

**Colorado Pollution Prevention
Network**

**Pollution Prevention Success
Story Compendium**

May 1998

Colorado Success Story Compendium Overview

This Success Story Compendium was developed to serve as a vehicle for cross-feeding successful pollution prevention case studies, initiatives and approaches implemented at federal facilities in Colorado.

Rather than a "recipe book" or a technical manual, the Compendium provides pollution prevention managers key facts and information about the scope and applicability of various Colorado federal facility pollution prevention success stories. The intent is that each success story provides pollution prevention managers enough information to consider whether a particular initiative is something he/she should learn more about for possible implementation at their facility. Technical and operational points of contact are included in each success story.

The Compendium is organized by "Keyword" categories, based on the Keyword Index following this overview. To find success stories relating to a particular topic, users should search the Keyword Index for the closest Keyword and go to that section to find success stories on their topic of interest.

This Compendium is meant to be a "living document" that will be frequently updated and expanded. New success stories will be solicited periodically. Success Stories should be submitted in the compendium format and include all requested information. Even though some Keyword categories may not currently contain success stories now, they can be included in the future as they are documented.

It is the sincere hope of those who developed this Compendium that will serve as a useful resource for Colorado federal pollution prevention managers and that it will promote greater partnership, contact and crossfeed among Colorado federal facilities, and state and Federal agencies.

KEYWORD LIST: select the best one for your project.

Aircraft/Airfield Maintenance
Alternative Fuel Vehicles
Base Exchange/Store
Bicycles/Alternative Transportation
Body Shop
Buy Recycled/Affirmative Procurement
Commuting to Work
Composting
Construction and Demolition
Deicing
Earth Day
Energy Conservation
Food Service
Fueling
Golf Courses
Gray Water Reuse/Effluent Recycling
Hazardous Waste
Hazmart Pharmacy
Hospitals/Clinics/Medical Offices
Hotels/Billeting/Lodging/Housing
Household Hazardous Waste
Integrated Pest Management
Laboratories
Laundries
Lettering
Office
Painting/Paint Stripping
Pallets
Partnerships
Pesticides
POL
Print Shop
Public Awareness/Education
Recycling
Restoration Projects w/P2 Components
Reuse
Stormwater (best management practices, P2)
Sustainable Design/Sustainable Living
Training
Vehicle Maintenance Shop
Wastewater Treatment
Water Conservation
Other

INSTRUCTIONS FOR COMPLETING P2 SUCCESS STORY SUMMARY:

Complete one success story form for each significant pollution prevention initiative at your facility that you would like to share with other Federal facilities. The success story notebook will be organized by chapter - each keyword will be the name of a chapter. Limit the scope of each success story to fit as much as possible under one keyword.

KEYWORD: Please choose the most appropriate word from the list at the end of these instructions.

FACILITY: Please provide the name, city and state of the facility where the success story took place. For example: U.S. Environmental Protection Agency Region 8, Denver, CO.

P2 PROJECT NAME: for your specific project.

FOCUS OF SUCCESS STORY: In one or two paragraphs, please describe the process, activity, chemical or issue addressed by this P2 success story, focusing on **what** pollution prevention **technique/program** was implemented and **how** it was put into place. Highlight waste streams, technologies or resources used, describe the emphasis of educational programs, etc. Costs will be reported in separate blocks below.

ORIGINAL PROCESS: Please describe in 1-2 sentences the original situation or process which provided the opportunity for pollution prevention. In other words, give the background within which the success story was implemented, and the reasons why P2 was needed.

FACILITY DESCRIPTION / MISSION / SIZE: Please provide a brief one or two sentence description of the office/installation listed under "Facility" above. For example, the EPA Denver Office has a staff of approximately 800 employees and grantees who oversee and administer environmental laws, regulations, Executive Orders and programs within a six state Region. The Region operates a Laboratory and has an operations office in Montana.

COSTS: In the spaces below, we are looking for both startup and annual recurring costs.

START-UP COSTS: Please provide a brief summary of the initial funding required to implement this P2 success story. Include costs of equipment, initial purchases, buildings and building renovations, educational materials, travel, training, staff hours, etc.

RECURRING COSTS: Please summarize the ANNUAL ongoing costs associated with implementing this P2 success story. Include costs of maintenance, supplies, repairs, training, estimated staff hours, etc. If there were no annual maintenance costs, write NONE in the space provided.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS: Please explain the annual cost savings from implementation of your success story. Be sure to include avoided costs, such as landfill or hazardous waste disposal costs avoided.

PAYBACK PERIOD: How long, after initial implementation/set up did it or will it take to pay for the project and begin to see monetary savings or cost avoidance? An easy way to calculate this is:

$$\text{PAYBACK PERIOD IN YEARS} = \frac{\text{Start-up Cost}}{\text{Annual benefit minus Annual Cost}}$$

OTHER BENEFITS (NON-MONETARY): Please provide your comments about any relevant benefits other than cost savings that resulted from your success story. These could include worker health/safety, environmental benefits, improved work space, increased environmental awareness, more storage, reduced waste, better reporting capability, improved compliance status, increased productivity public relations benefits, improved management systems, etc.

OBSTACLES: Give the major obstacles that were overcome to implement this P2 project and explain how you overcame them.

SOURCE / SUPPLIER: Include the name, address and phone number with area code, email address of vendors or suppliers of materials used for this project, i.e., equipment, products, educational materials, etc.

