



**Marine Corps Air Ground Task Force Training Command  
Marine Corps Air Ground Combat Center  
Twentynine Palms, California**



**FY2002  
Secretary of Defense  
Environmental Awards Submission**

**Pollution Prevention  
Team Award**



## Introduction

The Marine Air Ground Task Force Training Command (MAGTFTC) is pleased to submit a nomination package for the Secretary of Defense/Secretary of the Navy FY02 Environmental Awards in the category of Pollution Prevention Team Award. The team consists of the following organizations:

- Total Waste Innovations (MAGTFTC)
- Hazardous Waste Minimization Center (MAGTFTC)
- Anteon Corporation (Contractor)
- Battelle Memorial Institute (Contractor)

The Marine Air Ground Task Force Training Command, Marine Corps Air Ground Combat Center (MAGTFTC MCAGCC), Twentynine Palms, California is the premier training facility in the Marine Corps. The land mass of the Combat Center comprises is 935 square miles or 597,283 acres of which less than 20,000 acres are dedicated to facility infrastructure, community support and family housing, and the maintenance of vehicles and equipment.

The primary mission of the Training Center is to provide live-fire combined arms training that promotes readiness of operating forces. The combined arms training is provided through the Combined Arms Exercise (CAX) program. The objective of the CAX program is to exercise and train active duty and Reserve Fleet Marine Force units and Marine Air Ground Task Forces (MAGTFs) in command, control and coordination of combined arms in a maneuver-warfare live-fire environment. The CAX is the most realistic, live-fire training exercise in the Marine Corps in which the Marines traverse the impact area into which they just fired live munitions. The CAX provides the commanders and the Marines the opportunity to employ all the weapons systems of the MAGTF in support of maneuver. Approximately 3,000-4,000 Marines and Sailors participate in each of ten CAX training cycles which uses the "building block" approach, starting with small-unit training and culminating in a final three-day exercise (FINEX) utilizing all Marine Corps available resources of naval gunfire, artillery, small arms, fixed and

rotary wing aircraft and mechanized artillery, just as they would in a wartime environment.

The secondary mission of MAGTFTC MCAGCC is to provide facilities, services, and support, responsive to the needs of tenant commands, Marines, Sailors and their families. MAGTFTC support a population of 20,743 that includes tenant organizations, military personnel, dependents and civilian workforce.

MCAGCC is located in San Bernardino County in the southern Mojave Desert approximately 150 miles east of Los Angeles and 150 miles west of Las Vegas. It is also located four miles north of the City of Twentynine Palms, a community that caters to tourism of the adjoining Joshua Tree National Park and provides housing, supply, administrative and minor construction support to MCAGCC.

In the past two years budget reductions, increased environmental requirements, greater public scrutiny, the requirement to become more efficient, and to privatize commercial-like functions has facilitated and accelerated the MAGTFTC MCAGCC Pollution Prevention program in to becoming an efficient organization, performing the required functions by the most economical means.

In 2000, the MAGTFTC MCAGCC Environmental Management System (EMS) identified five different waste management activities of solid waste disposal, solid waste recycling, hazardous waste, ordnance/range residue waste, and military scrap waste that were not being managed with optimal efficiency. These waste management activities involved multiple organizations that had overlapping duties and functions, and competed against one another for limited resources. These waste management functions pulled Marines and Sailors from their primary mission of training for war to do waste management functions. In FY01, MAGTFTC, with the assistance of Anteon Corporation, began utilizing EMS in a reengineering analysis of all waste management activities with the following objectives:

- Comply with San Bernardino County hazardous waste management requirements.
- Meet Executive Order and other environmental regulatory requirements.
- Return Marines back to perform Marine function of “training for war” not waste management.
- Meet DoD Measures of Merit for reducing waste and toxic releases and to increase recycling.
- Improve efficiency of operations for the Marines and overall waste management.
- Provide greater safety to the Marines and to waste management operators.
- Reduce cost for waste functions.

