integrated Solid Waste Management Policy established goals to reduce non-hazardous solid waste by 40 percent and reduce construction and demolition (C&D) debris by 50 percent.

A contractor (CC Disposal) picks up solid waste from dumpsters at NAS Corpus Christi for disposal at the municipal landfill. The charge is approximately \$40 per ton. Another contractor (BFI) collects municipal solid waste from NAS housing areas. The hospital manages any biohazard waste that they generate. The Qualified Recycling Program (QRP) (i.e., recycling center) closed in 2003 and has not been re-opened. Although CCAD operates a more robust single-stream recycling operation, NAS Corpus Christi does not currently participate in their recycling program.

The following wastes are recycled at NAS Corpus Christi:

- White paper from some office locations (this program is continuing to grow)
- Intact pallets
- Used oil
- Lead-acid batteries
- Scrap metal

Efforts were made to recycle vehicle tires, but personnel have not been able to find a local facility to accept them.

Current P2 Initiatives

- Construction contracts include goals for C&D waste diversion, and these goals are tracked by contracting officers
- There are several aerosol can puncturing stations throughout NAS Corpus Christi (e.g., PWC at Building 19, CCAD, USCBP, USCG, and L3-Vertex). These cans are recycled as scrap metal

Method for Tracking Solid Waste Generation

Non-hazardous solid waste is tracked throughout the year, and is entered into the U.S. Navy Environmental Portal. C&D waste diversion and disposal is tracked by contracting officers and the data is provided to the Environmental Department. The disposal weight of non-hazardous waste is provided by solid waste contractors

Solid Waste Data

Non-hazardous solid waste for FY2010–2012 was provided by NAS Corpus Christi personnel, and is summarized in Table 0-5: Non-Hazardous Solid Waste Generation, FY2010–2012.

Table 0-5: Non-Hazardous Solid Waste Generation, FY2010–2012

Non-Hazardous Solid Waste Type	FY2010	FY2011	FY2012
	Amount (tons)	Amount (tons)	Amount (tons)
Recycled Solid Waste	787.48	1,089.35	1,174.41
Solid Waste Sent to Landfill	3,603.83	4,035.76	3,473.15
C&D Debris Diverted	27,586.42	6,428.43	73.61
C&D Debris Sent to Landfill	478.24	262.43	253.55

The percent of solid waste recycled increased from FY2010 to FY2012 (17.9 percent to 25.3 percent). However, the diversion rate reported for C&D waste decreased in that same timeframe, from 87.4 percent to 25.1 percent.

STORMWATER MEDIA MAP

There are 25 stormwater drainage basins/areas at NAS Corpus Christi, identified as Basins A-Y. Six of the 25 drainage basins contain sources of industrial pollutants. These include Basins A, C, G, H, Q, and R. Industrial operations within these six drainage basins fall into one of the following seven state-defined industrial categories (relevant to stormwater):

- Scrap and Waste Recycling Facilities
- Land Transportation and Warehousing
- Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas Located at Air Transportation Facilities
- Treatment Works
- Hazardous Waste Treatment, Storage, or Disposal Facilities
- Landfills and Land Application Sites
- Fabricated Metal Products

Stormwater pollution data is monitored through the installation stormwater permits and not included in this plan.

WASTEWATER MEDIA MAP

Two wastewater treatment plants are in use: the Industrial Wastewater Treatment Plant (IWTP) and the Domestic Wastewater Treatment Plant (DWTP). They both discharge into Corpus Christi Bay. The IWTP biologically treats all industrial wastewater from CCAD plus wastewater from the HM-15 washrack. CCAD wastewater is pretreated for metals and cyanide removal prior to discharge to the IWTP. The IWTP is designed to treat up to 1.0 million gallons per day (MGD), but receives only about 100,000 gpd on average.

The IWTP consists of an equalization tank, a spill capture tank, a storage tank, a multi-step activated sludge unit (containing an aeration basin, re-aeration basin, aerobic sludge digester, final clarifier, and a chlorine contact chamber), and sludge drying beds.

The DWTP treats sewage and other non-industrial wastewater from the Station. The plant was built in 1942 and consists of two comminutor/wet well units, a grit chamber, two primary clarifiers, two trickling filters, two secondary clarifiers, an anaerobic sludge digester, and sludge drying beds. In 2005-2006, DWTP added two 250,000-gallon equalization tanks to the head of the plant to minimize the need to bypass treatment during high flow. The high flows occurred during rain events, which is indicative of infiltration /inflow problems in the sanitary sewer system. DWTP bypass events were occurring 2-3 times per year prior to addition of the equalization tank. In addition, a new chlorination/de-chlorination process was added to the DWTP in 2005-2006 to disinfect the both the IWTP and DWTP effluent (combined). The new disinfection system replaces a UV system that was plagued by levels of suspended solids in the treated water that inhibited transmission of the UV light. Sodium hypochlorite solution and sodium metabisulfite solution are now used for chlorination and de-chlorination respectively.

Current P2 Initiatives

- Approximately 17 oil/water separators (OWSs) are installed to separate oil from wastewater as an industrial pretreatment system prior to directing the water to sewer; and
- grease traps are installed at restaurant facilities to remove grease from entering the sewer system and interfering with operations at the wastewater treatment facilities.

Wastewater Generation Data

Flow to the IWTP is supplemented with 20,000 – 40,000 gpd of domestic wastewater to provide biomass for the activated sludge system to work. Sludge from the IWTP is generally disposed off-site in a landfill as a non-hazardous waste (depending on waste characterization analysis). The DWTP plant capacity is 2.75 MGD, but only 300,000 to 500,000 gallons are received on a typical day. The plant typically receives 100,000 gpd of non-domestic wastewater and 300,000 to 400,000 gpd of domestic wastewater. The rotating distribution arm of the trickling filters will often not rotate due to lack of flow. This can be very detrimental to treatment. In addition, one of the trickling filters is located at a slightly higher elevation than the other, which further restricts flow.

APPENDIX B. ENVIRONMENTAL MEDIA MATRIX

ENVIRONMENTAL MEDIA MATRIX

A total of 47 work centers were identified and visited at NAS Corpus Christi during the update of the P2 Management Plan. The matrix below lists all of these Work Centers and identifies the environmental media that they impact (in more than a casual manner). The media areas checked in this matrix were selected based on review of media plans, permits, studies, and interviews with Work Center and installation personnel. Table 0-1 lists the work centers (i.e., shops) evaluated as part of this P2 Management Plan.

Table 0-1: Work Centers Evaluated

Work Center Name	Air	Energy	Hazardous Materials	Hazardous Waste	Stormwater	Solid Waste
AIMD-470 Oil Lab	X		X			
AIMD-51F Composite	X		X			X
AIMD-74C Fish Shop	X		X			X
AIMD-800 Riggers			X	X		
Air Operations - GEMD			X			
Air Operations - Transient Line			X	X		
Area Maintenance Support Activity (AMSA) #7	X		X	X		X
Aviation Equipment Shop, Work Center 130			X			
Aviation Life Support Shop, Work Center 800			X			
Battery Maintenance, Work Center 930		X	X			X
C-12 Maintenance Shop	X		X	X		X
Calibration Lab/Avionics, Work Center 600/610	X		X			
Component Overhaul and NDI Shop, Work Center 500	X		X	X		X
Conditional Maintenance Shop, Work Center 620	X		X	X		X
Corrosion Control Shop, Work Center 121	X		X	X		X
GSE Corrosion Control, Work Center 920	X		X	X		X
GSE Shop, Work Center 900	X		X	X		X
GSE Shop, Work Center 910/900	X		X	X		X
Line Services Shop, Work Center 300			X			
Marine Reserves				X		
MWR - Auto Skills Center			X			X
MWR - Bowling Alley			X			X
MWR - Golf Course Maintenance			X			X
MWR - Housing Maintenance	X		X			X
MWR - Marina			X		X	X
Naval Health Clinic	X	X	X	X		X
Navy Region South Fire Department			X			
Navy Supply Fuel Branch	X	X			X	
Public Works - A/C Repair, Work Center 23	X		X			X
Public Works - Carpenter Shop, Work Center 01	X		X			X
Public Works – Low/High Voltage Electrician, Work Centers 21 and 22		X	X	X		

Work Center Name	Air	Energy	Hazardous Materials	Hazardous Waste	Stormwater	Solid Waste
Public Works - Machining, Work Center 10						X
Public Works - Painting, Work Center 02	X		X	X		X
Public Works - Plumbing and Pipefitting, Work Center 11			X			
Public Works - Recycling						
Public Works - Sheet Metal Shop, Work Center 13			X			X
Public Works - Transportation, Work Center 60			X			X
Public Works - Utilities	X	X	X			X
Public Works - Welding, Work Center 12	X		X			X
Security Department – K-9 Training			X			X
T-34 Avionics, Work Center 220			X			
T-34 Material Control Room, Work Center 50						
T-34 Scheduled Maintenance Shop, Work Center 140	X		X	X		X
T-34 Unscheduled Maintenance Shop, Work Center 110	X		X	X		X
T-44 Avionics, Work Center 221			X			
T-44 Material Control Room, Work Center 50						
T-44 Scheduled Maintenance Shop, Work Center 141	X		X	X		X
T-44 Unscheduled Maintenance Shop, Work Center 111	X		X	X		X
USCBP	X		X	X	X	X
USCG - Aviation Survival Technician (AST)	X		X	X		X
USCG - Avionics	X		X			X
USCG - Corrosion Control	X		X	X		X
USCG - Fixed Wing Shop			X			
USCG - GSE Shop	X		X	X		X
USCG - Helicopter Shop	X		X	X		X
Wash Crew Shop, Work Center 320			X		X	X

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The following work centers that were included in the 2008 P2 Plan were discontinued as of the 2013 P2 Plan revision:

- Mobile Inshore Undersea Warfare Unit-108/IBU-15, ER04 - Vehicle Maintenance

AIMD TRAUX Operations:

- AIMD-410 Powerplants
- AIMD-51A Structures
- AIMD-51C Welding
- AIMD-51E Tire Shop
- AIMD-520 Hydraulics
- AIMD-530 Non-Destructive Inspection
- AIMD-610 Comm/Nav
- AIMD-620 Electricians
- AIMD-690 Micro/Min
- AIMD-990 Ground Support
- AIMD-050 Material Control
- AIMD-51B Painting
- Air Operations-AB03 Arresting Gear

HM-15 Operations:

- HM-15-12C Corrosion Control
- HM-15-13A Paraloft
- HM-15-16A-B Mine Countermeasure Equipment
- HM-15-16C TAC Support/ Transportation
- HM-15-16D Boat Maintenance
- HM-15-110 Powerplants
- HM-15-120 Airframes
- HM-15-140 Phase Shop
- HM-15-210 Avionics
- HM-15-220 Electronics
- HM-15-230 Ordnance
- HM-15-310 Line Division
- HM-15 Hazmat Storage

AIMD Battery Maintenance, Work Center 930

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel are responsible for testing and recharging/servicing batteries for T-34, T-44, T-6, and C-12 aircraft, GSE, and auxiliary power unit (APU) equipment. Batteries include optima gel cell batteries, as well as aircraft lead/acid batteries.

Work Center Process

- Battery maintenance and recharging

Process Description: Battery Maintenance and Recharge

Work center personnel are responsible for testing and recharging/servicing batteries for T-34, T-44, and C-12 aircraft, GSE, and APU equipment. Batteries include optima gel cell batteries, as well as aircraft lead/acid batteries. Approximately 400 batteries are serviced per year. The use of maintenance free, absorbed glass mat gel batteries has replaced the use of many conventional flat-plate lead acid batteries. Glass mat gel batteries only need recharged, no maintenance is involved. They provide a longer service life and thus the rate of spent battery generation is reduced. Intact lead/acid batteries are sent to the environmental department for recycle.

Process Flow Diagram

KEY MATERIALS USED

Sulfuric Acid
Electrolyte

→

Recharge/Refill Battery

→

KEY WASTE PRODUCED

Waste Batteries
Empty Containers

AIMD-470 Oil Lab

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently BAE)

Work Center Description

This shop analyzes engine oil samples for evidence of trace metals to reduce occurrence of catastrophic engine failure. Sample analysis is performed for both MH-53E helicopters and the T-34/T-44 aircraft.

Work Center Processes

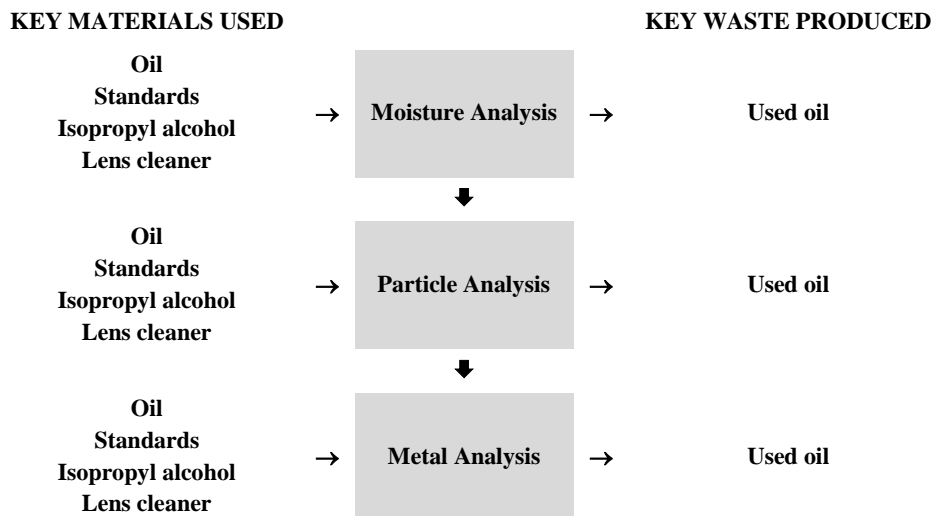
- Engine oil analysis

Process Description: Engine Oil Analysis

This shop analyzes engine oil samples for evidence of trace metals to reduce occurrence of catastrophic engine failure. The process is also known as the naval oil analysis program (NOAP). Sample analysis is performed for both the MH-53E helicopters and the T-34/T-44 aircraft.

Multiple tests are run for each sample. Moisture analysis, particle analysis and metal analysis are conducted using a moisture analyzer, an electronic particle counter, and a spectrometer. Sample jars are cleaned in an aqueous parts washer. Used oil from samples is collected for recycling.

Process Flow Diagram



AIMD Paraloft, Work Center 800

Location: Hanger 42

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel are responsible for maintenance and repair of flight gear for helicopters. This primarily consists of flight suits, jackets, boots, helmets, medical kits, and survival radios.

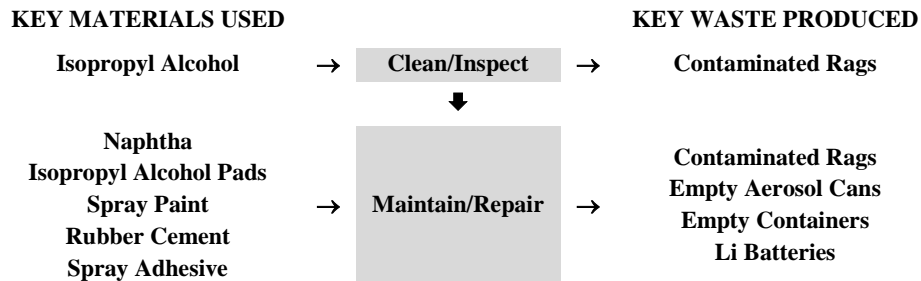
Work Center Processes

Flight survival equipment repair

Process Description: Flight Survival Equipment Repair

Work center personnel are responsible for maintenance and repair of flight gear for helicopters. This primarily consists of flight suits, jackets, boots, helmets, medical kits, ordnance, sea dye markers, and survival radios. The lithium batteries in the survival radios are changed out every three years or when one fails. Used batteries from survival radios are recycled offsite. All flight gear is periodically inspected based on preventive maintenance schedule and repaired or replaced as needed.

Process Flow Diagram



Air Operations – Ground Electronics Maintenance Department (GEMD)

Location: Building #70

Operated by: NAS Corpus Christi Air Operations

Work Center Description

Shop personnel maintain or repair ground electronics equipment (i.e., control tower), radios, and security systems. This equipment includes airport surveillance radar, precision approach radar, and communication equipment.

Work Center Processes

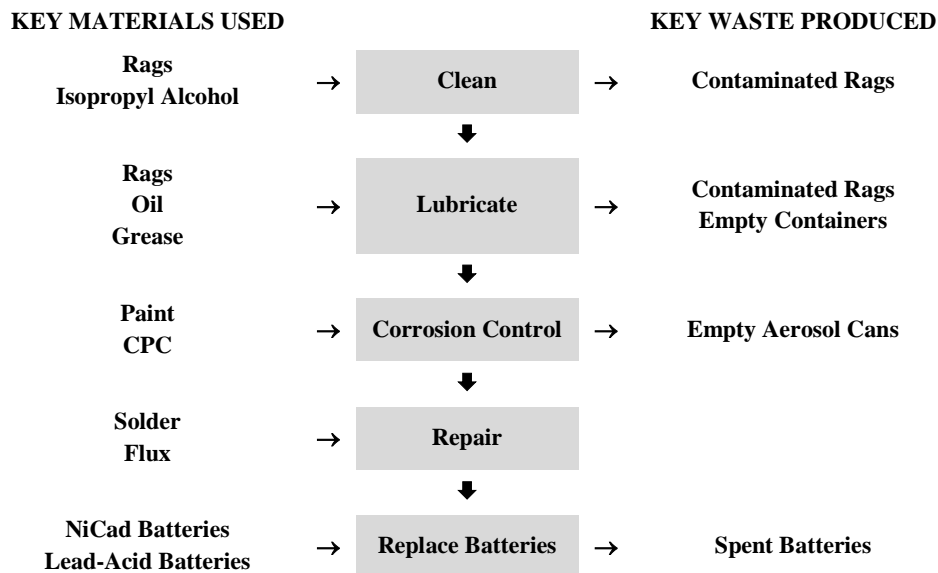
- Radio maintenance and repair
- Hydraulic oil servicing

Process Description: Radio Maintenance and Repair

The shop performs maintenance and minor repair of the radios used by air traffic control personnel. All contacts are cleaned with isopropyl alcohol and treated with a variety of corrosion prevention compounds (CPC). Used lead-acid and NiCad batteries are generated by radio equipment usage. The batteries are collected and stored in two separate hazardous waste satellite accumulation areas.

A limited amount of touch-up painting using aerosol cans is performed on the exterior faces of some of the components as a corrosion prevention measure.

Process Flow Diagram



Process Description: Hydraulic Oil Servicing

Shop personnel service a radar turntable in the air traffic control tower. Hydraulic fluid is added to the system as needed. Grease is used by shop personnel to lubricate chairs in the control tower.

Process Flow Diagram

KEY MATERIALS USED

Rags
Hydraulic Oil

→

Hydraulic Fluid Service

→

KEY WASTE PRODUCED

Contaminated Rags
Empty Containers

Air Operations - Transient Line (T-Line)

Location: Building #70

Operated by: NAS Corpus Christi Air Operations

Work Center Description

The work center provides general servicing of transient aircraft. Transient aircraft are not stationed at this air station, but require refueling or minor servicing during a stopover. General servicing includes the addition of fuel or oil, but excludes any maintenance or repair of the aircraft.

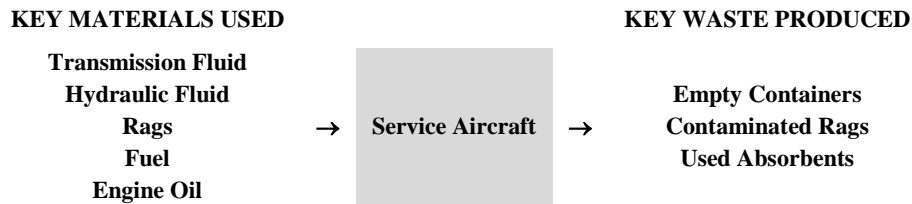
Work Center Processes

- Service transient aircraft

Process Description: Service Transient Aircraft

Shop personnel service transient aircraft, which typically involves providing KEROSENE BASED AVIATION TURBINE FUEL, hydraulic fluid, and engine oil.

Process Flow Diagram



AMSA-7– Area Maintenance Support Activity #7

Location: Building #1722

Operated by: NAS Corpus Christi

Work Center Description

AMSA-7 provides first, second, and third echelon maintenance and repair support for Army Reserve vehicles and equipment. All vehicles and equipment from the 63rd Army Reserve Support Command (RSC) units south of San Antonio TX are serviced. This includes heavy trucks, trailers, generators, and forklifts. Note that AMSA-7 and associated operations are scheduled to relocate to Robstown, Texas in April 2014. Building 1722 will then be taken over by the US Army's 453rd Transportation Company.

Work Center Processes

- Equipment and Vehicle Maintenance

Process Description: Equipment and Vehicle Maintenance

The shop is responsible for the maintenance of Army Reserve vehicles and equipment for units south of San Antonio TX, Victoria TX, and Yokum TX and the 90th Regional Readiness Command (RRC) out of Little Rock, Arkansas. This includes heavy trucks, trailers, generators, and forklifts. Any repair beyond the work center's capabilities would be repaired at a contractor repair shop in Corpus Christi.

The vehicles and equipment are generally delivered to the shop for servicing. On occasion, shop personnel will go to the site to retrieve the equipment to be serviced. An IT-48C Inland Technology Parts Washer with Breakthrough solvent is used to clean and degrease parts. The solvent is filtered to preserve the life of the cleaning solvent.

Maintenance consists of fluid changes (i.e., oil, antifreeze, brake fluid, hydraulic fluid). The work center uses an Oberg oil filter crusher. Used oil is collected for off-site recycling.

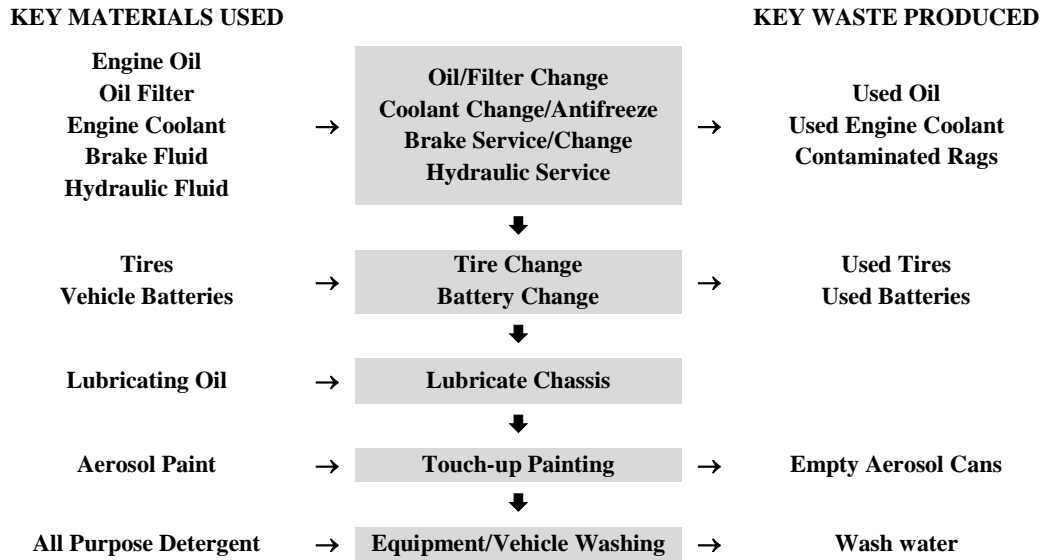
Other components serviced or changed out are batteries, brakes and tires. Used tires are staged, packaged and turned into DRMO. The tires are then recycled offsite. All vehicle batteries are recycled through a one-for-one exchange in which the supplier (Exide) picks the batteries up at the work center.

