OREGON ARMY NATIONAL GUARD

Regulation Number 210-4
POLLUTION PREVENTION PLAN

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OREGON MILITARY DEPARTMENT
Headquarters Oregon National Guard
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OREGON ARMY NATIONAL GUARD **October 2006**
REGULATION NUMBER 210-4

Facilities Engineering
POLLUTION PREVENTION PLAN

SUMMARY. This regulation provides responsibilities and guidance for pollution prevention (P2) within the Oregon Army National Guard (ORARNG). Required by Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, this regulation is written to ensure ORARNG compliance with applicable Federal, state and local laws and regulations. This regulation updates requirements to conform to Federal and state regulatory rules, requiring additional action by ORARNG units and support activities.

This regulation also provides guidelines to reduce, avoid, or eliminate the use of toxic substances and the generation of hazardous wastes as required by the Oregon Department of Environmental Quality (DEQ) Toxics Use and Hazardous Waste Reduction (TUHWR) Act of 1989 detailed in Oregon Administrative Rules (OAR) 340-135-0050. Appendix C contains site-specific details for Camp Withycombe. Appendix D contains site-specific details for Camp Rilea.

SUGGESTED IMPROVEMENTS. The proponent of this regulation is the Environmental Branch of the Installations (AGI-E). Users are invited to send comments to the Oregon Military Department (OMD). ATTN: AGI-E, 1776 Militia Way, P.O. Box 14350, Salem, OR 97309-5047.

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Executive Summary

Introduction

This Pollution Prevention (P2) Plan provides a quantitative look at the progress of the Oregon Army National Guard (ORARNG) environmental management program. This P2 Plan:

- Establishes baseline data and tracks progress toward the goals.
- Sets goals for reductions in key environmental media.
- Documents previous P2 projects evaluated and/or implemented.
- Describes P2 projects being considered.

Table 3-2 in Chapter 3, Installation Pollution Prevention Program, provides a brief look at the goals for each medium (such as air, water, waste, etc.), the regulatory driver for the goal, the baseline year (the year that is measured against), and the target year (the year that the goal should be reached).

Progress toward Goals

The ORARNG has made notable progress towards its goal of continuous reduction of hazardous waste generation, reducing dependency on ozone-depleting substances (ODSs), and researching innovative technology to prevent pollution. The media specific Chapters 5-14 of the P2 Plan further discusses the progress made towards reaching the P2 goals and provides recommendations for improving the program.

As summarized in Table ES-1, several P2 initiatives were implemented in the mid- to late-1990's and early 2000 at several ORARNG facilities. The italicized entries in the table are proposed projects that are waiting for approval. Each project is further discussed in the P2 Plan, as noted in the P2 Plan Section column. Table ES-2 through ES-12 provides the funding source for each P2 initiative by facility and is based on the 2001 P2 Plan, ORARNG Regulation 210-4.

Proposed P2 Projects

There are seven major P2 initiatives assessed in the 2006 update to the P2 Plan. An economic analysis to replace the vault at the Salem Army Aviation Support Facility (AASF) #1 is located in Section 5.5.1, which is followed by an analysis and list of potential lead recyclers for spent ammunition in Section 5.5.2. Section 6.5.1 contains a summary of the information required to implement a Qualified Recycle Program at Camp Withycombe and Camp Rilea. Four systems were evaluated in Section 7.5.1 to improve the air quality and reduce air emissions at the Oregon Sustainment Maintenance Site (OSMS) at Camp Withycombe. Section 14.4.1 briefly describes the closed loop re-refined oil program for state-wide implementation. Several technologies were evaluated in Appendix C, Section 3 to reduce the bead blast hazardous waste stream and oil/water separator (OWS) sludge hazardous waste at the OSMS. A brief discussion to reduce the OWS sludge hazardous waste at Camp Rilea is located in Appendix D, Section 3. Other P2 projects identified but not considered practical for further evaluation at this time are located in the media specific chapters, where appropriate.

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ES-1. PROJECT SUMMARY TABLE

Project Name	P2 Plan Section	Camp Withy.	Camp Rilea	Medford FMS	Springfield FMS	La Grande FMS	Portland FMS	Tigard FMS	AASF #1	AASF #2	COUTES	Salem FMS
Aerosol Can Puncturer	5.4.1	1998/ 1999	2000	2000/ 2001	1995/ 2001	1998			1998	2000		1998
Antifreeze Recyclers	5.4.2	1996/ 1998	1998		1996	2001	1998	1997			1999	
Aqueous Washer Better Engineering	5.4.3	1995/ 1996									1995/ 1996	
Aqueous Washer Jet	5.4.4	1999	1995/ 1996								1999	1999
Battery Acid/Lead Acid Exchange	5.4.5	1995	1995	1996	1996	1992	1996	1996			1996	
Centralized HSMS	5.4.6	X	X	X	X	X	X	X	X	X	X	X
Hot Pressure Washer	5.4.7	1996	1998/ 2005									
Laundry of Shop Rags	5.4.8	1995	X	X	X	1994	X	X	X	X	X	X
Oil Filter Crusher	5.4.9	1996-2001	1999	1998	1998	2001	2000	2000			1999	1998
Paint Gun Cleaner	5.4.10	1999/ 2000	1999								2000	
Propane Cylinder System	5.4.11	2000/ 2001	2000	.	2001	2001	2001	2001	2001		2001	2001
Secondary Containment Structures	5.4.12	1999/ 2002	2002	2002		2002	2002	2002	2002	2002	2002	2002

Project Name	P2 Plan Section	Camp Withy.	Camp Rilea	Medford FMS	Springfield FMS	La Grande FMS	Portland FMS	Tigard FMS	AASF #1	AASF #2	COUTES	Salem FMS
Vehicle and Aircraft Washing	5.4.13	1997										
VOC Emissions	5.4.14	1997										
Weapons Cleaning System	5.4.15	1999/ 2001	1999		1998-2001				2000	2000	2000	2000
ZEP Parts Washer	5.4.16	1993	1993	1993	1994	1994	1994	1994	1995	1993	1994	1994
Replace Batteries	5.4.17											
Replace wash rack vault	*5.5.1*								*Pending*			
Replace blasting media	*Appendix C, Sect 2.1*	*Pending*										
Evaluate OWS Sludge	*App C, Sect 2.2; App D, Sect 2.1;*	*Pending*	*Pending*									
Cardboard Recycling	6.4.1						1996	1996	1995		1996	
Cardboard Recycling Sub Site	6.4.2				1995							
Develop QRP	*6.5.1*	*Pending*	*Pending*									
Develop ECO Plan	*7.5*	*Pending*										
Dustless Sanding Equipment	*7.5.1*	*Pending*										

Project Name	P2 Plan Section	Camp Withy.	Camp Rilea	Medford FMS	Springfield FMS	La Grande FMS	Portland FMS	Tigard FMS	AASF #1	AASF #2	COUTES	Salem FMS
Develop a Water Management Plan	*8.4*											*Pending*
Non-ODS Water Coolers	11.3.1	1999	1999	2000			1999	1999	1996/ 1999		1999	1999/ 2000
Air Conditioner Replacement	11.3.2								1997			
Develop an Energy Management Plan	*13.4*											*Pending*
Participate in a closed loop re-refined oil program	*14.4.1*	*Pending*	*Pending*						*Pending*			

ES-2. CAMP WITHYCOMBE

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 1998/99	EPR OR00099004	5.4.1
Antifreeze Recyclers	Used Antifreeze	Implemented 1996/98	EPR OR00099001	5.4.2
Aqueous Washer Better Engineered	Solvents	Implemented 95-96	EPR	5.4.3
Aqueous Washer Jet	Solvents	Implemented 1999	EPR OR00099011	5.4.4
Battery Acid/Lead Acid Exchange	Used Batteries	Implemented 1995	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Hot Pressure Washer	Hazardous waste/ Hydrocarbons	Implemented 1999	EPR OR00099007	5.4.7
Laundry of Shop Rags	Contaminated Rags	Implemented 1995	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 1996 /1998/ 2001	EPR OR00099003	5.4.9
Paint Gun Cleaner	Solvents	Implemented 1999 /2000	EPR OR00099008	5.4.10
Propane Cylinder System	Reactive Waste	Implemented 2000 /2001	EPR OR00000001	5.4.11
Secondary Containment Structures	POLs	Implemented 2002	EPR OR03500021	5.4.12
Vehicle and Aircraft Washing	Hazardous waste/Hydrocarbons	Implemented 1997	EPR OR	5.4.13
VOC Emissions	VOC	Implemented 1997	EPR	5.4.14
Weapons Cleaning System	Solvents	Implemented 1999 /2001	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1993	EPR OR00093006	5.4.16
Non-ODS Water Coolers	Refrigerants	Implemented 1999	EPR OR00099006	11.3.1

ES-3. CAMP RILEA

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 2000	EPR OR00099004	5.4.1
Antifreeze Recyclers	Used Antifreeze	Implemented 1998	EPR OR00099001	5.4.2
Aqueous Washer Jet	Solvents	Implemented 1995-1996	EPR	5.4.4
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1995	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Hot Pressure Washer	Hazardous waste/ Hydrocarbons	Implemented 1998 / 2005	EPR	5.4.7
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 1999	EPR OR00099003	5.4.9
Paint Gun Cleaner	Solvents	Implemented 1999	EPR OR00099008	5.4.10
Propane Cylinder System	Reactive Waste	Implemented 2000	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR23000001	5.4.12
Weapons Cleaning System	Solvents	Implemented 1999	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1993	EPR OR23000001	5.4.16
Non-ODS Water Coolers	Refrigerants	Implemented 1999	EPR OR00099006	11.3.1

ES-4. MEDFORD FMS

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 2000 / 2001	EPR OR00099004	5.4.1
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1996	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 1998	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Pursuing Funding	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR12000001	5.4.12
ZEP Parts Washer	Solvents	Implemented 1993	EPR	5.4.16
Non-ODS Water Coolers	Refrigerants	Implemented 2000	EPR OR00000001	11.3.1

ES-5. SPRINGFIELD FMS[1]

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 1995 / 2001	OTHER	5.4.1
Antifreeze Recycling	Used Antifreeze	Implemented 1996	EPR	5.4.2
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1996	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 1998	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Pursuing Funding	EPR OR11200001	5.4.12
Containment Structures	POLs	Pursuing Funding	EPR	5.4.12
Weapons Cleaning System	Solvents	Implemented 1998 / 1999 / 2001	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1994	EPR OR00094AAH	5.4.16
Cardboard Recycling Sub Site	Solid Waste	Implemented 1995	BMP	6.4.2
Non-ODS Water Coolers	Refrigerants	Implemented 1999	EPR OR00099005	11.3.1

1. Formally Lebanon FMS.

ES-6. LA GRANDE FMS

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 1999	EPR OR00099004	5.4.1
Antifreeze Recycler	Used Antifreeze	Implemented 2000	EPR OR00099001	5.4.2
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1992	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Hot Pressure Washer	Hazardous waste/Hydrocarbons	Pursuing Funding	EPR OR00099007	5.4.7
Laundry of Shop Rags	Contaminated Rags	Implemented 1994	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 2001	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR10000001	5.4.12
Weapons Cleaning System	Solvents	Implemented 2001	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1994	EPR OR00094AAH	5.4.16

ES-7. PORTLAND FMS

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Antifreeze Recycler	Used Antifreeze	Implemented 1998	EPR OR00099001	5.4.2
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1996	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 2000	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR16500001	5.4.12
ZEP Parts Washer	Solvents	Implemented 1994	EPR OR00094AAH	5.4.16
Cardboard Recycling	Solid Waste	Implemented 1996	BMP	6.4.1
Non-ODS Water Coolers	Refrigerants	Implemented 1999	EPR OR00099006	11.3.1

ES-8. TIGARD FMSS

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Antifreeze Recycling	Used Antifreeze	Implemented 1997	BMP	5.4.2
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1996	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 2000	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR16000001	5.4.12
ZEP Parts Washer	Solvents	Implemented 1994	EPR	5.4.16
Cardboard Recycling	Solid Waste	Implemented 1996	BMP	6.4.1
Non-ODS Water Coolers	Refrigerants	Implemented 1999	EPR OR00099006	11.3.1

ES-9. SALEM AASF #1

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 1998	EPR OR00099004	5.4.1
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher Oberg	POLs	Pursuing Funding	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Replace of NiCad Batteries	Used Batteries	Further Investigation Required		5.4.17
Secondary Containment Structure	POLs	Implemented 2002	EPR OR20500001	5.4.12
Weapons Cleaning System IT-48WC	Solvents	Implemented 2000	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1995	EPR	5.4.16
Cardboard Recycling	Solid Waste	Implemented 1995	BMP	6.4.1
Water Coolers Non-ODS	Refrigerants	Implemented 1996	OTHER	8.4.1
Water Coolers Non-ODS	Refrigerants	Implemented 1999	EPR OR00099006	8.4.1
Air Conditioner Replacement	Refrigerants	Implemented 1997	OTHER	11.3.2

ES-10. PENDLETON AASF #2

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Aerosol Can Puncturer	Reactive Waste	Implemented 2000	EPR OR00099004	5.4.1
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Propane Cylinder System	Reactive Waste	Pursuing Funding	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR15200001	5.4.12
Weapons Cleaning System	Solvents	Implemented 2000	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1993	EPR OR00094AAH	5.4.16

ES-11. CENTRAL OREGON UNIT TRAINING EQUIPMENT SITE

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Antifreeze Recycler	Used Antifreeze	Implemented 1999	EPR OR00099001	5.4.2
Aqueous Washer Better Engineered	Solvents	Implemented 1995-1996	EPR	5.4.3
Aqueous Washer Landa	Solvents	Implemented 1999	EPR OR00099011	5.4.4
Battery Acid/Lead Acid Batteries	Used Batteries	Implemented 1996	BMP	5.4.5
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Hot Pressure Washer	Hazardous waste/Hydrocarbons	Pursuing Funding	EPR OR00099007	5.4.7
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 1999	EPR OR00099003	5.4.9
Paint Gun Cleaner IT-100	Solvents	Implemented 2000	EPR OR00099008	5.4.10
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR17500001	5.4.12
Weapons Cleaning System	Solvents	Implemented 2000	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1994	EPR OR00094AAH	5.4.16
Cardboard Recycling	Solid Waste	Implemented 1996	BMP	6.4.1
Non-ODS Water Coolers	Refrigerants	Implemented 1999	EPR OR00099005	11.3.1

ES-12. SALEM FMS

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	P2 Plan Section
Antifreeze Recycler	Used Antifreeze	Implemented 1998	EPR OR00099001	5.4.2
Aqueous Washer Landa	Solvents	Implemented 1999	EPR OR00099011	5.4.4
Centralized HSMS	Hazardous waste	Implemented	BMP	5.4.6
Laundry of Shop Rags	Contaminated Rags	Implemented	OTHER	5.4.8
Oil Filter Crusher	POLs	Implemented 1998	EPR OR00099003	5.4.9
Propane Cylinder System	Reactive Waste	Implemented 2001	EPR OR00000001	5.4.11
Secondary Containment Structure	POLs	Implemented 2002	EPR OR21000002	5.4.12
Weapons Cleaning System	Solvents	Implemented 2000	EPR OR00099002	5.4.15
ZEP Parts Washer	Solvents	Implemented 1994	EPR OR00094AAH	5.4.16
Non-ODS Water Coolers	Refrigerants	Implemented 1999/2000	EPR OR00099006	11.3.1

Chapter 1
Introduction

1.1 Statement of Purpose

The purpose of the Pollution Prevention (P2) Plan is to establish the commitment of the Oregon Army National Guard (ORARNG) to environmental leadership in pollution prevention by outlining the concepts and practices necessary to reduce the use of hazardous materials and the release of pollutants. This Plan should be used as a tool for the ORARNG to document, track, and manage its P2 efforts in pursuit of achieving P2 goals.

The ORARNG P2 Plan is designed to meet the objectives of Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*, guidelines of Department of Army Pamphlet (DA PAM) 200-1, and meet additional state and national P2 goals as discussed in Chapter 2.

This Plan also complies with Reduction Plan requirements of Oregon Administrative Rules (OAR) 340-135-0050, *Toxic Use and Hazardous Waste Reduction (TUHWR) Plan Requirements and Certification*, as they apply to Camp Withycombe and Camp Rilea. Appendix C and D contain site-specific details for Camp Withycombe and Camp Rilea, respectively.

1.2 Background and Mission

On August 3, 1993, President Clinton signed Executive Order (EO) 12856, entitled *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements.* This order requires each Federal agency to:

- Develop an agency-wide P2 strategy, which commits the agency to source reduction and emphasizing P2 as the primary means of achieving and maintaining compliance with Federal, state, and local environmental requirements;
- Establish a voluntary goal to reduce total releases and off-site transfers of toxic chemicals or toxic pollutants by 50 percent;
- Develop facility-level P2 plans; and
- Apply Life Cycle Analysis and Total Cost Accounting principles, to the greatest extent practicable, when evaluating P2 opportunities.

By signing this EO and emphasizing the importance of P2 in environmental management, President Clinton has challenged the Federal government to publicly lead by example by applying P2 in the management of its facilities and in its acquisition practices. By preventing pollution, the Federal government not only protects the environment and the public's health, but also saves the taxpayers' money by reducing pollution control costs and long-term liability for expensive cleanups.

The ORARNG has both Federal and state missions. The Federal mission is to train and maintain combat ready units available to mobilize, deploy, and execute assigned wartime missions in

support of the National Military Strategy. The state mission is to function efficiently for the protection of life and property and to preserve peace, order, and public safety under competent orders of the Governor of the State of Oregon.

> *"The Oregon National Guard will sustain a quality force of trained and ready patriots. Through effective use of resources, we will be fully capable of performing our Federal, State, and community missions. We are committed to providing the citizens of Oregon and the nation a well-equipped, highly motivated militia."*

The State Headquarters, located in Salem, Oregon, includes the Environmental Branch of the Installations Office (AGI-E). This office strives to ensure that installation and facility operations and activities are in compliance with environmental regulations and policy, and ensure that the natural resources are not adversely impacted by ORARNG activities.

1.3 Definition of Pollution Prevention

P2 encompasses those activities, which reduce the quantity of hazardous, toxic, or other contaminants at the source of generation through conservation, material substitution, process modification, or increased efficiency in the use of energy, water, or other materials. P2 means the application of source reduction techniques to reduce public and ecological health risks, and to ensure the safety and welfare of the public and the environment.

For purposes of this Plan, the ORARNG considers and refers to a P2 project as one that applies source reduction, recycling, or waste minimization in order to reduce pollution from an installation's current business practices, industrial processes, base operations, or other routine activities.

P2 complements good waste management practices. As illustrated in Figure 1-1, P2—or source reduction—is preferable to recycling, and recycling is preferable to treatment, and treatment is preferable to disposal.

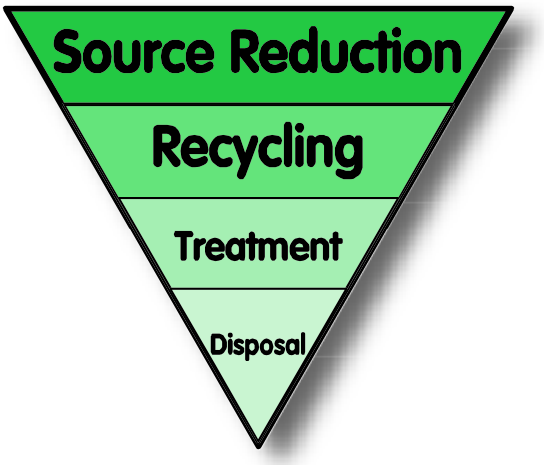

Figure 1-1. Preferred Pollution Prevention Hierarchy

1.4 Benefits of Pollution Prevention

Waste and resource management programs that adopt P2 principles can benefit in some of the following ways:

- Reduced costs associated with the procurement and storage of hazardous materials and subsequent disposal of hazardous waste.
- Reduced costs associated with the management, treatment, and disposal of hazardous wastes.
- Decreased use of energy and water resources.
- Enhanced relations with the public, neighboring communities, and regulators.
- Reduced costs of complying with environmental and hazardous materials regulations, and diminished risk of non-compliance.
- Reduced future compliance liability.
- Improved long-term environmental quality and prevention of environmental degradation.

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Chapter 2
Pollution Prevention Regulatory Background

The Army's P2 policies originate in legislation enacted by the U.S. Congress. EOs direct Federal agencies, including the Department of Defense (DoD), to conform to Federal legislation and may impose non-legislated requirements as well. The DoD issues directives and instructions in response to the EOs. These DoD policy statements are interpreted and promulgated in Army regulations, pamphlets, and other policy documents. In addition, Major Army Commands (MACOMs), Major Subordinate Commands, and individual installations may adopt supplemental policies. This section provides summaries of the major laws, EOs, and DoD policy statements pertaining to P2. Due to the wide-reaching nature of P2 issues and frequent changes to laws and regulations, the list is not intended to be all-inclusive.

2.1 Federal Legislation

2.1.1 Resource Conservation and Recovery Act (RCRA) of 1976.

The RCRA of 1976 was the first major law requiring P2. "...It shall be a condition of any permit issued under this section for the treatment, storage, or disposal of hazardous waste on the premises where such waste was generated that the permitee certify, no less often than annually, that the generator of the hazardous waste has a program in place to reduce the volume or quantity and toxicity of such waste to the degree determined by the generator to be economically practicable."

2.1.2 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.

This act required that generators of hazardous wastes must evaluate and document their procedures for controlling the environmental impacts of their operations.

2.1.3 Hazardous and Solid Waste Amendments (HSWA) of 1984.

This act required all RCRA-regulated generators of hazardous waste to develop waste minimization programs.

2.1.4 Pollution Prevention Act of 1990.

The Federal Pollution Prevention Act (PPA) was enacted on 5 November 1990. The PPA defined P2 as source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources and protection of natural resources by conservation. The PPA focused attention on reducing pollution through cost-effective changes in producing, operating, and using raw materials, establishing source reduction as a more desirable solution than waste management or pollution control.

Facilities that are required to report releases for the Toxic Release Inventory (TRI) under the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, must provide documentation of their procedures for preventing the release of or for reusing these materials. The PPA established the comprehensive national policy known as the pollution protection hierarchy, as illustrated in Chapter 1.

Federal facilities, such as the ORARNG, were subjected to the requirements of the PPA when President Clinton signed EO 12856, setting the Federal government's P2 policy. President Clinton noted:

"...Federal facilities will set the example for the rest of the country and become the leader in applying pollution prevention to daily operations, purchasing decisions, and policies. In the process, Federal facilities will reduce toxic emissions, which help avoid cleanup costs and promote clean technologies."

2.1.5 The Energy Policy Act (EPAct) of 2005

The EPAct of 2005 builds upon the guidelines established in 1992 to meet the nation's energy needs. The EPAct encourages the use of "alternative fuels," i.e., those not derived from petroleum, to help reduce U.S. dependence on imported oil for transportation. Some pertinent aspects of the EPAct of 2005 include[1]:

- Requires "duel-fueled" vehicles acquired under the EPAct of 1992 program to be operated on alternative fuels.
    - The EPAct of 1992 required 75 percent of DoD fleets of 20 or more light-duty vehicles should be light-duty alternative fuel vehicles (AFVs) by fiscal year 2000. Vehicles heavier than 8,500 lbs. gross vehicle weight rating (GVWR), and law enforcement, emergency, and military tactical vehicles are exempt from EPAct requirements.
- Requires a 20 percent reduction in Federal building energy use by 2015, provides funding for energy efficiency programs for public buildings, and increases fuel efficiency requirements for Federal vehicles.
- The Department of Energy (DOE) "Clean Cities" program provides grants to state and local governments to acquire alternative fueled and fuel cell vehicles, hybrids and other vehicles, including ultra low-sulfur diesel vehicles.
- Provides tax credits for owners of hybrid vehicles
- Bans the use of methyl tertiary butyl ether (MTBE) in motor fuels after 31 December 2014.
- Requires onsite inspections of underground storage tanks every three years after a brief period for the state to update its backlog.

[1] Additional information is available at http://energycommerce.house.gov/108/energy_pdfs_2.htm (website accessed July 2006).

- Requests that states submit an annual inventory to the EPA detailing the number of regulated tanks in its state and identify those tanks that are leaking.

2.1.6 National Defense Authorization Act (NDAA) FY 2002

For FY 2005 and 2006, the NDAA of FY 2002 requires five percent (5%) of the procured light duty trucks that fall under Section 303 of EPAct to be alternative fueled or hybrid vehicles. In FY 2007 and beyond, the percentage rises to ten percent (10%). The NDAA, Section 318, also requires 100 percent of the light duty (non-tactical) truck acquisitions not falling under Section 303 of EPAct to be hybrid starting in FY 2005.

2.2 State Pollution Prevention Legislation

2.2.1 Toxic Use Reduction and Hazardous Waste Reduction Act of 1989

The Oregon Department of Environmental Quality (DEQ) Toxics Use and Hazardous Waste Reduction (TUHWR) Act of 1989 requires businesses to develop formal reduction plans and is intended to reduce, avoid, or eliminate the use of toxic substances and the generation of hazardous wastes. This Plan is modified to comply with the TUHWR Plan requirements detailed in the TUHWR Act, OAR 340-135-0050.

However, the ORARNG may claim an exemption from the Plan requirement and the annual progress report requirement of OAR 340-135-0070 (1) and (2), if the ORARNG Environmental Management System (EMS), as defined in Oregon Revised Statute (ORS) 468.172, meets the requirements of OAR 340-135-0044.

2.2.2 OAR 340-242-0010 through 0290, Employee Commute Options (ECO) Plan

The ECO Plan per OAR 340-242-0010 through 0290, require employers in the Portland area with *more than 50 employees* reporting to a single work site provide incentives for employee use of alternative commute options. The incentives must have the potential to reduce commute trips to the work site by 10 percent within three years. This requirement is applicable to Camp Withycombe, which is located in the City of Clackamas (within the Portland area).

2.3 Presidential Executive Orders

2.3.1 Executive Order 13101, "Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition," September 1998.

This EO requires Federal agencies to implement acquisition programs aimed at procuring products that are environmentally preferable, energy efficient, and/or contain post-consumer recovered materials. This order supersedes EO 12873.

The 2005 (reissued) Federal Acquisition Regulation (FAR) provides requirements and guidance regarding green procurement of environmental preferable materials and services for government agencies.

FAR, Subpart 23.404(a) requires Federal facilities implement green procurement programs which include the following:

- Recovered materials preference program.
- Agency promotion program.
- Program for obtaining estimates and verification of recovered materials.
- Annual program review.

FAR, Subsection 11.002(d)(2) states Federal facilities must consider using environmentally preferable products and services when creating or reviewing Federal specifications, product descriptions, and when describing government requests for supplies/services.

FAR, Subpart 7.105(16) mandates environmental and energy conservation objectives are included in applicable acquisition solicitations and contracts. FAR, Subpart 23.203(a) requires government agencies purchase ENERGY STAR® or other energy-efficient products listed on the Federal Energy Management Program (FEMP) Product Energy Efficiency Recommendations product listing. This section also requires products, which consume energy in a standby condition, be listed on the FEMP Standby Power Devices product listing or purchase a similar, energy-efficient product. Contracted services for government agencies must also meet standby power device requirements.

2.3.2 Executive Order 13123, "Greening the Government through Efficient Energy Management," June 1999.

This EO establishes requirements intended to encourage efficient energy management in the Federal Government. Specific goals of this EO include:

- Reduce greenhouse gas emissions from facility energy use 30 percent by 2010 from a 1990 baseline.
- Reduce facility energy consumption 30 percent per square foot by 2005 and 35 percent by 2010 from a 1985 baseline.
- For industrial and laboratory activities, reduce energy consumption 20 percent by 2005 and 25 percent by 2010 from a 1990 baseline.
- Expand use of renewable energy by purchasing electricity from renewable energy sources. The Federal government goal is to install 2,000 solar energy systems at Federal facilities by the end of 2000, and 20,000 solar energy systems at Federal facilities by 2010.
- Reduce the use of petroleum or improve the efficiency of petroleum use.
- Reduce total energy use and associated greenhouse gas and other air emissions as measured at the source.
- Reduce water consumption and associated energy use. Where possible, include water cost savings and associated energy cost savings in Energy-Savings Performance Contracts or other financing mechanisms.

2.3.3 Executive Order 13148, "Greening the Government through Leadership in Environmental Management," April 2000.

By including many of the P2 elements of several previously existing EOs, this EP revokes the following: EO 12843 of April 1993, EO 12856 of August 1993, EO 12969 of August 1995, and section 1-4 "Pollution Control Plan" of EO 12088 of October 1978. EO 13148 establishes goals that involve establishing environmental management programs as well as goals that involve reaching measurable P2 milestones. The goals that pertain directly to P2 are:

- Reduce TRI Form R releases 10 percent annually or 40 percent by 31 December 2006 from a baseline year of 2001. In addition to this reduction goal, note that this EO requires Federal facilities to fully comply with the requirements of the EPCRA.
- Reduce the use of Environmental Protection Agency (EPA) priority chemicals 50 percent by 31 December 2006. The EPA Interagency Workgroup identified 31 priority chemicals.[2]
- Develop a plan to phase-out the procurement of Class I Ozone Depleting Substances (ODS) by 31 December 2010. The facility must develop this plan by 31 April 2001. Note that the Army established a goal to eliminate all ODS from each Army installation by 31 December 2003 and to develop the phase-out plan by 30 September 2000.
- Develop a plan that addresses the facility's contribution toward achieving the goals in this EO. This plan must be developed by March 2002. Note that this P2 plan satisfies this requirement.
- Determine the feasibility of implementing a hazardous material pharmacy system at the facility. The facility must make this determination by April 2002.
- Institute environmentally and economically beneficial practices pertaining to landscaping activities. These practices must be based upon the Guidance for Presidential Memorandum on Environmentally and Economically Beneficial Landscape Practices on Federal Landscaped Grounds (60 Fed. Reg. 40837). Landscaping activities should have conformed to this guidance since October 2001.

2.3.4 Executive Order 13149, "Greening the Government through Federal Fleet and Transportation Efficiency," April 2000.

This EO establishes goals to improve the average fuel economy and to increase the use of alternative fuels for fleet vehicles. Note that this order exempts tactical military vehicles, law enforcement vehicles, and emergency vehicles from its requirements. Unlike the EPAct, however, it does not exempt vehicles outside a covered metropolitan statistical area (MSA). Therefore, all non-tactical vehicles are covered under EO 13149. This EO supersedes EO 13031 of December 1996. This order established the following specific goals:

- Reduce vehicle petroleum consumption 20 percent by the end of FY 2005 from a FY 1999 baseline.

[2] A complete list of the priority chemicals are available at the website last accessed in July 2006: http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm. The list is also located in Chapter 10, Table 10-1.

- Increase the average EPA fuel economy rating of cars and light trucks by at least 1 mile per gallon (mpg) by the end of FY 2002 and by 3 mpg by the end of 2005 from an FY 1999 baseline.
- Ensure that alternative fuels account for at least 50 percent of the fuels used in dual-fuel, AFVs.
- Ensure that at least 75 percent of car and light truck procurements are alternatively fueled vehicles.
- Agencies must develop a plan to comply with EO 13149 and EPAct requirements. They must ensure that a combination of AFV acquisition and alternative fuel use, and the acquisition of higher fuel economy vehicles are used to successfully achieve the goals of EO 13149.

These goals are established for entire agencies. Individual facilities within an agency do not necessarily have to meet the requirements, as long as the agency as a whole reaches the goals.

2.3.5 Executive Order 13221, "Energy Efficient Standby Power Devices," August 2001.

This EO requires Federal agencies to purchase energy efficient standby power devices, which consume less than one-watt of energy during standby mode, whenever feasible.

2.4 Department of Defense Directives and Instructions

2.4.1 DoD Instruction 4715.4, "Pollution Prevention," June 1996.

This document provides explicit guidance on P2 activities. It reiterates the P2 hierarchy principle, and establishes the DoD P2 measures of merit (MoM) for TRI release reduction, hazardous waste reduction, non-hazardous solid waste diversion, and use of alternatively fueled vehicles. Note that the TRI and hazardous waste reduction goals became obsolete on 31 December 1999. As a result, the DoD is currently developing new MoM that will be incorporated into this plan as soon as they become available.

2.4.2 DoD Memorandum, "New DoD P2 Measure of Merit," May 1998.

This memorandum establishes a new solid waste measure of merit to replace those in DoD Instruction 4715.4 (above). The new MoM is to "ensure that the diversion rate for non-hazardous solid waste is greater than 40 percent while ensuring integrated non-hazardous solid waste management programs provide an economic benefit when compared with disposal using land filling and incineration alone." This goal is to be attained by the end of FY 2005.

2.4.3 Memorandum, Assistant Secretary for Installations, Logistics, and Environment, "Ozone-Depleting Chemicals (ODC) Elimination at Army Installations," 13 February 1996.

With this memorandum, the Assistant Chief of Staff for Installation Management revised the requirements of two previous memorandums issued by the Secretary of the Army for Installations, Logistics, and Environment. The first memorandum, "Ozone-depleting Chemicals (ODCs) Elimination at Army Installations" 13 February 1996, established an Army-wide goal to

completely eliminate Class I ODCs from all Army installations by December 2003. The second memorandum, "Elimination of Ozone Depleting Chemicals (ODCs) in Army Facilities – Action Memorandum" 22 November 2002, revised the first memorandum's policy to require each Army installation to be "free of dependence" on commercial Class I ODCs by 31 December 2003.

The memorandum, "Change in Army Policy for the Elimination of Ozone Depleting Chemicals" 7 January 2003, requires Army Installation Commanders to eliminate dependency on the commercial availability of Class I ODCs by the end of FY 2003, instead of eliminating all Class I ODCs by the end of FY 2003.

With this memorandum, the Assistant Secretary of the Army for Installations, Logistics, and Environment established an Army-wide goal to completely eliminate Class I ODS from all Army installations by 31 December 2003. In 2002, this policy was revised to require each Army installation to be "free of dependence" on commercial Class I ODCs by 31 December 2003. This means that facilities must conduct the following activities:

- Continue to use recovered ODCs after FY 2003. Facilities, however, cannot bring any more Class I ODCs onto the installation. Facilities must use what they have, but cannot recharge a halon system; if it discharges, it must be converted.
- Continue to use hermetically sealed ODC systems after FY 2003.
- Facilities do not have to retire their halon systems by the end of FY 2003.
- Eliminate Class I ODC solvents from all Army industrial operations by FY 2005.
- Identify halon alternatives for all Army weapon system applications by FY 2006.[3]

[3] A reference for halon alternatives is available at ASA (ALT)'s Environmental Support Office (ESO) website, (last accessed May 2006): http://www.environmentalsupportoffice.com/ODC/ODC_XSummary.htm#Background

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Chapter 3
Installation Pollution Prevention Program

3.1 Policy

The ORARNG is a dynamic organization of citizen soldiers and airmen, striving for excellence and focused on readiness. Its mission is to maintain a trained, equipped, and professional force, dedicated to the highest quality service to the nation, the state, and its communities. Its goal is to be prepared to respond to any assigned Federal or state missions.

In preparing to meet mission requirements, the ORARNG incorporates environmental stewardship and sustainability into all operations. It is committed to continually improving its environmental management program and to the prevention of pollution. To that end its objectives are to:

- Communicate its environmental requirements to all levels of the agency[4];
- Provide management oversight and personnel training to instill environmental stewardship, ensure an understanding of the agency EMS and its requirements, and obtain a commitment to compliance;
- Aggressively pursue compliance with applicable regulatory requirements at all levels of government, DoD, Department of the Army (DA), and the National Guard Bureau (NGB) environmental policies, regulations, and guidance, and other requirements to which the agency subscribes;
- To the extent mission requirements allow, identify and implement P2 opportunities in all aspects of operations; and
- Partner with Federal, state, and local agencies, community groups, and other interested parties to communicate mission requirements, and minimize environmental impacts that do not obstruct readiness while concurrently pursuing opportunities for environmental excellence.

The ORARNG will continually strive to improve its environmental management by working with directorates, commands, and units to improve efficiency and effectiveness. It will provide necessary training, and conduct annual internal evaluations to determine conformance with requirements, identify policy issues that must be addressed by agency leadership, and assess the agency's performance in achieving its goals, objectives, and projected targets.

The ORARNG will ensure required documentation is complete, current, and available to employees. And, it will ensure its environmental policy is available to the public via the World Wide Web, which will act as a bridge to increased community awareness of its environmental programs.

[4] The use of the term agency refers to the ORARNG.

3.2 Pollution Prevention Management Structure

The ORARNG manages its overall environmental program through a series of defined responsibilities. As an aspect of the environmental program, each installation also manages its P2 program in this manner. The various levels of responsibility for environmental management are as follows:

3.2.1 Command Level

With regards to the environmental program, ORARNG command personnel are responsible for establishing overall policies, instituting regulations, and setting goals. In addition, they are responsible for establishing budgets and authorizing funding for the overall program and for specific projects. Command and Directorate level personnel stay involved in environmental activities primarily through regular meetings of the installation Environmental Quality Control Committee (EQCC) that meets once per quarter.

3.2.2 Primary Level

The ORARNG Environmental Branch of the Installations Office maintains the principal responsibility for environmental oversight and management. The environmental office consists of personnel who are each responsible for managing various environmental programs such as P2, hazardous waste, solid waste, air emissions, above and underground storage tanks, etc.

3.2.3 Support Level

Organizations and personnel at this level have the responsibility of furnishing the environmental office with the resources and/or data required to manage various environmental programs. Participants at this level include the installation Command Staff and it's Directorates. Some specific examples of support level activities include: the Command Judge Advocate providing legal advice for permit registration; the Logistics Division overseeing hazardous material supply operations; The Directorate of Contracting providing policy and oversight for credit card hazardous material purchases, and the Safety Office maintaining environmental training records for installation personnel.

3.2.4 Task Level

This level consists mostly of contracted organizations that provide the installation with a specific work product. Some examples may include the various contractors that: help develop the installation master plan, operate the hazardous substance management system, manage the hazardous waste storage yard, and generate annual TRI reports.

3.2.5 Resource Level

Resources are typically regarded as various personnel on post who have environmental training, experience, or knowledge and can contribute to specific aspects of environmental program management. Resources include those with extensive environmental knowledge such as environmental office personnel who are not directly responsible for a specific program but who may lend advice and assistance to that program's manager. Resources may also include

personnel who serve in a limited environmental capacity such as those responsible for managing hazardous waste at industrial activities.

3.2.6 Operator Level

This level of personnel has the responsibility of providing technical information about the existing processes and potential process changes to operations and waste generation activities to the primary level personnel. Some specific examples of this level include the motor pool personnel and Department of Public Works (DPW) shop personnel.

3.3 Baseline Development

The baselines for the installation's P2 objectives are primarily derived from the pollution reduction goals established by "greening of the Government" EOs and DoD Policies, and the Guidance for Developing Army Pollution Prevention Plans. As new laws and policies are developed, P2 goals will change to meet policy demands, see Table 3-2 for P2 goals. Baseline data is important for two reasons:

1. Baseline data is used as a measure of performance; it can be compared with data in the future to determine if the ORARNG is reducing waste and emissions. Many of the goals are based on reducing waste by a certain percentage from a specific baseline year.
2. Baseline data is used to target areas for pollution prevention opportunity assessments (PPOA).

The baseline data are reported in the subsequent chapters of this plan according to goal areas. Where more than one year of data is available, the progress made to date in attaining the P2 goals was evaluated and is discussed in the appropriate chapter of this regulation. These baselines are based on the following metrics in Table 3-1.

Table 3-1. ORARNG Baseline Pollution Prevention Metrics

P2 Plan Chapter	P2 Goal Area	Metric/Unit of Measure	Goal
5	Hazardous Waste	Total hazardous waste disposed (pounds)	Continuous Reduction
6	Solid Waste	Percent of total generated solid waste diverted to recycling (percent)	40% Solid Waste Diversion Rate
7	Air Emissions	Amount of air emissions emitted (tons)	Continuous Reduction
8	Water	Amount of water consumed (gallons)	Continuous Reduction
8	Wastewater	Amount of wastewater generated (gallons)	Continuous Reduction
9	TRI Form R Chemical Releases	Amount of releases and off-site transfers (pounds)	40% TRI Releases Reduction
10	EPA Priority Chemicals	Purchases of individual target chemicals (pounds)	50% Priority Chemical Use Reduction
11	ODCs	Total inventory (pounds)	Free of dependence on Class I ODCs
12	Vehicle Fuel Use	Amount of petroleum consumed (gallons)	20% Reduction

P2 Plan Chapter	P2 Goal Area	Metric/Unit of Measure	Goal
12	Vehicle Fuel Use	Amount of alternative fuel consumed (gallons)	100% of fuels consumed in dual-fueled vehicles will be alternative fuel
12	Alternatively Fueled Vehicles	Number of AFV leased/procured (count)	75% of vehicles are AFV
13	Energy	Electricity consumed (kWh) per total square feet of agency facilities	Use 7.5 percent of renewable energy
			20% Reduction in Electrical Energy Consumption
14	Affirmative Procurement		Develop a Green Procurement Plan

3.4 PPOAs

When reduction requirements are determined, options for meeting the requirements must be identified. These options are identified through PPOAs. PPOAs examine current processes and identify and evaluate alternatives for P2. Projects identified by PPOAs must have complete data to show the cost benefit of the project.

Opportunity assessments are the one method for identifying process improvements or options. Conducting an opportunity assessment involves examining all input sources, material usage, and waste generation by type and weight, and determining practical and economical options for waste reduction. This generally involves examining each process involving a targeted substance to determine ways to avoid use or minimize generation of that substance. Detailed baseline information characterizing material use and waste streams for each process may be gathered concurrently with the assessment process.

A PPOA is conducted by forming a team to visit an activity, a shop, or other location where industrial processes occur, observe the process or activity of the shop, and brainstorm ideas to reduce waste and emissions or conserve resources. Opportunity assessments may be performed by trained post level or MACOM personnel, or contractors and, to be effective, must have the involvement of process-level personnel. In Section 2 of Chapters 5-14 of this document represents the results of the most recent PPOA for each chapter's respective media.

After the potential P2 project is evaluated for practicality and economic savings, the P2 project may be put into place. Sometimes this involves getting approval for the proposed change. Personnel will ensure that any change to a process complies with all applicable orders, technical manuals, or military specifications (MILSPECS). If a P2 project requires a capital purchase, funding will need to be obtained. Money can come from the process organization itself or from funds available for P2 projects.

Sometimes implementing a P2 alternative is fairly simple and doesn't involve capital purchases or major changes to the target process. Examples include "just in time" purchasing or participation in a red rag laundering/recycling program. These ideas can be put into action without detailed evaluation, so shop personnel can start employing them immediately.

Environmental program managers can help by sharing information on these ideas with shop personnel.

3.5 Pollution Prevention Goals

Chapters 5-14 of this Plan describe the installation's P2 goals with respect to each environmental media area. The installation developed these goals based on environmental laws, EOs, and DoD policies. As new laws and policies are developed, P2 goals will change to meet policy demands. Table 3-2, Summary of ORARNG Pollution Prevention Goals, provides information on the goals for each medium, the regulatory driver for the goal, the baseline year (the year that is measured against), and the target year (the year that the goal should be reached).

ORARNG's long-term P2 goals are to eliminate the use of hazardous materials, eliminate the generation of wastes, and eliminate emissions of pollutants to the environment (zero discharge). Achieving the goal of complete elimination is recognized as not being technically or economically feasible. Thus, the ORARNG will continue to strive to achieve the goals set in Table 3-2. The ORARNG is committed to finding innovative processes to reduce the quantity of hazardous waste and solid waste generated.