P2 CONTACT: The name, title, mailing address and telephone number of the Pollution Prevention/Environmental Management contact familiar with this project. Give the email address if known.

OPERATIONAL CONTACT: The name, title, address and telephone number of the technical/operational contact who can answer questions about implementation of the technology or project. Give the email address if known.

PHOTO / GRAPHICS / LOGO: Please provide a representative photograph, graphic, metrics table, or agency logo which we will use if space is available.

KEYWORD: ALTERNATIVE FUEL VEHICLES

FACILITY: PETERSON AIR FORCE BASE, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: CONSTRUCTION OF COMPRESSED NATURAL GAS FUELING STATION

FOCUS OF SUCCESS STORY: The final chapter to this success story has yet to be written. The Air Force will be converting more of its fleet to CNG in the near future and will require a station to fuel these vehicles. Peterson AFB presently has 47 dual fuel vehicles converted to CNG and is expecting to receive more from GSA. A convenient CNG filling station will be required at Peterson AFB and will be funded with FY98 money. In an effort to save the Air Force \$110-300K a partnership between the Col. Springs Airport, the City of Colorado Springs and Peterson AFB was established. The airport has agreed to lease a portion of airport property adjacent to Peterson's west gate for the site of the filling station. Peterson AFS would be the primary user and would agree to enter into a service contract of five years, one base year with four option years with the CNG distributor. The distributor would supply the structure, the fueling station equipment and the billing. This is too good to be true. Peterson AFS would have access to a CNG station for virtually no capital output.

ORIGINAL PROCESS: At the present time Peterson AFS relies on the CNG station at the intersection of I-25 and Fillmore to refuel its vehicles that require CNG. This is not a practical solution for the productive use of CNG vehicles due to the commuting time of approximately 45 min. to 1 hr. for a round trip fill up.

FACILITY DESCRIPTION, MISSION, SIZE: Transportation presently has 47 CNG bi-fuel vehicles that are Air Force owned and 7 CNG bi-fuel vehicles that are leased through GSA.

COST:
START UP COSTS The vehicles in the transportation fleet have already been converted and replacement vehicles will be CNG capable. If the station is built off base Peterson would not have to pay at all. If the station is built on Peterson the infrastructure is estimated at \$300K. The fueling station would be contractor owned and operated.

RECURRING COSTS There would no recurring cost.

COST SAVINGS OR AVOIDANCE: I have been provided a cost savings based on seven vehicles - The time period covered six months. The total fuel used during this time was 187.46 gallons, @ \$0.85 price per gallon. This provided an estimated dollar savings of \$73.11. Dollars saved are based on an avg. gasoline price of \$1.30 per gallon. The savings per gallon would be \$0.45.

MONETARY SAVINGS Transportation currently estimates the consumption for the 47 USAF vehicles @ 31,441 gallons for a total annual mileage of 395,000 mi. based on last year's data. Transportation is able To purchase gas for \$0.74 per gallon, CNG currently sells for \$0.84 per gallon equivalent. There would not be a \$ saving but the reduction of air pollution would be significant.

PAYBACK PERIOD Start Up Cost 200,000
Last Year repair/fuel Cost 44,000 Minus New Cost 4,000
PAYBACK In 5 Years

KEYWORD: ALTERNATIVE FUEL VEHICLES

FACILITY: PETERSON AIR FORCE BASE, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: CONSTRUCTION OF COMPRESSED NATURAL GAS FUELING STATION

OTHER BENEFITS (NON-MONETARY):

CNG vehicles significantly reduce air pollution and cost less to operate. Vehicles running solely on natural gas reduce carbon monoxide emissions up to 99 percent, with a 30 percent reduction in carbon dioxide and nitrogen oxide emissions. As directed by EO12844, Federal fleets must acquire alternative fueled vehicles as a percentage of all vehicles acquired by the following schedule FY-97:33%, FY-98:50%, FY-99:75%.

OBSTACLES:

Information for this project was gathered by several different groups over a period of two years. This resulted in some misunderstanding of the requirement to let private vehicles with CNG capability access to Peterson. This access is not required in this geographic area. If this had been clear, the CNG station would have been built on Peterson from the start.

SOURCES/SUPPLIERS:

Trillium
4702 County Road 106
Elizabeth, CO 80107
(800)-920-1166

Natural
5855 Stapleton Drive
Denver, CO 80216
(303)-322-4600

P2 CONTACT:

Daniel Rodriguez
Chief, Environmental Quality
21st Space Wing
21CES/CEVQ
580 Goodfellow St.
Peterson AFB CO 80914-2370
danrodri@spacecom.af.mil
DSN 834-1459 (719) 556-1459
FAX (719) 556-8078

Walter Roberts
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21st Space Wing
21 CES/CEVQ
580 Goodfellow St.
Peterson AFB CO 80914-2370
warobert@spacecom.af.mil
DSN 834-1458 (719) 556-1458
FAX (719) 556-8078

OPERATIONAL CONTACT:

Jerry Cummings
21 LSS/LGSF
DSN 834-4359 (719) 556-4359

KEYWORD: COMMUTING TO WORK

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: TRAVEL REDUCTION INCENTIVE PROGRAM

FOCUS OF SUCCESS STORY: The Academy received a prestigious award from the Clean Air Campaign of the Pikes Peak Region for its participation in the 1997 Great TRIP Challenge (GTC). During the GTC, Academy employees saved almost 8,000 vehicle miles by carpooling to work and to meetings, biking, walking, telecommuting, and staying in at lunch.

