SAMPLE TEXT FOR ARMY POLLUTION PREVENTION PLANS

JUNE 2001

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Summary of Pollution Prevention Goals

Media	Goal	Source of Goal	Baseline Year	Target Year
Hazardous Waste	Continuous annual reduction in disposal	Proposed DoD MoM	NA	NA
Solid Waste	40% diversion	DoD MoM	NA	Dec 2005
Air Emissions	Continuous annual reduction in emissions	DoD MoM	NA	NA
Water Use	Continuous annual reduction in potable water use	---	NA	NA
Wastewater Generation	Continuous annual reduction in wastewater generation	---	NA	NA
TRI Releases	40% Reduction	EO 13148	2001	Dec 2006
EPA Priority Chemicals	50% Reduction in chemical use	EO 13148	2002	Dec 2006
ODSs	Eliminate Class I ODSs from inventory	Memorandum ASA IL&E	NA	Dec 2003
Vehicle Fuel	Increase fleet fuel efficiency by 3 miles per gallon	EO 13149	1999	Dec 2005
	Reduce vehicle petroleum consumption by 20%	EO 13149	1999	Dec 2005
	Ensure that alternative fuels account for 50% of fuels used in dual-fuel vehicles	EO 13149	NA	2005
	Ensure that 75% of vehicles procured in the target year and beyond are alternative fuel vehicles	EO 13149	NA	1999
Energy	Reduce facility energy consumption by 30%	EO 13123	1985	2005
	Reduce facility energy consumption by 35%	EO 13123	1985	2010
Affirmative Procurement	Train procurement officers and integrate AP into developing plans, work statements, and specifications	EO 13148	NA	NA

PROJECT SUMMARY TABLE

Project Name	Targeted Pollution Source	Implementation Status and Date	Funding Source	Compliance Thru P2?	P2 Plan Section

CHAPTER 1
INTRODUCTION

1.1 STATEMENT OF PURPOSE

This Plan establishes this installation's commitment to environmental leadership in pollution prevention (P2) by outlining the concepts and practices necessary to reduce the use of hazardous materials and the release of pollutants. This Plan is also meant to be used as a tool for the installation to document, track, and manage its pollution prevention efforts in pursuit of achieving pollution prevention goals.

1.2 BACKGROUND AND MISSION

1.3 DEFINITION OF POLLUTION PREVENTION

Pollution prevention encompasses those activities which reduce the quantity of hazardous, toxic, or industrial pollutants at the source by changing the production, industrial, or other waste generating process. In addition, pollution prevention is not limited to hazardous pollutants released to air, water, and land, but also includes activities to reduce the amounts of non-hazardous commercial and household wastes.

Pollution prevention is any mechanism that successfully and cost-effectively avoids, prevents, or reduces the sources of pollutant discharges or emissions other than the traditional method of treating pollution at the discharge end of a pipe or stack. A pollution prevention project is one which 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.

1.4 BENEFITS OF POLLUTION PREVENTION

As concern for the environment has risen in our society, increased environmental regulation and public awareness have raised the standards, costs, and potential liabilities of waste management practices. Waste and resource management programs that adopt P2 principles can realize benefits on many different fronts:

- 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

CHAPTER 2
POLLUTION PREVENTION REGULATORY BACKGROUND

The Army's pollution prevention policies originate in legislation enacted by the U.S. Congress. Executive Orders direct federal agencies, including the Department of Defense, to conform to Federal legislation and may impose non-legislated requirements as well. The Department of Defense issues directives and instructions in response to the Executive Orders. 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, executive orders, and DOD policy statements pertaining to pollution prevention. 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.

An early legal impetus for P2 practices. "...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.

Facilities 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. However, this act goes beyond wastes designated as hazardous. The intent is to force industries to reduce or prevent pollution at the source. In addition to source reduction, it also emphasizes reuse and closed loop recycling whenever possible. The emphasis is fundamentally different from off-site recycling, treatment, and disposal as primary ways to handle waste. The Pollution Prevention Act first established as comprehensive national policy the pollution protection hierarchy described in Chapter 1.

2.2 STATE POLLUTION PREVENTION LEGISLATION

2.3 PRESIDENTIAL EXECUTIVE ORDERS

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

This Executive Order (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.

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

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

- Reduce greenhouse gas emissions from facility energy use 30% by 2010 from a 1990 baseline
- Reduce facility energy consumption 30% per square foot by 2005 and 35% by 2010 from a 1985 baseline
- For industrial and laboratory activities, reduce energy consumption 20% by 2005 and 25% by 2010 from a 1990 baseline.