Table 3-2. Summary of ORARNG Pollution Prevention Goals

Media	Goal	Source of Goal	Baseline Year	Target Year	P2 Plan Chapter
Hazardous Waste	Continuous annual reduction in disposal.	DoD MoM	N/A	N/A	5
Solid Waste	40% diversion in solid waste.	DoD MoM	N/A	Dec 2005	6
Air Emissions	Continuous annual reduction in emissions.	DoD MoM	N/A	N/A	7
	Employers in the Portland area with *more than 50 employees* shall reduce commute trips to the work site by 10% within 10 years: applicable to Camp Withycombe.	OAR 340-242-0010 through 0290	2006	2009	7
Water Use	Continuous annual reduction in potable water use.	Army P2 Plan Guidance	N/A	N/A	8
Wastewater Generation	Continuous annual reduction in wastewater generation.	Army P2 Plan Guidance	N/A	N/A	8
TRI Releases	40% reduction in TRI releases.	EO 13148	2001	Dec 2006	9
EPA Priority Chemicals	50% reduction in chemical use.	EO 13148	2001	Dec 2006	10
ODCs	Installations must be free of dependence on Class I ODCs.	Memorandum ASA IL and E	N/A	Dec 2003	11
Vehicle Fuel	Increase fleet fuel efficiency by 3 miles per gallon.	EO 13149	1999	Dec 2005	12
	Reduce vehicle petroleum consumption by 20%.	EO 13149	1999	Dec 2005	12
Vehicle Fuel	Ensure that 75% of vehicles procured in the target year and beyond are AFVs.	EPAct of 1992	N/A	1999	12

Media	Goal	Source of Goal	Baseline Year	Target Year	P2 Plan Chapter
	Ensure that alternative fuels account for 100% of fuels used in dual-fuel vehicles.	EPAct of 2005	N/A	N/A	12
	Ensure that 100% of light-duty trucks not covered by EPAct are hybrid vehicles, if available.	NDAA	N/A	2005	12
Energy Use	Reduce facility energy consumption by 30%.	EO 13123	1985	2005	13
	Reduce facility energy consumption by 35%.	EO 13123	1985	2010	13
	Reduce Federal building energy consumption by 20%.	EPAct of 2005	2003	2015	13
Priority Chemical Use	Continuous annual reduction in quantity in use of hazardous chemicals.	Department of the Army	N/A	N/A	14
Affirmative Procurement	Train procurement officers and integrate affirmative procurement into developing plans, work statements, and specifications.	EO 13148	N/A	N/A	14

3.6 Implementation and Evaluation

The policies and procedures established in this regulation are developed, approved, and implemented by AGI-E. This section describes some of the methods and tools the installation uses to track and document its environmental efforts such as P2 projects and initiatives. Designated personnel at the Oregon Military Department (OMD) AGI-E are responsible for ensuring the progress of the environmental program-specific P2 project is tracked and compare the progress to baseline data.

Waste generation quantities can be compared before and after a P2 project is implemented to see if the project achieved its desired effect and helped to reduce waste. When data is not detailed enough to evaluate the project's effects, then the project is evaluated qualitatively. The P2 project should also be evaluated for its effect on the process, its costs, and the overall mission of the ORARNG.

3.6.1 Army Environmental Database for Environmental Quality

The database is used to maintain the installation environmental information, including compliance, conservation, program management, and P2 programs. The primary goal of Army Environmental Database for Environmental Quality (AEDB-EQ) is to provide DoD with the information it requires as well as providing headquarters, MACOM, major subordinate commands (MSC), and installations with critical management information while minimizing short suspense tasking to installation personnel.

3.6.2 Status Tool for the Environmental Program

Installation personnel use Status Tool for the Environmental Program (STEP) to plan, program, budget and forecast costs to manage the environment; to practice good environmental stewardship; and to attain and maintain compliance with existing and pending Federal, state, local environmental laws and regulations. It is used to show past expenditures, to track project execution and performance, to refine and validate requirements for the budget year, and to plan and program requirements and resources in the out-years.

3.6.3 Environmental Performance Assessment System

The Environmental Performance Assessment System (EPAS) is an Army-wide program that documents an installation's compliance status on a three- to five-year cycle. As a component of the EPAS, assessors evaluate the installation's P2 program in terms of its performance with many of the directives and EOs described in Chapter 2. This evaluation is included as part of a document called the Environmental Performance Assessment Report (EPAR). At the conclusion of the EPAS, the assessors write an EPAR and provide copies to the installation and its MACOM. The installation then works with the MACOM to develop an Installation Corrective Action Plan (ICAP). Developing the ICAP serves as an opportunity to consider and plan for P2 projects that can help achieve and maintains compliance.

3.6.4 Toxic Use and Hazardous Waste Reduction Plan

The AGI-E will coordinate with staff at facilities subject to the TUHWR requirements. ORARNG large and small quantity generators of hazardous waste, such as Camp Withycombe and Camp Rilea, are required to develop a Reduction Plan. These plans were developed to address hazardous waste streams or toxic chemicals in use that represent more than 10 percent by weight of the cumulative hazardous waste generated at each of these respective facilities in the previous year. As progress is made to reduce the top priority hazardous waste streams, as evaluated in Appendix C and D, AGI-E staff will review the hazardous waste data for the most recent reporting year to identify the next waste stream that represents ten percent or more of the total hazardous waste generated to reach the goal of continuous reduction.

The TUHWR Annual Progress Report is submitted in accordance with OAR 340-135-0070 and contains: an analyses of the progress made or impediments towards reducing the amount of hazardous waste generated at the facility; the annual quantities (in pounds) of each hazardous waste generated for each hazardous waste evaluated; and an explanation of each hazardous waste generated for each hazardous waste evaluated.

3.7 Pollution Prevention Reporting Requirements and Funding

The installation has the following P2 reporting requirements:

- Hazardous waste generator biennial or annual report (RCRA)
- AEDB-EQ hazardous waste disposal and recycling roll-ups (AR 200-1)

- Status Tool for the Environmental Program (STEP) of programming, budgeting, and execution for all environmental projects, including P2 (AR 200-1)
- Installation Status Report Part II (Environment)
- EPCRA Tier I/II Reports (CERCLA)
- TUHWR Annual Progress Report (OAR 340-135-0070)

P2 projects are funded from the account of the proponent's operating budget.

3.8 Employee Awareness and Training

The ORARNG should implement an employee awareness and training program that provides a general awareness to the P2 requirements and the TUHWR requirements to applicable personnel. Employees at facilities subject to TUHWR should be involved in hazardous waste reduction planning and implementation, as their job classification allows.

Chapter 4
Compliance through Pollution Prevention

4.1 Description of Compliance through P2

P2 is a management tool that an installation can use to reduce its compliance burden. This section represents the installation's efforts to categorize and document its compliance benefit. The following examples illustrate the concept of compliance through prevention.

4.1.1 Camp Withycombe

Camp Withycombe occupies 153 acres in Clackamas, Oregon. The four primary facilities on Camp Withycombe are: 3670 Field Maintenance Shop (FMS), Oregon Sustainment Maintenance Site (OSMS), the United States Property and Fiscal Office – Supply Distribution Center (USPFO-SDC) and State Maintenance Shop (SMS). Secondary facilities include a Military History Museum, Readiness Center, and various offices and warehouses. There is one above ground fueling station, two wash racks, and one paint booth at the OSMS and one at the SMS.

4.1.2 Camp Rilea

Camp Rilea occupies approximately 2,200 acres on the Clatsop Plains between Columbia Beach and Sunset Beach in Warrenton, Oregon. The primary facilities on Camp Rilea are: the Unit Training Equipment Site (UTES), Post Maintenance (PM), and a Readiness Center. Camp Rilea has one tenant: the Air National Guard (ANG) 116 Air Control Squadron (ACS). Secondary facilities include enlisted and officer quarters, small arms and weapon training ranges, ammunition storage bunkers, waste water treatment plant, ropes course, Military Operations in Urban Terrain (MOUT) training facility, maneuver training areas, rappelling tower, two above ground fueling stations, and three wash racks.

4.1.3 Salem FMS

The FMS occupies 7.5 acres in Salem, Oregon. The FMS is used primarily to repair equipment. The ancillary shop areas include shop offices, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack at this facility.

4.1.4 COUTES

The Central Oregon Unit Training and Equipment Site (COUTES) occupies approximately 20 acres in Redmond, Oregon. The COUTES is used primarily to train reserve mechanics, although full time employees are assigned to this facility. Primary facilities include a maintenance building, warehouse and trailer house. The ancillary shop areas include shop office, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack at this facility and one above ground fueling point.

4.1.5 Medford FMS

The FMS occupies 1.1 acres in Medford, Oregon. The FMS is used primarily to repair equipment. The ancillary shop areas include shop offices, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack at this facility.

4.1.6 Springfield FMS

The unit and equipment from the Lebanon FMS recently transferred to Springfield, Oregon. The FMS is used primarily to repair equipment. The ancillary shop areas include shop offices, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack and one aboveground storage tank (AST) at this facility.

4.1.7 La Grande FMS

The FMS is located in LaGrande, Oregon. The FMS is used primarily to repair equipment. The ancillary shop areas include shop offices, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack and one AST at this facility.

4.1.8 Portland FMS

The FMS occupies 13.76 acres and is located in Portland, Oregon. The FMS is used primarily to repair equipment. The ancillary shop areas include shop offices, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack at this facility.

4.1.9 Tigard FMSS

The Field Maintenance Sub-Shop (FMSS) occupies 2.5 acres and is located in Tigard, Oregon. The FMSS is used primarily to train reserve mechanics, although full time employees are assigned to this facility. The ancillary shop areas include shop offices, tool room, flammable storage, battery room, mechanical room, custodial area and work bays. There is one wash rack at this facility.

4.1.10 Army Aviation Support Facility #1

The Army Aviation Support Facility (AASF) #1 occupies 20 acres and is located in Salem, Oregon. The AASF is used to provide aviation safety, aviators and crewmembers flight training, controls utilization and operation of assigned aircraft, and performs inspection, maintenance, repair, and modifications on fixed and rotary winged aircraft. The AASF #1 maintains aircraft in a readiness state to be used for training exercises, natural disaster relief, or combat. The facility has one aircraft wash rack and two ASTs.

4.1.11 Army Aviation Support Facility #2

The AASF #2 is located in Pendleton, Oregon. The AASF #2 provides aviation safety, aviator and crewmember flight training, controls utilization and operation of assigned aircraft, and performs inspection, maintenance, repair, and modifications on fixed and rotary winged aircraft. The facility is used to maintain aircraft in a readiness state to be used for training exercises, natural disaster relief, or combat. The facility has one aircraft wash rack and two ASTs.

4.2 Compliance Sites

4.2.1 Hazardous Waste Reduction

Camp Withycombe is currently the largest ORARNG hazardous waste generator, generating an average of 7,700 pounds of hazardous waste per month in calendar year (CY) 2005, of which, over 98 percent is generated at the OSMS. Reducing this amount to less than the 2,200 pounds

per month threshold would allow the installation to be considered a small quantity generator (SQG). However, due to the increased tempo of equipment rebuild being conducted at the OSMS, reduction of the amount of hazardous waste being generated is not feasible without changing the current technology. New technologies are evaluated to reduce the hazardous waste stream at the OSMS at Camp Withycombe in order to lower the generator status to a SQG.

Camp Rilea is currently the second largest ORARNG hazardous waste generator, generating an average of 500 pounds of hazardous waste per month in CY 2005. As such, it is considered a small quantity hazardous waste generator. Reducing this amount to less than the 220 pounds per month threshold would allow the installation to be considered a conditionally exempt small quantity generator (CESQG) of hazardous waste. Reduction of the current level of hazardous waste generation is not feasible in order to maintain operational tempo for this facility. Initiatives are in place to maintain the generator status and prevent it from becoming a large quantity generator (LQG).

All other facilities in the state are CESQGs of hazardous waste. Further reduction in the amount of hazardous waste generated at these facilities is not operationally feasible.

4.2.2 Hazardous Waste Reduction Initiatives

The ORARNG has implemented the P2 options in Table 4-1 at facilities across the state to reduce the generation of hazardous waste.

Table 4-1. P2 Initiatives Implemented to Reduce Generation of Hazardous Waste

P2 Plan Section	Project Name	Description	Facility
5.4.1	Aerosol Can Puncturer	Puncture empty aerosol cans to dispose as a recyclable metal rather than a reactive hazardous waste.	Camp Withycombe, Camp Rilea, Medford FMS, Springfield FMS, La Grande FMS, Salem AASF #1, Pendleton AASF #2, Salem FMS
5.4.2	Antifreeze Recyclers	Recycling antifreeze onsite to reduce cost of purchasing new ethylene glycol and quantity of used antifreeze generated.	Camp Withycombe, Camp Rilea, Springfield FMS, La Grande FMS, Portland FMS, Tigard FMS, COUTES
5.4.3	Aqueous Washer Better Engineering	Switch from petroleum-based to aqueous-based parts washing to reduce annual hazardous waste generation by 6,936 lbs per year.	Camp Withycombe, COUTES
5.4.4	Aqueous Washer Jet	Switch from petroleum-based to aqueous-based parts washing to reduce annual hazardous waste generation.	Camp Withycombe, Camp Rilea, COUTES, Salem FMS
5.4.5	Battery Acid/Lead Acid Exchange	Exchange lead acid batteries on a one-for-one basis with a commercial vendor to reduce total generation of lead acid batteries by 99% and reduce storage of sulfuric acid.	Camp Withycombe, Camp Rilea, Medford FMS, Springfield FMS, La Grande FMS, Portland FMS, Tigard FMS, COUTES

P2 Plan Section	Project Name	Description	Facility
5.4.6	Centralized HSMS	Centrally procure hazardous materials for activities post-wide allows materials to be purchased in bulk, reduces overall procurement cost, reduces the amount of shelf life expired wastes, and installation's overall hazardous waste disposal fees.	All maintenance shops that support units
5.4.7	Hot Pressure Washer	Allowed vehicles to be pressure washed at the vehicle wash rack prior to being moved to the maintenance bays, and eliminating the trailing of paints, oil, and lubricants (POLs).	Camp Withycombe, Camp Rilea
5.4.8	Laundry of Shop Rags	Commercial laundering of shop rags/coveralls was implemented as an Occupational Safety and Health Administrative (OSHA) measure to prevent contaminants from spreading outside of the work place. Commercial laundering increases the longevity of the rags/coveralls, and reduces the amount of rags/coveralls disposed and purchased.	All maintenance shops use laundered rags.
5.4.9	Oil Filter Crusher	Crushing used oil filters reduces the volume of the filters and allows metal recycling and recovery of used oil.	Camp Withycombe, Camp Rilea, Medford FMS, Springfield FMS, La Grande FMS, Portland FMS, Tigard FMS, COUTES, Salem FMS
5.4.10	Paint Gun Cleaner	Automatic washing units clean paint spray guns to reduce hazardous waste generation by approximately 167 pounds per year.	Camp Withycombe, Camp Rilea, COUTES
5.4.11	Propane Cylinder System	Remove the fill stem from a propane cylinder enabling the cylinder to be recycled as scrap metal. Savings of $150 per cylinder.	Camp Withycombe, Camp Rilea, Springfield FMS, La Grande FMS, Portland FMS, Tigard FMS, Salem AASF #1, COUTES, Salem FMS
5.4.12	Secondary Containment Structures	As required by the Spill Prevention Control and Countermeasure (SPCC) Plan for facilities with fuel hauling equipment, and 40 Code of Federal Regulations (CFR) 112.3 and OAR 340-047-0160, a secondary containment system is used to house fuel hauling assets to reduce the probability of a serious petroleum product release to the environment.	Camp Withycombe, Camp Rilea, Medford FMS, La Grande FMS, Portland FMS, Tigard FMS, Salem AASF #1, Pendleton AASF #2, COUTES, Salem FMS
5.4.13	Vehicle and Aircraft Washing	A Landa Alpha 3100D Water Maze coalescing filter system with an ozone generator to the wash rack discharge water to the OWS. Then, passes through the coalescing filter prior to discharge to the sanitary sewer system.	Camp Withycombe

P2 Plan Section	Project Name	Description	Facility
5.4.14	VOC Emissions	The paint booth is a fully enclosed Binks system equipped with dry filters and a manometer. The manometer measures differential pressure across the filters and indicates when filters require replacement. The facility is also equipped with a multi-media blasting system to remove oil paint from equipment surfaces. The new system is capable of using garnet, glass, and plastic blast medial. An attached cyclone unit will separate dry paint chips from blast media, allowing for reuse of the blast media.	Camp Withycombe
5.4.15	Weapons Cleaning System	Switching from petroleum-based to non-petroleum based weapon cleaning systems has reduced the annual hazardous waste generation.	Camp Withycombe, Camp Rilea, Medford FMS, Springfield FMS, La Grande FMS, Portland FMS, Tigard FMS, Salem AASF #1, Pendleton AASF #2, COUTES, Salem FMS
5.4.16	ZEP Parts Washer	Replace a hazardous waste solvent-based parts washer with a less hazardous petroleum based solution	Camp Withycombe, Camp Rilea, Springfield FMS, La Grande FMSS, Salem AASF #1, Pendleton AASF #2, COUTES, Salem FMS
5.4.17	Replace Batteries	Requires all users of alkaline batteries to procure battery-recharging devices and establish procedure to ensure that spent batteries are frequently recharged and that a minimal supply of charged batteries be available for emergencies.	Unknown

4.2.5 Permits

Several ORARNG facilities maintain permits for air and water sources. It is recommended that the permits be reviewed periodically to determine if the permitted source can be modified, replaced, or removed so that it no longer requires a permit.

4.2.6 Toxic Release Inventory Release Thresholds

None of the ORARNG facilities are required to submit a TRI under Superfund Amendments and Reauthorization Act, Title III, Section 313 reporting requirements.

4.2.7 EPA Priority Chemical Thresholds

None of the ORARNG facilities purchase materials above the EPA Priority Chemical Thresholds.

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Chapter 5
Hazardous Waste

5.1 Goal

The ORARNG hazardous waste reduction goal is to show a continual improvement in the rate of hazardous waste generated. Hazardous wastes include all wastes that fall under an EPA hazardous waste code and that require a hazardous waste manifest for disposal. Non-RCRA hazardous and universal wastes represent wastes that are not always considered hazardous under RCRA (i.e., used batteries, used antifreeze, used oil, PCBs, asbestos etc.), but must be managed separately from municipal solid wastes in accordance with Federal, state, and local regulations (i.e., 40 CFR 260-266, OAR 340.100-106, etc.).

5.2 Baseline and Progress

The ORARNG hazardous waste goal is continuous reduction. Table 5-1 compares CY 2005 hazardous waste and non-hazardous waste generation rates for all ORARNG facilities to a baseline year of 2000. Since the mission at the OSMS in Camp Withycombe is different then the other ORARNG facilities, the waste generation totals are separated, if known. As shown in the table below, the ORARNG has made an effort to reduce the amount of hazardous waste, but the OSMS generates the majority of the waste for the ORARNG.

Table 5-1. Total Waste Generated at all ORARNG Facilities

Waste Type	Baseline Year[1] 2000 (lbs)	Comparison Year 2005 (non-OSMS) (lbs)	Comparison Year 2005 (OSMS) (lbs)	Comparison Year 2005 Total (lbs)
Hazardous	47,716	15,688	86,634	102,322
Non-hazardous	8,568	55,239[2]	1,869	57,108
Universal[3]	Not established	8,685	1,258	9,943

1. Obtained from 2001 P2 Plan.
2. Approximately 43,910 pounds of non-hazardous wash rack sludge was removed in CY 2005.
3. Universal waste total includes all used batteries and fluorescent lamps.

Table 5-2 identifies the facilities that generate hazardous waste, which includes universal waste, in CY 2005. ORARNG facilities that are a CESQG of hazardous waste may transport its hazardous waste to another facility within the ORARNG, as long as they ensure delivery. Therefore, the disposal quantity for some facilities, as noted in Table 5-2, may include waste generated at a nearby CESQG facility.

The OSMS at Camp Withycombe generates the most hazardous waste of all of the ORARNG facilities. Used bead blast material and OWS sludge are the largest hazardous waste streams at 57,120 lbs and 20,528 lbs respectively. Other waste streams generated at the OSMS include paint, radiator tank pump out, snail trap, used filters, image intensifier, solvent and universal

waste batteries and lamps. The remaining facilities at Camp Withycombe generate 4,703 pounds of waste, which includes paint, aerosol cans, used fuel filters, used parts washer, and universal waste batteries and lamps.

Camp Rilea generated 1,320 lbs of OWS sludge waste and 2,140 pounds of waste oil pump out. The waste oil pump out was a one time event after shop personnel mistakenly poured hazardous material into the tank. Other types of waste generated during CY 2005 included lead, waste paint, used filters, expired paint, solvent, absorbent and universal waste lamps and batteries. Other types of waste generated during CY 2005 include absorbents with JP-8, universal waste batteries, and lamps.

Waste generated at the units or readiness centers that are not collocated with a maintenance activity are authorized to self-transport hazardous waste to their supporting maintenance shop. Waste generated at some maintenance shops are picked up by a Defense Reutilization and Marketing Office (DRMO) contractor.

Table 5-2. Hazardous Waste Disposal by ORARNG Facilities for CY 2005

Generator	Pounds[1]
OSMS at Camp Withycombe	87,892
Camp Rilea[2]	8,480
Camp Withycombe	4,703
Salem AASF #1[2]	3,871
Portland FMS[2] and Kliever	2,615
Lebanon FMS[2, 3]	1,244
Salem FMS[2]	885
COUTES[2]	588
Pendleton AASF and Pendleton	326
McMinnville	283
Coos Bay	210
Eugene Readiness Center	210
Forest Grove	210
Ashland	210
Roseburg	210
La Grande FMS[2]	178
Bend	150
TOTAL	**112,265**

1. Data provided by OMD, AGI-E, and includes universal waste totals (lamps/batteries)
2. Disposal quantity may include waste generated at nearby CESQG facilities.
3. The Lebanon FMS transferred to the Springfield FMS in 2006.

The total CY 2005 weight of the common waste streams generated at the ORARNG facilities are summarized in Table 5-3. The values in parenthesis designate non-hazardous or universal waste amounts. The filters waste stream include used mask filters, used oil filters, fuel filters, used parts washer filters, and used JP-8 filters. The paint waste stream does not include expired paint, but does include paint booth filters, used paint and paint thinner. The batteries are considered universal waste, but are tracked as hazardous waste.

Table 5-3. Quantity of Common Waste Streams by ORARNG Facility in CY 2005

Location	Waste Streams (pounds per year)						
	Bead blast media	OWS Sludge	Paint	Filter	Lead Debris	Used Antifreeze	Batteries
Camp Withycombe (not including OSMS) in Clackamas	---	(12,800)	623 (3)	328	---	---	(3,491)
OSMS at Camp Withycombe in Clackamas	57,120	20,528	3,435	410 (299)	---	---	(721)
State Maintenance at Camp Withycombe					210		
Camp Rilea in Warrenton	---	1,320 (1,460)	361 (400)	410 (400)	456[1]	250	(1,461)
Medford FMS	---	(160)	---	---	---	---	---
Lebanon FMS[2]	---	---	160	---	789	1,294	(74)
COUTES in Redmond	---	(16,630)	---	---	588	---	---
La Grande FMS	---	(11,300)	---	47	---	---	(30)
Portland FMS	---	320	394 (386)	12	---	---	(676)
Tigard FMSS	---	---	---	---	---	---	---
Salem FMS	---	---	177	60	---	---	(110)
Salem AASF #1	---	1,550	9	225 (152)	---	315	(1,213)
Pendleton AASF #2	---	---	---	20	140	---	---
Pendleton	---	---	---	---	150	---	---
McMinnville	---	---	---	---	210	---	(73)
Eugene	---	---	---	---	200	---	---
Forest Grove	---	(1,560)	---	---	210	---	---
Bend	---	---	---	---	150	---	---
Coos Bay	---	---	---	---	210	---	---
Roseburg	---	---	---	---	210	---	---
Kliever	---	---	---	---	210	---	---
Total Hazardous Waste	**57,120**	**23,718**	**5,159**	**1,512**	**3,733**	**1,859**	**0**
Total Non-hazardous or Universal Waste	**0**	**43,910**	**789**	**851**	**0**	**0**	**7,849**

1. Lead debris at Camp Rilea is generated at the nearby ORARNG CESQG facilities.
2. The Lebanon FMS transferred to the Springfield FMS in 2006.

The three largest waste streams generated by the ORARNG are bead blast media, OWS sludge, and lead debris. The OSMS is the largest generator of hazardous waste OWS sludge, and the only generator of bead blast media; P2 opportunities for these waste streams are evaluated in Appendix C. Camp Rilea is the second largest generator of hazardous waste OWS sludge; P2 opportunities for these waste streams are evaluated in Appendix D.

5.3 Description of Major Hazardous Waste Streams

Table 5-4 lists the largest CY 2005 hazardous waste, universal waste, and non-RCRA hazardous waste streams generated at the ORARNG, excluding the OSMS located at Camp Withycombe, which is summarized in Table 5-5.

Table 5-4. Largest ORARNG (non-OSMS) waste streams for CY 2005[1]

Waste Types[2]	Name	Pounds
HW	Lead debris	3,733
HW	OWS wash rack sludge (hazardous)	3,190
HW	Waste oil pump out[3]	2,140
HW	Paint	1,513
HW	Solvent	600
HW	Filters, JP-8	598
HW	Paint, expired	477
HW	JP-8	320
HW	Roof coating	280
HW	Filters, fuel	265
HW	Filters/Absorbent pad, JP-8	225
HW	CLP	213
HW	Lead debris with water	200
HW	Hydraulic FRH w/barium	200
HW	Aerosol paint residue	160
HW	Absorbent with JP-8	150
HW	Dry Cleaning Solvent (hazardous)	144
HW	Aerosol cans	110
HW	Gasoline	101
HW	Lead weights	100
	Total	**14,719**
UW	Batteries, Alkaline	4,149
UW	Lamps, Fluorescent	1,582
UW	Batteries, Lithium	1,049
UW	Batteries, NiCad	867
UW	Batteries, Lead-acid	861
UW	Lamps, Sodium	261
UW	Batteries, Magnesium	112
UW	Batteries, Silver	50
UW	Lamps, HID	35
UW	Batteries, Alkaline/Mercury	15
UW	Lamps, Halide	10
	Total	**8,991**

Waste Types[2]	Name	Pounds
Non-RCRA HW	OWS wash rack sludge (non-hazardous)	43,910
Non-RCRA HW	Contaminated soil with oil (non-hazardous)	3,261
Non-RCRA HW	Used Antifreeze	1,859
Non-RCRA HW	Hydraulic fluid with soil and gravel	1,553
Non-RCRA HW	Paint, Latex	789
Non-RCRA HW	Contaminated soil with JP-8 (non-hazardous)	602
Non-RCRA HW	Grease	548
Non-RCRA HW	Filters, oil	400
Non-RCRA HW	PCB	256
Non-RCRA HW	ZEP Solvent	254
Non-RCRA HW	Absorbent with paint	224
Non-RCRA HW	Floor sweep with oil	211
Non-RCRA HW	Filters, parts washer	152
Non-RCRA HW	Contaminated soil, with diesel (non-hazardous)	150
Non-RCRA HW	Rags, Weapon cleaning (non-hazardous)	135
Non-RCRA HW	Kitchen grease/expired	134
Non-RCRA HW	Asbestos brake shoes	121
Non-RCRA HW	Dirt with debris	104
Non-RCRA HW	Carbon Removing Compound	100
Non-RCRA HW	Dry Cleaning Solvent (non-hazardous)	80
Non-RCRA HW	Absorbent with dirt	70
	Total	**54,913**

1. Data provided by OMD, AGI-E.
2. HW = Hazardous Waste, UW = Universal Waste, CLP = Cleaner, Lubricant, and Protectant, HID = High Intensity Discharge, PCB = Polychlorinated Biphenyls
3. Emergency waste oil pump out at Camp Rilea due to operator error.

Lead debris, waste oil pump out, and OWS wash rack sludge are the largest hazardous waste streams generated at ORARNG facilities, not including the Camp Withycombe OSMS; whereas, OWS wash rack sludge is the largest non-RCRA hazardous waste generated. The waste oil pump out is not a regular waste stream. Personnel added a non-waste oil product to the tank, so the entire waste oil tank was pumped out.

In CY 2005, the sludge from OWS wash racks at all applicable facilities were pumped at a higher frequency than previous years. The sludge at most facilities primarily tests as non-hazardous; however, the sludge at the OSMS consistently contains high levels of cadmium, and the sludge at Camp Rilea occasionally contains high levels of cadmium, so it is managed as a hazardous waste. P2 opportunities for these waste streams are discussed in Appendix C and D as part of the *Camp Withycombe and Camp Rilea Toxic Use and Hazardous Waste Reduction Plan*.

The OSMS at Camp Withycombe has unique operations as compared to the other ORARNG facilities. The top hazardous waste, non-RCRA hazardous waste, and universal wastes streams generated at the OSMS are listed in Table 5-5.

Table 5-5. Largest OSMS Hazardous waste streams for CY 2005[1]

Waste Types	Name	Pounds
HW	Bead blast	57,120
HW	OWS Wash rack sludge (hazardous)	20,528
HW	Radiator tank pump out	2,240
HW	Paint	2,052
HW	Snail trap	1,138
HW	Paint booth filters	1,108
HW	Image Intensifiers	1,007
HW	Alkaline Cleaner	548
HW	Filters, fuel	293
HW	Paint thinner	275
HW	Filters, parts washer	193
HW	Ether cylinder	51
HW	Solvent	40
HW	Epoxy with MEK	26
HW	Sulfuric Acid	15
	Total	**86,634**
UW	Batteries, NiCad	640
UW	Lamps, Fluorescent	537
UW	Batteries, Alkaline	81
	Total	**1,258**
Non-RCRA HW	Bead blast-Elect (non-hazardous)	724
Non-RCRA HW	Solvent	400
Non-RCRA HW	Filters, oil	299
Non-RCRA HW	Absorbent with fuel	246
Non-RCRA HW	Grease	200
	Total	**1,869**

1. Data provided by OMD, AGI-E.

Hazardous waste generation for the OSMS is further evaluated in Appendix C. The evaluations of P2 projects for two hazardous waste streams (bead blast media and OWS sludge) are available in Section 3 of Appendix C, *Camp Withycombe Toxic Use and Hazardous Waste Reduction Plan*.

5.4 Current P2 Initiatives

The P2 initiatives summarized in this section were evaluated in the 2001 ORARNGR 210-4 Pollution Prevention Plan and are also summarized in tables located in the Executive Summary and Table 4-1 P2 Initiatives Implemented to Reduce Generation of Hazardous Waste.

5.4.1 Aerosol Can Puncturer

Description: Aerosol can residues are mainly paints and lubricants. The DEQ considers an aerosol can a reactive hazardous waste until the can has been punctured. If the contents are thoroughly depleted, the can may be recycled as scrap metal instead of as a hazardous waste.

Environmental Evaluation: The aerosol can puncturer ranges from manually operated single can puncturers to more sophisticated puncturers/crushers with pre-loaders. The devices puncture and empty cans in compliance with EPA requirements and also collect or filter propellants to meet most state air emission standards. Aerosol can residues are mainly divided into paints and lubricants, with dedicated drums for each. Propellant filters must be changed periodically depending on the unit. Savings in disposal costs are significant as empty steel cans are sold for scrap metal recycling.

Economic Evaluation:

> **Implementation Costs**: The implementation costs associated with this initiative varies from $577 to $903 and the equipment typically pays for itself in less than two years.
> **Recurring Costs**: Replacement of combination filters averages $203.65 annually with this initiative, if filters are replaced every other year.
> **Recurring Cost Savings**: Savings result from reduced labor requirements as well as disposal of empty aerosol cans. These costs total $1,725.
> **Payback Period**: The payback period is calculated by dividing implementation cost by the net cost savings as follows: $577/ ($1,725-$203.65) = 0.379 years

Implementation Status: This initiative has been approved as a valid project and has reduced waste generation by approximately 1,800 pounds of empty aerosol cans.

5.4.2 Antifreeze Recycling

Description: The three main reasons for recycling used antifreeze are to conserve our natural resources, reduce the cost of new antifreeze purchases, and reduce both the cost and problems associated with used antifreeze disposal. The latter reason is becoming a stronger impetus for recycling due to the increasing trend of Federal, state and local governing agencies enacting more restrictive legislation on environmental protection matters. Antifreeze recycling filters and cleans used antifreeze so that it may be reused in vehicles and delays the disposal of antifreeze as hazardous waste. Recycling antifreeze significantly reduces the quantity of new antifreeze procured.

Environmental Evaluation: Recycling of spent antifreeze solutions is a viable alternative to disposing of these products, which may be considered hazardous due to the toxicity of the ethylene glycol component, the toxicity of the products of degradation/oxidation of ethylene glycol, and/or the heavy metals content. Recycling antifreeze is a cost effective alternative to disposal. All units produce waste either in the form of sludge or spent filters.

Economic Evaluation: Minimize the quantity of spent antifreeze (glycol) that must be disposed of and the potential for spills to the environment. Reduce requirement for procurement of new antifreeze.

> **Implementation Costs:** The implementation costs associated with this initiative is $3,332 and the equipment typically pays for itself in less than two years.
> **Recurring Costs:** Recurring costs average $300 year for antifreeze additives.
> **Recurring Cost Savings:** Savings result from reduced labor requirements as well as disposal of used antifreeze contaminated with oils and heavy metals. These costs total $2,536.
> **Payback Period:** The payback period is calculated by dividing implementation cost by the net cost savings as follows: $3,332 / ($2,536-$300) = 1.49 years

Implementation Status: This initiative has been approved as a valid project.

5.4.3 Aqueous Washer Better Engineering™

Description: The Better Engineering Impulse II Parts Washer is a portable, caster-mounted, top loading cleaning cabinet with spray nozzles along the interior walls and ceiling that blast an environmentally safe detergent in an aqueous solution onto non-critical soiled parts that would ordinarily require hand detailing. The parts to be cleaned are placed on a rotating turntable in the unit. The system is entirely closed-loop, and no water is discharged. The combination of high temperature and strong blast pressure enables the washer to remove contaminants from the parts.

Environmental Evaluation: Aqueous parts washers use biodegradable detergent solutions to remove dirt, grime, oil and grease from a variety of parts. This eliminates the costly purchase and disposal of solvents. The purifying/recycling closed-loop washers with oil skimmers and filters can reuse the same detergent solution over and over, further minimizing operating costs.

Economic Evaluation: Reduce labor time to clean parts. Replace the use of a hazardous solvent with a biodegradable solvent. Realize cost savings in labor, materials, handling, and disposal of hazardous waste. Reduce quantity and toxicity of waste stream.

Implementation Status: This initiative has been approved as a valid project.

5.4.4 Aqueous Parts Washer Jet

Description: Until 1999, many activities at the installation used solvent-based parts-washing units to remove dirt, oil, and grease from various types of small parts. The solvent was a petroleum-based, PD680 type II solvent that periodically became laden with contaminants and had to be changed. The new washers use a less-hazardous aqueous solution to remove oils, dirt, and grease from parts. In addition, microbes are suspended in the aqueous solution of the new washer systems. Although the microbes do not play a role in helping remove dirt and grease from parts, they serve to greatly extend the life of the aqueous solution by producing enzymes that biodegrade the oil and grease that gets washed off of the parts. The microbes feed off of the oil and grease, thereby removing it from the solution. In addition, these units are also equipped with filters to remove particulate (which is not consumed by the microbes) from the solution. By keeping the solution free of these contaminants (oil, grease, dirt), its life is greatly extended, allowing it may be used for much longer periods than petroleum-based solvent. The need to

remove and replace the cleaning fluid is then reduced which, in turn, decreases the amount of waste fluid generated.

Environmental Evaluation: Because the solvent in this type of parts washing unit is an aqueous solution, it contains neither volatile organic compounds (VOCs) nor hazardous air pollutants (HAPs). Therefore, this solution does not introduce such compounds into the environment as it evaporates. In addition, because the solvent solution is continuously cleaned through microbial digestion and filtration, it does not have to be changed as often. This has reduced waste generation by about 220 lbs of used oil and grease per year per parts washing unit. Replacing six washing units has reduced annual waste generation by 1,320 lbs per year.

Economic Evaluation:

Implementation Costs: $18,921.00 (6 aqueous washers at $3,153.50 each)
Recurring Costs: $1,082 per year per unit
Recurring Cost Savings: $2,512 per year per unit
Payback Period: 1.958 years

Implementation Status: This initiative has been approved as a valid project.

5.4.5 Battery Acid/Lead-Acid Batteries from Vehicle Maintenance

Description: Lead-acid batteries have a lead anode, a lead dioxide cathode, and an aqueous sulfuric acid electrolyte. The battery cell contains 60 to 75 percent lead and lead oxide, by weight, and the electrolyte contains between 28 and 51 percent sulfuric acid, by weight. Lead-acid batteries are being exchanged on a one-for-one basis with a commercial vendor.

Environmental Evaluation: Lead-acid batteries that are recycled are excluded from facilities monthly totals of hazardous waste generated (40 CFR 261.5). Therefore, recycling may help facilities reduce their generator status and lessen the amount of regulations (i.e., recordkeeping, reporting, inspections, transportation, accumulation time, emergency prevention and preparedness, emergency response) they are required to comply with under RCRA, 40 CFR 262.

Economic Evaluation: Potential monetary compensation from purchase of lead-acid batteries by recycler and meeting state requirements regarding the ban of disposing lead-acid batteries in landfills.

Implementation Costs: None
Recurring Costs: $720 labor per year
Recurring Cost Savings: approximately $18,000.00
Payback Period: N/A

Implementation Status: This initiative has been approved as a valid project.

5.4.6 Centralized Hazardous Substance Management

Description: The Hazardous Substance Management System (HSMS) has been established to serve as a centralized point for hazardous material procurement, tracking, and management. The support maintenance shop is the centralized point, so units usually coordinate with their support maintenance shop to obtain POL products. Due to the geographical location of the various facilities within Oregon, one centralized HSMS is not practical.

Environmental Evaluation: The reduction of fewer quantities of excess, expired and unserviceable hazardous materials means less hazardous waste. This benefit helps facilities meet the requirements of waste reduction under RCRA, 40 CFR 262, and may also help facilities reduce their generator status and lessen the amount of regulations (i.e., recordkeeping, reporting, inspections, transportation, accumulation time, emergency prevention and preparedness, emergency response) they are required to comply with under RCRA, 40 CFR 262. In addition, a centralized hazardous materials program will decrease the amount of hazardous materials purchased and stored on site (since the facility will know inventory is on hand) therefore, decreasing the possibility that the facility would meet any of the reporting thresholds of SARA Title III (40 CFR 300, 355, 370, and 372; and EO 12856). A centralized hazardous materials program may also decrease the amount of oil stored on site below threshold amounts for the requirement to develop and implement a SPCC Plan under 40 CFR 112.

Economic Evaluation: Centrally procuring some hazardous materials for activities statewide allows such materials to be purchased in bulk. This reduces the overall cost of hazardous material procurement. In addition, reducing the amount of shelf-life expired wastes will reduce the installation's overall hazardous waste disposal fees. Because of funding issues, other hazardous materials are procured by the individual activities.

Implementation Status: This initiative has been approved as a valid project.

5.4.7 Hot Pressure Washer

Description: Purchase of a hot pressure washer replaced the previous method of removing large automotive components from vehicles and transporting them to the wash rack.

Environmental Evaluation: Use of a hot pressure washer prevents oil and other automotive fluids from dripping onto the bay floors and leaving a trail of contaminated soil from the bay to the wash rack. Replacing the current method of large parts cleaning has reduced the amount of contaminated soil and media generated per year.

Economic Evaluation:

> **Implementation Costs:** The implementation cost associated with this initiative is $3,867.
> **Recurring Costs:** Annual costs associated with replacement parts and utilities are $120 per year.
> **Cost Savings:** Savings result from reduced cleanup requirements since equipment is washed in place. An average cost for the cleanup of a small spill would be $350. The estimated cost savings is $2,525.
> **Payback Period:** The payback period is calculated by dividing implementation cost by the net cost savings as follows: $3,867 / ($2,525-$120) = 1.60 years

Implementation Status: This initiative has been approved as a valid project.

5.4.8 Laundry of Shop Rags and Coveralls

Description: Towels are routinely used for shop maintenance to replace typical baled rags. A contractor delivers new towels when ordered, and replaces hazardous material-soaked towels with clean towels within EPA guidelines. By using these contracts, activities reduce the procurement cost and eliminate disposal costs associated with performing maintenance using baled rags. A contractor delivers new towels when ordered, replaces dirty towels with clean towels, and launders the dirty towels within EPA guidelines.

Environmental Evaluation: By using the rag laundry service, activities eliminate procurement and disposal costs associated with baled rags.

Economic Evaluation: This program eliminates the need for disposal of contaminated shop rags as hazardous waste.

Implementation Status: This initiative has been approved as a valid project.

5.4.9 Oil Filter Crusher

Description: Crushed oil filters can be sold as scrap metal if the following criteria are met: the filters are not terne lined, have not been mixed with hazardous waste and have been gravity hot drained. Hot draining requires puncturing the dome end of the filter and allowing it to drain before crushing. Gravity draining may include dismantling the filter or any other method that drains free-flowing oil from the filter. Oil filter crushers hydraulically puncture and crush filters to reduce waste volume and collect free-flowing oil in a drum for disposal or recycling.

Environmental Evaluation: Oil filter crushing and emptying helps eliminate the cost and liability associated with hazardous waste disposal, minimizes the volume of waste disposed, and creates useful steel products through recycling.

Economic Evaluation: Oil filter crushers eliminate the disposal cost of used oil filters.

> **Implementation Costs:** The implementation costs associated with this initiative is $3,988.80 for each oil filter crusher; 12 at $3,988.80 each equal $47,865.60.
> **Recurring Costs:** The average costs of utilities to implement this initiative are $48 annually.
> **Cost Savings:** Savings result from the recycling of oil filters and used oil rather than the disposal of oil filters. These costs total $1,935.50 per year.
> **Payback Period:** The payback period is calculated by dividing implementation cost by the net cost savings as follows: $3,988.80 / ($1,935.50-$48.00) = 2.11 years

Implementation Status: This initiative has been approved as a valid project.

5.4.10 Paint Gun Cleaners

Description: Automatic paint gun washing units can replace the usual method of disassembling paint guns, manually cleaning them with solvent, and reassembling them. Automatic gun washers are equipped with a solvent reservoir, an enclosed washing sink, and a solvent recirculation pump. With these units, painters attach the assembled spray guns to washing nozzles located inside the sink. They then close the lid and start the automatic washing process. The washing unit continuously flushes solvent through the inside of the spray gun as well as over the outside surface, cleaning the entire gun in one step. The entire process takes about 5 minutes, while manual cleaning requires at least 20 minutes. The solvent within the cleaning unit is repeatedly reused until it becomes too dirty to be effective. Then it is removed and replaced with new solvent.

Environmental Evaluation: The self-contained Inland Technology IT-100 paint gun washer allows the recovery of spent paint so it can be reused. The purchase of four paint gun cleaners has reduced solvent waste generation by 1,198 lbs per year.

Economic Evaluation: The paint gun washer dramatically reduces labor required to clean paint guns, as well as solvent procurement and disposal.

Implementation Costs: $10,722.20 (4 paint gun cleaners at 2,680.55 each)
Recurring Costs: $530 per unit per year
Recurring Cost Savings: $3,810 per unit per year
Payback Period: 0.7759 years

Implementation Status: This initiative has been approved as a valid project.

5.4.11 Propane Cylinder System

Description: The propane cylinder recycling system safely removes the valve stem so the canister can be recycled as scrap steel. The disposal rate for propane bottles that aren't entirely empty is between $150 and $250 each, depending on the size. Once the valve stem has been removed and the propellant has been released, the cylinder becomes "recyclable" steel and is not subject to disposal fees.

Environmental Evaluation: The DEQ considers a compressed gas cylinder a reactive hazardous waste until the cylinder stem is removed or the cylinder is punctured. Activated carbon filters in the system help remove VOCs from the propellant.

Economic Evaluation:

Implementation Costs: $8,369.28 (12 propane cylinder systems at $697.44 each)
Recurring Costs: The average costs of recovered solvents are $12 - 19 per unit per year
Recurring Cost Savings: Savings resulting from the recycling of propane cylinders rather than disposal is $7,450 per unit per year
Payback Period: 0.0994 years or $697.44 / ($7,450 - $19) = 0.093 years

Implementation Status: This initiative has been approved as a valid project.

5.4.12 Secondary Containment Structures

Description: This initiative provides secondary containment structures as required by the SPCC Plan for the facility and 40 CFR 112.3 and OAR 340-047-0160, such structures include containment for drums or refueling trucks.

Environmental Evaluation: Secondary containment structures reduce/eliminate the possibility of spills reaching the environment and any associated clean up or restoration activities associated with potential spills.