The Academy is a member of the Travel Reduction Incentive Program (TRIP), a program sponsored by the Clean Air Campaign of the Pikes Peak Region. TRIP sponsors the annual GTC competition during which local businesses try to outdo each other in reducing air pollution from vehicle travel.

Since joining TRIP in 1995, the Academy has saved a total of 64,684 travel miles or 1.7 tons of air pollutants! As part of its on-going TRIP initiatives, the Academy is developing bus service for cadets, evaluating telecommuting, promoting TRIP through e-mail and articles in the base paper, and funding a Guaranteed Ride Home program for employees who use alternate commuting modes.

ORIGINAL PROCESS: The Academy had not participated in the GTC before this year's competition.

FACILITY DESCRIPTION, MISSION, SIZE: The Air Force Academy sits on 19,000 acres located just north of Colorado Springs. The Academy's primary mission is to train future aerospace leaders. Activities include cadet academic and military training, base maintenance and support, and airfield operations.

COST:

START UP COSTS None.

RECURRING COSTS Air Quality Manager's time to participate in Clean Air Campaign and base-level meetings and publicize the TRIP program.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS Savings from reduced vehicle use and less fuel consumption from employee's carpooling or walking to meetings.

PAYBACK PERIOD N/A

OTHER BENEFITS (NON-MONETARY) Reduced air pollution.
Public relations benefits and positive publicity for the Academy's environmental program.

OBSTACLES: Getting management buy-in to commit resources to a non-mission essential project that provides a limited monetary payback.

SOURCE/SUPPLIER: N/A

KEYWORD: COMMUTING TO WORK

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: TRAVEL REDUCTION INCENTIVE PROGRAM

P2 CONTACT:

Diana Dean
HO USAFA/CEVC
8120 Edgerton Drive, Suite 40
USAF Academy CO 80840-2400
(719) 333-4483

OPERATIONAL CONTACT:

Larry Reisinger
HQ USAFA/CEVC
8120 Edgerton Drive, Suite 40
USAF Academy CO 80840-2400
(719) 333-2289

KEYWORD: COMPOSTING / PARTNERSHIPS

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: PARTNERSHIP WITH FORT CARSON TO PROVIDE COMPOST TO THE COLORADO MOUNTAIN RECLAMATION FOUNDATION

FOCUS OF SUCCESS STORY: To comply with new NPDES permit requirements, the Academy upgraded its wastewater treatment facilities to meet more restrictive effluent standards. The Academy's wastewater treatment plant effluent however is totally recycled. The plant effluent is used to irrigate road medians, athletic fields, the golf course, parade fields and other areas. The plant upgrade helped improve the quality of the recycled effluent.

ORIGINAL PROCESS: The original plant up as a partner in the Colorado Mountain Reclamation Program in 1995, but its participation was hampered by the unavailability of vehicle support to transport the compost to the reclamation areas.

FACILITY DESCRIPTION, MISSION, SIZE: The Air Force Academy sits on 19,000 acres located just north of Colorado Springs. The Academy's primary mission is to train future air and space leaders. Activities include cadet academic and military training, base maintenance and support, and airfield operations.

Fort Carson has a population of over 100,000, including active duty military, family members, civilians and retirees. The cantonment area is 137,403 acres and Pinon Canyon maneuver site is 235,896 acres. Fort Carson serves four major units with a total of 13,077 soldiers and 546 combat systems (Tanks, Bradleys, Howitzers, and helicopters). Fort Carson's main mission is combat readiness training.

COST:
START UP COSTS None.

RECURRING COSTS Recurring costs for the Academy include the cost of producing compost and manpower to assist Fort Carson in transporting to reclamation sites. Fort Carson's costs include the cost of manpower, vehicles, and fuel to transport the compost approximately four times per year.

COST SAVINGS OR AVOIDANCE:
MONETARY SAVINGS Since this is a community involvement/Goodwill initiative, no cost savings are realized.

PAYBACK PERIOD N/A
OTHER BENEFITS (NON-MONETARY) Community relations - an opportunity to tangible give something back to the Community! Restoration of mining scarred areas and the aesthetic value of beautification. This partnership also promotes contact between Academy and Fort Carson personnel. Expanded partnering between the two bases is being considered.

OBSTACLES: Getting management buy-in to commit resources to a non-mission essential project that provides a limited monetary payback.

SOURCE/SUPPLIER: N/A

KEYWORD: COMPOSTING / PARTNERSHIPS

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

**P2 PROJECT NAME: PARTNERSHIP WITH FORT CARSON TO PROVIDE COMPOST TO THE
COLORADO MOUNTAIN RECLAMATION FOUNDATION**

P2 CONTACT:

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USAF Academy CO 80840-2400
(719) 333-4483

Kelly O'Neill
HQ Fort Carson
Fort Carson AFZ-ECM-PP
DECAM, Bldg 323
Fort Carson CO 80913-5000
oneillk@carson-emh1.army.mil
(719) 526-6838

OPERATIONAL CONTACT:

N/A

KEYWORD: HAZARDOUS WASTE

FACILITY: DEFENSE FINANCE AND ACCOUNTING SERVICE, DENVER, COLORADO

P2 PROJECT NAME: MICROFILM PROCESS

FOCUS OF SUCCESS STORY: Defense Finance and Accounting Service (DFAS) used a microfilm process to store DoD personnel financial records. The microfilm process was changed in March 1996, to a bleachless system. The old process produced a waste with silver and chromium above RCRA levels and a pH < 1. The new bleachless system cost less to operate and does not produce a waste stream that is RCRA hazardous.