The reengineering analysis assessed process flows; analyzed twelve months of costs associated with the waste functions, staffing, materials, and equipment; benchmarked and performed preliminary market analysis against the capabilities of commercial companies; and developed cost estimates to perform the waste functions. A Staff Action Brief (STAB) was prepared for each waste management function summarizing the analysis and recommendations to meet the objectives and was briefed to the Command and customers for approval. A commercial-like Business Plan was prepared and MAGTFTC began implementing **Total Waste Innovations (TWI)** as a consolidated organization that would perform all waste management activities under a business-like entity for the entire Combat Center. **TWI** is operating under the guidance of a non-appropriated funded (NAF) instrumentality in four unique work centers manned by NAF personnel. The centers are called the Hazardous Waste Recycling Center (HWRC), the Residential Commercial Recycling Center (RCRC), the Industrial Recycling Operations Center (IROC), and the Range Residue Processing Center (RRPC). These centers are responsible for collecting, consolidating, processing, packaging, recycling, transporting, and selling or disposing all waste generated at MCAGCC.

MAGTFTC MCAGCC utilizes commercial off-the-shelf software -- “QuickBooks Pro” -- that is utilized by the business industry to track all operating costs, provide inventory controls, records for sales, reutilizations, invoices for reimbursable services and sales, and tracks cost avoidance. Two secondary software systems, -- “Hazardous Material Management System” and “FieldACE” -- track the day-to-day compliance with environmental regulatory requirements, such as hazardous material/hazardous tracking from issue to ultimate disposal, and compliance with environmental regulations through a quarterly self-assessment program. As the **TWI** processes improve, change, or increase in mission, changes are incorporated into the programs to assure a constant assessment and reevaluation occurs on the **TWI** Centers and the overall program.

### **Hazardous Material Management**

MAGTFTC established a Hazardous Material Minimization (HAZMIN) Center to control and manage all the hazardous materials being ordered, received, and issued at the Combat Center. The HAZMIN Center, which operates within the Center Logistics Division, Consolidated Supply Support Branch (CSSB), is responsible for complete support of all CAX unit consumable supply requirements as well as coordination of all their ground fuel deliveries to Camp Wilson. Lastly, CSSB is responsible for compliance with all hazardous material (HM) requirements aboard MAGTFTC. Working with all its customers, the HAZMIN Center has established a protocol and policy for establishment of an Authorized User List (AUL). The AUL authorizes the HAZMIN Center customers to request, purchase, and receive only the HM required to perform their units respective mission to ensure that all customers have sufficient HM for a 10-day supply. With the assistance of a contracted support team from ENVIROMAX Corporation and its Hazardous Material Management System, the HAZMIN Center provides all the tracking of HM throughout the Combat Center and Material Safety Data Sheet (MSDS) production and issue. Prior to the procurement of any new HM not on the AUL, requests must be approved by

HAZMIN Center personnel and the Natural Resources and Environmental Affairs (NREA) Division. Working with the customer, the requirements, initial issue quantity, continued quantity, and recommended HM are determined. Together, the HAZMIN Center and NREA Division determine all reasonable types of HM that may fulfill the requirements based upon application of the HM, the amount of hazardous substance in the HM, disposal or recycling options, and cost. Based upon this information, a recommendation of the preferred HM is made to the customer for concurrence.

The HAZMIN Center has also enhanced its internal EMS by constant review of its inventory and of efficiency of utilization of HM in stock. Reordering and stocking of underutilized HM is reduced or discontinued and underutilized stock is placed in its Free Issue Point. The Free Issue Point offers HM that is excess, no longer required or returned by customers free to all MCAGCC customers who have an authorization on their AUL for such HM. As indicated in Table 1, the efforts of the HAZMIN Center have provided a substantial savings to individual units by reducing their inventory control requirements. It has also reduced hazardous substance (HS) or toxic releases, and reduced the quantity of unused HM that is ultimately disposed as a hazardous waste. The County of San Bernardino is recommending this type of HM management and control program to some of the larger commercial industries within the county.