Economic Evaluation: This initiative will reduce the amount of spilled materials that are released to the environment, reduce cleanup costs, and ensure continued compliance with 40 CFR 112.

> **Implementation Costs:** The implementation costs associated with this initiative range from $3,528 to $25,733. This equipment typically has an extensive payback period, but is required by regulation.
> **Recurring Costs:** There are no significant recurring costs associated with this initiative.
> **Recurring Cost Savings:** Savings result from reduced cleanup requirements. Since spills are unpredictable, an estimate of cost savings is not available. An average cost for the cleanup of a small spill is estimated at $350.00.
> **Payback Period:** The payback period is calculated by dividing implementation cost by the net cost savings as follows: $25,733 / ($350-$0) = 73.522 years

Implementation Status: This initiative has been approved as a valid project.

5.4.13 Vehicle and Aircraft Washing; Landa Oil/Water Separator System

Description: Aircraft and vehicle washing operations generate large quantities of wastewater containing free and emulsified oils, detergents, heavy metals, suspended solids, and other contaminants. Management of wash rack wastewater varies from activity to activity. However, the most prevalent practice used involves treatment with an oil/water separator (OWS) prior to discharging into a sanitary sewer. This practice is not recommended due to the emulsified oils generated by the detergents and heavy metals found in the waste stream. Conventional OWSs do not effectively remove dissolved metals and emulsified oils that are commonly found associated with this activity.

A closed loop wash rack wastewater recycling system offers ORARNG activities an alternative that can achieve compliance with discharge limits while reducing water and detergent usage. As environmental regulations continue to set more stringent discharge limits for wastewater contaminants, recycling becomes even more lucrative since regulatory agencies grant permitting exemptions to activities that recycle wastewater on-site.

The wash rack is equipped with a Landa Alpha 3100D Waster Maze coalescing filter system with an ozone generator. Wash water will discharge to the OWS, and then pass through the coalescing filter prior to discharge to the sanitary sewer system. The Landa is an in-line filtration system, but does not have water recycling and storage capability.

Environmental Evaluation: Use of a closed loop wash rack recycle system complies with EOs 13123 and 13148 requiring Federal facilities to implement water conservation projects and to reduce offsite hazardous waste disposal. Closed loop wash rack recycle systems also keep activities in compliance with local discharge requirements.

- Complies with discharge requirements.
- Reduces annual quantity of water used to wash vehicles, equipment, and aircraft.
- Reduces annual detergent used to wash vehicles, equipment, and aircraft.
- Reduces loading on wastewater treatment plants.

Economic Evaluation: Closed loop wash racks are specifically sized to meet the needs of the facility. System design varies on the number and types of vehicles, equipment, and/or aircraft washed at the specific facility. Consequently, the purchase, installation, and operation cost of a closed loop system varies significantly from activity to activity. The following illustrates the fixed costs and recurring costs for the Navy's closed loop system as described in the overview section. Costs based on an estimated 500,000 gallons of wastewater generated in one year.

Implementation Costs: Approximately $100,000
Recurring Costs: Approximately $18,800
Recurring Cost Savings: Not evaluated
Payback Period: 2-7 years

Implementation Status: This initiative has been approved as a valid project.

5.4.14 VOC Emissions from Painting/Scrubber Sludge from Paint Booths/Cleanup Solvent from Painting

Description: The paint booth is a rear-draft system where air, VOC emissions, and paint mists are drawn through filters in the back wall. High volume low pressure (HVLP) paint guns are used for more efficient application of paint, reduction of paint over spray, and reduction of VOC emissions. Paint guns and pots are cleaned using a Safety Kleen Model 1107-paint gun cleaning system. Paint-related wastes are disposed through the Safety Kleen contract.

The paint booth is a fully enclosed Binks system equipped with dry filters and a manometer. The manometer measures differential pressure across the filters and indicates when filters require replacement. The facility is also equipped with a multi-media blasting system to remove oil paint from equipment surfaces. The new system is capable of using garnet, glass, and plastic blast media. An attached cyclone unit will separate dry paint chips from blast media, allowing for reuse of the blast media. Paint residue will be sampled and analyzed to determine proper disposal.

Environmental Evaluation: The waste stream generated in a dry filter paint booth is a spent filter laden with paint booth particulate emissions. No other media is contaminated during the collection of the particulate waste; hence the quantity of waste generated is minimized. For instance, when using lead or zinc chromate paints, the dry filter can eliminate approximately 50 to 90 percent of the hazardous waste as compared to a water curtain spray paint booth. The removal and replacement of the spent filters is a simple procedure. The method for disposal of

the spent filters will depend on the particular constituents of the paint used. Many facilities now segregate operations involving hazardous and non-hazardous painting into separate paint booths in order to expedite waste handling and disposal.

Economic Evaluation:

Implementation Costs: Approximately $100,000
Recurring Costs: Approximately $18,800
Recurring Cost Savings: Not evaluated
Payback Period: 2-7 years (estimated)

Implementation Status: This initiative has been approved as a valid project.

5.4.15 Weapons Cleaning System

Description: The Inland Technology IT-48WC Weapons Cleaning System is a high volume usage system that recycles Breakthrough™ solvent continuously through a high efficiency filtration system.

Environmental Evaluation: Breakthrough™ is a state of the art solvent designed to help users break out of the tangle of regulations regarding emissions, disposal, and industrial health hazards. Breakthrough™ is a virtually odorless, low toxicity, high-purity hydrocarbon that exhibits a very low degree of irritancy to the eyes and is non-irritating to the skin. Breakthrough™ has low vapor pressure to control VOC emissions, in non-photochemically reactive, non-carcinogenic and is exempt from SARA, Title III, Sections 302 or 313, CERCLA, and RCRA requirements. Also worker exposure is not regulated by the OSHA Z-list, and Breakthrough™ has no listed components and no characteristics of hazardous waste per EPA.

The implementation of this initiative has reduced the amount of used solvent and filters by about 1,642 lbs per year.

Economic Evaluation:

Implementation Costs: $51,578.10 (14 weapon cleaning systems at $3,684.15 each)
Recurring Costs: $125 each per year
Recurring Cost Savings: $2,031 each per year
Payback Period: 1.9213 years

Implementation Status: This initiative has been approved as a valid project.

5.4.16 ZEP Parts Washers

Description: This system uses a petroleum-based solvent rather than a citrus-based solvent. Reasons cited were the cleaning capability of petroleum-based solvents are less irritable to some employees than citrus-based products.

Environmental Evaluation: The solvent does not require change out from the parts washer; therefore, the solvent is not a hazardous waste stream. Due to evaporation, small quantities of new solvent are added, as required. The system uses a 3-phase filtering system:

a) The first filtration process consists of a filter cartridge and housing located on the side of the parts washer. This filter removes any larger particles or residue that has not settled to the bottom of the parts washer solvent reservoir. These filters are replaced approximately every three to four weeks.

b) A secondary filter process is used when the operator determines that the solvent is dirty and is losing its cleaning capabilities. The solvent gets darker in color due to the presence of oil in the solvent. Before leaving the shop for the evening, a Dyna Trap filter is hooked up and the parts washer is left running for the evening. Upon arrival at the shop the following morning, the operator unhooks the filter from the system and changes the cartridge filter on the side of the parts washer. These filters are reused and last approximately six months.

c) The third filtration process in the Dyna Reclaim filter, which is used on a three month interval, right after the Dyna Trap filter process. The Dyna Reclaim filter is hooked up to the system overnight to make a final complete cleaning and revitalizing of the solvent. These filters are replaced approximately once per year.

The final process of the ZEP system is removal of the sludge from the system. On an annual or biannual basis, the sludge is collected from the bottom of the solvent reservoir. This sludge must be tested and will probably be characterized as a hazardous waste due to heavy metals from the parts cleaning process itself.

This has reduced waste generation by about 730 lbs of used solvent per year per parts washing unit. Replacing the 27 washing units throughout the state has reduced annual waste generation by 19,730 pounds per year.

Economic Evaluation:

Implementation Costs: $33,000 (27 ZEP parts washers at $1,222 each)
Recurring Costs: $9,450
Recurring Cost Savings: $10,550
Payback Period: 3.152

Implementation Status: This initiative has been approved as a valid project.

5.4.17 Rechargeable Alkaline Batteries

Description: Most units and activities with equipment requiring small standard sized batteries (AAA through D-cells) on the installation dispose of their alkaline batteries as a universal waste. To minimize this waste stream, activities could begin using rechargeable alkaline batteries. Since they are rechargeable, these batteries have a much longer life than traditional alkaline batteries. Using these batteries would therefore reduce the frequency at which batteries are changed and would, in turn, reduce the amount of used batteries being disposed. Renewable batteries are available in sizes AAA through D-cells, as well as other specialty sizes such as 6V and 9V.

Implementing this alternative would require all users of alkaline batteries to procure battery-recharging devices. It would also involve each unit to establish a procedure to ensure that spent

batteries are frequently recharged and that a minimal supply of charged batteries be available for emergencies.

Environmental Evaluation: Rechargeable alkaline batteries can be expected to last at least 25 times as long. Waste generation records indicate that the installation disposes of about 3,566 lbs of used alkaline batteries per year. Assuming that the rechargeable batteries can last 25 times longer, fully implementing this initiative could reduce battery disposal from 3,566 lbs to 143 lbs per year for a net reduction of 3,423 pounds.

Economic Evaluation:

Implementation Costs: Initial costs for this initiative include purchasing rechargeable alkaline batteries as well as recharging equipment. Implementation costs total $24,570.

Batteries: As described above, the installation generates about 3,566 lbs of used alkaline batteries per year. Assuming an average of 2.7 alkaline batteries per pound, annual battery use is 9,628 batteries. At an average purchase cost of $2.50 per rechargeable battery, purchasing 9,628 batteries costs $24,070.

Rechargers: Units/activities using these batteries would need to purchase a number of recharging units depending on the types and quantities of batteries they use. These devices typically cost about $25 each and a unit would probably need about two rechargers. An estimated 10 units/activities (based on disposal records) would be qualified candidates for using renewable alkaline batteries. This would bring the total implementation cost to $500 for the entire installation.

Recurring Costs: Recurring costs will result from having to periodically buy new rechargeable batteries and dispose of unusable ones. These costs are approximately $1,060 per year.

Battery Purchase: Renewable alkaline batteries typically cost about three times as much as regular non-rechargeable alkaline batteries. However, as described above, they can be expected to last at least 25 times as long. As such, fully implementing this initiative could reduce the 9,628 batteries per year to 385 per year. At an average cost of $2.50 per rechargeable battery, purchasing 385 rechargeable batteries per year would cost $963.

Battery Disposal: Disposing of 385 rechargeable batteries equates to about 143 lbs of waste. The installation waste generation records show that this installation spends $0.68 per pound to dispose of used alkaline batteries. Assuming that disposing of rechargeable alkaline batteries will have the same unit costs, disposal would total $97 per year.

Recurring Cost Savings: Savings would result from reduced purchase and disposal of traditional alkaline batteries. These savings total $10,416.

Purchase: Implementing this initiative would result in no longer having to purchase the estimated 9,628 non-rechargeable alkaline batteries per year. At an average cost of $0.83 for a traditional alkaline battery, this would save $7,991 per year.

Disposal: Waste generation records show that the installation spends $0.68 per pound to dispose of used alkaline batteries. Eliminating the disposal of 3,566 pounds of traditional alkaline batteries per year would, therefore, save an annual total of $2,425.

Payback Period: The payback period is calculated by dividing the implementation cost by the net cost savings. Note that the net cost savings is the difference between the recurring costs and the recurring cost savings. $24,570 / ($10,416-$1,060) = 2.6 years

Implementation Status: This project is being evaluated for applicability and benefits.

Based on CY 2005 battery generation summarized in Table 5-6, it may be cost effective to implement a rechargeable battery program at Camp Withycombe, Camp Rilea, Salem AASF #1, and Portland FMS.

Table 5-6. CY 2005 Battery Disposal

Waste Stream	Facility	Pounds	Disposal Cost
Batteries, Alkaline	Camp Withycombe	2,450	$710.50
Batteries, Alkaline	Camp Rilea	946	$277.28
Batteries, Alkaline	Salem AASF #1	299	$87.31
Batteries, Alkaline	Portland FMS	275	$79.75
Batteries, Alkaline	OSMS	81	$23.49
Batteries, Alkaline	McMinnville	73	$29.20
Batteries, Alkaline	Lebanon FMS	47	$13.63
Batteries, Alkaline	Salem FMS	39	$11.31
Batteries, Alkaline	La Grande FMS[1]	20	$5.80
Batteries, Alkaline/Mercury	Portland FMS	15	$6.00
Batteries, Lithium	Portland FMS	375	$648.75
Batteries, Lithium	Camp Rilea	290	$213.70
Batteries, Lithium	Camp Withycombe	250	$432.50
Batteries, Lithium	Salem FMS	71	$122.83
Batteries, Lithium	Lebanon FMS[1]	27	$46.71
Batteries, Lithium	Salem AASF #1	26	$44.98
Batteries, Lithium	La Grande FMS	10	$17.30
Batteries, Magnesium	Camp Withycombe	112	$44.80
Batteries, NiCad	OSMS	640	$499.20
Batteries, NiCad	Camp Withycombe	435	$339.30
Batteries, NiCad	Salem AASF #1	386	$301.08
Batteries, NiCad	Camp Rilea	85	$41.80

Waste Stream	Facility	Pounds	Disposal Cost
Batteries, NiCad	Portland FMS	11	$8.58
Batteries, Silver	Camp Rilea	50	$20.00
Total		**7,013**	**$4,025.80**

1. The Lebanon FMS transferred to the Springfield FMS in 2006.

5.5 Potential P2 Initiatives

The P2 opportunities for two of the major waste streams, bead blast media and OWS wash rack sludge, are discussed in Appendix C and D as part of the *Camp Withycombe and Camp Rilea Toxic Use and Hazardous Waste Reduction Plan*. The P2 initiative recommended for the vault at the Salem AASF #1 wash rack is documented in Section 5.5.1; whereas, the P2 initiative to reduce hazardous waste lead debris disposal cost is described in Section 5.5.2. Other hazardous waste P2 opportunities considered for the ORARNG facilities but not evaluated are listed in Section 5.5.3.

5.5.1 Replacement of Vault for Wash Rack at Salem AASF #1

Description: The exterior washing of aircraft and engine cleaning takes place on an uncovered wash rack located at the Salem AASF #1. AASF #1 personnel perform exterior washing of C-12, C-23, OH-58, and Blackhawk aircraft using a mixture of water and ZEP II Exterior Aircraft Cleaner with the use of a pressure washer. It is estimated that approximately eight aircraft are washed per month. Engine cleaning operations currently occur for only Blackhawk aircraft at the AASF #1. A mixture of water and Engine Gas Path Cleaning Compound are used to clean the aircraft engines.

The AASF #1 wash rack is fitted with a storm water diversion valve. The wash rack diversion valve is designed to allow an initial volume of storm water equivalent to three times its drainage area (e.g. 15 gallons) to be collected by the sanitary sewer network prior to automatically diverting storm water to the storm sewer network. The pressure washers used to clean aircraft on the wash rack are also tied into the wash rack system to ensure that when the pressure washers are turned on the water is directed to the sanitary sewer network.

Water enters the drain on the flightline and is collected in a sump that holds 15 gallons. After this capacity is reached, excess water is then diverted to another underground holding area; this area has no lid and is visible under a manhole cover. The wash water then enters a covered sump/vault which can hold approximately 10,000 gallons. Once this vault is approximately 1/3 full, the water is pumped to two evaporator units located in a nearby building. Sludge produced from the evaporator units has been characterized as hazardous waste by ORARNG environmental staff.

The two evaporator units are Water Blaze HBG-30D systems, both approximately three years old. The rated heat input capacity of the natural gas fired evaporator units are 375,000 British thermal units (Btu)/hr. There is no maintenance contract for the evaporators and on occasion they have been non-operational for a short time, such as during a compressor failure.

According to AASF #1 personnel, there is a leak in the lid of the 10,000 gallon sump of the wash rack, allowing for groundwater intrusion due to high groundwater levels in the area. Personnel estimate about 90% of water contained in the sump at the time of the site visit in February 2006 to be groundwater. Personnel state the concrete lid of the sump was sealed 2 years ago by a contractor and this work was performed at no cost as it was under warranty. According to ORARNG environmental personnel, the contractor may have installed the wrong type of vault, leading to the problems incurred with the leaking lids. As a result of the increased quantity of water in the sump, the evaporators are run at an increased frequency, corresponding to increased natural gas usage. Additionally, increased amounts of sludge are produced from the increased evaporator usage. AASF #1 personnel believe that the increase in sludge is caused by sediment in the groundwater.

Proposed Process Modifications: Remove the current wash rack vault and install a new vault.

Technological Evaluation: The removal of the current AASF #1 wash rack vault and replacement with a new vault would eliminate the current groundwater intrusion.

Environmental Safety and Occupational Health (ESOH) Evaluation: A reduction in the amount of water passing through the evaporator units would minimize natural gas usage and associated costs from their continued operation. Reductions in hazardous waste generation from the removal of groundwater sediment from the waste stream would also be observed with the proper design of the wash rack vault.

Economic Evaluation:

Implementation Costs: Initial costs include the capital cost to remove the current vault and replace it with a new properly designed vault. Implementation costs total $65,000.

Replacement of Wash rack Vault: Costs for the removal and replacement of the existing wash rack sump include the cost of the work plan, equipment, materials, and labor; it is estimated that these costs would total approximately $65,000.[5]

Recurring Costs: No additional recurring costs for the replacement wash rack vault are anticipated.

Recurring Cost Savings: Savings result from reduced natural gas usage and labor requirements associated with the reduction in evaporator usage, as well as reduced costs from hazardous waste disposal. These costs total $7,666.

Natural gas costs. The AASF #1 operates the two evaporator units 24 hours a day, for 5 days a week for 6 months in order to remove the groundwater, for a total of 5,760 hours. During normal operation for the remaining 6 months, the AASF #1 operates each evaporator for 8 hours, 13 days a month, for a total of 1,248 hours, resulting in annual usage of 7,008 hours. Under normal operations throughout the year, annual usage is estimated to be 2,496 hours. Each evaporator is rated at 375,000 Btu/hr (3.75 Therms). Based on natural gas usage data

[5] *Note: The costs provided are only engineering estimates. It is recommended that the ORARNG environmental office obtain a quote from a contractor to revise these cost estimates and the payback period to assess cost-effectiveness, as construction costs may vary.*

provided by ORARNG, the approximate cost of natural gas is $.80 per Therm. The cost of current annual natural gas usage for the AASF #1 from the operation of the evaporators is estimated to be $21,024, and the cost under normal operation is estimated to be $14,976. Estimated savings from decreased natural gas usage is estimated to be $6,048.

Labor costs. AASF #1 personnel estimate labor required to maintain the evaporator units during continual operation for removal of groundwater to be 6 hours per week. During normal operation of the evaporators, labor time for maintenance is estimated to be 2 hours per week. At a labor cost of $15 an hour, the estimated cost of labor is approximately $3,120 from current operations and $1,560 for normal operations year-round. Estimated savings from labor are $1,560.

Hazardous waste disposal costs. According to AASF #1 personnel and hazardous waste disposal data for 2005, typically 140 lb of sludge is disposed each month although that amount can vary with the amount of activity on the wash rack. During CY 2005, the AASF #1 disposed of 1,160 lbs of hazardous sludge from the evaporator units. At $0.35 per pound, this cost an estimated $406. Based on hazardous waste disposal data for December 2005, the amount of wash rack sludge disposed of increased to 180 lbs due to the continual operation of the evaporators. Applying a factor of 180/140 to the CY 2005 disposal cost approximates the increased hazardous waste generation for half of the year, while the remainder of the year is assumed to be the same generation rate as observed in CY 2005. The estimated hazardous waste disposal costs from the leaking wash rack lid are estimated to be $464. Estimated savings from hazardous waste disposal are $58.

Payback Period: The payback period is calculated by dividing implementation cost by the net cost savings as follows:

$65,000/ $7,666 = 8.479 years

Implementation Status: This project is being evaluated for applicability and benefits. Table 5-7 may be used to track the implementation progress for this project.

Table 5-7. Pollution Prevention Project Schedule for Camp Rilea

Targeted Pollution Source	Reduction Option	Implementation Status	Reason Option Not Selected	Impediments	Fiscal Year Funding
Contaminated soil or wash rack sludge	Replace Wash Rack Vault	Awaiting approval	TBD	TBD	TBD

5.5.2 Recycle Lead Debris from Firing Range Activity

Description: Lead debris is the largest hazardous waste stream for non-OSMS ORARNG facilities. In 2005, approximately 4,000 lbs of lead debris was generated at ORARNG firing ranges for a disposal cost of more than $1,400, as shown in Table 5-8.

Proposed Process Modifications: The ORARNG can reduce the waste disposal cost of lead debris by identifying local metal salvage recycling vendors who accept lead debris from firing range activities. In addition, the steel and brass casings from the spent bullets can also be recycled through these same metal salvage recycling vendors. Although there is not a large market demand for lead in the United States, salvage companies do accept this material and ship it overseas where lead is used in the electronics and manufacturing markets.

Table 5-9 identifies local metal salvage vendors for the various ORARNG facilities that generate lead debris. Local metal salvage vendors could not be identified within county limits for Camp Rilea and Coos Bay Readiness Center. Roseburg has a local vendor but they do not accept lead.

Technological Evaluation: Metal recyclers commonly accept scrap metals including spent ammunition. Metal recycling is a common industrial practice with numerous vendors located throughout the state.

Economic Evaluation:

Implementation Costs: The initial costs to implement this P2 opportunity includes an estimate on the labor required to set up recycling contracts and provide information to each facility with an indoor firing range. Most salvage companies do not require a contract in order to receive recyclables. However, it may be beneficial for the ORARNG to maintain an agreement with the local recycling vendors for services and prices if large quantities of lead debris will be recycled on a continual basis. The implementation cost does not include purchasing material if the way lead debris is stored or handled has to be changed.

Estimate that 16 hours of labor is required per facility to set up a recycling contract, prepare a brief standard operating procedure (SOP) for managing lead debris from firing range activity, and distribute to applicable facilities. Estimate a labor rate of $25.00 per hour, for 16 hours, at 10 facilities with indoor firing ranges. Three of the 13 facilities listed in Table 5-8 do not have local recycling vendors. Implementation cost is $25.00/hour x 16 hours/day x 10 facilities for a total implementation cost of $5,200.00.

Recurring Costs: Recurring costs associated with recycling the lead debris would include the management of the lead waste and the transportation of the waste to the recycling facility. Management of the lead debris would include the separation of the lead debris, the steel casings and the brass casings, and storage of each of these wastes prior to transportation.

Recurring Cost Savings: Recurring cost savings will vary for each facility that generates lead debris from firing range activities. Any facility that has a local metal salvage vendor, which accepts lead debris from firing range activities, is going to have a recurring cost savings. The money generated from the sale of the scrap lead will depend on the current market rate. However, three ORARNG facilities do not have a local metal salvage company that will accept lead debris. These facilities will need to continue to dispose of their lead debris as hazardous waste or determine if transporting the waste to another ORARNG facility with a recycling program is allowable and economically feasible. During CY 2005, the hazardous waste disposal cost was $1,453.80/year. If facilities with recycling vendors recycled the lead debris, the revenue would have been $192.30/year and the facilities without recycling vendors continued to dispose of the lead debris as hazardous waste, the cost would be $458.40 year. The annual cost for CY 2005 would have been $266.10 instead of $1,453.80, for a recurring savings of approximately $1,453.80 - $266.10 = $1,187.70. If

ORARNG facilities also recycle the spent casings from the firing range, and include the sale money into the recycling profit, then the total recurring cost savings will increase.

Labor costs. The labor costs associated with the management of the lead debris as a recyclable material versus the costs associated as a hazardous waste is negligible. The lead debris will still need to be collected, properly stored, and prepared for transport whether it is being handled as a recyclable material or hazardous waste.

Hazardous waste disposal costs. According to CY 2005, hazardous waste disposal data obtained from AGI-E, typically 140 to 210 lbs of lead debris is annually generated at each firing range. ORARNG facilities with lead debris recycling options can reduce hazardous waste disposal cost by 100%. ORARNG facilities with no lead debris recycling options available will not change the hazardous waste disposal cost. Estimated savings from hazardous waste disposal for all ORARNG facilities combined are $995.40 per year.

Payback Period: The payback period is calculated by dividing implementation cost by the net cost savings from disposing of lead debris as recyclable material instead of as hazardous waste. The payback period is 5.22 years ($5,200/$995.40)

Table 5-8. CY 2005 Lead Debris Disposal

Location	County	Waste Stream	Lead Debris (lbs)	Cost for disposal ($)	Approximate Revenue from Recycling ($)	Cost for disposal with no recycling options ($)
Camp Rilea[1]	Clatsop	Lead Debris	456	$182.40	$0.00	$182.40
Camp Rilea	Clatsop	Lead Debris with Water	200	$68.00	$0.00	$68.00
Camp Rilea	Clatsop	Lead Weights	100	$40.00	$0.00	$40.00
State Maintenance at Camp Withycombe	Clackamas	Lead Debris	210	$84.00	$10.50	$0.00
Lebanon FMS[2]	Linn	Lead Debris	789	$168.40	$78.90	$0.00
COUTES	Deschutes	Lead Debris	588	$235.00	$29.40	$0.00
Pendleton AASF #2	Umatilla	Lead Debris	140	$56.00	$7.00	$0.00
Pendleton	Umatilla	Lead Debris	150	$60.00	$7.50	$0.00
McMinnville	Yamhill	Lead Debris	210	$84.00	$10.50	$0.00
Eugene	Lane	Lead Debris	200	$80.00	$20.00	$0.00
Forest Grove	Washington	Lead Debris	210	$84.00	$10.50	$0.00
Bend	Deschutes	Lead Debris	150	$60.00	$7.50	$0.00
Coos Bay	Coos	Lead Debris	210	$84.00	$0.00	$84.00
Roseburg	Douglas	Lead Debris	210	$84.00	$0.00	$84.00
Kliever	Multnomah	Lead Debris	210	$84.00	$10.50	$0.00
Total			**4,033**	**$1,453.80**	**$192.30**	**$458.40**

1. Lead debris at Camp Rilea is generated at nearby ORARNG CESQG facilities.
2. The Lebanon FMS transferred to the Springfield FMS in 2006.

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Table 5-9. Metal Salvage Vendors in Select Oregon Counties[1]

Metal Salvage Vendors	Counties Serviced	Facilities that can be serviced	Price for lead ($/lb)	Price for brass casings ($/lb)	Price for steel casings ($/lb)	Notes
Metro Metals Northwest 5611 NE Columbia Blvd. Portland, OR (503) 287-8861	Clackamas, Multnomah and Washington	State Maintenance at Camp Withycombe and Kliever Readiness Center	Mixed lead $0.05/lb Clean lead $0.15/lb	Clean Brass $0.45/lb Dirty Brass .$0.20/lb	$0.10/lb	Dirty brass is considered brass casings with primer caps or other metallic contamination.
RS Davis Recycling 10105 SE Mather Rd. Clackamas, OR (503) 655-5433	Clackamas, Multnomah and Washington	State Maintenance at Camp Withycombe and Kliever Readiness Center	$0.05/lb	Clean Brass $1.40/lb Dirty Brass $0.50/lb	$0.04/lb	Drop box service is available for large quantities, ask for Joe
Nudelman SJ and Son 2707 NW Nela Street Portland, OR (503) 226-4051	Clackamas, Multnomah and Washington	State Maintenance at Camp Withycombe and Kliever Readiness Center	N/A	N/A	N/A	They accept lead but would not provide pricing over the phone.
Kosta's Scrap Metals 8250 N. Albina Ave. Portland, OR (503) 289-7884	Clackamas, Multnomah and Washington	State Maintenance at Camp Withycombe and Kliever Readiness Center	N/A	N/A	N/A	This is an uncommon material but they do accept it. Current pricing not available over the phone.
Rivergate Scrap Metals 9645 N. Columbia Blvd. Portland, OR (503) 283-3324	Clackamas, Multnomah and Washington	State Maintenance at Camp Withycombe and Kliever Readiness Center	$0.00	$1.15/lb	$0.05/lb	For the brass casings it is okay for the primer caps to be on.
Burcham's Metals 3407 Pacific Blvd. SW Albany, OR (541) 926-4616	Linn	Lebanon FMS	$0.10/lb	Clean Brass $1.20/lb Dirty Brass $.50/lb	Can vary from $0.03 to 0.05/lb	Dirty brass is considered brass casings with primer caps or other metallic contamination.
Recycling Depot Inc. 32987 Brewster Road Lebanon, OR (541) 259-5454	Linn	Lebanon FMS	N/A	N/A	N/A	Does not accept lead and would not provide pricing over the phone.

Metal Salvage Vendors	Counties Serviced	Facilities that can be serviced	Price for lead ($/lb)	Price for brass casings ($/lb)	Price for steel casings ($/lb)	Notes
Swift and McCormick Metal Processors, Inc. 3192 NE Sedgewick Ave. Redmond, OR (541) 548-4448	Deschutes	Bend COUTES	$0.05/lb	$1.25/lb $1.40/lb for large quantities	$0.03/lb	For the brass casings it is okay for the primer caps to be on. Large quantities get a higher rate.
RS Davis Recycling Inc. Hermiston, OR (541) 567-9167	Umatilla	Pendleton facilities	$0.05/lb	Clean Brass $1.10/lb Dirty Brass $0.30/lb	$0.03/lb	Dirty brass is considered brass casings with primer caps or other metallic contamination.
Ross Salvage Yard Hermiston, OR (541) 567-8575	Umatilla	Pendleton facilities	$0.00	Can vary from $0.60 – 0.80/LB	$0.00	Does not pay for the lead or steel casings, as they have no value to the company.
Cherry City Metals Salem, OR (503) 588-0721	Yamhill	McMinnville	$0.05/lb	$1.35/lb	$0.03/lb	For the brass casings it is okay for the primer caps to be on.
DC Metals 380 S. Danebo Ave. Eugene, OR (541) 344-3741	Lane	Eugene and Springfield FMS	$0.15/lb	Clean Brass can vary from $1.00-1.20/lb Dirty Brass $0.70/lb	$0.04/lb	Dirty brass is considered brass casings with primer caps or other metallic contamination.
Pacific Recycling Inc. 3300 Cross Street Eugene, OR (541) 461-3443	Lane	Eugene and Springfield FMS	$0.10/lb	Clean Brass $1.34/lb Dirty Brass $0.40/lb	$0.04/lb	Dirty brass is considered brass casings with primer caps or other metallic contamination.
Mcgovern Metals Company Inc Steel and Scrap 3801 Old Highway 99S Roseburg, OR (541) 679-7012	Douglas	Roseburg	$0.00	Can vary from $0.80 – 1.00/lb	$0.03/lb	Accepts lead but does not pay for it.

Notes:

1. e^2M is not recommending these recyclers. This information is for references purposes only and is not intended to be a complete list of available recyclers for each selected county in Oregon. All vendors stated that the casings must be from spent bullets, and the material (lead slugs, brass casings, and steel casings) must be separated and clean of contaminants.

5.5.3 Additional Hazardous Waste P2 Opportunities Considered:

Resealing Wash rack Vault Lid: The wash rack vault lid at the Salem AASF #1 was previously sealed; however, it did not resolve the issue of groundwater leaking into the wash rack vault and is not considered as a viable option.

Alternative Ammunition: It is recommended that the ORARNG evaluate alternative ammunition for the indoor firing ranges. Various types of green ammunition are available, but require approval for use by military personnel.

BMP for Indoor Firing Range Filters: It is recommended that the ORARNG document a Firing Range Operations and Maintenance Standard Operating Procedure (O&M SOP) that identifies best management practices (BMPs) for disposal and cleaning of indoor firing range filters, frequency of when filters should be removed or cleaned, and additional management challenges or P2 initiatives for firing range filters. If water is used to clean filters, identify methods for disposing of lead contaminated water, and metal limits for water discharged to the local publicly owned treatment works (POTW). Estimated cost of a Firing Range O&M SOP is $20,000 to $30,000.

Purchase oil wringer: It is recommended that ORARNG personnel estimate the cost to purchase an absorbent wringer for oil contaminated absorbent pads.

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Chapter 6
Solid Waste

6.1 Goal

The ORARNG solid waste goal is to divert 40 percent of the annual total non-hazardous solid waste stream from landfill disposal and incineration, while ensuring the program provides an economic benefit when compared with use of the method of disposal alone. Examples of diversion include source reduction, recycling, and composting activities.

This goal is identified in the DoD's P2 Measure of Merit (MoM). The MoM requires all installations that generate more than one ton per day of solid waste to calculate, and annually report to DoD, their diversion rate and cost avoidance resulting from integrated solid waste management.

6.2 Baseline and Progress

The ORARNG is progressing towards meeting the 40 percent solid waste diversion goal. Table 6-1 shows the progress of the solid waste reduction program over the past 3 years, and identifies the estimated weight of garbage generated and diverted (i.e., recycled) in tons per fiscal year for all ORARNG facilities combined. This information is based on data annually submitted to NGB. The amount of solid waste diverted from disposal is calculated by subtracting the amount of waste disposed from the amount of waste generated. The diversion rate, as a percentage, is calculated by dividing the amount of waste diverted by the amount of waste generated. The diversion rate is discussed further in Section 6.3 but has remained less than 25 percent over the past three years.

Table 6-1. Solid Waste Diversion Data

	FY 2003 (in tons)	FY 2004 (in tons)	FY 2005 (in tons)
Tons Generated (without diversion)	1,222	1,333	989
Tons Disposed[1]	990	1086	818
Tons Diverted[2]	232	247	171
Percent Diverted	19%	18%	17%

1. The weight of garbage generated is based on the size of the dumpster (in yards) at each facility, frequency of waste pickup, an estimated factor of 150 lbs per yard for the OMD and 250 lbs per yard for Camp Rilea and Camp Withycombe, and the conversion factor of 2,000 lbs per ton. The original data is available through the OMD, Operations and Maintenance Branch of Installations, (AGI-O).
2. Data is available through the OMD, AGI-O.

Table 6-2 outlines the percent of solid waste diverted from disposal from FY 1999 to FY 2005. The current diversion rate is approximately 21 percent, which may not be wholly accurate as some recycling rates are estimated and items being recycled through DRMO are not tracked.

Table 6-2. Percent of Solid Waste Diverted from Disposal by Recycling

	FY 1999[1]	FY 2000[1]	FY 2001[1]	FY 2002[2]	FY 2003[3]	FY 2004[3]	FY 2005[3]
Percent Solid Waste Diverted	7%	11%	44%	Not Determined	19%	18%	17%
Target Goal	40%	40%	40%	40%	40%	40%	40%

1. Data for 1999 to 2001 was obtained from the ORARNGR 210-4 P2 Plan, dated 01 July 2001.
2. No data was available for FY 2002.
3. Data for 2003 to 2005 was calculated using data from the OMD, AGI-O.

6.3 Description of Major Solid Waste Streams

The OMD, AGI-O, staff annually obtains solid waste data from each facility. This data includes information such as the cost of solid waste disposal, the volume of solid waste disposed and estimates of solid waste recycled.

Solid waste is collected in dumpsters at each facility and is disposed of on a regular basis by solid waste contractors. Dumpsters are usually half full when dumped. Camp Withycombe and Camp Rilea have their own dumpsters and solid waste trucks, which are used to transport their solid waste to a local transfer facility. The solid waste transfer facility for Camp Withycombe is Metro South Recycle and Western Ore Waste for Camp Rilea. [6]

The major non-hazardous solid waste stream generated by ORARNG facilities is office type waste, which consists of paper and cardboard. Metal, bottles, wood and tires comprise the remaining streams of non-hazardous solid waste generated. As summarized in Table 6-3, the Joint Force Headquarters (JFHQ) and Readiness Centers consistently recycle cardboard and office paper.

Camp Withycombe does not participate in office paper recycling and did not recycle corrugated cardboard in FY 2005. Section 6.5 assesses P2 recycling opportunities at Camp Withycombe.

Camp Rilea consistently recycles office paper and wood; however, cardboard recycling has decreased over the past three years from a high in FY 2002.

DRMO usually recycles the scrap metal, so OMD staff does have efficient records of recycle quantities since FY 2003. The recycling rate may not accurately reflect the current recycling activity.

Table 6-3. ORARNG Solid Waste Recycling from FY 2002 to 2005 (in Tons)[1]

Recycle type	FY 2002	FY 2003	FY 2004	FY 2005
JFHQ Document-Shred[2]	56	61	63	56
JFHQ Cardboard[3]	8	8	8	8
Camp Rilea Cardboard	100	27	27	27

[6] This is based on data available at the OMD, AGI-O.

Recycle type	FY 2002	FY 2003	FY 2004	FY 2005
Camp Rilea Office Paper	9	9	9	9
Camp Rilea Wood Recycle	n/a	5	4	8
Camp Rilea Metal	8	2	0	0
Camp Rilea Tires	n/a	n/a	n/a	1
Camp Withycombe Cardboard	75	75	75	0
Camp Withycombe Metal	n/a	n/a	n/a	0
Readiness Center Paper[4]	24	24	36	36
Readiness Center Bottles[4]	5	5	2	2
Readiness Center Cardboard[4]	16	16	23	23
Total Recycle Weight (tons)	**301**	**232**	**247**	**171**

1. Recycling data provided by OMD, AGI-O staff.
2. The amount of shredded paper picked up for recycling at JFHQ is based on the number of bins picked up multiplied by the estimated weight of one bin.
3. Cardboard at the JFHQ is dumped weekly, and the amount recycled is estimated.
4. The amount of paper, bottles, and cardboard recycled by the Readiness Centers are estimated by OMD staff.

Recycling items such as cans, bottles, cardboard, or paper is not feasible for facilities located in eastern Oregon or other remote locations, since there are no nearby recycling facilities.

6.4 Current P2 Initiatives

The P2 initiatives summarized in this section were evaluated in the 2001 ORARNGR 210-4 Pollution Prevention Plan and are also summarized in tables located in the Executive Summary. The various ORARNG facilities currently recycle paper, cardboard, bottles, wood, and metal scrap as a solid waste source reduction initiative. The estimated recycle rates were summarized in Table 6-3.

6.4.1 Cardboard Recycling

Description: Corrugated cardboard is made from strong, good quality wood fiber and includes un-waxed cardboard boxes and brown paper bags. Cardboard usage is widespread and contributes significantly to the waste stream disposed in landfills, even though cardboard is universally marketable, profitable, and easily recycled.

Environmental Evaluation: Recycling corrugated cardboard or reducing the use of cardboard will help facilities meet the requirements under EO 13101 requiring executive agencies (e.g., DoD) to incorporate waste prevention and recycling in their daily operations. Reducing the volume of waste disposed in landfills by an average of 12.7 percent (U.S. EPA, 1994), reduces landfill disposal fees and may generate revenue from the sale of the cardboard.

Economic Evaluation: Not evaluated.

Implementation Status: This initiative has been approved as a valid project.

6.4.2 Paper Recycling Sub Site

Description: Paper products have been estimated to represent 35-40 percent of the waste presently disposed in landfills. The P2 goal for Federal facilities reduction of municipal solid waste (MSW) is 50 percent. Significant progress toward this goal can be achieved through waste paper recycling. Recycling offers the opportunity to decrease the cost of landfill disposal and provide a renewable source of fiber for recycled paper production as well as a number of other uses.

The quality of recycled paper products continues to improve, thereby increasing the demand for recyclable paper, especially, office waste paper (OWP), which is normally of higher quality due to higher fiber content. This paper is now recycled for use in printing and writing paper, graphics stock, and tissue paper. The paper industry has been improving and integrating paper de-inking processes in existing mills in order to improve their ability to increase the quantity and quality of their recycled pulp feedstocks. Some projections indicate that there could be a shortage of recycled feedstocks in the near future if the quantities of recycled paper do not increase.

Environmental Evaluation: Recycling paper or reducing the use of paper will help facilities meet the requirements under EO 13101 requiring executive agencies (e.g., DoD) to incorporate waste prevention and recycling in their daily operations.

Economic Evaluation: Not evaluated.

Implementation Status: This initiative has been approved as a valid project. However, it is only implemented at JFHQ, Camp Rilea, Camp Withycombe, and some Readiness Centers.

6.5 Potential P2 Initiatives

The potential P2 initiative being evaluated is a review of the procedures required to establish a Qualified Recycling Program (QRP) at Camp Withycombe and Camp Rilea. Additional recommendations to enhance the ORARNG solid waste program are summarized in Section 6.5.2.

6.5.1 Develop a Qualified Recycling Program at Camp Withycombe and Camp Rilea

Description: Camp Withycombe and Camp Rilea do not currently have a QRP. In the mid and late 1990's, a number of recycling initiatives were implemented to reduce the amount of solid waste that was being disposed. The initiatives included paper and cardboard recycling, propane cylinder recycling, antifreeze recycling, and recycling crushed oil and fuel filters as scrap metal. The scrap metal and antifreeze recycling is still being implemented at Camp Withycombe; however, the paper and cardboard recycling was discontinued. Camp Rilea recycles cardboard, office paper, wood, and occasionally recycles metal and tires.

Background Information: A QRP is defined as a set of organized operations that require concentrated efforts to divert or recover scrap waste, as well as efforts to identify, segregate, and maintain the integrity of the recyclable materials in order to maintain or enhance their

marketability. A QRP must include an adherence to a control process that provides accountability for all materials processed through the program operations.

Department of Defense Instruction (DoDI) 4715.4 "Pollution Prevention" and the supplemental memorandum titled, "Qualified Recycling Program Guidance" encourage DoD installations to establish and operate QRPs, where feasible and effective. DoDI 4715.4 recommends that the QRP be implemented as a component of the installation's Integrated Solid Waste Management Plan (ISWMP) so it can be integrated with other waste management options. In addition, DoDI 4715.4 requires that a QRP establish the following:

- Procedures for segregating and collecting, and selecting specific materials intended to be recycled[7];
- Methods for maintaining fiscal accountability of funds received from the sale of recycled materials and the disbursal of these funds; and
- A process to review all projects and activities funded from the proceeds of the sale of recycled materials.

The "Qualified Recycling Program Guidance" memorandum provides instruction on recordkeeping procedures that need to be implemented to support program management as well as requirements on conducting mandatory audits; guidance on the appropriate use of net proceeds from the sale of recyclables; and instructions relating to the costs associated with recycling programs (e.g., initial costs, equipment costs, transportation costs, and labor).

The Defense Logistics Agency (DLA) is charged with the sale of recyclable materials generated from military services through the DRMO. An installation with a QRP is encouraged to consider the use of the direct sales authority provided for in current Army policy. An installation may sell its recyclables directly to outside sources rather than through the Defense Reutilization and Marketing Service (DRMS)/DRMO if the direct sale is expected to result in a profit, increased efficiency, or cost effectiveness.

Prior to establishing a QRP that will include direct sales authority, a thorough economic analysis must be conducted and evaluated to determine the most cost effective alternative. Alternatively, structured recycling programs can be used where a QRP is not the best option. For example, it may be more cost effective to outsource the recycling operation rather than fund an installation QRP.

Once the economic analysis has been completed and shown to be cost effective, a QRP Business Plan must be developed, a QRP program manager assigned, and a QRP committee developed.

[7] A list of excluded items that are not allowed to be sold in a QRP can also be found in DoDI 4715.4.

Technological Evaluation: There are numerous waste products that can be considered recyclable materials. These include, but are not limited to: high-quality paper and paper products; newspaper; scrap paper[8]; cardboard; plastic; metal cans; glass; used oil (except when considered a hazardous waste); batteries, tires; wood, food, and yard waste. In addition, metal scrap (including ferrous and non-ferrous scrap) and firing range expended brass and mixed metals gleaned from firing range cleanup that do not require demilitarization[9] may be included in a QRP. Most of these items have a resale value that can be obtained from selling directly to recyclers or factory sources. The resale value for each item can vary depending on factors such as seasonal and cyclical demand swings, supply and price of alternatively available sources, and the quality of the waste product.

Environmental Evaluation: Recycling is preferable to disposal. Recycling allowable waste materials will help the facility to meet the requirements under EO 13101, which requires executive agencies (e.g., DoD) to incorporate waste prevention and recycling in their daily operations. Recycling not only reduces the volumes of waste disposed of in the landfill, it also reduces the fees the facility pays to dispose of their waste and generates revenue that can be used in future P2 opportunities or the Morale, Welfare, and Recreation (MWR) fund.