ORIGINAL PROCESS: Microfilm process which produced a hazardous waste stream that was corrosive and toxic (D002, D007, and D011).

FACILITY DESCRIPTION, MISSION, SIZE: The Defense Finance and Accounting Service, located on the southwest corner of the former Lowry Air Force Base, operates centralized pay systems for all active duty Air Force, Air National Guard and Air Force Reserve members, as well as survivors of Army, Navy, Marine Corps and Air Force members and DOD civilian employees. It accounts to Congress for all money appropriated to the Air Force and selected DOD agencies. It employs 1,800 people.

COST:
START UP COSTS The process was converted to function with bleachless chemistry. Cost \$5,000.00 to convert the process equipment.

RECURRING COSTS None.

COST SAVINGS OR AVOIDANCE:
MONETARY SAVINGS \$26,000/year is saved in HW transportation and disposal costs. The new process does not use two chemicals used in the old process, thus saving \$13,000/year in chemicals for the new process. This is an annual savings of \$39,000.

PAYBACK PERIOD $\$5000 / (\$39,000 - \$0) = .13$ years

OTHER BENEFITS (NON-MONETARY) Increased worker safety since new process is not corrosive and toxic. Eliminated future CERCLA environmental liability.
Improved work area.
Increased environmental awareness.
Reduced a hazardous waste stream.

OBSTACLES: The project was delayed since DFAS had \$32,000 worth of film on hand for the old process. DFAS decided to use up the film prior to converting the process.

SOURCE/SUPPLIER: Anacomp Inc.
7808 Cherry Creek Drive South Suite 205
Denver CO 80231
(303) 752-1316

KEYWORD: HAZARDOUS WASTE

FACILITY: DEFENSE FINANCE AND ACCOUNTING SERVICE, DENVER, COLORADO

P2 PROJECT NAME: MICROFILM PROCESS

P2 CONTACT:

Todd DeGarmo
Environmental Engineer
DFAS-DE/WV BLDG 408
6760 E. Irvington Place
Denver, Colorado 80279
(303) 676-4666 DSN 926-4666
tdegarmo@cleveland.dfas.mil or
tdegarmo@spacecom.af.mil

OPERATIONAL CONTACT:

Carmen Hoffman
(303) 676-6417 DSN 926-4617

KEYWORD: HAZARDOUS WASTE

FACILITY: ELDORADO AIR STATION, TEXAS

**P2 PROJECT NAME: TOXIC & HAZARDOUS MATERIALS - REDUCTION THROUGH
MANAGEMENT PRACTICES**

FOCUS OF SUCCESS STORY: Substitution of a less hazardous water treatment chemical for sulfuric acid.

ORIGINAL PROCESS: Eldorado AS formally applied 96% sulfuric acid and Garrett-Callahan Formula 2927- L to its industrial water for corrosion control in the installation chillers. The new management practice is to use only Garrett-Callahan Formula 2923-L. This new procedure eliminates the need to use any sulfuric acid on the installation.

FACILITY DESCRIPTION, MISSION, SIZE: Eldorado AS used to provide early warning of sea-launched ballistic missile attack. In October 1995, this 120 acre 14 facility installation was placed into caretaker status. Today, much of the engineering support equipment continues to operate and be maintained by 12 on-site contract personnel.

COST:

START UP COSTS There were no tangible start-up or recurring costs. Both of the Garrett-Callahan products were comparable in price.

RECURRING COSTS None.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS Approximately \$3,350 / yr in sulfuric acid cost

PAYBACK PERIOD N/A

OTHER BENEFITS (NON-MONETARY) Safety of employees enhanced by not using sulfuric acid, Spiff potential reduced.

OBSTACLES: The change in practice required coordination from wastewater environmental regulators to ensue the change in chemicals did not impact wastewater discharge limitations.

SOURCE/SUPPLIER: Garrett-Callahan
111 Rollins Road
Milbrae CA 94030
(415) 697-5811

P2 CONTACT: Mr. W.D. Ritchie
21 CES/CEV
580 Goodfellow Street
Peterson AFB CO 90914-2370
DSN 834-8060 (719) 556-8060

OPERATIONAL CONTACT: Mr. Gary Breen
Environmental Manager
Raytheon Support Services Company
P.O. Box 1198
Eldorado AS TX 76936
(915) 853-3502

KEYWORD: HAZARDOUS WASTE

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: WEAPONS CLEANERS

FOCUS OF SUCCESS STORY: A weapon cleaner with a filtration system and safe, environmentally friendly solvent designed for high volume usage. The system cleans weapons faster and gets them cleaner.

ORIGINAL PROCESS: Weapons were cleaned with spray and wipe application of ozone depleting substances that contained 1,1,1-Trichloroethane, Freon 113, and chlorinated phenols.

FACILITY DESCRIPTION, MISSION, SIZE: Fort Carson has a population of over 100,000, including Active Duty Military, Family Members, Civilians, and Retirees. The Cantonment Area is 137,403 acres and Pinon Canyon Maneuver Site is 235,896 acres, Fort Carson serves 4 major units with a total of 13,077 soldiers and 546 Combat Systems (Tanks, Bradleys, Howitzers, and Helicopters). Fort Carson's primary mission is training for combat readiness.

COST:

START UP COSTS Hardware: \$2,000
Solvent (55 gallon drum): \$1,300

RECURRING COSTS New solvent needs to be purchased every 5 years, depending on use.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS Manpower savings could be up to \$300,000 per year, considering that the unit can reduce weapons cleaning time by 80%.