Touch-up painting is done as needed. Equipment is washed on a wash rack prior to returning it to the unit. The wash rack is equipped with an oil water separator.

Unlike most shop, this shop continues to have a reusable rag program. Per Mr. Cantu, AMSA-7 has its own separate contract for rag recycling and does not participate in the Air Station's rag

recycling program. Clean rags are delivered by Admiral Linen Service and the contaminated rags are picked up for offsite laundering.

Process Flow Diagram



Auto Hobby Shop

Location: Building #1737 and #1277

Operated by: MWR

Work Center Description

This work center allows NAS personnel to service their own automobiles by providing them with the necessary tools and assistance. The most common tasks performed by NAS personnel are oil changes. MWR-Hobby staff will replace antifreeze at a nominal fee (compared to rates at commercial businesses). There is a small store run by Navy Exchange (NEX) where patrons can purchase tires, oil changing supplies, batteries, etc. Note that the vehicle washrack cited in the 2008 P2 Plan is no longer used.

Work Center Processes

- Repair and Maintain Vehicles

Process Description: Repair and Maintain Vehicles

NAS personnel maintain their own vehicles. Auto skills center patrons are allowed to service their own vehicles under the guidance of MWR staff. NAS personnel are supplied with tools and equipment by MWR, but must bring their own supplies. MWR employees answer the patrons' questions about vehicle repair and maintain the equipment in the Auto Skills Center.

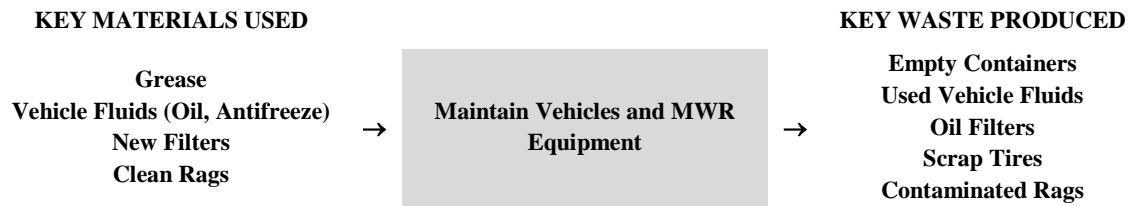
The following is a list of some of the possible services they could perform on their own vehicles:

- oil changes,
- repairs to,
- engines,
- brakes,
- exhausts,
- fluid servicing, and
- minor paint touch-up.
- MWR employees often perform the following tasks:
 - antifreeze replacement,
 - answering questions concerning auto repair, and
 - maintain MWR equipment.

Used oil filters are punctured, drained, and crushed. Used vehicle batteries (lead-acid) are returned to vendor through NEX. A Graymills Biomatic parts washer is present at the facility but per Mr. Pizana has never been used. Brakes are cleaned on an aqueous-based Clayton brake

cleaning system. Personnel also operate a Freon recovery unit for air conditioning service. Although an antifreeze recycler is located at this work center, it is not currently in use.

Process Flow Diagram



Aviation Equipment Shop, Work Center 130

Location: Hanger 56

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel perform scheduled and unscheduled maintenance of T-34 and T-44 aviation equipment.

Work Center Processes

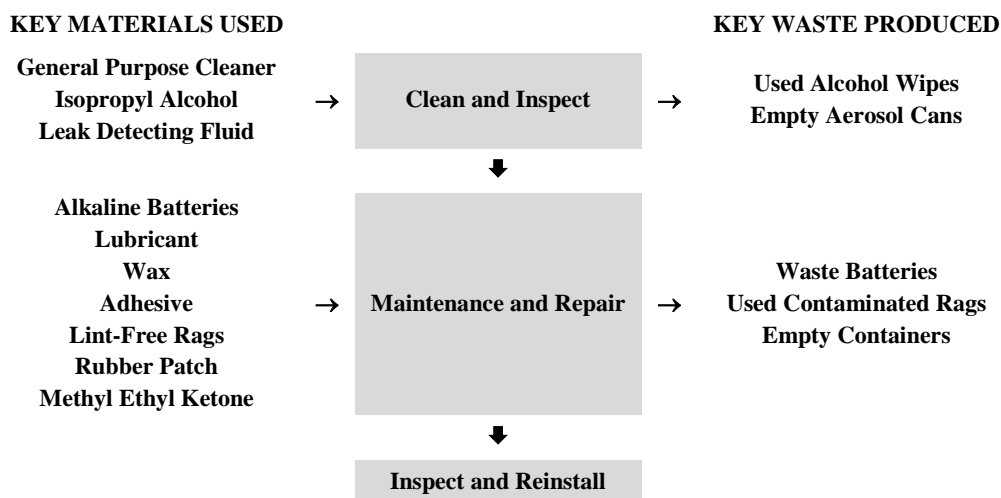
Flight survival gear maintenance

Process Description: Flight Survival Gear Maintenance

Work center personnel inspect flight survival gear, such as parachute, life rafts, and life jackets for imperfections or damage. Parachutes are cleaned with a mild detergent to remove adhesives from the surface. Cords are waxed, sensor plugs are cleaned with isopropyl alcohol, and service dates are installed on the metal parts of the parachute. If defects or damage is found, it is repaired.

Life rafts and life jackets are cleaned and checked for leaks with a leak-detection fluid. Leaks are repaired with synthetic rubber (i.e., neoprene, polychloroprene) patches. Alkaline batteries in life vest radios are replaced (the use of lithium batteries has been replaced with alkaline batteries). Once repaired or cleaned, each piece of equipment must be inspected as a quality assurance measure before being re-installed on the aircraft.

Process Flow Diagram



Aviation Life Support, Work Center 800

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently BAE)

Work Center Description

Shop personnel service, clean, maintain, pack, stock, and repair pilot's life support and emergency equipment for the T-34, T-44, and some USCBP aircraft. Equipment includes life jackets, life rafts, parachutes, survival/life vests, helmets, web gear, harnesses, and radios. Flight gear and survival equipment on aircraft must be maintained and tested to verify the equipment will function properly when needed in emergencies.

Since the 2008 P2 management plan, the AIMD-800 riggers processes have been taken over by this work center. The AIMD-800 riggers work center is responsible for the maintenance and repair of life support systems for helicopters. This primarily consists of dry suits, life preservers, life rafts, helicopter air breathing devices (HABDs), and survival radios.

Work Center Processes

- Flight/survival gear maintenance
- Life support system repair

Process Description: Flight/Survival Gear Maintenance

Work center personnel maintain approximately 6,000 pieces of flight/survival equipment per year. This equipment includes parachutes, life rafts, life jackets, helmets, harnesses, and tactical radios. Equipment is received and cleaned, and repaired as necessary. Once repaired or cleaned, each piece of equipment must be inspected as a quality assurance measure before being re-installed on the aircraft.

Parachutes are inspected thoroughly for imperfections like rips or tears. The parachute is cleaned with a mild detergent to remove adhesives from the surface. Cords are waxed. If defects are found, they are repaired. Sensor plugs are cleaned with isopropyl alcohol. Service dates are also installed on the metal parts of the parachute and the parachute is repacked.

Life rafts are checked for leaks and are cleaned and repaired, as needed. Toluene must be used to clean equipment per specification.

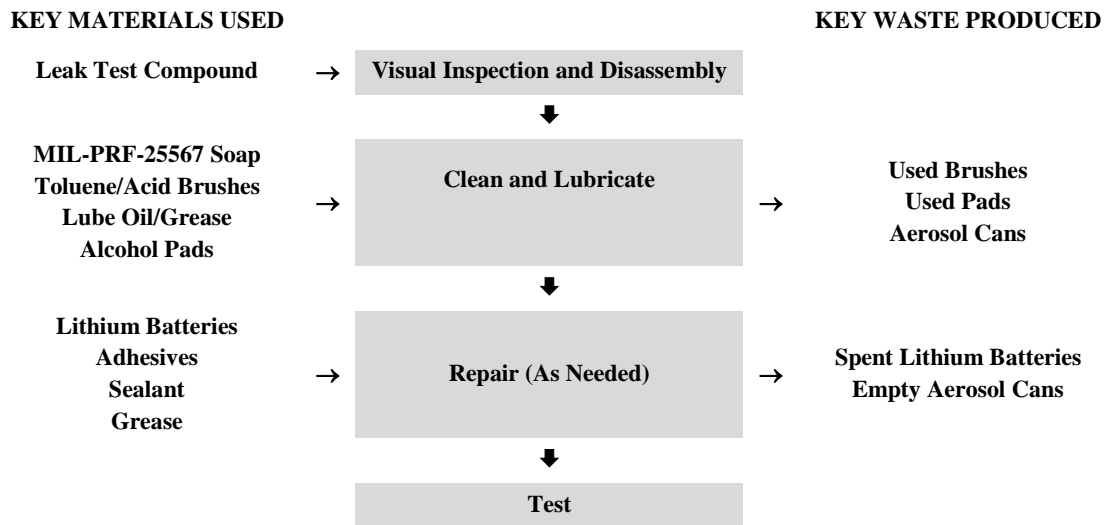
Survival/life vests are inspected repaired, packed, and batteries are recharged or changed in radios.

Helmets are re-taped, lubricated, and cleaned.

Web gear (harnesses) are inspected and repaired/sewed.

Patches and nametags are sewn on suits, as needed.

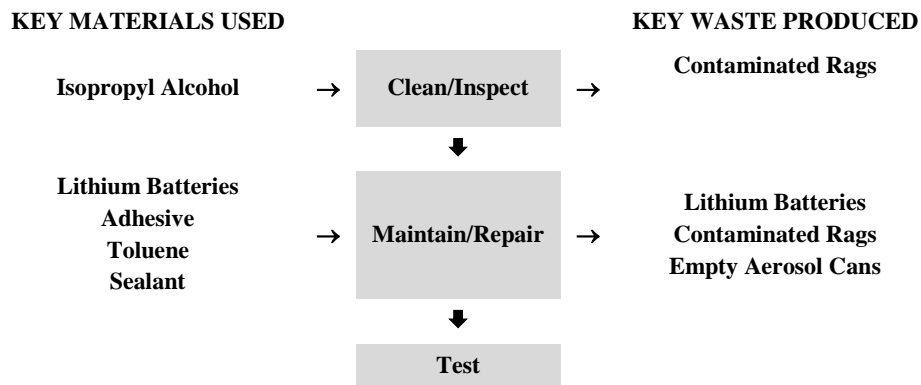
Process Flow Diagram



Process Description: Life Support System Repair

Work center personnel are responsible for maintenance and repair of life support systems for the Sikorsky MH-53 helicopters. This primarily consists of dry suits, life preservers, life rafts, helicopter air breathing devices (HABDs), and survival radios. The lithium batteries in the survival radios are changed out every three years or when one fails. All flight gear is periodically inspected based on preventive maintenance schedule and repaired or replaced as needed.

Process Flow Diagram



C-12 Maintenance Shop

Location: Hangar 55

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

This work center is operated by L-3 Vertex and maintains/services 27 C-12 Huron twin-engine turboprop aircraft. Maintenance and repair ranges from aircraft washing to aircraft touch-up painting and structural work to electronic repair and replacement.

Work Center Processes

- Fuel sampling
- Non-destructive inspection (NDI)
- Aircraft maintenance

Process Description: Fuel Sampling

This shop is also responsible for the flight line servicing of the aircraft. This primarily consists of parking and launching of aircraft, fueling GSE, walk down of aircraft, and the daily collection of fuel samples from aircraft. Fuel samples are collected from 20 aircraft per day. The used fuel samples are placed in used fuel drums. The fuel farm is contacted and empties the drums when they are full. Used fuel is also generated on occasion from aircraft repair.

Process Flow Diagram

KEY MATERIALS USED

Isopropyl Alcohol
F-24

→

Daily Fuel Sampling

→

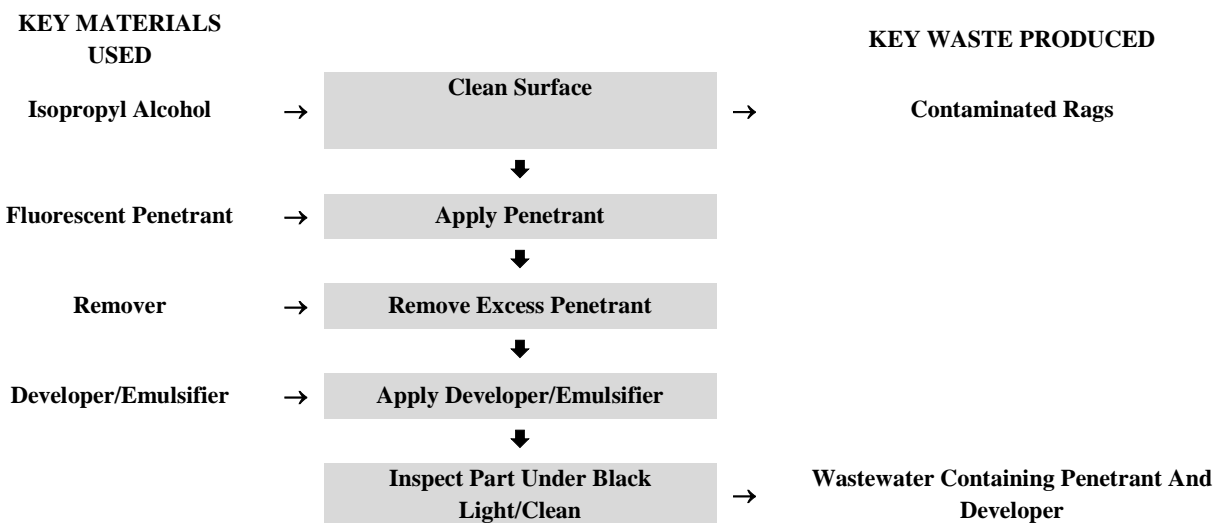
KEY WASTE PRODUCED

F-24

Process Description: Non-Destructive Inspection

Fluorescent penetrant inspection is used to find cracks, seams, laps, laminations, and porosity on machined surfaces. Inspection allows a flaw or defect in the metal to be visible when placed under a black light. Metal parts are cleaned with isopropyl alcohol prior to testing. Penetrant is sprayed onto the metal and allowed to sit for an hour (for ferrous parts) or 30 minutes (for non-ferrous parts) in order to “penetrate” the cracks or defects. Excess penetrant is removed with spray remover and developer is applied after. The developer helps to expose the penetrant absorbed into the defects when placed under the black light to evaluate the part.

Process Flow Diagram



Process Description: Aircraft Maintenance

Work center personnel perform small-scale general maintenance and repair of the C-12 aircraft. This includes structural repair of the “skins,” landing gear, doors, hatches, brakes and tires. The shop is also responsible for the maintenance of the aircraft hydraulic systems (i.e. brakes and struts), but does not test the hydraulic fluid. All gears on the aircraft are mechanical with the exception of the brakes. Personnel also perform maintenance and minor repair of the avionics systems of the C-12 aircraft. Virtually all avionic components are electronic-based. If work center personnel cannot repair the component, it is replaced and the defective component is shipped offsite for repair.

Engine Cleaning - Every six to eight weeks, the two engines are cleaned using a solution of gas path cleaner and water. Two gallons of mixed solution (1-cup gas path cleaner, balance water) is used per engine per cleaning. The used engine cleaning solution is collected for disposal.

Aircraft Engine Oil Servicing - Engine oil and oil filters are changed periodically for each aircraft. Used oil is collected for recycle. Used oil filters are placed in a 35-gallon drum for offsite disposal. The drum has not filled up over the last six years.

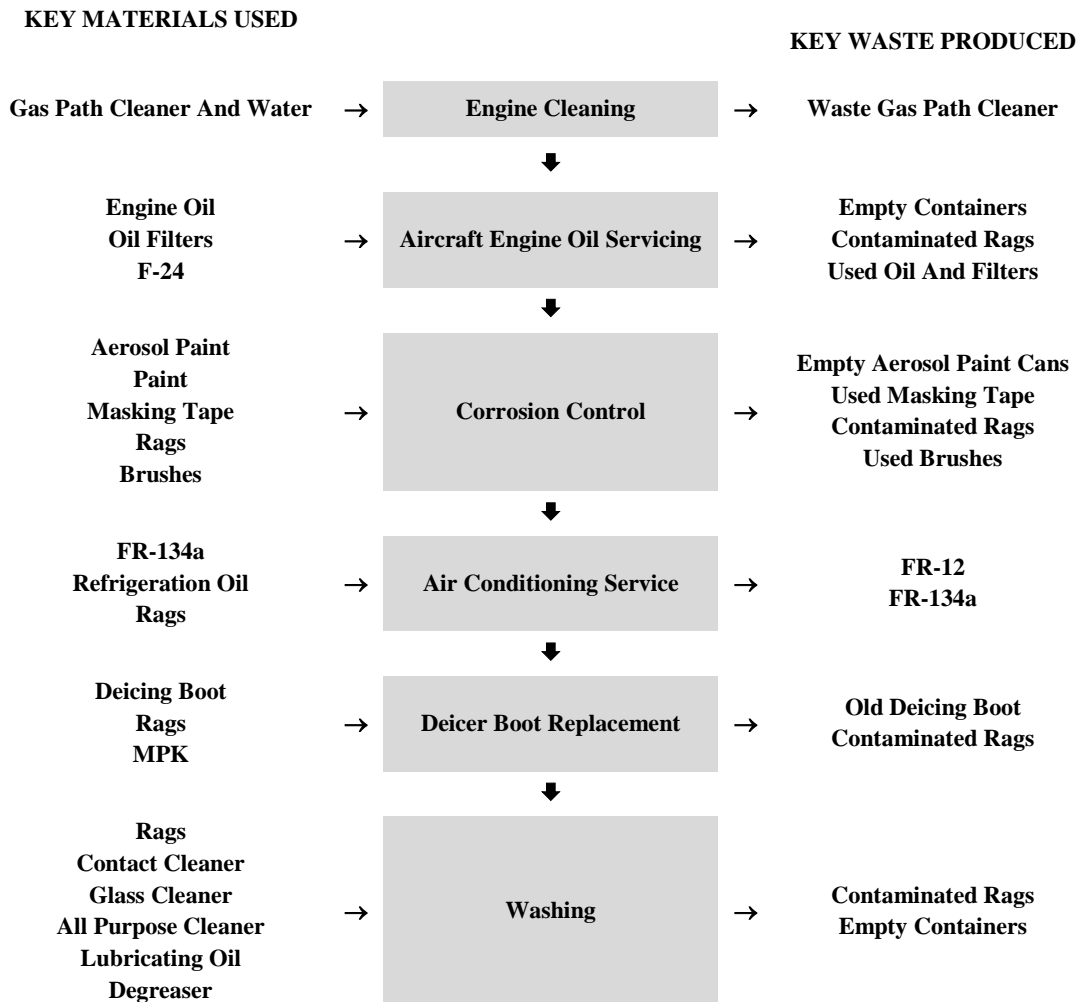
Corrosion Control - This work center performs small-scale painting and corrosion prevention of the C-12 aircraft. Aircraft painting is transitioning from the use of aerosol spray paints to HVLP paint guns. All C-12 aircraft painting is done at night, since T-34/T-44 aircraft painting is done in the same space during the day. Inspections are conducted to identify surface corrosion or deep scratches in the paint. On average, three aircraft are painted per night using two HVLP paint guns and five colors of paint (white, international orange, black, red, and blue). HVLP paint gun cleaning is done using a spray gun cleaning kit and paint thinner. The cleaner has a 5-gallon capacity and the cleaner is scheduled to be changed out every two months.

Air Conditioning Service - C-12 aircraft air conditioning systems originally used FR-12. Shop personnel convert the air conditioning systems to FR-134a during normal maintenance and repair. A Freon recovery unit is used to collect the used refrigerant for recycling.

Deicer Boot Replacement - De-icing boots are periodically removed from the wings of the aircraft and replaced. NAS Corpus Christi is transitioning to a fast boot system by BF Goodrich in which the boots are pre-adhesive. Methyl propyl ketone (MPK) is used to pre-clean the aircraft wing prior to new boot placement. MPK has replaced methyl ethyl ketone (MEK) as the pre-cleaning solvent. A small amount of toluene is used to ensure a clean surface for adhesion.

Aircraft Washing - Aircraft are washed at a rate of two to three per night 5 days a week. Each aircraft is washed at least every two weeks. The aircraft are washed at the USCBP wash rack near Hangar 51. An alternate wash rack is located near Hangars 56 and 57. The hinges of all aircraft doors are then lubricated as well as all of the struts wiped down with hydraulic fluid.

Process Flow Diagram



Calibration Lab/Avionics, Work Center 600/610

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

Work center personnel are responsible for testing, cleaning, repairing, calibrating, troubleshooting, and maintaining avionics equipment for T-34, T-44, C-12, and USCBP' aircraft.

