

**COLORADO/DOD
POLLUTION PREVENTION
NETWORK
VEHICLE MAINTENANCE
STAFF ASSISTANCE VISIT
FINAL REPORT**

**Fort Carson, CO
Buckley ANGB, CO
US Air Force Academy, CO**

Conducted By:

**Air Force Center for Environmental Excellence
Army Industrial Operations Command
Colorado Dept. of Public Health and Environment
Parsons Engineering Science**



9-13 March 1998

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STAFF ASSISTANCE VISIT INTRODUCTION

This Vehicle Maintenance Pollution Prevention Staff Assistance Visit (SAV) was conducted at the request of members of the Colorado/DoD Pollution Prevention Network. The Colorado/DoD Pollution Prevention Network is a group of pollution prevention representatives from Colorado Department of Defense installations, local industry, EPA Region VIII, and the Colorado Department of Public Health and Environment. The purpose of the group is to discuss, share, and cross-feed pollution prevention ideas and initiatives with one another.

The Air Force Center for Environmental Excellence (AFCEE) put together a SAV Team to perform walk-through pollution prevention opportunity assessments and to make on-the-spot recommendations for vehicle maintenance facilities at three Colorado DoD installations: Fort Carson, Buckley ANGB, and the United States Air Force Academy. The six-member SAV Team consisted of personnel from the Air Force Center for Environmental Excellence, the Army Industrial Operations Command, Parsons Engineering Science, and the Colorado Department of Public Health and Environment. Pre-visit questionnaires were developed to gather data from the installations prior to the visit. The visit was conducted 9-13 March 1998 and an outbrief of findings was delivered to Colorado/DoD Pollution Prevention Network members at their quarterly meeting.

A secondary purpose of this visit was to collect data for the update of the Air Force Transportation/Vehicle Maintenance Pollution Prevention Model Shop Report. This report, produced by AFCEE, is a conglomeration of numerous pollution prevention ideas/initiatives applicable to typical Air Force vehicle maintenance operations. Each opportunity in the report includes a discussion of the alternative, advantages/disadvantages, equipment required, vendor sources, cost data, and return on investment calculations. The updated report is expected to be completed by 1 July 1998.

In accordance with the SAV MOU, this Final Report summarizes the staff assistance visit and the recommendations presented at the SAV Outbrief. A short description of each opportunity identified is provided along with the SAV Team's Priority Ranking for that opportunity. The Priority Ranking is a prioritization of which opportunities the installation should pursue first. The SAV Team developed the ranking based on many factors such as environmental impact, cost, return on investment, mission impacts, etc. Further research on the opportunities including equipment and vendor information is NOT included in this report. The Air Force Transportation/Vehicle Maintenance Pollution Prevention Model Shop Report, when completed, will contain detailed write-ups for most of the opportunities and management practices identified in this report.

The SAV Memorandum of Understanding (MOU), SAV team member list, installation POC list, and pre-visit questionnaire results are presented in the appendices of this report.

SITE VISIT REPORT

The purpose of this staff assistance visit (SAV) is to provide on-site pollution prevention assistance for vehicle maintenance facilities for three installations of the Colorado/DoD Pollution Prevention Network: Fort Carson, Buckley Air National Guard Base, and the United States Air Force Academy. A secondary purpose of the visit was to collect information and opportunities for the update of the Air Force Pollution Prevention Model Shop Report developed by Air Force Center for Environmental Excellence.

The Staff Assistance Team was a mixture of personnel from four different entities. Mr. John Matthews from the Air Force Center for Environmental Excellence, San Antonio, Texas led the team. Ms. Toni McNeal and Mr. Walter Hinz represented the Army Industrial Operations Command out of Rock Island, Illinois. Mr. John Rodgers and Ms. Jennifer Sachar represented Parsons Engineering Science, Fairfax, Virginia. Parsons Engineering Science is the contractor responsible for updating the Air Force Pollution Prevention Model Shop Report. Mr. Neil Kolwey of the Colorado Department of Public Health and Environment, Denver, Colorado participated in the USAF Academy visit as well as the outbrief.

The staff assistance visit took place 9-13 March 1998. Fort Carson was visited first on Monday and Tuesday. Buckley Air National Guard Base was visited on Wednesday. The USAF Academy was visited on Thursday. The site visit outbrief took place at the USAF Academy Officer's Club on Friday, March 13. The following is a brief summary of the information gathered and observations made at these facilities.

Fort Carson

An initial meeting was conducted with Chief Cosgrove at the Directorate of Logistics, Vehicle Maintenance facility, Building 8000 to introduce the SAV Team and to explain objectives of the visit. Chief Cosgrove provided an overview of the organization and operations of Vehicle Maintenance. After the meeting, Chief Cosgrove gave the SAV Team a tour of the vehicle maintenance operations/shops. A visual inspection was performed of most of the vehicle maintenance operations shops including the simple maintenance shop, the GS level maintenance shop, the parts washing shop, the electronics shop, the oil analysis shop, the engine performance testing shop, small component repair shop, the battery shop, the tire shop, the allied trades shop, and the paint shop. The team walked through the entire area of the building discussing the details of the equipment or processes in each physical area. Personnel involved in individual processes were interviewed on specific details of their work and on the performance of equipment. An outbrief of initial findings was presented to Chief Cosgrove and to the Vehicle Maintenance Supervisor, Mr. Joe Massouda.

Because of the size and complexity of the building and the limited time available to perform the visit, not all operations were evaluated in detail. A list of implemented P2 initiatives at Fort Carson was developed. Twenty-two new P2 opportunities were identified by the SAV Team for Fort Carson and these recommendations were presented at the SAV outbrief.

Buckley Air National Guard Base

An initial meeting was conducted with SSgt Beth Finney (Buckley ANGB Pollution Prevention POC) at her office to introduce the SAV Team and to explain objectives of the visit. SSgt Finney provided an overview of the organization and operations of the base pollution prevention program and the vehicle maintenance mission at Buckley. After the meeting, SSgt Finney took the SAV Team to Vehicle Maintenance and introduced them to Mr. Larry Clark. Mr. Clark is the vehicle maintenance shop foreman. He gave the SAV Team a tour of the facilities. A visual inspection was performed of most of the vehicle maintenance operations shops including the general purpose vehicle maintenance shop, the special purpose vehicle maintenance shop, and the aircraft refueler truck maintenance shop. The vehicle maintenance shop at Buckley is fairly small as they maintain only about 170 vehicles and no longer perform any allied trade or vehicle painting services. The team walked through the entire area of the building discussing the details of the equipment or processes in each physical area. An outbrief of initial findings was presented to SSgt Finney and Mr. Clark.

The SAV Team also briefly visited the Aerospace Ground Equipment (AGE) maintenance shop to collect additional data on some pollution prevention equipment in use there. A list of implemented P2 initiatives at Buckley was developed. Nine new P2 opportunities were identified by the SAV Team for Buckley and these recommendations were presented at the SAV outbrief.

United States Air Force Academy

An initial meeting was conducted with Ms. Karen Craig (Academy Hazardous Waste POC) at her office to introduce the SAV Team and to explain objectives of the visit. Ms. Craig provided an overview of the organization and operations of the base pollution prevention program and the vehicle maintenance mission at the Academy. After the meeting, Ms. Craig took the SAV Team to Vehicle Maintenance and introduced them to Mr. Joe O'Connor. Mr. O'Connor is the vehicle maintenance shop supervisor. He gave the SAV Team a tour of the facilities. A visual inspection was performed of most of the vehicle maintenance operations shops including the general purpose vehicle maintenance shop, the special purpose vehicle maintenance shop, and the lube rack, the allied trades shop, the paint shop, and the upholstery shop. The vehicle maintenance shop at the Academy maintains about 488 vehicles. The team walked through the entire area of the building discussing the details of the equipment or processes in each physical area. An outbrief of initial findings was presented to Ms. Craig and Mr. O'Connor.

A list of implemented P2 initiatives for the Academy was developed. Sixteen new P2 opportunities were identified by the SAV Team for the Academy and these recommendations were presented at the SAV outbrief.

Staff Assistance Visit Outbrief

The Staff Assistance Visit Outbrief was performed on Friday during the quarterly meeting of the Colorado/DoD Pollution Prevention Network Meeting held at the USAF Academy Officer's Club. Representatives from each DoD facility, from local industry, from the USEPA, and from the Colorado Department of Public Health and Environment were in attendance. The SAV Team presented the mission, the vehicles maintained, the processes performed, the wastes generated,

the implemented pollution prevention initiatives, and the recommended pollution prevention opportunities for each vehicle maintenance facility. The Colorado/DoD P2 Network members present were very pleased with the job the SAV Team did. There was much discussion and cross-feed of information between members about the opportunities identified. After the SAV Team outbrief, a representative from Inland Technologies briefed on the chemical substitution identification process and on technologies his company has developed that are applicable to DoD vehicle maintenance operations.

I. INTRODUCTION

A. Staff Assistance Visit (SAV) Team Members:

Mr. John Matthews (Air Force Center for Environmental Excellence, Brooks AFB, Texas)
Ms. Toni McNeal (Army Industrial Operations Command, Rock Island Arsenal, Illinois)
Mr. Walter Hinz (Army Industrial Operations Command, Rock Island Arsenal, Illinois)
Mr. John Rodgers (Parsons Engineering Science, Fairfax, Virginia)
Ms. Jennifer Sachar (Parsons Engineering Science, Fairfax, Virginia)
Mr. Neil Kolwey (Colorado Department of Public Health and Environment, Denver, Colorado)

B. Staff Assistance Visit Scope/Purpose:

1. Provide on-site pollution prevention (P2) staff assistance for vehicle maintenance operations at Fort Carson, Buckley Air National Guard Base, and United States Air Force Academy.
2. Perform walk-through P2 opportunity assessments and provide on-the-spot recommendations.
3. Collect data for the Air Force Center for Environmental Excellence (AFCEE) Transportation/Vehicle Maintenance Pollution Prevention Model Shop Report.

C. Outbrief Structure:

For each installation, the SAV team will discuss:

- A. POCs interviewed at each installation
- B. Mission of the vehicle maintenance function
- C. Types of vehicles maintained
- D. Maintenance Processes Performed
- E. Waste Streams
- F. Already implemented P2 initiatives
- G. Recommended P2 opportunities

II. FORT CARSON

A. POCs: CW2 Michael Cosgrove (Directorate of Logistics, Vehicle Maintenance Building 8000)
Mr. Joe Massouda (Directorate of Logistics, Vehicle Maintenance, Building 8000)
Ms. Karen White (Fort Carson Pollution Prevention Manager, DECAM, Building 340)

B. Mission: The Directorate of Logistics (DOL) performs both simple maintenance and GS-level (depot level) maintenance operations for tactical and heavy equipment vehicles. Customers include the 3rd Combat Maneuver Brigade, 3rd Armored Cavalry, 43rd Support Group, 10th Special Forces, and various base training units.