PAYBACK PERIOD Less than one year.

OTHER BENEFITS (NON-MONETARY) People come in contact with HM less often.
The solution gets the weapons cleaner than CLP Products.
The new solvent is safer for the environment.
Products (filter, solvent) are not expected to be designated as HW after use.

OBSTACLES: Expense.
Difficult to show man-hour cost avoidance.

SOURCE/SUPPLIER: Ron Carberry
Inland Technology, Inc.
401 East 27th Street
Tacoma, WA 98421
1-800-552-3100

P2 CONTACT: Kelly O'Neill
HQ Fort Carson
Fort Carson AFZ-ECM-PP
DECAM, Bldg 323
Fort Carson CO 80913-5000
oneillk@carson-emh1.army.mil
(719) 526-6838

KEYWORD: HAZARDOUS WASTE

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: WEAPONS CLEANERS

OPERATIONAL CONTACT:

Bob Mullins, Environmental Inspector HQ, Fort Carson
AFZC-ECM-PP
DECAM, Bldg. 323
Fort Carson, CO 80913-5000
mullinsb@carson-emh1.army.mil
(719) 526-6999

KEYWORD: HAZMART PHARMACY

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: HAZARDOUS MATERIALS CONTROL CENTER (PHARMACY)

FOCUS OF SUCCESS STORY: Centralized storage and tracking of hazardous materials (HM) at Fort Carson.

ORIGINAL PROCESS: HM was ordered and controlled by anyone on post who wanted it

FACILITY DESCRIPTION, MISSION, SIZE: Fort Carson has a population of over 100,000, including Active Duty Military, Family Members, Civilians, and Retirees. The Cantonment Area is 137,403 acres and Pinon Canyon Maneuver Site is 235,896 acres, Fort Carson serves 4 major units with a total of 13,077 soldiers and 546 Combat Systems (Tanks, Bradleys, Howitzers, and Helicopters). Fort Carson's primary mission is training for combat readiness.

COST:

START UP COSTS

Contracted Staff:	\$260K
Building Renovations:	55K
Computer System:	75K
HM Storage Vaults:	60K
TOTAL:	\$450K

RECURRING COSTS Contracted staff will be a recurring cost, to increase the second year and decrease and remain stable for following years.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS Currently, the Hazardous Materials Control Center has a \$300,000 cost avoidance for the post. Other posts have shown \$740K (Red River Army Depot), \$10 million in acquisition avoidance (Point Mugu Naval Air Weapon Station), and \$400K (Fort Campbell).

PAYBACK PERIOD 1.5 years

OTHER BENEFITS (NON-MONETARY)

- Less HM purchased and disposed of.
- Safer conditions for troops and emergency crews.
- Increased storage capacity at motorpools.
- Toxic Release Inventory reporting made easier.

OBSTACLES:

- Startup costs.
- Finding an experienced staff for a new system.
- Finding a suitable building.
- Introducing a new method of doing business.

SOURCE/SUPPLIER:

Pacific Environmental Services
6001 South Miami Blvd., Ste 300
P.O. Box 12077
Research Triangle Park, North Carolina 27709-2077
(919) 941-0234
Attn: Mike Dousette

KEYWORD: HAZMART PHARMACY

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: HAZARDOUS MATERIALS CONTROL CENTER (PHARMACY)

P2 CONTACT:

Kelly O'Neill
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Fort Carson AFZ-ECM-PP
DECAM, Bldg 323
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(719) 526-6838

OPERATIONAL CONTACT:

Ron Brown
Pacific Environmental Services
HQ, Fort Carson
AFZC-ECM-PP
DECAM, Bldg. 323
Fort Carson, CO 80913-5000
(719) 526-5349

KEYWORD: OFFICE

FACILITY: EPA REGION 8, DENVER, COLORADO

P2 PROJECT NAME: EPA CONFERENCE CENTER

FOCUS OF SUCCESS STORY:

The EPA Conference Center has implemented a number of pollution prevention ideas since its inception in 1989. Energy efficient lighting was installed and occupancy sensors were added in every room. Each room has panels of Whisper Wall - a fabric covered panel that absorbs sound. Users can pin flip chart pages or other materials to the Whisper Wall with steel pins and avoid using tape. As a result, walls do not have to be painted as frequently. The carpet was installed in squares, so it can be replaced in small sections if needed. We replace the arms of chairs as they wear out rather than buying new chairs. Non-toxic flip chart markers are used. Office supplies with recycled content are used where possible, and the copy machine uses paper with 35% postconsumer content. Ceramic mugs are available for large meetings and employees are encouraged to bring their own reusable mugs. The Conference Center purchased excellent speaker phones and provides them for conference calls. Office paper and aluminum cans are recycled. Plastic name tags are reused.

ORIGINAL PROCESS:

Prior to the Conference Center, there was no concerted pollution prevention for meetings at the EPA offices. EPA Region 8 was spending approximately \$100,000+ a year for large meeting rooms and audiovisual rental in hotels.

FACILITY DESCRIPTION, MISSION, SIZE:

The EPA Region 8 Office has approximately 600 employees and is located in a private office building in downtown Denver. The EPA oversees, administers and enforces environmental laws, regulations and programs. The Conference Center has 15 meeting rooms. The first year of operation, it handled about 100 people per day and now handles 1400-1600 people per day. Conference Center space is available to other Federal tenants in our building.