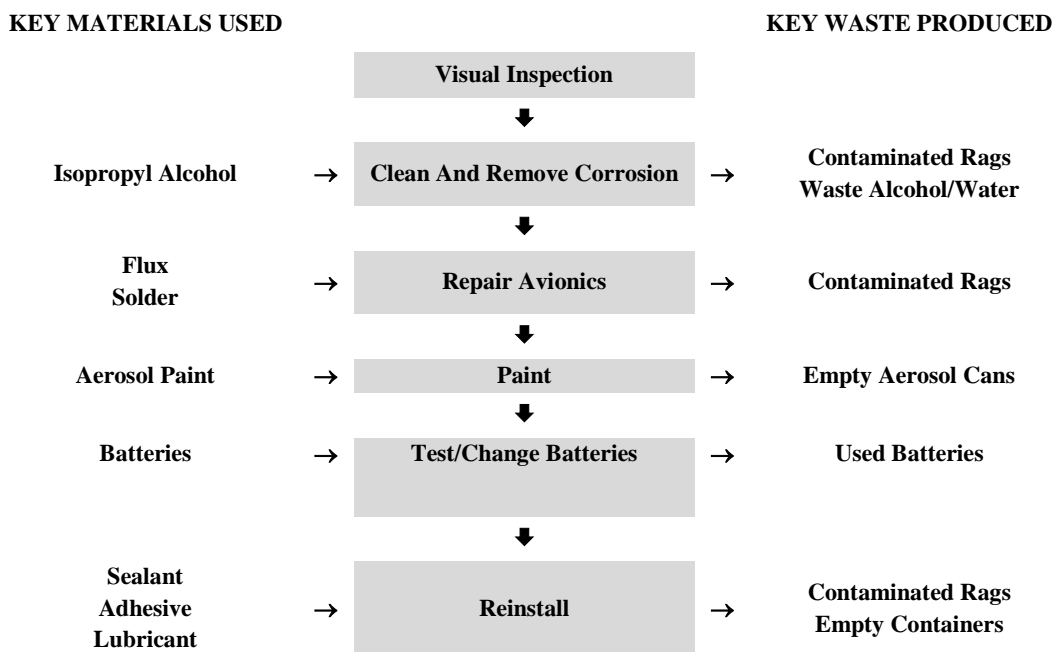
Work Center Process

- Avionics calibration, repair, and maintenance

Process Description: Avionics Repair, Calibration, and Maintenance

Visual inspection determines where the electrical component malfunction is occurring. Personnel then repair the component. steps in this process include cleaning the component with alcohol in the ultrasonic cleaning units, mechanical removal of any corrosion, touch-up painting, and the repair, testing, and calibration of avionics equipment. Approximately 6,000 pieces of equipment are serviced per year. NiCad, lithium, and seal lead-acid battery change-outs are also done in this shop. Electronic test equipment is calibrated to keep systems working accurately.

Process Flow Diagram



Component Overhaul And Non-Destructive Inspection (NDI) Shop, Work Center 500

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

Work center personnel are responsible for maintenance of T-34 and T-44 aircraft components such as tires and wheel assemblies, flight control actuators, fuel nozzles and filters, torque knees, canopies, and aircraft skin repairs.

Work center personnel are also responsible for non-destructive inspection (NDI) on the various aircraft components. Metal parts, when fabricated, repaired, or welded, must be inspected for defects prior to installation or reinstallation on the aircraft. Due to sensitivity and the extreme conditions placed on the metal while in flight, each metal component must meet specific criteria in order to guarantee the security of the aircraft. A technical order specifies what type of inspection is to be performed on each component or part. This work center uses fluorescent penetrant, magnetic particle, and eddy current (electrical impulse machine) inspections. The eddy current inspection method utilizes equipment that only generates NiCad batteries as a waste product. The NiCad batteries are rechargeable.

Work Center Processes

- Component maintenance and repair

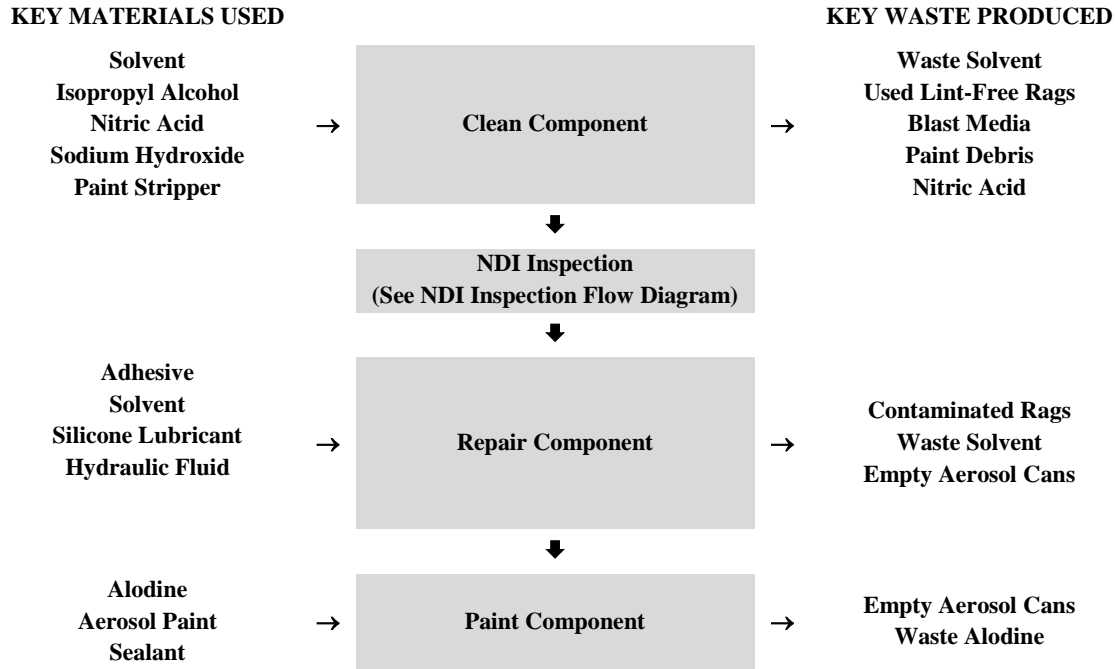
NDI fluorescent penetrant inspection

- NDI magnetic particle inspection

Process Description: Component Maintenance and Repair

Maintains and repairs approximately 6,000 components for T-34 and T-44 aircraft. First, the component is cleaned with solvents and/or isopropyl alcohol and it is inspected for cracks or imperfections with one of three NDI inspection methods. The area of the component in need of repair is stripped of paint, sanded, or blasted with plastic or glass beads and repaired. The component is then prepared for painting using chromate conversion coating (i.e., Alodine) and spray paint. The shop no longer uses HVLP paint guns (a Greco paint gun cleaner remains in the shop but is not used).

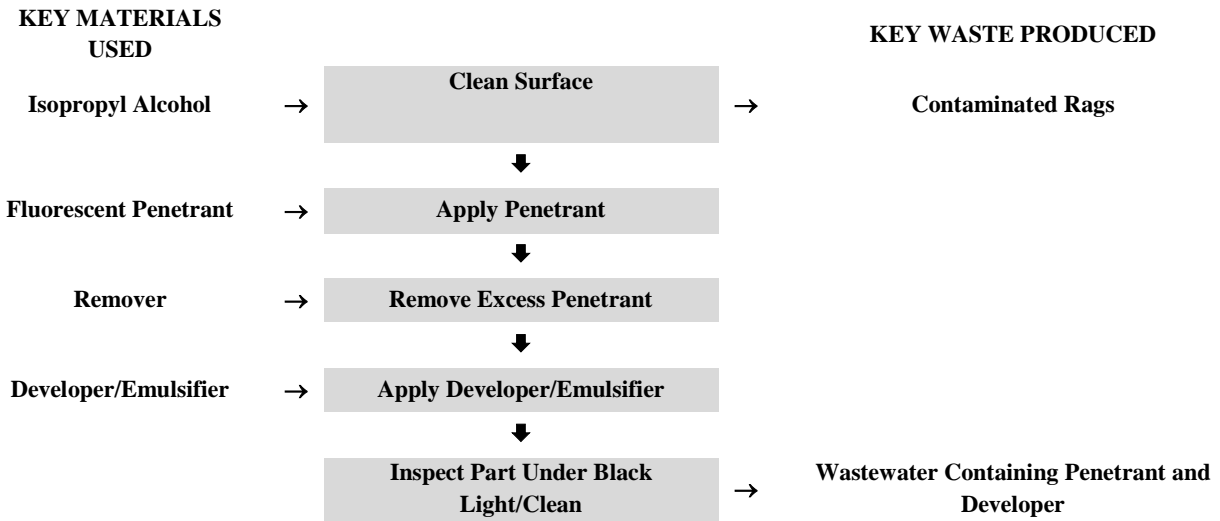
Process Flow Diagram



Process Description: Non-Destructive Inspection

Fluorescent penetrant inspection allows a flaw or defect in the metal to be visible when placed under a black light. Metal parts are cleaned with isopropyl alcohol prior to testing. Penetrant is sprayed onto the metal and allowed to sit for an hour (for ferrous parts) or 30 minutes (for non-ferrous parts) in order to “penetrate” the cracks or defects. Excess penetrant is removed with spray remover and developer is applied after. The developer helps to expose the penetrant absorbed into the defects when placed under the black light to evaluate the part.

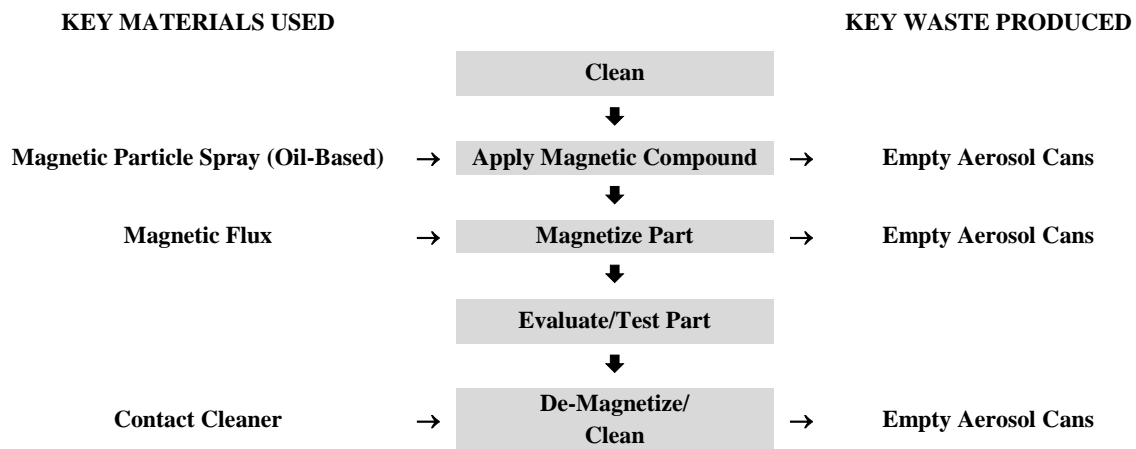
Process Flow Diagram



Process Description: Magnetic Particle Inspection

Magnetic particle inspection is an NDI process for detecting surface and slightly subsurface discontinuities in ferromagnetic materials such as iron, nickel, cobalt, and some of their alloys. Ferrous metals such as aluminum, steel, and titanium are cleaned with isopropyl alcohol prior to inspection for cracks or imperfections. The part is then placed into a solvent bath containing iron particles or filings. The solution is magnetized and the iron filings penetrate the cracks or imperfections in the part. The part is removed and cleaned once again with contact cleaner and water.

Process Flow Diagram



Conditional Maintenance Shop, Work Center 620

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

This shop performs unscheduled, major, structural repairs of T-34 and T-44 aircraft, depot-level maintenance, and spar replacement. Shop personnel service approximately 35 aircraft per year.

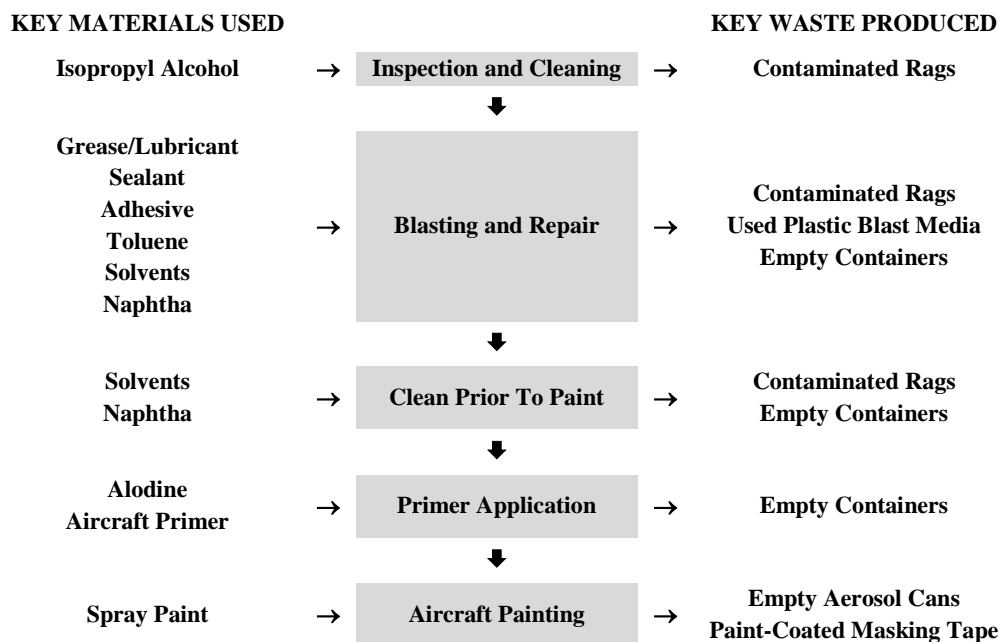
Work Center Processes

- Repair/refurbish aircraft

Process Description: Repair/Refurbish Aircraft

First, the aircraft is inspected and the damaged area is cleaned. Shop personnel remove surface deposits and paint with a bead blast gun, and repair the damaged area. The aircraft is then primed for painting with a chromate conversion coating (i.e., Alodine) and primer, and then painted with aerosol paint. Aerosol cans are not punctured.

Process Flow Diagram



Corrosion Control Shop, Work Center 121

Location: Hanger 55

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel perform scheduled (every 56 days) inspections of T-34 and T-44 aircraft for corrosion and fungus control, performs corrosion control rework, removes fungus, and restores aircraft paint systems. Shop personnel service approximately 100 T-34s and 55 T-44s per month.

Work Center Processes

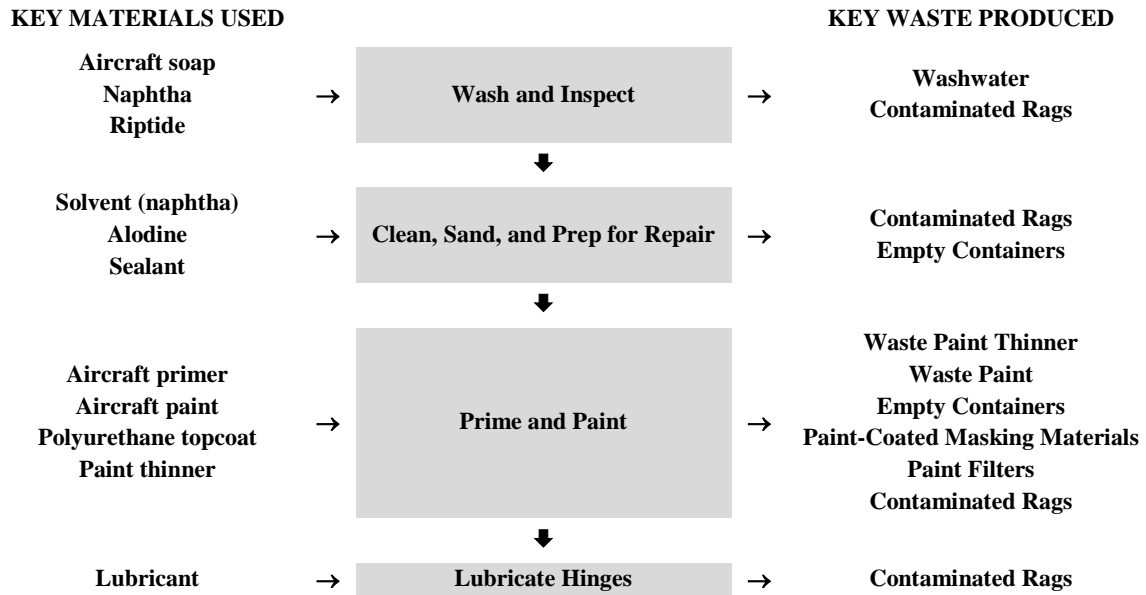
- Aircraft corrosion/fungus control and aircraft painting

Process Description: Aircraft Corrosion/Fungus Control and Painting

Work center personnel are responsible for removing and preventing all corrosion from T-34 and T-44 aircraft. This shop is also involved in paint system restoration, when needed, after corrosion repair. This involves small-scale painting using paint pens and/or aerosol paint for small objects and HVLP paint guns for larger objects to minimize VOC releases during spray painting.

The aircraft is first washed and inspected for corrosion and fungus. If corrosion control and rework is needed, shop personnel manually sand the area with hand-held sanders, repair the damaged area, and perform corrosion control and prevention. If the aircraft has fungus, it is removed with a dry vacuum. The aircraft is then primed and painted using HVLP paint guns. Epoxy primer is used instead of primer containing chromium. Paint guns are cleaned within a Greco paint gun cleaning unit. Finally, the hinges are lubricated and the aircraft is returned to service.

Process Flow Diagram



Ejection Seat Shop

Location: Building #82

Operated by: Contractor (currently BAE)

Work Center Description

Personnel perform repair, cleaning and replacing the explosive charge in T-6 ejection seats and canopies.

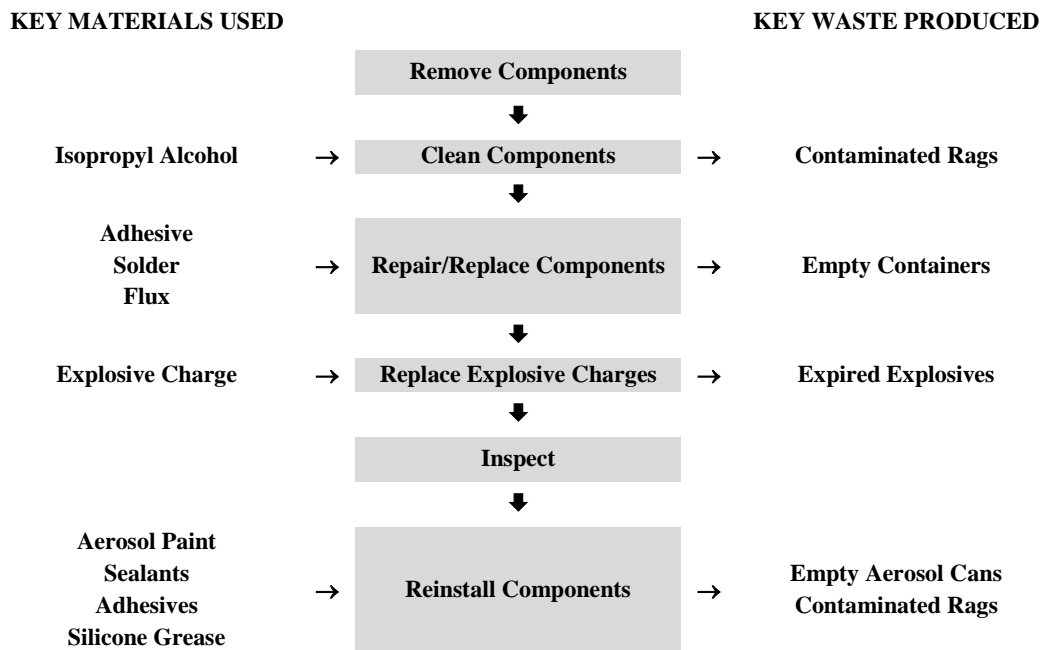
Work Center Process

- Mine countermeasure equipment maintenance and repair

Process Description: Mine Countermeasure Equipment Maintenance and Repair

First, personnel clean connectors and contacts using isopropyl alcohol. Mine countermeasure equipment is repaired using light soldering and silicone grease on equipment gaskets. Explosive charges (300-pound charges) for ejection seats and canopies are regularly replaced; removed explosives are disposed of through the Weapons Armory.

Process Flow Diagram



Ground Support Equipment (GSE) Corrosion Control, Work Center 920

Location: Hangar 51

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

Work center personnel perform corrosion control on GSE, as needed. The GSE corrosion control shop provides removal, sanding, and grinding of painted surfaces requiring repair, and cleaning, prepping, priming, and painting/touch-up of prepared surfaces of approximately 200 pieces of ground support equipment per year. Work center personnel perform corrosion control on a small quantity of miscellaneous non-aircraft equipment as well.

Four parts washers are located at this work center:

- One uses EP921 (citrus-based parts washer solvent) for HVLP paint booth equipment
- One uses PD-680 solvent for cleaning bearings and heavily oiled parts
- Two use steam, heat, and MIL-PRF-29602 cleaning compound
- This shop also has two blast cabinets: one uses plastic media, and one uses glass media.

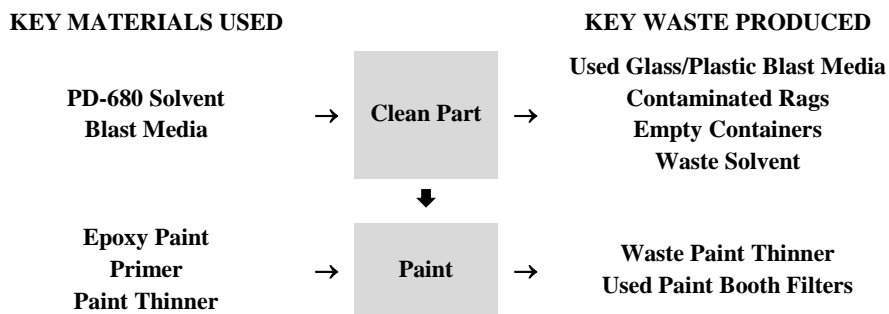
Work Center Process

GSE corrosion control

Process Description: GSE Corrosion Control

The shop uses a large plastic blast media walk-in booth with high pressure blast for larger equipment and a smaller plastic media blaster cabinet for smaller pieces. A glass bead cabinet is also used for small equipment that does not need much abrasive force, mostly used for pitted corrosion removal.

Process Flow Diagram



Hangar 57 Ground Support Equipment (GSE) Shop, Work Center 900

Location: Hangar 57

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

Work center personnel provide preventive maintenance (scheduled), repair (unscheduled maintenance), and corrosion control for T-44 and T-34 aircraft GSE such as golf carts, wing jacks, gas and diesel engines, mules, hydraulic generators, forklifts, and carts. GSE is maintained on a schedule to help prevent breakdowns and to extend the life of the equipment. Duties include fluid changes, parts cleaning and repairs, engine repair, and support equipment electrical repair.

