



**FORT CARSON 25-YEAR SUSTAINABILITY GOAL PLAN**  
**GOAL: ZERO WASTE (ZW)**

**Goal Statement:**

Total weight of solid and hazardous waste disposed of is reduced to zero by 2027, and every year thereafter.

**25-Year Vision**

The long term goal for this 25-Year Plan is to ensure that the total weight of solid and hazardous waste disposed of is reduced to zero by 2027, and every year thereafter. The desired end state is to eliminate or dramatically reduce the amount of waste generated and to effectively use, reuse or recycle all materials.

**Ownership and Involvement (Resources, Roles and Authority)**

**Goal Proponent:** DPW, Director

**Goal Lead & Fort Carson Partners:** DPW Chief, Operations & Maintenance; ISRO Sustainability Planner; DPW Recycle Operations Team Lead; DPW Energy, Noise, and P2 Planner; DPWED Hazardous Waste Storage Facility Manager; DPWED RCRA Program Coordinator; DFMWR, Chief Supplies & Services. Support and participation by the DRMO/DRMS and DOL is critical in order to achieve this goal.

**Partnerships:** Peterson Air Force Base (AFB); Schriever AFB; Pueblo Chemical Depot; Colorado Association for Recycling; Recycling Coalition of Colorado Springs, El Paso County, Keep Colorado Springs Beautiful

**Fort Carson SEMS – Significant Aspects and Impacts**

Fort Carson Sustainability and Environmental Management System (SEMS) cites eight aspects of activities on the Installation that have significant impacts on sustainability. Priority significant impacts include solid waste, hazardous waste and water quality (water quantity/use is addressed in Goal 1), specifically as they relate to the following activities and operations:

- Solid Waste in Food Services (procuring and transporting food and supplies)
- Solid Waste in Food Services (maintenance)
- Solid Waste in Vehicle and Equipment (repair and maintenance)
- Solid Waste in Waste Management-Demolition/Construction/Renovation
- Solid Waste in Training (collective unit training)
- Hazardous Waste in Supply and Procurement (supply and services selection)
- Hazardous Waste in Vehicle and Equipment Maintenance (painting)
- Hazardous Waste in Training (collective unit training)
- Hazardous Waste in Vehicle and Equipment Maintenance (repair/preventive maintenance)

**Legal and Other Requirements**

1. AR-200-1 Environmental Protection and Enhancement, 21 Dec 07 - requires installations to develop Integrated Solid Waste Management Plans (ISWMPs), establishes solid waste MoMs, and authorizes direct sales of recyclables.
2. Department of Defense (DoD) Measure of Merit - The DoD Measure of Merit is achieving a 40% waste diversion rate. Fort Carson has achieved the measure and is surpassing it with target of 65% waste diversion rate by

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- FY11. Sustainable Management of Waste in Military Construction, Renovation, and Demolition Activities—All military construction, renovation, and demolition projects shall include contract performance requirements for a 50% minimum diversion of construction and demolition (C&D) waste by weight, from landfill disposal.
3. AR-420-29, Utility Services - Calls for the implementation of integrated solid waste management, development of the ISWMP, source reduction to reduce the waste stream, and implementation of a QRP.
  4. Executive Order 13423 and 13514 - requires agencies reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, increase diversion of solid waste as appropriate, and maintain cost-effective waste prevention and recycling programs in its facilities. Executive Order 13514 strengthened the previous order by mandating the federal government lead by example in preventing pollution and eliminating waste. Agencies must foster markets for sustainable technologies and environmentally preferable materials, products, and services. Results of efforts made by each agency in implementing the order must be published on a publicly available Federal website.
  5. DODI 4715.4 - Pollution Prevention, implements policy, assigns responsibility, and establishes procedures to implement pollution prevention programs throughout DoD. Among many other things, it requires that DoD agencies establish a cost-effective waste prevention program and QRP.
  6. 10 U.S.C. 2577 - Disposal of Recyclable Materials is a law requiring the Secretary of Defense to establish regulations for the sale of recyclable materials and the operation of recycling programs at military installations (i.e., for qualified recycling programs).
  7. The Resource Conservation and Recovery Act (RCRA), 6 CCR 1007-3, §264.73(b)(9) and Fort Carson's Part B Permit, Sec II.K.6 - Establishes goals to protect human health and the environment from the potential hazards of waste disposal and encourages resource and energy conservation. RCRA also requires that the federal government actively participate in procurement programs that foster the recovery and use of recycled materials and energy. Specifically, requires that Fort Carson develop a written program to reduce the volume or quantity and toxicity of hazardous waste generated to the maximum degree determined to be economically practicable, and to use treatment, storage, or disposal methods currently available that minimize the present and future threat to human health and the environment.
  8. 6 CCR 1007-2, Part 1- Regulations Pertaining to Solid Waste Sites and Facilities, Colorado Department of Public Health and Environment, establish requirements for all solid waste disposal and recycling facilities in the state.
  9. Fort Carson Commanding General's Policy Letter #15, Mandatory Hazardous Waste Awareness Training Policy, 1 November 2005, revised 18 March 2008 and added sign off by the Garrison Commander. This Policy mandates annual RCRA General Awareness Training to applicable personnel, describes where and how to obtain the training, and mandates anyone in violation of the mandate that results in an NOV will pay for any associated fines.
  10. SEMS goal - Sustainable Transportation
  11. SEMS goal - Energy & Water Resources
  12. SEMS goal - Sustainable Development