C. Vehicles Maintained: Humvees
Armored Vehicles (tanks, etc.)
5 Ton Trucks
2.5 Ton Trucks
Trailers
Refuelers
Forklifts
Snow Plows
Snow Mobiles

D. Vehicle Maintenance Processes Performed:

Oil/Oil Filter Changes	Parts Machining
Antifreeze Changes	Fuel Filter Changes
Transmission Fluid Changes	Oil Analysis
Engine Rebuilds	Solvent Parts Washing/Degreasing
Transmission Rebuilds	Aqueous Parts Washing/Degreasing
Brake Maintenance	Garnet Media Blasting
Tire Changes/Maintenance	Silica Media Blasting
Battery Maintenance	Vacuum Sanding
Fuel Injector Rebuilds	Vehicle Painting
Pump Repair/Rebuilds	Stenciling
Circuit Board Repair/Cleaning	Drum/Container Rinsing
Carburetor Cleaning	Vehicle Washing
Body Work/Welding	Spill Clean-up
Air Conditioning Repair/Recharges	Floor Washing
Engine Performance Testing (Dynamometer)	

E. Waste Streams Generated:

- | | |
|--|---|
| Used POLs (Oils, Transmission Fluid, etc.) | Spent Solvent from Solvent Sinks |
| Oil Filters | Spent Filters from Solvent Sinks |
| Fuel Filters | Wastewater from Aqueous Parts Washers |
| Refueler Truck Filters | Wastewater from Vehicle Washing |
| Air Filters | Wastewater from Floor Cleaning |
| Used (Recyclable) Antifreeze | Wastewater from Drum/Container Rinsing |
| Contaminated (Waste) Antifreeze | Air Emissions from Parts Washing Solvents |
| Antifreeze Recycling Sludge | Air Emissions from Paints and Thinners |
| Scrap Metal | Used Rags |
| Scrap Rubber | Uniforms |
| Scrap/Wood Pallets | Used Absorbent Clay |
| Batteries | Used Absorbent Pads |
| Battery Electrolyte | Brake Fluid |
| Tires | Brake Dust |
| Used Paint Thinner (Paint Gun Washing) | Used Metal Drums |
| Unused/Excess Paint and Thinner | Used Plastic Drums/Bottles/Containers |
| Empty Aerosol Cans | Cardboard |
| Paint Booth Filters | Office Paper |
| Empty Paint Cans | Aluminum Cans |
| Spent Garnet Blast Media | |
| Spent Silica Blast Media | |
| Paint/Metal Dust from Vehicle Sanding | |

F. Implemented P2 Initiatives:

#	Initiative Title	Description	Type of P2 Initiative
1	Implementation of the Army Oil Analysis Program (AOAP)	Involves regular testing of engine oil to determine if and when it needs to be changed. This way oil changes are only performed when needed instead of on a regular mileage/time basis.	Source Reduction
2	Bulk Distribution of Engine Oils	Bulk distribution of vehicle fluids avoids generation of solid waste from small individual containers. It also helps to prevent spills and allows mechanics to acquire the exact amount of fluid needed for the job.	Source Reduction
3	Used Oil Recycling	Used oil generated by Vehicle Maintenance is picked up by a contractor and burned off-site for energy recovery instead of being disposed of as solid or hazardous waste.	Recycling
4	Scrap Metal Recycling	All types of scrap metal (cast iron, aluminum, steel, etc.) are collected in dumpsters outside of Building 8000 and turned into DRMO to be recycled.	Recycling

5	Use of Aqueous Parts Washers	Vehicle Maintenance has about 13 large aqueous jet washers for parts cleaning and degreasing. These large dishwasher-type washers use hot water and soap to clean gears, engine blocks, transmission parts, etc. Using aqueous parts washers avoids purchasing and disposing of hazardous solvents to do the same job.	Source Reduction
6	Use of HVLP Paint Guns	The Vehicle Maintenance Paint Shop uses High Volume, Low Pressure (HVLP) paint guns to paint vehicles. This style of paint gun reduces over-spray and the amount of paint needed per job.	Source Reduction
7	Sanding and Media Blasting for Paint Removal	Vehicle Maintenance uses vacuum sanders and media blasting (garnet and silica) to remove paint from vehicles/parts. This method of paint removal replaces the old chemical stripping method. Instead of disposing of large volumes of thinners/strippers, you dispose of the blast media dust and paint dust.	Source Reduction
8	Use of a Paint Can Shaker to Mix Paint	Using a paint can shaker to mix paint instead stirring it by hand avoids (1) accidental paint spilling (2) paper, drop cloth, and stirring stick waste generated during the stirring process (3) releasing of VOCs while the paint can is open.	Source Reduction
9	Participation in the Fort Carson Hazardous Material Pharmacy Program	The Hazardous Material Pharmacy Program allows Vehicle Maintenance to obtain daily quantities of hazardous materials they need. Shops must apply for an authorization in order to purchase and receive a certain material. This program helps reduce the amount of material stored at each shop, helps reduce the amount expired shelf life material, and gives a single source on the base to make chemical substitutions.	Source Reduction
10	Recycling of Office Paper, Cardboard, and Aluminum Cans	Vehicle Maintenance has a baler to collect and bundle cardboard for recycling. Office paper and aluminum cans are collected and recycled through the post recycling center.	Recycling
11	Use of an Enclosed Paint Gun Washer	Using an enclosed paint gun washer allows painters to reuse paint thinner to clean out paint guns and reduces the amount of VOCs released during cleaning.	Recycling
12	Reuse of Plastic Over-pack Drums	Vehicle Maintenance reuses large plastic over-pack drums within the shop.	Recycling
13	Laundering of Shop Rags	Vehicle Maintenance sends their shop towels to another organization on post to be laundered instead of being landfilled. Rags are exchanged monthly on a one-for-one basis.	Recycling
14	One-for-One	Spent sealed lead-acid batteries are turned in to the	Recycling

	Exchange of Batteries	distributor for recycling when a new one is purchased. The lead core and the sulfuric acid electrolyte are recycled/regenerated to make new batteries.	
15	Use of Re-capped Tires	Vehicle Maintenance purchases re-capped tires for forklifts and other non-critical vehicles.	Source Reduction
16	Crushing of Oil Filters Prior to Disposal	Fort Carson crushes oil filters before disposing of them to reduce the volume of waste placed in the landfill.	Source Reduction
17	Use of Special Brake Cleaning Equipment	Vehicle Maintenance uses special brake cleaning equipment on both asbestos and non-asbestos brakes to capture contaminated brake dust and to prevent releases to the environment and exposure to workers.	Source Reduction

G. Recommended P2 Opportunities:

#	Opportunity	Description	SAV Team Priority Ranking (1-22)
1	Recycle Antifreeze	There are many options to accomplish this opportunity. (1) Purchase an antifreeze recycler for Vehicle Maintenance. (2) Purchase an antifreeze recycler for a central location on post. (3) Collect the used antifreeze in an above ground storage tank and send it off-site to be recycled. There are many different types of antifreeze recyclers (distillation, filtration, ion exchange) at a varying range of costs. All types of antifreeze recycling will require the purchase of additives to bring the recycled antifreeze up to specification. Also be sure to check with the State to see if you need a recycle permit to use this equipment. Antifreeze recycling sludge and used filters will almost always be characterized as a hazardous waste.	1
2	Send Used Oil to be Re-refined	Sending used oil to be burned for energy recovery is not true recycling. It is really treatment with a benefit. Fort Carson is currently paying a contractor to pick up and burn their used oil. Companies such as Safety-Kleen are setting up systems where you buy a volume of re-refined oil and Safety-Kleen will pick up the same volume of used oil and re-refine it at no cost.	2
3	Reduce the Number	The SAV team counted at least 13 red Safety-Kleen	3

	of Part Washing Solvent Sinks	solvent parts washing sinks throughout Vehicle Maintenance. Each month Safety-Kleen changes out about between 30 and 50 gallons of solvent from each tank. If the density of the solvent is about 7 pounds per gallon, Vehicle Maintenance is going through about 44,000 pounds of solvent per year. First, Vehicle Maintenance should determine exactly what parts must be cleaned with solvent. Parts that do not need to be cleaned with solvent should be cleaned in the existing aqueous jet washers or with aqueous based fluid in small sinks. Second, Vehicle Maintenance should determine how many Safety-Kleen sinks are needed to clean the parts identified in step one. It is also not necessary to have a sink at each maintenance bay or in each small component shop. Many shops or bays can share the same sink. Third, Vehicle Maintenance should remove unneeded sinks, cancel solvent deliveries/pickups, and place the remaining sinks in strategic locations for sharing. See Opportunity # 20 for ideas about extending the life of the solvent in these sinks.	
4	Purchase Re-refined Oil	This affirmative procurement initiative helps close the loop on oil recycling. Purchasing re-refined oil eliminates the need for buying virgin oil.	4
5	Install Filters on Solvent Sinks	Recommend installing filtration units on the numerous red Safety-Kleen solvent sinks. Filtration units help prolong the life of the solvent which would require changing it less often. Recommend adjusting the current Safety-Kleen contract so that 50 gallons of solvent is not picked up from every sink each month whether it needed changing or not. Over a span of a year, this is an incredible amount of solvent being sent off-site as hazardous waste. Change the contract so that Safety-Kleen only picks up the solvent when called (when it needs to be changed).	5
6	Recycle Oil Filters as Scrap Metal	Currently Fort Carson is crushing oil filters and disposing them as solid waste. Many installations across the country are sending their oil filters to be recycled as scrap metal.	6
7	Upgrade/Replace Indoor Steam Booth/Wash Rack	Vehicle Maintenance has an indoor wash rack (steam booth) to wash vehicles and to triple rinse drums and other metal containers. The current unit is an old natural gas fired boiler used to heat up the water. The water is dispensed from the boiler tank through a spray wand/nozzle. Because of its age, this boiler must run all day long to provide hot water on demand (it takes a long time to fire up the boiler and heat all of the water in the tank). Because the boiler runs all day long, water must flow through it constantly as well. Water is continuously flowing out of the hose and down to the sanitary sewer.	7