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

By including many of the pollution prevention elements of several previously existing executive orders, this executive order revokes the following: Executive Order 12843 of April 1993, Executive Order 12856 of August 1993, Executive Order 12969 of August 1995, and section 1-4 “Pollution Control Plan” of Executive Order 12088 of October 1978. Executive Order 13148 establishes goals that involve establishing environmental management programs as well as goals that involve reaching measurable pollution prevention milestones. The goals that pertain directly to pollution prevention are:

- Reduce Toxic Release Inventory (TRI) Form R releases 10% annually or 40% 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 Emergency Planning and Community Right to Know Act (EPCRA).

- Reduce the use of Environmental Protection Agency (EPA) priority chemicals 50% by 31 December 2006. Note that the EPA Interagency Workgroup has not yet established the list of priority chemicals. The executive order allows the workgroup until February 2001 to complete the list. The baseline year for the 50% reduction will be the calendar year immediately following the year in which the workgroup establishes the priority chemical list.

- 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 (discussed further below).

- Develop a plan that addresses the facility’s contribution toward achieving the goals in this executive order. 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 must conform to this guidance by 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 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. This executive order supersedes EO 13031 of December 1996. This order established the following specific goals:

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

- 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% of the fuels used in dual-fuel, alternative fuel vehicles.

- Ensure that at least 75% of car and light truck procurements are alternatively-fueled vehicles.

2.4 DEPARTMENT OF DEFENSE (DOD) 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 for TRI releases reduction, hazardous waste reduction, non-hazardous solid waste diversion, and 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 measures of merit 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 measure of merit is to "ensure that the diversion rate for non-hazardous solid waste is greater than 40% while ensuring integrated non-hazardous solid waste management programs provide an economic benefit when compared with disposal using landfilling and incineration alone." This goal is to be attained by the end of fiscal year (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 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.

CHAPTER 3
INSTALLATION POLLUTION PREVENTION PROGRAM

3.1 POLICY

This installation is committed to an active policy of protecting the environment through the following efforts:

- Providing a clean and safe environment in our community
- Ensuring a safe and healthy workplace for our staff
- Complying with all applicable laws and regulations
- Reducing the use of hazardous substances
- Reducing releases of pollutants to the environment
- Conserving energy and natural resources
- Maximizing recycling efforts
- Promoting pollution prevention through education, training, and awareness

To accomplish these objectives, this installation continuously identifies opportunities to reduce or eliminate pollution through source reduction and other prevention methods. This policy extends to all environmental media including hazardous waste, solid waste, air, water, and wastewater.

This installation is committed to reducing the amount and toxicity of pollution that it generates. As part of this commitment, the installation give priority to source reduction. Where source reduction is not feasible, this installation will investigate and implement other prevention measures such as recycling, treatment, and controlled disposal.

Pollution prevention is the responsibility of everyone at this installation.

3.2 POLLUTION PREVENTION MANAGEMENT STRUCTURE

This installation manages its overall environmental program through a series of defined responsibilities. As an aspect of the environmental program, the installation also manages its pollution prevention 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, installation 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) which meets once per quarter.

3.2.2 Primary Level

The installation Environmental 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 pollution prevention, 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 its 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 Toxic Release Inventory 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 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" executive orders and the Department of Defense Measures of Merit. These baselines are the based on the following metrics and are quantitatively identified in chapters 5-14 of this plan.

- Hazardous Waste: Total disposed (pounds)
- Solid Waste: Percent of total generated diverted to recycling (percent)
- Air Emissions: Amount emitted (tons)
- Water: Amount Consumed (gallons)
- Wastewater: Amount generated (gallons)
- TRI Form R Chemical Releases: Releases and off-site transfers (pounds)
- EPA Priority Chemicals: Purchases of individual target chemicals (pounds)
- Ozone Depleting Substances: Total inventory (pounds)
- Vehicle Fuel use: Amount of petroleum consumed (gallons)
  Amount of alternative fuel consumed (gallons)
- Energy: Electricity used (kWh) per total square feet of installation facilities
- Alternatively-Fueled Vehicles: number of vehicles leased/procured

3.4 OPPORTUNITY ASSESSMENTS

When reduction requirements are determined, options for meeting the requirements must be identified. These options are identified through pollution prevention opportunity assessments (P2OAs). P2OAs examine current processes and identify and evaluate alternatives for pollution prevention. Projects identified by P2OAs must have complete data to show the cost benefit of the project.

Opportunity Assessments are the method of 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 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. 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. Section 2, Chapters 1-11 of this document represent the results of the most recent P2OA for each chapter's respective media.