Economic Evaluation: Before establishing a QRP, an installation must complete a thorough economic analysis to determine if the QRP would be cost effective, or if another alternative recycling program would be the more cost effective option. The economic analysis required is an intensive process that should consider all the financial costs, benefits, and risks in establishing a QRP.

Implementation Status: DoD Instruction 4715.4 encourages DoD installations to consider establishing and developing a QRP where feasible. Based on the limited information collected by OMD on current recyclable material available (cardboard, paper, and metal) at Camp Withycombe and Camp Rilea, it would appear superficially that a QRP might not be the most cost effective option. However, a unified regional QRP, where two or more installations in a geographical area combine efforts, might be feasible, considering the locations of other ORARNG facilities in relation to Camp Withycombe or Camp Rilea. Therefore, it is recommended that the ORARNG further evaluate the implementation of a QRP (specifically a unified regional QRP) by performing the required economic analysis.

Appendix E contains additional information for this P2 initiative, including potential recycling vendors and references.

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[8] Scrap paper is a generic term used to describe a mixture of high and low grade waste paper types. Common paper items found in scrap paper include: office paper, newspaper, corrugated cardboard, magazines, box board, envelopes, junk mail, phone books, and packaging paper.

[9] DA PAM 200-1 requires QRPs that directly sell fired brass and authorized range cleanup to have personnel, who are trained in the identification and recognition of ammunition, explosives, and dangerous articles (AEDA), inspect such material for compliance with DoDI 4715.4 and DUSD(ES) implementation guidance. In addition, a Memorandum, dated 15 May 1998, relating to the recycling of firing range scrap requires that the firing range scrap be certified safe by an appropriate authority (personnel trained in AEDA) before a QRP can accept the material for disposal.

6.5.2 Additional Solid Waste P2 Opportunities Considered

Track Solid Waste and Recycling Data: Currently, the volume of many of the recyclable materials such as paper, bottles, and cardboard are estimated, and some recyclables released to DRMO are not tracked. In order to accurately report the amount of solid waste being diverted from disposal, an enhanced system of recordkeeping and reporting should be developed and used, which will include all materials that are recovered and/or disposed. This reporting system should also include any recyclables picked up by DRMO.

Software such as the Solid Waste Annual Reporting (SWAR) system is available to DoD installations to assist them in tracking and reporting solid waste and recycling data. The latest version is the SWARWeb system[10] which is a web based data management program, released in December 2002, and available through DENIX (www.denix.osd.mil), which allows access via user id and password from any internet connected computer. The SWARWeb system provides flexibility in tracking recyclable and disposed materials, and solid waste program costs.

Establish a Recycling Program: The ORARNG may consider establishing an organized and defined recycling program that will identify administrative and accounting procedures, individual responsibilities for each facility, available recyclable materials, as well as potential recycling markets.

Encourage Recycling: Promote recycling efforts and provide recycling education to improve the recycling efforts currently underway at ORARNG facilities. There are three common factors among successful recycling programs:

1. The number of materials that are recycled or salvaged within the program;
2. The level of commitment to a recycling program from the facility commanders and the Solid Waste Program Manager; and
3. Effective education and promotion programs, which are offered frequently and with variety and that target the audience.

Develop an Integrated Solid Waste Management Plan (ISWMP): Develop a state-wide ISWMP for the ORARNG to fully integrate the waste management system, purchasing of recycled content products, or Affirmative Procurement (AP), as needed, to stimulate markets for recycled goods. The ISWMP identifies source reduction measures that may be used to reduce solid waste streams; defines various elements of the waste stream and identifying avenues of reuse, recycling or disposal for each. An ISWMP assigns responsibilities and tasks to installation personnel for the effective execution of the solid waste program and closes the circle on recycling by incorporating the Green Procurement Program (GPP) into contracting and purchasing, and document correct procedures for all aspects of solid waste management including storage, collection, segregation, transportation, treatment, recycling, and disposal, and present factors potentially affecting solid waste management, and list alternatives and contingency plans for future consideration.

[10] See the SWARWeb factsheet located on the internet at https://www.denix.osd.mil/denix/Public/News/EITM/FactSheets/SWAR.pdf. Site accessed 29 June 2006.

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Chapter 7
Air Emissions

7.1 Goal

The installation's goal is to have a continuous reduction in air emissions from stationary sources for criteria pollutants and hazardous air pollutants (HAPs), while ensuring that facilities maintain their emission levels below major source thresholds.

7.2 Baseline and Progress

Table 7-1 below summarizes the actual emissions from stationary point sources generated by ORARNG during CY 2003. This information was taken from a study of 14 ORARNG facilities conducted by Environmental Resources Management in February 2004. This data will serve as the baseline against which emissions will be measured.

Table 7-1. ORARNG CY 2003 Air Emissions from Stationary Sources [1]

Facility[2]	PM_{10} (tpy) [3,4]	SO_2 (tpy)	CO (tpy)	NO_x (tpy)	VOCs (tpy)	HAPs (tpy)
Camp Rilea MTA (Warrenton)	0.31	0.04	4.41	1.82	3.35	0.31
Camp Withycombe (Clackamas)	2.94	<0.01	0.62	14.03	0.55	2.94
COUTES (Redmond)	<0.01	<0.01	<0.01	0.34	<0.01	<0.01
Kliever Memorial Readiness Center (Portland)	0.08	<0.01	1.11	0.67	0.93	0.08
La Grande FMS	<0.01	<0.01	0.01	0.03	<0.01	<0.01
Lebanon FMS[3]	<0.01	<0.01	0.11	0.22	0.02	<0.01
Maison Readiness Center (Tigard)	<0.01	<0.01	0.02	0.1	<0.01	<0.01
Medford FMS/ Readiness Center	0.13	0.01	1.67	0.14	1.39	0.13
Pendleton AASF #2	0.01	<0.01	0.18	0.18	0.15	0.01
Salem AASF #1	0.11	<0.01	1.5	1.87	1.26	0.11
Salem Anderson Readiness Center	0.26	0.03	3.88	0.2	2.84	0.26
Salem FMS	-	-	-	0.91	-	-
Salem OMD	0.13	0.02	1.66	0.09	1.33	0.13
Total	**3.79**	**0.10**	**15.17**	**20.6**	**11.82**	**3.97**

1. Source: *Air Emissions Inventories: Oregon Military Department, 14 Facilities, Oregon*, OMD, February 2004, Environmental Resources Management. Facility-specific data has been aggregated to estimate statewide emissions.
2. The city that the facility is located in is in parentheses if needed.
3. The Lebanon FMS transferred to the Springfield FMS in 2006.

3. Particulate matter with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$) emissions were not calculated for CY 2003 as the U.S. EPA issued its final designations for $PM_{2.5}$ non-attainment areas in December 2004.
4. tpy = tons per year

7.3 Description of Major Emission Sources

The ORARNG does not currently have any major Title V emission sources. A list of additional air emission sources that can be assessed for future P2 opportunities at ORARNG facilities are provided in the Table 7-2. This list does not include storage tanks.

Table 7-2. Air Emission Sources[1]

Location	Air Emission Source (Quantity)	Additional data
Camp Rilea	Pressure Washer (2)	156 hrs/yr at 0.2 hp; 2,190 hr/yr at 5 hp
Camp Rilea	Parts Washer (3)	Breakthrough Solvent IT48
Camp Rilea	Parts Washer (1)	Jet Washer (Aqueous)
Camp Rilea	Emergency backup generator (3)	Run 12 hr/yr each; 1 at 20 hp, 2 at 80 hp
Camp Rilea	Parts Washer (5)	ZEP Dynaclean 143
Camp Withycombe	Pressure Washer (2)	730 hrs/day; 0.2 hp
Camp Withycombe	Paint Booth	Chemical agent resistant coating (CARC) Paint (261 gal/mo)
Camp Withycombe	Sanitary Wastewater Treatment System	Flows 150,000 gal/day. Two Lagoons at 60' x 120' each to serve 1,500 persons
Camp Withycombe	Parts Washer (1)	Safety-Kleen Solvent 6801
Camp Withycombe	Parts Washer (4)	ZEP Dynaclean 143
Camp Withycombe Bldg 3670	Parts Washer (1)	Breakthrough Solvent IT48
Camp Withycombe Bldg 3670	Parts Washer (1)	Jet Washer (Aqueous)
Camp Withycombe Bldg 3670	Parts Washer (1)	ZEP Dynaclean 143
Camp Withycombe OSMS	Parts Washer (1)	Breakthrough Solvent IT48
Camp Withycombe OSMS	Grit Blasting	Empire Blast Finishing Booth
Camp Withycombe OSMS	Parts Washer (1)	Jet Washer (Aqueous)
Camp Withycombe OSMS	Parts Washer (1)	Safety-Kleen Gold
Camp Withycombe OSMS	Parts Washer (2)	ZEP Dynaclean 143
COUTES (Redmond)	Parts Washer (2)	Breakthrough Solvent IT48
COUTES (Redmond)	Parts Washer (2)	Jet Washer (Aqueous)
COUTES (Redmond)	Parts Washer (3)	Safety-Kleen Gold
COUTES (Redmond)	Parts Washer (1)	ZEP Dynaclean 143
Kliever Memorial Readiness Center	Parts Washer (1)	ZEP Dynaclean 143
La Grande FMS	Pressure Washer (2)	730 hrs/day; 0.2 hp
La Grande FMS	Parts Washer (1)	Breakthrough Solvent IT48
La Grande FMS	Parts Washer (1)	ZEP Dynaclean 143

Location	Air Emission Source (Quantity)	Additional data
Lebanon FMS[2]	Parts Washer (1)	Breakthrough Solvent IT48
Lebanon FMS[2]	Parts Washer (4)	ZEP Dynaclean 143
Medford FMS	Parts Washer (1)	Breakthrough Solvent IT48
OMD	Emergency backup generator	Run 30 min/week; 235 hp
OMD (Owen Summers Bldg)	Boiler	3.1 MMBtu/hr
OMD (Owen Summers Bldg)	Boiler	462,000 Btu/hr
Pendleton AASF #2	Parts Washer (1)	Breakthrough Solvent IT48
Salem AASF #1	Parts Washer (1)	Breakthrough Solvent IT48
Salem AASF #1	Boiler (2)	Less than 10 MM Btu/hr each
Salem AASF #1	Parts Washer (1)	ZEP Dynaclean 143
Salem Anderson Readiness Center	Boiler (2)	3,392 MMBtu/hr (each)
Salem Anderson Readiness Center	Boiler (1)	500,000 Btu/hr
Salem Anderson Readiness Center	Emergency backup generators (2)	Run 30 min/week
Salem FMS	Parts Washer (1)	Breakthrough Solvent IT48
Salem FMS	Parts Washer (1)	Jet Washer (Aqueous)
Salem FMS	Parts Washer (1)	ZEP Dynaclean 143
Umatilla Depot Hermiston	Parts Washer (1)	Breakthrough Solvent IT48
Umatilla Depot Hermiston	Parts Washer (1)	ZEP Dynaclean 143

1. Source: *Air Emissions Inventories: Oregon Military Department, 14 Facilities, Oregon*, OMD, February 2004, Environmental Resources Management.
2. The Lebanon FMS transferred to the Springfield FMS in 2006.

7.4 Current P2 Initiatives

There are no current P2 initiatives for air emission reduction.

7.5 Potential P2 Initiatives

Camp Withycombe is required to have an Employee Commute Options (ECO) plan per Oregon OAR. The ECO rules (OAR 340-242-0010 through 0290), affect employers in the Portland area with *more than 50 employees* reporting to a single work site. Affected employers must provide incentives for employee use of alternative commute options. The incentives must have the potential to reduce commute trips to the work site by 10 percent within three years. An ECO Plan should be developed and an annual employee survey should be maintained to measure progress toward this goal.

It is recommended that the OMD conduct an Air Emission Inventory for ORARNG facilities to identify all air pollutant sources, document current emissions, and measure progress of air emission reduction activities, as well as comply with local, state and Federal regulatory

requirements. Also, it is recommended that the sanding equipment at the Camp Withycombe prepping bay be replaced to improve air quality, as discussed in Section 7.5.1.

7.5.1 Evaluation of Dustless Sanding Equipment for Camp Withycombe Prepping Bay

Description: The sanding of equipment prior to painting takes place in the prepping bay at the Camp Withycombe OSMS. Current operations primarily include the sanding of generators, while larger pieces of equipment such as forklifts and large vehicles are also sanded in this area. Approximately 50 to 70 generators are sanded each month. Twelve pneumatic air powered sanding units are in operation in the bay.

Sanding operations create a significant amount of visible particulate matter in the bay. The ventilation system in the prepping bay consists of two ducts located just above ground level at the back of the bay. The collected air and dust is then vented directly to the outside of the bay into the personnel parking area without filtration. According to ORARNG environmental staff, the ventilation system does not provide adequate exhaust from the bay as indicated by elevated levels of lead in samples of respirable air.

The dust created from sanding operations that settles onto the floor of the bay is collected by OSMS personnel by sweeping the bay twice daily. This waste is then emptied into garbage cans and disposed of as municipal waste. Based on the results of analytical testing, ORARNG environmental staff confirmed that the waste dust is a non-hazardous waste.

The prepping bay does not have a decontamination area or vestibule in the bay of the OSMS. Personnel working in the prepping bay and adjacent bead blasting bay often enter the administrative areas of the facility to use the restroom or break room without removing protective clothing. These actions track potentially hazardous materials from sanding/prepping areas into the eating and office areas.

Proposed Modification: Replace all sanding equipment with dustless sanders equipped with vacuums.

Technological Evaluation: Dustless sanding equipment captures particulate matter generated during the sanding process by use of an attached vacuum. The orbital sanding disc used in this type of equipment contains holes that allow for the dust to be collected by vacuum during the sanding process. Dust is then collected in filters within the vacuum unit as opposed to becoming airborne. This technology is readily available and currently employed by several Navy and Air Force installations for corrosion control activities. The use of this equipment would not decrease the quality or efficiency of sanding operations.

Environmental Safety and Occupational Health (ESOH) Evaluation: The installation of dustless sanders in the prepping bay of the Camp Withycombe OSMS will minimize the generation of airborne particulate emissions and increase efficiency of sanding operations. According to vendor estimates, dustless sanders can achieve up to 99.99 percent efficiency in removing airborne particulate matter 0.12 microns or larger and up to 98 percent efficiency in

removing all particulates, while also decreasing sanding time by up to 30 percent.[11,12] The efficient capture and disposal of particulate matter at the point of generation should greatly reduce personnel exposure to lead contaminated dust.

Economic Evaluation:

Implementation Costs: Initial costs include the capital cost to purchase the dustless sanding equipment and the cost to train employees. Implementation costs total $85,176.

Dustless Sanding Equipment: Capital costs for the dustless sanding system include the cost of the sanders, vacuums, hoses, abrasives, tools, filters, and necessary adapters and storage equipment. Each pneumatic dustless sanding equipment system costs an estimated $14,196. Equipped with dual ports to allow for simultaneous use of two sanders, six units would be needed to replace the 12 currently in place. The cost of the equipment is an estimated $85,176. The price of each unit may vary as the equipment and accessories can be tailored to the needs of Camp Withycombe and some vendors also offer more competitive prices on equipment through the General Services Administration (GSA). Both air-powered and electric vacuum units are available, so electrical costs may vary depending on the specifications of Camp Withycombe.

Training Costs: The OSMS would be required to initially train approximately 15 personnel for one hour on how to operate the dustless sanding equipment and change the filters, at an estimated labor cost of $225.

Recurring Costs: Annual cost differentials would be those associated with the purchase of filters for the dustless sanding equipment. Recurring costs total $2,086.36.

Filter Replacement Costs: Each vacuum for the dustless sanding equipment is equipped with a first-stage disposable bag filter, a pre-filter, and an ULPA (Ultra-Low Penetrating Air) filter. The disposable bag filters cost an estimated $9.90 and will be replaced weekly for each of the three units, at an annual cost of $1,544.40. The pre-filter captures 95 percent of particulates 0.5 microns and larger, and costs approximately $40.77. These pre-filters will be replaced twice annually for each of the three vacuum units, at a cost of $244.60. The final stage ULPA filter, which filters particles down to 0.12 microns, has a service life of at a minimum five years and costs $495.60, or an estimated $99.12 per year spread over the five years, or $297.36 for the three units. The total annual costs of these filters would be $2,086.36.

Operation and Maintenance of Equipment: The proposed process modification is a replacement with similar equipment. Therefore, there is no anticipated increase in O&M costs. The newer dustless sanders may actually have less maintenance required than older equipment.

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[11] *Clayton Associates, http://www.jclayton.com/home/BrowseProduct.asp?DeptID=109&ProductNo=DM-200 (May 2006).*

[12] *Fein Power Tools, http://www.feinus.com/p/pdf/dust-free_sanding_brochure_p.pdf, accessed May 2006.*

Recurring costs would include system maintenance and the replacement of filters and abrasives; however, it is assumed the existing recurrent costs will be roughly equivalent to the proposed recurring costs.

Training Costs: No additional training costs are anticipated.

Recurring Cost Savings: Savings result from reduced labor requirements associated with the collection and disposal of the dust generated in the bay. These costs total $15,060.

Labor costs. With the current equipment, shop personnel (10) spend 30 minutes per day sweeping the bay floors and disposing of the collected materials. Assuming an average hourly wage of $15 an hour and 251 production days per year, this equates to a cost of $18,825. Greater than 99 percent of the dust from sanding operations would be collected by vacuums on the dustless sanding equipment. However, it is assumed that shop personnel will still need to spend some time sweeping the bay floor to maintain a clean work area. It is assumed that 2 people will sweep the floor for 30 minutes per day at the end of each of the 251 production days, at a projected cost of $3,765. Estimated savings from labor are $15,060.

Payback Period: The payback period is calculated by dividing implementation cost by the net cost savings as follows:

$85,176 / ($15,060-$2,086.36) = 6.565 years

Implementation Status: This project is being evaluated for applicability and benefits.

Potential Vendors for Dustless Sanding Equipment: e^2M is not recommending the vendors listed below and this list is for references purposes only and is not intended to be a complete listing of vendors.

Bosch Tools
Distributor: Western Tool Supply
12518 NE Airport Way
Portland, OR 97230
503-255-7331
Manufacturer Website: www.boschtools.com

Fein Power Tools, Inc.
Distributor: Western Tool Supply
12518 NE Airport Way
Portland, OR 97230
503-255-7331
Manufacturer Website: www.feinus.com

Clayton Associates
575 Prospect Street, Unit 213
Lakewood, NJ 07801-5040
Phone: 732-363-2100
Web Site: www.jclayton.com

7.5.2 Additional Air Quality P2 Opportunities Considered

Installation of Ventilation Hoods: Ventilation hoods could be installed at the OSMS prepping bay to remove air and particulate matter from the bay to reduce exposure to personnel; however, due to the varying height of equipment that enters the bay, this option was deemed infeasible.

Adjusting/Balancing Air Flow: Increasing and/or balancing the airflow through the OSMS prepping bay would potentially reduce dust inside the work area. This option would decrease the temperature in the bay, requiring the air in the bay to be heated during winter months. A significant increase in natural gas usage, and associated costs, would be needed to regulate the temperature in approximately 48,000 cubic feet of air in the bay. The use of an air recycling system or the installation of a variable frequency drive on the exhaust could reduce natural gas usage.

Directing Exhaust into Bead blast Filtration System: In conjunction with an adjustment to the airflow and variable frequency drive to increase the amount of air collected by the ventilation system at the OSMS prepping bay, the exhaust from the prepping bay could be directed into the high efficiency particulate air (HEPA) filtration system in the adjacent bead blasting bay for the collection of particulates prior to exhaust into the ambient air. The air could then be recycled into the prepping bay to reduce natural gas usage associated with the drop in temperature from the increased exhaust. It is estimated that the construction of the ventilation system and retrofit of the current bead blast filtration system would cost approximately $75,000 to $100,000. Additionally, the increased particulate matter being directed into the bead blast filtration would necessitate additional change-out of the bead blast unit filters. Currently, filter change-outs for the bead blast unit occur every six months and cost $4,500 per change-out.

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Chapter 8
Water and Wastewater

8.1 Goal

The installation's goal is to show a continual annual reduction in potable water consumption and in wastewater generation.

8.2 Baselines and Progress

Annual water consumption and wastewater generation for the combined activities of all ORARNG installations from FY 1998 through 2005 is shown in Tables 8-1 and 8-2, and graphically displayed in Figure 8-1.

Table 8-1. ORARNG Water Consumption (Thousands of Gallons per fiscal year)

1998	1999	2000	2001	2002	2003	2004	2005
39,881	24,765	32,034	31,300	37,457	40,144	32,883	44,265

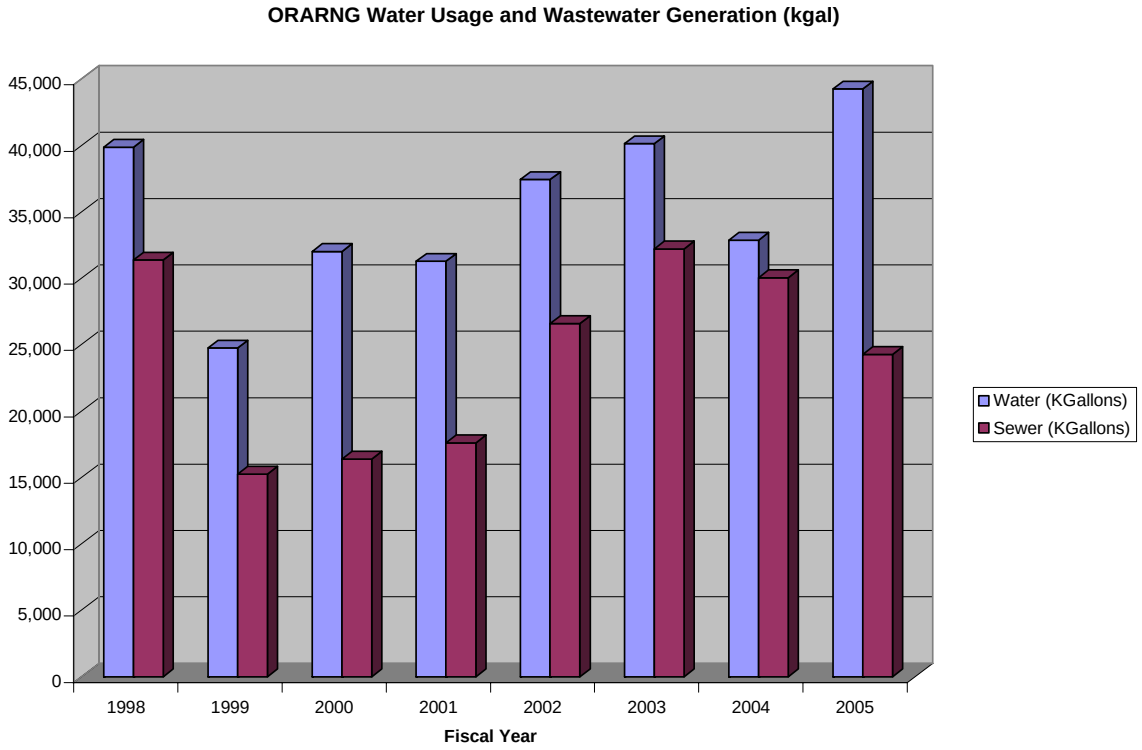
Table 8-2. ORARNG Wastewater Generation (Thousands of Gallons per fiscal year)

1998	1999	2000	2001	2002	2003	2004	2005
31,386	15,264	16,391	17,616	26,602	32,215	30,052	24,271

The majority of water consumption is from landscaping activities; however, no data is available to delineate the impact of these activities. According to the water usage for the timeframe provided, over the past six years water consumption trends upward. Water consumption decreased 38 percent between 1998 and 1999; however, it increased 79 percent between 1999 and 2005 to surpass the 1998 consumption levels.

The wastewater generation rates are estimated based on the average amount of water purchased during the winter months. The assumption here is that irrigation does not occur during the winter and that the winter water consumption rates are a good approximation of the base load non-irrigation use of water. However, this assumption does not account for any ground water or storm water that may enter the sanitary sewer network. Consequently, measurements of progress towards wastewater generation goals are an estimate only.

Figure 8-1. Water Consumption and Wastewater Generation (Thousands of Gallons per fiscal year)



8.3 Current P2 Initiatives

There are no documented P2 initiatives for water consumption reduction and wastewater generation.

8.4 Potential P2 Initiatives

EO 13123, Greening the Government through Efficient Energy Management, encourages Federal agencies, such as the ORARNG, to reduce costs and implement cost-effective water efficiency improvements. It is recommended that the OMD develop a water management plan to specify the uses of the ORARNG water consumption and disposal, as well as identify opportunities for water conservation and track progress towards P2 goals. The Federal Energy Management Program (FEMP), through the requirements of EO 13123, also recommends the implementation of at least four of the following best management practices (BMPs) for water conservation:

BMP # 1 - Public Information and Education Programs
BMP # 2 - Distribution System Audits, Leak Detection and Repair
BMP # 3 - Water Efficient Landscaping
BMP # 4 - Toilets and Urinals
BMP # 5 - Faucets and Showerheads
BMP # 6 - Boiler/Steam Systems

BMP # 7 - Single-Pass Cooling Systems
BMP # 8 - Cooling Tower Systems
BMP # 9 - Miscellaneous High Water-Using Processes
BMP #10 - Water Reuse and Recycling

Additional information on these BMPs is available at the FEMP Water Efficiency website: http://www.eere.energy.gov/femp/technologies/water_fedrequire.cfm.

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Chapter 9
Toxic Release Inventory Form R Releases

9.1 Goal

The EPCRA was authorized under Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986. Section 313 of EPCRA requires the EPA and states to collect annual data on releases and transfers of certain toxic chemicals from industrial facilities and make the data available to the public in the TRI. In 1990, Congress passed the PPA, which required that additional data on waste management and source reduction activities be reported under TRI.

The TRI program has expanded significantly since its inception. The EPA has issued rules to roughly double the number of chemicals included in the TRI to approximately 650, and reduced the reporting thresholds for certain persistent, bioaccumulative, and toxic (PBT) chemicals in order to provide additional information to the public on these chemicals.

EO 13148 requires Federal agencies to comply with the provisions of EPCRA and the PPA of 1990. Furthermore, EO 13148 requires agencies to set a goal of reducing by 40 percent total releases (on-site and offsite) and transfers off-site for treatment of TRI chemicals. This goal is to be met by 31 December 2006, using the 2001 reporting year as a baseline. Currently, the ORARNG is below any reporting threshold for toxic releases and does not submit a TRI to EPA[13]. Therefore, no baseline or annual data is available.

The initial goal was to reduce the total release and disposal of toxic chemicals by at least 50 percent by 31 December 1999 compared to a 1994 baseline, in accordance with EO 12856[14]. On 26 April 2000, EO 12856 was superseded by EO 13148, which reinforces the reduction of TRI releases and off-site transfers of toxic chemicals for treatment or disposal by 10 percent annually or by 40 percent overall by 31 December 2006, compared to a 2000 baseline.

9.2 Baseline and Progress

The ORARNG baseline is not established because the amount of toxic chemicals released, if any, are below the reporting thresholds.

[13] Review the EPA website http://www.epa.gov/tri/ to determine if the ORARNG facilities submit a TRI.
[14] See AR 200-1, 5-4 and 10-1d.

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Chapter 10
EPA Priority Chemical Reduction

10.1 Goal

Section 503(b) of EO 13148 requires that goals be developed to reduce the use of 31 priority chemicals as identified by the EPA's National Partnership for Environmental Priorities. Federal facilities are to reduce the use of the EPA priority chemicals listed in Table 10-1 by 50 percent by 31 December 2006 using 2001 reporting year as a baseline, the complete list of EPA priority chemicals is in Table 10-2.[15]

Table 10-1. Reporting Threshold for EPA Priority Chemicals to Reduce/Eliminate

Chemical	Reporting Threshold and Measurement
Mercury	More than zero pounds of mercury
Cadmium	More than zero pounds of cadmium used
Lead	More than 5 pounds of lead solder used
Naphthalene	More than 100 pounds of Naphthalene used
PCB's >/= 500 ppm	More than zero pounds of PCBs in fluid

Table 10-2. EPA Priority Chemical List

Chemical Name	CASRN[1]
Organic Chemicals and Chemical Compounds	
1,2,4-Trichlorobenzene	120-82-1
1,2,4,5-Tetrachlorobenzene	95-94-3
2,4,5-Trichlorophenol	95-95-4
4-Bromophenyl phenyl ether	101-55-3
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Benzo(g,h,i)perylene	191-24-2
Dibenzofuran	132-64-9
Dioxins/Furans (considered one chemical on this list)	1746-01-6
Endosulfan, alpha and Endosulfan, beta (considered one chemical on this list)	959-98-8 33213-65-9
Fluorene	86-73-7
Heptachlor and Heptachlor epoxide (considered one chemical on this list)	76-44-8 1024-57-3
Hexachlorobenzene	118-74-1
Hexachlorobutadiene	87-68-3

[15] Additional guidance is available online at: http://www.epa.gov/epaoswer/hazwaste/minimize/chemlist.htm, last accessed in July 2006.

Chemical Name	CASRN[1]
Hexachlorocyclohexane, gamma- (Lindane)	58-89-9
Hexachloroethane	67-72-1
Methoxychlor	72-43-5
Naphthalene	91-20-3
PAH Group (as defined in TRI; Polycyclic Aromatic Compounds)	PAH
Pendimethalin	40487-42-1
Pentachlorobenzene	608-93-5
Pentachloronitrobenzene (Quintozene)	82-68-8
Pentachlorophenol	87-86-5
Phenanthrene	85-01-8
Polychlorinated Biphenyls (PCBs)	1336-36-3
Pyrene	129-00-0
Trifluralin	1582-09-8
Metals and Metal Compounds	
Cadmium	7440-43-9
Lead	7439-92-1
Mercury	7439-97-6

1. CASRN = Chemical Abstract Services Registry Number

10.2 Baseline and Progress

The ORARNG should establish procedures in the EMS to track the use of priority chemicals, as well as technologies or management procedures researched and/or implemented to minimize priority chemical use. This can be conducted in a three step process:

- Step 1: Identify the activities that use priority chemicals
- Step 2: Conduct an opportunity assessment
- Step 3: Identify a waste minimization program

The waste minimization program should annually track all priority chemical use, independent of any reporting thresholds. Table 10-3 summarizes the main priority chemicals and identifies an alternative chemical or technology for its current use.

Table 10-3. Alternative Chemical or Technology for EPA Priority Chemicals

Priority Chemical	Use	Alternate Chemical / Technology
Mercury	Temperature and pressure measuring device	Digital and electronic measuring device
	Switches	Electronic thermostats – mechanical switches, ultrasonic and photoelectric sensors
Cadmium	Electroplating	Alternative metal coatings, metal deposition, flame coating
Lead	Tin/Lead Soldering	Tin copper eutectic, tin silver eutectic
Naphthalene	Pesticide	Integrated Pest Management/Process Change
PCB's >/= 500 ppm	Insulating material	Early retirement of existing PCB-containing equipment

Chapter 11
Ozone Depleting Chemicals

11.1 Goal

In February 1996, the Army-wide goal was to completely eliminate Class I ozone-depleting substances (ODCs) from all Army installations by December 2003. However, the goal was revised in November 2002 to require each Army installation to be "free of dependence" on commercial Class I ODCs by 31 December 2003. Chapter 2 has additional details of this goal. This means that facilities must conduct the following activities:

- Continue to use recovered ODCs after FY 2003. Facilities, however, cannot bring any more Class I ODCs onto the installation. Facilities must use what they have, but cannot recharge a halon system; if it discharges, it must be converted.
- Continue to use hermetically sealed ODC systems after FY 2003.
- Facilities do not have to retire their halon systems by the end of FY 2003.
- Eliminate Class I ODC solvents from all Army industrial operations by FY 2005.
- Identify halon alternatives for all Army weapon system application by FY 2006.[16]

What Are Class I ODCs?
The EPA published lists of two categories of ODCs: "Class I" and "Class II" substances. Class I ODCs include fully halogenated chlorofluorocarbons (CFCs), halons, CCl4, 1,1,1-trichloroethane (TCA), methyl bromide, and hydrobromofluorocarbons (HBFCs). Class I ODCs deplete the ozone layer to a greater extent than Class II, so they are subject to more stringent controls and a more rapid phase-out schedule. Class II ODCs include only hydrochlorofluorocarbons (HCFCs). Because HCFCs decompose more readily than CFCs before reaching the stratosphere, they cause less damage to the ozone layer than CFCs. The terms ODSs and ODCs are used interchangeably.

11.2 Baseline and Progress

Although ODC-containing equipment is still being utilized at several ORARNG installations, the OMD has been able to effectively reduce its dependency on Class I ODCs. As shown in Table 11-1, there are only three locations that contain Class I ODC greater than 50 pounds.[17]

[16] A reference for halon alternatives is available at ASA (ALT)'s Environmental Support Office (ESO) website, (last accessed May 2006): http://www.environmentalsupportoffice.com/ODC/ODC_XSummary.htm#Background.
[17] This data is based on data collected in April 2004.

Table 11-1. ORARNG Facilities with ODC greater than 50 pounds[1]

Facility	Unit	ODC Type	ODC Pounds
Hillsboro Readiness Center	Refrigerator	R-12	140
Grants Pass Readiness Center	A/C (rear of building)	R-22	66
Salem OMD	Chiller A/C	R-22	178

1. Data obtained in April 2004.

The *ORARNG Ozone-Depleting Chemical Elimination Plan*, December 2000, contains an inventory of all Class I ODC equipment and provides further guidance for reducing dependency on commercial Class I ODCs.

11.3 Current P2 Initiatives

11.3.1 Non-ODS Refrigerant Water Coolers

Description: The refrigerants used in drinking fountains to chill the water have historically been CFC. However, Title VI of the Clean Air Act (CAA) established a program to phase out use and/or manufacturing of ODSs. At least two companies offer CFC-free refrigeration units as part of their drinking fountain products. Both use a non-ozone-depleting chemical called HFC-134a (also known as R-134a), which is a hydrofluorocarbon. While R-134a is a non-ozone-depleting refrigerant, it is a greenhouse gas and has a global warming potential. Thus, these units must be serviced by certified refrigeration technicians and are subject to the "non-venting rule" for Class I and Class II ODS replacements per the Clean Air Act Amendments (CAAA) as stated in 58 FR 92, Section 608(c)(2) page 28,664, that took effect as of 15 November 1995.

Environmental Evaluation: Use of non-ozone depleting chemicals as refrigerants in drinking fountains (such as HFC-134a) will help facilities meet the requirements under 40 CFR 82, Subpart D and EO 12843 requiring Federal agencies to maximize the use of safe alternatives to Class I and Class II ODS, to the maximum extent practicable. It should be noted that while R-134a is a non-ozone depleting refrigerant, these units are subject to the "non-venting rule" for Class I and Class II ODS replacements per Section 608 of the CAAA.

Economic Evaluation: Water fountains are typically only replaced on an "as needed" basis. The installation costs for both CFC-12 and ODS-free fountains are the same. Water fountains do not typically require special periodic maintenance. Any service would require personnel trained in the handling of R-134a. ODS free water fountains range in price from $250 to $350 from GSA depending on size.

Implementation Costs: $25,010.56
Recurring Costs: $25.00 per unit per year
Recurring Cost Savings: $1,050 per unit per year
Payback Period: 73.756 years

Implementation Status: This initiative has been approved as a valid project.

11.3.2 Air Conditioner Replacement

Description: CFCs and HCFCs have been used as refrigerants since the 1930s. Due to the ozone depleting effect of CFCs and HCFCs and the eventual phase out of the production of these chemicals, old Class I ozone containing air conditioners were replaced with more efficient non-ODC air conditioners.

Environmental Evaluation: The replacement of ozone containing air conditioners will eliminate the use of an ODS, and save money on overall costs through the retrofit of existing equipment. Reduce ODC release into the atmosphere.

Economic Evaluation: Recycle refrigerants for reuse at facility. Reduce hazardous waste disposal and handling costs. Reduce the purchase of new refrigerants.

Implementation Status: This initiative has been approved as a valid project.

11.4 Potential P2 Initiatives

No additional potential P2 initiatives have been identified to replace remaining Class I ODC equipment.

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Chapter 12
Vehicle Fuel Conservation

12.1 Goals

The goals for vehicle fuel conservation are as follows:

- Increase the average EPA fuel economy of cars and light trucks by at least one (1) mpg by the end of FY 2002 and three (3) mpg by the end of FY 2005, using FY 1999 as a baseline.
- Reduce vehicle petroleum consumption 20 percent be the end of FY 2005 from a FY 1999 baseline for light-, medium-, and heavy-duty non-tactical vehicles.
- Ensure that alternative fuels account for at least 50 percent of the fuels used in dual-fuel, alternative fuel vehicles (AFVs).
- Ensure that at least 75 percent of car and light truck procurements are alternatively fueled vehicles.
- Ensure that 100 percent of light truck procurements are hybrid vehicles. This applies to vehicles not covered under EPAct requirements (that is, vehicles outside of a covered MSA).

The sources of the goals on vehicle fuels are EO 13149, "Greening the Government Through Federal Fleet and Transportation Efficiency, April 2000," the EPAct of 1992 (for the 75 percent requirement for AFVs), the NDAA of 2002 (for hybrid vehicle requirements), and the Guidance for Developing Army Pollution Prevention Plans. None of the goals apply to tactical or emergency vehicles.

An AFV is a dedicated, flexible-fuel, bi-fuel, or dual-fuel vehicle. Alternative fuels include the following:

- Methanol, denatured ethanol, and other alcohols.
- Mixtures containing 85 percent or more by volume of methanol, denatured ethanol, and other alcohols with gasoline or other fuels.
- Natural gas (compressed or liquefied)
- Liquefied petroleum gas (propane)
- Hydrogen
- Coal-derived liquid fuels
- Fuels (other than alcohol) derived from biological materials, including biodiesel
- Electricity (including electricity from solar energy)

12.2 Baseline and Progress

EO 13149 requires that the goals be met at the agency level, so the ORARNG should coordinate the development and tracking of these goals with the NGB. Allowances are made for facilities that cannot feasibly meet these goals because of a lack of alternative fuels, fleet size, etc. The ORARNG is encouraged to undertake the following action items:

1. Obtain data on vehicle fuel use and miles driven to establish a baseline against which future efforts can be evaluated. This data can be used to justify purchases of AFV or educational programs regarding fuel conservation.
2. Obtain vehicle procurement guidelines and determine if the ORARNG maintain AFVs.
3. As vehicles are leased or acquired, the ORARNG should consider purchasing hybrid vehicles.
4. Stay informed of alternate fuel stations near ORARNG facilities.

According the U.S. DOE Energy Efficiency and Renewable Energy - Alternative Fuel Station Locator[18] there are fueling stations for electric, compressed natural gas (CNG), liquefied petroleum gas (propane), BioDiesel, and Ethanol 85% (E85) in the State of Oregon. Currently, there are no fueling stations in Oregon for liquefied natural gas (LNG), or hydrogen. Cities that have alternative fuel station(s) are listed in Table 12-1. ORARNG facilities that want to purchase an AFV should check the U.S. DOE website to determine if a fuel station is easily accessible.

Table 12-1. Quantity of Alternative Fuel Stations in the State of Oregon by City[1]

City	Electric	CNG	Propane	Biodiesel	Ethanol	LNG[2]	Hydrogen[2]
Aloha	1						
Beaverton			1				
Bend			1	1			
Central Point			1	1			
Corvallis			1	1			
Eugene		1*	1	3	Planned		
Grants Pass			1				
Gresham			1				
Hermiston			1				
Hillsboro		1	2				
Klamath Falls			2				
Madras			1				
McMinnville			1				
Medford		3	2	1			
Milwaukie			1				
Newport			1				
North Bend			1				

[18] Alternative Fuel Station Locator website last accessed May 2006: http://afdcmap2.nrel.gov/locator/findpane.asp

City	Electric	CNG	Propane	Biodiesel	Ethanol	LNG[2]	Hydrogen[2]
Odell				1			
Portland	2	5*	7	5	Planned		
Redmond			1				
Roseburg		Planned	2				
Saint Helens	1*						
Salem		2	2	1	1*		
Seaside			1				
Sutherlin				1			
Tigard			2				
Tualatin		2*					

1. At least one of the locations marked with an (*) are private and/or government access only. Data obtained from http://afdcmap2.nrel.gov/locator/findpane.asp (accessed July 2006).
2. Currently, no fueling stations are located in Oregon for this alternative fuel.

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Chapter 13
Energy Conservation

13.1 Goal

According to the EPAct of 1992, the goal for facility energy consumption is to reduce the consumption 30 percent per square foot by 2005 and 35 percent by 2010 from a 1985 baseline. The EPAct of 2005 builds upon the guidelines established in 1992. This act requires that agency-wide energy use at Federal buildings meet incremental reductions (as measured by energy consumption per gross square foot) through 2015. These reductions are to be measured against a 2003 baseline as specified in Table 13-1.[19] This table may be used to track ORARNG progress towards meeting the energy consumption reduction goals.

Table 13-1. Energy Consumption Reduction Goals

Fiscal Year	Energy Consumption	Gross Square Foot	GOAL Percent Reduction compared to 2003	ACTUAL Percent Reduction compared to 2003
2003	**14,825,379 kWh**		**BASELINE**	**N/A**
2006	TBD	TBD	2%	TBD
2007	TBD	TBD	4%	TBD
2008	TBD	TBD	6%	TBD
2009	TBD	TBD	8%	TBD
2010	TBD	TBD	10%	TBD
2011	TBD	TBD	12%	TBD
2012	TBD	TBD	14%	TBD
2013	TBD	TBD	16%	TBD
2014	TBD	TBD	18%	TBD
2015	TBD	TBD	20%	TBD

The EPAct of 2005 also requires all Federal buildings to use advanced meters or metering devices that provide, at a minimum, daily data that measure the hourly consumption of electricity. This data should be made available to facility energy managers and incorporated into existing Federal energy tracking systems.

13.2 Baseline and Progress

The ORARNG tracks energy consumption at each installation; however, the total square footage used to calculate the energy consumption rate has not been updated. Therefore, consumption per square foot does not include the changes in space occupied over the years. The 1985 energy

[19] http://energycommerce.house.gov/108/0205_Energy/05policy_act/Title%201%20-%20Energy%20Efficiency.PDF (website accessed July 2006). Additional information is available at http://energycommerce.house.gov/108/energy_pdfs_2.htm (website accessed July 2006).

consumption data is not available to determine the baseline level. Throughout the years, electrical and natural gas use has not changed significantly.

Table 13-2, and Figure 13-1, shows combined electricity consumption for all ORARNG facilities between FY 2000 and 2005. Electricity use declined in 2002, but steadily increased annually.

Table 13-2. ORARNG Electricity Consumption from FY 2000 to 2005 (KWHr)

Baseline						Target: 30% less than FY 1985
FY 1985	**2000**	**2001**	**2002**	**2003**	**2004**	**FY 2005**
Not available	15,707,232	13,867,083	13,532,298	14,825,379	15,136,601	15,945,639

Annual utility usage for various comfort heating and cooling devices includes from FY 1998 through 2005 is also shown in Tables 13-3, as well as in Figures 13-1, 13-2, and 13-3. Figure 13-2 highlights the peak in natural gas use in FY 1999 and maintaining moderate usage thereafter. As shown in Figure 13-3, propane use has increased significantly since 1998; whereas, oil use decreased from FY 2001 to FY 2004 and increased drastically in FY 2005.