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13. SEMS goal - Sustainable Training Lands
  14. SEMS goal - Sustainable Procurement
  15. SEMS goal - Air Quality

### **The Army's Strategy and Fort Carson' SEMS**

The Army Strategy for the Environment: Sustain the Mission – Secure the Future establishes a long-range vision that enables the Army to meet its mission today and into the future. The strategy commits Army leaders at all levels to certain goals and challenges them to develop innovative methods to achieve them. The Fort Carson Sustainability Program was created as a means to facilitate this mission by establishing goals and the policies, plans and procedures needed to attain those goals. The Fort Carson Sustainability Plan operationalizes the Army's strategy by providing the structure for planning, implementation, and monitoring and measuring progress: The Sustainability and Environmental Management System (SEMS). The SEMS is what drives the Installation's projects and initiatives, specifies continual improvements necessary to achieve desired goal end states, compels environmental compliance and champions a more sustainable installation.

### **Background - Zero Waste Disposal**

Achieving a goal of zero waste by 2027 will require drastic changes in material handling particularly tight controls over procurement of hazardous materials. A critical part of material handling is inventory management and product substitution.. Additionally, reuse of materials will need to be practiced to create a closed-loop system in material handling. This means that manufacturers need to take back products to reuse in manufacturing process. In turn, the buyer (e.g., Fort Carson, Dept. of Army) needs to support such a culture change in the manufacturing industry by purchasing products/services from companies with sustainable products and practices (i.e., take-back programs, leasing agreements, biodegradable or long-term use products). Therefore, success with the zero waste goal will depend on objectives and initiatives in the procurement goal that seek to reduce and ultimately eliminate waste.

Additionally, new technology that changes waste to valuable commodity will be critical to handling what waste cannot be reduced or eliminated in the manufacturing, procurement and use stages. For example, biological and chemical processes can convert "waste" material into electricity or heat/steam.

Desired end states related to waste reduction are:

- ◆ Incentives to reuse or recycle products are in place.
- ◆ Decrease in the use of hazardous materials.
- ◆ Create a composting program.
- ◆ Coordination between local organizations to encourage recycling and reuse.
- ◆ Recycle or reuse of construction and demolition waste.
- ◆ More recycling options in the region.
- ◆ Cost analyses take total environmental and social costs into consideration.
- ◆ Product life-cycle costs are shared by user and producer.
- ◆ Better influence on what suppliers provide to increase shelf-lives and decrease hazardous content.
- ◆ Government agencies coordinating on recycling efforts.

Meetings for this goal have included primarily DOD representatives from area installations as far as Buckley Air Force Base near Denver.