3.5 POLLUTION PREVENTION GOALS

Chapters 5-14 of this plan describes the installation's pollution prevention goals with respect to each environmental media area. The installation developed these goals based on environmental laws, executive orders, and Department of Defense policies.

3.6 IMPLEMENTATION AND EVALUATION

This section describes some of the methods and tools the installation uses to track and document its environmental efforts such as pollution prevention projects and initiatives.

3.6.1 Environmental Quality Report.

This report is part of an automated system used to collect a wide variety of installation environmental information, including compliance, conservation, program management, and pollution prevention programs. The primary goal of EQR is to provide DOD with the information it requires as well as providing HQDA, MACOM, major subordinate commands (MSC), and installations with critical management information while minimizing short suspense tasking to installation personnel. The EQR program is a result of the 1996 Defense Environmental Quality Program Annual Report to Congress, RCS DD-A&T (A) 1997. All data elements in the EQR are based on the DOD RCS-A&T (A) 1997 reporting protocol, and other law(s) and regulation(s) reporting requirements. All of which provide users and policy makers with periodic updates on critical data within the Army's environmental program. The EQR serves as the source of data for: annual environmental quality (EQ) reports to Congress; semi-annual EQ reports to the DoD; quarterly reports for the Quarterly Army Performance Review; MACOM EQ IPRs; Installation Management Steering Committee meetings; and semi-annual EO reports to MACOMs.

3.6.2 Army Environmental Program Requirements.

Installation personnel use the EPR database 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 Compliance Assessment System.

This system, known as the ECAS, is an Army-wide program that documents an installation's compliance status on a 3-year cycle. As a component of the ECAS, assessors evaluate the installation's pollution prevention program in terms of its compliance with many of the directives and executive orders described in Chapter 2. This evaluation is included as part of a document called the Environmental Compliance Assessment Report (ECAR). After each time the installation undergoes an environmental compliance assessment, the assessors write an ECAR 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 maintain compliance.

3.7 REPORTING REQUIREMENTS

The installation has the following P2 reporting requirements:

- Hazardous waste generator biennial or annual report, from RCRA
- Environmental Quality Report (EQR) hazardous waste disposal and recycling roll-ups, from AR 200-1
- Environmental Program Requirements (EPR) of programming, budgeting, and execution for all environmental projects, including P2, from AR 200-1
- ODS procurement approvals and determinations, from section 326 of the National Defense Authorization Act for FY93
- Solid Waste Annual Report (SWAR)
- Installation Status Report Part II (Environment)
- EPRCA Tier I/II Reports

3.8 POLLUTION PREVENTION PROJECT FUNDING

Pollution prevention projects are funded from the appropriate account of the proponent's operating budget.

CHAPTER 4
COMPLIANCE THROUGH POLLUTION PREVENTION

4.1 DESCRIPTION OF COMPLIANCE THROUGH P2

Pollution Prevention can be a strong tool that an installation can use to reduce its compliance burden. Since the concept of pollution prevention was first introduced, it has been accepted that P2 can improve an installation's compliance status. However, this benefit was taken as a matter of course but was not widely explored. This section represents the installation's efforts to categorize and document its compliance benefit. The following example illustrates the concept of compliance through prevention.

Installation A has 5 motor pools that generate used solvent as a hazardous waste. Recently, Installation X implemented a pollution prevention initiative that could double the life of the solvent which, in turn, reduced the amount of used solvent generated by 50%. Although this initiative has obvious benefits, it does not reduce the installation's compliance burden as much as might first be expected. This is because each of the 5 motor pools are still generating used solvent as a hazardous waste (albeit half as much). As a result, the installation must still ensure that these 5 motor pools operate in full compliance with hazardous waste storage and handling laws. In this light, the installation has received little *compliance* benefit aside from perhaps having to fill out a few less hazardous waste manifests.

Installation B also had 5 motor pools that generated used parts washing solvent as a hazardous waste. Recently, however, this installation consolidated these motor pools so that they are now housed in a single facility. This consolidation has allowed the activities to share resources which, in turn, reduced solvent use and generation by 25%. This reduction is not as much as that realized by installation A. However, Installation B has gained a benefit in that it now only has to manage a single hazardous waste site rather than 5 separate ones. Installation B, therefore, has realized a compliance benefit by reducing the number of its compliance sites.