HAZMIN CENTER	FY01	FY02
Number of Free Items Issued	5,909	3,449
Total Pounds of Free Issue	108,560	181,727
Unit Cost Savings In Free Issue	\$211,089	\$170,584
Total Pounds of HS Reduced	20,627	34,529
Number of Items Removed from Inventory	5	276

**Table 1**

## Hazardous Waste Management and the Hazardous Waste Recycle Center

Prior to the EMS **TWI**, hazardous waste (HW) management was the individual unit responsibility, with each unit having 2-3 Full-Time Equivalents (FTEs) performing the characterization, packaging, classification, labeling, and transportation to the less than 90-day hazardous waste accumulation area (HWAA). In order to meet the 90-day deadline for disposal at the HWAA, all HW was accepted and disposed since it had already been classified. The management of HW in this manner did not meet all the regulatory requirements. Daily unit level discrepancies exceeded 150 annually. MAGTFTC MCAGCC could not meet HW reduction requirements because the incentive at the unit level was to move and dispose of HW in a timely manner, not to reduce the quantity, cost or toxicity of HW disposed. The cost for the HW Management function exceeded \$3.1M annually; it required 114 full- and part-time personnel equating to 49.16 man-years to run the program; and disposed of 740 tons of hazardous waste annually.

Under **TWI**, the Hazardous Waste Recycling Center (HWRC) was established to manage all of the Combat Center HW to include the individual unit level collection, characterization, packaging, transportation, recycling and disposal. The HWRC provides full-service HW management to include containment, transfer containers, pre-labeled collection containers, bulk storage containers, 3-day scheduled pick-up service for all HW and recyclable HW.

### HWRC Transferring Recyclable Hazardous Waste



Additional services the HWRC provides are shop rag pick-up and cleaning service, solvent recycling machines, and household hazardous waste pick-up from on-base housing.

■ Prior to **TWI**, shop rags service was contracted for \$41.7K annually. This service provided no reduction in HW management since rags had to be manifested from the Combat Center as HW. The HWRC now provides government procured shop rags to individual units, weekly service cleaning, and return to the unit. This effort eliminated the off-site hazardous waste recycling contract, reduced off-site manifesting of 25,800 pounds of rags annually and provided a \$33.8K reduction in operational costs.

■ MAGTFTC had contracted to provide weekly solvent machine and solvent rental for \$78K annually that manifested 23,385 gallons or 187,080 pounds of solvent annually. MAGTFTC tried water-based solvents with the rented machines but the emulsified fuel water-based solvent could not be treated at the installation wastewater treatment plant or at the contractor sites. MCAGCC then evaluated two solvent machines that had on-system recycling mechanisms for petroleum based mineral spirits. The evaluation criteria were performance, ease of maintenance, recycle time, make-up solvent requirement. In 2001, 58 solvent machines were procured from Clarus Technologies. Since implementing the new solvent machines, MAGTTC has disposed of only 73 gallons or 584 pounds of solvent/still bottoms from the machines, and only 320 gallons of make-up solvent was required by the entire Combat Center. MAGTFTC has achieved a \$72.5K annual savings from FY 00 and reduced off-site transfer of solvent by 22,801 pounds.

■ In FY02, MAGTFTC HWRC initiated a curbside household hazardous waste (HHW) collection and recycling program. Working with the County of San Bernardino, the program has been established to legally and safely manage HHW. Prior to FY02 HHW was either taken 17 miles to the nearest County HHW collection center, disposed by residents in household trash,

or abandoned. The HWRC has provided red HHW collection containers and monthly pick-up service to the military families. Incidents of HHW being disposed of in trash has been reduced 86%, enabled the collection of 9,831 pounds of HHW, of which 7,482 pounds of paint, used oil, filters, and empty containers have been recycled.