The purposes of partnering with other area installations to achieve this goal are to:

- Learn from recycling and reduction activities at other installations.
- Share information concerning purchases and disposal amounts.
- Determine money saving ways to recycle.
- Create new markets for recycling and other waste diversion technologies and practices with the volume from several installations.
- Create a healthy competition between installations.
- Combine efforts to reduce total workloads.
- Support local waste reduction businesses

### **Challenges & Barriers**

- Limited technology
- Current waste management programs are divided between refuse/recycle and hazardous waste – and to add to the challenge, hazardous waste management is divided into two programs under two different commands. The DPW ED manages hazardous waste and DRMO manages the hazardous waste contract
- Equipment – need more recycle containers and more drivers
- Waste and recycle data tracking and reporting. Not all wastes go through DPW Operations or the HWSF
- Inconsistencies across installations
- Education will be required as the number of materials to be reduced or recycled is increased
- There is a lack of control over purchases by credit cards; need better integration with and influence over procurement. Lack of or inconsistent directorate and command support – or low prioritization

### **Training**

SEMS Awareness  
Hazardous Waste General Awareness Training  
Environmental Protection Officer 40-hr course (modules on P2, hazardous waste, recycling, hazardous material management, etc.)  
R & U training (includes P2, Recycle and Hazardous Waste)

### **Communication**

External (Coordinated with PAO and aligned with Installation strategic communication strategies)

Internal: Publish a zero waste-related goal article for publication in the Mountaineer annually. Host a Zero Waste Goal Garrison Commander's breakfast annually. Publicize recycle location and commodity information in the Mountaineer, at Mayor's Meetings and various other venues throughout the year. Host an educational station focusing on recycling during annual Earth Day celebrations held on-Post for Fountain-Fort Carson District 8 schools. The DPW Environmental Division Environmental Compliance Assessment Team trains units about recycling efforts on the Installation and supports unit recycling initiatives. Goal progress is tracked and publicized in the annual Fort Carson Sustainability Report, which is distributed to internal and external audiences.

### **Document Control**

Pollution Prevention (P2) Plan – Hard copy located in P2 Manager’s office, electronic copy located on K drive

Installation Solid Waste Management (ISWM) Plan – Maintained on DPW SharePoint

Refuse Contract – Kept in Contracting Officer’s Representative (COR) office

Hazardous Waste Management Plan – Maintained on DPW SharePoint

Part B Permit – Maintained on DPW SharePoint

Commanding General and Garrison Commanders Mandatory Hazardous Waste Awareness Training Policy – and implementing guidance – the Training Tracking SOP - Maintained on DPW SharePoint

### **Operational Controls**

**Training Tracking SOP** guides the DPW ED through ensuring trainees are appropriately tracked. Designates responsibilities and locations of where tracking spreadsheets should be jointly maintained

**HWSF Operational SOPs** – Guides HWSF personnel on proper operations at the facility. Maintained on DPW SharePoint

Recycle Operational SOPs Maintained on DPW SharePoint

### **Monitoring & Measurement**

The Biennial Reports, Annual Activity Reports and annual (fiscal and calendar) internal reports contain detailed information on waste processed through the HWSF and are located on the K drive. The RCRA Program Coordinator is responsible for these reports

The Solid Waste Annual Report (SWAR) contains detailed information on all solid waste and recycled material managed on the Installation. The Recycle Program Manager is responsible for this report.

### **Evaluation of Compliance**

External EPA/CDPHE Inspections evaluate Fort Carson’s compliance with applicable state, federal and permit requirements. Reports for these annual inspections are on the K drive. Inspections that result in a Compliance Advisory or Order indicate non-compliance.

EPAS inspections are internal to the Army and check to see if Fort Carson’s activities are conducted in compliance with state, federal, and Department of the Army requirements. Issuance of a finding indicates non-compliance and triggers immediate corrective action and reporting.

Environmental Compliance Assessment Team (ECAT) conducts internal inspections of all activities on the installation to provide programmatic support throughout the Garrison.

Other additional external and internal compliance inspections may be conducted as required.

### **Nonconformity**

Nonconformity would be identified via a Compliance Advisory issued by the CDPHE or a NOV from EPAS inspectors.

Nonconformity of Solid Waste procedures would be identified through ECAT or EPAS inspections.

Nonconformity with SEMS would be identified through the annual audit.

Mismanagement of solid waste is addressed through on-the-spot corrections.

### **Control of Records**

Construction Waste Diversion Reports – The Corps of Engineers has been asked by DPW Environmental to provide electronic reports to the P2 Manager for filing/use on completed construction projects. Reports are kept electronically on P2 Manager's computer and shared with Recycle Manager for inclusion in annual SWARS report.

Part B Permit Operating Record - As required by Fort Carson's Part B Permit, all records pertaining to the disposal of hazardous waste are maintained in the official Operating Record located at the HWSF Administration Office.