Work Center Processes

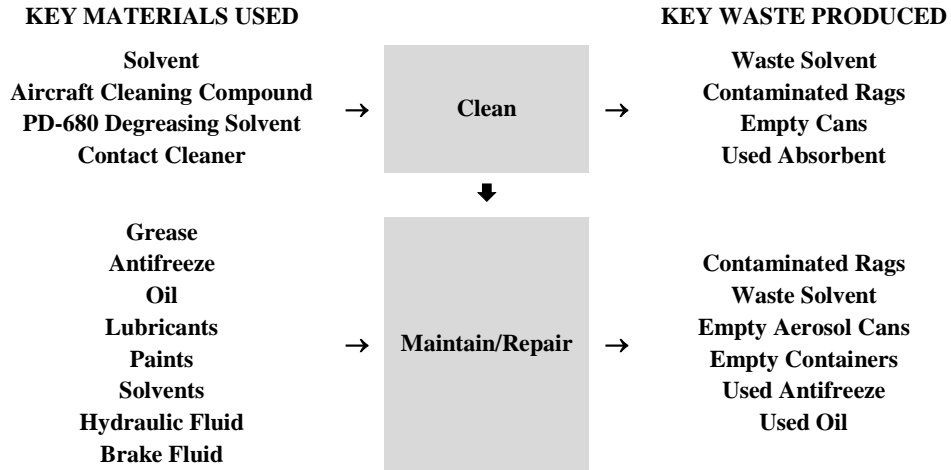
- Support equipment maintenance

Process Description: Support Equipment Maintenance

Scheduled maintenance is performed on approximately 1,200 pieces of support equipment per year. Maintenance includes fluid and filter changes, part cleaning, and minimal touch-up painting. When the equipment comes in for service, the equipment is washed or rinsed to remove grease and dirt. The support equipment is then inspected for damage as well as wear and tear. Fluids that are in need of changing are drained from their appropriate reservoirs and contained in waste drums. Hydraulic fluid is sent to Hangar 51 for particle counter testing. Filters are changed and replaced and fluids refilled. If batteries are changed, spent batteries are collected for recycling and sent to the NAS Environmental Department along with used oil filters (where are crushed and recycled). Touch-up painting is done with some aerosol paint, but recently with more non-aerosol paint, if appropriate.

Unscheduled maintenance of support equipment involves repair of broken down parts or equipment. Some fluids may require draining in order to remove a part, to facilitate repair, or to remove any chance of a fire hazard if using electric tools to do repair work. Brakes will be replaced on such equipment like tow motors. Components that need replacing are removed and new components are soldered on to the equipment. Greases and lubricants are applied to ease movement and prevent wear and tear of parts. Once the equipment or component has been repaired, a test is run to ensure proper function.

Process Flow Diagram



Hangar 51 Ground Support Equipment (GSE) Shop, Work Center 910/900

Location: Hangar 42 (Temporary)

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

Work center personnel provide complete preventive maintenance (scheduled) and periodic repair and rework (unscheduled maintenance) on GSE for T-34, T-44, C-12, HM-15 aircraft. Personnel also provide maintenance for some GSE from USCBP. GSE includes tow tractors, golf carts, jack testers, wing jacks, maintenance stands, gas and diesel engines, mules, hydraulic generators, forklifts, and carts. GSE is maintained on a scheduled basis to help prevent breakdowns and to extend the life of the equipment. Duties include washing, fluid changes, parts cleaning and repairs, engine repair, touch-up painting, tire buildup, brake cleaning, and inspection, and support equipment electrical repair.

Work Center Processes

- GSE maintenance
- Hydraulic fluid testing

Process Description: GSE Maintenance

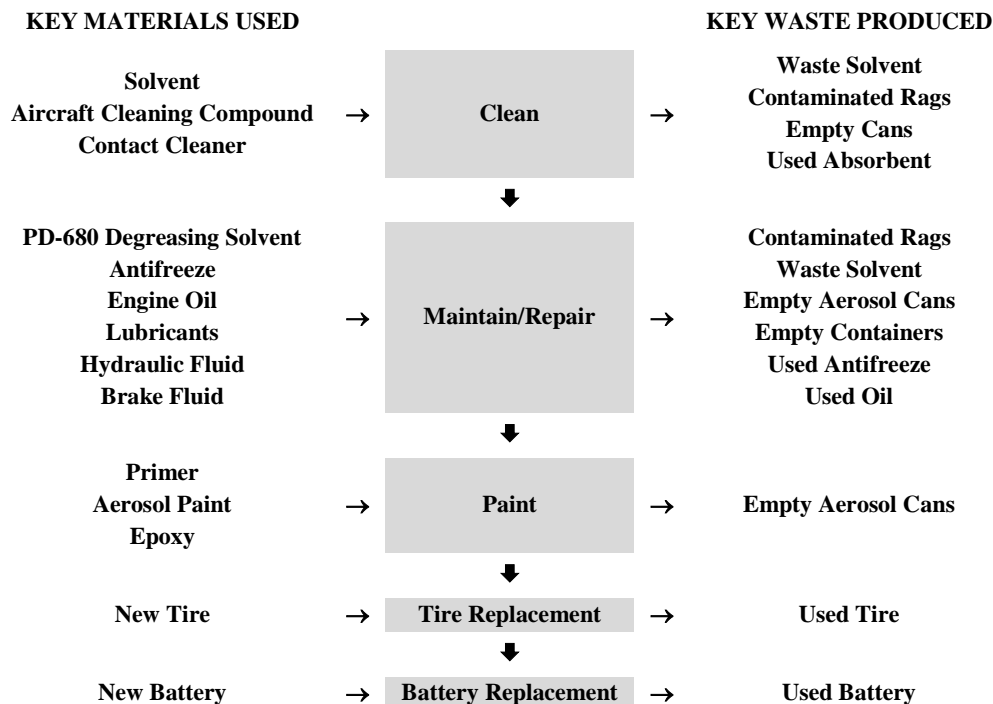
Scheduled maintenance is performed on approximately 1,300 motorized units and 300 non-motorized units of support equipment per year. Maintenance includes fluid and filter changes, engine repair, tire buildup, wash rack (drains to wastewater treatment system), antifreeze service, parts cleaning, and touch-up painting. When the equipment comes in for service, the equipment is washed with MIL-C-85570 cleaning compound to remove grease and dirt. A n aqueous parts cleaner is also used to clean parts. The support equipment is then inspected for damage as well as wear and tear. Fluids that are in need of changing are drained from their appropriate reservoirs and contained in waste drums. Filters are changed and replaced and fluids refilled.

Unscheduled maintenance of support equipment involves repair of broken down parts or equipment. Some fluids may require draining in order to remove a part, to facilitate repair, or to remove any chance of a fire hazard if using electric tools to do repair work. Brakes will be replaced on such equipment like tow motors. Components that need replacing are removed and new components are soldered on to the equipment. Greases and lubricants are applied to ease movement and prevent wear and tear of parts. Once the equipment or component has been repaired, a test is run to ensure proper function.

If batteries are changed, spent batteries are collected for recycling and sent to the NAS Environmental Department along with used oil filters (where they are crushed and

recycled). Touch-up painting is done with aerosol paint. Empty aerosol cans are punctured in a puncture unit. Waste anti-freeze is processed in an anti-freeze recycling unit.

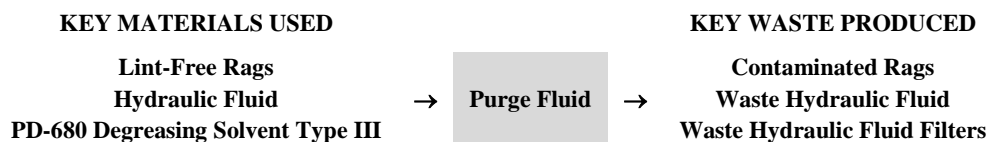
Process Flow Diagram



Process Description: Hydraulic Fluid Testing

Hydraulic fluid is tested using a Portable Oil Diagnostic System (PODS) for measuring, storing, and reporting oil contamination important for reliable hydraulic system operation. Testing is conducted to verify that hydraulic fluid properties are within operating limitations. This is done 90 percent of the time with a particle counter and 10 percent of the time with a patch test (using PD-680 degreasing solvent). The patch testing is the method used to test while the equipment is deployed and not in the shop, therefore, it must be practiced for training purposes.

Process Flow Diagram



Limited Avionics, Work Center 210

Location: Hanger 42 (Temporary)

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

This work center performs maintenance and minor repair of the avionics associated with MH-53E helicopters. The aircraft avionics consist of the global positioning system (GPS) and communication equipment. If work center personnel cannot repair the component, it is replaced and the defective component is shipped to AIMD for repair.

The work center shares the same space with Work Center 220 Electronics.

Work Center Process

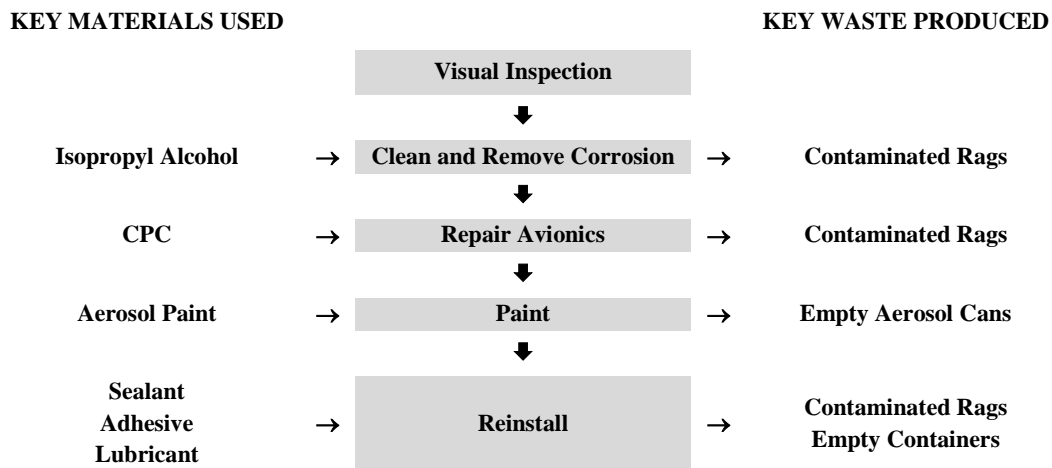
- Avionics repair and removal/installation

Process Description: Avionics Repair and Removal/Installation

Work center personnel perform maintenance and minor repair of the avionics associated with MH-53E helicopters. The aircraft avionics consist of the global positioning system (GPS) and communication equipment. The shop also repairs the wiring connecting the avionic components to the rest of the aircraft. All contacts are cleaned with isopropyl alcohol and treated with a variety of corrosion prevention compounds (CPC). If work center personnel cannot repair an avionic component, it is replaced and the defective component is shipped to AIMD for repair.

Touch-up painting is performed on the exterior faces of some of the avionic components as a corrosion prevention measure.

Process Flow Diagram



Naval Health Clinic

Location: Building #H-100

Operated by: U.S. Navy

Work Center Description

This work center is part of the Naval Health Clinic and provides medical services for Sailors, Marines, and their families. In-patient services are no longer offered at this location, and the work center was downgraded from a hospital to a health clinic. The clinic has transitioned to all digital x-ray equipment, and film processing is no longer used. The following departments operate at this clinic:

- Dental
- Family Practice
- Flight Medicine
- Immunizations
- Behavioral Health
- Optometry
- Pediatrics
- Pharmacy
- Physical Therapy
- Radiology
- Wellness Clinic

All expired pharmaceuticals are returned to the manufacturer through a reverse-distribution process. The clinic has transitioned to all digital x-ray equipment, and film processing is no longer used. This eliminates the need for a silver recovery unit and the associated hazardous waste that is a by-product of traditional x-rays. Environmental staff has implemented a functioning EMS that includes quarterly meetings and monthly inspections of each department, and has set energy conservation goals to reduce energy use by 10 percent.

Work Center Processes

- Dental Amalgam Use

Process Description: Dental Amalgam Fillings

Amalgam is used for tooth fillings. Dental amalgam is made of two nearly equal parts: liquid mercury and a powder containing silver, tin, copper, zinc and other metals. Waste dental amalgam is collected as hazardous waste and filtered from the wastewater stream using chair-side traps and an inline filter on the wastewater main.

Process Flow Diagram

KEY MATERIALS USED

Amalgam



Cavity Filling



KEY WASTE PRODUCED

Amalgam Scrap
Chair-Side Traps Containing Amalgam
Inline Wastewater Filter Containing Amalgam

Navy Supply – Fuel Branch

Location: Building #28 and #1717

Operated by: Contractor (currently Doss Aviation, Inc.)

Work Center Description

This work center is operated by a contractor (Doss) to the Defense Logistics Agency (DLA). The contractor manages fuels and refueling for all NAS Corpus Christi aircraft and vehicles. This includes receiving, storage, handling, and issue of F-24 and unleaded gasoline. They do not handle diesel fuel or aviation gasoline. Specific operations include aircraft refueling/defueling and delivering fuel to government-operated vessels as required. The fuel branch does not have anything to do with the NEX gas station. The work center also manages the storage and distribution of liquid oxygen and nitrogen. They also perform minor maintenance to the tanks (including touch-up painting and valve replacement) and tank trucks.

Liquid nitrogen and oxygen distribution is conducted on station by a contractor. Liquid oxygen is stored in a 2,000-gallon tank (used for breathing apparatus in aircraft). Nitrogen is provided by two mobile nitrogen generators (used on the flight line for tire inflation). The nitrogen tank located onsite has been decommissioned. Propane is delivered as needed by a local supplier.

Work Center Processes

- Fueling, defueling and sampling
- Fuel truck maintenance

Process Description: Fueling, Defueling, And Sampling

Tanker trucks deliver kerosene-based aviation fuel (i.e., F-24) to two 250,000-gallon storage tanks. Fuel is transported by nine tanker trucks, as follows:

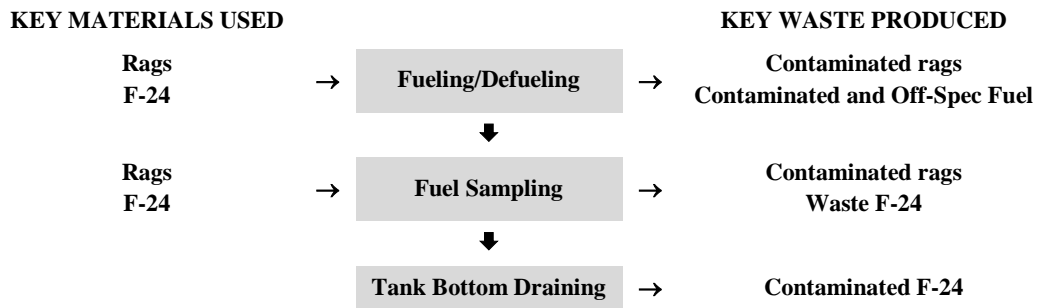
- Six 5,000-gallon tank trucks used for F-24
- Two 5,000-gallon tank trucks used for waste F-24
- One 2,000-gallon tank truck used for diesel/gasoline dual tanker)
- Diesel is delivered to an 8,000-gallon tank at the Public Works service station by the supplier, from where it is dispensed by the end users into their ground vehicles. Doss simply tracks the inventory and paperwork for gasoline.
- Doss does not support the NEX gas station. There is no aviation gas used on station. All aircraft use F-24. General Services Administration (GSA) vehicles are fueled by either the NEX gas station or the fuel branch tanks.

Waste F-24 is collected from the tenant commands by Doss personnel and stored in a 5,000-gallon waste fuel tank at the fuel farm. Water is drained monthly from the bottoms of the 250,000-gallon F-24 tanks and placed in the waste fuel tank. A full waste fuel tank typically

consists of 400-600 gallons of water and the balance is fuel. A contractor empties the tank 4 to 5 times per year and this low-grade fuel is reused offsite.

Samples are collected from all defueled F-24 loads, and periodically from delivered F-24 loads. Gasoline that is only slightly off-specification is placed in the 4000-gallon Public Works service station tank and reused in ground vehicles. The remaining off-specification fuel is placed in the waste fuel tank. Some defueled F-24 may be returned to the 250,000-gallon storage tanks if the quality of the material is assured, and the fuel is transported in the dedicated defuel truck.

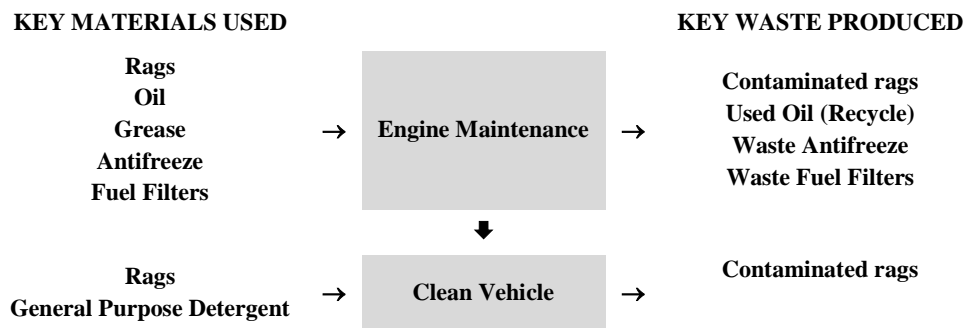
Process Flow Diagram



Process Description: Fuel Truck Maintenance

Doss trucks are maintained on station in Building #28. Waste oil and antifreeze collected during maintenance and repair is placed in public works hazardous waste satellite accumulation areas.

Process Flow Diagram



Marina

Location: Building #1757

Operated by: MWR

Work Center Description

This work center is responsible for maintaining motor and sailboats for rental to government employees.

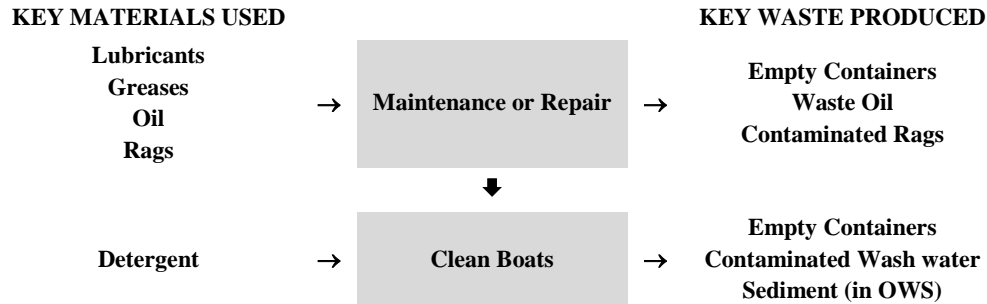
Work Center Processes

- Repair/ maintain sail and motor boats

Process Description: Repair/ Maintain Sail and Motor Boats

Personnel maintain and repair three sailboats, seven motor boats, and a variety of recreational equipment such as bicycles and camping gear. The boats at the marina require minor preventive maintenance and occasional repair such as replacement of propellers and minor electrical repairs. More significant maintenance and repairs are conducted by a vendor in Corpus Christi. Marina personnel also routinely clean the boats. The wash rack is equipped with an oil/water separator.

Process Flow Diagram



Marines Reserves

Location: Building #1722

Operated By: Charlie Company, 1st Battalion, 23rd Marine Regiment, 4th Marine Division

Work Center Description

This shop performs weapons cleaning and battery replacement for squad and field radios.

Work Center Processes

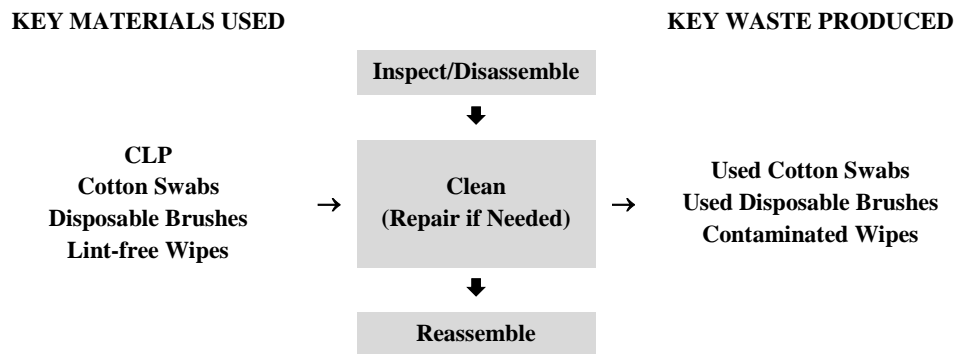
- Weapons Cleaning
- Battery Replacement

Process Description: Weapons Cleaning

Work center personnel (Reservists and Inspector/Instructor (I&I) staff) manually clean weapons five to six times a year using Cleaning, Lubricant, and Preservative (CLP), cotton swabs, brushes, and lint-free cloth wipes (per technical order). The following weapons are cleaned:

- M-16 Rifles
- Infantry Assault Rifles
- M-9 Pistols
- M-249 Squad Assault Weapons
- M-203 Grenade Launchers
- 60-mm Mortars
- M-240 Machine Guns

Process Flow Diagram



Process Description: Battery Replacement

Non-rechargeable lithium batteries are replaced in radios as needed.

Process Flow Diagram



MWR - Bowling Alley

Location: Building #1707

Operated by: Commander, Navy Installations Command (CNIC)

Work Center Description

This work center is part of the Morale, Welfare, and Recreation (MWR) program under the CNIC. Work center personnel are responsible for operating and maintaining the bowling alley (Lighthouse Lanes) at NAS Corpus Christi.

Work Center Processes

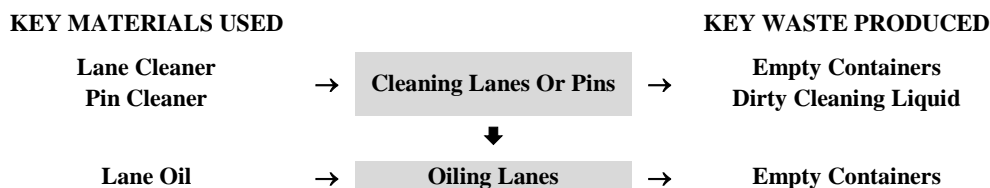
- Maintain bowling alley and pins
- Adjusting bowling ball finger holes

Process Description: Maintain Bowling Alley and Pins

The lanes need to be cleaned of oil and dirt and then re-oiled every night. An automatic enclosed lane cleaner is put at the beginning of each lane and the first pass removes all the dirt and oil, the second pass puts down fresh lane oil. All hazardous materials (i.e., lane cleaner/oil, pin cleaner) are purchased through HAZMART.

The pins are cleaned in a pin cleaning machine located in the workroom of the bowling alley. The pins are cleaned when they have an excess of dirt and oil build up, this is approximately every 2 months.

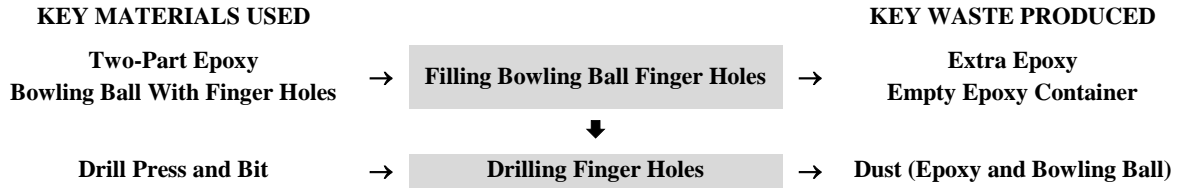
Process Flow Diagram



Process Description: Adjusting Bowling Ball Finger Holes

Customers can purchase un-drilled bowling balls in the pro shop and have the finger holes drilled at lighthouse lanes. Occasionally customer's fingers will change sizes and they need different sized or spaced finger holes. If a customer has a bowling ball with finger holes already drilled, they can have different finger holes drilled by having the holes filled with epoxy and then re-drilling the finger holes. Lighthouse Lanes has the necessary equipment to do either process. All hazardous materials (i.e., epoxy) are purchased through HAZMART.