The HWRC has also worked with the County of San Bernardino Fire Department, the California lead agency for the MAGTFTC **TWI** HW program to obtain numerous approvals of permit-by-rule notifications for on-site recycling of California designated HW. These on-site recycling systems are for:

- ◆ Aerosol Can Crushing
- ◆ Evacuating Compressed Gas Cylinders
- ◆ Drum crushing
- ◆ Empty Can Crushing
- ◆ Fluorescent Light Bulbs crushing and mercury recovery
- ◆ Anti-freeze recycling
- ◆ Solvent recycling
- ◆ Recovery of oil from shock absorbers
- ◆ Oil and Fuel Filters crushing
- ◆ Hydraulic Fluid recycling
- ◆ Fuel Recycling
- ◆ Shop Rag Cleaning
- ◆ Freon Recovery
- ◆ Bioremediation of Petroleum

Contaminated Soil

**HWRC ODS Recovery/Recycling From Residential Refrigerators**



By centralizing HW management under **TWI's** HWRC, the MAGTFTC produced the following benefits:

- Reduced the man-years needed to manage the installation's HW from 49.16 to 13.8.
- Met mandated reduction in off-site transfer of HW from 740 tons in FY00, to 676.6 tons in FY01, and to 443.9 tons in FY02.
- Increased on-site HW recycling and reuse from zero in FY00, to 74.4 tons in FY01, and to 330.5 tons in FY02. Additionally, 14,000 tons of petroleum contaminated soil is now utilized annually for landfill cover material.
- Reduced the Operational & Maintenance Marine Corps (O&MMC) funds required to manage the installation's HW from \$1,721,600 in FY00, to \$1,437,300 in FY01, to \$894,000 in FY02.
- Saved an additional \$154,700 in new hazardous material procurement by on-site recycling and reuse of HW, resulting in a 5% reduction in toxic releases.

### **Solid Waste Management and the Residential Commercial Recycle Center**

Prior to FY 01, it appeared that MAGTFMC MCAGCC residents, tenants, and work force did not care where or what happened to its trash, who disposed of it, where it went, or even if it was recycled. Five major organizations performed some type of solid waste management function for trash. The easiest option was to contract the disposal of 7,003 tons of trash at a cost of \$747,000 annually. This action did not meet any reduction or recycling goals, it forced the installation to accept potential off-site liability, and the Combat Center received minimal revenue returns for recycling. After completion of the EMS reengineering STAB, **TWI** was called to action again to provide full-service solid waste collection and recycling service for MAGTFMC and its customers and to reduce the amount of trash being disposed in the landfill by increasing recycling. The Residential Commercial Recycling Center (RCRC) was established to meet this challenge. The RCRC worked with the State of California Department of Conservation and the San Bernardino County, Environmental Health Services Division, to develop and establish a full-service solid waste

collection and recycling program. The RCRC was registered as a self-hauler, and received permits for operating a drop-off community service program, a curbside collection program, and as a certified Recycle Center. The RCRC provides the following services encompassing the full range of trash pickup and disposal services for the Combat Center:

- Daily and bi-weekly service for over 450 trash and recycling dumpsters on a daily or bi-weekly basis;
- Bi-weekly service to 137 buildings for pick-up office paper and cardboard;

#### **RCRC Recycling at Command Headquarters Office**



- Weekly trash and curbside recycling service to over 1,500 family housing residents on base;
- Special call request for bulk or large items;
- Drop-off CA Redemption Value (CRV) Center to turn-in and receive cash for CRV items;
- On-site sorting, packaging, and sale of post-consumer paper, plastic, glass, cardboard, steel cans, and aluminum.