All records documenting solid waste and recycling activities are maintained at the DPW Operations and Maintenance Division offices.

### **Annual Review**

The P2 Plan, Recycle and ISWM Plan, Hazardous Waste Management Plan, this Plan and all SOPs are reviewed annually and updated as necessary.

The CG/GC Mandatory HW Training Policy is updated by the GCs office whenever there is a change in command or significant change in procedure.

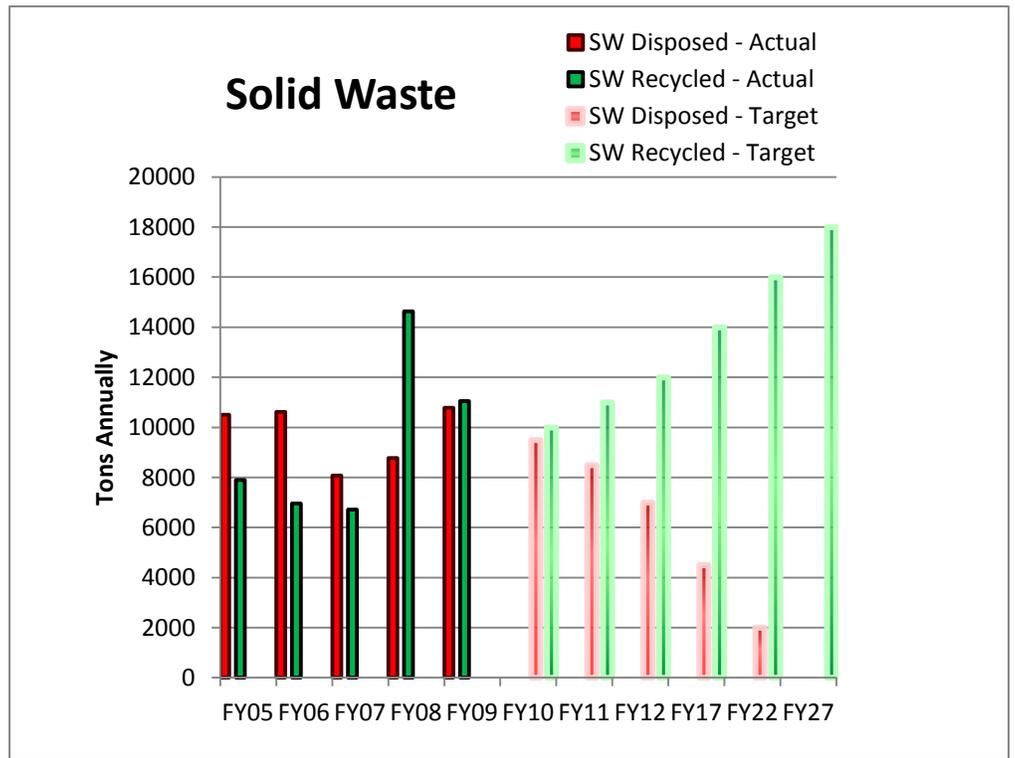
The Permit B Permit is modified several times throughout the year. The majority of modifications are initiated by CDPHE as the status of SWMUs change. Modifications initiated by Fort Carson relate to minor edits such as contact information or more significant updates such as adding waste codes or language required through recent legislation.

**Goal Objectives and Targets**

**Objective ZW1: Reduce solid waste disposal through sustainable procurement practices, reduction in material use, reuse and recycling**

**Target by FY12:**  
Weight of solid waste disposed of 8k tons (30% reduction using 2005 baseline)

**Target by FY17:**  
Weight of waste disposed of 4.5k tons (70% reduction using 2005 baseline)



**Details on Objective Target Graph ZW1**

**Measure:** Tons of waste disposed of annually (1 ton, short, US = 2000 lbs)

**Scope:** All non-regulated, non-C&D solid waste sent for disposal and all wastes recycled

**Source:** SWARs report

**Baseline:** The FY05 baseline is 10.5k tons (21,000,000 lbs)

**Limitations:** Not all solid waste and recycling activity is captured due to DRMO or subcontractors not reporting to DPW OPs

**Verification & Validation:**

**Comment:** Prior Zero Waste Plans reported solid waste disposal in terms of “per capita” or pounds per person. However, it was decided that reporting just annual weights was more in-line with the goal as the goal does not tie “zero” to any certain number. The goal is zero waste on Fort Carson by 2027 whether the population swells to over 300,000 or is reduced through BRAC or other affects to 500.