Process Flow Diagram



MWR - Golf Course Maintenance

Location: Building #1743

Operated by: Commander, Navy Installations Command (CNIC)

Work Center Description

This work center is part of the Morale, Welfare, and Recreation (MWR) program. Work center personnel are responsible for maintaining the NAS Corpus Christi golf course.

Work Center Processes

Maintain golf course

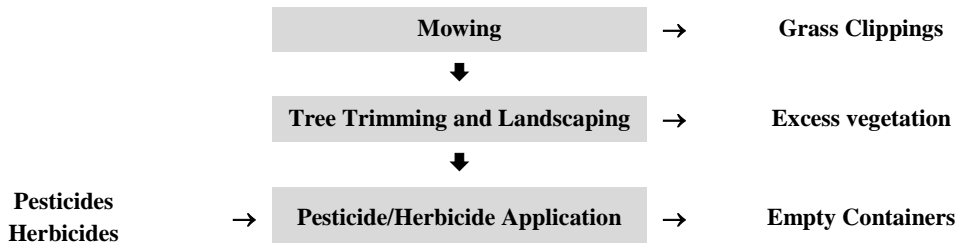
Process Description: Maintain Golf Course

Work center personnel maintain NAS Corpus Christi (MWR) golf course grounds, including cutting grass, trimming trees, watering the course, application of pesticide/herbicides, cleaning golf carts, and landscaping small flowerbeds. The course is irrigated during the morning or early evening as much as possible using reclaimed water.

Process Flow Diagram

KEY MATERIALS USED

KEY WASTE PRODUCED



MWR-Housing Maintenance

Location: Building # 1841

Operated by: MWR

Work Center Description

This work center is responsible for maintaining the 51 facilities operated by MWR.

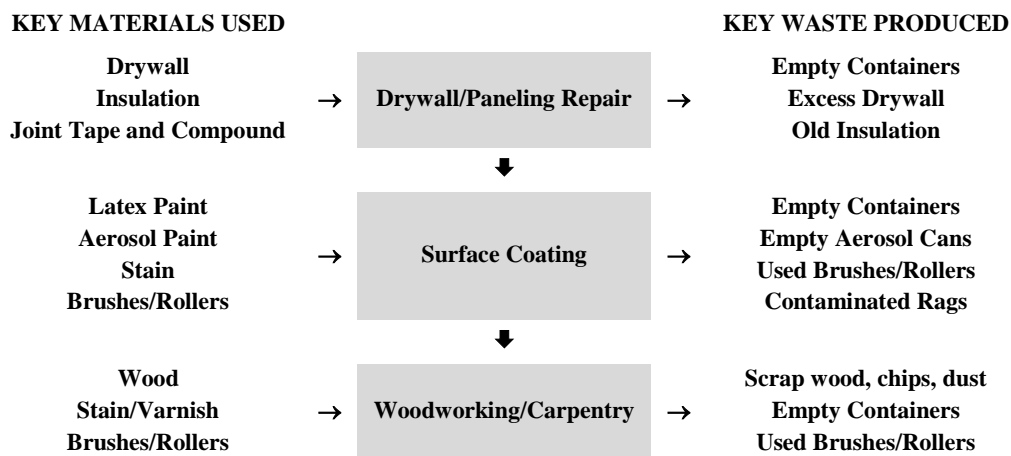
Work Center Processes

- Maintain MWR Facilities

Process Description: Maintain MWR Facilities

Work center personnel maintain all MWR facilities at NAS Corpus Christi, including routine building maintenance, dry wall installation/repair, painting, minor plumbing (outside of wall), minor low-voltage electrical repair/replacement, flooring installation (e.g., carpet, ceramic tile), and carpentry for specialty items.

Process Flow Diagram



Navy Region South Fire Department

Location: Building # 7 (Station 1) and #1742 (Station 2)

Operated by: Air Operations

Work Center Description

Fire Department personnel are responsible for responding to emergencies, servicing all fire extinguisher cylinders on air station, and maintaining firefighting equipment. This shop encompasses two fire stations, a carbon dioxide (CO₂) Shop (Building 1745), and Auxiliary Landing Fields at Cabaniss and Waldron. Fire Station 1 is located in Building #7, and Fire Station 2 is located in Building #1742.

Fire training is performed using a propane-fueled mobile aircraft firefighter training simulation unit. Only water is sprayed on the propane fire during testing. No Aqueous Film-Forming Foam (AFFF) or liquid fuels are used. Vehicle maintenance of the fire-fighting trucks is performed by Public Works Transportation.

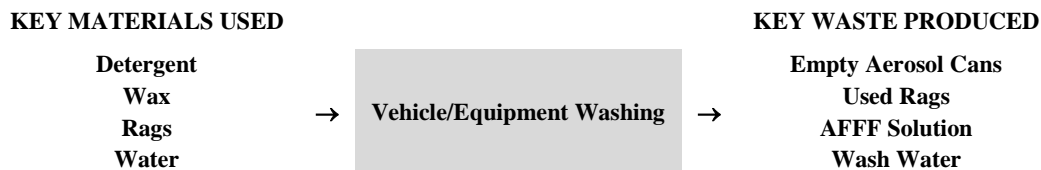
Work Center Processes

- Firefighting equipment washing
- Fire extinguisher servicing

Process Description: Fire Fighting Equipment Washing

Personnel at both Stations wash fire-fighting equipment including fire trucks and fire extinguishing systems. Hangars 42 (HM-15) and 50 (USCBP) have AFFF systems. In the event of a discharge, the AFFF flows to drains located inside the hangars.

Process Flow Diagram



Process Description: Fire Extinguisher Servicing

Halon and CO2 extinguishers are filled at the CO2 Shop in Building 1745. The CO2 Shop in Building 1745 operates a Hydro-Test Products Halon Recovery Unit to capture halon from expired units. Testing and servicing of the extinguishers is done off-site by a contractor.

Process Flow Diagram

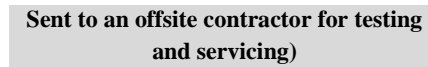
KEY MATERIALS USED

Halon
CO₂
Nitrogen



KEY WASTE PRODUCED

Scrap Metal (unserviceable fire extinguishers)



Ordnance Operations

Location: Building #1863

Operated By: Navy Munitions Command – Component Corpus Christi

Work Center Description

The work center manages the magazine where ammunition for small arms weapons is stored. As part of this effort, personnel maintain and stencil ammunition containers.

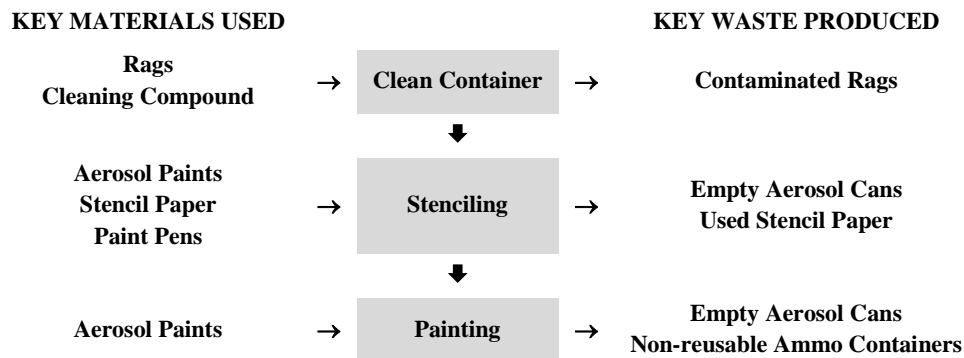
Work Center Processes

- Stenciling

Process Description: Stenciling

Work center personnel maintain and stencil ammunition containers using paint pens (“Uni-Paint” by Mitsubishi Pencil Company) or aerosol paints. Touch-up painting of the tops of light boxes is done as needed. Empty/used aerosol cans are turned into the Environmental Department for disposal.

Process Flow Diagram



Public Works - Air Conditioning Repair, Work Center PW-23

Location: Building #19

Operated by: NAS Corpus Christi Public Works

Work Center Description

Air conditioning repair maintains and repairs air conditioning units and refrigeration equipment. They also maintain air conditioning units that have cooling water towers (for large buildings).

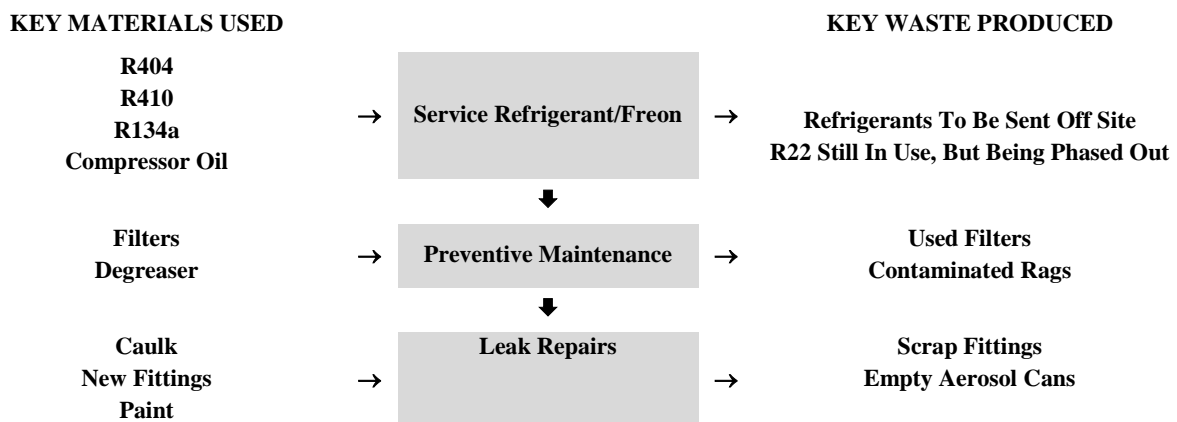
Work Center Processes

- Air conditioning and refrigeration repair

Process Description: A/C and Refrigeration Repair

Shop personnel maintain mainly window air conditioning units, industrial refrigerators, and some on NAS ice machines. Shop personnel also install new units when old units cannot be repaired. Air conditioning repair personnel remove Freon using a recovery unit from equipment prior to repair or scrapping. The Freon is either recharged into the equipment or sent off site through a certified vendor. Scraped refrigeration equipment is sent to Defense Reutilization and Marketing Office (DRMO), which provides disposition/disposal services of excess property received from the military services.

Process Flow Diagram



Public Works - Carpenter Shop, Work Center PW-01

Location: Building #19

Operated by: NAS Corpus Christi Public Works

Work Center Description

The carpenter shop does basic woodworking for NAS Corpus Christi. They also hang doors (interior and exterior). Locksets are no longer installed by the Carpenter Shop; they are now installed by the Locksmith.

Work Center Processes

- Carpentry

Process Description: Carpentry

Carpentry shop personnel mainly repair existing woodwork, such as furniture and stairs. In addition, this shop is responsible for hanging doors. Personnel use a dust collection system for woodworking equipment (e.g., band saw with, router, planer, table saw, lathe).

Process Flow Diagram

KEY MATERIALS USED

Wood
Glue
Hardware
Paint
Paint Thinner
Stain



KEY WASTE PRODUCED

Scrap Wood
Saw Dust
Contaminated Rags
Used Paint Brushes
Waste Paint Thinner

Public Works - Low Voltage Electrician (Work Center PW-21) and High Voltage Electrician (Work Center PW-22)

Location: Building #23

Operated by: NAS Corpus Christi Public Works

Work Center Description

Work center personnel maintain high voltage (i.e., overhead and underground power going to the buildings) and low voltage (i.e., all electrical components inside buildings) electrical equipment at NAS Corpus Christi.

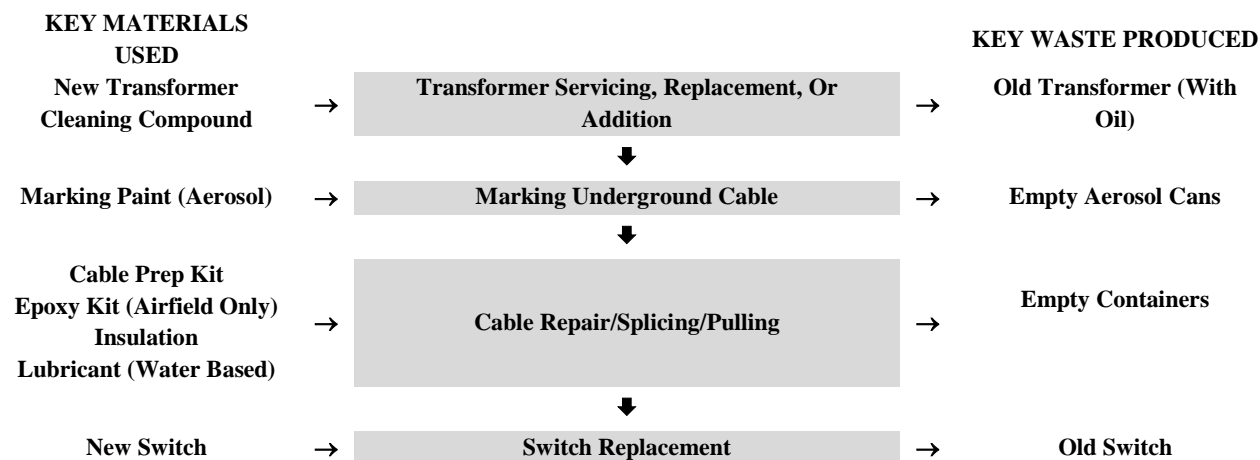
Work Center Processes

- High voltage maintenance
- Low voltage maintenance

Process Description: High Voltage Electrical Maintenance

When necessary high voltage electricians will install the necessary transformers and power lines for a new building or when a building needs more power. Approximately one transformer is replaced or added per year. All transformers on NAS have been tested and determined to have dielectric fluid free of polychlorinated biphenyl (PCB) contamination. The high voltage electricians also repair and maintain the current electrical power going to the buildings and airfields (for airfield lighting) on the air station. The majority of the work performed in this work center is post transformer. Personnel also maintain, repair, and replace electrical switches; there are both SF₆ gas switches and oil filled switches still in service.

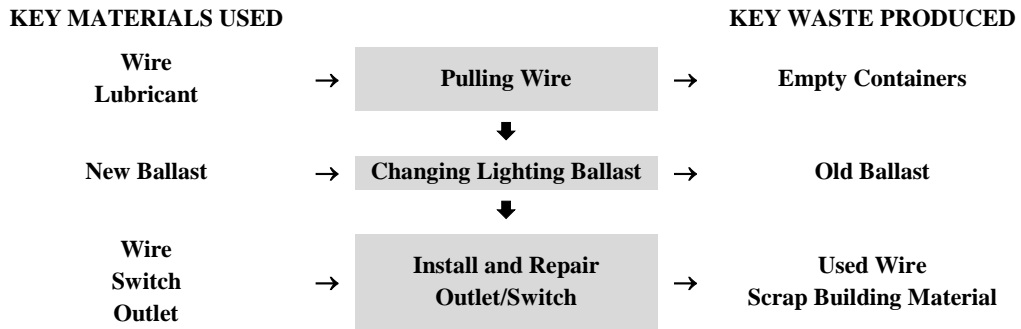
Process Flow Diagram



Process Description: Low Voltage Electrical Maintenance

The electricians maintain all electrical lines, fixtures, outlets, and switches inside the buildings and structures at the air station. Electricians change all light bulbs and the environmental department crushes them. Approximately 50-75 service calls are answered per week.

Process Flow Diagram



Public Works - Machining, Work Center PW-10

Location: Building #19

Operated by: NAS Corpus Christi Public Works

Work Center Description

Machining shop processes include metal machining and equipment repair at NAS Corpus Christi. There are currently no machinists employed at Public Works, however, equipment for machining is still present.

Work Center Processes

- Metal machining

Process Description: Metal Machining

Work center personnel perform machining services as needed, including repair motors, air compressors, pumps, and air handlers.

Process Flow Diagram

KEY MATERIALS USED

Replacement Parts
New Motors
Pumps
Compressors



Replacing Or Repairing Equipment



KEY WASTE PRODUCED

Spent Parts and Equipment
Scrap Metal
Contaminated Rags

Public Works - Painting, Work Center PW-02

Location: Building #19

Operated by: NAS Corpus Christi Public Works

Work Center Description

This work center provides all painting services at NAS Corpus Christi.

Work Center Processes

- Painting

Process Description: Painting

Shop personnel respond to service calls and perform various types of painting projects. Services include indoor painting (i.e., offices, ceiling tiles) and exterior painting (i.e., road lines, crosswalks, mechanical equipment). Painting of building exteriors is not performed in-house, and is contracted outside of NAS Corpus Christi.

Process Flow Diagram

KEY MATERIALS USED

Primer
Paint
Thinner
Solvent
Brushes
Rollers
Aerosol Paint

→

Interior/Exterior
Painting

→

KEY WASTE PRODUCED

Used Disposable Brushes and Rollers
Contaminated Rags
Empty Paint Cans
Waste Paint
Empty Aerosol Cans

Public Works - Plumbing and Pipefitting, Work Center PW-11

Location: Building #19

Operated by: NAS Corpus Christi Public Works

Work Center Description

Plumbing and pipefitting repairs plumbing inside buildings (e.g., leaking pipes and fixtures) and exterior piping (e.g., sewer and gas lines).

Work Center Processes

- Plumbing and pipefitting

Process Description: Plumbing and Pipefitting

This shop repairs interior plumbing, inside and outside of the wall, on an on needed basis on the air station. Most of the repairs involve leaking pipes and replacing worn fixtures (e.g., new toilet and faucets). Occasionally plumbing inside of a wall will need to be replaced, repaired, or a new fixture is installed (with the associated new plumbing).

The other major responsibility of this shop is to maintain and repair the underground pipes on the NAS (e.g., sewer, natural gas, water distribution).

Process Flow Diagram



Public Works – Recycling Center

Location: N/A

Operated by: NAS Corpus Christi Public Works

Work Center Description

The recycling center is no longer a centralized work center. The QRP that formerly operated at NAS Corpus Christi was discontinued. Currently, contractors pick up white paper, pallets, cardboard, and lead-acid batteries for recycling. Two cardboard bailers and an aluminum can crusher are still located onsite, but are not in use.

Public Works - Sheet Metal Shop, Work Center PW-13

Location: Building #19

Operated by: NAS Corpus Christi Public Works

Work Center Description

Personnel in the sheet metal shop primarily install prefabricated metal parts (i.e., ductwork, gutters, roof flashings), but occasionally fabricate parts. No personnel currently work in the sheet metal shop, although equipment and machinery for sheet metal work are still present at the work center.

Work Center Processes

- Sheet metal shop

Process Description: Sheet Metal Shop

Purchasing pre-fabricated pieces is more economical than custom fabrication by shop personnel, so the majority of installation of new ductwork, gutters, and roof flashing is done with pre-fabricated supplies. Shop personnel also repair existing ductwork and gutters as needed.

Process Flow Diagram



Public Works - Transportation, Work Center PW-60

Location: Building #20

Operated by: NAS Corpus Christi Public Works

Work Center Description

Work center personnel maintain Public Works' vehicles that are not included in the GSA program, including fire trucks, forklifts, heavy-duty machinery, and approximately 12 electric cars. Personnel also maintain the generators owned by NAS Corpus Christi. All major services and repairs beyond simple routine maintenance are performed by an off-site facility. GSA fleet vehicles (which account for approximately 85 percent of vehicles at NAS Corpus Christi) are sent off-site for service. Vehicle washing is no longer a task performed in this work center.

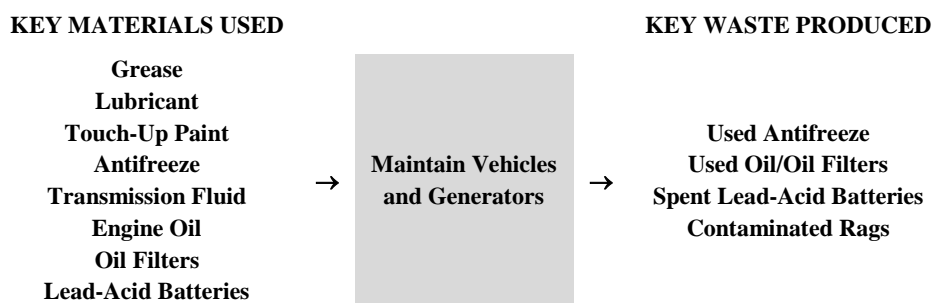
Work Center Processes

- Repair and maintain vehicles

Process Description: Repair/Maintain Vehicles

Personnel perform simple, routine maintenance of non-GSA vehicles and generators. This maintenance includes oil changes, limited fluid servicing, minor paint touch-up, and preventive maintenance. Used oil is collected for recycling. This work center has an anti-freeze recycling unit, but it is not used and antifreeze is collected for offsite recycling. Vehicle batteries are maintenance-free and are exchanged by the supplier at time of replacement.

Process Flow Diagram



USCG – Armory

Location: Hangar 41

Operated by: USCG

Work Center Description

Work center personnel maintain and services small arms and pyrotechnic launching devices for the USCG. Maintenance of small firearms is performed weekly and prior to firing.

Work Center Processes

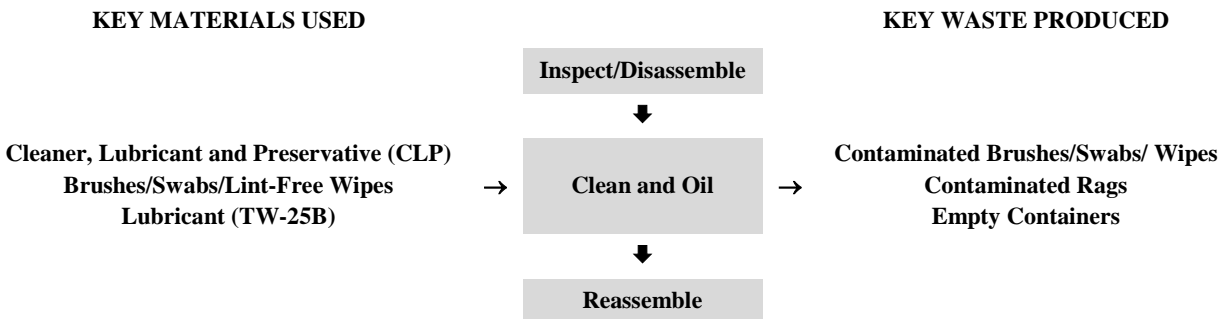
- Weapons cleaning

Process Description: Weapons Cleaning

Firearms are maintained at least weekly. Prior to maintenance, ammunition is removed and the bore and chamber are inspected for flaws and wear. The weapon is dismantled and cleaned with rags (approximately 3 per weapon), brushes, and swabs. Lubricant is applied to all metal parts of the weapon by either swab or aerosol spray. The weapon is reassembled and tested.