Installation C also has 5 motor pools that generate used solvent. This installation has recently implement Installation A's initiative that reduced solvent use and generation by 50% at each of its motor pools. At installation C, however, the used solvent represented a large percentage of the installation's total hazardous waste generation. So large in fact that by reducing it by 50%, the installation downgraded its hazardous waste generator status form large quantity generator to small quantity generator. So even though Installation C must still manage these 5 separate hazardous waste generation sites, it may do so under more relaxed standards. Installation C, therefore, has realized a compliance benefit by reducing one of its compliance thresholds.

4.2 COMPLIANCE SITES

4.2.1 Hazardous Waste Storage Facilities

Quantity of Hazardous Waste Storage Areas. This table is provided to track the progress that this Installation has made in reducing its number of hazardous waste compliance sites.

Facility Type	Quantity				
	1999	2000	2001	2002	2003
Part B	1	1			
90-Day	11	6			
Satellite	37	38			

Initiatives to Reduce the Number of Areas.

Centralized Hazardous Substance Management. In addition to reducing the amount of hazardous waste generation, this initiative has also reduced the number of 90-day hazardous waste accumulation sites on post. Before implementing this system, each activity that generated hazardous waste managed a 90-day accumulation site to store its waste while awaiting pick-up for disposal. Now, under the new system, the installation employs a hazardous waste management contractor to collect hazardous waste from post activities and take it to a centralized 90-day storage facility. This has allowed the individual waste-generating activities to down-grade their waste storage areas from 90-day sites to satellite accumulation areas. This, in turn, has reduced the environmental compliance burden of having to manage multiple 90-day sites at the installation. This initiative was implemented in fall of 2000 and the HSMS is expanding to include more installation activities. For more information on this initiative, see section 5.4.1.

Sample text has not been provided for the following sections since they will closely follow section 4.2.1

4.2.2 Permitted Air Emission Sources

4.2.3 Permitted Solid Waste Disposal Facilities

4.3 COMPLIANCE THRESHOLDS

4.3.1 Hazardous Waste Thresholds

Threshold Status. This installation currently generates 57,003 pounds of hazardous waste per year or about 4,751 pounds per month. As such, it is considered a large quantity hazardous waste generator. Reducing this amount to less than the 2,200 pounds per month threshold would allow the installation to be considered a small quantity generator.

Initiatives to Reduce Generation to Below the Threshold.

> Aqueous Based Parts Washing. Switching from petroleum-based to aqueous-based parts washing has reduced annual hazardous waste generation by 6,936 lbs per year. This initiative was implemented in 1999. For more information, refer to section 5.4.2
>
> Paint Gun Washing Units. This initiative involves using automatic washing units to clean paint spray guns. It is estimated that this initiative will reduce hazardous waste generation by a total of 167 pounds per year. This initiative is scheduled to be implemented in July 2001. Refer to Section 5.5.1 for more information.

Sample text has not been provided for the following sections since they will closely follow section 4.3.1

4.3.2 TRI Release Thresholds

4.3.3 EPA Priority Chemical Thresholds

CHAPTER 5
HAZARDOUS AND INDUSTRIAL WASTE

5.1 PREVENTION GOAL

The installation's hazardous and industrial waste reduction goal is to show a continuous annual reduction in the overall disposal of these wastes. For the purposes of this plan, hazardous wastes include all wastes that fall under an EPA hazardous waste code and that require a hazardous waste manifest for disposal. Industrial wastes represent wastes that are not always considered hazardous under RCRA but must be managed separately from municipal solid wastes. Examples might include used antifreeze, used batteries, used oil, etc.)

5.2 BASELINE AND PROGRESS

Baseline	Hazardous Waste (pounds disposed per calendar year)						Target: Continuous Reduction
1999	2000	2001	2002	2003	2004	2005	2006
65,794	57,003						

Baseline	Non-Hazardous Industrial Waste (pounds disposed per calendar year)						Target: Continuous Reduction
1999	2000	2001	2002	2003	2004	2005	2006
103,496	98,874						

5.3 DESCRIPTION OF MAJOR WASTE GENERATING ACTIVITIES

5.3.1 100th Support Battalion

Waste generating activities of the 100th SB include the following:

Motor Pool - Building 1234. This building houses the organizational maintenance motor pool of B Company, and employs about a dozen personnel and 25 vehicles used for pick up and delivery. The only significant waste stream from this location is used absorbent, however antifreeze, rags, and some used oil are occasionally generated here. Hazardous material use includes propane, alkaline batteries, and various spray solvents, lubricants and aerosol paints for touch-up procedures. Some Chemical Agent Resistant Coating (CARC) painting may also occur at this location.