#### **RCRC Curbside Recycling in Family Housing**



This full-service program was announced through local flyers to the family housing residents and to the offices of the Command and tenant organizations. As part of recycling awareness, an annual Recycling Incentive Program was established that provides an opportunity for competition among units, direct cash back to the unit or individual redeeming California Redemption Value (CRV) items, and encourages solid waste reduction aboard the Combat Center. To participate in the incentive program, individuals simply have to turn in their CRV items to the CRV Center. On the spot cash refunds are given at the time of turn-in. When the items are turned in to the CRV Center, the individual identifies his or her unit or spouse's unit, and the unit gets credit for the turn-in. At the end of the Recycle Incentive period on September 30<sup>th</sup>, the top three units turning in the most CRV items by weight are awarded checks in the amount of \$500.00, \$300.00, and \$200.00 to be utilized for unit level functions. In the two years of the program's existence, it has brought in 35,572 pounds of CRVs that allowed individuals or units to receive \$15,087.52 in return. The RCRC then received \$24,760.00 from the sale of these items recovered.

Using **TWI's** Residential Commercial Recycling Center (RCRC) to manage all residential and commercial solid waste trash, curbside collection, and post consumer commodity recycling has resulted in the following benefits to the installation and its customers:

- Reduced the annual solid waste management cost from \$1,108,700 in FY00, to \$540,700 in FY01 to \$524,500 in FY02
- Decreased solid waste disposal from 7,003 tons in FY00, to 6,834 in FY01, and to 6,103 FY02
- Increased recycling from 112.2 tons in FY00, to 147.9 tons in FY01, and 312.3 tons in FY02
- Increased recycling revenue from \$12,000 in FY00 to \$86,600 in FY01 to \$212,400 in FY02

## Scrap Military and Industrial Waste and the Industrial Recycling Operations Center

In FY00, all excess or unserviceable items originating from military units, Combat Center organizations, and scrap from family housing and repair of base facilities that were declared scrap by the owner were taken to the Defense Reutilization and Marketing Office (DRMO) for disposition. DRMO would assess the item and if it was deemed that the item's value on the open market did not exceed \$250.00, it would be disposed in the landfill as solid waste. For those items that were sold as scrap, MAGTFTC was not receiving the full amount of the revenue from the sale. Administrative and recording keeping problems were preventing proper tracking of both the amounts disposed and the amounts offered for sale. Once again, the EMS **TWI** analysis recommended the establishment of an Industrial Recycling Operations Center (IROC) to manage, recycle, and sell military/industrial related scrap generated by MCAGCC.

Beginning in FY01 the IROC, established under the **TWI**, utilizing business-like principles was tasked to provide an alternative to disposal of used commercial, industrial, and military type equipment having no potential value for government reuse, that might be a commodities having scrap value or meeting non-military specifications for private and public industry use. To accomplish this the IROC performs these services:

- A management control system for the collecting, sorting, classifying, and accounting for scrap commodity items for reuse or sale.

### IROC Preparing Scrap Surplus for Sealed Bid Sale



- A reutilization program for military units that can utilize off-specification military goods
- A donation program that allows scrap material from the maintenance of real property or military housing resident, to be collected or received at no cost to the donor.
- A program that allows potentially recyclable commodities to be removed by the IROC for public sale prior to demolition of facilities and structures.
- A Cash and Carry program that allows anyone to buy a scrap item for private use.
- A sealed bid program to allow competitive sales of items that may have a retail value of \$5,000.00 or more.

IROC Preparing Scrap Surplus for Sealed Bid



The IROC of **TWI** has provided the Command, the tenant units, and the public with the following benefits:

- An 83% increase in the amount of scrap material managed as a post-consumer scrap product available through the Cash and Carry and sealed bid programs;
- Increased the amount of diverted solid waste from 505 tons in FY01 to 2,921 tons in FY02;
- Provided an increase of sales from \$8,900 in FY00 to \$159,000 in FY01 to \$251,000 in FY02;
- Increased military unit reutilization of once-scrap items from 3.3 tons in FY01 to 92.6 tons in FY02. Reutilization of these items resulted in a savings to the military units of \$197,501 in FY02.