		This is tremendous waste of natural gas and water. Recommend replacing this system with one that heats water quickly and can be shut off when not in use.	
8	Above Ground Bulk Distribution System for Oils, POLs, and Antifreeze	Vehicle Maintenance currently has a bulk distribution system (with an underground storage tank) for some types of engine oil. Recommend getting an above ground bulk distribution system for all vehicle fluids (all types of engine oil, transmission fluid, antifreeze, brake fluid, hydraulic fluids, etc). This cuts down on smaller container waste. It also helps to prevent spills and allows mechanics to acquire the exact amount of fluid needed for a job. Also recommend replacing the current underground storage tank with an above ground system to avoid potential environmental headaches with monitoring the soil for leaks. The Air Force Academy vehicle maintenance shop has a model distribution system in which the above ground tanks are located outside the building in large storage lockers.	8
9	Pump Used POLs to Outside Used Oil Storage Tank or Use the Oil Caddy	<p>Used engine oils and other petroleum, oils, and lubricants (POLs) are currently hand carried in drip pans from the vehicle to the outside above ground used oil tank. This action has a large spill potential. Recommend moving the used oil tank closer to the building, installing a small sink to the wall of the inside of the building, and running a pipe from the sink to the used oil tank. Employees take their drip pans to the sink and pour out the oil with out carrying it a long distance over ice and snow. A small pump can be installed to move the oil from the sink to the tank in batch mode. This prevents accidental contamination of the used oil as the sink contents can be checked (for water, hazardous waste, etc.) before pumping. A grate can also be put on top of the sink and used to drain oil filters.</p> <p>The “Oil Caddy” is a special type of drip pan that has rollers, hoses, and a small enclosed storage tank. Mechanics roll the Oil Caddy under a vehicle when they are ready to perform an oil change. After draining the oil into the tank, the mechanic rolls the Oil Caddy to the used oil tank without fear of spilling any oil. Next, the mechanic hooks up a standard compressed air hose to the Oil Caddy and pumps the drained oil through a hose from the small tank into the bulk used oil tank.</p>	9
10	Red Rag Contract	Currently Vehicle Maintenance shop rags are collected and sent elsewhere on post to be laundered. Recommend using a red rag contract through a local off-site vendor. That way, Fort Carson can eliminate the on-site generation and	10

		treatment of this wastewater in their on-base water treatment plant. Once an initial set of red rags are purchased, they can be laundered for just pennies a rag. Buckley ANGB and the Air Force Academy are currently laundering their rags for about 7 to 8 cents per rag. Rags are exchanged one-for-one on a weekly, biweekly, or monthly basis.	
11	Explore the Possibility of Using Engine Oil By-pass Filters	Recommend exploring the possibility of installing engine oil by-pass filters on some vehicles. A by-pass filter is an additional filter system to be installed on the vehicle that takes about 10% of the circulating engine oil per pass, microfilters it, and returns it to the oil pool. Metals and other particles break down engine oil and therefore require oil to be changed regularly. By filtering out those particles, oil life can be extended at least 2 to 3 times longer. Since oil changes are performed less often with by-pass filters, an oil analysis program should accompany the use of oil by-pass filters in order to closely monitor oil quality and prevent engine breakdown. Vehicle Maintenance at Fort Carson is a good candidate for this opportunity since they already have a rigorous oil analysis program. Installing by-pass filter systems on tactical vehicles may require approval from the single or item manager.	11
12	Reuse/Recycle the Blast Media in Construction Projects	Vehicle Maintenance uses both garnet and silica blast media in vehicle and part de-painting. The spent blast media is often characterized as a hazardous waste because of the high metal content from the paint dust and from the vehicle body. This spent blast media could be mixed with cement and asphalt in post construction projects. The hazardous leaching characteristic is then removed because the metals are encapsulated in the cement/asphalt matrix. Check with the State to see if this reuse is OK. Some states may not allow you to do this.	12
13	Use Reusable Absorbent Pads for Spill Cleanup	Use absorbent pads for spill cleanup instead of absorbent clay (kitty litter). To absorb the same amount of spilled fluid, it takes a lighter weight of absorbent pads to clean up the spill than absorbent clay. Plus, an absorbent pad wringer can be purchased to squeeze the fluids out of the pad so that the pad can then be reused. There are many varieties of absorbent pads. Some are designed for oil; some are designed for aqueous solutions; some are multi-purpose; and there are some designed to perform a specific job (such as skimming oil off of a pool of antifreeze/ water). Some absorbent pads are also made from recycled content paper or plastic.	13

14	Use Mini-max Steam Cleaner System for Circuit Board and Small Parts Cleaning	Currently the Vehicle Maintenance Electronics Shop is using aerosol spray solvents to clean circuit boards and other electronic components. Recommend using a small component steam cleaning system to clean these components. The system consists of a wand that shoots a hot water/steam stream out of a nozzle. This system may also be ideal for some of the small parts cleaning in the small pump/fuel injector rebuild shops at Vehicle Maintenance. Buckley ANG Base is successfully using 4 of these cleaning systems for a wide variety of applications.	14
15	Replace Maintenance Batteries with Maintenance-Free Batteries	Currently Vehicle Maintenance is draining and replacing electrolyte in many of their batteries. This task requires Fort Carson to purchase and dispose of the sulfuric acid electrolyte as a hazardous waste along with requirements to provide adequate battery and electrolyte storage, ventilation, secondary containment, and personal protection for workers, etc. Vehicle Maintenance could replace batteries that must be maintained with commercial off-the-shelf sealed lead acid batteries and develop a one-for-one exchange program. Eventually, the need for a battery shop and all of the environmental headaches that go with it could be eliminated.	15
16	Seal Drain in the Battery Shop Floor and Add Secondary Containment for Storage of Electrolyte	The Battery Shop at Vehicle Maintenance stores batteries, recharges batteries, and drains/refills the electrolyte. There is an open drain on the shop floor next to the area where the battery maintenance occurs and next to the area where the electrolyte is stored. Recommend sealing off this drain to prevent the leaking of electrolyte if there was a spill in the room. Also recommend secondary containment for the electrolyte stored in this room. Containers of electrolyte are currently being stored on wood pallets next to that open drain.	16
17	Reuse of Absorbent Clay Before Disposal	At Vehicle Maintenance, absorbent clay (kitty litter) is used for spill cleanup. If clay absorbent must be used, it is best to use a 3 container system (new, used, spent) to ensure maximum use before disposal. After use, the clay is placed in the used bin. The used bin clay is reused until it is spent (completely saturated). Only then is it placed in the spent bin. A screen on top of the used bin to help separate the spent clay from clay that still has life.	17
18	Install Above Ground Hydraulic Vehicle Lifts	As the lift systems are being replaced, install hydraulic vehicle lifts that have above ground storage tanks for the hydraulic fluid. This prevents the potential of leaking hydraulic fluid into the underground soil.	18
19	Replace Gasoline	About half of Fort Carson's forklifts are already electric	19

	Powered Forklifts With Electric or Compressed Natural Gas (CNG) Ones	powered. As new forklifts are purchased to replace the gasoline powered ones, ensure that they are either electric or natural gas powered.	
20	Reuse/Compost Wood Pallets	The wood pallets generated at Vehicle Maintenance are currently being disposed of as solid waste. Pallets in good condition can be reused elsewhere on post. Pallets in poor condition can be chipped for mulch and used on post. If Fort Carson does not have a grinder or want to purchase one, maybe another installation has one and will accept the pallets. Maybe the city of Colorado Springs has a brush site that can accept them.	20
21	Purchase a Paint Can Crusher	Currently, Vehicle Maintenance places empty paint and thinner cans on outside, uncovered wood pallets to await to be sent to DRMO for recycling. A paint can crusher would allow them to crush the cans and place them in a closed 55 gallon drum. This would prevent rain/snow from washing residues into the environment and would keep the cans in good (rust-free) condition for recycling as regular steel.	21
22	Use Gel Cell Type Batteries	Where applicable, use gel cell type batteries in lieu of standard maintenance lead acid and sealed (maintenance-free) lead acid batteries. These batteries are filled with a gel substance that prevents leaking of battery acid if the outside casing breaks. They can be mounted at any angle in the vehicle and have been shown to produce more cold cranking amps than regular batteries. Although these batteries are more expensive, they typically last up to twice as long a standard sealed lead acid battery. This would reduce the amount (weight) of batteries generated at Fort Carson each year.	22

III. BUCKLEY ANG BASE

A. POCs: Mr. Larry Clark (Vehicle Maintenance Foreman, 140 LS/LGTM)
Mr. Scott Pillet (Environmental Flight Chief, 140 AGINS/CEV)
Ms. Beth Finney (Pollution Prevention Manager, 140 AGINS/CEV)

B. Mission: The 140th LS/LGTM supports the 140th Fighter Wing with vehicle maintenance operations for 170 general and special purpose vehicles.

C. Vehicles Maintained: Pick-ups
Vans
Police Cars
2.5 Ton Trucks
Fire Trucks
Refuelers
Snow Plows

D. Vehicle Maintenance Processes Performed:

Oil/Oil Filter Changes
Antifreeze Changes
Transmission Fluid Changes
Brake Maintenance
Tire Changes/Maintenance
Carburetor Cleaning
Air Conditioning Repair/Recharges

Fuel Filter Changes
Aqueous Parts Washing/Degreasing
Drum/Container Rinsing
Vehicle Washing
Spill Clean-up
Floor Washing

E. Waste Streams Generated:

Used POLs (Oils, Transmission Fluid, etc.)
Oil Filters
Fuel Filters
Refueler Truck Filters
Air Filters
Used (Recyclable) Antifreeze
Contaminated (Waste) Antifreeze
Antifreeze Recycling Sludge
Scrap Metal
Scrap Rubber
Scrap/Wood Pallets
Batteries

Wastewater from Aqueous Parts Washers
Wastewater from Vehicle Washing
Wastewater from Floor Cleaning
Wastewater from Drum/Container Rinsing
Used Rags
Uniforms
Used Absorbent Clay
Used Absorbent Pads
Used Metal Drums
Used Plastic Drums/Bottles/Containers
Cardboard
Office Paper