COST:

START UP COSTS

Whisper walls for all the rooms cost approximately \$25,000. Speaker phones cost approximately \$800 each, depending on number ordered and if any promotions are available. Additional construction costs were incurred.

RECURRING COSTS

Staffed by 2 part time Senior Environmental Employees and one contractor <\$25,000. Space rent is about \$180,000 annually.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS

Savings haven't been quantified. However, we rarely have to pay for hotel meeting rooms and audio visual equipment rental. We also save staff resources, since we don't have to cut as many purchase orders for room and audiovisual rental. Expensive equipment can be leveraged - don't need a speaker phone, datashow or TVNCR for each room, for example. Some travel has been reduced because employees and managers are willing to conduct their work using a conference call due to the good audio quality of the speaker phones.

PAYBACK PERIOD

N/A

KEYWORD: OFFICE

FACILITY: EPA REGION 8, DENVER, COLORADO

P2 PROJECT NAME: EPA CONFERENCE CENTER

OTHER BENEFITS (NON-MONETARY)

Enhances EPA's public image. Energy savings, reduction in use of toxic products, waste minimization have occurred but have not been quantified. Staff has improved working conditions - meetings can be held in fully equipped, centralized facility and not disrupt employees' work space. Information flow, communication, training opportunities are expanded.

OBSTACLES:

Had to request and receive building funds from EPA Headquarters.

SOURCES/SUPPLIER:

Whisper Walls
10957 E. Bethany Dr.
Aurora, CO 80014
(303) 671-6696

Polycom Soundstation Polycom, Inc.
2584 Junction Avenue
San Jose, CA 95134-1902
(408) 526-9000

P2 CONTACT:

Dianne Thiel (8P2-P2)
U.S. EPA Region 8
999 18th Street, Suite 500
Denver, CO 80202-24660
(303) 312-6389
thiel.dianne@epamail.epa.gov

OPERATIONAL CONTACT:

Harry H. Hill, III (8TMS-1)
U.S. EPA Region 8
999 18th Street, Suite 500
Denver, CO 80202-2466
(303) 312-6456
hill.harryh@epamail.epa.gov

KEYWORD: RECYCLING - AEROSOL CANS

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: RECYCLING PROGRAM FOR AEROSOL CANS AND PAINT

FOCUS OF SUCCESS STORY: Last year, the USAF Academy generated 1,308 pounds of waste aerosol cans. The cans required disposal as hazardous waste because they were not empty and, in some cases, could not be emptied due to defective nozzles, etc. Because propellant gasses remain in 'empty' aerosol containers, disposing of them in a municipal solid waste landfill may be prohibited. Partially empty aerosols may be considered 'reactive' by RCRA. Consequently, the Hazardous Waste Program implemented an aerosol can recycling program that punctures and empties aerosol cans. The punctured, empty cans are recycled as scrap metal and the bulked paint is also recycled.

ORIGINAL PROCESS: Aerosol cans which did not meet the RCRA definition of empty were collected, containerized and disposed as hazardous waste. Empty aerosol cans were disposed as hazardous or as municipal solid waste.

FACILITY DESCRIPTION, MISSION, SIZE: The Air Force Academy sits on 19,000 acres located just north of Colorado Springs. The Academy's primary mission is to train future air and space leaders. Activities include cadet academic and military training, base maintenance and support, and airfield operations.

COST:
START UP COSTS Aerosol Can Puncturing System (including filter cartridges)- \$659
55 gal. drum (to containerize paint removed from cans) - \$42

RECURRING COSTS Replacement cartridges - \$135 (replaced approximately every 45-60 days) 55 gal. drum - \$42 (replaced approximately once per year). Monetary savings include not only the hazardous waste disposal costs associated with unused aerosol cans, but also the drums used to containerize the waste. Additionally, the crushed cans will be sold as scrap metal (current scrap steel prices are approximately \$20 per ton).

COST SAVINGS OR AVOIDANCE:
MONETARY SAVINGS Hazardous waste disposal cost - \$1.09 per pound (averaging \$1,426 per year) 55 gal. drums - \$42 (averaging \$420 per year)

PAYBACK PERIOD The break even point on the initial equipment investment should occur within the first year. The actual payback period is dependent on the number of paint cans which require disposal or recycling.

OTHER BENEFITS (NON-MONETARY): Aerosol can puncturing, crushing and recycling is a means to eliminate disposing of aerosol cans as hazardous or solid waste. The puncturing device safely punctures the cans, capturing their contents (including the VOC emissions) for ease in recycling and disposal. This recycling process also reduces liability associated with hazardous waste disposal and disposal of aerosol containers in municipal landfills. Proactive recycling programs also demonstrate the Academy's commitment to pollution prevention and environmental protection.

OBSTACLES: Committing the resources for the purchase of equipment.

KEYWORD: RECYCLING - AEROSOL CANS

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: RECYCLING PROGRAM FOR AEROSOL CANS AND PAINT

SOURCE/SUPPLIER: Aerosolv Puncturing System - New Pig
Technical Service Staff
1-800-HOT-HOGS
NEWPIGTEK@AOL.COM

P2 CONTACT: Diana Dean
Air Force Academy
HQ USAFA/CEVC
8120 Edgerton Drive, Suite 40
USAF Academy CO 80840-2400
(719) 333-4483

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KEYWORD: RECYCLING - WASTE PAINT / PAINT CANS

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: RECYCLING PROGRAM FOR WASTE PAINT AND PAINT CANS

FOCUS OF SUCCESS STORY: Last year, The USAF Academy generated 13,114 pounds of waste paint at a disposal cost of \$35,000. As part of the Academy's pollution prevention efforts, the Hazardous Waste Program implemented a paint and paint can recycling program to recycle paint and paint cans.