Cleaning and lubricating compounds are purchased directly from GSA.

Process Flow Diagram



U.S. Customs and Border Patrol (USCBP)

Location: Hangar 50

Operated by: Contractor (currently Lockheed Martin)

Work Center Description

This work center is operated by a contractor to USCBP. Work center personnel provide services required to keep eight P-3 aircraft and associated Ground Support Equipment (GSE) operational.

Work Center Processes

- P-3 aircraft maintenance
- GSE maintenance

Process Description: P-3 Aircraft Maintenance

USCBP performs several processes, as described below, on the P-3 aircraft as part of daily maintenance, pre-flight inspections, and required repairs. All preventative and scheduled maintenance is done at the USCBP facility in Waco, Texas.

Changing and servicing of fluids- most fluid changing and servicing is part of scheduled maintenance and is conducted at Waco, but this facility has the ability to change and replace all fluids in the P-3 aircraft. When fluids are removed from the aircraft all the fluid is captured and sent off site for disposal or recycling. Used oil filters are punctured and disposed of as waste. The new fluids are all tagged with bar codes in NAS Corpus Christi HAZMART. When fluids are being removed or added to an aircraft, drip pans and absorbent pads are placed in necessary locations to prevent spills on the Hangar deck (i.e. Floor). The waste caught in drip pans is poured into the corresponding waste storage drum and the drip pan is used again for the same fluid. The absorbent pads are placed into a separate disposal drum.

Fabrication- if a panel of an aircraft is damaged and a new panel cannot be purchased USCBP will fabricate the panel out of sheet metal. The majority of P-3 components are stock items and do not need to be fabricated. Because of this fabrication is rarely done at this USCBP facility (approximately once per year).

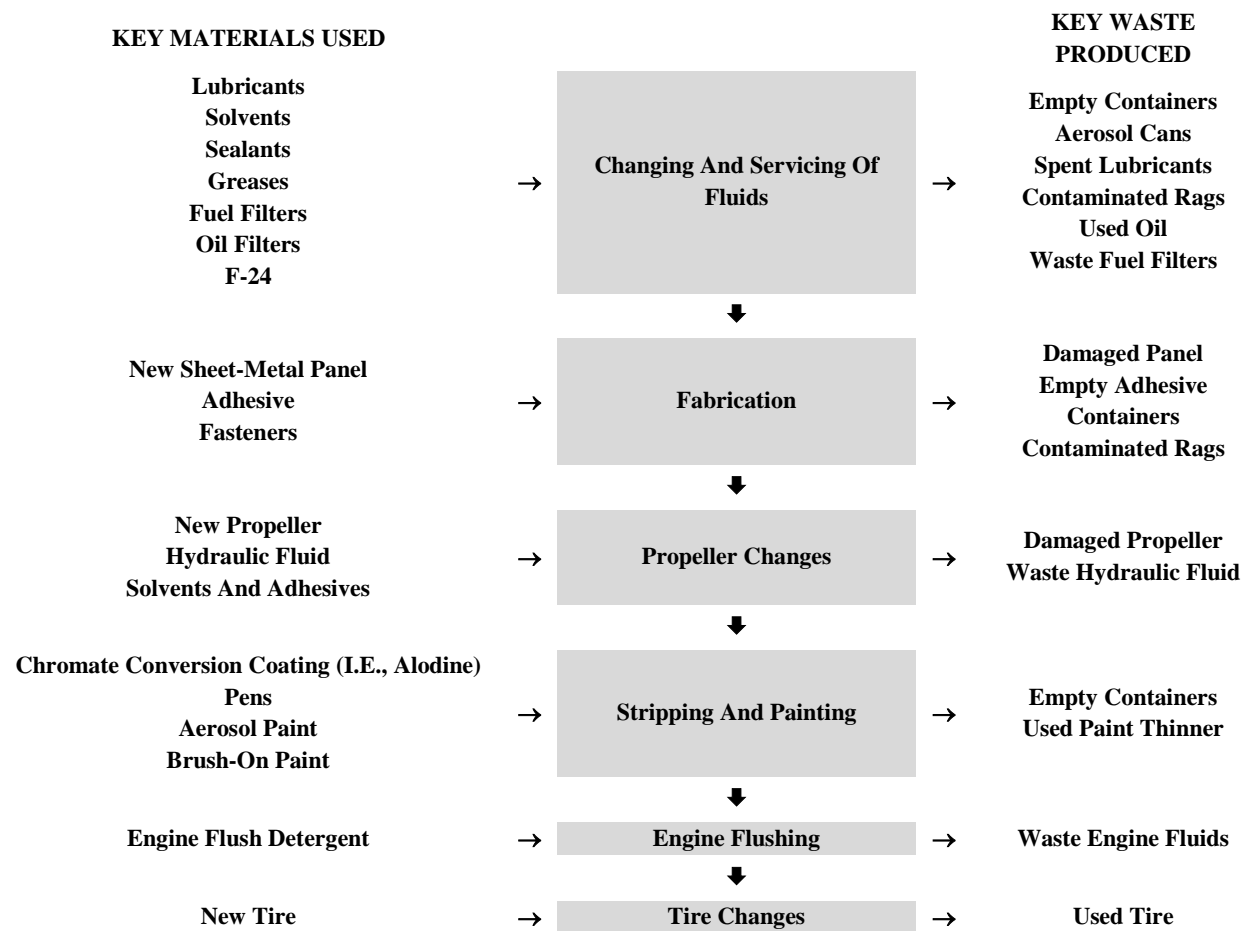
Propeller changes- on occasion USCBP will need to replace a propeller on a P-3 aircraft. When a propeller is changed, the hydraulic fluid is collected and sent off site and the propeller is either repaired and reused or recycled as scrap metal.

Stripping and painting- only small to medium stripping and painting applications occur at USCBP. Schedule corrosion control is done as part of preventive maintenance in Waco. If stripping and painting is required, USCBP will use Alodine pens to prepare the surface for increased paint adhesion. Painting is done with either touch up pens, brushes, or a high-volume HVLP. All painting and stripping is considered open surface coating because USCBP does not have a paint booth.

Engine flushing- this is done on an as needed basis, when a P-3 aircraft engine (there are four engines on each aircraft) is not running at the desired revolutions per minute (RPM). An engine flush is performed to clean the fuel lines and increase the RPM to the desired rate. The engine flush is conducted outside in the wash rack. An engine flush detergent (non-hazardous) is forced through the engine fuel lines using a pressure washing system. The waste fluid from this process is collected in 55-gal drums and shipped off site as a waste (sometimes as hazardous waste, sometimes as Class I waste).

Tire changes- the tires on the landing gear are part of the scheduled maintenance performed at Waco. Personnel at this work center can change a tire in an emergency.

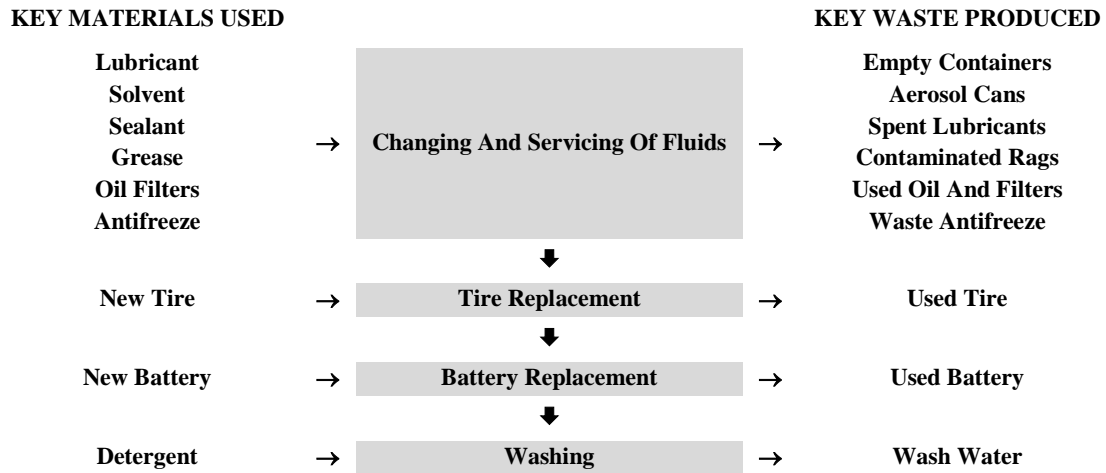
Process Flow Diagram



Process Description: GSE Maintenance

USCBP personnel maintain a fleet of GSE that is used exclusively for P-3 aircraft. The GSE vehicles require scheduled oil changes and antifreeze flushes. Antifreeze is recycled. The GSE are washed periodically in the aircraft wash rack. Occasionally the GSE require tire and battery changes; all tires and batteries are returned to DLA through environmental.

Process Flow Diagram



USCG – Aviation Survival Technician Shop

Location: Hangar 41

Operated by: USCG

Work Center Description

Shop personnel service, cleans, maintains, and repairs pilot’s flight gear and survival equipment involved with three Dolphin helicopters and three Falcon jets. Equipment includes 45 life jackets, 12 life rafts, 24 parachutes, rescue baskets, radios, oxygen carts, and 12 dewatering pumps. Flight gear and survival equipment on aircraft must be maintained and tested to verify the equipment will function properly when needed in emergencies.

Work Center Processes

- Flight/survival gear maintenance

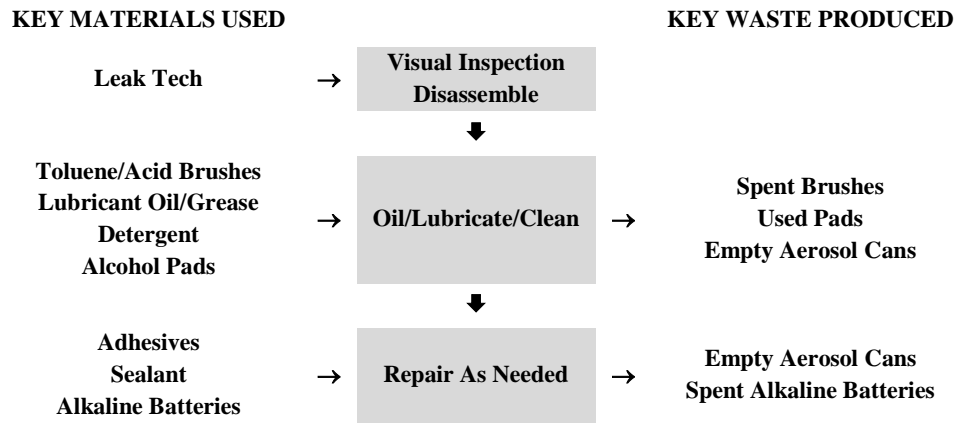
Process Description: Flight/Survival Gear Maintenance

Parachutes are inspected thoroughly for imperfections like rips or tears. The parachute is cleaned with a mild detergent to remove adhesives from the surface. Cords are waxed. If defects are found, they are repaired. Sensor plugs are cleaned with isopropyl alcohol. Service dates are also installed on the metal parts of the parachute.

Life rafts and life jackets are checked for leaks and are cleaned and repaired as needed. Alkaline batteries in life vest radios are replaced. Baskets and other survival and rescue equipment are cleaned and lubricated.

Once repaired or cleaned, each piece of equipment must be inspected as a quality assurance measure before being re-installed on the aircraft.

Process Flow Diagram



USCG - Avionics

Location: Hangar 41

Operated by: USCG

Work Center Description

Work center personnel are responsible for testing, repairing, troubleshooting, and maintaining avionics equipment including electrical and communications equipment. Shop personnel service three Falcon jets and three Dolphin helicopters. Corrosion control efforts are performed by members of the USCG “corrosion control team” comprised of workers from multiple shops.

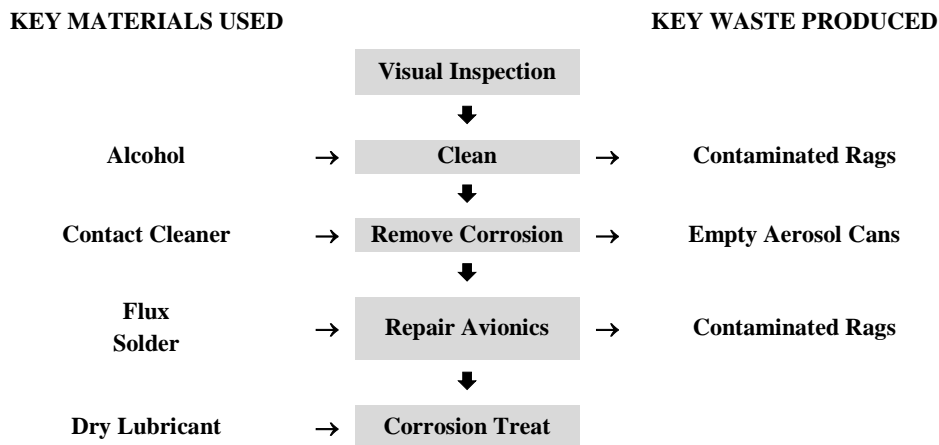
Work Center Process

- Avionics repair

Process Description: Avionics Repair

Visual inspection determines where the component malfunction is occurring. Personnel then repair the component. steps in this process include cleaning the component with alcohol, mechanical removal of corrosion, and re-painting by the corrosion control team. The repair and testing of avionics equipment is performed by shop personnel. NiCad battery change-outs are also done in this shop on both the helicopters and the jets.

Process Flow Diagram



USCG - Fixed Wing Shop

Location: Hangar 41

Operated by: USCG

Work Center Description

Work center personnel perform scheduled maintenance on three Falcon jets with two ATF3 engines each. Maintenance is conducted every 100 flight-hours. Maintenance includes aircraft washing, minor engine repairs, and the servicing of system hydraulics. Corrosion control efforts are performed by members of the USCG “corrosion control team” comprised of workers from multiple shops.

Work Center Processes

Aircraft washing

- Aircraft maintenance and repair
- Hydraulic servicing

Process Description: Aircraft Washing

The Falcon jets are flown at least twice daily on average and are washed after each flight, equating to 3-6 washes per day. The 50-foot by 100-foot wash rack is located outside and is not covered. It is the same one used by the helicopter shop. Aircraft soap is used to wash the aircraft with heated, de-mineralized water flowing through a high-pressure washer attachment. The spent wash water then flows through an oil water separator to the sanitary sewer.

Process Flow Diagram

KEY MATERIALS USED

Aircraft Soap

→

Wash Aircraft

→

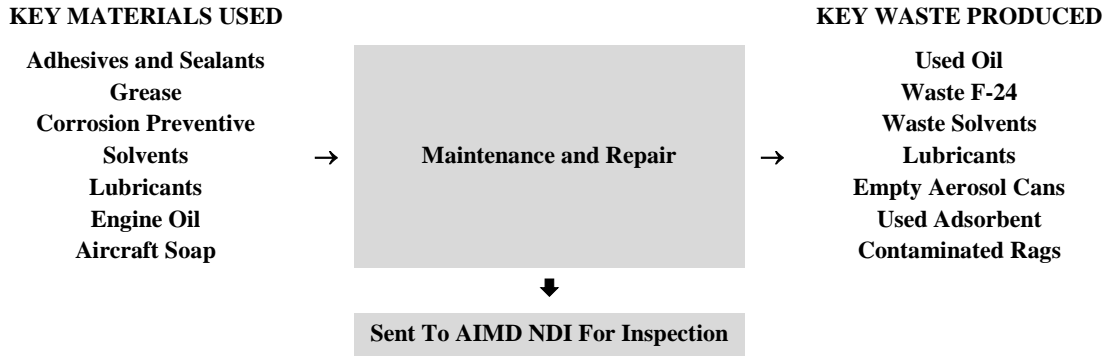
KEY WASTE PRODUCED

Tech Wipes
Wastewater

Process Description: Aircraft Maintenance and Repair

Work center personnel perform scheduled maintenance and minor repairs on three Falcon jets with two ATF3 engines each. Maintenance is conducted every 100-flight hours. Airframe repair and maintenance includes patchwork repair and composite work. The damaged or un-serviced part is cleaned and sanded, if necessary. Solvents used for maintenance include MEK, isopropyl alcohol, toluene, and EP921. Corrosion control is performed by the corrosion control team – either at fixed wing shop or at the metal shop. The repair is done and the part is sent to the NDI shop in Hangar 51, AIMD, for inspection and returned to the fixed wing shop for painting and/or release of repaired component.

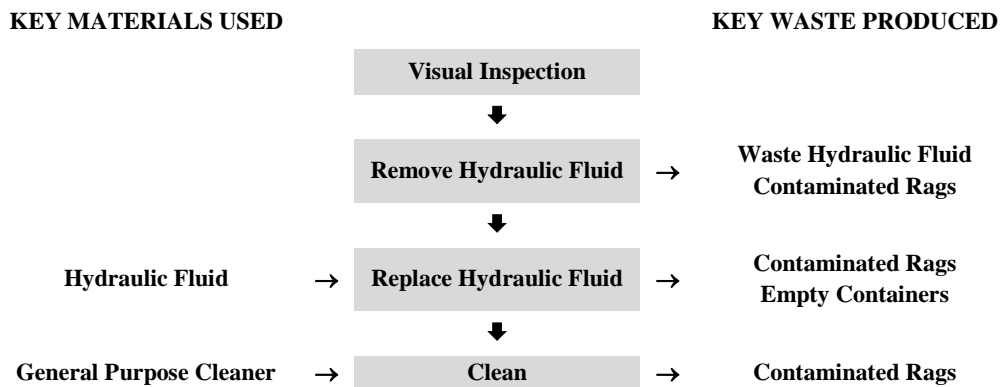
Process Flow Diagram



Process Description: Hydraulic Servicing

Work center personnel perform scheduled and unscheduled repair and maintenance of Falcon jet hydraulic systems. Parts are cleaned in a naphtha solvent circulation/degreasing vat.

Process Flow Diagram



USCG - Ground Support Equipment (GSE) Shop

Location: Hangar 41

Operated by: US USCG

Work Center Description

Work center personnel provide complete preventive maintenance (scheduled) and repair (unscheduled maintenance) of a wide range of aircraft GSE used by the USCG in support of the Dolphin helicopters and Falcon jet aircraft. GSE is maintained on a schedule to help prevent breakdowns and to extend the life of the equipment. Duties include fluid changes, parts cleaning and repairs, engine repair, and support equipment electrical repair. GSE includes mules, hydraulic generators, forklifts, carts, scrubbers, washers, etc. Corrosion control efforts are performed by members of the USCG “corrosion control team” comprised of workers from multiple shops. This shop has the only blast unit at the USCG facility.

Work Center Processes

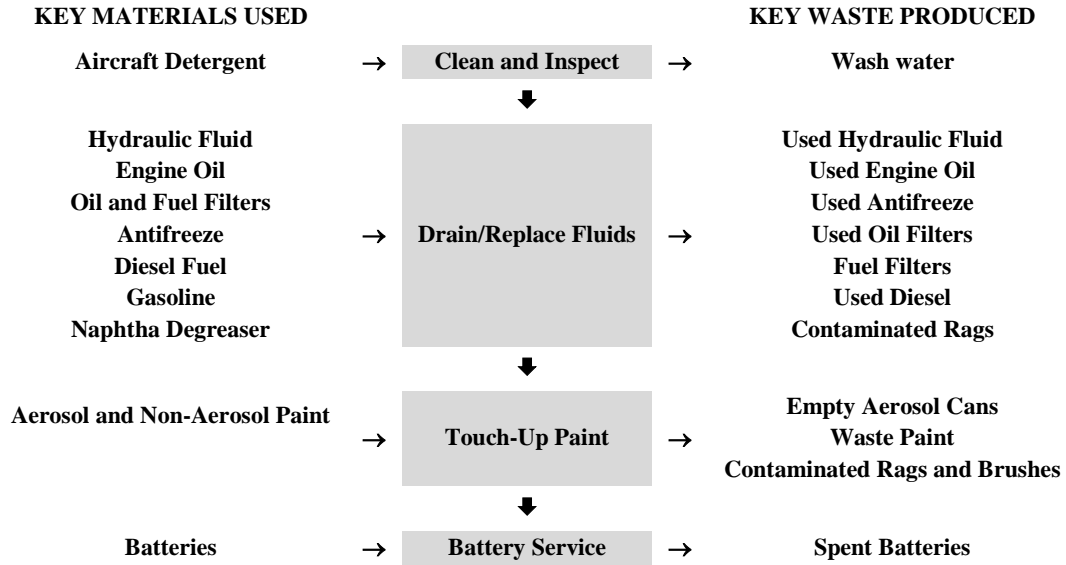
GSE repair and maintenance

Process Description: GSE Repair and Maintenance

Scheduled maintenance on GSE includes fluid and filter changes, part cleaning, and minimal touch-up painting. When the GSE come in for service, the equipment is washed or rinsed on a wash rack to remove grease and dirt. The GSE is then inspected for damage as well as wear and tear. Fluids that are in need of changing are drained from their appropriate reservoirs and contained in waste drums. Filters are changed and replaced and fluids refilled. If batteries are changed, spent batteries are collected for recycling and sent to the NAS Environmental Department along with used oil filters (where they are crushed and recycled). Touch-up painting is done with some aerosol paint or non-aerosol paint, as appropriate.

Unscheduled maintenance of GSE involves intermediate repair of broken down parts or equipment. Some fluids may require draining in order to remove a part, to facilitate repair, or to remove any chance of a fire hazard if using electric tools to do repair work. Brakes will be replaced on such equipment like tow motors. Components that need replacing are removed and new components are soldered on to the equipment. Greases and lubricants are applied to ease movement and prevent wear and tear of parts. Once the equipment or component has been repaired, a test is run to ensure proper function.

Process Flow Diagram



USCG - Helicopter Shop

Location: Hangar 41

Operated by: USCG

Work Center Description

Work center personnel perform scheduled maintenance on MH-65 helicopters with two engines each. Maintenance is conducted every 100 flight-hours. Maintenance includes aircraft washing, minor engine repairs, and the servicing of system hydraulics. This shop also uses a paint booth for helicopter painting. Corrosion control efforts are performed by members of the USCG “corrosion control team” comprised of workers from multiple shops.

Work Center Processes

Aircraft washing

- Aircraft maintenance and repair
- Hydraulic servicing

Process Description: Aircraft Washing

Helicopters are flown twice daily on average and are washed after each flight, equating to 3 to 6 washes per day. The 50-foot by 100-foot wash rack is located outside and is not covered. It is the same one used by the fixed wing shop. Aircraft soap is used to wash the helicopter with heated, de-mineralized water flowing through a high-pressure washer attachment. The wash water then flows through an oil/water separator to the sanitary sewer.