Brake Fluid
 Brake Dust
 Tires

Aluminum Cans

F. Implemented P2 Initiatives:

#	Initiative Title	Description	Type of P2 Initiative
1	Uses Aqueous-based Parts Cleaning Instead of Solvent-based cleaning	Buckley ANGB has reduced the amount of solvent parts washing sinks from 33 to 1 base-wide. Vehicle Maintenance has removed their solvent wash sinks and uses an aqueous jet washer to clean vehicle parts.	Source Reduction
2	Antifreeze Recycling	Vehicle Maintenance uses an antifreeze recycling unit (distillation type) to recycle antifreeze.	Recycling
3	Checks pH to Determine Antifreeze Changes	Instead of changing out the antifreeze in the vehicles on a regular time/mileage schedule, Vehicle Maintenance tests the pH of the antifreeze to identify when it is time to change it.	Source Reduction
4	Purchasing Re-refined Oil	Vehicle Maintenance is purchasing re-refined oil through base supply through a local vendor. Purchasing re-refined oil eliminates the need for virgin oil and stimulates demand for used oil as a feedstock in the re-refining process.	Source Reduction
5	Bulk Distribution of Engine Oils and Hydraulic Fluid	Bulk distribution of vehicle fluids avoids generation of solid waste from small individual containers. It also helps to prevent spills and allows mechanics to acquire the exact amount of fluid needed for the job.	Source Reduction
6	Use of the "Oil Caddy" Drip Pans	Vehicle Maintenance uses "Oil Caddy" drip pans for collecting used oil from engines and transferring oil to the used oil tank. The "Oil Caddy" is a special type of drip pan that has rollers, hoses, and a small enclosed storage tank. Mechanics roll the Oil Caddy under a vehicle when they are ready to perform an oil change. After draining the oil in to the pan, the mechanic rolls the Oil Caddy to the used oil tank without fear of spilling any oil. Next, the mechanic hooks up a standard compressed air hose to the Oil Caddy and pumps the drained oil through a hose from the small tank into the bulk used oil tank.	Source Reduction
7	Recycling of Oil/Fuel Filters	Spent oil and fuel filters are drained, crushed, drummed, and sent off-base to be recycled through a local vendor.	Recycling
8	Puncturing/	Aerosol cans at Buckley ANG are collected from the	Recycling

	Recycling of Aerosol Cans	shops, segregated according to type, and punctured to drain the remaining can contents. Once the aerosol cans are punctured, the metal is recycled as scrap.	
9	Use of Sealed Lead Acid Batteries	Vehicle Maintenance purchases only sealed (maintenance-free) lead acid batteries. Purchasing these batteries eliminates the need to drain and replace electrolyte (sulfuric acid). It also eliminates the need to provide adequate battery and electrolyte storage, room ventilation, secondary containment, and personal protection for workers.	Source Reduction
10	Red Rag Contract	Red shop rags are collected and sent off-site to a vendor to be laundered. Laundering and reusing rags saves money and prevents them from being disposed of as solid waste. Laundering rags off-site eliminates the need to deal with wastewater permits to discharge the wash water or to have an on-site water treatment plant.	Recycling
11	Scrap Metal Recycling	Scrap metal parts are collected in drums (according to type) at Vehicle Maintenance and are turned into DRMO to be recycled.	Recycling
12	Paper, Cardboard, and Aluminum Can Recycling	Vehicle Maintenance collects office paper and cardboard and recycles them through the base recycling center. Aluminum cans are also collected and recycled by shop employees.	Recycling

G. Recommended P2 Opportunities:

#	Opportunity	Description	SAV Team Priority Ranking (1-9)
1	Fully implement the hazardous material pharmacy concept	The Hazardous Material Pharmacy Program allows Vehicle Maintenance to obtain daily quantities of hazardous materials they need. Shops must apply for an authorization in order to purchase and receive a certain material. This program helps reduce the amount of material stored at each shop, helps reduce the amount of expired shelf life material, and gives a single source on the base to make chemical substitutions.	1
2	Send Used Oil to be Re-refined	Sending used oil to be burned for energy recovery is not true recycling. It is really treatment with a benefit. Fort Carson is currently paying a contractor to pick up and	2

		burn their used oil. Companies such as Safety-Kleen are setting up systems where if a volume of re-refined oil is purchased, Safety-Kleen will pick up the same volume of used oil and re-refine it at no cost.	
3	Implement an Oil Analysis Program	Oil analysis is a great pollution prevention opportunity for reducing the amount of oil generated at vehicle maintenance facilities. The concept is that you sample and test the engine oil on a regular basis to determine if and when it needs to be changed. That way oil changes are only performed when needed and not on a time or mileage schedule. There are many different types of oil analysis testing systems ranging from a few hundred dollar hand held device to a many thousand dollar computerized system. Choose the system that best fits your needs. If purchasing equipment for this opportunity is not an option, Fort Carson has a great oil analysis laboratory that you can use. There might also be labs in the Denver area that can perform the oil tests with a quicker turnaround. Oil analysis testing also has another added benefit. Mechanics can use the results to determine engine wear so that preventive maintenance can be performed before a disaster happens.	3
4	Purchase an Absorbent Pad Wringer	Vehicle Maintenance uses absorbent pads for spill cleanup. Purchasing of an absorbent pad wringer will allow them to reuse the pads over and over again. Wringers are available that have clamps to attach it to the top of a 55-gallon drum. Fluids squeezed out of the pad are collected in the drum. POLs squeezed out of the pads can be placed in the used oil tank. Antifreeze squeezed out of the pads can be placed in their antifreeze recycler.	4
5	Explore the Possibility of Using Engine Oil By-pass Filters	Recommend exploring the possibility of installing engine oil by-pass filters on some vehicles. A by-pass filter is an additional filter system to be installed on the vehicle that takes about 10% of the circulating engine oil per pass, microfilters it, and returns it to the oil pool. Metals and other particles break down engine oil and therefore require oil to be changed regularly. By filtering out those particles, oil life can be extended at least 2 to 3 times longer. Generally, higher use or higher mileage vehicles tend to be better candidates for this program. Recommend trying this on security police cars first. Since oil changes are performed less often with by-pass filters, an oil analysis program should accompany the use of oil by-pass filters in order to closely monitor oil quality and prevent engine breakdown. Also check to see if installing by-pass filter systems on your newer	5

		vehicles voids any warranties.	
6	Distribute Antifreeze in Overhead Bulk Distribution System	Currently Vehicle Maintenance purchases virgin antifreeze in 55-gallon drums and mechanics pump out what they need into a smaller container to bring to the vehicle. There are no established procedures to ensure that the recycled antifreeze from the recycler is used first over the virgin antifreeze. Recommend installing overhead distribution lines and a bulk distribution tank for antifreeze. The antifreeze from the recycler could be pumped directly into the antifreeze distribution tank. This would force the use of the recycled antifreeze and reduce the amount of virgin antifreeze purchased.	6
7	Wash Floors as Needed With Mop Bucket or Electric Floor Cleaner	While the SAV Team was visiting, Vehicle Maintenance personnel were cleaning the shop floors even though the floors did not seem too dirty. Lots of dry soap was spread out over an area of the floor and washed off by a hose with a spray nozzle. Recommend using a mop bucket or an electric floor cleaner to wash floors to help conserve water and soap. Many electric floor cleaners recycle the same water and soap over and over again.	7
8	Pump Used POLs to Outside Used Oil Storage Tank	Used engine oils and other petroleum, oils, and lubricants (POLs) are currently hand carried in drip pans from the vehicle to the outside above ground used oil tank. This action has a large spill potential. Recommend moving the used oil tank closer to the building, installing a small sink to the wall of the inside of the building, and running a pipe from the sink to the used oil tank. Employees take their drip pans to the sink and pour out the oil without carrying it a long distance over ice and snow. A small pump can be installed to move the oil from the sink to the tank in batch mode. This prevents accidental contamination of the used oil as the sink contents can be checked (for water, hazardous waste, etc.) before pumping. A grate can also be put on top of the sink and used to drain oil filters.	8
9	Reuse/Recycle Buckeye Soap Containers	Currently Vehicle Maintenance orders Buckeye soap in 55-gallon plastic containers. When the containers are empty, they are disposed of as solid waste. Recommend trying to reuse these containers within the shop (maybe as a crushed oil filter holder, used absorbent pad container, etc.) If the drums cannot be reused in the shop, try to find a place in town who will take them to be recycled (check with the city recycling manager). Another possibility could be to return the empty drum back to the company to be reused or recycled when they deliver a new container of soap.	9

IV. USAF ACADEMY

A. POCs: Mr. Joe O'Connor (Vehicle Maintenance Foreman, 10 ABW/LGTM)
Ms. Diana Dean (Chief of Compliance, 510 CES/CEVC)
Ms. Karen Craig (Hazardous Waste Manager, 510 CES/CEVC)

B. Mission: Support the USAF Academy with vehicle maintenance operations for 488 general and special purpose vehicles for all base organizations and tenants.

C. Vehicles Maintained: Pick-ups
Vans
Buses
Heavy Duty Trucks
Police Cars
Fire Trucks
Construction equipment
Snow Plows

D. Vehicle Maintenance Processes Performed:

Oil/Oil Filter Changes
Antifreeze Changes
Transmission Fluid Changes
Engine Rebuilds
Fuel Filter Changes
Brake Maintenance
Tire Changes/Maintenance
Body Work/Welding
Air Conditioning Repair/Recharges

Solvent Parts Washing/Degreasing
Aqueous Parts Washing/Degreasing
Silica Media Blasting
Vacuum Sanding
Vehicle Painting
Stenciling
Vehicle Washing
Spill Clean-up
Floor Washing

E. Waste Streams Generated:

Used POLs (Oils, Transmission Fluid, etc.)
Oil Filters
Fuel Filters
Air Filters
Used (Recyclable) Antifreeze
Contaminated (Waste) Antifreeze
Antifreeze Recycling Sludge
Scrap Metal

Spent Solvent from Solvent Sinks
Spent Filters from Solvent Sinks
Wastewater from Aqueous Parts Washers
Wastewater from Floor Cleaning
Wastewater from Drum/Container Rinsing
Wastewater from Vehicle Washing
Air Emissions from Paints and Thinners
Used Rags

Scrap Rubber
 Scrap/Wood Pallets
 Batteries
 Tires
 Used Paint Thinner (Paint Gun Washing)
 Unused/Excess Paint and Thinner
 Empty Aerosol Cans
 Paint Booth Filters
 Empty Paint Cans
 Spent Silica Blast Media
 Paint/Metal Dust from Vehicle Sanding

Uniforms
 Used Absorbent Clay
 Brake Fluid
 Brake Dust
 Used Metal Drums
 Cardboard
 Office Paper
 Aluminum Cans