ORIGINAL PROCESS: Paint cans which were partially full (not meeting the definition of RCRA empty) were containerized in 55 gallon drums and disposed of as hazardous waste. RCRA empty paint cans were disposed of in solid waste dumpster's and ultimately landfilled.

FACILITY DESCRIPTION, MISSION, SIZE: The Air Force Academy sits on 19,000 acres located just north of Colorado Springs. The Academy's primary mission is to train future air and space leaders. Activities include cadet academic and military training, base maintenance and support, and airfield operations.

COST:

START UP COSTS Paint Can Crusher (crushes one-gallon and five-gallon cans) - \$2,100
Paint Can Shaker (stirs paint left in cans to facilitate pouring paint) - \$1,100
55 gal. drum - \$42

RECURRING COSTS 55 gal. drum - \$42 (replaced approximately once per year)
Paint Recycling via Fuels Blending - \$0.33 per pound

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS Hazardous waste disposal costs - \$2.73 per pound (averaging \$35,000 per yr)
55 gal. drums - \$1,890 per year
Profit from scrap metal recycling: \$20 per ton

PAYBACK PERIOD The actual payback period will depend on the quantity of paint and paint cans generated. Based on 1996 generation data, payback should occur within 3 months.

OTHER BENEFITS (NON-MONETARY): Paint can crushing and paint recycling is a means to eliminate disposing of waste paint and paint cans as hazardous or solid waste and reduces environmental liability. Recycling programs promote environmental stewardship.

OBSTACLES: Committing the resources for the purchase of equipment.

SOURCE/SUPPLIER: N/A

P2 CONTACT: Diana Dean
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KEYWORD: RECYCLING - WASTE PAINT / PAINT CANS

FACILITY: U.S. AIR FORCE ACADEMY, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: RECYCLING PROGRAM FOR WASTE PAINT AND PAINT CANS

OPERATIONAL CONTACT:

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KEYWORD: TRAINING

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: JOINT SERVICES POLLUTION PREVENTION VIDEO

FOCUS OF SUCCESS STORY: The need for a P2 Training and idea exchange video was identified by the Environmental Protection Agency (EPA), the United States Air Force Academy (USAFA) and Fort Carson. Representatives from each agency decided to pool resources and jointly fund a video.

ORIGINAL PROCESS: No training video was in place.

FACILITY DESCRIPTION, MISSION, SIZE: Fort Carson has a population of over 100,000, including active duty military, family members, civilians and retirees. The cantonment area is 137,403 acres and Pinon Canyon maneuver site is 235,896 acres. Fort Carson serves four major units with a total of 13,077 soldiers and 546 combat systems (Tanks, Bradleys, Howitzers, and helicopters). Fort Carson's main mission is combat readiness training.

The Air Force Academy sits on 19,000 acres located just north of Colorado Springs. The Academy's primary mission is to train future air and space leaders. Activities include cadet academic and military training, base maintenance and support, and airfield operations.

The EPA Region 8 Office has approximately 600 employees and is located in a private office building in downtown Denver. The EPA oversees, administers and enforces environmental laws, regulations, and programs.

COST:

START UP COSTS The video cost was \$45,000 to script, film, edit, develop graphics and provide 60 copies of the film (20 to each partner).

RECURRING COSTS The P2 video costs \$2.50 to reproduce if extras are needed.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS N/A

PAYBACK PERIOD N/A

OTHER BENEFITS (NON-MONETARY): P2 ideas were shared, the P2 concept was widely disseminated, and the video was a catalyst for other partnering ideas.

OBSTACLES: Finding a funding mechanism for joint services to be able to fund a single contractor.

SOURCE/SUPPLIER: Robert Sheldon
CH2M Hill
100 Invemess Terrace East
Englewood, Colorado 80112-5304
(303) 771-0900

KEYWORD: TRAINING

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: JOINT SERVICES POLLUTION PREVENTION VIDEO

P2 CONTACT:

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Dianne Thiel (8P2-P2)
U.S. EPA Region 8
999 18th Street, Suite 500
Denver, CO 80202-24660
(303) 312-6389
thiel.dianne@epamail.epa.gov

OPERATIONAL CONTACT:

Same as above.

KEYWORD: VEHICLE MAINTENANCE SHOP

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: FILTRATION SYSTEM REPLACEMENT FOR TRADITIONAL PARTS WASHERS

FOCUS OF SUCCESS STORY: Currently, Fort Carson is utilizing Safety Kleen to provide motorpool parts washers. The solvent is non-RCRA waste, but is regulated, has volatile organic compounds (VOCs), and a very strong odor. The new method uses a filtration system that extends the life of the solvent and uses a pleasant smelling, less toxic substance. The solvent cleans well and the filters have been tested as non-hazardous.

ORIGINAL PROCESS: Previously used parts washers used solvent that contained VOCs.

FACILITY DESCRIPTION, MISSION, SIZE: Fort Carson has a population of over 100,000, including Active Duty Military, Family Members, Civilians, and Retirees. The Cantonment Area is 137,403 acres and Pinon Canyon Maneuver Site is 235,896 acres, Fort Carson serves 4 major units with a total of 13,077 soldiers and 546 Combat Systems (Tanks, Bradleys, Howitzers, and Helicopters). Fort Carson's primary mission is training for combat readiness.