Process Flow Diagram

KEY MATERIALS USED

Aircraft Soap

→

Wash

→

KEY WASTE PRODUCED

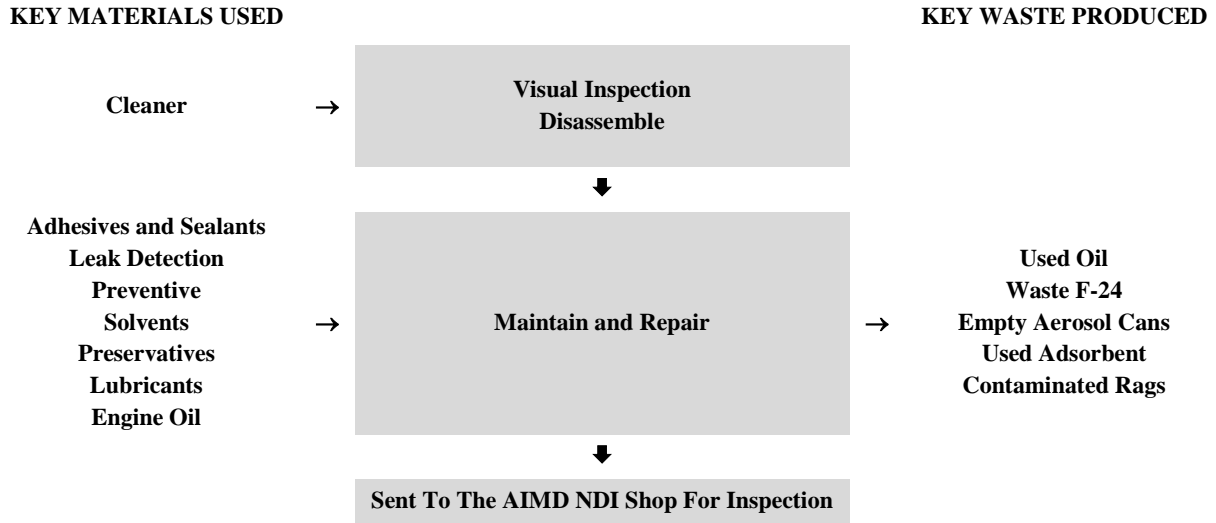
Wastewater
Tech Wipes

Process Description: Aircraft Maintenance and Repair

Work center personnel perform scheduled maintenance and minor repairs on three Dolphin helicopters with two engines each. Maintenance is conducted every 100 flight-hours. Airframe repair and maintenance includes patchwork repair and composite work.

The damaged or un-serviced part is cleaned and sanded, if necessary. The repair is done by the corrosion control team (at either the helicopter shop or the metal shop) and the part is sent to the NDI shop in Hangar 51, AIMD, for inspection and returned to the helicopter shop.

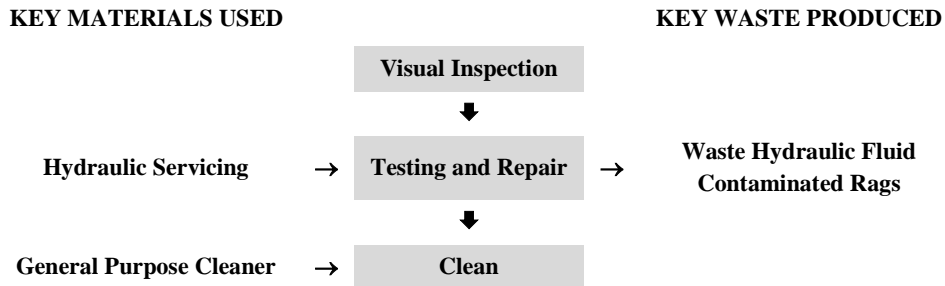
Process Flow Diagram



Process Description: Hydraulic Servicing

Perform scheduled and unscheduled maintenance of dolphin helicopter hydraulic systems.

Process Flow Diagram



USCG – Metal Shop

Location: Hangar 41

Operated by: USCG

Work Center Description

Work center personnel perform scheduled and unscheduled structural repairs and tire repairs on three HH65A (Dolphin helicopters) and three HU25A (Falcon turbofan jets). The USCG eliminated their NDI shop and now uses the NDI shop at AIMD, Hangar 51.

Work Center Processes

- Aircraft airframe repair
- Tire repairs

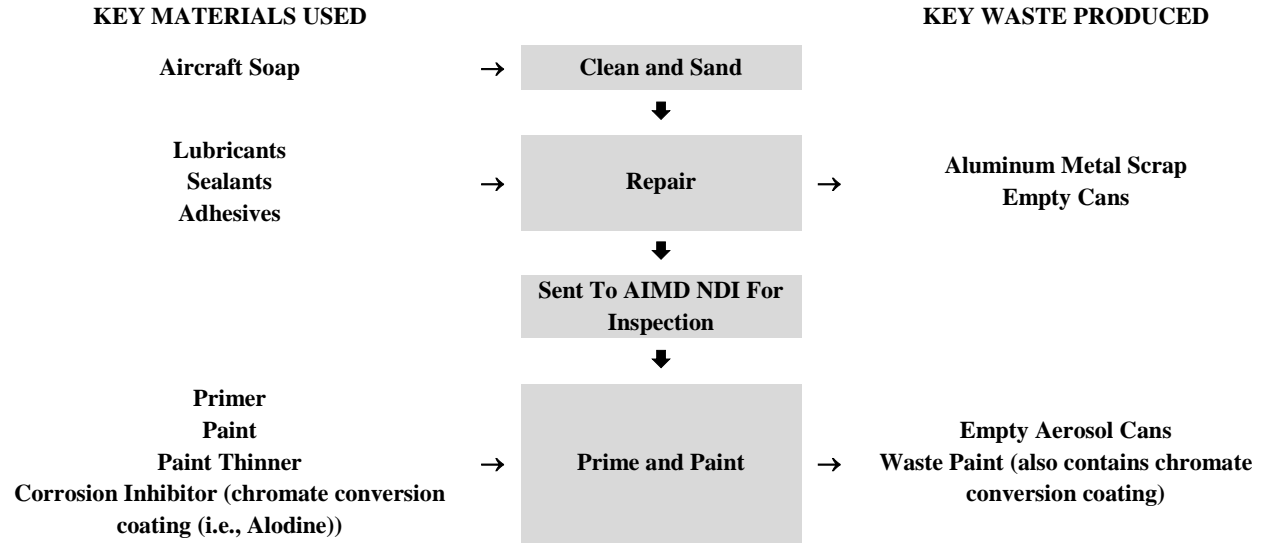
Process Description: Aircraft Airframe Repair

Perform scheduled and unscheduled airframe repair and maintenance, including fiberglass patchwork repair and composite work on Dolphin helicopters and Falcon jets. Scheduled maintenance is on an hourly, seven day, 30 day, 90 day, or 6 month basis.

Corrosion control efforts are performed by members of the USCG “corrosion control team” comprised of workers from multiple shops. Work is performed in the hangars holding the aircraft or at the metal shop. Parts are cleaned in a small solvent circulation/degreasing vat. Scrap metal is recycled.

The damaged part is cleaned and sanded, if necessary, using a dust-free sander. The repair is completed and the part is sent to the NDI shop at AIMD, Hangar 51, for inspection and returned to aircraft repair for painting. Painting is conducted in a paint booth using HVLP paint guns. HVLP equipment is cleaned in an inland technologies (EP 921) gun cleaner. Paints containing chromate were phased-out in 2012.

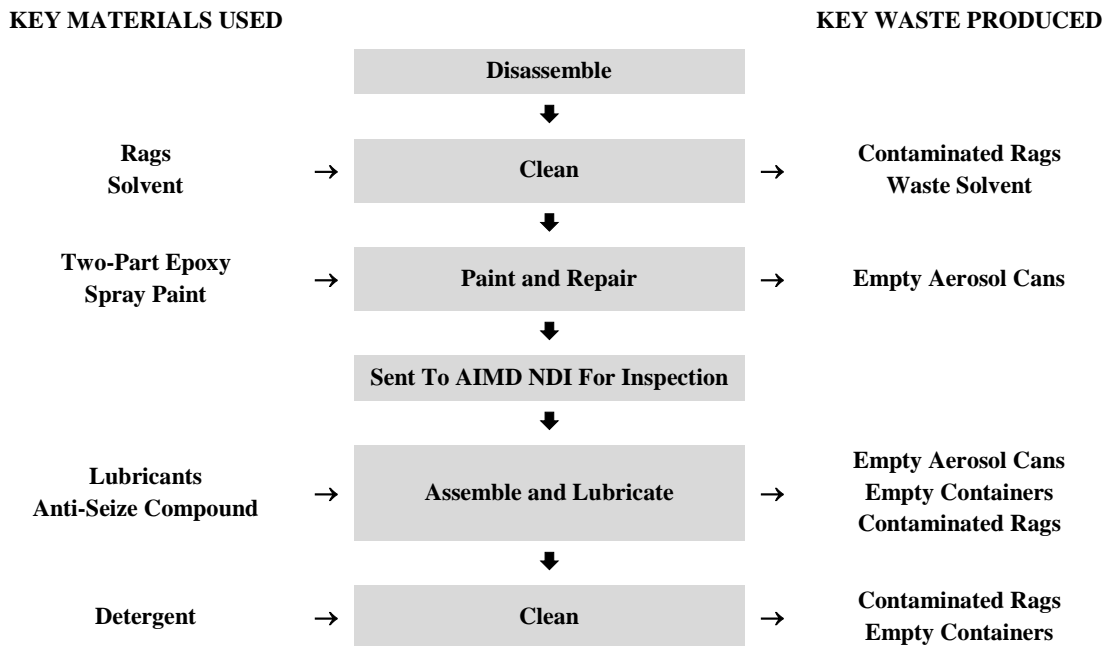
Process Flow Diagram



Process Description: Tire Repairs

The tire repair shop performs work on the wheel assemblies by cleaning, re-painting, building up, and installing new tires on a scheduled or unscheduled (as needed) maintenance routine. Wheels are sent to CCAD for stripping, if needed, and then sent to the NDI shop in Hangar 51 (AIMD) for inspection. The wheels are then sent back to the USCG metal shop for repair and/or re-painting and the buildup of the new tire. The new tires are then installed. Hydraulic line servicing and repair is now done in the individual helicopter shop and the fixed wing/Falcon shop.

Process Flow Diagram



Security Department – K-9 Training

Location: Building #104

Operated by: NAS Corpus Christi Security Department

Work Center Description

This work center trains the K-9 unit of the police department for explosive detection. The K-9 unit dogs are housed in a kennel in a separate facility.

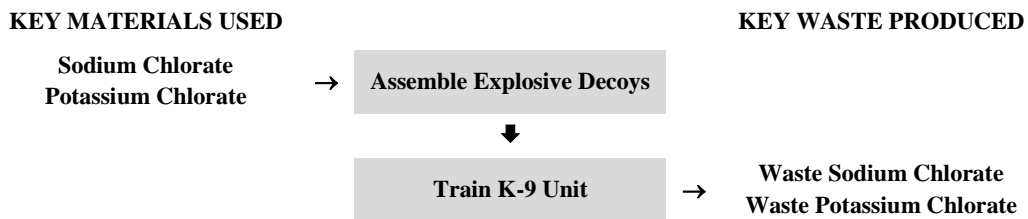
Work Center Processes

- K-9 explosives training
- Weapons cleaning

Process Description: K-9 Training

Explosive training is conducted with the use of hazardous materials (sodium chlorate, potassium chlorate). HAZMART also issued sodium hydroxide to this facility, but personnel are unaware of the process for which this material is used. Small amounts of the explosive training chemicals are used, and waste is turned into the hazardous waste division. In November 2013, a satellite accumulation point for sodium hydroxide and potassium hydroxide was established.

Process Flow Diagram

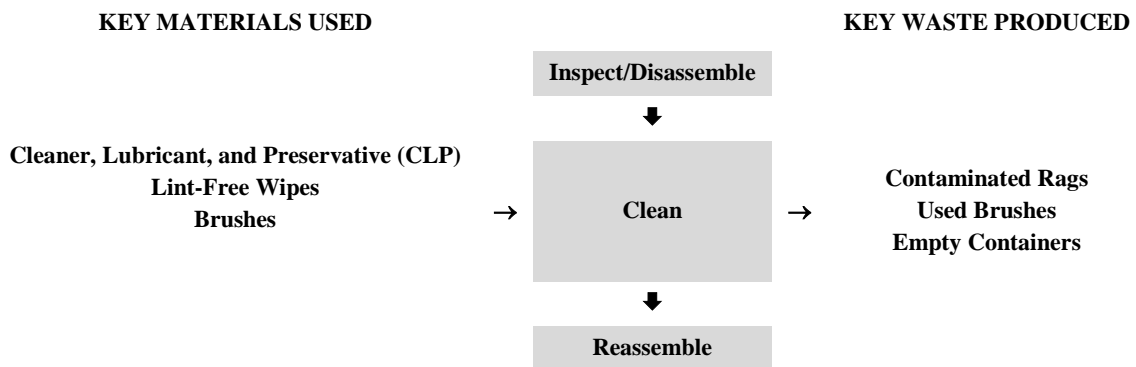


Process Description: Weapons Cleaning

Work center personnel maintain and services M-14, .38 caliber weapons, 9 mm weapons, and 40 mm cannons for NAS security forces. The weapons are cleaned manually using small quantities of break free, brushes and lint-free cloth wipes (per technical order). The rate of servicing is typically 30-45 weapons per week. Approximately 3 to 5 gallons of used wipes are generated each month.

The work center is also responsible for storing weapons for tenants at the facility. These tenants include HM-15 and marine reserves. The tenants maintain their own weapons.

Process Flow Diagram



T-34 Avionics Shop, Work Center 220

Location: Hanger 56

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel are responsible for testing, repairing, troubleshooting, and maintaining avionics equipment for the T-34 aircraft including electronics, electrical wiring and components, communications equipment, and batteries.

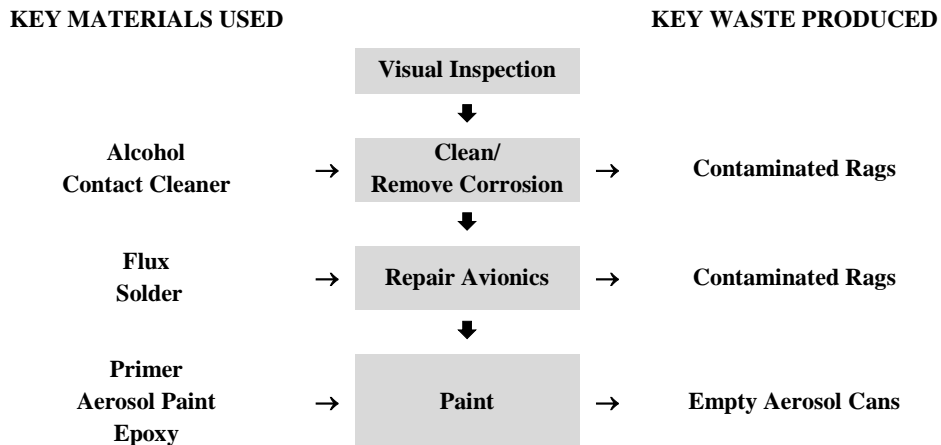
Work Center Process

- Avionics repair

Process Description: Avionics Repair

Visual inspection determines where the component malfunction is occurring. Personnel then clean the area with alcohol, mechanically remove corrosion, repair and/or replace the component by soldering, and finally repaint, if needed.

Process Flow Diagram



T-34 Unscheduled Maintenance Shop, Work Center 110

Location: Hanger 56

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel perform organizational level unscheduled maintenance and repairs on the over 100 T-34 aircraft for the VT-27 and VT-28 squadrons on an as needed basis. Unscheduled maintenance includes complete engine changes, propeller repairs and change-outs, airframe surface repairs, flight control removal, replacement, and adjustments, engine run-ups, and service repairs to taxi aircraft.

Work Center Processes

- T-34 unscheduled maintenance

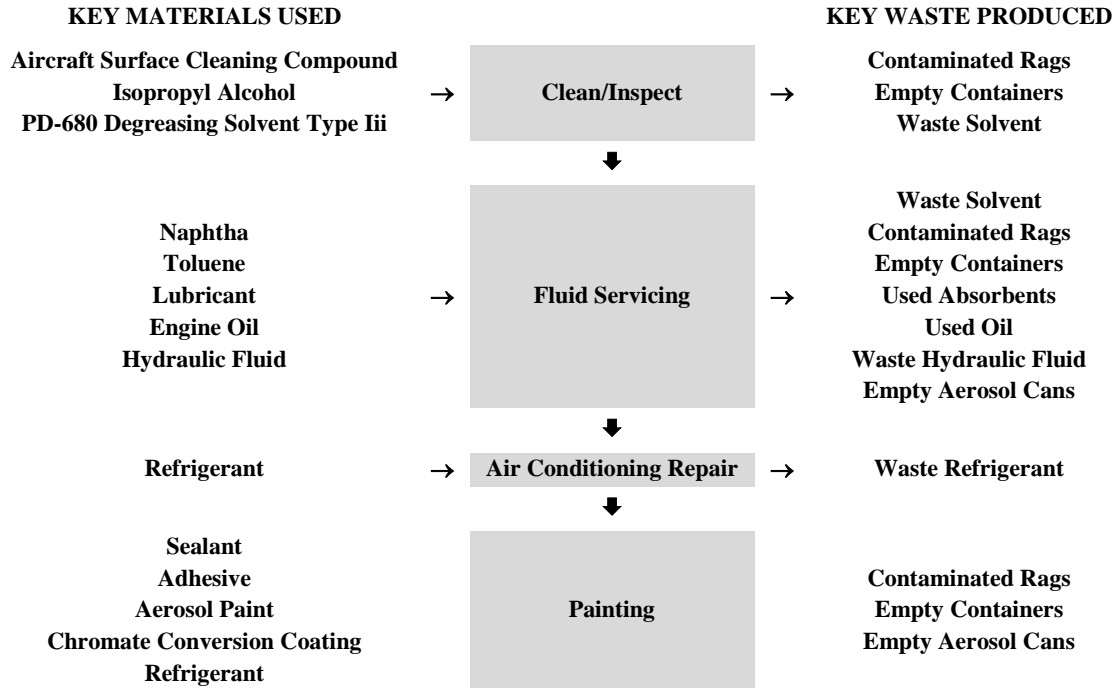
Process Description: T-34 Unscheduled Maintenance

The T-34 unscheduled maintenance shop performs as needed repair of the T-34 aircraft. The shop must first drain fluids, such as oil or hydraulic fluid, and then clean and inspect the damaged part. Either isopropyl alcohol or a PD-680 Degreasing Solvent Type III parts washer is used for engine degreasing. An aircraft cleaning compound is used for all-purpose cleaning.

When fluids are removed from the aircraft, the fluid is collected and sent off site for disposal or recycling. Used oil filters are punctured and drained; empty oil filters are recycled as scrap metal and used oil is recycled. When fluids are being removed or added to an aircraft, drip pans and absorbent pads are placed in necessary locations to prevent spills. The waste caught in drip pans is poured into the corresponding waste storage drum and the drip pan is used again for the same fluid. The absorbent pads are placed into a separate disposal drum.

If the cooling system requires repair, the refrigerant is captured with a recovery unit. Touch-up painting is done with a chromate conversion coating (i.e., Alodine) and aerosol paint.

Process Flow Diagram



T-34 Scheduled Maintenance Shop, Work Center 140

Location: Hanger 56

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel perform scheduled maintenance and minor repairs on the over 100 T-34 aircraft for the VT-27 and VT-28 squadrons. Inspection and maintenance is conducted every 100-flight hours on airframes and engine power plants systems and to-be-determined on the adjustments to flight controls. Typical maintenance includes cleaning, adjusting, testing, and lubrication of each part of the engine.

Work Center Processes

- T-34 scheduled maintenance

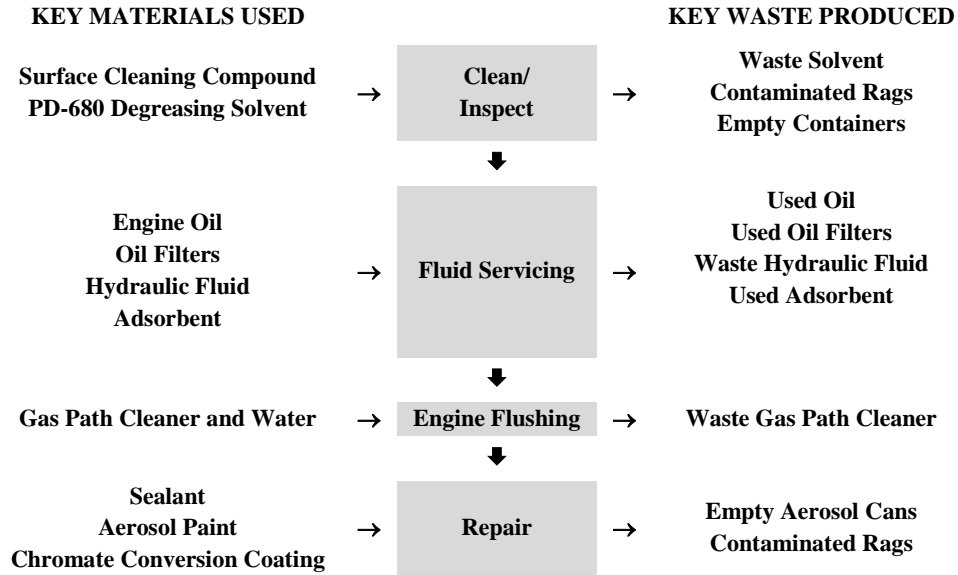
Process Description: T-34 Scheduled Maintenance

The T-34 scheduled maintenance performs periodic and scheduled maintenance and inspections on the T-34 engines. The shop also changes oil and filters on a scheduled basis. The hydraulic fluid is tested using a particle counter in Hangar 51, Navy AIMD. Typically, there are several levels of inspection performed at different operating hour intervals. These inspections will often involve the changing of fluids and filters and performing lubrications. Occasionally parts are removed, inspected, and reinstalled. When maintenance requires the removal and cleaning of parts, an aqueous parts washer is used which is located in Hangar 55, component repair shop.

Changing and servicing of fluids- fluids removed from the aircraft are collected and sent off site for disposal or recycling. Used oil filters are punctured and drained, and the empty filter recycled as scrap metal. Used oil is collected for recycling. When fluids are being removed or added to an aircraft, drip pans and absorbent pads are placed in necessary locations to prevent spills. The waste caught in drip pans is poured into the corresponding waste storage drum and the drip pan is used again for the same fluid. The absorbent pads are placed into a separate disposal drum.

Engine flushing- this is done on an as needed basis, when a T-34 aircraft engine is not running at the desired revolutions per minute (RPM). An engine flush is performed to clean the fuel lines and increase the RPM to the desired rate. An engine flush detergent (non-hazardous) is forced through the engine fuel lines using a pressure washing system. The waste fluid from this process is captured and shipped off site as a non-RCRA waste.