Service and Support Activity - Building 2345. This facility is primarily used to store and issue a majority of the military issue items used by units associated with the 100th SB. With a few exceptions, items are not turned in or exchanged for new ones through the Service and Support Activity (SSA), the key exceptions being used lead-acid vehicle batteries and tires. Other than lithium and lead-acid vehicle batteries, a significant amount of hazardous materials are stored here and this location is currently not part of the Hazardous Material Control Center (HMCC) / Hazardous Substance Management System (HSMS) program.

Motor Pool - Building 1789. This building houses the bulk of the HHC and 100th SB motor pools. The organizational level maintenance functions for about 150 vehicles of the 100th SB are performed on one side of the building, and direct support (DS) maintenance for several hundred battalion vehicles are performed on the other side. Normal motor pool type wastes are generated at this facility in typical quantities. These include antifreeze, used oil, absorbent, oil/water separator sludge, rags, lithium and lead-acid vehicle batteries, contaminated MOGAS, and occasional aerosol cans. Chemical Agent Resistant Coating (CARC) painting is not conducted at this facility.

Logistics - Building 3401. This building houses the Logistics section of the 100th SB. This unit provides logistical planning and support to various units in the theater. Its function is purely administrative as no wastes are generated and no hazardous materials are stored here.

5.3.2 Directorate of Community Activities

The Directorate of Community Activities (DCA) operates numerous recreational activities on the installation. These include the following:

Auto Craft Shop – Building 128. This shop provides the space and equipment needed for installation personnel to perform maintenance on their privately owned vehicles. Wastes from this area include used oil, used parts-washing solvent, used antifreeze, and car-wash sludge.

Boat Shop – Building 206. This facility rents boats and boating equipment to installation personnel. Personnel at this shop service and repair the equipment. Wastes primarily include used oil and used absorbent material.

Golf Course Maintenance – Building 2096. Personnel at this facility perform grounds maintenance such as mowing and pesticide application. They also service and repair the mowing equipment as well as the facility's golf carts. The major wastes from this activity include used oil, used absorbent, and used batteries.

Bowling Alley – Building 3702. The major waste from the bowling alley is deep fat frying oil, which is generated by the facility's food service operation.

5.3.3 Directorate of Logistics

The Directorate of Logistics (DOL) has two facilities that regularly generate hazardous/industrial wastes.

Installation Maintenance Facility (IMF) – Building 481. The IMF serves as the central maintenance facility for all military tactical vehicles at the installation. This facility performs direct support level vehicle maintenance (such as painting and engine rebuild) that personnel can not perform at the unit level. The IMF also performs routine vehicle maintenance such as oil changes, coolant system flushes, brake pad replacement, etc. Wastes from this facility include used oil, waste fuels, used absorbent material, used batteries, and used paint thinner. Note that the IMF currently recycles its used antifreeze.

Supply Warehouse – Building 303. This area serves as the main storage area for the various supplies needed by DOL activities. Wastes from this facility include small amounts of expired or damaged hazardous materials such as paints, solvents, oils, and adhesives.

5.3.4 Directorate of Public Works

Facility Maintenance Shops – Building 225. Personnel within these shops are responsible for maintaining the buildings and utility systems at the installation. Specific shops in this area include electrical, plumbing, paint, and mechanical maintenance. Wastes include used batteries, adhesives, paints, thinners, and used absorbent.

Fire Stations. The two fire stations at the installation (Buildings 456 and 1433) are responsible for responding to hazardous material spills. As a result, these fire stations generate wastes such as used absorbent and contaminated soil.

Mobile Equipment Maintenance – Building 158. This shop provides vehicle service and repair to all heavy equipment used within the Directorate of Public Works (DPW). Types of equipment include construction vehicles, garbage collection trucks, tractors, etc. Wastes from this activity include used oil, used absorbent, and used antifreeze, waste fuels, and used solvents.

Power Plant – Building 2098. This facility provides steam heat to all installation buildings. The primary wastes from the power plant include used oil, and used absorbent.

Waste Turn-in Point – Building 656. The DPW uses a contractor to collect hazardous and industrial wastes from installation activities. After collecting various wastes from around post, the contractor takes them back to this facility to process them before turning them in to the Defense Reutilization and Marketing Office (DRMO). Some of the wastes that the contractor collects are not directly attributable to a single activity on post. As a result, these are considered miscellaneous wastes generated at the waste-collection point. These wastes can include used batteries, used antifreeze, fluorescent lights, paint, thinners, used oil, and waste fuels.

Waste Water Treatment Plant – Building 1446. The installation wastewater treatment plant generates sludge as well as small amounts of waste chemicals used during the waste water treatment process.