### **Ordnance and Range Residue and the Range Residue Processing Center**

For purposes of safety and decreased liability, the MAGTFTC regularly performs range maintenance and range clearance operations. Annually, these clearance operations generate approximately 8,000 tons of solid waste consisting of gleaned ordnance and range residue material posing a potential explosive hazard (MPPEH) from live fire and maneuver training activities at the Combat Center. Prior to 2001, MPPEH was either stockpiled on the range or the individual Marine unit was responsible for turn-in and for providing a certification to DRMO that items contained no explosive hazard. Individual units provided this certification solely based on a visible inspection of the MPPEH. Because of incidents of live rounds being turned in to the DRMO and the probability of an accident occurring, DRMO stopped receiving any items coming from the range unless the Marines performed additional time consuming requirements to ensure that no MPPEH was in the gleaned item which provided no added value to the process. The Natural Resources and Environmental Affairs Division was tasked to review the waste management through the EMS program and provide recommendations through a STAB. The STAB recommended establishing a Range Residue Processing Center (RRPC) under **TWI** to be staffed with qualified personnel with Explosive Ordnance Disposal and/or range maintenance background to provide third party certification of all gleaned MPPEH from the ranges. The RRPC either performs gleaning operations themselves or receives MPPEH items from training units returning from the field. A multiple stage certification process is performed by the RRPC, with 95% of the certification being completed by mechanical process of the gleaned MPPEH item.

With the assistance of Battelle Memorial Institute, who provides the engineering and scientific support for evaluating commercial off-the-shelf equipment that could be utilized to provide a mechanical certification, the RRPC



utilizes five major pieces of plant equipment and numerous hand-held industrial tools to mechanically process all MPPEH. The major plant equipment utilized by the RRPC is categorized by the material it processes:

- *Spent Brass Processing.* Spent casings of .50 caliber and smaller are processed through a Hammermill.

- Twenty-millimeter casings are run through an ordnance deformer, in order to prevent the brass from being reloaded.

The Ordnance Deformer and Hammermill combined have processed over 511,000 pounds or 255 tons of spent casings.

Hammermill with Processed Expended Brass



20mm Expended Brass Deformer



- *Aluminum Range Gleanings.* Aluminum ordnance residue consisting of 40mm practice grenades and cartridge cases, mortar and bomb fins, and 120mm discarding sabot pieces are processed through an aluminum melting furnace, which is permitted through the local air quality management district. The melting furnace produces 500 to 600 lb aluminum sows. In 750 hours of operation, over 225,000 pounds/112.5 tons of scrap aluminum has been processed through the furnace.



- *Scrap Metal Shredding.* To date, over 2.5 million pounds of ammunition cans, propellant charge cans, and other light metal MPPEH has been mechanically processed through a heavy-duty shredder to demilitarize and reduce the volume of low-value scrap metal.

Shredder



- *Heavy Metal Shearing.* To date, over 610 tons of practice bombs (500-lb, 750-lb, 1,000-lb and 2,000-lb bombs) and large metal targets (vehicle hulls) have been demilitarized using a hydraulic demolition shear. Each practice bomb case was pierced and then sheared to allow the inert concrete filling to be inspected and/or removed.



Metal targets are sheared to non-recognizable scrap steel.

Establishing the Range Residue Processing Center (RRPC) as part of the TWI organization has produced the following benefits:

- MCAGCC has gleaned, mechanically processed, and provided a third party certification of over 2,500 tons of once MPPEH;
- Has allowed the mechanically processed scrap metal to be sold by the TWI Industrial Recycling Operations Center.
- Has eliminated live munitions or residue from being turned in/ or inadvertently sent off-site for recycling.
- As compared to a contracted effort, has achieved a cost avoidance of over \$1,500,000 at an operating cost of less than \$500,000.