Process Flow Diagram



T-34 Tool Room, Work Center 50

Location: Hanger 56

Operated by: Contractor (currently L-3 Vertex)

Work Center Description

Shop personnel maintain, tracks, and issues tools (pneumatic tools, rivet guns, hand tools, specialty tools) and hazardous materials for Hangar 56 (T-34) work centers.

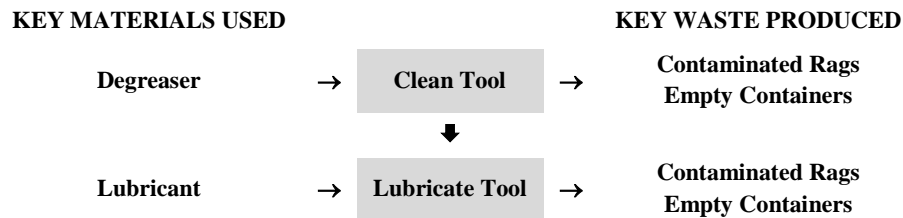
Work Center Processes

Clean/lubricate tools

Process Description: Clean/Lubricate Tools

Tools such as pneumatic tools, rivet guns, hand tools, and specialty tools are cleaned and lubricated to keep them in good working condition and ready for issue.

Process Flow Diagram



T-44 Avionics Shop, Work Center 221

Location: Hangar 57

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel are responsible for testing, repairing, troubleshooting, and maintaining avionics equipment for the T-44 aircraft including electronics, electrical wiring and components, communications equipment, and batteries.

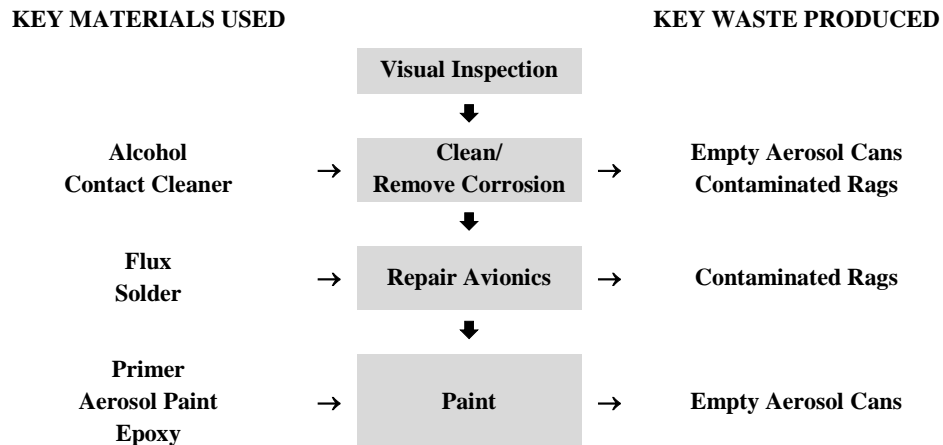
Work Center Process

- T-44 avionics repair

Process Description: Avionics Repair

Visual inspection determines where the component malfunction is occurring. Personnel then clean the area with alcohol, mechanically remove corrosion, repair and/or replace the component by soldering, and finally repaint, if needed.

Process Flow Diagram



T-44 Unscheduled Maintenance Shop, Work Center 111

Location: Hangar 57

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel perform organizational level unscheduled maintenance and repairs on the 54 T-44 aircraft for the VT-31 squadrons on an as needed basis. Unscheduled maintenance includes complete engine changes, propeller repairs and change-outs, airframe surface repairs, flight control removal, replacement, and adjustments, engine run-ups, and service repairs to taxi aircraft.

Work Center Processes

- T-44 unscheduled maintenance

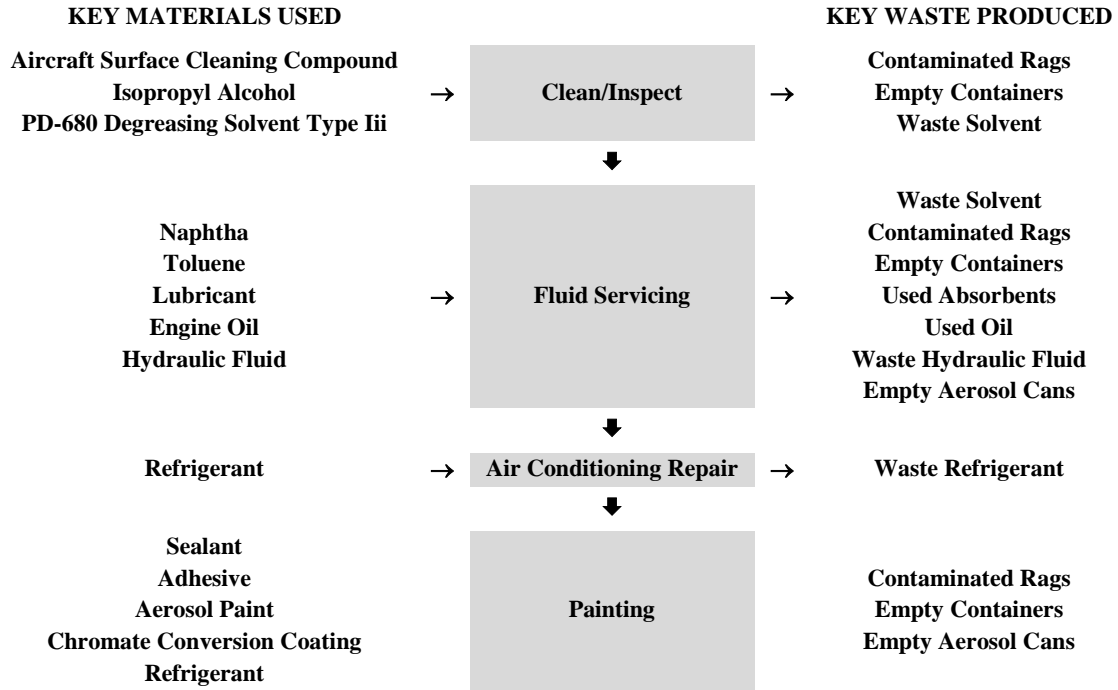
Process Description: T-44 Unscheduled Maintenance

The T-44 unscheduled maintenance shop performs as needed repair of the T-44 aircraft. The shop must first drain fluids such as oil or hydraulic fluid and then clean and inspect the damaged part. Cleaning is done either with isopropyl alcohol or with the PD-680 Degreasing Solvent parts washer for engine degreasing or with aircraft cleaning compound for overall washing. If the cooling system requires repair, the Freon/refrigerant is drained and recovered with an air recovery unit.

When fluids are removed from the aircraft, the fluid is captured and sent off site for disposal or recycling. If a filter is removed (e.g. oil filter) it is punctured and the drained oil sent for recycle and the filter is sent for scrap metal recycle. When fluids are being removed or added to an aircraft, drip pans and absorbent pads are placed in necessary locations to prevent spills. The waste caught in drip pans is poured into the corresponding waste storage drum and the drip pan is used again for the same fluid. The absorbent pads are placed into a separate disposal drum.

If the cooling system requires repair, the refrigerant is captured with a recovery unit. Touch-up painting is done with a chromate conversion coating (i.e., Alodine) and aerosol paint.

Process Flow Diagram



T-44 Scheduled Maintenance Shop, Work Center 141

Location: Hanger 57

Operated by: Contractor (currently BAE)

Work Center Description

Work center personnel perform scheduled maintenance and minor repairs on 54 T-44 aircraft for the VT-31 squadron. Inspection and maintenance is conducted every 100-flight hours on airframes and engine power plants systems and to-be-determined on the adjustments to flight controls. Typical maintenance includes cleaning, adjusting, testing, and lubrication of each part of the engine.

Work Center Processes

- T-44 scheduled maintenance

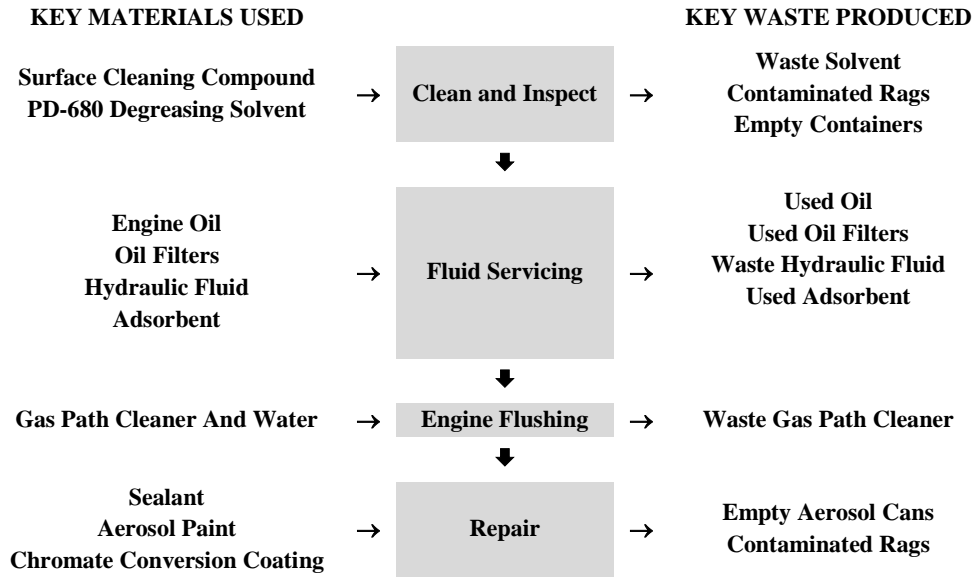
Process Description: T-44 Scheduled Maintenance

The T-44 scheduled maintenance shop performs periodic and scheduled maintenance and inspections on the T-44 engines. The shop also changes oil and filters on a scheduled basis. The hydraulic fluid is tested using a particle counter at Hangar 51, Navy AIMD. Typically, there are several levels of inspection performed at different operating hour intervals. These inspections will often involve the changing of fluids and filters and performing lubrications. Occasionally parts are removed, inspected, and reinstalled. When maintenance requires the removal and cleaning of parts, they are sent to the component overhaul shop in Hangar 55, which has an aqueous-based parts washer.

Changing and servicing of fluids- when fluids are removed from the aircraft, all the fluid is captured and sent off site for disposal or recycling. Used oil filters are punctured and drained; empty oil filters are recycled as scrap metal and used oil is recycled. When fluids are being removed or added to an aircraft, drip pans and absorbent pads are placed in necessary locations to prevent spills. The waste caught in drip pans is poured into the corresponding waste storage drum and the drip pan is used again for the same fluid. The absorbent pads are placed into a separate disposal drum.

Engine flushing- this is done on an as needed basis, when a T-44 aircraft engine is not running at the desired revolutions per minute (RPM). An engine flush is performed to clean the fuel lines and increase the RPM to the desired rate. An engine flush detergent (non-hazardous) is forced through the engine fuel lines using a pressure washing system. The waste fluid from this process is canned into 55-gal drums and shipped off site as a non-RCRA, dot regulated waste.

Process Flow Diagram



Wash Crew Shop, Work Center 320

Location: Hanger 56/57

Operated by: Contractor (currently BAE)

Work Center Description

Shop personnel wash T-34 and T-44 aircraft on a scheduled basis; every 14 days. Wash racks are located at Hangars 56 and 57. Personnel also re-lubricate aircraft parts after washing.

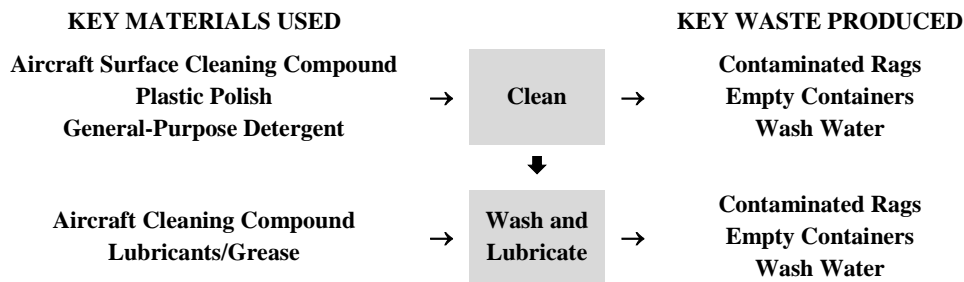
Work Center Processes

- Aircraft washing

Process Description: Aircraft Washing

T-34 aircraft are washed at the Hangar 56-wash rack and T-44 aircraft are washed at Hangar 57 wash rack. The aircraft are washed every 14 days with aircraft surface cleaner soap and water. The wash rack at Hangar 57 uses a high-pressure wash nozzle. The wash rack at Hangar 56 uses a bucket of soap and water until repairs are made to the airlines. Canopies are cleaned with glass cleaner and hinges, door panels, and props are greased and lubricated after washing. The wash water drains through an oil/water separator and then to the to the domestic wastewater treatment plant.

Process Flow Diagram



APPENDIX D. POINTS OF CONTACT

Table 0-1: P2 Supporting Data POCs

Information Requested	Available (Yes/No)	POC(s)	POC Phone Number
Previous P2 Plan	Yes	John Phillips	361-961-5356
Annual Summary Of P2 Projects	No	John Phillips	361-961-5356
Solid Waste Management Plan And Recycling Plan	No	John Phillips	361-961-5356
Solid Waste Generation Data	Yes	John Phillips	361-961-5356
Hazardous Materials Management Plan	No	Amber Kunselman, Travis Baran	361-961-3670
Hazardous Waste Management Plan	Yes	Amber Kunselman, Travis Baran	361-961-3670
Biannual And Annual Hazardous Waste Reports	Yes	Amber Kunselman, Travis Baran	361-961-3670
Hazardous Waste Generation	Yes	Amber Kunselman, Travis Baran	361-961-3670
Pesticides Management Plan	Yes	Nancy Mitton	361-961-5354
Pesticide Application Rates	No	Nancy Mitton	361-961-5354
Ozone Depleting Substances Inventory	No	Dilip Shaw	361-961-5365
Air Emissions Inventory	Yes	Dilip Shaw	361-961-5365
Consolidated Hazardous Material Reutilization And Inventory Management Program (CHRIMP) Data	Yes	Dilip Shaw	361-961-5365
Authorized Use List (AUL)	Yes	Mariana Bocanegra	361-961-3212
Hazardous Material Usage	Yes	Mariana Bocanegra	361-961-3212
EMS Aspect List	No	Ross Ybarra	361-961-2170
Energy Studies	Yes	Roberto Reece	361-961-2152

Table 0-2: Work Center POCs

Work Center	Work Center Description	POC	POC Phone Number
Aviation Support	Air Operations/Flight Support	Bevan Benson	361-961-4216 or 361-961-3924
CCAD	Recycling Program	Derek Borne	361-961-6943
MWR	Bowling Alley	Leo Curiel	361-961-3805
	Golf Course	J. Zercher	
Navy Supply	Fuel Branch	Javier Portillo	361-961-3265
Naval Hospital	Environmental Program	Ricky Foust	361-961-3215
Public Works	Plumbing and Pipefitting Air Conditioning Repair	Rick Wilkey	361-961-4372
	Carpenter Shop Machining Painting Sheet Metal Shop	Tony Moreno	361-961-4372
	Low/High Voltage Electrician	Sam Simmons	361-961-3341
	Transportation	Mondo	361-961-2367
USCG	All Shops	Jammie Fisher	361-939-6330
USCBP	All Shops	Chuck Burns	361-698-6903
	All Shops	Tom Matthews	361-549-2261
Doss Aviation	Fuel Branch	Frank Ewald	361-961-3372
L-3 Vertex	AIMD Hangar 51 Ground Support Equipment	Jorge Pena	361-961-2060
	AIMD	Robert Brossig	361-961-2060
	Hangar 57 Ground Support Equipment	Mr. D. Montalvo	361-939-4200
	C-12 Maintenance	Paul Wegner	361-937-4515 or 361-961-4515
	Limited Avionics	William Stecker	361-937-7980
	Component Overhaul and Non- Destructive Inspection	Billy Rhodes	361-961-5644
	Conditional Maintenance	Ron Hennie	361-931-4142
BAE	T-34 Unscheduled Maintenance	Gilbert Mendez	361-961-4522
	T-34 Scheduled Maintenance	Bill McDonald	361-961-4116
	T-34 Avionics	Gary Brown	361-961-4168
	T-44 Scheduled Maintenance	B. Johnson	361-961-4251
	T-44 Unscheduled Maintenance	Mark Stewart	361-961-4251
	T-44 Avionics	Alvin Villarreal	361-961-4158
	Aviation Equipment	Debbie Ryder	361-961-4244
	Corrosion Control	D. Whitehead	361-961-4205
	T-34 Tool Room	J. D. Allen	
AIMD Battery Maintenance	Mr. Ron Rincon	361-961-2374	

APPENDIX E. WORK CENTER P2 QUESTIONNAIRE

NAS Corpus Christi Work Center Pollution Prevention (P2) Questionnaire

Background Information

1. Work Center: _____
2. POC name: _____ Phone Number: _____
3. Is this a new work center? Yes No
4. Are there any new processes identified during the shop survey? Yes No N/A
*If yes, describe.*_____
5. Have there been changes made to this work center since the last P2 Plan Update? Yes No
*If yes, describe.*_____
6. Is there a MILSPEC or technical publication associated with shop processes? Yes No
*If yes, describe.*_____
7. Reviewed process flow diagram with work center personnel? Yes No N/A
Mark any changes on the process flow diagrams.

Housekeeping

8. Are floor drains connected to stormwater or wastewater? Yes No N/A
 9. Is housekeeping adequate? Yes No
Note staining, absorbent pads under equipment, leaking equipment, etc.
-

10. Do all hazardous materials have HSMS Barcodes? Yes No

Training

11. Training provided to work center personnel:
HAZMAT Yes No *How often:* _____
Waste disposal Yes No *How often:* _____
Recycling Yes No *How often:* _____
Other Yes No *Describe.* _____
12. Who provides the training? _____

P2 Goals and Awareness

13. Are work center personnel familiar with the P2 goals for this shop? Yes No
14. Is the P2 Plan available in the work center? Yes No

APPENDIX F. STATUS OF PREVIOUS P2 INITIATIVES

Table 0-1: Status of Recommended P2 Opportunities Identified in Previous P2 Plan Updates

Description of P2 Recommendation	Work Center	Year Identified	Status in 2008 ¹¹	Status in 2013 ¹²
Use an inventory control system such as the Hazardous Inventory Control System (HICS) until the Hazardous Material Control and Management (HMC&M) module is available to the entire Navy.	Supply	1993	Recommendation implemented. HSMS software is in use for this purpose currently.	HSMS is still in use for all Navy operations except for the Naval Health Clinic.
Where feasible, use MIL-C-85570 Type II detergent with water rinsing in lieu of solvent wiping prior to painting.	L3-Vertex-121(Corrosion Control)	1993	Recommendation implemented.	Recommendation implemented.
Replace Freon 113 and trichloroethane with PD-680 for applications other than ultrasonic filter cleaning and hydraulic fluid patch testing.	L3-Vertex-110 L3-Vertex-111	1993	Recommendation implemented. PD-680 Type III is used.	PD-680 Type III is used.
Utilize bulk preservative materials dispensed from a pump spray bottle.	Facility-wide	1993	Undetermined.	Implemented at the USCG facilities.
Replace 1,1,1 Trichloroethane or Freon with isopropyl alcohol to clean electrical components. Crush and recycle oil filters.	CG-Avionics AIMD-610	1993	Recommendation implemented.	Recommendation implemented.
Replace MEK, LPS Laboratories degreaser, CFC 113, or methylene chloride with PF Degreaser.	L3-Vertex-140 L3-Vertex-141 PW- Electricians	1993	Indeterminate, but only solvents used are isopropyl alcohol and PD-680.	Undetermined.
Implement the use of HVLP paint spray equipment to increase paint transfer efficiency.	PW-Transportation USCBP AIMD-51B	1993	Still in use at USCBP and AIMD51B. Limited painting performed at PW Transportation.	Recommendation implemented.
Replace aerosol painting with brush applications where feasible.	L3-Vertex-110 L3-Vertex-111	1993	Recommendation not implemented.	Recommendation not implemented

¹¹ As part of the 2008 update, work centers were reviewed to determine if these P2 practices have been implemented.

¹² PHE reviewed the 1993 and 2008 P2 recommendations with work center personnel to determine the status the initiatives as of 2013.

Description of P2 Recommendation	Work Center	Year Identified	Status in 200811	Status in 201312
	L3-Vertex-121 (Corrosion Control) PW-Painting AMSA-7 L3-Vertex-900 (GSE)			
Collect, clean, and reuse contaminated rags.	Facility-wide	1993	Shop towel laundering program implemented for most shops, but needs to be implemented at USCBP and Public Works.	The shop towel laundering program has been discontinued.
Collect and recycle used antifreeze.	Facility-wide	1993	Antifreeze is recycled off-site.	Anti-freeze recycling units are used in some work centers.
Collect, drain, crush, and recycle metal oil filters.	Facility-wide	1993	Recommendation implemented.	Recommendation implemented.
Brief/Train L3 Shop personnel on proper equipment and use	Multiple L3 Shops	2008	N/A	Undetermined.
Maintain and/or replace damaged Navy-owned equipment	Multiple L3 Shops	2008	N/A	Recommendation not implemented.
Develop HazMat awareness plan and pamphlet	Facility-wide	2008	N/A	Recommendation not implemented.
Switch to a one coat painting system (UNICOAT)	L3 and USCG Corrosion Control	2008	N/A	Recommendation not implemented. The UNICOAT system does not meet the military specifications for corrosion control.
Collect fluorescent tubes intact for recycle	Facility-wide	2008	N/A	Contractor is able to recycle crushed fluorescent tubes.
Initiate a shop towel laundering program for those shops not currently participating in one	USCBP Public Works Air Operations Mobile Inshore Undersea	2008	N/A	The shop towel-laundrying program has been discontinued.

Description of P2 Recommendation	Work Center	Year Identified	Status in 200811	Status in 201312
	Warfare Unit			
Promote and expand "no-cost" white paper recycle program and include cardboard and aluminum cans	Facility-wide	2008	N/A	White paper recycling program has been implemented in some office spaces.
Investigate using leased plastic/glass blast media for recycle	Multiple AIMD Shops and HM-15 16 A/B	2008	N/A	Recommendation not implemented due to concern over liability for contaminated blast media.
Use aqueous-based paint gun cleaning solvent versus paint thinner	Multiple HM-15 Shops + L3 C12 Shop	2008	N/A	Paint thinner is still in use at these shops. In CY2012, 23,928.61 pounds of paint thinner were issued to work centers.
Pre-treat waste fluids from jet engine flushing/gas path cleaning and deck washing and then dispose via sanitary sewers - or - utilize "MA 110 RTU" engine gas path cleaner as does the HM-15 110 Powerplant Shop (they claim to generate no waste from this operation)	Facility-wide	2008	N/A	Recommendation not implemented.