5.4 CURRENT POLLUTION PREVENTION INITIATIVES

5.4.1 Centralized Hazardous Substance Management

Description. Through the Directorate of Logistics, the installation has established a Hazardous Substance Management System (HSMS) and control center to serve as a centralized point for hazardous material procurement, tracking, and management.

Note that the HSMS has only recently been implemented and currently includes only a few units and activities. As the center becomes more established, it will expand to include more activities.

Environmental Benefit. Since this initiative has only recently been implemented, it's environmental benefits can not yet be measured. However, it is expected that this initiative will greatly reduce the amount hazardous waste having to be disposed of as a result of shelf-life expiration.

In addition to reducing the amount of hazardous waste generation, this initiative has also reduced the number of 90-day hazardous waste accumulation sites on post. Before implementing this system, each activity that generated hazardous waste managed a 90-day accumulation site to store its waste while awaiting pick-up for disposal. Now, under the new system, the installation employs a hazardous waste management contractor to collect hazardous waste from post activities and take it to a centralized 90-day storage facility. This has allowed the individual waste-generating activities to down-grade their waste storage areas from 90-day sites to satellite accumulation areas. This, in turn, has reduced the environmental compliance burden of having to manage multiple 90-day sites at the installation.

Economic Benefit: Centrally procuring hazardous materials for activities post-wide 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.

5.4.2 Aqueous-based Parts Washing

Note: Aqueous parts washers are not currently approved as a PD680 replacement. USATACOM is the commodity manager for PD680 solvents and coordination with them is necessary for PD680 substitutes. This text is provided as an example only and is not intended for implementation.

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 which 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 solvent 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 to 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 Benefit. Because the solvent in this type of parts washing unit is an aqueous solution, it contains neither Volatile Organic Compounds (VOCs) or 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 408 lbs of used solvent per year per parts washing unit. Replacing the 17 washing units on post, therefore, reduces annual waste generation by 6,936 lbs per year.

Economic Benefit.

Implementation Costs: 27,285

17 aqueous washers at $1,605 each

Recurring Costs: $15,062/yr

Replace Cleaning Solution lost to Evaporation/Dragout: $6,494/yr
Replace Filters once per month: $1,581
Annual Solvent Replacement. $3,604/yr
Filter and Used Solvent Disposal. $1,683/yr
Labor: $1,700/yr

Recurring Cost Savings: $26,112

Reduced HW Disposal: $17,017/yr
Reduced Solvent Purchase: $9,095/yr

Payback Period: 2.5 years

5.5 POTENTIAL POLLUTION PREVENTION INITIATIVES

5.5.1 Automatic Washing Units for Paint Guns

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 pump to recirculate the solvent. 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. Both the 4/123rd Aviation maintenance activity and the DOL Installation Maintenance Facility could benefit from implementing such an initiative.

Technical Evaluation. An automatic paint gun-washing unit is easy to install since it is relatively small and operates from a typical 110v electrical outlet. In addition, it is easy to operate and requires minimal operator training, and can reduce the time required to clean paint equipment (by about 15 minutes per cleaning). The only regular maintenance associated with such a unit is to periodically remove the thinner and replace it with fresh material. One possible area of concern is that although the manufacturers of the equipment state that the unit will thoroughly clean the paint guns, it may not clean them as well as disassembling them and cleaning them by hand when certain types of paint are used. Before making a commitment to buy an automatic washing unit, it would be beneficial to either rent one or arrange an onsite demonstration to determine how well it cleans compared to the current method and with the paint materials currently being used.

Environmental Evaluation. The automatic gun washer extends the useful life of the thinner by continuously recirculating it. This allows less thinner to be used, resulting in an overall reduction. Assume that the average gun-washing unit holds 5 gallons of thinner that must be changed once every 6 months. This would generate a total of 10 gallons per year (20 for two washing units). Currently, the AVIM and the DOL IMF generate a combined 308 lbs/yr (refer to Appendix B). Assuming a specific gravity of 0.8, this equates to about 45 gallons per year. Implementing this alternative would therefore result in a combined reduction of 25 gallons per year or about 167 lbs per year. Additionally, compatible filtration units that would further extend the life of the thinner may be available in the near future.

Economic Evaluation. This evaluation is for purchasing two washing units; one for the AVIM and one for the DOL IMF.

Implementation Costs. The implementation costs associated with this initiative would be the cost of two washing unit and the cost to purchase the thinner needed to initially fill it. The average paint gun washing units costs about $1,200 (units typically range in price from $600 to $3,000). At $6.00 per gallon, it would cost a total of $30 to initially fill the unit's 5-gallon tank. The total cost to initially implement this P2 alternative would be $1,230 for each unit or $2,460 for both.