**Initiatives in support of Obj. ZW1 (FY10/11)**

**Initiative ZW1.1: Waste to Energy (WTE) -** Fort Carson, along with five other Army Installations, is participating in a WTE feasibility analysis with the Army Environmental Center

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(AEC) and National Renewable Energy Laboratories (NREL). Waste data, cost data and other aspects are being provided for review to determine if a cost effective solution can be pursued. Participants involved: DPW Operations and Environmental Division, five other installations, AEC, and NREL.

**Initiative ZW1.2: Environmental Battle Book** – A field manual has recently been developed outlining all the common wastes found on Fort Carson with the description of proper disposal and/or recycling avenues. This book will be provided to soldiers to improve communication and reduce waste disposal while improving recycling

Participants involved: DPW Operations and Environmental Division

**Initiative ZW1.3: Compost Investigation** – For a short time some Fort Carson organic waste was being diverted from local landfills and going to a local composter who has now suspended operations. If the composting site becomes operational again this opportunity will be pursued.

Participants involved: DPW Operations and Environmental Division

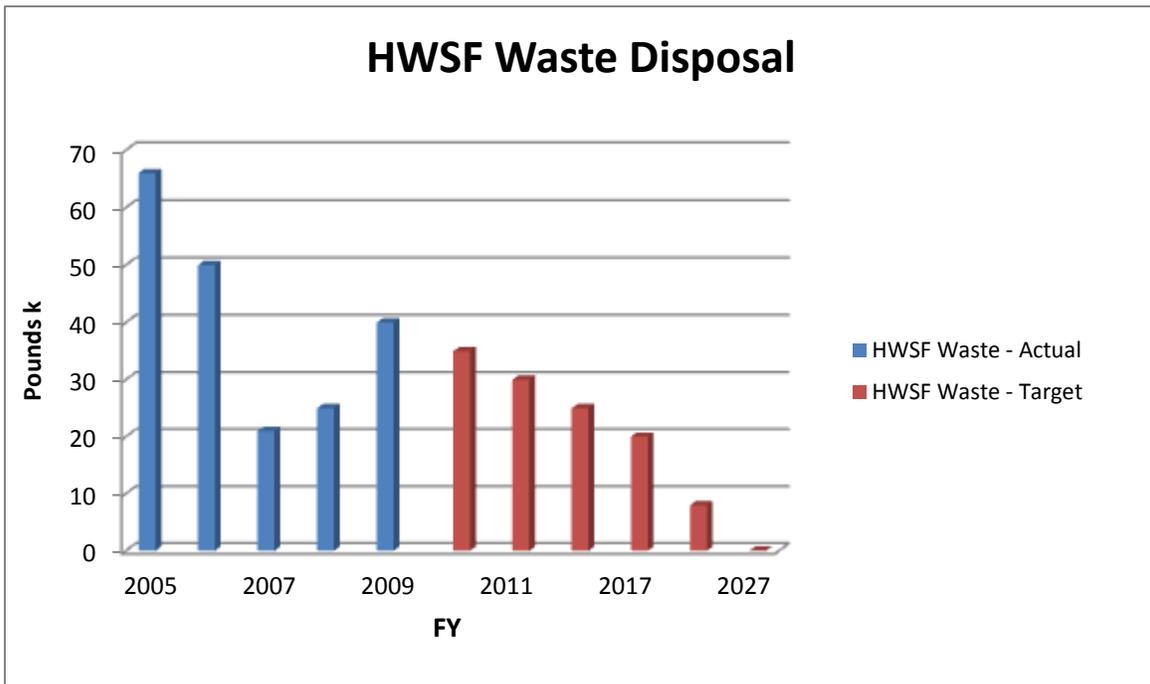
**Initiative ZW1.4: Regional Recycling Consortium** – This is a potential initiative that would involve coordinating with other local military Installations (Peterson AFB, Schriever AFB, etc.) to potentially develop an expanded recycling center on Fort Carson which would allow for greater flexibility to the DoD to store construction waste and other recyclables.