F. Implemented P2 Initiatives:

#	Initiative Title	Description	Type of P2 Initiative
1	Overhead Bulk Distribution of All Vehicle Fluids	Bulk distribution of vehicle fluids avoids generation of solid waste from small individual containers. It also helps to prevent spills and allows mechanics to acquire the exact amount of fluid needed for the job. The Academy is bulk distributing all engine oils, transmission fluid, hydraulic fluid, antifreeze, and power steering fluid. Fluid tanks are located in storage lockers (with secondary containment) adjacent to the building.	Source Reduction
2	Antifreeze recycling	Vehicle Maintenance uses an antifreeze recycling unit (distillation type) to recycle antifreeze.	Recycling
3	Crushing of Oil Filters Prior to Disposal	The Academy crushes oil filters before disposing of them to drain/recycle the residual oil and to reduce the volume of waste placed in the landfill.	Source Reduction
4	Sanding and Media Blasting for Paint Removal	Vehicle Maintenance uses vacuum sanders and silica media blasting to remove paint from parts. This method of paint removal replaces the old chemical stripping method. Instead of disposing of large volumes of thinners/strippers, you dispose of the spent blast media dust and paint dust.	Source Reduction
5	Use of Sealed Lead Acid Batteries	Vehicle Maintenance purchases only sealed (maintenance-free) lead acid batteries. Purchasing these batteries eliminates the need	Source Reduction

		to drain and replace electrolyte (sulfuric acid). It also eliminates the need to provide adequate battery and electrolyte storage, room ventilation, secondary containment, and personal protection for workers, etc.	
6	Using Vehicle Lifts with Above Ground Hydraulic Fluid Storage Tanks	Hydraulic vehicle lifts that have above ground storage tanks for the hydraulic fluid are used at Vehicle Maintenance. This prevents the potential of leaking hydraulic fluid into the underground soil. Leaks and spills are easily identified and cleaned up.	Source Reduction
7	Use of the “Oil Caddy” Drip Pans	Vehicle Maintenance uses “Oil Caddy” drip pans for collecting used oil from engines and transferring oil to the used oil tank. The “Oil Caddy” is a special type of drip pan that has rollers, hoses, and a small enclosed storage tank. Mechanics roll the Oil Caddy under a vehicle when they are ready to perform an oil change. After draining the oil in to the pan, the mechanic rolls the Oil Caddy to the used oil tank without fear of spilling any oil. Next, the mechanic hooks up a standard compressed air hose to the Oil Caddy and pumps the drained oil through a hose from the small tank into the bulk used oil tank. Vehicle Maintenance is also using an “Oil Caddy” system for the collection of antifreeze. It is clearly marked “For Antifreeze Only” to prevent cross contamination with the oil unit.	Source Reduction
8	Use of Compressed Natural Gas Vehicles	The Academy has between 70 and 75 compressed natural gas (CNG) vehicles in use on base. Vehicle Maintenance also has a CNG fueling station. Compressed Natural Gas vehicles burn much cleaner than standard gasoline powered vehicles.	Source Reduction
9	Use of HVLP Paint Guns	The Vehicle Maintenance Paint Shop uses High Volume, Low Pressure (HVLP) paint guns to paint vehicles. This style of paint gun reduces over-spray and the amount of paint needed per job.	Source Reduction
10	Puncturing/Recycling of Aerosol Cans	Aerosol cans at the Academy are collected from the shops, segregated according to type, and punctured to drain the remaining can contents. Once the aerosol cans are punctured, the metal is recycled as scrap through Preston.	Recycling

11	Purchasing Re-refined Oil	Vehicle Maintenance is purchasing re-refined oil. Purchasing re-refined oil eliminates the need for virgin oil and stimulates demand for used oil as a feedstock in the re-refining process.	Source Reduction
12	Crushing/Recycling of Paint Cans	The Academy Vehicle Maintenance Paint Shop crushes paint cans and sends them to Preston to be recycled as scrap metal.	Recycling
13	Using Stick-on Vinyl Lettering	Vehicle Maintenance uses stick on vinyl letters on the vehicles instead of using spray paints and stencils.	Source Reduction
14	Uses of Aqueous Parts Washers	Vehicle Maintenance uses a Kansas Instruments aqueous jet washer to clean parts instead of using solvents.	Chemical Substitution
15	Oil Drip Collection Cans for Detroit Tour Buses	Vehicle Maintenance maintains 16 large Detroit buses for tours and for transporting of Cadets from one side of the base to another. These buses constantly leak oil to the ground from the engine. They found and attached a special drip can to the underside of these buses to capture the dripping oil. Once a month the cans are removed from the buses and poured out into the used oil tank.	Source Reduction
16	Use of Low VOC Paint	The Paint Shop at Vehicle Maintenance uses low volatile organic compound (VOC) paint for their vehicles. This type of paint contains less solvent/thinner and takes less time to dry.	Chemical Substitution
17	Use of Paint Gun Washers	Using a paint gun washer lets painters reuse paint thinner to clean out paint guns. They also reduce the amount of VOCs released during cleaning process.	Source Reduction
18	Use of Denatured Alcohol as Windshield Washer Fluid	Denatured alcohol is used as a windshield washing fluid in all base vehicles. This is a good substitute from the standard washer fluids. Mechanics place blue food coloring into the alcohol to turn it light blue so that it looks like normal windshield washer fluid.	Chemical Substitution
19	Scrap Metal Recycling	All types of scrap metal (cast iron, aluminum, steel, etc.) are collected in dumpsters outside of the building and turned into DRMO to be recycled.	Recycling
20	Red Rag Contract	Red shop rags are collected and sent off-site to a vendor to be laundered. Laundering and reusing rags saves money and prevents them from being disposed of as solid waste. Laundering rags off-site eliminates the need to	Recycling

		deal with wastewater permits to discharge the wash water or to have an on-site water treatment plant.	
21	Paper, Cardboard, and Aluminum Can Recycling	Vehicle Maintenance collects office paper, cardboard, and aluminum cans and recycles them through the base recycling center.	Recycling
22	Solvent Recycling Systems	Vehicle Maintenance reduced the solvent wastes and extends solvent life by continuously filtering and recycling the solvent in their small parts washing sinks.	Recycling
23	Actively Searches the Internet for P2 Ideas	Mr. Joe O'Connor, the Vehicle Maintenance Shop Foreman, actively searches the internet for pollution prevention opportunities/ideas to apply at his shop.	
24	Participates in the Academy Hazardous Material Pharmacy Program	The Hazardous Material Pharmacy Program allows Vehicle Maintenance to obtain daily quantities of hazardous materials they need. Shops must apply for an authorization in order to purchase and receive a certain material. This program helps reduce the amount of material stored at each shop, helps reduce the amount expired shelf life material, and gives a single source on the base to make chemical substitutions.	Source Reduction
25	Paints Vehicles Only to Keep Them "Safe and Serviceable"	The Paint Shop only paints vehicles to keep them "Safe and Serviceable" (as defined in the AFI). Vehicles are not stripped and painted because they have a few scratches on them. This is a great philosophy for vehicle painting.	Source Reduction

G. Recommended P2 Opportunities:

#	Opportunity	Description	SAV Team Priority Ranking (1-17)
1	Reuse Solvent in Paint Gun Washer	Safety-Kleen currently changes out the lacquer thinner in both paint gun washers each month (about 30 gallons per month). Recommend either installing a solvent filtration system on one of the gun washers or purchasing a solvent still to reuse the solvent over and over again. With this	1

		opportunity, a batch of solvent could last an entire year or more. Then there would no longer be a need for a Safety-Kleen contract.	
2	Find a Substitute for the Paint Gun Washer with an Inland Technology Product	Currently the Paint Shop is using lacquer thinner to wash paint guns. Lacquer thinner is extremely flammable substance and contains numerous EPA-17 chemicals. Recommend finding a substitute for the lacquer thinner. Inland Technology makes a paint thinner called EP 921 that is a non-hazardous substitute.	2
3	Reduce the Number of Paint Gun Washers	The Paint Shop currently has two paint gun washers although they only paint about 4 vehicles per month (about one vehicle per week). Recommend removing one of the paint gun washers as Safety-Kleen currently changes out the lacquer thinner in both on a monthly basis.	3
4	Recycle Oil Filters as Scrap Metal	Currently the Academy is crushing oil filters and disposing them as solid waste. Although this reduces the amount of volume put into the landfill, this waste stream can easily be recycled. Many installations across the country are sending their oil filters to DRMO to be recycled.	4
5	Send Used Oil to be Re-refined	Sending used oil to be burned for energy recovery is not true recycling. It is really waste treatment with a benefit. The Academy has a contractor to pick up and burn their used oil. Companies such as Safety-Kleen are setting up systems where you buy a volume re-refined oil and Safety-Kleen will pick up the same volume of used oil and re-refine it at no cost.	5
6	Implement an Oil Analysis Program	Oil analysis is a great pollution prevention opportunity for reducing the amount of oil generated at vehicle maintenance facilities. The concept is that you sample and test the engine oil on a regular basis to determine if and when it needs to be changed. That way oil changes are only performed when needed and not on a time or mileage schedule. There are many different types of oil analysis testing systems ranging from a few hundred dollar hand held device to a many thousand dollar computerized system. Choose the system that best fits your needs. If purchasing equipment for this opportunity is not an option, Fort Carson has a great oil analysis laboratory that may be of use. There might also be labs in the Denver area that can perform the oil tests with a quicker turnaround. Oil analysis testing also has another added benefit. Mechanics can use the results to determine engine wear so that preventive maintenance can be performed before a disaster happens. You can also justify the costs of the oil tests from the savings in oil purchases/disposals and from the labor hour savings from fewer oil changes.	6

7	Decant Inland Technology Parts Washing Solvent	Vehicle Maintenance currently uses Inland Technology's "Breakthrough" solvent in their small red parts washing sinks. These systems already have a filtration system to prolong solvent life. However, when the solvent is considered "spent", it may be possible to let the metals and particles settle and to decant the clean solvent off of the top for reuse.	7
8	Explore the Possibility of Using Engine Oil By-pass Filters	Recommend exploring the possibility of installing engine oil by-pass filters on some vehicles. A by-pass filter is an additional filter system to be installed on the vehicle that takes about 10% of the circulating engine oil per pass, microfilters it, and returns it to the oil pool. Metals and other particles break down engine oil and therefore require oil to be changed regularly. By filtering out those particles, oil life can be extended at least 2 to 3 times longer. Generally, higher use or higher mileage vehicles tend to be better candidates for this program (security police cars may be a good candidate). Since oil changes are performed less often with by-pass filters, an oil analysis program should accompany the use of oil by-pass filters in order to closely monitor oil quality and prevent engine breakdown. Check to see if installing by-pass filter systems on your newer vehicles voids any warranties.	8
9	Use Leftover Top Coat Paint as Base/Foundation Coats	Leftover top coat paint used on one vehicle can be saved and reused as a base or foundation coat on another vehicle.	9
10	Use Reusable Absorbent Pads for Spill Cleanup	Use absorbent pads for spill cleanup instead of absorbent clay (kitty litter). To absorb the same amount of spilled fluid, it takes a lighter weight of absorbent pads to clean up the spill than with absorbent clay. You can purchase an absorbent pad wringer to squeeze the fluids out of the pad and the pad can then be reused. There are many varieties of absorbent pads. Some are designed for oil; some are designed for aqueous solutions; some are multi-purpose; and there are some designed to perform a specific job (such as skimming oil off of a pool of antifreeze). Some absorbent pads are made from recycled content paper or plastic.	10
11	Use a 2 or 3 stage Paint Gun Cleaning Operation	Following a paint job, the Paint Shop currently pre-washes paint guns in a 5 gallon bucket of solvent to remove the bulk of the paint. Then the painters use the paint gun washer to do the fine cleaning. Fresh solvent is used and disposed of from both of these cleaning stages. Recommend a 2 or 3 stage cleaning system where the spent solvent from each step is moved to the previous stage.	11