COST:
START UP COSTS Three years worth of supplies - Hardware should last at least 15 years:
Hardware: \$2,367 / unit
55 Gal. Drum of Cleaner: \$1,443 / drum
Filters (12): \$160 / box
Total cost: \$3,969.95

RECURRING COSTS Recurring costs include purchase of one drum of cleaner approximately every three years, 12 filters every three years, and fluorescent lamps when broken at \$2.00/lamp. For the price of a plane ticket, the vendor will train on use and maintenance for free if more than 20 units are purchased.

COST SAVINGS OR AVOIDANCE:
MONETARY SAVINGS An average cost for a Safety Kleen parts washer is \$700/year. After the initial purchase of equipment, this amount is saved, because the solvent does not have to be changed but once every two to three years, depending upon use.

PAYBACK PERIOD After capital expenditure, the savings is only about \$75 per year per machine. This can make a difference, depending upon the number of units replaced. For only one machine, the payback period will be approximately 4 years.

OTHER BENEFITS (NON-MONETARY) Ozone Depleting Chemicals are decreased, soldiers work environment is improved due to the smell and reduced exposure to hazardous chemicals, decreased disposal of solvent.

OBSTACLES: The main obstacle was that the soldiers and shop workers did not want to have to service the machines themselves after having a contractor (Safety Kleen) do this for so long. However, once the advantage of the smell and utility of the units was discovered, the new units became more heavily used than the Safety Kleen units.

KEYWORD: VEHICLE MAINTENANCE SHOP

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

**P2 PROJECT NAME: FILTRATION SYSTEM REPLACEMENT FOR TRADITIONAL PARTS
WASHERS**

SOURCE/SUPPLIER: Inland Technology
1-800-552-3100
POC: Ron Carberry

P2 CONTACT: Kelly O'Neill
HQ Fort Carson
Fort Carson AFZ-ECM-PP
DECAM, Bldg 323
Fort Carson CO 80913-5000
oneillk@carson-emh1.army.mil
(719) 526-6838

OPERATIONAL CONTACT: Bob Mullins, Environmental Inspector HQ, Fort Carson
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(719) 526-6999

KEYWORD: VEHICLE MAINTENANCE SHOP

FACILITY: FORT CARSON, COLORADO SPRINGS, COLORADO

P2 PROJECT NAME: ANTIFREEZE RECYCLING

FOCUS OF SUCCESS STORY: Antifreeze is now recycled instead of poured into the Sewage Treatment System.

ORIGINAL PROCESS: Antifreeze from motor pool activities was changed out, poured into the installation water treatment system, and new antifreeze was purchased.

FACILITY DESCRIPTION, MISSION, SIZE: Fort Carson has a population of over 100,000, including Active Duty Military, Family Members, Civilians, and Retirees. The Cantonment Area is 137,403 acres and Pinon Canyon Maneuver Site is 235,896 acres, Fort Carson serves 4 major units with a total of 13,077 soldiers and 546 Combat Systems (Tanks, Bradleys, Howitzers, and Helicopters). Fort Carson's primary mission is training for combat readiness.

COST:

START UP COSTS Equipment: \$11,073
Additives: 4,000

RECURRING COSTS Additives: \$4000 - enough to recycle 3750 gallons of antifreeze.

COST SAVINGS OR AVOIDANCE:

MONETARY SAVINGS For every 3,750 gallons of antifreeze recycled, the post saves \$9,402. The cost for additives has been subtracted.

PAYBACK PERIOD Payback will begin in 1.5 years

OTHER BENEFITS (NON-MONETARY) The quantity of antifreeze purchased and wasted has decreased significantly. Therefore, the risks to the environment are decreased.

OBSTACLES: Training on use of the machine.
Ensuring that antifreeze is not contaminated by oil.
Power requirements: 240V 3 Phase 40A

SOURCE/SUPPLIER: Finnish-Thompson
POC: Regis Finn
(301) 924-5150

P2 CONTACT: Kelly O'Neill, Pollution Prevention Coordinator
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FACILITY INDEX:

Names of Facilities Contributing Success Stories:

Air Force Academy

Defense Finance and Accounting Service

Eldorado Air Station

EPA Region 8

Fort Carson

Peterson Air Force Base

Space Command

SUBJECT INDEX:

(Gives secondary headings for success stories which cover more than one area)

SECONDARY HEADING:

Bicycles / Alternative Transportation:

see also Commuting to Work (Air Force Academy)

Body Shop:

See also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

Energy Conservation:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

Fueling:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

Hazmart Pharmacy:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

Household Hazardous Waste:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

Painting / Paint Stripping:

see also Recycling - Paint and Paint Cans (Air Force Academy)

Partnerships:

see also Composting (Fort Carson and Air Force Academy)

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

Pesticides:

see also Recycling - Aerosol Cans and Paint (Air Force Academy)

POL:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy, EPA Region 8)

SUBJECT INDEX, continued:

(Gives secondary headings for success stories which cover more than one area)

SECONDARY HEADING:

Recycling:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy,
EPA Region 8)

Reuse:

see also Training - Joint Services P2 Video (Fort Carson, Air Force Academy,
EPA Region 8)

Training:

see also Office (EPA Region 8)

Vehicle Maintenance:

see also Training (Fort Carson, Air Force Academy, EPA Region 8)

Wastewater Treatment

see also Hazardous Waste (Eldorado Air Station)