Participants involved: DPW Operations and Environmental Division

**Objective ZW2: Waste disposed of through the HWSF is reduced through sustainable procurement practices, reduction in material use, reuse and recycling**

**Target by FY12: Total weight of HWSF waste disposed of is 46k lbs (30% reduction using 2005 baseline of 66k)**

**Target by FY17: Total weight of HWSF waste disposed of is 20k lbs (70% reduction using 2005 baseline of 66k)**



**Details on Objective Target Graph ZW2**

**Measure:** Pounds, in thousands (\$000) of waste disposed of through the HWSF annually.

FY05	FY06	FY07	FY08	FY09
66k	50k	21k	25k	40k

**Scope:** All regulated (hazardous and universal) and non-regulated (e.g., N001 grease) solid waste that is processed, stored and shipped from the hazardous waste storage facility, except for PCBs and wastes that were ultimately recycled and already counted for in solid waste numbers – which is nearly all of the universal wastes. Tracking of IDW hazardous waste weights and data began in late FY08, and accounts for the significant increase in waste disposal in FY09. Disposal weight data of non-regulated waste processed at the HWSF, such as used grease, was included in the annual totals beginning in FY07. PCBs are not counted as they were a temporary waste stream and because the weights were so large – up to 17k+ - it would have skewed the data. IDW non-hazardous waste is not included because ...it's water. Additionally, in CY09 it was revealed that certain wastes were being counted twice – in SWARS

reporting data and hazardous waste data. So, by deleting PCB weights and recycled waste, the new FY05 baseline is 66,000.

**Source:** Enviance Database

**Baseline:** The FY05 baseline is 66,000lbs.

**Limitations:** Not all waste disposed of is reported to the DPW.

**Verification & Validation:** Hazardous waste data is continually generated as required through various external regulatory reports and internal costing or waste minimization measuring.

Newer reports are compared with reports previously generated to ensure numbers match up.

**Comment:** Prior Zero Waste Plans reported hazardous waste disposal in terms of “per capita” or pounds per person. However, it was decided that reporting just annual weights was more in-line with the goal as the goal does not tie “zero” to any certain number. The goal is zero waste on Fort Carson by 2027 whether the population swells to over 300,000 or is reduced through BRAC or other affects to 500.

### **Initiatives in support of Objective ZW2 (FY10/11)**

**Initiative ZW2.1: Solvent Distillers** – Currently, two distillers are used to recycle solvent from part washers on Post and have done so since 2004. The distillers recycle about 80% of the solvent (20% waste) for reuse. The distillers are old and not as efficient as newer models. Funding has been requested to replace these distillers.

Participants involved: DPW Operations and Environmental Division

**Initiative ZW2.2: Motorpool Recycling** – Funds have been requested to buy equipment such as oil-drain systems, dry sweep dispensing carts, rag cans (to support shop towel laundering), fuel/used oil blending machines, oil filter crushing machines, and aerosol can puncturing systems to support soldier needs and reduce waste.

Participants involved: DPW Operations and Environmental Division

**Initiative ZW2.3: Hazardous Material Control Center (HMCC) Committee** – A subcommittee has been formed under the Environmental Quality Control Council (EQCC) to review and address hazardous material issues on Fort Carson. These issues include overstocking of materials, ordering materials outside of the HMCC supply chain and developing better review procedures.

Participants involved: DOL and DPW Environmental Division

**Initiative ZW2.4: Heptane Recycling:** a Heptane Distillation Unit was installed at the HWSF in CY09. HWSF personnel initiated heptane recycling activities so that the used product is re-used by the AOAP rather than sent off site for disposal

Participants involved: DOL and DPW Environmental Division

**Initiative ZW2.5: Digital Mammography Equipment.** – Used developer (fixer) waste from mammography equipment was reduced in CY09, will be reduced further in CY10 and eliminated by CY11 as all medical facilities on Fort Carson have upgraded to digital equipment

Participants involved: MEDDAC

**Initiative ZW2.6: Research Additional Recycling Opportunities** – While a significant amount of hazardous wastes have either been eliminated or have had recycling programs started over

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the last five years (heptane recycling, bead blast media leasing, paint thinner recycling, antifreeze recycling, latex paint recycling, etc.), additional hazardous and solid wastes that are a challenge need to be investigated for P2 opportunities to include industrial grease, residential electronics, mattresses, Styrofoam, used methanol (hospital), used fixer (hospital) and enamel paints.

Participants involved: P2, RCRA, HWSF, Recycle