		This ensures that the solvent is completely used before disposal. The solvent from the first stage is disposed of or recycled and fresh solvent is placed into the last stage.	
12	Reuse of Absorbent Clay Before Disposal	At Vehicle Maintenance, absorbent clay (kitty litter) is used for spill cleanup. If clay absorbent must be used, it is best to use a 3 container system (new, used, spent) to ensure maximum use before disposal. After use, the clay is placed in the used bin. The used bin clay is reused until it is spent (completely saturated). Only then is it placed in the spent bin. A screen can be placed on top of the used bin to help separate the spent clay from clay that still has life.	12
13	Purchase Re-capped Tires for Non-critical/Non-passenger Vehicles	This is an affirmative procurement initiative. In many cases, re-capped tires last just as long as new tires. Purchasing re-capped tires avoids purchasing new virgin tires and prevents used tires from being disposed of in precious landfill space.	13
14	Use Mini-max Steam Cleaner System for Small Parts Cleaning	Recommend using small component steam cleaning systems to clean small parts that are currently cleaned with solvent. The system consists of a wand that shoots a hot water/steam stream out of a nozzle. Buckley ANG Base is successfully using 4 of these cleaning systems for a wide variety of applications.	14
15	Replace the Water-Based Brake Cleaning System with a Vacuum/Filtration One	Vehicle Maintenance uses a water-based brake cleaning system. The unit rolled under the wheel of the vehicle and water is pumped through hoses to wash the metal dust off of the brakes. The water in the unit's tank eventually must be changed and is often characterized as hazardous due to the high metal content. Recommend purchasing a vacuum/filtration brake cleaning unit. For this unit, mechanics insert the wheel into an enclosed container and use a vacuum to clean off the brakes. The air is filtered and dust is collected in a filter bag. Then only the filter and dust need to be disposed of instead of 15-20 gallons of contaminated water.	15
16	Reuse/Recycle the Blast Media in Construction Projects	Vehicle Maintenance uses silica blast media in part de-painting. The spent blast media is often characterized as a hazardous waste because of the high metal content from the paint dust and from the vehicle body. This spent blast media could be mixed with cement and asphalt in post construction projects. The hazardous leeching characteristic is then removed because the metals are encapsulated in the cement/asphalt matrix. Check with the State to see if this reuse is OK. Some states may not allow you to do this.	16

MEMORANDUM OF UNDERSTANDING

Between

**THE AIR FORCE CENTER FOR ENVIRONMENTAL EXCELLENCE,
ENVIRONMENTAL QUALITY TECHNICAL SUPPORT DIVISION (AFCEE/EQT)**

And

THE COLORADO/DOD POLLUTION PREVENTION NETWORK

4 February 1998

The purpose of this Memorandum of Understanding (MOU) is to specify the working relationship between AFCEE/EQT and the Colorado/DoD Pollution Prevention Network in conducting a Vehicle Maintenance Pollution Prevention Staff Assistance Visit. This MOU is between the Air Force Center for Environmental Excellence, Environmental Quality Technical Support Division (AFCEE/EQT) and the Colorado/DoD Pollution Prevention Network. This MOU establishes the roles of each organization for this project and is meant to outline the responsibilities of each organization while maintaining flexibility to incorporate changes to meet each organization's support requirements.

AFCEE/EQT RESPONSIBILITIES:

1. AFCEE/EQT will provide on-site pollution prevention staff assistance to vehicle maintenance facilities at three Colorado military installations (Fort Carson, USAF Academy, and Buckley Air National Guard). The Staff Assistance Visit has been tentatively scheduled for 9-13 March 1998 and will be performed at no cost to the Colorado/DoD Pollution Prevention Network or any of the installations that the members represent. The objective of this Staff Assistance Visit is to conduct a review of vehicle maintenance operations and suggest potential pollution prevention opportunities/initiatives.
2. AFCEE/EQT will be responsible for organizing the Staff Assistance Team.
3. The Staff Assistance Team will present an informal out-brief of findings and pollution prevention opportunities to Colorado/DoD Pollution Prevention Network members at the conclusion of the site visit.
4. AFCEE/EQT will develop a pre-visit questionnaire to gather background information from each site on vehicle maintenance processes performed, hazardous materials used, hazardous wastes generated, environmental compliance issues, and implemented pollution prevention initiatives.
5. AFCEE/EQT will also submit a Staff Assistance Visit Final Report to the Colorado/DoD Pollution Prevention Network. The Final Report will contain the completed pre-visit questionnaires, a list of Staff Assistance Team members, a brief summary of each installation's vehicle maintenance mission/processes/pollution prevention program, and a summary of the findings and opportunities presented and discussed at the out-brief.

COLORADO/DOD POLLUTION PREVENTION NETWORK RESPONSIBILITIES:

Ms. Karen Craig or designated replacement from the Colorado/DoD Pollution Prevention Network will serve as the principle point of contact (POC) for monitoring all technical efforts relating to this Staff Assistance Visit. For the purposes of this MOU, Ms. Craig will be responsible for, but not limited to the following:

1. Coordinating with members of the Colorado/DoD Pollution Prevention Network on all staff assistance visit milestones/activities including meeting agendas and times, site visit dates and times, out-brief times, final report distribution, etc.
2. Coordinating the dates and times for each site visit with the appropriate installation POCs and making billeting arrangements for Staff Assistance Team members.
3. Distributing the pre-visit questionnaire developed by AFCEE/EQT to the appropriate installation POCs for completion. Completed questionnaires must be returned to the AFCEE/EQT POC by 27 February 1998.
4. Providing a list of site visit POCs, phone numbers, and addresses (including building numbers) installation maps (with vehicle maintenance facilities identified) to staff assistance team personnel.
5. Planning and scheduling the site visit out-brief. This includes acquiring a meeting room, setting the agenda, inviting attendees, scheduling briefings by Colorado/DoD Pollution Prevention Network members, and arranging for necessary audio/visual equipment.

Mr. John P. Matthews Date

Air Force Center for Environmental Excellence,
Environmental Quality,
Technical Support Division
(AFCEE/EQT)

Ms. Karen Craig Date

Colorado/DoD Pollution Prevention Network

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INSTALLATION POINTS OF CONTACT

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Vehicle Maintenance POC:

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Directorate of Logistics
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Fort Carson CO 80913

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BUCKLEY ANG

Pollution Prevention POC:

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Aurora, CO 80011-9551

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Vehicle Maintenance POC:

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AIR FORCE ACADEMY

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POINT OF CONTACT (POC) INFORMATION

Installation Name **FORT CARSON**

Pollution Prevention Point of Contact:

Title/Rank:	First Name:	Last Name:
MS	KAREN	WHITE

Office Symbol: AFZC-ECM-ECD

Street Address: 801 TEVIS STREET

Building Number: 302

City: FORT CARSON

State: CO

Zip Code: 80913

Commercial Phone: (719) 526-6838

DSN Phone: 691-6838

FAX Extension: 2091

E-mail: whitek@carson-emh1.army.mil

Vehicle Maintenance Point of Contact:

Title/Rank:	First Name:	Last Name:
CW2	MICHAEL	COSGROVE

Office Symbol: DOL

Street Address:

Building Number: 8000

City: FORT CARSON

State: CO

Zip Code: 80913

Commercial Phone: (719) 526-3314

DSN Phone: 691-3314

FAX Extension: 2685

E-mail:

VEHICLE MAINTENANCE OVERVIEW

Installation Name

FORT CARSON

Total Number of Vehicles in Fleet: N/A

Types and number of each type of vehicles in fleet : N/A Equipment supported is post-wide. We are a GS shop not the owning users.

Is vehicle maintenance performed on a regular schedule? (Yes/No) YES

Are oil changes performed on a schedule? (Yes/No) YES

Average Monthly Amount of Used Oil Generated in Vehicle Maintenance:

Used Oil Disposal Method

Does Vehicle Maintenance Have an Oil Analysis Program (OAP)? (Yes/No) YES

Oil Analysis Equipment Manufacturer's Name: Baird Instruments, Inc.

Oil Analysis Equipment Manufacturer's Phone Number: 1-800-229-4087

How is OAP working? How is OAP Equipment working? Any Issues/Problems? OAP is working well

Does Vehicle Maintenance have Bulk Distribution of Fluids? (Yes/No) YES

What fluids are bulk distributed? Antifreeze and Engine Oils

Does the Vehicle Maintenance shop have floor drains? (Yes/No) YES

Are drains connected to an Oil Water Separator? (Yes/No) YES

Does Vehicle Maintenance have a refueling station? (Yes/No) YES

Does Vehicle Maintenance use DRMO? (Yes/No) YES

What does Vehicle Maintenance use DRMO for? Used but serviceable parts

POLLUTION PREVENTION AND ENVIRONMENTAL COMPLIANCE

Installation Name:

FORT CARSON

**List 3 Environmental
Compliance
Challenges/Problems
at Vehicle Maintenance**

1. The development of an antifreeze recycle program that meet the needs at Fort Carson.
2. A program for recycling oil.
3. Collection of all excess hazardous materials that had expired shelf life.