Recurring Costs. There are no significant recurring costs associated with this initiative.

Recurring Cost Savings. Savings result from reduced labor requirements as well as purchasing and disposing of less thinner. These costs total $7,925.

Labor. Using an automatic washer could reduce paint gun cleaning times by at least 15 minutes per gun. Since both paint shops must clean two guns daily, two automatic units would save 60 minutes (1.0 hours) per day. During a year with 250 workdays, this would total about 250 hours in labor reduction. At a cost of $30/hr this would save a total of $7,500/yr in labor.

Material. Annual recurring costs savings would result from periodically purchasing less fresh thinner. As mentioned in the environmental evaluation section above, each washing unit holds 5 gallons of thinner and is changed once every 6 months, resulting in a total of 20 gallons purchased per year, instead of at least 45 gallons. This is a savings of at least 25 gallons per year, and at $6 per gal, this would cost $150 annually from the two units.

Waste Disposal. As described in the environmental evaluation section above, two automatic paint gun-washing units could reduce the AVIM and IMF paint shops' thinner waste by about 167 lbs per year. At a disposal cost of $1.65 per pound, this would save $275 per year.

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

$$\$2,460 / (\$7,925 - \$0) = 3.75 \text{ months}$$

Implementation Status – In Progress. The installation received funds for implementing this initiative in late 2000. The 2 units are currently on order and will be installed upon receipt. They are expected to be operational by July 2001.

5.5.2 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 non-hazardous industrial 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 of. Renewable batteries are available in sizes AAA through D-cells, as well as other specialty sizes such as 6V and 9V.

Technical Evaluation. 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 that there are an average of 2.7 alkaline batteries per pound, this equates to an annual battery use of 9,628 batteries. At an average purchase cost of $2.50 per rechargeable battery, purchasing 9,628 batteries would cost $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 will total $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 alkalines 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.

$$\frac{\$24{,}570}{\$10{,}416/\text{yr} - \$1{,}060/\text{yr}} = 2.6 \text{ years}$$

Implementation Status – Currently pursuing funding. Environmental personnel have selected this project for implementation and will include this initiative in its next EPR submittal.

PLEASE NOTE: The content of Chapters 6-14 closely mirrors that of Chapter 5. Therefore, to avoid redundancy, these chapters don't provide sample text except to identify the media-specific goals and baselines.

CHAPTER 6
SOLID WASTE

6.1.1 Goal

Ensure that the diversion rate for non-hazardous solid waste is greater than 40% by the end of FY 2005.

6.1.2 Baseline and Progress

Note that this goal does not have a baseline amount. This is because the 40% diversion rate represents 40% of the total amount of solid waste generated in 2005 and is independent of previous years' diversion amounts.

Solid Waste (percentage diverted from disposal to recycling)						Target: 40%
1999	2000	2001	2002	2003	2004	2005
7%	11%					

6.2 DESCRIPTION OF MAJOR SOLID WASTE STREAMS

6.3 CURRENT P2 INITIATIVES

6.4 POTENTIAL P2 INITIATIVES

CHAPTER 7
AIR EMISSIONS

7.1.1 Goal

The installation's goal is to show a continuous annual reduction in air emissions.

7.1.2 Baseline and Progress

Air Emissions (Tons emitted per calendar year)							Target: Continuous Reduction
Pollutant	1999	2000	2001	2002	2003	2004	2005
PM_{10}	717.02						
SO_2	641.15						
CO	1,186.44						
NO_x	489.89						
VOCs	58.93						
HAPs	26.11						

7.2 DESCRIPTION OF MAJOR EMISSION SOURCES

7.3 CURRENT P2 INITIATIVES

7.4 POTENTIAL P2 INITIATIVES

CHAPTER 8
WATER AND WASTEWATER

8.1.1 Goal

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

8.1.2 Baselines and Progress

Water Consumption (Million of Gallons per year)							Target: Continuous Reduction
1999	2000	2001	2002	2003	2004	2005	2006
139.9							

Wastewater Generation (Million of Gallons per year)							Target: Continuous Reduction
1999	2000	2001	2002	2003	2004	2005	2006
34.9							

8.2 CURRENT INITIATIVES

8.3 POTENTIAL P2 INITIATIVES

CHAPTER 9
TOXIC RELEASE INVENTORY FORM R RELEASES

9.1.1 Goal

Reduce TRI Form R chemical releases 40% overall by 31 December 2006 from a 2001 baseline.