### Summary

In summary, by using EMS as a business reengineering tool, the MAGTFTC has successfully established the **TWI**, a Non-Appropriated Funded (NAF), Category B Instrumentality. TWI operates as a commercial business, developing a commercial-like Business Plan, utilizing fees for service (reimbursements), and revenue generated by sales to accomplish the following:

- Achieve or exceed compliance with County hazardous waste mandates;
- Achieve and/or exceed all Federal, State, and DoD waste reduction requirements from a total of 7,743 total tons disposed in FY00 to 6,546 tons in FY02;
- Increase overall recycling from 112 tons in FY00 to 3,563 tons;
- Reduce manpower requirements to perform a necessary waste management function by
  - Returning 97 Marines back to their primary occupational specialties instead of having them manage waste, and.
  - By eliminating or realigning eleven appropriated funded employees who were performing waste functions;
- Improving efficiency and safety for the Marines and the **TWI** operators by 60%.

- Reduce the overall waste management cost from \$3,113,700 prior to TWI to \$2,300,000 for FY03.;
- Reducing hazards and environmental liability;
- Increasing recycling revenues from \$12,000 in FY00 to over \$490,000 in FY02.

The EMS Team includes the entire Combat Center staff, Marines, and sailors. Other acknowledgement must go to support contractors, vendors, and the agencies below for accepting the EMS **TWI** concept, assisting in development and providing a constant check and balance of the reengineering to ensure that the most efficient, compliant and optimal waste management processes and functions are being conducted at the Combat Center.

#### Federal Agencies

- ✱ U.S. EPA Region 9 for acceptance of the Range Residue Processing Center and management of ordnance and range residue;
- ✱ Federal Trades and Security Commission for oversight and guidance on the control, management, and sale of scrap military surplus equipment and materials;
- ✱ The Naval Facilities Engineering Service Center and Naval Facilities Contracting Office for contract support.;
- ✱ U.S. Army Research Office for contract support services.;
- ✱ General Services Administration for contract support services.

#### County, Regional and State of California Agencies

- ✱ San Bernardino County for direction and oversight in hazardous material management, hazardous waste, solid waste control and reduction;
- ✱ California Department of Conservation for assistance in the residential and commercial recycling program; and
- ✱ Mojave Desert Air Quality Management District for permitting of required TWI operations

#### Private/Commercial Agencies

- ✱ Anteon Corporation for the EMS

Reengineering analysis of waste management functions;

- ✱ Battelle Memorial Institute for support in the RRPC;

- ✱ Potomac Hudson Engineering for providing the basic concepts of EMS and automated compliance tracking system;

- ✱ EnviroMAX Corporation for the hazardous material and hazardous waste tracking system;

- ✱ Clarus Technologies for efficient solvent

machines;

- ✱ Hoover Containment Inc. for supplying bulk liquid transportation and storage devices;

- ✱ Bestway Laundry Solutions for supplying the technology and equipment to support rag and uniform cleaning operations;

- ✱ North State Environmental for compressed gas cylinder removal and recycling service.

## ***Nomination Info:***

### Brief Summary:

The Marine Air Ground Task Force Training Command Pollution Prevention Team consists of Total Waste Innovations (MAGTFTC), the Hazardous Waste Minimization Center (MAGTFTC), Anteon Corporation (Contractor), and the Battelle Memorial Institute (Contractor). The Marine Air Ground Task Force Training Command utilized its Environmental Management System as business reengineering tool for all waste management functions, establishing a Non-Appropriated Funded (NAF), Category B Instrumentality, called **Total Waste Innovations (TWI)** that operates as a commercial enterprise. In two years since establishing **TWI**, the success is measured by exceeding regulatory compliance standards, total waste reduction of 1,200 tons, increase of recycling by 3,451 tons, returning 97 Marines and Sailors back to the Fleet Marine Force who were previous performing a waste function, reduced overall waste management cost by \$817,000, and generated over \$900,000 in recycling revenue.

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