**List any recent Pollution
Prevention initiatives
implemented at Vehicle
Maintenance:**

Implementation of a Hazardous Material Control Center
(Pharmacy)

**List any future/planned
Pollution Prevention initiatives
at Vehicle Maintenance:**

Antifreeze Recycling Program
Recycled Oil Program

PROCESSES PERFORMED IN VEHICLE MAINTENANCE

Installation Name:

FORT CARSON

For each process performed by vehicle maintenance, check the box:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Oil/Filter Changes | <input checked="" type="checkbox"/> Body Work/Repair |
| <input checked="" type="checkbox"/> Transmission Fluid Changes | <input checked="" type="checkbox"/> Radiator Repair |
| <input checked="" type="checkbox"/> Antifreeze Changes | <input checked="" type="checkbox"/> Welding |
| <input checked="" type="checkbox"/> Power Steering Fluid Changes | <input checked="" type="checkbox"/> Parts Machining |
| <input checked="" type="checkbox"/> Fuel Filter Changes | <input checked="" type="checkbox"/> Brake Jobs |
| <input checked="" type="checkbox"/> Tune Ups/Spark Plug Changes | <input checked="" type="checkbox"/> Tire Changes |
| <input checked="" type="checkbox"/> Solvent Tank Parts Washing | <input checked="" type="checkbox"/> Tire Repair/Capping |
| <input checked="" type="checkbox"/> Aqueous Parts Washing | <input checked="" type="checkbox"/> Battery Changes |
| <input checked="" type="checkbox"/> Vehicle Painting | <input checked="" type="checkbox"/> Battery Maintenance/Electrolyte Refills |
| <input checked="" type="checkbox"/> Parts Painting | <input checked="" type="checkbox"/> Air Conditioning Recharges |
| <input checked="" type="checkbox"/> Vehicle De-Painting (Sanding) | <input checked="" type="checkbox"/> Air Conditioning Repair |
| <input checked="" type="checkbox"/> Vehicle De-Painting (Solvent) | <input checked="" type="checkbox"/> Air Conditioning Upgrades to R134a |
| <input checked="" type="checkbox"/> Vehicle De-Painting (Media Blasting) | <input checked="" type="checkbox"/> Engine Rebuilds |
| <input checked="" type="checkbox"/> Parts De-Painting (Sanding) | <input checked="" type="checkbox"/> Transmission Rebuilds |
| <input checked="" type="checkbox"/> Parts De-Painting (Solvent) | <input checked="" type="checkbox"/> Vehicle Washing |
| <input checked="" type="checkbox"/> Parts De-Painting (Media Blasting) | <input checked="" type="checkbox"/> Vehicle Refueling |
| | <input checked="" type="checkbox"/> Vehicle Emissions Testing |

Other Processes Performed:

HAZARDOUS MATERIALS IN VEHICLE MAINTENANCE

Installation Name: **FORT CARSON**

**Do Vehicle Maintenance shops participate in a base
Hazardous Material Pharmacy Program? (Yes/No)** YES

List the Top 7 Hazardous Materials used by Vehicle Maintenance:

	Hazardous Material	Annual Usage (lbs)	Vendor/Trade Name	Product NSN(s)
1.	CARC Paint - Tan	24,624	HENZEIN	8010-01-278-3640
2.	CARC Paint - Green	24,204	HENZEIN	8010-01-227-7547
3.	Air Craft Thinner	17,712	CSD	8010-00-181-8079
4.	Enamel Paint	3,200		
5.	15/40 Oil	4,090 Gal		9150-01-213-3118
6.	30 Weight Oil	900 Gal		9150-00-183-6808
7.	10 Weight Oil	1,500 Gal		9130-00-183-7807

HAZARDOUS WASTES GENERATED BY VEHICLE MAINTENANCE

Installation Name: **FORT CARSON**

Do the Vehicle Maintenance Shops have a Hazardous Waste Accumulation Site? (Yes/No) YES

List the Top 5 Hazardous Wastes Generated by Vehicle Maintenance:

	Hazardous Waste	Annual Generation (lbs)
1.	ACETONE/PAINT THINNER	620 Gal
2.		
3.		
4.		
5.		

SOLID WASTE RECYCLING AT VEHICLE MAINTENANCE

Installation Name

FORT CARSON

Commodities Recycled at Vehicle Maintenance (Check the Boxes):

Possible Recycling Method Choices: Through Base Recycling Program, Through DRMO, Through Off-site Vendor/Contractor, Through Shop Employee, etc.

- | | |
|--|-------------------------------|
| <input checked="" type="checkbox"/> Office Paper | Recycling Method: POST |
| <input checked="" type="checkbox"/> Mixed Paper | Recycling Method: POST |
| <input checked="" type="checkbox"/> Cardboard | Recycling Method: POST |
| Aluminum Cans | Recycling Method: |
| <input checked="" type="checkbox"/> Paperboard Boxes | Recycling Method: POST |
| Plastic Container | Recycling Method: |
| Glass | Recycling Method: |
| <input checked="" type="checkbox"/> Oil Filters | Recycling Method: DRMO |
| <input checked="" type="checkbox"/> Scrap Metal | Recycling Method: DRMO |

Other Commodities Recycled:

Solid Waste Recycling Equipment in Vehicle Maintenance (Check the Boxes):

- Cardboard Bailer
- Aluminum Can Crusher
- Office Paper Recycling Bins
- Plastic Container Recycling Bins
- Glass Recycling Bins
- Scrap Metal Recycling Bins
- Oil Filter Crusher

Other Solid Waste Recycling Equipment:

POINT OF CONTACT (POC) INFORMATION

Installation Name **BUCKLEY ANGB**

Pollution Prevention Point of Contact:

Title/Rank:	First Name:	Last Name:
MS	BETH	FINNEY

Office Symbol: AGINS/CEV

Street Address: 660 SOUTH ASPEN STREET, STOP 26

Building Number: 1005, RM 178

City: BUCKLEY ANGB

State: CO

Zip Code: 80011-9551

Commercial Phone: (303) 677-6158

DSN Phone: 877-6158

FAX Extension: 6159

E-mail: efinney@cobkf.ang.af.mil

Vehicle Maintenance Point of Contact:

Title/Rank:	First Name:	Last Name:
MSgt	PHIL	WELSH

Office Symbol: LGTM

Street Address: 17772 E ARAPAHOE BASIN AVE, STOP 11

Building Number: 340

City: BUCKLEY ANGB

State: CO

Zip Code: 80011-9511

Commercial Phone: (303) 677-9502

DSN Phone: 877-9502

FAX Extension: 6316

E-mail: pwelsh@cobkf.ang.af.mil

VEHICLE MAINTENANCE OVERVIEW

Installation Name

BUCKLEY ANGB

Total Number of Vehicles in Fleet: 160

Types and number of each type of vehicles in fleet : 76 General Purpose Vehicles
63 Special Purpose Vehicles

Is vehicle maintenance performed on a regular schedule? (Yes/No) YES

Are oil changes performed on a schedule? (Yes/No) YES

Average Monthly Amount of Used Oil Generated in Vehicle Maintenance: 110 Gal

Used Oil Disposal Method CONTRACTOR

Does Vehicle Maintenance Have an Oil Analysis Program (OAP)? (Yes/No) NO

Oil Analysis Equipment Manufacturer's Name: N/A

Oil Analysis Equipment Manufacturer's Phone Number: N/A

How is OAP working? How is OAP Equipment working? Any Issues/Problems? N/A

Does Vehicle Maintenance have Bulk Distribution of Fluids? (Yes/No) YES

What fluids are bulk distributed? Motor Oil

Does the Vehicle Maintenance shop have floor drains? (Yes/No) YES

Are drains connected to an Oil Water Separator? (Yes/No) YES

Does Vehicle Maintenance have a refueling station? (Yes/No) NO

Does Vehicle Maintenance use DRMO? (Yes/No) YES

What does Vehicle Maintenance use DRMO for? Vehicle Disposal

POLLUTION PREVENTION AND ENVIRONMENTAL COMPLIANCE

Installation Name:

BUCKLEY ANGB

1. Outside drains go to sanitary sewer.

List 3 Environmental Compliance Challenges/Problems at Vehicle Maintenance

2. Hazardous Waste Satellite Accumulation Point (SAP) floor accumulates 6 inches of rain water.

3. Insufficient heat in refueler maintenance shop

List any recent Pollution Prevention initiatives implemented at Vehicle Maintenance:

One-for-One exchange with tire vendor.

List any future/planned Pollution Prevention initiatives at Vehicle Maintenance:

Modification to outside wash rack drain.

PROCESSES PERFORMED IN VEHICLE MAINTENANCE

Installation Name:

BUCKLEY ANGB

For each process performed by vehicle maintenance, check the box

- | | |
|---|--|
| <input checked="" type="checkbox"/> Oil/Filter Changes | <input type="checkbox"/> Body Work/Repair |
| <input checked="" type="checkbox"/> Transmission Fluid Changes | <input type="checkbox"/> Radiator Repair |
| <input checked="" type="checkbox"/> Antifreeze Changes | <input checked="" type="checkbox"/> Welding |
| <input type="checkbox"/> Power Steering Fluid Changes | <input type="checkbox"/> Parts Machining |
| <input checked="" type="checkbox"/> Fuel Filter Changes | <input type="checkbox"/> Brake Jobs |
| <input checked="" type="checkbox"/> Tune Ups/Spark Plug Changes | <input checked="" type="checkbox"/> Tire Changes |
| <input type="checkbox"/> Solvent Tank Parts Washing | <input checked="" type="checkbox"/> Tire Repair/Capping |
| <input checked="" type="checkbox"/> Aqueous Parts Washing | <input checked="" type="checkbox"/> Battery Changes |
| <input type="checkbox"/> Vehicle Painting | <input type="checkbox"/> Battery Maintenance/Electrolyte Refills |
| <input type="checkbox"/> Parts Painting | <input checked="" type="checkbox"/> Air Conditioning Recharges |
| <input type="checkbox"/> Vehicle De-Painting (Sanding) | <input checked="" type="checkbox"/> Air Conditioning Repair |
| <input type="checkbox"/> Vehicle De-Painting (Solvent) | <input type="checkbox"/> Air Conditioning Upgrades to R134a |
| <input type="checkbox"/> Vehicle De-Painting (Media Blasting) | <input type="checkbox"/> Engine Rebuilds |
| <input type="checkbox"/> Parts De-Painting (Sanding) | <input type="checkbox"/> Transmission Rebuilds |
| <input type="checkbox"/> Parts De-Painting (Solvent) | <input checked="" type="checkbox"/> Vehicle Washing |
| <input type="checkbox"/> Parts De-Painting (Media Blasting) | <input type="checkbox"/> Vehicle Refueling |
| | <input checked="" type="checkbox"/> Vehicle Emissions Testing |

Other Processes Performed:

HAZARDOUS MATERIALS USED BY VEHICLE MAINTENANCE

Installation Name:

BUCKLEY ANGB

**Do Vehicle Maintenance shops participate in a base
Hazardous Material Pharmacy Program? (Yes/No)**

NO

List the Top 7 Hazardous Materials used by Vehicle Maintenance:

	Hazardous Material	Annual Usage (lbs)	Vendor/Trade Name	Product NSN(s)
1.	RTV Adhesive		DOW	8040-00-144-9774
2.	Denatured Alcohol		AAPER	6810-00-543-7415
3.	Trim Adhesive		3M	8040-00-995-7080
4.	Antifreeze		Old World	6850-00-181-7940
5.	Epoxy		EPI Seal	8040-00-738-6429
6.	Carb Cleaner		Berryman	6850P640409
7.	Floor Soap		Buckeye	

HAZARDOUS WASTES GENERATED BY VEHICLE MAINTENANCE

Installation Name: **BUCKLEY ANGB**

Do the Vehicle Maintenance Shops have a Hazardous Waste Accumulation Site? (Yes/No) YES

List the Top 5 Hazardous Wastes Generated by Vehicle Maintenance:

	Hazardous Waste	Annual Generation (lbs)
1.	Waste unleaded fuel filters	20
2.	JP8 Filter Elements	200
3.		
4.		
5.		