9.1.2 Baseline and Progress

TRI Form R Releases
(Total pounds released per calendar year)

TRI Form R Chemical	Baseline 2001	2002	2003	2004	2005	2006	Target
Glycol Ethers	3,188						1,913
Lead Compounds	14,234						8,540
Chlorine	1,563						938

9.2 DESCRIPTION OF FORM R RELEASES

9.2.1 Glycol Ethers
9.2.2 Lead Compounds
9.2.3 Chlorine

9.3 CURRENT P2 INITIATIVES

9.4 POTENTIAL P2 INITIATIVES

CHAPTER 10
EPA PRIORITY CHEMICAL REDUCTION

10.1.1 Goal

Reduce the use of EPA priority chemicals 50% by 31 December 2006 from a baseline of 2002.

10.1.2 Baseline and Progress

EPA TOXIC CHEMICALS
(pounds used per calendar year)

EPA Chemical	Baseline 2002	2003	2004	2005	2006	Target
Chemical 1						
Chemical 2						
Chemical 3						
Chemical 4						
Chemical 5						
Chemical 6						
Chemical 7						
Chemical 8						
Chemical 9						
Chemical 10						
Chemical 11						
Chemical 12						
Chemical 13						
Chemical 14						
Chemical 15						
Total use						

Note that the EPA Interagency Workgroup will determine specific chemicals for this table in 2001.

CHAPTER 11
OZONE DEPLETING SUBSTANCES

11.1 GOAL

Eliminate all Class I Ozone Depleting Substances from the installation' inventory by 31 December 2003

11.2 BASELINE AND PROGRESS

Class I Ozone Depleting Substances (Total pounds in inventory)				Target: 0 lbs
1999	2000	2001	2002	2003
4,026.11	4,026.11			

11.3 DESCRIPTION OF ODS-CONTAINING EQUIPMENT

11.4 CURRENT P2 INITIATIVES

11.5 POTENTIAL P2 INITIATIVES

CHAPTER 12
VEHICLE FUEL CONSERVATION

12.1 GOALS

- Increase the average EPA fuel economy of cars and light trucks by at 1 mpg by the end of FY 2002 and 3 mpg by the end of FY 2005 from a FY 1999 baseline.
- Reduce vehicle petroleum consumption 20% be the end of FY 2005 from a FY 1999 baseline.
- Ensure that alternative fuels account for at least 50% of the fuels used in dual-fuel, alternative fuel vehicles.
- Ensure that at least 75% of car and light truck procurements are alternatively-fueled vehicles.

12.2 BASELINES AND PROGRESS

FLEET FUEL ECONOMY (average fuel efficiency of non-tactical fleet in miles/gal)						Target: 16.8
Baseline						
FY 1999	2000	2001	2002	2003	2004	FY 2005
13.8	13.8					

VEHICLE FUEL USE (total gallons consumed for non-tactical fleet vehicles)						Target: 20% less
Baseline						
FY 1999	2000	2001	2002	2003	2004	FY 2005

ALTERNATIVE FUEL USE (% of alternative fuel consumed in alternative-fueled vehicles)						Target: 50%
1999	2000	2001	2002	2003	2004	2005
10%	17%					

ALTERNATIVE FUELED VEHICLE PROCUREMENT (% of vehicles procured that are alternatively fueled)						Target: 50%
1999	2000	2001	2002	2003	2004	2005
35%	48%					

12.3 CURRENT P2 INITIATIVES

12.4 POTENTIAL P2 INITIATIVES

CHAPTER 13
ENERGY CONSERVATION

13.1 GOAL

Reduce facility energy consumption 30% per square foot by 2005 and 35% by 2010 from a 1985 baseline. Note that the Executive Order 13123 allows for a separate, less stringent goal for industrial and laboratory activities. However, this installation does not track energy consumption separately for such activities. As a result, the 30-35% (more stringent) reduction goal will apply to the installation as a whole.

13.2 BASELINE AND PROGRESS

	Energy Consumption (KWHr/ft^2)					Target:
Baseline						20% less
FY 1985	2000	2001	2002	2003	2004	FY 2005

13.3 CURRENT P2 INITIATIVES

13.4 POTENTIAL P2 INITIATIVES

CHAPTER 14
AFFIRMATIVE PROCUREMENT

14.1 GOALS

- Train procurement officers
- Integrate AP into developing plans, work statements, and specifications

14.2 CURRENT POLLUTION PREVENTION INITIATIVES.

14.3 POTENTIAL POLLUTION PREVENTION INITIATIVES.