Table 13-3. ORARNG Utility Usage from FY 1998 to 2005[1]

Fiscal Year	Electricity (kWh)	Natural Gas (Therms)	Propane (Gallons)	Oil (Gallons)	Diesel (Gallons)
1998	16,206,032	738,647	12,390	37,783	0
1999	14,970,086	831,893	23,650	24,162	0
2000	15,707,232	769,528	35,461	16,106	0
2001	13,867,083	718,095	51,705	21,238	0
2002	13,532,298	722,924	60,079	18,035	398
2003	14,825,379	731,475	63,524	3,800	0
2004	15,136,601	718,418	53,782	1,000	0
2005	15,945,639	747,508	42,371	10,124	0

1. Data provided by OMD, AGI-O, (December 2005).

Figure 13-1. Energy Use - Electricity

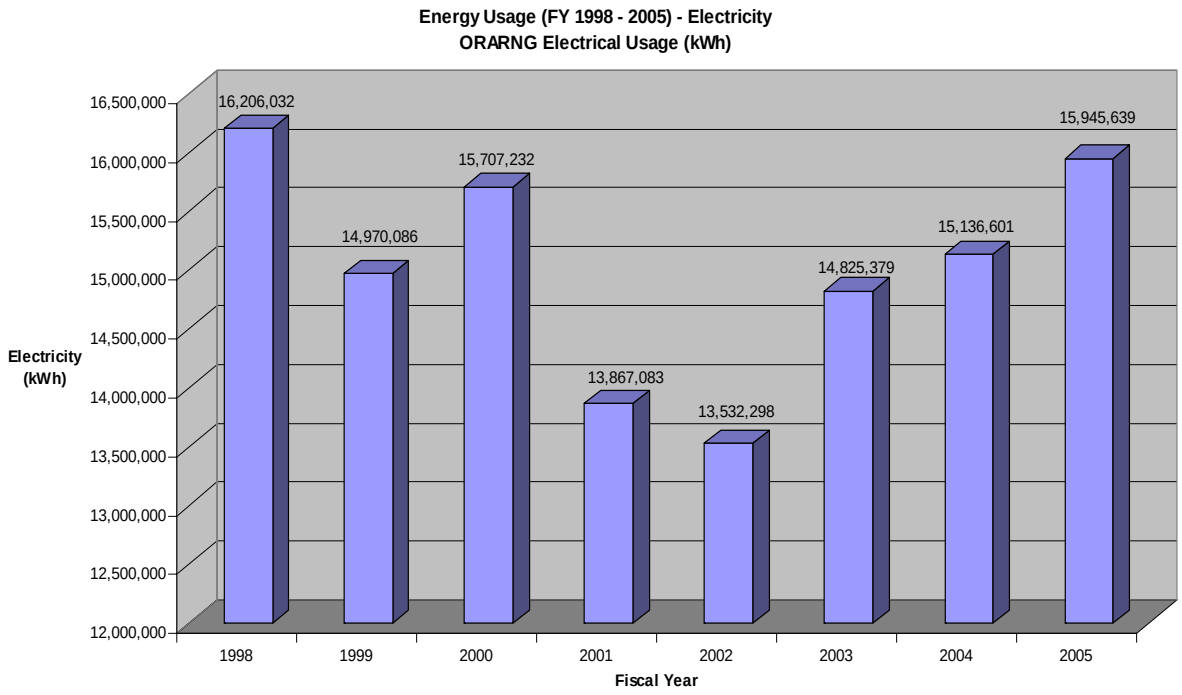


Figure 13-2. Energy Use – Natural Gas

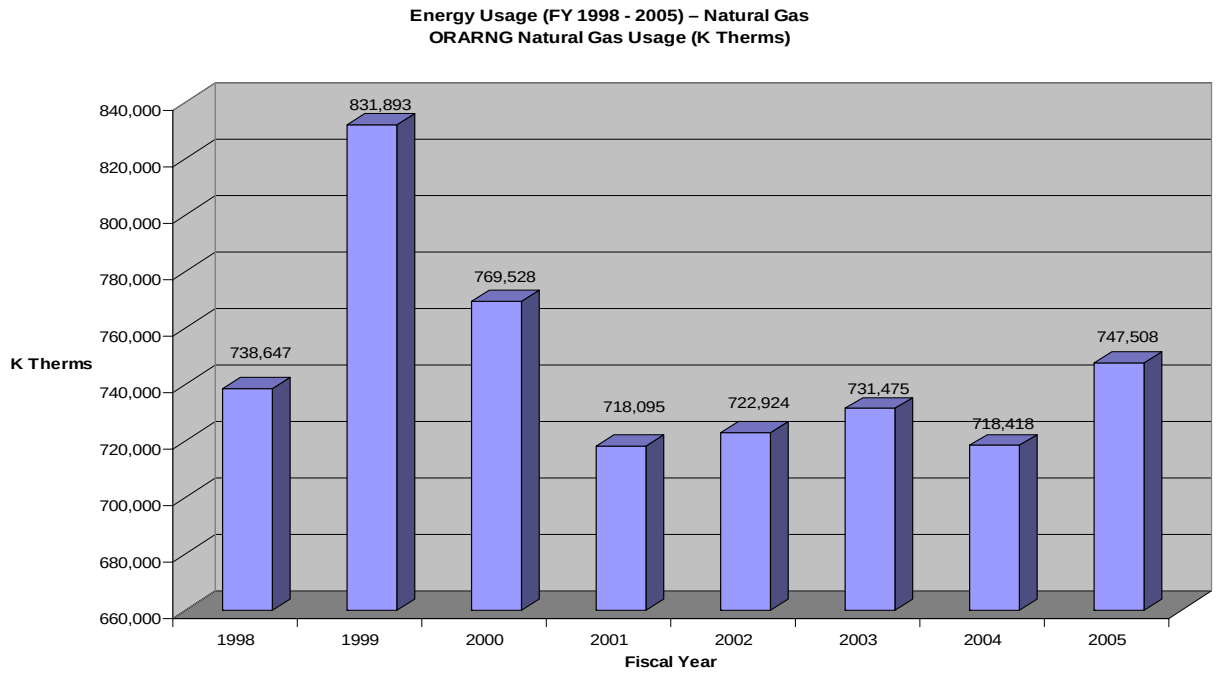
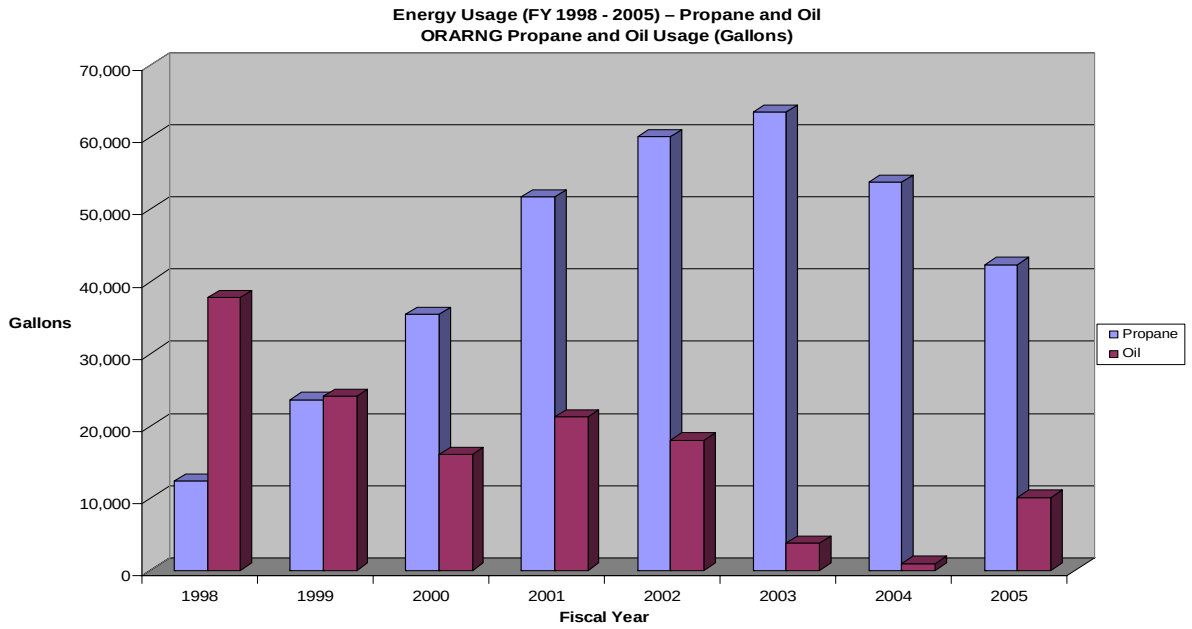


Figure 13-3. Energy Use – Propane and Oil



13.3 Current P2 Initiatives

The ORARNG currently participates in the Oregon Department of Energy's State Energy-Efficient Design (SEED) program. Through this program, required under OAR 330-130, the ORARNG works to ensure that cost-effective energy conservation measures are included in new and renovated facilities.

13.4 Potential P2 Initiatives

The creation of an Energy Management Plan would enable the ORARNG to effectively outline a strategy for the management and implementation of energy-related activities for all facilities. The development of such a plan would assist the ORARNG in identifying opportunities for energy conservation, assuring necessary data elements are collected, and track progress towards P2 goals.

Chapter 14
Affirmative Procurement

14.1 Goals

Affirmative Procurement (AP) is the policy and practice of purchasing goods made with recycling materials and/or bio-based products as part of the Green Procurement Program (GPP). The GPP requires agencies to participate in the following programs or practices, but only recommends the participation in the EPA's Environmentally Preferable Purchasing (EPP) program:

- Purchase recycled-content products from, as listed in EPA's Comprehensive Procurement Guideline (CPG) items or AP items. Initially, the AP program was known as the "Buy Recycled" program; however, bio-based products are now part of the mandatory Federal purchasing preference program. This program is authorized under Section 602 of RCRA and further defined by EO 13101. The Federal Acquisition Regulation support aspects of the recycled-content product purchase program.
- Purchase bio-based products made from rapidly renewable plant materials such as domestic agricultural or forestry materials. Products include soy inks, vegetable-based lubricating oils, office paper, etc.
- Purchase energy efficient and low standby power products as defined in EPAct of 2005, EO 13123, and EO 13221. (See Chapter 13, Energy Conservation)
- Purchase alternatively fueled vehicles, alternative fuels, and fuel efficient vehicles as defined in EPAct of 2005 and EO 13149. (See Chapter 12, Vehicle Fuel Conservation)
- Follow the Original Equipment Manufacturer recommendations before installing ODS substitutes, as listed in the EPA Significant New Alternatives Program (SNAP) list, in air conditioning and refrigeration systems. (See Chapter 11, Ozone Depleting Substances)
- Reduce the generation of hazardous waste and promote the use of non-hazardous materials as defined in the EPA priority chemical list. (See Chapter 5, Hazardous Waste)

14.2 Baseline and Progress

There is no baseline for the GPP, as the intent of the program is to encourage facilities to buy environmentally preferred, energy efficient, bio-based, non-hazardous, recycled, or recovered items.

The ORARNG has not yet reached the goal of training its procurement officers in AP. There is limited training performed as part of the training for the International Merchant Purchase Authorization Card (IMPAC). However, there is no formal process established for integrating AP into developing plans, work statements, and specifications, although it may be occurring on an ad hoc basis.

The ORARNG does not have an Affirmative Acquisitions and an EPP Plan, which would provide reporting requirements for the following items:

- Paper
- Metals
- Batteries
- Re-refined oil
- Retread tires
- Toner cartridges
- Other items that are purchased with recycled content
- Yard waste and solid waste

The plan should also include information about construction products, landscaping, and other efforts to further the AP and EPP program. Data on the re-refined oil program is the only product discussed in this chapter of the seven EPA-defined categories. Although paper with recycled content is usually purchased at the ORARNG.

In CY 2005, Camp Withycombe was the only ORARNG facility that participated in the Closed Loop Re-refined Oil Program, which is administered through the Defense Logistics Agency (DLA). Other ORARNG facilities located in Portland, Salem, Lebanon[20], and Warrenton purchased basic re-refined oil in CY 2005. Basic re-refined oil is waste oil that is not returned for re-refining, but rather is disposed of or incinerated for energy. Table 14-1 shows the types of oil purchased[21] in CY 2005 throughout the ORARNG.

Table 14-1. Types of Engine Lubricating Oils Purchased in CY 2005[1]

Type of Lubricating Oil	Annual Quantity in Pounds	Percent of Total Oil Purchased
Closed loop re-refined oils	26,328	17%
Basic re-refined oils	2,311	1%
Non-re-refined oils that could be re-refined	127,389	82%
Total of all lubricating oils purchased	**156,028**	**100%**

1. Data provided by OMD, AGI-O.

Approximately 18 percent of the oil purchased by the ORARNG in CY 2005 was re-refined from used oil through the Closed Loop and the Basic Re-refined Oil Program. The ORARNG has made some progress in moving toward its goal of purchasing all oil through the Closed Loop Re-refined Oil Program, but there still remains a significant gap. An examination of the oil purchases by shop can be performed to find and target the shops that are not yet participating fully in the program. Additional hazardous material purchases are listed by facility in Appendix F.

[20] The Lebanon FMS transferred to the Springfield FMS in 2006.
[21] Data was obtained from the Standard Army Retail Supply System (SARSS).

14.3 Current P2 Initiatives

Camp Withycombe purchases oil through the Closed Loop Re-refined Oil Program. Most ORARNG facilities (such as Camp Rilea, Lebanon FMS[22], Tigard FMSS, Portland FMS, and Salem AASF #1) purchases oil through the Basic Re-refined Oil Program. However, each location that purchases re-refined lubricating oil, also purchases lubricating oil that could be re-refined.

14.4 Potential P2 Initiatives

In addition to participating in a closed loop re-refined oil program, as discussed in Section 14.4.1, it is recommended that the ORARNG improve the AP program as listed below:

1. Develop an Awareness Training Program to train and educate all procurement officers to evaluate and purchase AP and EPP products. In addition, ensure that Awareness Training is documented and can be provided during an inspection.
2. Develop an Affirmative Acquisitions and an Environmentally Preferable Products Plan, and include an internal process for tracking and reporting AP purchases. This comprehensive tracking and reporting program will be useful during external environmental inspections such as an Environmental Performance Assessment System.
3. Document all non-AP compliant purchases that are over $2,500 (those that do not meet recycled/recovered content or bio-based requirements for reasons based on price, performance, or product availability).
4. Provide a handy list of designated CPG and bio-based products to all procurement officers so they can easily refer to it when making purchases.
5. Continue to increase the list of AP and EPP products by searching for AP, biobased and EPP compliant products in catalogs or on the web and request these types of products from vendors and other supply sources.
6. Update the AP Plan to a GPP. The GPP educates all purchasing personnel and activities, including government credit card holders, in environmentally preferable buying practices.

14.4.1 Participate in a closed loop re-refined oil program

Description: Used oil is generated throughout the ORARNG from changing oil in a variety of tactical and non-tactical vehicles. The amount of used oil generated in CY 2005 was 2,145 lbs, which excludes used oil recovered through the closed-loop re-refined oil program at Camp Withycombe.

Technical Evaluation: Re-refined oil is used oil that has been refined again to remove impurities. Re-refined oil conserves a non-renewable natural resource, and the closed loop re-refined oil program reduces the used oil waste stream.

To produce re-refined oil, used oil is collected and sent to a re-refiner for processing. The used oil is put through essentially the same manufacturing/refining process as that used to produce

[22] The Lebanon FMS transferred to the Springfield FMS in 2006.

motor oil from virgin oil, although there are some modifications which allow for decontamination of the used oil, separation of water from the oil, and other measures to ensure quality. Re-refined oil is certified by the American Petroleum Institute (API) and will not void warranties by major manufacturers of engines, and is approved by the U.S. Army Tank-Automotive and Armaments Command (TACOM) for MIL-PRF-2104 and commercial item descriptions A-A-52039 and A-A-52306, which cover all engines used throughout the DoD.

Prior to the re-refining process, the collected used oil is tested, and inappropriate feed stocks are rejected. The re-refining process consists of three distillation stages—dehydration, fuel stripping, and vacuum distillation—that produce distilled oil, fuel, and asphalt extender products. The distilled oil is then hydro-treated to produce the finished base oil, which is blended with an additive package to produce a finished re-refined oil product.

Re-refining oil constitutes an indefinite recycling loop since the base stock oil is refined back to its original status and can be used again and again. The "bottoms" that are removed during the refining process can be used in asphalt blends or in the manufacturing of roofing shingles.

Defense Supply Center Richmond (DSCR) developed a re-refined oil program in conjunction with the EPA CPG. The EPA designated re-refined oil in the CPG, meaning that Federal agencies are required to purchase re-refined oil products. In March 1999, the Under Secretary of Defense issued a memorandum directing DoD activities to participate in the re-refined program.[23] In the DSCR "closed loop" program, re-refined oil is ordered through the same purchasing channels now used for regular oil, and used oil is picked up *at no cost* to the activity by a contractor. All DoD activities have been directed to participate in the program.

Chemical Use/Hazardous Waste Reduction: In a closed loop program, all used oil would be re-refined; therefore, there would be a 100 percent reduction in used oil disposal.

Economic and Environmental Evaluation: The cost of re-refined oil is very similar to the cost of pure oil; therefore, there would be no significant change in the cost of inputs. There would be a significant difference; however, in the disposal costs since the closed loop program includes free pickup of used oil up to 120 percent of the amount of re-refined oil purchased on an annual basis.

A closed loop re-refined oil program is true *recycling* and offers numerous advantages over used oil *recovery* programs (in which used oil is frequently used as a boiler fuel). A closed loop re-refined oil program:

- Complies with EO 13101, which requires agencies to incorporate waste prevention and recycling into daily operations and to work to increase and expand markets for recovered materials through greater Federal Government preference and demand for such products.
- Complies with EO 12873, which requires the Federal Government to assume leadership in making more efficient use of natural resources through acquisition of items made with recovered materials.

[23] For more information: http://www.dscr.dla.mil/userweb/dscrld/Re-refined/under_secretary_of_defense.htm (website accessed June 2006).

- Complies with the RCRA, which requires any Federal agency using Federal funds to procure items composed of the highest percentage of recovered material practicable. Re-refined oil is one of the guideline items designated by the EPA.
- Reduces air pollution associated with used oil incineration.
- Reduces the amount of energy required for oil production.

The ORARNG Environmental office could increase involvement in the closed loop re-refined oil program by distributing the DSCR brochure, *Re-refined Motor Oil*, to all facilities, or they could develop an ORARNG-specific brochure outlining the procedures for ordering and disposing of oil.

Additional information on the closed loop oil program can be found at http://www.dscr.dla.mil/userweb/dscrld/Re-refined/refined.htm and http://www.dscr.dla.mil/userweb/dscrld/Re-refined/RR.htm.

14.5 AP Program References

Sources where AP products can be purchased include Government and non-government entities:

- Government Supply Sources, such as:
  - General Services Administration (GSA)
  - Defense Logistics Agency (DLA)
  - Government Printing Office (GPO)
  - Federal Logistics Information System (FLIS)
  - Your own supply store on post
  - Javits-Wagner-O'Day Act (JWOD) Organizations
  - Federal Prison Industries (UNICOR)
- Off-Post Commercial Vendors (i.e., Home Depot, Lowe's, Office Depot, and Staples)

Other information on AP programs and AP and EPP products can be found on the web. There are websites available that can provide an example of contract language for the incorporation of AP where deemed as appropriate. A small list of websites, but not intended as a comprehensive list, available include:

- EPA: www.epa.gov/cpg and www.epa.gov/oppt/epp
- Government Procurement: www.govexec.com/procurement
- GSA: www.gsa.gov
- DLA: www.dscr.dla.mil or www.emall.dla.mil
- JWOD: www.jwod.com
- USDA: www.usda-biobasedproducts.net/public

- SBA: http://pro-net.sba.gov
- Green Order: http://greenorder.com
- http://chppm-www.apgea.army.mil/gwswp/SolidWaste/affirmpro.htm
- http://chppm-www.apgea.army.mil/gwswp/SolidWaste/Credit%20Card%20Training.pps

Appendix A

Abbreviations

AASF	Army Aviation Support Facility
ACS	Air Control Squadron
AEDA	Ammunition, Explosives, and Dangerous Articles
AEDB-EQ	Army Environmental Database for Environmental Quality
AFV	alternative fuel vehicle
AGI-E	Environmental Branch of Installations
AGI-O	Operations and Maintenance Branch of Installations
ANG	Air National Guard
AOAP	Army Oil Analysis Program
API	American Petroleum Institute
AP	Affirmative Procurement
AR	Army Regulation
ARNG	Army National Guard
AST	Aboveground Storage Tank
BMP	Best Management Practice
Btu	British Thermal Units
CAAA	Clean Air Act Amendments
CARC	Chemical Agent Resistant Coating
CASRN	Chemical Abstract Services Registry Number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESQG	Conditionally Exempt Small Quantity Generator
CFC	chlorofluorocarbons
CFR	Code of Federal Regulations
CLP	Cleaner, lubricant, and protectant
CNG	Compressed Natural Gas
CO	Carbon Monoxide
COUTES	Central Oregon Unit Training and Equipment Site
CPG	Comprehensive Procurement Guide
CY	Calendar Year
DA PAM	Department of the Army Pamphlet
DEQ	Department of Environmental Quality
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOE	Department of Energy
DPW	Department of Public Works
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
DSCR	Defense Supply Center Richmond
ECO	Employee Commute Options
EMS	Environmental Management System
EO	Executive Order

EPA	Environmental Protection Agency
EPAct	Energy Policy Act
EPAR	Environmental Performance Assessment Report
EPAS	Environmental Performance Assessment System
EPCRA	Emergency Planning and Community Right to Know Act
EPP	Environmentally Preferable Purchasing
EQCC	Environmental Quality Control Committee
ESO	Environmental Support Office
ESOH	Environmental Safety and Occupational Health
FAR	Federal Acquisition Regulation
FEMP	Federal Energy Management Program
FLIS	Federal Logistics Information System
FMS	Field Maintenance Shop
FMSS	Field Maintenance Sub-Shop
FY	Fiscal Year
gal	gallons
GPO	Government Printing Office
GPP	Green Procurement Program
GSA	Government Services Administration
GVWR	gross vehicle weight rating
HAPs	Hazardous Air Pollutants
HBHC	hydrobromofluorocarbons
HCFC	hydrochlorofluorocarbons
HEPA	High-Efficiency Particulate Air
HSMS	Hazardous Substance Management System
HSWA	Hazardous and Solid Waste Amendments
HVLP	High volume low pressure
ICAP	Installation Corrective Action Plan
IMPAC	International Merchant Purchase Authorization Card
ISWMP	Integrated Solid Waste Management Plan
JFHQ	Joint Force Headquarter
JWOD	Javits-Wagner-O'Day Act
kWh	Kilowatts per hour
lbs	pounds
LGQ	Large Quantity Generator
LNG	Liquefied Natural Gas
MACOM	Major Army Commands
MILSPECS	military specifications
mo	Month
MoM	measures of merit
MOUT	Military Operations in Urban Terrain
mpg	mile(s) per gallon
MSA	metropolitan statistical area
MSC	major subordinate commands
MSW	Municipal Solid Waste
MTBE	methyl tertiary butyl ether

MWR	Morale, Welfare, and Recreation
$NaHCO_3$	Sodium Bicarbonate
NDAA	National Defense Authorization Act
NGB	National Guard Bureau
NO_x	Oxides of Nitrogen
O_3	Ozone
OAR	Oregon Administrative Rules
ODC	Ozone-depleting Chemical
ODS	Ozone-depleting Substances
OMD	Oregon Military Department
O&M	Operations and Maintenance
ORARNG	Oregon Army National Guard
ORS	Oregon Revised Statute
OSHA	Occupational Safety and Health Administration
OSMS	Oregon Sustainment Maintenance Site
OWP	Office Waste Paper
OWS	oil/water separator
P2	Pollution prevention
PB	Lead
PBT	Persistent, Bioaccumulative and Toxic
PCBs	polychlorinated biphenyls
PM	Post Maintenance
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 microns
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 microns
POL	Paints, Oils and Lubricants
POTW	Publicly Owned Treatment Works
PPA	Pollution Prevention Act
PPOA	Pollution Prevention Opportunity Assessment
QRP	Qualified Recycling Program
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act of 1986
SARSS	Standard Army Retail Supply System
SEED	State Energy-Efficient Design
SMS	State Maintenance Shop
SNAP	Significant New Alternatives Program
SOP	Standard Operating Procedure
SPCC	Spill Prevention Control and Countermeasures
SQG	Small Quantity Generator
STEP	Status Tool for the Environmental Program
SWAR	Solid Waste Annual Reporting
TACOM	Tank-automotive and Armaments Command
TCA	1,1,1-trichloroethane
tpy	tons per year
TRI	Toxic Release Inventory
TSCA	Toxic Substance Control Act
TSDF	Treatment, Storage or Disposal Facility

TUHWR	Toxics Use and Hazardous Waste Reduction
ULPA	Ultra-Low Penetrating Air
USPFO - SDC	United States Property and Fiscal Office – Supply Distribution Center
UTES	Unit Training Equipment Site
VOCs	Volatile Organic Compounds
yr	year

Definitions

Appliance: Any device that contains and uses a Class I or Class II substance as a refrigerant and that is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer.

Cartridge Filter: A discrete filter unit containing both filter paper and activated carbon that traps and removes contaminants from petroleum solvent, together with the piping and ductwork used in installing this device.

Characteristic Waste: The characteristics of ignitability, corrosivity, reactivity, and toxicity that identify hazardous waste.

Chemical Warfare Agent: A substance that because of its chemical properties is used in military operations to kill, seriously injure, or incapacitate humans or animals or deny use of indigenous resources.

Container: Any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

Designated Facility: A hazardous waste treatment, storage, or disposal facility (TSDF) that is identified on a manifest as the destination of a hazardous waste shipment. The facility must have an appropriate permit, have interim status, or be regulated under specific recycling requirements.

Non-attainment Area: Any area designated as being in non-attainment with the National Ambient Air Quality Standard (NAAQS) for ozone pursuant to rulemaking under section 107(d)(4)(A)(ii) of the CAA.

Disposal: The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or onto any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

EPA Hazardous Waste Number: The number assigned by USEPA to each hazardous waste listed in 40 CFR 261, Subpart D, and to each characteristic identified in 40 CFR 261, Subpart C.

Facility: All contiguous land and structures, other appurtenances, and improvements of the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (i.e., one or more landfills, surface impoundments, or combination of them).

Federally Enforceable: All limitations and conditions enforceable by the Administration, including those requirements developed pursuant to 40 CFR, requirements within any applicable state implementation plan, and any permit requirements established pursuant to 40 CFR.

Generator: Any person or group whose act or process produces hazardous waste identified or listed in 40 CFR 261 or whose act first causes a hazardous waste to become subject to regulations.

Good Management Practice (GMP): A practice that, although not mandated by law, is encouraged to promote safe operating procedures.

Hazardous Waste: A solid waste, not specifically excluded from the restrictions of Federal regulation (42 USC 6901), that meets the criteria listed in 40 CFR 261 or is specifically named as a hazardous waste in Federal regulations.

Household Waste: Includes material discarded by single and multiple residential dwellings, hotels, motels, and other similar permanent or temporary housing.

Incinerator: Any furnace used in the process of burning solid waste for the purpose of reducing the volume of the waste by removing combustible matter.

Infectious Waste: 1. Equipment, instruments, utensils, and fomites of a disposable nature from the rooms of patients who are suspected to have or have been diagnosed as having a communicable disease and who must therefore be isolated as required by public health agencies. 2. Laboratory waste, such as pathological specimens and disposable fomites (any substance that may harbor or transmit pathological organism). 3. Surgical operating room pathological specimens and disposable fomites attendant thereto and similar disposable materials from outpatient areas and emergency rooms.

Landfill: A disposal facility or a part of a facility where waste is placed in or on land and that is not a land treatment facility, a surface impoundment, an underground injection well, a salt bed formation, an underground mine, or a cave.

Hazardous Waste Management: The systematic control of the collection, source separation, storage, transportation, processing, treatment, recovery, and disposal of hazardous waste.

Material-Tracking System: Each generator developing an in-house system to ensure that all hazardous materials and wastes are controlled from purchase to release or disposal in order to reduce loss and spillage.

Medical Waste: When defined as applicable to municipal waste combustors, any solid waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in production or testing of biological agents. Medical waste does not include hazardous waste identified under RCRA-C or any household waste as defined in RCRA, subpart C.

Off-Specification Used Oil: Used oil burned for energy recovery and any fuel produced from used oil that exceeds the following allowable limits:

Arsenic	5 ppm max.

Cadmium	2 ppm max.
Chromium	10 ppm max.
Lead	100 ppm max.
Flash Point	100 °F min.
Total halogens	4000 ppm max.

Particulate Emissions: Any airborne finely divided solid or liquid material, except uncombined water, emitted to the ambient air.

Pollution Prevention: Source reduction and other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or other resources, or protection of natural resources by conservation. Recycling, energy, treatment, and disposal are not included in the definition of pollution prevention. However, some practices commonly described as "in-process recycling" may qualify as pollution prevention. Examples might include solvent recycling, metal recovery from a spent plating bath, and recovery of volatile organic compounds (VOCs).

Qualifying Recycling Program: Organized operations that require concerted efforts to (a) divert or recover scrap or waste from waste streams; (b) identify, segregate, and maintain the integrity of the recyclable materials to maintain or enhance the marketability of the material.

Recyclable Material: Material that normally has been or would be discarded (such as scraps and waste) and material that may be reused after undergoing some type of physical or chemical processing. Recyclable materials may include discarded materials that have undergone demilitarization or mutilation at an installation before being transferred to the property disposal office for sale. Recyclable materials do not include (1) precious-metal-bearing scrap; (2) those items that may be used again for their original purpose or functions without any special processing, such as used vehicles, vehicle or machine parts, bottles (not scrap glass), electrical components, and unopened containers of unused oil or solvent.

Recycling: The process by which recovered materials are transformed into new or usable products.

Resource Recovery Facility: Any physical plant that processes residential, commercial, or institutional sold waste biologically, chemically, or physically and recovers useful products (such as shredded fuel, combustible oil or gas, steam, metal, or glass) for resale or reuse.

Sludge: Any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

Source Reduction: Any practice that reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or emitted to the environment (including fugitive emissions) before recycling, treatment, or disposal. The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products,

substitution or raw materials, and improvements in housekeeping, maintenance, training, and inventory control.

Source Separation: The setting aside of recyclable materials at their points of generation by the generator.

Sump: Any pit or reservoir that meets the definition of tank and the troughs or trenches connected to it that serve to collect hazardous waste for transport to hazardous waste TSDFs, except that as used in the landfill, surface impoundment, and waste pile rules, "sump" means any lined pit or reservoir that serves to collect liquids drained from a collection and removal system or a leak-detection system for subsequent removal from the system.

Treatability Study: A study in which a hazardous waste is subjected to a treatment process to determine one or more of the following:

- Whether the waste is amenable to the treatment process
- What pretreatment, if any, is required
- The optimal process conditions needed to achieve the desired treatment
- The efficiency of a treatment process for a specific waste or wastes
- The characteristics and volumes of residuals from a particular treatment process

Treatment: Any method, technique, or process (including neutralization) designed to change the physical, chemical, or biological character or composition of any hazardous waste.

Used Oil: Any oil that has been refined from crude oil or any synthetic oil that has been used and as a result of such is contaminated by physical or chemical impurities.

Volatile Organic compound (VOC): Any compound of carbon, excluding carbon monoxide (CO), carbon dioxide, carbonic acid, metallic carbides, carbonates, and ammonium carbonate, that participates in atmospheric photochemical reactions.

Appendix B

References/Pollution Prevention Opportunity Assessments

ENVIRONMENTAL PROTECTION AGENCY GUIDANCE

General Guidance

Waste Minimization Opportunity Assessment manual, EPA/625/7-88/003, 1988.
Facility Pollution Prevention Guide, EPA/600/R-92/088, 1992.
Pollution Prevention in the Federal Government: Guide for Developing Pollution Prevention Strategies for Executive Order 12856 and Beyond, EPA/300/B-94/007, 1994.
Pollution Prevention and Right-to-Know in the Government: Executive Order 12856, EPA/100/K-93/001, 1993.
Setting Priorities for Hazardous Waste Minimization, EPA/530/R-94/015, 1994.
A Primer for Financial Analysis of Pollution Prevention Projects, EPA/600/R-93/059, 1993.
Pollution Prevention Act of 1990, Public Law 101-508, 1990.

Industry-Specific Guidance

These guides list source-reduction and recycling techniques for specific industries. The guides have been published by the Pollution Prevention Research Branch of EPA's Office of Research and Development as a series of industry-specific pollution prevention guidance manuals.

Industrial Category	EPA Document No.	Date
Automotive Refinishing Industry	*EPA/625/7-91/016*	*10/91*
Auto Repair Industry	*EPA/625/7-91/013*	*10/91*
Fiberglass Reinforced and Composite Plastics	*EPA/625/7-91/014*	*1991*
Mechanical Equipment Repair Industry	*EPA/625/R-92/008*	*1992*
Metal Finishing Industry	*EPA/625/R-92/011*	*1992*

Fact Sheets

The following fact sheets contain overviews, tips, or guidelines for pollution prevention. Some provide only general information or advice on how to set up programs; others identify pollution prevention opportunities for specific industries, processes, or materials. EPA, state agencies, and local governments produced the fact sheets. In many cases, multiple sources have published fact sheets on particular topics. Fact sheets on the topic areas below are available from the EPA library, 401 M Street, SW, Washington DC 20460 (202/260-1963). The source of this information is *Pollution Prevention Resources and Training Opportunities in 1992*, EPA, Office of Pollution Prevention and Toxics and Office of Environmental Engineering and Technology Demonstration, EPA/5650/8-92-002, January 1992.

FACT SHEETS

General and Introductory Information

Conservation Tips for Business
General Guidelines
Getting More Use Out of What We Have
Glossary of Waste Reduction Terms
Guides to Pollution Prevention
Hazardous Waste Minimization
How Business Organizations Can Help
Local Governments and Pollution Prevention
Pollution Prevention (General)
Pollution Prevention Fees
Pollution Prevention Training and Education
Pollution Prevention Through Waste Reduction
Recent Publications
Reduce Hazardous Waste
Reuse Strategies for Local Government
Source Reduction Techniques for Local Government
U.S. EPA's Pollution Prevention Program
Waste Exchanges: Everybody Wins!
Waste Exchange Services
Waste Minimization Fact Sheet
Waste Minimization in the Workplace
Waste Reduction Can Work For You
Waste Reduction Overview
Waste Reduction/Pollution Prevention: Getting Started
Waste Reduction Tips for All Businesses
Waste Source Reduction
Waste Source Reduction Checklist
What is Pollution Prevention?
Why Reduce Waste?

Legislative Information/EPA and State Initiatives

EPA's 2% Set Aside Pollution Prevention Projects
EPA's "List of Lists" Projects
EPA's Pollution Prevention Enforcement Settlement Policy
EPA's Pollution Prevention Incentives for States
EPA's Pollution Prevention Strategy
New Form R Reporting Requirements
Oregon's Toxic Use Reduction Act
Pollution Prevention Act of 1990

Setting up a Program

1991 Small Business Pollution Prevention Grants
An Organization Strategy for Pollution Prevention

Considerations in Selecting a Still for Onsite Recycling
Pollution Prevention Grant Program Summaries and Reports
Procuring Recycled Products
Recycling Market Development Program
Selecting a Supplier, Hauler, and Materials Broker
Solid Waste Management Financial Assistance Program
Source Reduction at Your Facility
Starting Your Own Waste Reduction Program
The Alexander Motor's Success Story
The Eastside Plating Success Story
The Wacker Payoff
Waste Reduction Checklists
- *General*
- *Cleaning*
- *Coating/Painting*
- *Formulating*
- *Machining*
- *Operating Procedures*
- *Plating/Metal Finishing*

Waste Source Reduction: Implementing a Program

Process/Material Specific

Aerosol Containers
Aircraft Rinsewater Disposal
Acids/Bases
Chemigation Practices to Prevent Groundwater Contamination
Corrugated Cardboard Waste Reduction
Demolition
Empty Containers
Gunwasher Maintenance
Lead Acid Batteries
Machine Coolants:
- *Prolonging Coolant Life*
- *Waste Reduction*

Metal Recovery:
- *Dragout Reduction*
- *Ion Exchange/Electrolytic Recovery*
- *Etchant Substitution*

Old Paints, Inks, Residuals, and Related Materials
Pesticides:
- *Disposal of Unused Pesticides, Tank Mixes, and Rinsewater*
- *In-Filled Sprayer Rinse System to Reduce Pesticide Wastes*
- *Pesticide Container Disposal*
- *Preventing Pesticide Pollution of Surface and Groundwater*
- *Preventing Well Contamination by Pesticides*
- *Protecting Mountain Springs from Pesticide contamination*

Reducing and Saving Money Using Integrated Pest Management
Metals Recycling
Office Paper Waste Reduction
Plastics:
The Facts About Production, Use, and Disposal
The Facts on Degradable Plastics
The Facts on Recycling Plastics
The Facts on Source Reduction
Printing Equipment
Refrigerant Reclamation Equipment/Services
Reverse Osmosis
Safety Kleen, Inc. Users
Shop Rags from Printers
Small Silver Recovery Units
Solvents:
Alternatives to CFC-113 Used in the Cleaning of Electronic Circuit Boards
Onsite Solvent Reclamation
Reducing Shingle Waste at a Manufacturing Facility
Reducing Solvent Emissions from Vapor Degreasers
Small Solvent Recovery Systems
Solvent Loss Control
Solvent Management: Fiber Production Plant
Solvent Reuse: Technical Institute
Trichloroethylene and Stoddard Solvent Reduction Alternatives
Solvent Recovery: Fiber Production Plant
Solvent Reduction in Metal Parts Cleaning
Ultrafiltration
Used Containers: Management
Used Oil Recycling
Waste Management Guidance for Oil Cleanup
Water and Chemical Reduction for Cooling Towers
Waste Water Treatment Opportunities

<u>Industry-Specific</u>
Auto Body Shops
Automotive Painting
Automotive/Vehicle repair Shops
Asbestos Handling, Transport, and Disposal
Machine Toolers
Metal Finishers:
General
Effluent Minimization
Rinsewater Reduction

U.S. ARMY GUIDANCE

General Assistance

U.S. Army Construction Engineering Research Laboratory. P.O. Box 4005, Champaign, IL, 61820. 800-USA-CERL

U.S. Army Cold Regions Research and Engineering Laboratory (CERCL), Hanover, NH 03755-1290. 603-646-4200, DSN 684-4200

U.S. Army Environmental Hygiene Agency. Aberdeen Proving Ground, MD, 21010. (301) 671-3651 or DSN 584-3651.

U.S. Army Environmental Office. The Pentagon, Washington, DC, 20310-2600, (703) 693-5032 or DSN 223-5032.

U.S. Army Environmental Center (formerly the U.S. Army Toxic and Hazardous Materials Agency). Aberdeen Proving Ground, MD, 21010. 800-USA-EVHL, (301) 671-2427 or DSN 584-2427.

U.S. Army Environmental Policy Institute. Champaign, IL, 61820. (217) 373-3320.

Pollution Prevention

U.S. Army Environmental Center (formerly the U.S. Army Toxic and Hazardous Material Agency). Environmental Compliance Division. (301) 671-2427 or DSN 584-2427.

Recycling

U.S. Army Engineering and Housing Support Center (USAEHSC). Directorate of Public Works. (703) 704-1606/1601.

Defense Logistics Agency. Check local Defense Reutilization and Marketing Organization (DRMO) Fort Lewis WA.

Air Pollution

U.S. Army Environmental Hygiene Agency. Air Pollution Engineering Division. Air Pollution Source Management (301) 671-3500 or DSN 584-3500: or Ambient Air Quality Management (301) 671-3954 or DSN 584-3954.

U.S. Army Environmental Center. Environmental Compliance Division. (301) 671-2427 or DSN 584-2427.

CFCs and Halon

U.S. Army Environmental Office. The Pentagon, Washington, DC 20310-2600, (703) 693-5032 or DSN 223-5032.

U.S. Army Environmental Center. Environmental Compliance Division. (301) 671-2427 or DSN 584-2427.

Endangered Threatened Species, Natural Resources

U.S. Army Environmental Center. Natural and Cultural Resource Division (703) 355-7968 or DSN 345-7968.

U.S. Army Engineering Waterways Experiment Station (CEWES), Vicksburg, MS 39180-6199, (601) 634-2512, FTS 542-2513.

Hazardous and Toxic Waste and Material Management

U.S. Army Environmental Center. Environmental Compliance Division. (301) 671-2427 or DSN 584-2427.

U.S. Army Environmental Hygiene Agency. Waste Disposal Engineering Division. (301) 671-3651 or DSN 584-3651.

Environmental Protection Agency-RCRA/Superfund Hotline. (800) 424-9346.

Environmental Protection Agency- Toxic Substance Control Act (TSCA) Hotline. (202) 554-1404.

Hazardous Waste Minimization

U.S. Army Environmental Center. Environmental Compliance Division. Army HAZMIN Program. (301) 671-2427 or DSN 584-2427

U.S. Army Environmental Hygiene Agency. Waste Disposal Engineering Division, (301) 671-3651 or DSN 584-3651.

Solid Waste Management

U.S. Army Environmental Hygiene Agency. Ground Water and Solid Waste Management. (301) 671-2024.

U.S. Army Environmental Center. Environmental Compliance Division. (301) 671-2427 or DSN 584-2427.

General Environmental/Pollution Prevention

National Defense Center for Environmental Excellence. 1415 Scalp Avenue, Johnstown, PA 15904. (814) 269-2432

Air Force Center for Environmental Excellence, Pollution Prevention Division, Brooks Air Force Base, TX 78235-5318. (210) 526-4214, DSN 240-4214.

Navy Energy and Environmental Support Agency (NEESA). Port Hueneme, CA (805) 982-4897.

Annapolis Detachment of the Carderock Division, Naval Surface Warfare Center, Environmental Protection Branch, Craig Alig, Director, (410) 267-3526, DSN 281-3526.

Publications

U.S. Army Environmental Strategy into the 21st Century, 1992.

U.S. Army Engineering and Housing Support Center, *Installation Recycling Guide*, 1991.

U.S. Army Environmental Hygiene Agency, *A Commander's Guide to Infectious Waste Management at Army Health Care Facilities*, 1990.

U.S. Army Environmental Hygiene Agency, *A Commander's Guide to Hazardous Waste Minimization at Army Health Care Facilities*, 1990.

U.S. Army Corps of Engineers, *A Commander's Guide to Environmental Management*, 1990.

U.S. Army Corps of Engineers, *Hazardous Waste Management Systems Study*, 1991.

U.S. Army Environmental Center, *The Environmental Update, published quarterly*.

Army Environmental Policy Institutes, *Army Pollution Prevention Plan Manual: A Guide for Army Installation*, 1993.

Environmental Health Engineering Directorate. *U.S. Army Center for Health Promotion and Preventive Medicine Pollution Prevention Opportunity Assessment Protocol*, 1994.

Appendix C
Camp Withycombe
Toxic Use Reduction and Hazardous Waste Reduction Plan

Effective: 2006 to 2011

1.0 Scope and Objectives

The Camp Withycombe Toxic Use and Hazardous Waste Reduction (TUHWR) Plan is written in accordance with Oregon Administrative Rules (OAR) 340-135-0050. Camp Withycombe may claim an exemption from this requirement and the annual progress report requirement of OAR 340-135-0070 (1) and (2), if the ORARNG Environmental Management System (EMS) meets the requirements of OAR 340-135-0044. The Policy statement is located in Section 3.1 of the Pollution Prevention Plan.

Camp Withycombe is an Oregon Army National Guard (ORARNG) facility, located in Clackamas, Oregon. The installation occupies 153 acres. The facility is designated as a large quantity generator of hazardous waste and as a 10-day transfer facility under 40 CFR 263.

The Oregon Military Department Environmental staff at Environmental Branch of Installations (AGI-E) will work with Camp Withycombe staff to reduce the generation of hazardous waste. The top priority will be the largest hazardous waste streams by weight. The top priority hazardous waste streams represent ten percent, or more, of the total hazardous waste generated at Camp Withycombe. As progress is made to reduce the top priority hazardous waste streams evaluated in this Plan, AGI-E staff will review the Camp Withycombe Reduction Plan to evaluate other hazardous waste streams that represents ten percent, or more, of the total hazardous waste generated at Camp Withycombe.

The scope of this plan covers employees and activities related to hazardous material and waste at Camp Withycombe from 2006 to 2011, but may be updated annually to document reduction efforts. The goal of this TUHWR Plan and associated reduction activities is to eliminate or minimize the toxic substances used and hazardous waste generated. Each year AGI-E staff submits the Annual Progress Report, in accordance with OAR 340-135-0070, which contains:

- An analyses of the progress made or impediments towards reducing the amount of hazardous waste generated at Camp Withycombe,
- The annual quantities (in pounds) of each hazardous waste generated for each hazardous waste evaluated in this Plan,
- An explanation of each hazardous waste generated for each hazardous waste evaluated in this Plan.

2.0 Reduction Evaluations

This section describes the toxic use and hazardous waste activities conducted at Camp Withycombe during calendar year (CY) 2005. AGI-E conducted, and will annually conduct, an

internal analysis of the toxic material used and hazardous waste generation at Camp Withycombe.

Past toxics use reduction and hazardous waste reduction activities completed so far are described in Chapter 4 and 5 of the ORARNG 2006 Pollution Prevention Plan. The greatest challenge for Camp Withycombe is to reduce toxics use and hazardous waste generation, while operations and activities increase.

2.1 Major Waste Generating Activities

The four primary waste generating activities of Camp Withycombe are: 3670 Field Maintenance Shop (FMS), Oregon Sustainment Maintenance Site (OSMS), the United States Property and Fiscal Office – Supply Distribution Center (USPFO-SDC) and State Maintenance Shop (SMS). Secondary facilities include a Military History Museum, Readiness Center, and various offices and warehouses. There is one above ground fueling station, two wash racks and one paint booth in the OSMS and one at State Maintenance.

Field Maintenance Shop Building 6415: This building houses the 3670 FMS and has about a dozen full-time employees. The most significant waste streams from this location are JP-8, MOGAS, used oil, petroleum and lubricants, and universal waste. Hazardous material use includes paint, petroleum products, glue, engine coolant, batteries and JP-8.

Oregon Sustainment Maintenance Site (OSMS) Building 6481: This facility is the primary generator of hazardous waste on Camp Withycombe. It employs approximately 200-250 personnel in the following trades: electronics, welding, maintenance, painting and woodworking. The significant waste streams from this location are bead blast, waste paint related materials, waste gasoline, wash rack sludge, used oil and universal waste batteries. Hazardous materials used include: batteries, various spray solvents, lubricants, aerosol paints and CARC paints.

State Maintenance Building 6515: This building houses the facility maintenance functions for Camp Withycombe. They perform all the building and post maintenance to include plumbing, electrical, road repairs, building painting and other facility maintenance type repairs for the building on post. They perform both the state and Federal maintenance functions. They also support the outlying Readiness Centers in the Portland area. They consist of carpentry, painting, maintenance motor pool for the state vehicles, and storage for plumbing and electrical. They generate the following types of hazardous waste: waste bulbs, waste paint related materials, and some expired paints. They typically store all the facility janitorial cleaning supplies, a large supply of paints, aerosol products for POL's, large quantities of oils, smaller quantities of fuel for yard maintenance type equipment, and light bulbs for all the facility buildings.

USPFO Logistics - Building 6500: This building houses the warehouse for the Logistics section of the USPFO. This facility provides logistical planning and support to various units in the state. Its function is purely logistical and this facility normally doesn't generate any waste. This facility also is a DOT 10 day transfer facility for the state.

2.2 Toxics Used

Camp Withycombe does not maintain reportable quantities of toxic chemicals and is below reporting threshold for toxic chemical releases under the Federal Toxics Release Inventory (TRI) program. If toxic chemicals are identified by AGI-E personnel, a reduction plan will be developed that will address the following information: Toxics used, amount, estimated cost savings, hazardous constituents, location, reason for use, reduction options, rational for options not selected, reduction impediments, and reduction(s) implemented.

2.3 Hazardous Waste Generated

Over 45 tons of hazardous waste was generated during CY 2005 at Camp Withycombe. The 2006 to 2011 Camp Withycombe Reduction Plan will identify the largest hazardous waste streams by weight, defined as ten percent or more of the total hazardous waste generated, and identify solutions to reduce or eliminate the hazardous waste stream. Table 2-1 identifies the hazardous waste streams at Camp Withycombe during 2005 as a percentage of the total waste.

Table 2-1. Hazardous Waste Generated at Camp Withycombe during CY 2005

Hazardous Waste	CY 2005 Weight (lbs)	Percent of Total (%)
Bead Blast	57,120	61.22%
OWS Wash Rack Sludge	23,199	25.48%
Paint-Related Material	2,930	3.22%
Paint Booth Filters	2,050	2.25%
Image Intensifiers	1,666	1.83%
Snail Trap	1,138	1.25%
Radiator Solution	900	0.99%
Boiler Treatment	548	0.60%
JP-8 Fuel Filters	445	0.49%
Residue Smoke Grenades	380	0.42%
Safety-Kleen – Paint Thinner	324	0.36%
Bead Blast Filters	300	0.33%
Thinner	275	0.30%
Parts Washer Filters	193	0.21%
Solvent	154	0.17%
Fuel Filters	139	0.15%
Aerosol, Flammable	111	0.12%
ZEP with CARC	106	0.12%
Paint	99	0.11%
Ether Cylinders	65	0.07%
Coating Solution	50	0.05%
Absorbent with Benzene	40	0.04%
Mule Kick Bowl Cleaner	30	0.03%
Solvent Parts Washer Filter	30	0.03%
Epoxy with MEK	26	0.03%

Hazardous Waste	CY 2005 Weight (lbs)	Percent of Total (%)
Adhesive	24	0.03%
CLP	20	0.02%
Sulfuric Acid	15	0.02%
Aerosol, Non-Flammable	13	0.01%
Paint Filters	10	0.01%
Other	27	0.04%
TOTAL	**92,427**	**100.00%**

The quantity of hazardous waste generated fluctuates each year due to changes in missions and deployment schedules. However, bead blast media waste and wash rack sludge are the largest hazardous waste streams by weight generated at Camp Withycombe, representing the total waste generated by 62 percent and 25 percent, respectively. Paint-related material and paint booth filters are the next largest hazardous waste stream by weight at three percent and two percent, respectively, followed by image intensifiers. Each of the other waste streams represent less than one percent of the total waste generated, for a total of eight percent.

The quantity of hazardous waste generated at each shop on Camp Withycombe is summarized in Table 2-2. The OSMS is the largest generator of hazardous waste and the primary target for reduction efforts.

Table 2-2. Hazardous Waste Generated at Camp Withycombe by Shop during CY 2005

Shop	Hazardous Waste	CY 2005 Weight (lbs)
OSMS	Bead blast media	55,726
OSMS	Sludge	23,199
OSMS	Absorbent with Fuel	2,314
OSMS	Paint Booth Filters	2,050
OSMS	Image Intensifiers	1,666
OSMS	Snail Trap	1,138
OSMS	Radiator Solution	900
OSMS	Boiler Treatment	548
OSMS	JP-8 Fuel Filters	445
OSMS	Safety-Kleen – Paint Thinner	324
OSMS	Bead Blast Filters	300
OSMS	Thinner	275
OSMS	Parts Washer Filters	193
OSMS	Solvent	154
OSMS	Fuel Filters	139
OSMS	ZEP with CARC	106
OSMS	Ether Cylinders	65
OSMS	Aerosol, Flammable	46
OSMS	Absorbent with Benzene	40
OSMS	Solvent Parts Washer Filter	30
OSMS	Epoxy with MEK	26

Shop	Hazardous Waste	CY 2005 Weight (lbs)
OSMS	Sulfuric Acid	15
OSMS	Aerosol, Non-Flammable	13
OSMS	Paint Filters	10
OSMS	Acetone Swabs	6
OSMS	Absorbent with Fuel	5
State Shop	Paint-Related Material	616
State Shop	Paint	99
State Shop	Coating Solution	50
State Shop	Mules Kick Bowl Cleaner	30
State Shop	Adhesive	24
State Shop	Lye	5
3670th	CLP	20
3670th	Rifle Bore Cleaner	6
Museum	DDT	5
SDC	Residue Smoke Grenades	380
SDC	Aerosol, Flammable	65

The primary hazardous waste streams identified for reduction, during the Reduction Plan period of 2006 to 2011, are bead blast media and wash rack sludge waste. These wastes test hazardous due to cadmium contamination and represent ten percent or more by weight of the cumulative hazardous wastes generated in CY 2005. Table 2-3 lists the major hazardous waste generated at Camp Withycombe for the past five years, as reported annually to Oregon DEQ.

Table 2-3. Major Waste Trends at Camp Withycombe from CY 2001 to 2005[1]

Waste	2001 (lbs)	2002 (lbs)	2003 (lbs)	2004 (lbs)	2005 (lbs)
Bead Blast (Cadmium)	18,877	23,680	4,836	61,831	61,005
JP-8 Fuel Filters			271	1,031	629
Paint Booth Filters			1,064	1,582	2,060
Aerosol	56		0	0	70
Paint Waste	6,488	2,016	2,655	660	3,114
Snail Trap	459		0	0	1,138
Boiler Treatment			0	0	548
Image Intensifier	2,101		775	1,391	1,991
Wash rack sludge	8,486	11,820	11,800	17,380	27,588
Parts Washer			100		483
Safety-Kleen – Paint Thinner			1,858	2,484	2,002

1. Data obtained from the Annual TUHWR Report.

The ORARNG revised internal environmental guidance documents in 2001 to outline efforts to reduce the generation of hazardous waste. Due to increases in operation, the maintenance shops on Camp Withycombe have not reduced the amount of hazardous waste generated. The major waste stream identified for reduction is used bead blast media and wash rack sludge waste.

3.0 Reduction Analysis

The two hazardous waste streams identified for reduction analysis at Camp Withycombe include bead blast media and oil water separator (OWS) sludge. Seven technologies were evaluated in Section 3.1 of this Plan to reduce the amount of bead blast media disposed as hazardous waste. Potential solutions were evaluated in Section 3.2 of this Plan to minimize the toxicity of the OWS sludge so that it is not a hazardous waste.

3.1 Possible Alternatives to Garnet Bead Blast Paint Stripping

Process Description

Personnel in the Camp Withycombe Oregon Sustainment Maintenance Site (OSMS) use garnet bead blasting to strip paint from large equipment and small parts prior to priming and painting. The bead blasting operation creates a significant amount of dust and blast media that typically contains cadmium and lead. In CY 2005, a total of 57,120 pounds of used bead blast media was disposed of as hazardous waste.

The bead blasting operation is conducted in a blast booth installed 12 years ago, and primarily processes large pieces of equipment such as trailers, skids, generators, and forklifts, as well as small injector parts and brackets. On average, approximately six to 18 trailers and zero to four skids are blasted per month, and zero to 28 generators are blasted per week.

Large equipment, such as the trailers and skids, are steam cleaned to remove oil and grease and then garnet blast media is used to de-paint the equipment down to bare metal. Compressed air blows residual blast media off the trailers and off the skids. The equipment is then moved to the paint booth where a primer is applied and cured at 140ºF for 30 to 40 minutes. After the primer has set, the equipment is painted with a chemical agent resistant coating (CARC) top coat and heat cured.

The ventilation system in the blast booth is equipped with a HEPA filtration system to collect dust and particulate matter, which is stored in four 55-gallon drums. Three people spend approximately two hours every six months to change the filters in the blast booth. In CY 2005, the bead blast booth generated 300 pounds used filters that were disposed as hazardous waste; whereas, 1,146 pounds were disposed in CY 2004. The blast media is swept back into the media auger system once per hour, which takes approximately 15 to 20 minutes to complete. The blast media system recycles the garnet beads until they get too small and are captured by the filtration system. The blast media is changed out three times per year.

Pollution Prevention Opportunities Considered

Seven technologies were evaluated as an alternative to the current garnet bead blasting process used at the Camp Withycombe OSMS: aluminum oxide blast media, FLASHJET® coatings removal process, laser paint stripping, CO_2 bead blast media, sodium bicarbonate blast media, wheat starch blast media, and water jet stripping. Table 3-1 summarizes the advantages and disadvantages of the proposed technologies and identifies the recommendation for implementing each technology. The table is followed by a discussion of each proposed alternative.

Table 3-1. Summary Table for Proposed Alternatives

#	Alternative Technology	Advantages	Disadvantages	Implementation Recommendation
1	Aluminum Oxide Blast Media	Relatively inexpensive Minimal cost for equipment Blast media similar to garnet No size limitation of equipment depainted Reduces production time Increase recycle rate Reduce hazardous waste Reduce disposal cost	Modify existing equipment Upgrade screening equipment Replace blasting nozzle more frequently Training required	Medium Feasibility
2	FLASHJET® coating removal process	Effective in precision cleaning Effective first pass coating removal Reduce hazardous waste Reduce disposal cost	High capital investment High recurring cost Install new equipment and new blast booth New technology needs customization for Army use Size limitations on equipment depainted Train staff to use new equipment and process May increase energy use May increase production time	Low Feasibility
3	Laser Paint Stripping	Effective in precision cleaning Reduce hazardous waste Reduce disposal cost	High capital investment Install new equipment and new blast booth Size limitations on equipment depainted Training required Non-automated system may fatigue workers—due to weight Paint removal rate is slow and uneconomical.	Low Feasibility
4	CO_2 Blast Media	Effective in precision cleaning Reduce hazardous waste to a fine ash Reliable and repeatable stripping Minimal temperature increase	High capital investment Install new equipment and new blast booth Training required High technical skills required Increase production time Non-automated system may fatigue workers—due to cold temperature, weight, and thrust	Low Feasibility

#	Alternative Technology	Advantages	Disadvantages	Implementation Recommendation
4 cont.			Many health and safety concerns Must treat air emissions Modify air filtration due to CO2 Size limitations on equipment depainted	
5	Sodium Bicarbonate ($NaHCO_3$) Blast Media	No size limitation on equipment depainted Inexpensive blast media Centrifuge wastewater to reduce waste volume Water dissipates heat on substrate Process can selectively remove layers	High capital investment Training required Modify blast booth for water based application Prep time needed to mask surfaces and cover electrical components Must wash corrosive $NaHCO_3$ from surface Non-recyclable $NaHCO_3$ Media Wet sludge may be hazardous waste	Low Feasibility
6	Wheat Starch Blast Media	No size limitation on equipment depainted User friendly process Media is renewable, biodegradable natural resource Media is inexpensive and non-toxic Waste volume is ~5% of original volume Can selectively remove layers	High capital investment Modify blast booth for water based application and humidity control Training required Media can collect in cracks and may damage substrate Media is too soft, so paint removal rate is slow to moderate (inefficient) Media is moisture sensitive U.S. Air Force does not recommend this method	Low Feasibility
7	Water Jet Stripping	No size limitation on equipment depainted User friendly process No media required, but can add to enhance process Waste water can be recycled Compatible with most treatment systems Automated, fairly easy to operate Dustless process	High capital investment Modify blast booth for water based application Training required Ultrahigh pressure requires automated system. Potential damage to surface/joints/seals Slow paint removal rate Increase production times Separate system needed to collect, filter, and recycle wastewater.	Low Feasibility

Technology #1 - Aluminum Oxide Blasting Media

Currently garnet is used as the blasting media for removing paint and rust from a steel substrate. Aluminum oxide media is more aggressive than garnet, but is similar in weight per volume and could utilize the current blasting equipment after minor modifications. Aluminum oxide is faster than garnet, so production time will reduce. Aluminum oxide comes in various grits similar to the current grits available for garnet. The specific gravity of garnet blasting media is 3.9 – 4.1; whereas, aluminum oxide is 4.5. The slight increase in weight may affect the conveyance and screening components of the recycling system, so the screening equipment may need to be upgraded. Aluminum oxide is more aggressive on the blasting nozzles and will require more frequent replacement.

Environmental Evaluation

Garnet blasting media can typically be reused/recycled ten (10) times before disposal, as compared to aluminum oxide for 20 recycles before disposal. Therefore, substituting an aluminum oxide blasting media will reduce waste by approximately 50 percent.

Economic Evaluation

Implementation Costs: An initial analysis of the current equipment's compatibility using aluminum oxide media may result in no implementation cost or minimal upgrades.

Recurring Costs:

Annual Costs for Garnet Blasting (Current Process)

Materials:

Filters changes - 2 changes/yr at $4,500.00 per change	= $ 9,000.00
Media - 5,000 lbs/month[24] x $0.1125/lb x 12 months	= $ 6,750.00

Disposal Costs:

Media - 5,000 lbs/month + 300 lbs/month (5 percent blasted material) x 12 months = 63,600 lbs/month x $0.41/lb (disposal cost)	=$26,076.00
Drums – 40/yr at $75.00 ea.	=$ 3,000.00
Liners – 50/yr ct	=$ 235.00
Material and Disposal Cost	**=$45,061.00**

Labor[25]:

Assume one person per shift performs actual blasting; additional personnel steam clean, move equipment and perform prepping, sanding, and painting duties.

2 shifts x 8hr/shift x 5 days/ week x 52 weeks/yr at $15.00 /hr	=$62,400.00
Mechanical Repair 10 hr/month x 12 months x $18.00 /hr	=$ 2,160.00
Labor for Garnet Blasting	**=$64,560.00**

[24] Approximate monthly usage of garnet media during calendar year 2005 is 5,000 lbs based on approximately 57,000 lbs of annual hazardous waste generation of bead blast media at the OSMS.
[25] Assumes utilities and labor will be similar for one person to operate system per shift.

Annual Costs for Aluminum Oxide Blasting (Proposed Process)

Materials:

Filters changes - 1 change/yr at $4,500.00 per change	=$ 4,500.00
Media - 2,500 lbs/month ($00.30/lb) = $750.00/month x12 months	=$ 9,000.00

Disposal Costs:

Media - 2,500 lbs/month + 300 lbs/month (5 percent blasted material) x 12 months = 33,600 lbs/month x $0.41/lb (disposal cost)	=$13,776.00
Drums – 20/yr at $75.00 ea.	=$ 1,500.00
Liners – 20/yr ct	=$ 94.00
Total Material and Disposal Cost	**=$28,870.00**

Labor:

Assume one person per shift performs actual blasting; additional personnel steam clean, move equipment and perform prepping, sanding, and painting duties.

2 shifts x 8hr/shift x 5 days/ week x 52 weeks/yr at $15.00 /hr	=$62,400.00
Mechanical Repair 10 hr/month x 12 months x $18.00 /hr.	=$ 2,160.00
Labor for Aluminum Oxide Blasting	**=$64,560.00**

Recurring Cost Savings: Annual cost savings for material and disposal is approximately $16,191.

Payback Period: Undetermined, since the cost to upgrade the existing system is unknown.

Advantages	Disadvantages
Relatively inexpensive	Modify existing equipment
Minimal cost for equipment	Upgrade screening equipment
Blast media similar to garnet	Replace blasting nozzle more frequently
No size limitation equipment depainted	Train staff to use more aggressive media
Reduces production time	
Increase recycle rate	
Reduce hazardous waste	
Reduce disposal cost	

Implementation Recommendation: Medium Feasibility - Minimal investment if upgrades to existing equipment are minor, faster process resulting in manpower savings and reduces hazardous waste production by 50 percent.

Vendors

e^2M is not recommending the vendor listed below. The vendor list is for references purposes only and is not intended to be a complete list of vendors available for this product.

Composition Materials Co., Inc.
125 Old Gate Lane
Milford, CT 06460
(203) 874-6500 or (800) 262-7763

Technology #2 - FLASHJET® Coating Removal Process

The FLASHJET®[26] coatings removal process is an innovative new technology that was developed after ten years of extensive research. The system combines laser de-coating technology and CO_2 blast media into one process system. Patented by the Boeing Company, the FLASHJET®[27] is a pulsed optical energy de-coating process. It uses a combination of heat generated by a high-intensity pulsed xenon light and abrasion from a blast medium of carbon dioxide pellets. The paint from this process is shattered, and the residual particles are vacuumed and placed in a storage container.

The FLASHJET® process is a fully automated process that uses manipulator robotic assembly to strip the coatings from large and small components. The FLASHJET® process involves the use of the xenon-flash lamp and carbon dioxide pellet-blasting technologies. The xenon-flash lamp, which is the primary removal phase in the process, directs high-intensity pulsed light energy at the coating and explodes it into a fine ash. A continuous stream of recycled carbon dioxide pellets cools and cleans the substrate while forcing the effluent ash into a capture system. This effluent capture system separates the ash and organic vapors, processing the ash into high efficiency particulate air (HEPA) filters and the vapors through activated charcoal. The only waste generated in this process is the spent HEPA filters which are tested for hazardous waste characteristics and disposed of accordingly.

The system has a stripping rate of approximately 270 square feet per hour, and the xenon lamp is guaranteed for 500,000 flashes, which is directly dependent on the power level at which the lamp is operated (typically, 1 million flashes are obtained.)

Although the current application of this technology is primarily used on aircraft, the companies that market this system state that coating removal processes can be created for a variety of applications, from component parts to aircraft. The FLASHJET® coatings removal process cleans the painted surface on the first pass. This process would require a complete upgrade of the current blast booth.

Environmental Evaluation

The paint removed by the FLASHJET® process is the only waste generated. No additional media is contaminated. Therefore the generation of hazardous waste from this process will significantly decrease. This process will not affect air quality as long as the HEPA filters are replaced or cleaned as specified by the manufacturer.

Economic Evaluation

Implementation Costs: Initial costs include the capital cost to purchase the FLASHJET® coatings removal process and the installation, permit exemption, setup and training. Implementation costs total $3,271,000.

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[26] See http://p2library.nfesc.navy.mil/P2_Opportunity_Handbook/5_16.html and http://aec.army.mil/usaec/technology/p2compliance05.html. Sites accessed on June 01, 2006.
[27] See http://www.flashtech-inc.com/. Site accessed on June 01, 2006.

Recurring Costs:

Annual Costs for Garnet Blasting (Current Process) [28]

Material and Disposal Costs	**=$ 45,061.00**
Labor for Garnet Blasting	=$ 64,560.00

Annual Costs for FLASHJET® (Proposed Process)

Xenon Tube replacement $1,250.00 ea/ 40 hr. 2/week x52 weeks	=$130,000.00
Dry Ice 1,600 lbs/hr at $.05/lb X 80 hr/week x 52 weeks	=$332,800.00
Material and Disposal Cost	**=$462,800.00**

Recurring Cost Savings: None
Payback Period: N/A

Advantages	Disadvantages
Effective in precision cleaning	High capital investment
Effective first pass coating removal	High recurring cost
Reduce hazardous waste	Install new equipment and new blast booth
Reduce disposal cost	New technology needs customization for Army use
	Size limitations on equipment depainted
	Train staff to use new equipment and process
	May increase energy use
	May increase production time

Implementation Recommendations: Low Feasibility - large scale investment, slower process than current garnet bead blast system but greatly reduces the amount of hazardous waste produced and cost to dispose.

Potential Vendor for FLASHJET® Coatings Removal Process

e^2M is not recommending the vendor listed below. The vendor list is for reference purposes only and is not intended to be a complete list of vendors available for this product.

Flash Tech, Inc.
550 North Oak, Suite 200
Kansas City, MO 64118
Phone: (314) 895-3200
Contact: Wayne Schmitz, Director, Technical Services
E-mail: wschmitz@flashtech-inc.com

[28] The cost of the current garnet bead blasting process is identified in the Technology #1 write up.

Technology #3 - Laser Paint Stripper

Lasers can be used as a cleaning and paint removal tool. The use of lasers for paint removal does not require surface preparation, does not use a secondary medium to increase the amount of material disposed, and is a non-contact application. The energy beam on the laser is controllable and with the proper parameters, coatings can be selectively removed with minimal influence to the underlying substrate.

The laser generates a highly collimated, monochromatic beam of light that enables the beam to be tightly focused to create an area of high power density. In the focal volume, the intense beam will thermally incinerate the target material. If the power density is sufficient, the material combusts and disassociates into inert compounds. As a coating is volatilized, decomposition by-products are thrown into the laser beam and incinerated to produce carbon dioxide, water, inorganic pigment ash, and trace amounts of other compounds. The organic constituents are exhausted into the atmosphere, and particulate matter is collected in conventional filters for future disposal. Therefore, the amount of waste to be disposed of represents only a fraction of the original coating volume. The laser paint stripper has enhanced capability to apply advanced coating systems to a variety of metallic and non-metallic substrates by providing an efficient means to remove them. Although the laser can strip moderately contoured parts up to approximately a 45 degree angle, this is line of site technology.

Laser de-coating technology is effective at removing various coatings, including powder coats, electro coats, and chemical agent resistant coatings (CARC). However, the laser paint stripping process is still considered an emerging technology even though the technology has proven to be easily adaptable to different pain systems and substrates. Laser systems are the only known efficient method of stripping that generates less disposable waste than the initial volume of paint applied. The U.S. Army, U.S. Air Force, and U.S. Navy use various specifications of the laser decoating system:

- The U.S. Army's laser decoating system is a turn key procurement system that uses a high-energy CO pulse laser with real-time vision feedback control to remove coating from medium to large components. The system is specifically for stripping helicopter rotor blades.
- The U.S. Air Force's laser decoating system is a turn-key procurement system that uses a high-energy CO pulse laser to remove rain erosion coatings from composite aircraft radomes and flight control surfaces.
- A U.S. Navy contractor developed an Automated Laser Paint Stripper and documented the feasibility of using a laser to strip paint from a fighter-size aircraft.

Economic Evaluation

Implementation costs for laser decoating vary considerably depending on the process configuration required for the stripping application. The capital costs for a laser decoating system for depot level maintenance activities ranges between approximately $0.5 million to $1.5 million. Operating costs for laser decoating will vary considerable depending upon the process configuration required for the particular stripping application. The paint removal rate may be slow and increase labor cost.

Advantages	Disadvantages
Effective in precision cleaning	High capital investment
Eliminate use of hazardous chemicals	Install new equipment and new blast booth
Reduce hazardous waste	Size limitations on equipment depainted
Reduce disposal cost	Train staff to use new equipment and process
Advanced coating system	Non-automated system may fatigue workers—due to weight
	Paint removal rate is slow and uneconomical
	Works best on flat surfaces

Implementation Recommendations: Low Feasibility - large scale investment, slower process than current garnet bead blast system but reduces the amount of hazardous waste produced and cost to dispose.

Vendors

e^2M is not recommending the vendors listed below. The vendors list is for references purposes only and is not intended to be a complete list of vendors available for this product.

Industrial Laser System, LLC
210 William Pitt Way
Pittsburgh, PA 15238
888-428-8882
Fax: 412-367-0787
www.laser-industrial.com
bob_braumuller@msn.com

General Lasertronics Corporation
830 Jury Court, Suite 5
San Jose, CA 95112-2816
(408) 947-1181
www.lasertronics.com
info@lasertronics.com

Technology #4 - CO_2 Bead Blasting Media

CO_2 blasting media is similar to abrasive blasting media. This process can be used for cleaning, degreasing, some de-painting applications, surface preparation, and de-flashing.

The process starts with liquid CO_2 stored under pressure (~850 psig). The liquid CO_2 is fed to a pelletizer, which converts the liquid into solid CO_2 snow, and then compresses the snow into pellets at about -110° F. The pellets are metered into a compressed air stream and applied to a surface by manual or automated cleaning equipment with specially designed blasting nozzles. The CO_2 pellets are projected onto the target surface at high speed. As the pellets strike the surface, they induce an extreme difference in temperature between the coating or contaminant and the underlying substrate, weakening the chemical and physical bonds between the surface materials and the substrate. Immediately after impact, the pellets begin to vaporize directly from the solid phase to a gas, releasing CO_2 gas at a high velocity along the surface to be cleaned. The high velocity is caused by the extreme density difference between the gas and solid phases. This kinetic energy dislodges the contaminants (coating systems, contaminants, flash, etc.), resulting in a clean surface.

CO_2 blasting can be done at various velocities: subsonic, sonic, and even supersonic. CO_2 pellet blasting is effective in removing some paints, sealants, carbon and corrosion deposits, grease, oil and adhesives. However, higher pellet velocities and a more durable pellet are required to effectively remove military coatings. Blasting efficiency is approximately equal to that of other blasting operations and can approach 1 ft^2/minute after optimization. Waste cleanup and disposal are minimized because only the coating or contaminant residue remains after blasting. There is no liquid waste because CO_2 pellets evaporate. CO_2 blasting is not always a one-pass operation; effective blasting usually requires multiple passes to achieve desired effect

This technology will require the modification of the current air filtration system to minimize air emissions from coating particles and provide additional ventilations for worker health and safety. The CO_2 media is an asphyxiant. Rebounding pellets may carry coating debris and contaminate workers clothing and work area; moreover, the high velocity of CO_2 pellets and the compressed air may pose a potential safety hazard. Additional safety precautions include grounding to remove static energy buildup.

Economic Evaluation

Implementation Costs: Initial costs include the capital cost to purchase the AERO J5DX portable coatings removal unit setup and training. Implementation costs total $265,000.00($140,000 for unit with pelletizer and $125,000.00 for CO_2 storage tank).

Recurring Costs:

Annual Costs for Garnet Blasting (Current Process)[29]

Material and Disposal Cost	**=$ 45,061.00**
Labor for Garnet Blasting	=$ 64,560.00

[29] The cost of the current garnet bead blasting process is identified in the Technology #1 write up.

Annual Costs for CO_2 Bead Blasting (Proposed Process)

Materials:

82 tons/month of material at $110.00/ton x 12 months	=$108,240.00

Disposal Costs:

Waste - 300 lbs/month x 12 months x $0.41/lb (disposal cost)	=$ 1,476.00
Drums – 3/yr at $75.00 ea.	=$ 225.00
Liners – 20/yr ct	=$ 14.10
Material and Disposal Cost	**=$109,955.10**

Recurring Cost Savings: None
Payback Period: N/A

Advantages	Disadvantages
Effective in precision cleaning	High capital investment
Reduce hazardous waste to a fine ash	Install new equipment and new blast booth
Reliable and repeatable stripping	Size limitations on equipment depainted
Minimal temperature increase	Train staff to use new equipment and process
	High technical skills required
	Increase production time
	Non-automated system may fatigue workers—due to cold temperature, weight, and thrust
	Many health and safety concerns
	Must treat air emissions
	Modify air filtration due to CO2

Implementation Status: Low Feasibility - large scale investment, slower process than the current garnet bead blast. However, process will reduce hazardous waste production.

Vendors

e^2M is not recommending the vendors listed below. The vendors list is for references purposes only and is not intended to be a complete list of vendors available for this product.

CAE Alpheus
9119 Milliken Ave.
Rancho Cucamonga, CA 91730
Phone: (800) 257-4387 (1-800-ALPHEUS)
FAX: (909) 481-9724

Cold Jet, LLC
9105 Milliken Avenue
Rancho Cucamonga, CA 91730
Phone: (800) 257-4387
E-mail: info@coldjet.com

Service: Manufacturer of carbon dioxide pelletizing and blasting equipment

Va-Tran Systems, Inc.
677 Anita Street, Suite A
Chula Vista, CA 91911-4661
Phone: (619) 423-4555 or (800) 379-4231

Technology #5 - Sodium Bicarbonate Blasting Media

Sodium bicarbonate is a soft blast medium with a heavier specific gravity and less hardness than most plastic abrasives. The sodium bicarbonate stripping process is most frequently used with water, which acts as a dust suppressant. In this form, compressed air delivers sodium bicarbonate media from a pressure pot to a nozzle, where the medium mixes with a stream of water. The soda/water mixture impacts the coated surface and removes old coatings from the surface. The water dissipates the heat generated by the abrasive process, reduces the amount of dust in the air, and assists in the paint removal by hydraulic action. Workers need to mask the surface of the material being stripped to prevent intrusion of bicarbonate of soda blast media. Blast media begins to decompose at 140° Fahrenheit and may become corrosive if left entrapped within a structure; therefore, rinsing of the equipment is required to remove any remaining bicarbonate media.

The waste generated from sodium bicarbonate stripping system is a slurry consisting of sodium bicarbonate media, water, paint chips, and miscellaneous residues such as dirt and grease. Centrifuges can be used to separate the water from the contaminated waste stream, thus reducing the amount of hazardous waste being disposed. Filtered wastewater containing dissolved sodium bicarbonate may be treated at an industrial wastewater treatment plant. The sodium bicarbonate media can not be recycled; although the water can be separated for disposal. The paint chip and miscellaneous residue wastes may be considered a hazardous waste.

Economic Evaluation

Implementation Costs: Initial costs include the capital cost to purchase the unit with blasting enclosure, unit setup and training. The initial cost is $350,000.00.

Recurring Costs:

Annual Costs for Garnet Blasting (Current Process)

Material and Disposal Cost	**=$ 45,061.00**
Labor for Garnet Blasting	=$ 64,560.00

Annual Costs for Sodium Bicarbonate Blasting (Proposed Process)

Waste – 300 lbs/month x 12 months x $0.41/lb (disposal cost)	=$ 1,476.00
Drums – 3/yr at $75.00 ea.	=$ 225.00
Liners – 20/yr ct	=$ 14.10
Material and Disposal Cost	**=$ 1,715.10**

Recurring Cost Savings: $43,345.10
Payback Period: 8.1 years

Advantages	Disadvantages
No size limitation on equipment depainted Inexpensive blast media Centrifuge wastewater to reduce waste volume Water dissipates heat on substrate Process can selectively remove layers	High capital investment Train Staff Modify blast booth for water based application Prep time needed to mask surfaces and cover electrical components Must wash corrosive NaHCO3 from surface Non-recyclable NaHCO3 Media Wet sludge may be hazardous waste

Implementation Status: Low Feasibility - large scale investment, similar removal speed. Process has been successful in coating removal on tanks for the military. Process will reduce hazardous waste production. System is capable of increasing aggressiveness with the addition, if necessary, of aluminum oxide or garnet.

Vendors

e^2M is not recommending the vendors listed below. The vendors list is for references purposes only and is not intended to be a complete list of vendors.

Carolina Equipment & Supply Company
7251 Cross County Road
N. Charleston, SC 29418
Phone: (800) 394-4987 or (843) 760-3000
FAX: (843) 760-3500
Contact: Mr. Chris Fulmer
Service: Aqua Miser®
URL: http://www.blastandpaint.com/

Schmidt Manufacturing, Inc.
11927 South Highway 6
Fresno, TX 77545
Phone: (800) 231-2085 or (281) 431-0581
FAX: (281) 431-1717
Service: Accustrip System®

Friess Equipment
2222 Akron-Peninsula Road
Akron, OH 44313
Phone: (800) 899-7624 or (330) 945-9440
FAX: (216) 923-5833
Service: SOBI System
Contact: Mr. Jim Friess

Technology #6 - Wheat Starch Blasting Media

Wheat starch blasting is a user-friendly blasting process available as a fully developed stand-alone system specifically designed for wheat starch blasting, or as a process that can be adapted for use in systems designed for plastic media blasting (PMB). The abrasive media is a crystallized form of wheat starch that is non-toxic, biodegradable, and made from renewable resources. The abrasive blast media is similar in appearance to plastic media, except that it is softer. The wheat starch media is recycled in the system and may be used for up to 15 to 20 cycles. The waste stream generated by wheat starch blasting is sludge from the recycling system.

The wheat starch blasting process propels the media at less than a 35-psi nozzle pressure for most applications. The low pressure and relatively soft media have minimal effect on the surfaces beneath the paint; therefore, wheat starch is well suited for stripping paints without risking damage to the substrate. The wheat starch blasting process can remove a variety of coatings. Coating types range from resilient rain-erosion resistant coatings found on radomes and radar absorbing materials, to the tough polyurethane and epoxy paint systems. This system requires subsystem for media recovery and recycling, and equipment for dust control and collection.

Wheat starch blasting systems require a moisture control system to control the storage conditions of the medium. Moisture can severely affect the performance of the abrasive blast media. In addition, the spent wheat starch residue needs to be filtered or separated in a centrifuge to avoid contamination in the media which can result in a rough surface finish on delicate substrates.

Economic Evaluation

A full economic analysis was not completed for this alternative as the media is not aggressive enough for the paint removal process being conducted at the OSMS.

Implementation Costs: Initial costs include the capital cost to purchase the $75,000.00 unit and training.
Recurring Costs: This product is considerably softer than garnet and not applicable for this application; therefore, recurring costs were not evaluated.
Recurring Cost Savings: N/A
Payback Period: N/A

Advantages	Disadvantages
No size limitation on equipment depainted	High capital investment
User friendly process	Modify blast booth for water based application and humidity control
Media is renewable, biodegradable natural resource	Training required
Media is inexpensive and non-toxic	Media can collect in cracks and may damage substrate
Waste volume is ~5% of original volume	Media is too soft, so paint removal rate is slow to moderate (inefficient)
Can selectively remove layers	Media is moisture sensitive
	U.S. Air Force does not recommend this method

Implementation Status: Low Feasibility - Small scale investment but this media is not aggressive enough for this application. Generally, this media is used for sensitive substrates. Vendor does not recommend this media for this type of application.

Vendors

e^2M is not recommending the vendor listed below. The vendor list is for references purposes only and is not intended to be a complete list of vendors for this product.

Clemco Industries Corporation
Aerolyte Systems Division
One Cable Car Drive
Washington, MO 63090
Phone: (636) 239-0300
FAX: (800) 726-7559

Technology #7 - Water Jet Stripping

Water Jet stripping involves the use of water at pressures above 10,000 psi to mechanically remove coatings. High-pressure pumps force water through specially designed nozzles that direct the high-velocity stream upon a coated substrate. The kinetic energy of the Water Jet physically erodes the coating to expose the underlying substrate surface. These coatings may be removed from many different types of substrates, including metals, plastics, composites, and concrete.

Water Jet systems are classified as high-pressure or ultrahigh-pressure, depending on the operating pressures employed by the system. High-pressure Water Jet systems employ a stream of water at pressures of 10,000 to 25,000 psi. Ultrahigh-pressure Water Jet systems operate at pressures ranging from 25,000 to 55,000 psi. In addition to increased pressures, ultrahigh-pressure Water Jet systems typically use lower volumes of water (less than 7 gpm) than high-pressure systems.

Water Jet systems are highly versatile to meet a wide range of coating removal needs. Most organic coatings can be removed using pressures of 25,000 psi (170 MPa); however, lower pressures may be equally or more effective in some applications. However, higher pressures may be required for the removal of highly adherent coatings.

Water Jet stripping can be performed using manual or automated equipment. Manual systems include hand-held lances and manually propelled units. These systems allow for increased mobility and flexibility at low capital cost. In high-volume production applications, automated systems employing robots are often the most efficient and effective. However, it may also be required in some small-scale applications, since high reaction forces can fatigue operators of manually controlled Water Jet systems.

Economic Evaluation

Implementation Costs: Initial costs include the capital cost to purchase the Water Dyne Jet Stripping unit with closed loop water recycling unit, vacuum assist spray nozzle, vacuum unit and training. Implementation cost is approximately $248,000.

Recurring Costs:

Annual Costs for Garnet Blasting (Current Process) [30]

Material and Disposal Cost	**=$45,061.00**
Labor for Garnet Blasting	=$64,560.00

Annual Costs for Water Jet Stripping (Proposed Process)

Waste - 300 lbs/month x 12 months x $0.41/lb (disposal cost)	=$ 1,476.00
Drums – 3/yr at $75.00 ea.	=$ 225.00
Liners – 20/yr ct	=$ 14.10
Material and Disposal Costs	**=$ 1,715.10**

Recurring Cost Savings: $43,345.90
Payback Period: 4.25 years

[30] The cost of the current garnet bead blasting process is identified in the Technology #1 write up.

Advantages:	Disadvantages:
No size limitation on equipment depainted	High capital investment
User friendly process	Modify blast booth for water based application
No media required, but can add to enhance process	Training required
Waste water can be recycled	Ultrahigh pressure requires automated system.
Compatible with most treatment systems	Potential damage to surface/joints/seals
Automated, fairly easy to operate	Slow paint removal rate
Dustless process	Increase production times
	Separate system needed to collect, filter, and recycle wastewater.

Implementation Status: Low Feasibility - medium scale investment with a slower removal speed than the current garnet bead blast. System may require sump system for water recycling. High decibel rating may require sound walls.

Vendors

e^2M is not recommending the vendors listed below. The vendor list is for references purposes only and is not intended to be a complete list, as there may be other vendors for this type of equipment.

National Liquid Blasters (NLB)
29830 Beck Road
Wixom, Michigan 48393-2824
Phone: (800) 441-5059 or (248) 624-5555
FAX: (248) 624-0908

Aqua-Dyne, Inc.
3620 W. 11th Street
Houston, Texas 77008
Phone: (713) 864-6929 or (800) 324-5151
FAX: (713) 864-0313

Flow International Corporation
23500 64th Avenue South
Kent, WA 98032
Phone: (253) 850-3500
FAX: (253) 813-3285
URL: http://www.flowcorp.com

3.2 Evaluation of Oil/Water Separator (OWS) Sludge at Camp Withycombe OSMS

Process Description

The sludge from the wash rack sump and OWS at Camp Withycombe OSMS has been analyzed and shown to contain cadmium in excess of 1.0 mg/L, high enough to classify the sludge as hazardous waste (40 CFR 261.24). Without sampling the wash water from specific washing operations (e.g., engine washing, floor scrubber water), it is difficult to identify the source of cadmium in the sludge. In CY 2005, approximately 20,500 pounds of hazardous waste wash rack sludge was generated at Camp Withycombe OSMS.

The floors in the work bay are cleaned once a week with a zamboni style floor sweeper. The used wash water is then poured into the drain at the wash rack.

The indoor wash rack operates under recommended P2 guidelines, such as not rinsing vehicles after the paint stripping process. Engine blocks are steam cleaned in the wash rack, but the fluids are drained prior to cleaning.

The wash rack is equipped with a Landa Water Maze -Alpha Series system, which is a pre-treatment device used to filter out oil, solids and heavy metals in water before discharging to the sewer system. The indoor wash rack drains are connected to a sump with an OWS. Overflow is hooked up to the Water Maze system. The water from the wash rack drains into the wash rack sump, and the overflow is pumped through the Landa Water Maze.

The filtration in the Water Maze consists of first baffles. The first compartment is an inclined plate coalescor, which separates the oils, solids, and water. Solids settle to the bottom of the tank and oils are skimmed from the surface. Skimmed oil is returned to the sump and filtered water goes through additional filters, where an aerator injects bubbled ozone into the system to control organic loading. After the water has been filtered, it leaves the Water Maze system and drains to the publicly-owned treatment works (POTW).

The indoor wash rack is used almost daily, five days a week. The contents (i.e., sludge) of the wash rack sump and the dirt collected from the drain grate are scooped out once per week and put into a 55-gallon drum. The vendor pumps the contents from the sump and disposes of the 55-gallon drums of waste. Each drum of waste is tested prior to disposal to determine if it is hazardous. The sump and vault are pumped out approximately four times per year.

Preferred Technical/Environmental Evaluation #1 – Identify Source of Cadmium

The best way to reduce, or eliminate the amount of hazardous waste wash rack OWS sludge is to identify the source of the cadmium. It is recommended that wastewater from each of the following process is sampled for heavy metals, including cadmium and lead:

1. Washing vehicles and equipment
2. Steam cleaning engine blocks
3. Washing floors in work bays

Three initiatives that could reduce the amount of hazardous waste sludge are: isolate cadmium waste from engine wash, install an engine block washer cabinet, install an evaporator, or install a closed loop wash rack recycle system.

Preferred Technical/Environmental Evaluation #2 – Engine Block Washer Cabinet

A self contained high production cleaning cabinet can be an efficient way to clean engine blocks and small parts. Engine block cabinets can be either electric or natural gas and can come in many sizes depending on the items needing to be cleaned. Some are large enough to hold a transmission and some are perfectly sized for cleaning small component parts. They can also be equipped with an oil skimmer and an evaporator to reduce the amount of hazardous waste generated.

Economic Evaluation

Units can range from $1,000.00 to $6,000.00 depending on the size of the unit, the features requested, and the power source of the unit (electric or natural gas). Optional features such as oil skimmers and evaporators cost extra.

Implementation Status: This project is being evaluated for applicability and benefits.

Vendors

e^2M is not recommending the vendors listed below. The vendor list is for references purposes only and is not intended to be a complete list, as there may be other vendors for this type of equipment.

Enviro Quip	**Hydro-Blast Inc.**	**UniWashers**
www.eggreen.com	10250 S.E. Mather Road	P.O. Box 435
1-866-607-4514	Clackamas, OR 97015	Chartley, MA 02712-0435
	800-332-1590	800-361-9511
	www.hydro-blast.com	www.uniwashers.com
	Sales1@Hydro-Blast.com	info@uniwashers.com

Preferred Technical/Environmental Evaluation #3 – Evaporation Units:

An on-site evaporator can reduce disposal costs by eliminating 95 percent of wastewater. The evaporator can dry OWS sludge, wash water from steam cleaning engine blocks, and wash water from cleaning the work bay floors. Evaporators come in a variety of sizes depending on the application and the amount of wastewater generated. Processing capacities vary from eight gallons to 120 gallons per hour; however, evaporators may use more energy.

Evaporation units can either be electric or natural gas, with an optional propane conversion kit for winter months when natural gas costs are higher. An oil skimmer, which is built into the system, is designed to pipe the collected oil into a collection drum. Safety features include a safety shutdown and low water shutdown feature. Maintenance of the evaporator units is fairly simple and can be done by in-house personnel. The natural gas units are easier to clean than the electric units, as there is no heating element in the bottom of the unit to work around. In addition, the bottom of the unit is sloped in the natural gas units to allow the user the ease of

cleaning out the remaining sludge material. The efficiency of the evaporator can be affected if more than two to three inches of sludge build up in the bottom of the evaporator unit, or if the wastewater consistency is more solid than water.

Economic Evaluation

Electric units and natural gas/propane units come in a wide range of sizes. Compared to electric units, the natural gas units are more economical and efficient. A natural gas unit cost approximately $0.05 to $0.07 per gallon of wastewater to evaporate. An electric unit uses approximately 10.4 kilo Watt-hour per gallon of wastewater. Voltage and amperage ratings on the electric units can vary from 240 volts per 45 amps to 480 volts per 23 amps (three phase).

Electric Units

55 gallon capacity unit:	$5,300.00
75 gallon capacity unit:	$9,000.00
150 gallon capacity unit:	$15,000.00

Natural Gas Units

75 gallon capacity unit:	$12,000.00
150 gallon capacity unit:	$17,000.00
400 gallon capacity unit:	$45,000.00
Natural Gas conversion kit:	$100.00

An autofill cast iron pump, which is used to load the wastewater into the unit, is available for an additional $1,800; otherwise the evaporator is loaded manually.

Implementation Status: This project is being evaluated for applicability and benefits.

Vendors

e^2M is not recommending the vendors listed below. The vendor list is for references purposes only and is not intended to be a complete list, as there may be other vendors for this type of equipment.

Clean All Company
1239 Michael Lane
Blue Bell, PA 19422
(610) 275-1300
Fax (610) 275-1344
www.cleanallcompany.com
e-mail: Cleanone@erols.com

Preferred Technical/Environmental Evaluation #4 – Closed-loop Wash Rack Recycle System

A closed loop wash rack recycle system would continually recycle the wash water to reduce the annual quantity of water used to wash vehicles and equipment, and eliminate the discharge of wastewater sent to the POTW. However, the amount of hazardous waste sludge would not decrease. This system is further discussed in Section 5.4.14 of the ORARNG P2 Plan.

4.0 Employee Awareness and Training

Pollution prevention training for applicable environmental staff and facility personnel will provide the regulatory information on the TUHWR Act, reporting requirements, and identify the toxic or hazardous waste that is identified for reduction during the planning year. Additionally, personnel will receive hazardous waste management training.

5.0 Institutionalization

By incorporating the TUHWR Plan is into the Oregon Army National Guard Pollution Prevention (P2) Plan and Regulation 210-4, which is required by Army Regulation (AR) 200-1, Camp Withycombe demonstrates its commitment to TUHWR planning and related activities into management practices and procedures. Camp Withycombe personnel and Oregon Military Department (OMD) Environmental Branch of Installations (AGI-E) personnel shall periodically review the toxic use and hazardous waste generation, and identify changes to the reduction plan, as needed.

6.0 Implementation Plan

Several TUHWR opportunities were evaluated for Camp Withycombe. The tentative schedule of tasks and dates for implementation of the reduction options listed above are summarized in Table 6-1.

Table 6-1. Pollution Prevention Project Schedule for Camp Withycombe

Targeted Pollution Source	Reduction Option	Implementation Status	Reason Option Not Selected	Impediments	Fiscal Year Funding
Bead blast media	Aluminum Oxide Blast Media	Awaiting approval	TBD	TBD	TBD
Bead blast media	FLASHJET® coating removal process	Awaiting approval	TBD	TBD	TBD
Bead blast media	Laser Paint Stripping	Awaiting approval	TBD	TBD	TBD
Bead blast media	CO2 Blast Media	Awaiting approval	TBD	TBD	TBD
Bead blast media	Sodium Bicarbonate ($NaHCO_3$) Blast Media	Awaiting approval	TBD	TBD	TBD
Bead blast media	Wheat Starch Blast Media	Awaiting approval	TBD	TBD	TBD
Bead blast media	Water Jet Stripping	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Conduct test to identify source of cadmium	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Install a Parts Washer	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Install an Evaporator	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Isolate Engine Cleaning Waste in Parts Washer	Awaiting approval	TBD	TBD	TBD

7.0 Certification

Obtain, complete, and submit certification page, which is available online:
http://www.deq.state.or.us/wmc/hw/tuwrap/documents/NoticeofPlanCompletion.pdf

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Appendix D

Camp Rilea
Toxic Use Reduction and Hazardous Waste Reduction Plan
Effective: 2006 to 2011

1.0 Scope and Objectives

The Camp Rilea Toxic Use and Hazardous Waste Reduction (TUHWR) Plan is written in accordance with Oregon Administrative Rules (OAR) 340-135-0050. Camp Rilea may claim an exemption from this requirement and the annual progress report requirement of OAR 340-135-0070 (1) and (2), if the ORARNG Environmental Management System (EMS) meets the requirements of OAR 340-135-0044. The Policy statement is located in Section 3.1 of the Pollution Prevention Plan.

Camp Rilea is an Oregon Army National Guard facility, located in Warrenton, Oregon. The installation occupies approximately 2,200 acres on the Clatsop Plains between Columbia Beach and Sunset Beach. The facility is designated as a small quantity generator of hazardous waste under 40 CFR 263.

The Oregon Military Department Environmental staff at Environmental Branch of Installations (AGI-E) will work with Camp Rilea staff to reduce the generation of hazardous waste. The top priority will be the largest hazardous waste streams by weight. The top priority hazardous waste streams represent ten percent, or more, of the total hazardous waste generated at Camp Rilea. As progress is made to reduce the top priority hazardous waste streams evaluated in this Plan, AGI-E staff will review the Camp Rilea Reduction Plan to evaluate other hazardous waste streams that represents ten percent, or more, of the total hazardous waste generated at Camp Rilea.

The scope of this plan covers employees and activities related to hazardous material and waste at Camp Rilea from 2006 to 2011, but may be updated annually to document reduction efforts. The goal of this TUHWR Plan and associated reduction activities is to eliminate or minimize the toxic substances used and hazardous waste generated. Each year AGI-E staff submits the Annual Progress Report, in accordance with OAR 340-135-0070, which contains:

- An analyses of the progress made or impediments towards reducing the amount of hazardous waste generated at Camp Rilea,
- The annual quantities (in pounds) of each hazardous waste generated for each hazardous waste evaluated in this Plan,
- An explanation of each hazardous waste generated for each hazardous waste evaluated in this Plan.

2.0 Reduction Evaluations

This section describes the toxic use and hazardous waste activities conducted at Camp Rilea during calendar year (CY) 2005. AGI-E conducted, and will annually conduct, an internal analysis of the toxic material used and hazardous waste generation at Camp Rilea.

Past toxics use reduction and hazardous waste reduction activities completed so far are described in Chapter 5 of the ORARNG 2006 Pollution Prevention Plan. The greatest challenge for Camp Rilea is to reduce toxics use and hazardous waste generation, while operations and activities increase.

2.1 Major Waste Generating Activities

The primary facilities on Camp Rilea are: the Unit Training Equipment Site (UTES), Post Maintenance (PM), and an Readiness Center. Camp Rilea has one tenant: the Air National Guard 116 Air Control Squadron (ACS). Secondary facilities include enlisted and officer quarters, small arms and weapon training ranges, ammunition storage bunkers, waste water treatment plant, ropes course, Military Operations in Urban Terrain (MOUT) training facility, maneuver training areas, rappelling tower, two above ground fueling stations, and three wash racks.

Unit Training Equipment Site Building 6415: The UTES includes a maintenance shop, fueling station, lube rack, wash rack, warehousing facilities, and a controlled humidity parking building. The UTES provides maintenance for the vehicles and equipment used by the military units. The most significant waste streams from this location are JP-8, MOGAS, used oil, petroleum and lubricants, and universal waste. Hazardous materials used include: paint, petroleum products, glue, engine coolant, batteries and JP-8.

116 Air Control Squadron of the Air National Guard (ACS): The 116 ACS occupies two buildings. Building 7116 contains two maintenance bays and one paint bay. The Aerospace/Ground Equipment maintenance is also located in Building 7116. The AGE occupies three maintenance bays. The bays are used to maintain equipment and vehicles. The Mobility Storage Area is used to store emergency response equipment.

State Maintenance Facility Building 6515: This building houses the facility maintenance functions for Camp Rilea. Personnel at this location conduct all building and post maintenance (i.e., plumbing, electrical, road repairs, building painting and other facility maintenance type repairs for the building on post as well as the wastewater treatment plant). They perform both the state and Federal maintenance functions (carpentry, painting, maintenance motor pool for the state vehicles, and storage for plumbing and electrical). They generate hazardous waste (waste bulbs, waste paint related materials, and some expired paints), and store all janitorial cleaning supplies, a large supply of paints, aerosol products for POL's, large quantities of oils, smaller quantities of fuel for yard maintenance type equipment, and light bulbs for all the facility buildings.

2.2 Toxics Used

Camp Rilea does not maintain reportable quantities of toxic chemicals and is below reporting threshold for toxic chemical releases under the federal Toxics Release Inventory (TRI) program. If toxic chemicals are identified by AGI-E personnel, a reduction plan will be developed that will address the following information: Toxics used, amount, estimated cost savings, hazardous constituents, location, reason for use, reduction options, rational for options not selected, reduction impediments, and reduction(s) implemented.

2.3 Hazardous Waste Generated

Over three tons of hazardous waste was generated during CY 2005 at Camp Rilea. The 2006 to 2011 Camp Rilea Reduction Plan will identify the largest hazardous waste streams by weight, defined as ten percent or more of the total hazardous waste generated, and identify solutions to reduce or eliminate the hazardous waste stream. Table 2-1 identifies the hazardous waste streams at Camp Rilea during 2005 as a percentage of the total waste.

Table 2-1. Waste Generated at Camp Rilea during CY 2005

Waste Type	Generator	Waste Name	CY 2005 Weight (lbs)	Percent of Total (%)
HW	Camp Rilea	Waste Oil Pump Out	2,140	33.08%
HW	Camp Rilea	Wash rack sludge (hazardous)	1,320	20.41%
HW	Camp Rilea	Lead debris[1]	456	7.05%
HW	Camp Rilea	Filters, JP-8	350	5.41%
HW	Camp Rilea	Paint	328	5.07%
HW	Camp Rilea	Paint, expired	300	4.64%
HW	Camp Rilea	Solvent	280	4.33%
HW	Camp Rilea	Lamps, Sodium	210	3.25%
HW	Camp Rilea	Hydraulic FRH w/barium	200	3.09%
HW	Camp Rilea	Lead debris w/water[1]	200	3.09%
HW	Camp Rilea	Absorbent w/JP-8	150	2.32%
HW	Camp Rilea	Lead weights	100	1.55%
HW	Camp Rilea	Brake wash sludge	90	1.39%
HW	Camp Rilea	Filters, fuel	60	0.93%
HW	Camp Rilea	Industrial cleaner	50	0.77%
HW	Camp Rilea	Aerosol cans	41	0.63%
HW	Camp Rilea	Gasoline	40	0.62%
HW	Camp Rilea	Paint Aerosol Puncturer	33	0.51%
HW	Camp Rilea	Floor sealer	25	0.39%
HW	Camp Rilea	Sodium hydroxide	20	0.31%
HW	Camp Rilea	Lamps, Incandescent	15	0.23%
HW	Camp Rilea	Plastic Polish	14	0.22%
HW	Camp Rilea	Aluminum Brightener	10	0.15%
HW	Camp Rilea	Oven cleaner	8	0.12%

Waste Type	Generator	Waste Name	CY 2005 Weight (lbs)	Percent of Total (%)
HW	Camp Rilea	Hot Washer solid	6	0.09%
HW	Camp Rilea	Inhibitor Corrosion	6	0.09%
HW	Camp Rilea	Rust Converter	6	0.09%
HW	Camp Rilea	Solvent, aerosol	5	0.08%
HW	Camp Rilea	Mercury	3	0.05%
HW	Camp Rilea	Screen block	1	0.02%
HW	Camp Rilea	Tire bonding	1	0.02%
HW	Camp Rilea	XC rapid clean	1	0.02%
HW	**Camp Rilea**	**Total**	**6,469**	**100.00%**
UW	Camp Rilea	Batteries, Alkaline	946	47.04%
UW	Camp Rilea	Lamps, Fluorescent	575	28.59%
UW	Camp Rilea	Batteries, Lithium	290	14.42%
UW	Camp Rilea	Batteries, Lead-acid	115	5.72%
UW	Camp Rilea	Batteries, Silver	50	2.49%
UW	Camp Rilea	Batteries, NiCad	35	1.74%
UW	**Camp Rilea**	**Total**	**2,011**	**100.00%**

1. Lead debris and lead debris with water are generated at nearby CESQG facilities and brought to Camp Rilea for disposal.

The largest waste streams in CY 2005 are the waste oil pump out and wash rack sludge. The waste oil pump out is not a regular waste stream at Camp Rilea. It was pumped in CY 2005 after shop personnel mistakenly poured material into the tank.

Lead debris is collected from off-site conditionally exempt generators of hazardous waste, whom are allowed to self transport hazardous waste from satellite locations to a nearby facility within the same organization without a hazardous waste manifest, in accordance with Oregon DEQ Policy Number 1999-PO-002, effective 30 April 1999.

Since waste oil pump out is not regularly generated at Camp Rilea, the primary hazardous waste stream identified for reduction, during the Camp Rilea Reduction Plan period of 2006 to 2011, is wash rack sludge. The wash rack sludge tests hazardous due to high levels of cadmium and represent ten percent or more by weight of the cumulative hazardous wastes generated in CY 2005.

The major hazardous waste generated at Camp Rilea for the previous five years, as reported annually to Oregon DEQ, are listed in Table 2-2.

Table 2-2. Major Waste Trends at Camp Rilea from CY 2001 to 2005

Waste	2001 (lbs)	2002 (lbs)	2003 (lbs)	2004 (lbs)	2005 (lbs)
Paint Waste	2,251	260	1,490	436	734
Wash rack sludge	---	---	5,270	1,355	1,320

Waste	2001 (lbs)	2002 (lbs)	2003 (lbs)	2004 (lbs)	2005 (lbs)
JP-8 Absorbent	---	---	600	340	30
JP-8 Fuel Filters	---	---	775	205	620

The Oregon Army National Guard (ORARNG) revised internal environmental guidance documents in 2001 to outline efforts to reduce the generation of hazardous waste. The ORARNG environmental office worked with the equipment maintenance shops at Camp Rilea to reduce two major waste streams--waste paint and wash rack sludge.

Equipment maintenance shop personnel stored excess paint for so long that it became unusable, and was eventually discarded as hazardous waste. Through better management practices and training, equipment maintenance shop personnel reduced the amount of paint and related material generated from 2,251 pounds in 2001 to 1,490 pounds in 2003 to 734 pounds in 2005.

Camp Rilea personnel historically transported wash rack sludge as hazardous waste. In recent years, the wash rack sludge was tested for hazardous constituents to determine if it is non-hazardous. This practice decreased the amount of hazardous waste wash rack sludge from 5,270 pounds in 2003 to 1,320 pounds in 2005.

3.0 Reduction Analysis

Camp Rilea will focus on reducing wash rack sludge waste, which has historically tested hazardous due to cadmium contamination, for the Reduction Plan period of 2006 to 2011. The waste stream represents ten percent or more by weight of the cumulative hazardous wastes generated in CY 2005. Potential solutions were evaluated in Section 3.1 of this Appendix to minimize the toxicity or quantity of the OWS sludge.

3.1 Evaluation of OWS Sludge at Camp Rilea

Process Description

The sludge from the Camp Rilea UTES wash rack sump and OWS has been analyzed and shown to contain cadmium in excess of 1.0 mg/L, high enough to classify the sludge as hazardous waste per 40 CFR 261.24. Without sampling the wash water from specific washing operations (e.g. brake hub washing, floor scrubber water), it is difficult to identify the source of cadmium in the sludge. In CY 2005, approximately 1,320 pounds of hazardous waste wash rack sludge was generated at Camp Rilea.

The indoor wash rack is used regularly. The contents (i.e., sludge) of the wash rack sump and the dirt collected from the drain grate are scooped out once per week and put into a 55-gallon drum. The vendor pumps the contents from the sump and disposes of the 55-gallon drums of waste. Each drum of waste is tested prior to disposal to determine if it is hazardous. The sump and vault are pumped out approximately once or twice per year.

Waste Generated: Sludge from Wash Rack
Amount: 1,320 pounds per year
Hazardous Constituents: Cadmium

Location: Wash Rack
Reason for Generation: Contaminated sludge
Current Cost: $198.00 for disposal of 1,350 lbs/year

Preferred Technical/Environmental Evaluation #1 – Identify Source of Cadmium

The best way to reduce, or eliminate the amount of hazardous waste wash rack OWS sludge is to identify the source of the cadmium. It is recommended that wastewater from each process be sampled for heavy metals, including cadmium and lead.

Two initiatives that could reduce the amount of hazardous waste sludge are (1) install an evaporator, or (2) install a closed loop wash rack recycle system.

Preferred Technical/Environmental Evaluation #2 – Evaporation Units:

An on-site evaporator can reduce disposal costs by eliminating 95 percent of wastewater. The evaporator can dry OWS sludge, wash water from steam cleaning engine blocks, and wash water from cleaning the work bay floors. Evaporators come in a variety of sizes depending on the application and the amount of wastewater generated. Processing capacities vary from eight gallons to 120 gallons per hour; however, evaporators may use more energy.

Evaporation units can either be electric or natural gas, with an optional propane conversion kit for winter months when natural gas costs are higher. An oil skimmer, which is built into the system, is designed to pipe the collected oil into a collection drum. Safety features include a safety shutdown and low water shutdown feature. Maintenance of the evaporator units is fairly simple and can be done by in-house personnel. The natural gas units are easier to clean than the electric units, as there is no heating element in the bottom of the unit to work around. In addition, the bottom of the unit is sloped in the natural gas units to allow the user the ease of cleaning out the remaining sludge material. The efficiency of the evaporator can be affected if more than two to three inches of sludge build up in the bottom of the evaporator unit, or if the wastewater consistency is more solid than water.

Economic Evaluation

Electric units and natural gas/propane units come in a wide range of sizes. Compared to electric units, the natural gas units are more economical and efficient. A natural gas unit cost approximately $0.05 to $0.07 per gallon of wastewater to evaporate. An electric unit uses approximately 10.4 kilo Watt-hour per gallon of wastewater. Voltage and amperage ratings on the electric units can vary from 240 volts per 45 amps to 480 volts per 23 amps (three phase).

Electric Units

55 gallon capacity unit:	$5,300.00
75 gallon capacity unit:	$9,000.00
150 gallon capacity unit:	$15,000.00

Natural Gas Units

75 gallon capacity unit:	$12,000.00
150 gallon capacity unit:	$17,000.00
400 gallon capacity unit:	$45,000.00

Natural Gas conversion kit: $100.00

An auto-fill cast iron pump, which is used to load the wastewater into the unit, is available for an additional $1,800; otherwise the evaporator is loaded manually.

Implementation Status: This project is being evaluated for applicability and benefits.

Vendors

e^2M is not recommending the vendors listed below. The vendor list is for references purposes only and is not intended to be a complete list, as there may be other vendors for this type of equipment.

Clean All Company
1239 Michael Lane
Blue Bell, PA 19422
(610) 275-1300
Fax (610) 275-1344
www.cleanallcompany.com
e-mail: Cleanone@erols.com

Preferred Technical/Environmental Evaluation #3 – Closed-loop Wash Rack Recycle System

A closed loop wash rack recycle system would continually recycle the wash water to reduce the annual quantity of water used to wash vehicles and equipment, and reduce the discharge of wastewater sent to the POTW. However, the amount of hazardous waste sludge would not decrease. This system is further discussed in Section 5.4.14 of the ORARNG P2 Plan.

4.0 Employee Awareness and Training

Pollution prevention training for applicable environmental staff and facility personnel will provide the regulatory information on the TUHWR Act, reporting requirements, and identify the toxic or hazardous waste that is identified for reduction during the planning year. Additionally, personnel will receive hazardous waste management training.

5.0 Institutionalization

By incorporating the TUHWR Plan is into the Oregon Army National Guard Pollution Prevention (P2) Plan and Regulation 210-4, which is required by Army Regulation (AR) 200-1, Camp Rilea demonstrates its commitment to TUHWR planning and related activities into management practices and procedures. Camp Rilea personnel and Oregon Military Department (OMD) Environmental Branch of Installations (AGI-E) personnel shall periodically review the toxic use and hazardous waste generation, and identify changes to the reduction plan, as needed.

6.0 Implementation Plan

Several TUHWR opportunities were evaluated for Camp Rilea. The tentative schedule of tasks and dates for implementation of the reduction options listed above are summarized in Table 6-1.

Table 6-1. Pollution Prevention Project Schedule for Camp Rilea

Targeted Pollution Source	Reduction Option	Implementation Status	Reason Option Not Selected	Impediments	Fiscal Year Funding
OWS Sludge	Conduct test to identify source of cadmium	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Install a parts washer	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Install an evaporator	Awaiting approval	TBD	TBD	TBD
OWS Sludge	Isolate Engine Cleaning Waste in Parts Washer	Awaiting approval	TBD	TBD	TBD

7.0 Certification

Obtain, complete, and submit certification page, which is available online:
http://www.deq.state.or.us/wmc/hw/tuwrap/documents/NoticeofPlanCompletion.pdf

Appendix E

Supplemental Information to PPOA

1.0 Supplement to 6.5.1 QRP for Camp Withycombe and Camp Rilea

Recycling goals in Oregon are set for each separate wasteshed. A "Wasteshed" is defined in Oregon law as being an area of the state that shares a common solid waste disposal system, or an appropriate area in which to develop a common recycling system. For the most part, individual Oregon counties are designated as wastesheds. Each county is responsible for compiling information on recycling programs within the wasteshed and submitting that information to the Department of Environmental Quality.

Potential Recycling Vendors for Camp Withycombe

The greater Portland tri-county area, consisting of Clackamas, Multnomah, and Washington Counties is known as the Metro wasteshed. Camp Withycombe is located in Clackamas County and would be able to obtain information on available recycling programs established in the Metro wasteshed.

The information and list of recycling vendors contained in Table E-1 was obtained from the Metro Recycling Information website at http://www.metro-region.org/article.cfm?ArticleID=525. Information on vendors for the most common recyclable materials such as paper, plastic, glass, ink cartridges and scrap metal were obtained and placed in the table. The Metro Recycling Information website should be reviewed for any materials not listed in the table but which can be recycled, such as used oil, tires, wood waste, construction and demolition debris, and food and yard waste.

Potential Recycling Vendors for Camp Rilea

Camp Rilea is located in Warrenton, Oregon, which is in Clatsop County. Clatsop County also includes the cities of Astoria, Gearhart, Seaside and Cannon Beach. The only known local recycling vendors near the City of Warrenton are the Solid Waste Municipal Waste Contractor and Western Oregon Waste (WOW).[31] The City of Cannon Beach, located approximately 16 miles south of Warrenton, sells recyclable material, such as glass, newspaper, and office paper, to WOW, and cardboard to Longview Fibre located in the State of Washington through an agreement with Pacific Northwest Freight.[32] Table E-2 provides a short list of recycling vendors that could serve the Clatsop County area depending on how much recyclable material is available for sale. Most companies may require a minimum quantity of recyclable material for pick-up services; therefore, individual companies should be contacted for current rates and services.

Although there are fewer recycling vendor options for Camp Rilea as compared to Camp Withycombe, it should be noted that the City of Portland is a major hub for recycling vendors.

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[31] Reference: Personal communication between e^{2}M staff and the receptionist at the City of Warrenton on 3 October 2006 at phone number (503) 861-2234.
[32] Reference: Personal communication between e^{2}M staff and Andrew Mackey, recycling coordinator for the City of Cannon Beach (503) 436-0282.

WOW transports recyclable material to Portland for processing, packaging and selling. Therefore, a unified regional QRP with Camp Rilea and Camp Withycombe could be beneficial for both facilities.

Additional Recycling Vendors and Information

Additional recycling vendors can be found by accessing the Recycler's World website at www.recycle.net. This website provides information on recyclable material that is wanted for purchase and that is for sale throughout the United States. The benefit of using this website is the potential to market your available recyclable material to a much larger audience outside your regional area.

Commodity pricing for recyclable materials can be found by accessing the American Metal Marketing website at: http://www.amm.com/recman/. Prices are updated on a weekly basis.

e^2M is not recommending the recyclers listed in Tables E-1 and E-2. The information is for reference purposes only, and is not intended to be a complete list of all available recyclers in the Metro wasteshed or Clatsop County wasteshed. According to the Metro Recycling Information website there are over 304 recyclers within the greater Portland Tri-County area.

In addition to the information provided in Tables E-1 and E-2, numerous publications and brochures are available that pertain to recycling and reducing waste. Some publications provide a directory of recycling vendors indexed by state. A list of these publications can be found on the Oregon's DEQ's website at http://www.deq.state.or.us/wmc/solwaste/cwrc/govt.html.

Regulatory References and Guidance Documents on Qualified Recycling Programs

There are numerous documents available to assist an installation in implementing and establishing a Qualified Recycling Program. DODI 4715.4 and its associated supplemental memorandum are an excellent initial resource as to the requirements involved in establishing a QRP. However, guidance documents like those produced by the Navy and Air Force are an additional "how to" reference that can provide valuable information on developing and establishing a QRP.

The following is a list of the regulatory documents and guidance documents that outline the requirements involved with a QRP. This list is not intended to be an exhaustive compilation of all the resource material available.

1. DoD Instruction 4715.4 - Pollution Prevention, found at: http://www.dtic.mil/whs/directives/corres/pdf2/i47154p.pdf.
2. Memorandum from the Office of the Under Secretary of Defense, 24 April 2003 – Qualified Recycling Program Guidance, found at: http://www.afcee.brooks.af.mil/eq/recycling/QRPGuidance.pdf.
3. Public Law 97-214, Title 10 United States Code 2577, found at: http://uscode.house.gov/download/pls/10C153.txt.
4. Department of the Army Pamphlet 200-1, found at: http://www.army.mil/usapa/epubs/pdf/p200_1.pdf.
5. Army Regulation 420-49, found at: http://www.army.mil/usapa/epubs/pdf/r420_49.pdf.

6. Memorandum from the Office of the Under Secretary of Defense, 15 May 1998 - Pollution Prevention Measure of Merit, Recycling of Firing-Range Scrap Consisting of Expended Brass and Mixed metals Gleaned from Firing-Range Clearance Through Qualified Recycling Programs, found at: https://www.denix.osd.mil/denix/Public/ES-Programs/Pollution/Moms/moms2.html.
7. Naval Facilities User's Guide-2039-ENV, Qualified Recycling Program Guide, July 2000, found at: http://www.ofee.gov/wpr/NavyQRPjul2000.pdf.
8. Pro-Act Fact Sheet from AFCEE on Recycling, August 1995 (TI#6388), found at: http://www.p2pays.org/ref/09/08886.pdf.
9. Range Residue Resource Recovery (R4), A Guide for AFCEE Range Residue Project Managers, January 2002, found at: http://www.afcee.brooks.af.mil/products/ranges/downloads/R4%20Guide_version%201-10-02.doc.
10. DoD 4160.21-M, Defense Materiel Disposition Manual, Chapter 4 – Property Requiring Special Processing, found at: https://www.demil.osd.mil/demil_get_file.asp?link_id=315.

Table E-1. Potential Recycling Vendors in the Metro Wasteshed

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
1-800-GOT-JUNK (800) 468-5865 www.1800gotjunk.com	X		X	X		X	X	X		X			Pick up only
A Cut Above Hauling (971) 998-4654							X		X	X			Pick up only
Agri-Plas, Inc. 5016 Waconda Road NE Brooks (503) 390-2381				X	X							X	Fee for pick up
Battery Specialists Inc. 11207 SE Powell Portland (503) 761-2370									X				Will purchase waste
Battery Specialists Inc. 11257 NE Sandy Portland (503) 255-7423									X				Will purchase waste
Battery X-change Inc. 12990 SW Canyon Road Beaverton (503) 644-3425									X				
Battery X-change Inc. 2003 SE Belmont Portland (503) 232-6584									X				

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
Battery X-change Inc. 3007 NE Martin Luther King Blvd. Portland (503) 249-0101									X				
Battery X-change Inc. 311 SE Baseline Hillsboro (503) 640-3793									X				
Battery X-change Inc. 603 Seventh Street Oregon City (503) 656-7407									X				
Carton Service Inc. 2211 NW Front Avenue Portland (503)227-6428	X											X	Free pickup for large quantity
Cartridge World 3962 B SE Hawthorne Blvd. Portland (503) 231-7900											X		No disposal fee
Cascade Recycling (503) 775-2187							X		X	X			Pick up only
Cintas Document Management 5387 N. Marine Drive Portland (503) 229-0389	X	X	X										

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
City Recycle LLC 6600 NE Columbia Blvd. Portland (503) 254-1927	X	X	X				X						Minimum quantity required of 2-3 cubic yards
Denton Plastics 18811 NE San Rafael Portland (503) 257-9945 www.denplas.com					X							X	Minimum quantity required for purchase
Der Grosshandler (503) 669-7539	X												Pick up only
Ecolights Northwest (206) 343-1247									X				Pick up only; Disposal fees
Environmental Fibers International Inc. 4325 N. Commerce St. Portland (503) 737-2100 www.envirofiber.com	X	X	X										Will purchase waste
Environmental Protection Services (503) 408-8956									X				Disposal fee
Far West Fibers 10750 SW Denney Road Beaverton (503) 643-9944	X	X	X				X						Will purchase waste

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
Far West Fibers 6440 SE Alexander Street Hillsboro (503) 643-9944	X	X	X				X						Will purchase waste
Far West Fibers 12820 NE Marx Street Portland (503) 255-2299	X	X	X				X						Will purchase waste
IBS of NW Oregon 12550 NE Marx Portland (503) 256-3733									X				Will purchase waste
Ink, Incorportated (503) 520-9797											X		Pick up only
Iron Mountain Secure Shredding (503) 570-8778		X											Disposal fee
J.R.J. Hauling Inc. (503) 734-7172	X		X				X	X	X	X			Pick up only; Disposal fee
KB Recycling 9602 SE Clackamas Rd Clackamas (503) 659-7004 www.kbrecycling.com	X	X	X	X		X	X	X					Will purchase waste

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
Laser 2000 (503) 653-8770											X		Service for customers only
Metro Metals Northwest 5611 NE Columbia Blvd. Portland (503) 287-8861 www.metrometalsnw.com	X						X						Will purchase waste
Northwest Battery Supply 3750 SE Belmont Street Portland (503) 232-9002									X				
Northwest Print Strategies Inc. 8175 SW Nimbus Bldg 11 Beaverton (503) 641-5156											X		No disposal fee
Oregon Hauling and Cleanup (503) 381-4003	X					X	X		X	X			Pick up only; Disposal fee
Plastic Nation 20283 State Rd 7 #104 Boca Raton, FL (561) 482-9300 www.plasticnation.com				X	X	X	X						Outside of Oregon; Will purchase waste

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
Printpal Recycling (877) 310-2900											X		Pick up only; Will purchase waste
QSI International 6975 SW Sandburg St. Ste 320 Tigard (503) 612-0356											X		Will purchase waste
Quantum Resource Recovery 10750 SW Denney Road Beaverton (503) 646-2427 www.quantumresource.com					X		X						Will purchase certain waste
R2 Pallet 1780 B SE Ochoco Milwaukie (503) 653-1297					X					X			Wood and plastic pallets accepted
Rapid Refill Ink 1405 SW 11th Ave. Portland (503) 226-3465											X		Will purchase waste
RB Hauling (503) 784-7338							X						Pick up only; Disposal fee
Recycle Salvage (503) 775-0652							X		X				Pick up only

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
RS Davis Recycling 10105 SE Mather Clackamas (503) 655-5433 www.portlandrecycling.com							X		X			X	Disposal fee; Will purchase certain waste
Schnitzer Steel Products 12005 N Burgard Portland (503) 286-5771 www.schnitzersteel.com						X	X						Will purchase waste
SJ Nudelman and Son 2707 NW Nela Street Portland (503) 226-4051							X						
Smurfit Recycling 6328 SE 100th Avenue Portland (503) 777-4509 www.smurfitrecycling.com	X	X	X										
SWL Business Solutions 2020 NW Aloclek Drive Hillsboro (503) 656-6100 www.swlinc.biz											X		Will purchase waste
T.G. Pallet Repair 1729 Washington Street Oregon City (503) 655-5015					X					X			

Recycler Information for the Metro Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
Technology Conservation Group 6125 A N Basin Avenue Portland (503) 735-1102 www.tcgrecycling.com							X						Will purchase certain waste
Toner Inx 24023 NE Shea Lane Ste 108 Wood Village (503) 669-3439											X		Will purchase waste
Weyerhaeuser 5505 SW Western Ave. Beaverton (503) 643-0118 www.weyerhauser.com	X	X	X	X	X	X		X					Will purchase waste

A. Cardboard refers to corrugated cardboard (wavy layer between the two flat sheets)
B. Scrap paper refers to mail, paperback books, paperboard boxes, paper roll cores, etc.
C. Plastic - Bottles and Jars refer to plastic bottles and jars that are labeled #1 through #7 and that did not contain any toxic materials.
D. Plastic - Other refers to industrial plastic.
E. Metal products – iron refers to all iron or steel other than cans. Scrap metal.
F. Lead acid batteries refer to auto batteries and other sealed lead acid storage batteries.
G. Caveats:
1. Call before hauling any waste material to the recyclers to determine if they are still accepting the waste material.
2. Call before hauling any waste to determine disposal fees, and for prices on waste items that you wish to sell.
3. Recyclers listed may accept other forms of waste not listed in the table. Contact the recycler to determine if they will accept or purchase additional waste streams for your facility.
4. All information in this table was provided by accessing the Metro Recycling Information website at: http://www.metro-region.org/article.cfm?ArticleID=525.

Table E-2. Potential Recycling Vendors in the Clatsop County Wasteshed

Recycler Information for the Clatsop County Wasteshed	Paper Products			Plastic Products		Metal Products		Miscellaneous Type Products					Notes[G]
	Card-board[A]	Office paper	Scrap paper[B]	Bottles and jars[C]	Other[D]	Steel, Tin, Empty aerosol cans	Iron[E]	Glass bottles and jars	Lead acid batteries[F]	Pallets	Laser print cartridges	Drums (plastic, metal)	
Denton Plastics 18811 NE San Rafael Portland (503) 257-9945 www.denplas.com					X							X	Minimum quantity required for purchase
Far West Fibers 12820 NE Marx Street Portland (503) 255-2299	X	X	X				X						Will purchase waste
Longview Fibre 300 Fibre Way Longview, WA (360) 425-1550	X												Outside of Oregon; Will purchase waste
Plastic Nation 20283 State Rd 7 #104 Boca Raton, FL (561) 482-9300 www.plasticnation.com				X	X	X	X						Outside of Oregon; Will purchase waste
Schnitzer Steel Products 12005 N Burgard Portland (503) 286-5771 www.schnitzersteel.com						X	X						Will purchase waste
Weyerhaeuser 5505 SW Western Ave. Beaverton (503) 643-0118 www.weyerhauser.com	X	X	X	X	X	X		X					Will purchase waste

Appendix F

Chemical Usage

The following pages contain a list of the chemical purchases made in Standard Army Retail Supply System (SARSS) by ORARNG units, and another list follows that sorts the same data by chemical name. Chemical use data for 2005 was obtained from SARSS, provided by the Supply and Services Officer for the United States Property and Fiscal Office. Data was then entered into a database and sorted into categories by chemical type and the unit ordering the materials units are designated in SARSS by DODAAC ID. Purchases from International Merchant Purchase Authorization Card were not included because these purchases are not tracked centrally.

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Appendix F
ORARNG Material Purchase for CY 2005

CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	6850014649125	ANTIFREEZE	960
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150001866668	LUBE OIL MIL-L-2104 OE/	178
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150010355393	LUBRICATING OIL,GEAR	144
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150011524118	LUBRICATING OIL,ENGINE	106
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	84
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150011029455	BRAKE FLUID,AUTOMOTIVE	33
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	6830005843041	PROPANE	14
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150010955512	GREASE,BALL AND ROLLER BEARING	7
CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD	9150010546453	CLEANER,LUBRICANT	2
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	6850014649125	ANTIFREEZE	1,280
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	9150010355393	LUBRICATING OIL,GEAR	432
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	9150014386079	LUBRICATING OIL,ENGINE	387
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	9150011524119	LUBRICATING OIL,ENGINE	387
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	9150011029455	BRAKE FLUID,AUTOMOTIVE	117
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	9150002526383	HYDRAULIC FLUID AIRCRAFT	20
CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD	6850008807616	SILICONE COMPOUND	1
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150014386079	LUBRICATING OIL,ENGINE	16,649
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150001912772	LUBE OIL MIL-L-2104 OE/	11,749
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150011524119	LUBRICATING OIL,ENGINE	11,227
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8010001818080	THINNER,PAINT PRODUCTS	5,073
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8010011930517	EPOXY PRIMER COATING	2,048
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	6850014649137	ANTIFREEZE	1,319
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150010355394	LUBRICATING OIL,GEAR	792
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8010005985936	ENAMEL	430
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	332
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8010012297544	POLYURETHANE COATING	320
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150011977692	GREASE,AUTOMOTIVE ARTILLERY	315
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8030009381947	CORROSION PREVENTIVE	43
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8010008998825	PRIMER COATING	38
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	9150001178791	LUBRICATING OIL,ENGINE	36
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	6850002271887	CLEANING COMPOUND,LENS	14
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8040007644424	ADHESIVE	8
CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE	8040008263535	ADHESIVE	1
CLACKAMAS	W81UBH	W7NW USPFO FUTUEUR OR ARNG	10101 SE CLACKAMAS ROAD	9150011524119	LUBRICATING OIL,ENGINE	37,170

Appendix F
ORARNG Material Purchase for CY 2005

CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
CLACKAMAS	W81UBH	W7NW USPFO FUTUEUR OR ARNG	10101 SE CLACKAMAS ROAD	9150014386079	LUBRICATING OIL,ENGINE	9,292
CLACKAMAS	W90KMY	3670 OD CO MAINT GS	10101 SE CLACKAMAS ROAD	6840006877904	DISINFECTANT DETERGENT	240
						101,248
CORVALLIS	W90KLW	0162 IN BN 02 CO B REAR	1315 SW E STREET	7930008804454	DISHWASHING COMPOUND	32
CORVALLIS	W90KLW	0162 IN BN 02 CO B REAR	1315 SW E STREET	9150010546453	CLEANER,LUBRICANT	5
						37
EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD	9150010546453	CLEANER,LUBRICANT	19
EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD	8010006169143	ENAMEL	10
EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD	8010008489272	ENAMEL	9
EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD	9150011021473	CLEANER,LUBRICANT	2
						40
FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY	7930003577386	DETERGENT,GENERAL PURPOSE	50
FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY	6840005843129	DISINFECTANT DETERGENT	38
FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY	7930013268110	GLASS CLEANER	5
FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY	7930007218592	SCOURING POWDER	5
FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY	7930009265280	DETERGENT,GENERAL PURPOSE	1
						99
GRANTS PASS	W90KL7	0186 IN BN 01 CO D	666 BROOKSIDE BOULEVARD	9150010536688	CLEANER,LUBRICANT	103
GRANTS PASS	W90KL7	0186 IN BN 01 CO D	666 BROOKSIDE BOULEVARD	9150010546453	CLEANER,LUBRICANT	64
						167
GRESHAM	W90KLM	0162 IN BN 01 CO C	500 NE DIVISION STREET	7930013068369	CLEANING COMPOUND,SOLVENT	1
						1
HERMISTON	W81B3Y	W8BA ORARNG ELEMENT, JF HQ	UMATILLA ARMY DEPOT	9150011784725	LUBRICATING OIL,ENGINE	84
						84
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	9150011524119	LUBRICATING OIL,ENGINE	774
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	9150001116256	HYDRAULIC FLUID,FIRE RESISTANT	81
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	6810002863783	BATTERY WATER	24
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	9150001450268	GREASE AIRCRAFT GP WD	5
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	6850006645685	DRY CLEANING SOLVENT	3
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	6850002271887	CLEANING COMPOUND,OPTICAL LENS	2
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	9150002575370	GREASE, GRAPHITE, LUBRICATING	2
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	9150010546453	CLEANER,LUBRICANT	1
LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE	9150002617899	PENETRATING OIL VV-P-216	1

Appendix F
ORARNG Material Purchase for CY 2005

CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
LA GRANDE	W90XYT	W8BA 3D BN 116TH CAV OMS	64082 AIRPORT LANE	8040008658991	ADHESIVE SEALANT	2
LA GRANDE	W90XYT	W8BA 3D BN 116TH CAV OMS	64082 AIRPORT LANE	8040002629028	ADHESIVE	1
						896
LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET	8010005985936	ENAMEL	48
LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET	8010013316111	ENAMEL	13
LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET	8010013316108	ENAMEL	10
LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET	8010013316113	ENAMEL	10
LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET	6850012620635	PAINT FACE CAMOUFLAGE	2
LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET	7930004592247	CLEANING COMPOUND,OVEN	1
						84
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	9150011524119	LUBRICATING OIL,ENGINE	774
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	9150001116256	HYDRAULIC FLUID,FIRE RESISTANT	81
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	6810002863783	BATTERY WATER	24
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	9150001450268	GREASE AIRCRAFT GP WD	5
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	6850006645685	DRY CLEANING SOLVENT	3
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	9150002575370	GREASE, GRAPHITE, LUBRICATING	2
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	6850002271887	CLEANING COMPOUND,OPTICAL LENS	2
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	9150002617899	PENETRATING OIL VV-P-216	1
LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE	9150010546453	CLEANER,LUBRICANT	1
						893
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	6850006641403	ANTIFREEZE	1,061
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150011524118	LUBRICATING OIL,ENGINE	248
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150013534799	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	146
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150010355393	LUBRICATING OIL,GEAR	144
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	84
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150011784725	LUBRICATING OIL,ENGINE	84
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150001866668	LUBE OIL MIL-L-2104 OE/	71
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150011524117	LUBRICATING OIL,ENGINE	64

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE	9150014228899	LUBRICATING OIL,ENGINE	4
						1,906
LEBANON	W90KNY	0082 AR TRP TRP F CAV REAR	350 E MAPLE STREET	6850012620635	PAINT FACE CAMOUFLAGE	3
LEBANON	W90KNY	0082 AR TRP TRP F CAV REAR	350 E MAPLE STREET	7930002052874	POLISH SHOE	0
						3
MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY	8010013316113	ENAMEL	12
MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY	6850012620635	PAINT FACE CAMOUFLAGE	10
MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY	8010013316108	ENAMEL	4
MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY	9150010546453	CLEANER,LUBRICANT	3
						29
MEDFORD	W81B3B	0186 IN BN 01 HHC	1701 S PACIFIC HIGHWAY	9150007542595	GREASE MOLYBDENUM DISULFIDE	2
MEDFORD	W90KL4	0186 IN BN 01 CO A	1701 S PACIFIC HIGHWAY	9150008893522	LUBE OIL WEA LSA MIL-L	4
MEDFORD	W90KL4	0186 IN BN 01 CO A	1701 S PACIFIC HIGHWAY	9150009356597	LUBE OIL WEA LSA MIL-L	2
MEDFORD	W90KMN	0141 CS BN HHC DET 1	1701 S PACIFIC HIGHWAY	9150010546453	CLEANER,LUBRICANT	7
MEDFORD	W90KMN	0141 CS BN HHC DET 1	1701 S PACIFIC HIGHWAY	9150011021473	CLEANER,LUBRICANT	2
MEDFORD	W90KMN	0141 CS BN HHC DET 1	1701 S PACIFIC HIGHWAY	6840014906693	INSECT REPELLENT	1
						18
NEWPORT	W90KL1	0162 IN BN 02 HHC DET 1 REAR	541 SW COAST HIGHWAY	6850012620635	PAINT FACE CAMOUFLAGE	3
						3
PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET	9150014211432	LUBRICATING OIL	774
PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET	9150011149968	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	383
PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET	9150010355393	LUBRICATING OIL,GEAR	180
PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET	9150011524118	LUBRICATING OIL,ENGINE	142
						1,479
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	6850014649137	ANTIFREEZE	329
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150010355393	LUBRICATING OIL,GEAR	216
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150011524117	LUBRICATING OIL,ENGINE	210
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	84
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150001866668	LUBE OIL MIL-L-2104 OE/	72
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	6850014413218	ANTIFREEZE	54
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150001817724	GREASE, AIRCRAFT	48
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150011773988	LUBRICATING OIL,ENGINE	42
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	6810005973608	METHANOL, TECHNICAL	32
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	6850002811985	DRY CLEANING SOLVENT	31
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	24

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150010536688	CLEANER,LUBRICANT	14
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	5
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150002617899	PENETRATING OIL VV-P-216	5
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150010546453	CLEANER,LUBRICANT	4
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	9150001178791	LUBRICATING OIL,ENGINE	3
PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	3
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150011524117	LUBRICATING OIL,ENGINE	210
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150010355393	LUBRICATING OIL,GEAR	108
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	6850014649137	ANTIFREEZE	94
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	84
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150001866668	LUBE OIL MIL-L-2104 OE/	71
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	6850014413218	ANTIFREEZE	54
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150001817724	GREASE, AIRCRAFT	48
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150011773988	LUBRICATING OIL,ENGINE	42
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	6810005973608	METHANOL, TECHNICAL	32
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	6850002811985	DRY CLEANING SOLVENT	31
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	24
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150010536688	CLEANER,LUBRICANT	14
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150002617899	PENETRATING OIL VV-P-216	5
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	5
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150001178791	LUBRICATING OIL,ENGINE	3
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	3
PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE	9150010546453	CLEANER,LUBRICANT	3
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6850014649125	ANTIFREEZE	1,920
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6810005437415	ALCOHOL,DENATURED	1,782
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150010355393	LUBRICATING OIL,GEAR	720
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6850014649137	ANTIFREEZE	566
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150014211432	LUBRICATING OIL	387
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150011773988	LUBRICATING OIL,ENGINE	210
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150011524117	LUBRICATING OIL,ENGINE	210
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150001866668	LUBE OIL MIL-L-2104 OE/	178
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	168
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	164

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6830005843041	PROPANE	21
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150010546453	CLEANER,LUBRICANT	20
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150012623358	GREASE,AIRCRAFT	20
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150012602534	LUBRICANT,SOLID FILM	18
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150002617899	PENETRATING OIL VV-P-216	18
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	12
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	9150001178791	LUBRICATING OIL,ENGINE	10
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6850008807616	SILICONE COMPOUND	10
PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE	6850009739091	PENETRATING FLUID	2
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150011524117	LUBRICATING OIL,ENGINE	210
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150010355393	LUBRICATING OIL,GEAR	108
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	6850014649137	ANTIFREEZE	94
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	84
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150001866668	LUBE OIL MIL-L-2104 OE/	72
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	6850014413218	ANTIFREEZE	54
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150001817724	GREASE, AIRCRAFT	48
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150011773988	LUBRICATING OIL,ENGINE	42
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	6810005973608	METHANOL, TECHNICAL	32
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	6850002811985	DRY CLEANING SOLVENT	31
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	24
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150010536688	CLEANER,LUBRICANT	14
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	5
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150002617899	PENETRATING OIL VV-P-216	4
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	3
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150001178791	LUBRICATING OIL,ENGINE	3
PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE	9150010546453	CLEANER,LUBRICANT	3
PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE	6850014413218	ANTIFREEZE	108
PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE	6810002499354	SULFURIC ACID ELECTROLYTE	102
PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	33
PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	5
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150011524117	LUBRICATING OIL,ENGINE	168
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	6850014413218	ANTIFREEZE	108
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150010546453	CLEANER,LUBRICANT	90
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150009448953	GREASE AIRCRAFT GP WD	72

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150001817724	GREASE, AIRCRAFT	48
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	42
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150011773988	LUBRICATING OIL,ENGINE	42
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150010355393	LUBRICATING OIL,GEAR	36
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	32
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	9150010355392	LUBRICATING OIL,GEAR	24
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	6
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	6850008807616	SILICONE COMPOUND	4
PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE	6810002010906	ALCOHOL,DENATURED	1
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	6850014649125	ANTIFREEZE	960
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150011524117	LUBRICATING OIL,ENGINE	168
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	6810002499354	SULFURIC ACID ELECTROLYTE	102
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150010546453	CLEANER,LUBRICANT	90
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150009448953	GREASE AIRCRAFT GP WD	72
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150001817724	GREASE, AIRCRAFT	48
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150011773988	LUBRICATING OIL,ENGINE	42
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	42
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150010355393	LUBRICATING OIL,GEAR	36
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150011029455	BRAKE FLUID,AUTOMOTIVE	32
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	9150010355392	LUBRICATING OIL,GEAR	24
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	6
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	6850008807616	SILICONE COMPOUND	4
PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE	6810002010906	ALCOHOL,DENATURED	1
PORTLAND	W9003K	0141 CS BN CO A DET 1	10000 NE 33RD DRIVE	9150011021473	CLEANER,LUBRICANT	3
PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE	8010013323745	ENAMEL	6
PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE	6850009262275	CLEANING COMPOUND WINDSHIELD	4
PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE	8010013316113	ENAMEL	4
PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE	8010013316107	ENAMEL	2
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	6850014649125	ANTIFREEZE	480
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150011524118	LUBRICATING OIL,ENGINE	142
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150010355393	LUBRICATING OIL,GEAR	72

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	42
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150010546453	CLEANER,LUBRICANT	23
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150014228899	LUBRICATING OIL,ENGINE	7
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150010796124	CLEANER,LUBRICANT	6
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150011021473	CLEANER,LUBRICANT	6
PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	5
PORTLAND	W90T8R	0141 CS BN CO C	10000 NE 33RD DRIVE	7930013268110	GLASS CLEANER	2
						12,626
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150014211432	LUBRICATING OIL	774
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	6850014649137	ANTIFREEZE	471
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150001912772	LUBE OIL MIL-L-2104 OE/	392
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150011149968	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	383
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150010355393	LUBRICATING OIL,GEAR	324
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150009355851	GREASE AIRCRAFT LIQUID	140
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	125
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	6850014413218	ANTIFREEZE	90
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150011773988	LUBRICATING OIL,ENGINE	84
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	6830005843041	PROPANE	21
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150010546453	CLEANER,LUBRICANT	10
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	9150012623358	GREASE,AIRCRAFT	10
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	6850009262275	CLEANING COMPOUND WINDSHIELD	5
PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET	6850010826783	FUEL,ENGINE PRIMER	2
PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET	9150010355395	LUBRICATING OIL,GEAR	73
PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET	6830005843041	PROPANE	14
PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET	8010005985936	ENAMEL	6
PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET	7930007218592	SCOURING POWDER	2
PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET	7930009265280	DETERGENT,GENERAL PURPOSE	1
						2,927
PORTLAND	W90KMA	0218 FA BN 02 105 MM T	6255 NE CORNFOOT ROAD	6810005987316	SODIUM HYPOCHLORITE	52
PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD	6840013424143	DETERGENT, GENERAL PURPOSE	203
PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD	6810005987316	SODIUM HYPOCHLORITE	104

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD	7930002691272	ABSORBENT MATERIAL	100
PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD	6840005843129	DISINFECTANT DETERGENT	15
PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD	8010013316107	ENAMEL	3
PORTLAND	W90KME	0218 FA BN 02 HHSB 105 MM T	6255 NE CORNFOOT ROAD	9150011021473	CLEANER,LUBRICANT	1
						478
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	6850014649125	ANTIFREEZE	1,600
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150011524118	LUBRICATING OIL,ENGINE	885
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150001116254	HYDRAULIC FLUID,FIRE RESISTANT	810
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150001866668	LUBE OIL MIL-L-2104 OE/	784
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	6850014649137	ANTIFREEZE	236
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150011784725	LUBRICATING OIL,ENGINE	190
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	147
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150010355393	LUBRICATING OIL,GEAR	144
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	6850009262275	CLEANING COMPOUND WINDSHIELD	20
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	18
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150011029455	BRAKE FLUID,AUTOMOTIVE	8
REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST	9150010546453	CLEANER,LUBRICANT	4
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	6850014649125	ANTIFREEZE	1,920
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150011524118	LUBRICATING OIL,ENGINE	708
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150001866668	LUBE OIL MIL-L-2104 OE/	427
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150011784725	LUBRICATING OIL,ENGINE	169
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	44
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	42
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150011029455	BRAKE FLUID,AUTOMOTIVE	33
REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST	9150010546453	CLEANER,LUBRICANT	5
REDMOND	W81B27	1249 EN BN CO A CORPS MECH	2899 HIGHWAY 126 EAST	9150001116254	HYDRAULIC FLUID,FIRE RESISTANT	676
REDMOND	W81B27	1249 EN BN CO A CORPS MECH	2899 HIGHWAY 126 EAST	9150001866668	LUBE OIL MIL-L-2104 OE/	356
REDMOND	W81B27	1249 EN BN CO A CORPS MECH	2899 HIGHWAY 126 EAST	9150011524118	LUBRICATING OIL,ENGINE	71
REDMOND	W81K1P	0116 AR BN 03 CO A REAR	2899 HIGHWAY 126 EAST	6850014649125	ANTIFREEZE	1,440
REDMOND	W81K1P	0116 AR BN 03 CO A REAR	2899 HIGHWAY 126 EAST	9150011524118	LUBRICATING OIL,ENGINE	354

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
REDMOND	W81K1P	0116 AR BN 03 CO A REAR	2899 HIGHWAY 126 EAST	9150001116254	HYDRAULIC FLUID,FIRE RESISTANT	162
						11,253
SALEM	W66MRR	UNKNOWN	USPFO	9150001866668	LUBE OIL MIL-L-2104 OE/	33,158
SALEM	W66MRR	UNKNOWN	USPFO	6850014649125	ANTIFREEZE	7,200
SALEM	W66MRR	UNKNOWN	USPFO	9150011524118	LUBRICATING OIL,ENGINE	3,894
SALEM	W66MRR	UNKNOWN	USPFO	9150010355393	LUBRICATING OIL,GEAR	2,196
SALEM	W66MRR	UNKNOWN	USPFO	6850014649137	ANTIFREEZE	848
SALEM	W66MRR	UNKNOWN	USPFO	9150011029455	BRAKE FLUID,AUTOMOTIVE	431
SALEM	W66MRR	UNKNOWN	USPFO	9150009857099	LUBE OIL ATE MIL-L-236	418
SALEM	W66MRR	UNKNOWN	USPFO	9150006982382	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	367
SALEM	W66MRR	UNKNOWN	USPFO	9150014228899	LUBRICATING OIL,ENGINE	317
SALEM	W66MRR	UNKNOWN	USPFO	9150010546453	CLEANER,LUBRICANT	101
SALEM	W66MRR	UNKNOWN	USPFO	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	85
SALEM	W66MRR	UNKNOWN	USPFO	6850012620635	PAINT FACE CAMOUFLAGE	30
SALEM	W66MRR	UNKNOWN	USPFO	9150011021473	CLEANER,LUBRICANT	14
						49,059
SALEM	W81B26	1249 EN BN HHC CORPS MECH	1025 AIRPORT ROAD SE	9150011021473	CLEANER,LUBRICANT	1
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150011524118	LUBRICATING OIL,ENGINE	779
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150011524119	LUBRICATING OIL,ENGINE	774
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150001866668	LUBE OIL MIL-L-2104 OE/	605
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150011524117	LUBRICATING OIL,ENGINE	340
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150006574959	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	278
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150010355393	LUBRICATING OIL,GEAR	180
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150011773988	LUBRICATING OIL,ENGINE	168
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150011029455	BRAKE FLUID,AUTOMOTIVE	50
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150001116256	HYDRAULIC FLUID,FIRE RESISTANT	40
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150001889858	LUBE OIL MIL-L-2104 OE/	36
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150010546453	CLEANER,LUBRICANT	20
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150010796124	CLEANER,LUBRICANT	11
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150010536688	CLEANER,LUBRICANT	7
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150012602534	LUBRICANT,SOLID FILM	6
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	6850009262275	CLEANING COMPOUND WINDSHIELD	5

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150008893522	LUBE OIL WEA LSA MIL-L	4
SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE	9150011021473	CLEANER,LUBRICANT	2
SALEM	W81H8D	0041 AG HHD PER SVC	1025 AIRPORT ROAD SE	9150010546453	CLEANER,LUBRICANT	10
SALEM	W81H8D	0041 AG HHD PER SVC	1025 AIRPORT ROAD SE	9150010796124	CLEANER,LUBRICANT	1
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150011524119	LUBRICATING OIL,ENGINE	774
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150011524118	LUBRICATING OIL,ENGINE	425
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150006574959	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	417
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150001866668	LUBE OIL MIL-L-2104 OE/	285
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150010355393	LUBRICATING OIL,GEAR	216
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150001889858	LUBE OIL MIL-L-2104 OE/	142
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150011773988	LUBRICATING OIL,ENGINE	84
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150014228750	LUBRICATING OIL,ENGINE	80
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150001116256	HYDRAULIC FLUID,FIRE RESISTANT	20
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150008893522	LUBE OIL WEA LSA MIL-L	3
SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE	9150012602534	LUBRICANT,SOLID FILM	2
SALEM	W81LL8	W8BA HQ STARC OMS	1025 AIRPORT ROAD SE	9150014228750	LUBRICATING OIL,ENGINE	80
SALEM	W81LL8	W8BA HQ STARC OMS	1025 AIRPORT ROAD SE	9150006574959	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	70
SALEM	W81LL8	W8BA HQ STARC OMS	1025 AIRPORT ROAD SE	8010006169181	PRIMER COATING	5
SALEM	W81YX9	1042 MD CO AIR AMB REAR	1025 AIRPORT ROAD SE	9150011524118	LUBRICATING OIL,ENGINE	425
						6,345
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150009857099	LUBE OIL ATE MIL-L-236	429
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150012623358	GREASE,AIRCRAFT	61
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150013534799	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	42
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150001497431	HYDRAULIC FLUID,FIRE RESISTANT	41
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150002526383	HYDRAULIC FLUID AIRCRAFT	41
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	6810009838551	ISOPROPYL ALCOHOL TECH (32 OZ)	13
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	8030009381947	CORROSION PREVENTIVE	11
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150001806266	LUBE OIL A&E 8 OZ CN	6
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150008237860	LUBRICATING COMPOUND	6
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	6810002646715	MOLYBDENUM DISULFIDE	4
SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE	9150014228899	LUBRICATING OIL,ENGINE	4

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
						658
SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE	7930003577386	DETERGENT,GENERAL PURPOSE	14
SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE	8010005985936	ENAMEL	13
SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE	8010013316113	ENAMEL	8
SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE	8010009588148	LACQUER	1
						36
SALEM	W90KN1	1249 EN BN HHC CORPS MECH	3225 STATE STREET	8010008489272	ENAMEL	4
						4
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	8010009357079	LACQUER	60
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	8010009108154	ENAMEL	5
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	8010005985936	ENAMEL	5
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	7930013425315	CLEANING COMPOUND,SOLVENT	2
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	8010013316113	ENAMEL	2
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	8010013316107	ENAMEL	2
ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET	9150011021473	CLEANER,LUBRICANT	1
						77
THE DALLES	W90KNK	0116 AR BN 03 CO C	713 WEBER STREET	8010009357079	LACQUER	24
THE DALLES	W90KNK	0116 AR BN 03 CO C	713 WEBER STREET	6840007216055	DEODORANT GENERAL LQD	3
THE DALLES	W90KNK	0116 AR BN 03 CO C	713 WEBER STREET	8010013316113	ENAMEL	2
						29
WARRENTON	W81H9E	3670 OD CO MAINT GS	91426 RILEA MCCARTER ROAD	9150011524118	LUBRICATING OIL,ENGINE	354
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150011524118	LUBRICATING OIL,ENGINE	4,248
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150001866668	LUBE OIL MIL-L-2104 OE/	1,851
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	6850014649125	ANTIFREEZE	1,280
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150010355393	LUBRICATING OIL,GEAR	1,080
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150006574959	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	1,044
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	6850014649137	ANTIFREEZE	566
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150014228750	LUBRICATING OIL,ENGINE	400
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150011977693	GREASE,AUTOMOTIVE ARTILLERY	56
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150011029455	BRAKE FLUID,AUTOMOTIVE	50
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150014228899	LUBRICATING OIL,ENGINE	44
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150010546453	CLEANER,LUBRICANT	21
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150013534799	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	21

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CITY	Dodaac	UNIT	Address	NSN	Product Name SARSS	Sum Of Pounds
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150009354018	GREASE MOLYBDENUM DISULFIDE	9
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	6850008807616	SILICONE COMPOUND	3
WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD	9150011977688	GREASE,AUTOMOTIVE ARTILLERY	1
						11,028
WOODBURN	W90KN8	0082 AR TRP TRP E SIB	1630 PARK AVENUE	6850012620635	PAINT FACE CAMOUFLAGE	3
						3

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ORARNG Material Purchase for CY 2005

Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
6810	ALCOHOL,DENATURED	6810005437415	1782	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6810	ALCOHOL,DENATURED	6810002010906	1	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
6810	ALCOHOL,DENATURED	6810002010906	1	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
6810	BATTERY WATER	6810002863783	24	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
6810	BATTERY WATER	6810002863783	24	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
6810	ISOPROPYL ALCOHOL	6810009838551	13	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
6810	METHANOL, TECHNICAL	6810005973608	32	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
6810	METHANOL, TECHNICAL	6810005973608	32	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
6810	METHANOL, TECHNICAL	6810005973608	32	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
6810	MOLYBDENUM DISULFIDE	6810002646715	4	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
6810	SODIUM HYPOCHLORITE	6810005987316	104	PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD
6810	SODIUM HYPOCHLORITE	6810005987316	52	PORTLAND	W90KMA	0218 FA BN 02 105 MM T	6255 NE CORNFOOT ROAD
6810	SULFURIC ACID ELECTROLYTE	6810002499354	102	PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE
6810	SULFURIC ACID ELECTROLYTE	6810002499354	102	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
6830	PROPANE	6830005843041	21	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6830	PROPANE	6830005843041	21	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
6830	PROPANE	6830005843041	14	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
6830	PROPANE	6830005843041	14	PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET
6840	DEODORANT GENERAL LQD	6840007216055	3	THE DALLES	W90KNK	0116 AR BN 03 CO C	713 WEBER STREET
6840	DETERGENT, GENERAL PURPOSE	6840013424143	203	PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD
6840	DISINFECTANT DETERGENT	6840006877904	240	CLACKAMAS	W90KMY	3670 OD CO MAINT GS	10101 SE CLACKAMAS ROAD
6840	DISINFECTANT DETERGENT	6840005843129	38	FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY
6840	DISINFECTANT DETERGENT	6840005843129	15	PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD
6840	INSECT REPELLENT	6840014906693	1	MEDFORD	W90KMN	0141 CS BN HHC DET 1	1701 S PACIFIC HIGHWAY
6850	ANTIFREEZE	6850014649125	7200	SALEM	W66MRR	UNKNOWN	USPFO
6850	ANTIFREEZE	6850014649125	1920	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6850	ANTIFREEZE	6850014649125	1920	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
6850	ANTIFREEZE	6850014649125	1600	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
6850	ANTIFREEZE	6850014649125	1440	REDMOND	W81K1P	0116 AR BN 03 CO A REAR	2899 HIGHWAY 126 EAST
6850	ANTIFREEZE	6850014649137	1319	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
6850	ANTIFREEZE	6850014649125	1280	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
6850	ANTIFREEZE	6850014649125	1280	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
6850	ANTIFREEZE	6850006641403	1061	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
6850	ANTIFREEZE	6850014649125	960	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
6850	ANTIFREEZE	6850014649125	960	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014649137	848	SALEM	W66MRR	UNKNOWN	USPFO
6850	ANTIFREEZE	6850014649137	566	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6850	ANTIFREEZE	6850014649137	566	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
6850	ANTIFREEZE	6850014649125	480	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014649137	471	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
6850	ANTIFREEZE	6850014649137	329	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
6850	ANTIFREEZE	6850014649137	236	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
6850	ANTIFREEZE	6850014413218	108	PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014413218	108	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014649137	94	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014649137	94	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014413218	90	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
6850	ANTIFREEZE	6850014413218	54	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
6850	ANTIFREEZE	6850014413218	54	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
6850	ANTIFREEZE	6850014413218	54	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND	6850012350872	0	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
6850	CLEANING COMPOUND RIFLE BORE	6850002246657	0	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	20	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	12	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	6	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	6	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	5	PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	5	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	5	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	4	PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	3	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	3	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND WINDSHIELD	6850009262275	3	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
6850	CLEANING COMPOUND,OPTICAL LENS	6850002271887	14	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
6850	CLEANING COMPOUND,OPTICAL LENS	6850002271887	2	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
6850	CLEANING COMPOUND,OPTICAL LENS	6850002271887	2	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
6850	DRY CLEANING SOLVENT	6850002811985	31	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
6850	DRY CLEANING SOLVENT	6850002811985	31	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
6850	DRY CLEANING SOLVENT	6850002811985	31	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
6850	DRY CLEANING SOLVENT	6850006645685	3	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
6850	DRY CLEANING SOLVENT	6850006645685	3	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
6850	FUEL ENGINE PRIMER 8	6850008237861	0	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6850	FUEL,ENGINE PRIMER	6850010826783	2	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
6850	LEAK TEST COMPOUND TYPE II	6850006211819	0	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
6850	LEAK TEST COMPOUND TYPE II	6850006211819	0	LAGRANDE	W81J88	0116 AR BN 03 CO B REAR	FMS LAGRANDE
6850	PAINT FACE CAMOUFLAGE	6850012620635	30	SALEM	W66MRR	UNKNOWN	USPFO
6850	PAINT FACE CAMOUFLAGE	6850012620635	10	MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY
6850	PAINT FACE CAMOUFLAGE	6850012620635	3	LEBANON	W90KNY	0082 AR TRP TRP F CAV REAR	350 E MAPLE STREET
6850	PAINT FACE CAMOUFLAGE	6850012620635	3	NEWPORT	W90KL1	0162 IN BN 02 HHC DET 1 REAR	541 SW COAST HIGHWAY
6850	PAINT FACE CAMOUFLAGE	6850012620635	3	WOODBURN	W90KN8	0082 AR TRP TRP E SIB	1630 PARK AVENUE
6850	PAINT FACE CAMOUFLAGE	6850012620635	2	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
6850	PENETRATING FLUID	6850009739091	2	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6850	SILICONE COMPOUND	6850008807616	10	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
6850	SILICONE COMPOUND	6850008807616	4	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
6850	SILICONE COMPOUND	6850008807616	4	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
6850	SILICONE COMPOUND	6850008807616	3	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
6850	SILICONE COMPOUND	6850008807616	1	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
6850	SILICONE COMPOUND	6850008807616	0	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
6850	SILICONE COMPOUND	6850008807616	0	SALEM	W81B28	1249 EN BN CO B CORPS MECH	1025 AIRPORT ROAD SE
7930	ABSORBENT MATERIAL	7930002691272	100	PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD
7930	AIR SANITIZER	7930013808495	0	PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET
7930	CLEANING COMPOUND,OVEN	7930004592247	1	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
7930	CLEANING COMPOUND,SOLVENT	7930013425315	2	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
7930	CLEANING COMPOUND,SOLVENT	7930013068369	1	GRESHAM	W90KLM	0162 IN BN 01 CO C	500 NE DIVISION STREET
7930	CLEANING COMPOUND,SOLVENT	7930013068369	0	PORTLAND	W9003K	0141 CS BN CO A DET 1	10000 NE 33RD DRIVE
7930	CLEANING COMPOUND,SOLVENT	7930013068369	0	PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD
7930	CLEANING COMPOUND,SOLVENT	7930013068369	0	SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE
7930	DETERGENT,GENERAL PURPOSE	7930003577386	50	FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY
7930	DETERGENT,GENERAL PURPOSE	7930003577386	14	SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE
7930	DETERGENT,GENERAL PURPOSE	7930009265280	1	FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
7930	DETERGENT,GENERAL PURPOSE	7930009265280	1	PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET
7930	DISHWASHING COMPOUND	7930008804454	32	CORVALLIS	W90KLW	0162 IN BN 02 CO B REAR	1315 SW E STREET
7930	GLASS CLEANER	7930013268110	5	FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY
7930	GLASS CLEANER	7930013268110	2	PORTLAND	W90T8R	0141 CS BN CO C	10000 NE 33RD DRIVE
7930	POLISH SHOE	7930002052874	0	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
7930	POLISH SHOE	7930002052874	0	LEBANON	W90KNY	0082 AR TRP TRP F CAV REAR	350 E MAPLE STREET
7930	SCOURING POWDER	7930007218592	5	FOREST GROVE	W90KLN	0162 IN BN 01 HHC AASLT REAR	2950 TAYLOR WAY
7930	SCOURING POWDER	7930007218592	2	PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET
8010	ENAMEL	8010005985936	430	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8010	ENAMEL	8010005985936	48	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
8010	ENAMEL	8010013316111	13	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
8010	ENAMEL	8010005985936	13	SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE
8010	ENAMEL	8010013316113	12	MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY
8010	ENAMEL	8010006169143	10	EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD
8010	ENAMEL	8010013316113	10	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
8010	ENAMEL	8010013316108	10	LA GRANDE	W90KNF	0116 AR BN 03 HHC, TK BN REAR	404 12TH STREET
8010	ENAMEL	8010008489272	9	EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD
8010	ENAMEL	8010013316113	8	SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE
8010	ENAMEL	8010013323745	6	PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE
8010	ENAMEL	8010005985936	6	PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET
8010	ENAMEL	8010009108154	5	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
8010	ENAMEL	8010005985936	5	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
8010	ENAMEL	8010013316108	4	MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY
8010	ENAMEL	8010013316113	4	PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE
8010	ENAMEL	8010008489272	4	SALEM	W90KN1	1249 EN BN HHC CORPS MECH	3225 STATE STREET
8010	ENAMEL	8010013316107	3	PORTLAND	W90KMC	0218 FA BN 02 BTY B 105 MM T	6255 NE CORNFOOT ROAD
8010	ENAMEL	8010013316107	2	PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE
8010	ENAMEL	8010013316107	2	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
8010	ENAMEL	8010013316113	2	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
8010	ENAMEL	8010013316113	2	THE DALLES	W90KNK	0116 AR BN 03 CO C	713 WEBER STREET
8010	ENAMEL	8010014415927	0	PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE
8010	EPOXY PRIMER COATING	8010011930517	2048	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8010	LACQUER	8010009357079	60	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
8010	LACQUER	8010009357079	24	THE DALLES	W90KNK	0116 AR BN 03 CO C	713 WEBER STREET
8010	LACQUER	8010009588148	1	SALEM	W90KMK	0141 CS BN CO A	2310 17TH STREET NE
8010	POLYURETHANE COATING	8010012297544	320	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8010	PRIMER COATING	8010008998825	38	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8010	PRIMER COATING	8010006169181	5	SALEM	W81LL8	W8BA HQ STARC OMS	1025 AIRPORT ROAD SE
8010	THINNER,PAINT PRODUCTS	8010001818080	5073	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE

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8020	BRUSH,PAINT	8020002633873	0	SALEM	W90KNU	0641 MD HHD HHD	1921 TURNER ROAD SE
8030	CORROSION PREVENTIVE	8030009381947	43	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8030	CORROSION PREVENTIVE	8030009381947	11	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
8030	SEALING COMPOUND	8030001489833	0	PORTLAND	W90KML	0141 CS BN CO B	10000 NE 33RD DRIVE
8040	ADHESIVE	8040007644424	8	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8040	ADHESIVE	8040008263535	1	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
8040	ADHESIVE	8040002629028	1	LA GRANDE	W90XYT	W8BA 3D BN 116TH CAV OMS	64082 AIRPORT LANE
8040	ADHESIVE SEALANT	8040008658991	2	LA GRANDE	W90XYT	W8BA 3D BN 116TH CAV OMS	64082 AIRPORT LANE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	431	SALEM	W66MRR	UNKNOWN	USPFO
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	332	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	164	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	117	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	50	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	50	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	33	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	33	PORTLAND	W81B1T	0218 FA BN 02 HHSB 105 MM T	10000 NE 33RD DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	33	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	32	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	32	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	24	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	24	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	24	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	BRAKE FLUID,AUTOMOTIVE	9150011029455	8	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	CLEANER,LUBRICANT	9150010536688	103	GRANTS PASS	W90KL7	0186 IN BN 01 CO D	666 BROOKSIDE BOULEVARD
9150	CLEANER,LUBRICANT	9150010546453	101	SALEM	W66MRR	UNKNOWN	USPFO
9150	CLEANER,LUBRICANT	9150010546453	90	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010546453	90	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010546453	64	GRANTS PASS	W90KL7	0186 IN BN 01 CO D	666 BROOKSIDE BOULEVARD
9150	CLEANER,LUBRICANT	9150010546453	23	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010546453	21	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	CLEANER,LUBRICANT	9150010546453	20	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	CLEANER,LUBRICANT	9150010546453	20	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	CLEANER,LUBRICANT	9150010546453	19	EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD
9150	CLEANER,LUBRICANT	9150010536688	14	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	CLEANER,LUBRICANT	9150010536688	14	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010536688	14	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150011021473	14	SALEM	W66MRR	UNKNOWN	USPFO
9150	CLEANER,LUBRICANT	9150010796124	11	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	CLEANER,LUBRICANT	9150010546453	10	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	CLEANER,LUBRICANT	9150010546453	10	SALEM	W81H8D	0041 AG HHD PER SVC	1025 AIRPORT ROAD SE
9150	CLEANER,LUBRICANT	9150010546453	7	MEDFORD	W90KMN	0141 CS BN HHC DET 1	1701 S PACIFIC HIGHWAY
9150	CLEANER,LUBRICANT	9150010536688	7	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE

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9150	CLEANER,LUBRICANT	9150011021473	6	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010796124	6	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010546453	5	CORVALLIS	W90KLW	0162 IN BN 02 CO B REAR	1315 SW E STREET
9150	CLEANER,LUBRICANT	9150010546453	5	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	CLEANER,LUBRICANT	9150010546453	4	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	CLEANER,LUBRICANT	9150010546453	4	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	CLEANER,LUBRICANT	9150010546453	3	MCMINNVILLE	W90KLL	0162 IN BN 01 CO B	333 ARMORY WAY
9150	CLEANER,LUBRICANT	9150010546453	3	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010546453	3	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150011021473	3	PORTLAND	W9003K	0141 CS BN CO A DET 1	10000 NE 33RD DRIVE
9150	CLEANER,LUBRICANT	9150010546453	2	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	CLEANER,LUBRICANT	9150011021473	2	EUGENE	W90KLU	0162 IN BN 02 CO A REAR	2515 CENTENNIAL BOULEVARD
9150	CLEANER,LUBRICANT	9150011021473	2	MEDFORD	W90KMN	0141 CS BN HHC DET 1	1701 S PACIFIC HIGHWAY
9150	CLEANER,LUBRICANT	9150011021473	2	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	CLEANER,LUBRICANT	9150010546453	1	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
9150	CLEANER,LUBRICANT	9150010546453	1	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
9150	CLEANER,LUBRICANT	9150011021473	1	PORTLAND	W90KME	0218 FA BN 02 HHSB 105 MM T	6255 NE CORNFOOT ROAD
9150	CLEANER,LUBRICANT	9150011021473	1	SALEM	W81B26	1249 EN BN HHC CORPS MECH	1025 AIRPORT ROAD SE
9150	CLEANER,LUBRICANT	9150010796124	1	SALEM	W81H8D	0041 AG HHD PER SVC	1025 AIRPORT ROAD SE
9150	CLEANER,LUBRICANT	9150011021473	1	ST HELENS	W90KPB	0162 IN BN 01 CO D	474 S 7TH STREET
9150	CLEANER,LUBRICANT	9150011021473	0	PORTLAND	W90KMA	0218 FA BN 02 105 MM T	6255 NE CORNFOOT ROAD
9150	CLEANER,LUBRICANT	9150011021473	0	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	CLEANER,LUBRICANT	9150011021473	0	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	CLEANER,LUBRICANT	9150011021473	0	SALEM	W81H8D	0041 AG HHD PER SVC	1025 AIRPORT ROAD SE
9150	GREASE AIRCRAFT GP WD	9150009448953	72	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	GREASE AIRCRAFT GP WD	9150009448953	72	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	GREASE AIRCRAFT GP WD	9150001450268	5	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
9150	GREASE AIRCRAFT GP WD	9150001450268	5	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
9150	GREASE AIRCRAFT LIQUID	9150009355851	140	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	GREASE MOLYBDENUM DISULFIDE	9150009354018	9	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	GREASE MOLYBDENUM DISULFIDE	9150007542595	2	MEDFORD	W81B3B	0186 IN BN 01 HHC	1701 S PACIFIC HIGHWAY
9150	GREASE, AIRCRAFT	9150001817724	48	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	GREASE, AIRCRAFT	9150001817724	48	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	GREASE, AIRCRAFT	9150001817724	48	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	GREASE, AIRCRAFT	9150001817724	48	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	GREASE, AIRCRAFT	9150001817724	48	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	GREASE, GRAPHITE, LUBRICATING	9150002575370	2	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
9150	GREASE, GRAPHITE, LUBRICATING	9150002575370	2	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE

Appendix F
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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
9150	GREASE,AIRCRAFT	9150012623358	61	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	GREASE,AIRCRAFT	9150012623358	20	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	GREASE,AIRCRAFT	9150012623358	10	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977692	315	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	85	SALEM	W66MRR	UNKNOWN	USPFO
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	56	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	44	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	18	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	5	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	5	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	5	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977693	5	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	GREASE,AUTOMOTIVE ARTILLERY	9150011977688	1	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	GREASE,BALL AND ROLLER BEARING	9150010955512	7	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	HYDRAULIC FLUID AIRCRAFT	9150002526383	41	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	HYDRAULIC FLUID AIRCRAFT	9150002526383	20	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006574959	1044	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006574959	417	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150011149968	383	PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150011149968	383	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	367	SALEM	W66MRR	UNKNOWN	USPFO
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006574959	278	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	168	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	147	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150013534799	146	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	125	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	84	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	84	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	84	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	84	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	84	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006574959	70	SALEM	W81LL8	W8BA HQ STARC OMS	1025 AIRPORT ROAD SE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	42	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	42	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	42	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150006982382	42	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150013534799	42	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	HYDRAULIC FLUID,AUTOMATIC TRANSMISSION	9150013534799	21	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116254	810	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116254	676	REDMOND	W81B27	1249 EN BN CO A CORPS MECH	2899 HIGHWAY 126 EAST
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116254	162	REDMOND	W81K1P	0116 AR BN 03 CO A REAR	2899 HIGHWAY 126 EAST
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116256	81	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116256	81	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001497431	41	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116256	40	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	HYDRAULIC FLUID,FIRE RESISTANT	9150001116256	20	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBE OIL A&E 8 OZ CN	9150001806266	6	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	LUBE OIL ATE MIL-L-236	9150009857099	429	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	LUBE OIL ATE MIL-L-236	9150009857099	418	SALEM	W66MRR	UNKNOWN	USPFO
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	33158	SALEM	W66MRR	UNKNOWN	USPFO
9150	LUBE OIL MIL-L-2104 OE/	9150001912772	11749	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	1851	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	784	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	605	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	427	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	LUBE OIL MIL-L-2104 OE/	9150001912772	392	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	356	REDMOND	W81B27	1249 EN BN CO A CORPS MECH	2899 HIGHWAY 126 EAST
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	285	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	178	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	178	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBE OIL MIL-L-2104 OE/	9150001889858	142	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	72	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	72	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	71	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	LUBE OIL MIL-L-2104 OE/	9150001866668	71	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	LUBE OIL MIL-L-2104 OE/	9150001889858	36	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBE OIL WEA LSA MIL-L	9150008893522	4	MEDFORD	W90KL4	0186 IN BN 01 CO A	1701 S PACIFIC HIGHWAY
9150	LUBE OIL WEA LSA MIL-L	9150008893522	4	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBE OIL WEA LSA MIL-L	9150008893522	3	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBE OIL WEA LSA MIL-L	9150009356597	2	MEDFORD	W90KL4	0186 IN BN 01 CO A	1701 S PACIFIC HIGHWAY
9150	LUBRICANT,SOLID FILM	9150012602534	18	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBRICANT,SOLID FILM	9150012602534	6	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBRICANT,SOLID FILM	9150012602534	2	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBRICATING COMPOUND	9150008237860	6	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	LUBRICATING OIL	9150014211432	774	PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET
9150	LUBRICATING OIL	9150014211432	774	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	LUBRICATING OIL	9150014211432	387	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524119	37170	CLACKAMAS	W81UBH	W7NW USPFO FUTUEUR OR ARNG	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,ENGINE	9150014386079	16649	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524119	11227	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	LUBRICATING OIL,ENGINE	9150014386079	9292	CLACKAMAS	W81UBH	W7NW USPFO FUTUEUR OR ARNG	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,ENGINE	9150011524118	4248	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	LUBRICATING OIL,ENGINE	9150011524118	3894	SALEM	W66MRR	UNKNOWN	USPFO
9150	LUBRICATING OIL,ENGINE	9150011524118	885	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
9150	LUBRICATING OIL,ENGINE	9150011524118	779	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150011524119	774	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
9150	LUBRICATING OIL,ENGINE	9150011524119	774	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE
9150	LUBRICATING OIL,ENGINE	9150011524119	774	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150011524119	774	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150011524118	708	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	LUBRICATING OIL,ENGINE	9150011524118	425	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150011524118	425	SALEM	W81YX9	1042 MD CO AIR AMB REAR	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150014228750	400	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	LUBRICATING OIL,ENGINE	9150011524119	387	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,ENGINE	9150014386079	387	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,ENGINE	9150011524118	354	REDMOND	W81K1P	0116 AR BN 03 CO A REAR	2899 HIGHWAY 126 EAST
9150	LUBRICATING OIL,ENGINE	9150011524118	354	WARRENTON	W81H9E	3670 OD CO MAINT GS	91426 RILEA MCCARTER ROAD
9150	LUBRICATING OIL,ENGINE	9150011524117	340	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150014228899	317	SALEM	W66MRR	UNKNOWN	USPFO
9150	LUBRICATING OIL,ENGINE	9150011524118	248	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524117	210	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524117	210	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011773988	210	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524117	210	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524117	210	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011784725	190	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	LUBRICATING OIL,ENGINE	9150011784725	169	REDMOND	W81B1J	W8BA ORARNG ELEMENT, JF HQ	2899 HIGHWAY 126 EAST
9150	LUBRICATING OIL,ENGINE	9150011524117	168	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524117	168	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011773988	168	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150011524118	142	PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET
9150	LUBRICATING OIL,ENGINE	9150011524118	142	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011524118	106	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,ENGINE	9150011784725	84	HERMISTON	W81B3Y	W8BA ORARNG ELEMENT, JF HQ	UMATILLA ARMY DEPOT
9150	LUBRICATING OIL,ENGINE	9150011784725	84	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	LUBRICATING OIL,ENGINE	9150011773988	84	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	LUBRICATING OIL,ENGINE	9150011773988	84	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150014228750	80	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150014228750	80	SALEM	W81LL8	W8BA HQ STARC OMS	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,ENGINE	9150011524118	71	REDMOND	W81B27	1249 EN BN CO A CORPS MECH	2899 HIGHWAY 126 EAST
9150	LUBRICATING OIL,ENGINE	9150011524117	64	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	LUBRICATING OIL,ENGINE	9150014228899	44	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	LUBRICATING OIL,ENGINE	9150011773988	42	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150011773988	42	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011773988	42	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150011773988	42	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE

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Fsc	Product Name SARSS	NSN	Sum Of Pounds	CITY	Dodaac	UNIT	Address
9150	LUBRICATING OIL,ENGINE	9150011773988	42	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150001178791	36	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	LUBRICATING OIL,ENGINE	9150001178791	10	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150014228899	7	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150014228899	4	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	LUBRICATING OIL,ENGINE	9150014228899	4	SALEM	W90KM3	0641 MD HHD AUG AASF	1921 TURNER ROAD SE
9150	LUBRICATING OIL,ENGINE	9150001178791	3	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	LUBRICATING OIL,ENGINE	9150001178791	3	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,ENGINE	9150001178791	3	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	2196	SALEM	W66MRR	UNKNOWN	USPFO
9150	LUBRICATING OIL,GEAR	9150010355393	1080	WARRENTON	W81K1C	W8BA UTES CAMP RILEA	91426 RILEA MCCARTER ROAD
9150	LUBRICATING OIL,GEAR	9150010355394	792	CLACKAMAS	W81B31	3670 OD CO AUG CSMS	10101 SE CLACKAMAS DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	720	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	432	CLACKAMAS	W81B2E	W8BA ORARNG ELEMENT, JF HQ	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,GEAR	9150010355393	324	PORTLAND	W81B2M	0041 IN HHC HHC	6700 SW OAK STREET
9150	LUBRICATING OIL,GEAR	9150010355393	216	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	216	SALEM	W81H8M	0082 AR TRP TRP E SIB	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,GEAR	9150010355393	180	PORTLAND	W81371	0241 MI CO SEP BDE	6700 SW OAK STREET
9150	LUBRICATING OIL,GEAR	9150010355393	180	SALEM	W81B2U	W8BA ORARNG ELEMENT, JF HQ	1025 AIRPORT ROAD SE
9150	LUBRICATING OIL,GEAR	9150010355393	144	CLACKAMAS	W81B15	0162 EN CO SEP INF BDE	10101 SE CLACKAMAS ROAD
9150	LUBRICATING OIL,GEAR	9150010355393	144	LEBANON	W81B3R	W8BA ORARNG ELEMENT, JF HQ	36646 OAK DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	144	REDMOND	W813KY	0082 AR TRP TRP E SIB	2899 HIGHWAY 126 EAST
9150	LUBRICATING OIL,GEAR	9150010355393	108	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	108	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355395	73	PORTLAND	W90KMT	0041 IN HHC HHC	6700 SW OAK STREET
9150	LUBRICATING OIL,GEAR	9150010355393	72	PORTLAND	W90KMM	0141 CS BN HHC	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	36	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355393	36	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355392	24	PORTLAND	W81B1W	0218 FA BN 02 BTY B 105 MM T	10000 NE 33RD DRIVE
9150	LUBRICATING OIL,GEAR	9150010355392	24	PORTLAND	W81B1X	0218 FA BN 02 BTY C 105 MM T	10000 NE 33RD DRIVE
9150	PENETRATING OIL VV-P-216	9150002617899	18	PORTLAND	W81B14	W8BA ORARNG ELEMENT, JF HQ	10000 NE 33D DRIVE
9150	PENETRATING OIL VV-P-216	9150002617899	5	PORTLAND	W81B10	0141 CS BN HHC	10000 NE 33D DRIVE
9150	PENETRATING OIL VV-P-216	9150002617899	5	PORTLAND	W81B13	0141 CS BN CO C	10000 NE 33RD DRIVE
9150	PENETRATING OIL VV-P-216	9150002617899	4	PORTLAND	W81B17	0141 CS BN CO B	10000 NE 33RD DRIVE
9150	PENETRATING OIL VV-P-216	9150002617899	1	LA GRANDE	W81J9B	0116 AR BN 03 CO A REAR	64082 AIRPORT LANE
9150	PENETRATING OIL VV-P-216	9150002617899	1	LAGRANDE	W81J89	0116 AR BN 03 CO C	FMS LAGRANDE