SOLID WASTE RECYCLING AT VEHICLE MAINTENANCE

Installation Name

BUCKLEY ANGB

Commodities Recycled at Vehicle Maintenance (Check the Boxes):

Possible Recycling Method Choices: Through Base Recycling Program, Through DRMO, Through Off-site Vendor/Contractor, Through Shop Employee, etc.

- | | | | |
|---|--------------------------|--------------------------|------------------------|
| X | Office Paper | Recycling Method: | Base Recycling Program |
| | Mixed Paper | Recycling Method: | |
| | Cardboard | Recycling Method: | |
| X | Aluminum Cans | Recycling Method: | Base Recycling Program |
| | Paperboard Boxes | Recycling Method: | |
| | Plastic Container | Recycling Method: | |
| | Glass | Recycling Method: | |
| | Oil Filters | Recycling Method: | |
| X | Scrap Metal | Recycling Method: | Base Recycling Program |

Other Commodities Recycled: Antifreeze, Freon

Solid Waste Recycling Equipment in Vehicle Maintenance (Check the Boxes):

- Cardboard Bailer**
- X **Aluminum Can Crusher**
- Office Paper Recycling Bins**
- Plastic Container Recycling Bins**
- Glass Recycling Bins**
- X **Scrap Metal Recycling Bins**
- X **Oil Filter Crusher**

Other Solid Waste Recycling Equipment:

Aluminum Can Bin

POINT OF CONTACT (POC) INFORMATION

Installation Name **USAF ACADEMY**

Pollution Prevention Point of Contact:

Title/Rank:	First Name:	Last Name:
MS	KAREN	CRAIG

Office Symbol: 510 CES/CEV

Street Address: 8120 EDGERTON DRIVE, SUITE 40

Building Number:

City: USAF ACADEMY

State: CO

Zip Code: 80840-2400

Commercial Phone: (719) 333-2289

DSN Phone: 333-2289

FAX Extension: 3753

E-mail: craigk.ce@usafa.af.mil

Vehicle Maintenance Point of Contact:

Title/Rank:	First Name:	Last Name:
MR	JOE	O'CONNOR

Office Symbol: 10 ABW/LGTM

Street Address: 8122 EDGERTON DRIVE

Building Number:

City: USAF ACADEMY

State: CO

Zip Code: 80840-2450

Commercial Phone: (719) 333-3607

DSN Phone: 333-3607

FAX Extension: 3779

E-mail: oconnorjl.lg.usafa@usafa.af.mil

VEHICLE MAINTENANCE OVERVIEW

Installation Name

USAF ACADEMY

Total Number of Vehicles in Fleet: 488

Types and number of each type of vehicles in fleet : 278 General Purpose, 78 Special Purpose, 61 Heavy Equipment, 23 Material Handling, 48 Other

Is vehicle maintenance performed on a regular schedule? (Yes/No) YES

Are oil changes performed on a schedule? (Yes/No) YES

Average Monthly Amount of Used Oil Generated in Vehicle Maintenance:

Used Oil Disposal Method Energy recovery through DRMO contract

Does Vehicle Maintenance Have an Oil Analysis Program (OAP)? (Yes/No) NO

Oil Analysis Equipment Manufacturer's Name:

Oil Analysis Equipment Manufacturer's Phone Number:

How is OAP working? How is OAP Equipment working? Any Issues/Problems?

Does Vehicle Maintenance have Bulk Distribution of Fluids? (Yes/No) YES

What fluids are bulk distributed? ALL

Does the Vehicle Maintenance shop have floor drains? (Yes/No) YES

Are drains connected to an Oil Water Separator? (Yes/No) YES

Does Vehicle Maintenance have a refueling station? (Yes/No) NO

Does Vehicle Maintenance use DRMO? (Yes/No) YES

What does Vehicle Maintenance use DRMO for? Disposal of Scrap

POLLUTION PREVENTION AND ENVIRONMENTAL COMPLIANCE

Installation Name:

USAF ACADEMY

1. NONE

**List 3 Environmental
Compliance
Challenges/Problems
at Vehicle Maintenance**

2.

3.

**List any recent Pollution
Prevention initiatives
implemented at Vehicle
Maintenance:**

Antifreeze Recycling
Eliminate Battery Shop
HVLP Paint Guns

**List any future/planned
Pollution Prevention initiatives
at Vehicle Maintenance:**

PROCESSES PERFORMED IN VEHICLE MAINTENANCE

Installation Name:

USAF ACADEMY

For each process performed by vehicle maintenance, check the box

- | | |
|--|--|
| <input checked="" type="checkbox"/> Oil/Filter Changes | <input checked="" type="checkbox"/> Body Work/Repair |
| <input checked="" type="checkbox"/> Transmission Fluid Changes | <input type="checkbox"/> Radiator Repair |
| <input checked="" type="checkbox"/> Antifreeze Changes | <input checked="" type="checkbox"/> Welding |
| <input checked="" type="checkbox"/> Power Steering Fluid Changes | <input type="checkbox"/> Parts Machining |
| <input checked="" type="checkbox"/> Fuel Filter Changes | <input checked="" type="checkbox"/> Brake Jobs |
| <input checked="" type="checkbox"/> Tune Ups/Spark Plug Changes | <input checked="" type="checkbox"/> Tire Changes |
| <input checked="" type="checkbox"/> Solvent Tank Parts Washing | <input type="checkbox"/> Tire Repair/Capping |
| <input type="checkbox"/> Aqueous Parts Washing | <input checked="" type="checkbox"/> Battery Changes |
| <input checked="" type="checkbox"/> Vehicle Painting | <input type="checkbox"/> Battery Maintenance/Electrolyte Refills |
| <input checked="" type="checkbox"/> Parts Painting | <input checked="" type="checkbox"/> Air Conditioning Recharges |
| <input checked="" type="checkbox"/> Vehicle De-Painting (Sanding) | <input checked="" type="checkbox"/> Air Conditioning Repair |
| <input type="checkbox"/> Vehicle De-Painting (Solvent) | <input checked="" type="checkbox"/> Air Conditioning Upgrades to R134a |
| <input type="checkbox"/> Vehicle De-Painting (Media Blasting) | <input checked="" type="checkbox"/> Engine Rebuilds |
| <input type="checkbox"/> Parts De-Painting (Sanding) | <input type="checkbox"/> Transmission Rebuilds |
| <input type="checkbox"/> Parts De-Painting (Solvent) | <input type="checkbox"/> Vehicle Washing |
| <input checked="" type="checkbox"/> Parts De-Painting (Media Blasting) | <input type="checkbox"/> Vehicle Refueling |
| | <input checked="" type="checkbox"/> Vehicle Emissions Testing |

Other Processes Performed:

HAZARDOUS MATERIALS USED BY VEHICLE MAINTENANCE

Installation Name:

USAF ACADEMY

**Do Vehicle Maintenance shops participate in a base
Hazardous Material Pharmacy Program? (Yes/No)**

YES

List the Top 7 Hazardous Materials used by Vehicle Maintenance:

	Hazardous Material	Annual Usage (lbs)	Vendor/Trade Name	Product NSN(s)
1.	Antifreeze, 55 Gal	1,542	Ethylene Glycol	6850-00-181-7940
2.	Engine Oil (15W40)	1,078	Mobil Deluxe 1200	9150-01-152-4119
3.	Hardener, Urethane	120	DU Hardener	8010PDU5
4.	Freon, Liquefied	90	Suva Cold MP	6830PR134A
5.	Cleaner, Brake, Non-ODC	82	Non OCD Brake Cleaner	9150P19444
6.	Coating, Polyurethane	80	Aliphatic Isocyanate	8010-01-397-3942
7.	Thinner, Paint	80	Thinner Dope & Lacquer	8010-00-160-5787

HAZARDOUS WASTES GENERATED BY VEHICLE MAINTENANCE

Installation Name: **USAF ACADEMY**

Do the Vehicle Maintenance Shops have a Hazardous Waste Accumulation Site? (Yes/No) YES

List the Top 5 Hazardous Wastes Generated by Vehicle Maintenance:

	Hazardous Waste	Annual Generation (lbs)
1.	Paint related materials	Varies
2.		
3.		
4.		
5.		

SOLID WASTE RECYCLING AT VEHICLE MAINTENANCE

Installation Name

USAF ACADEMY

Commodities Recycled at Vehicle Maintenance (Check the Boxes):

Possible Recycling Method Choices: Through Base Recycling Program, Through DRMO, Through Off-site Vendor/Contractor, Through Shop Employee, etc.

<input checked="" type="checkbox"/> Office Paper	Recycling Method: Base Recycling Center
<input type="checkbox"/> Mixed Paper	Recycling Method:
<input checked="" type="checkbox"/> Cardboard	Recycling Method: Base Recycling Center
<input checked="" type="checkbox"/> Aluminum Cans	Recycling Method: Base Recycling Center
<input type="checkbox"/> Paperboard Boxes	Recycling Method:
<input checked="" type="checkbox"/> Plastic Container	Recycling Method: Base Recycling Center
<input checked="" type="checkbox"/> Glass	Recycling Method: Local Vendor
<input type="checkbox"/> Oil Filters	Recycling Method:
<input checked="" type="checkbox"/> Scrap Metal	Recycling Method: DRMO

Other Commodities Recycled:

Solid Waste Recycling Equipment in Vehicle Maintenance (Check the Boxes):

- Cardboard Bailer**
- Aluminum Can Crusher**
- Office Paper Recycling Bins**
- Plastic Container Recycling Bins**
- Glass Recycling Bins**
- Scrap Metal Recycling Bins**
- Oil Filter Crusher**

Other Solid Waste Recycling Equipment: