

Marine Corps Air Station Yuma Installation Sustainability Performance Plan January 2014



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EXECUTIVE SUMMARY

1.0 INTRODUCTION

Marine Corps Air Station (MCAS) Yuma has developed this Installation Sustainability Performance Plan (ISPP) to meet all current and applicable federal, Department of Defense (DoD), United States Marine Corps (USMC) and Marine Corps Installations West (MCIWEST) requirements (e.g., Executive Orders [EO] 13514 and 13423, the DoD Strategic Sustainability Performance Plan [SSPP], the USMC Sustainability Plan, and MCIWEST Order 5090.3, Sustainability Management Program [SMP]).

2.0 PURPOSE AND FRAMEWORK OF THE ISPP

MCIWEST Order 5090.3 states that Installation Commanders are responsible for the creation and implementation of ISPPs and Programs of Action and Milestones (POA&M) to achieve the reductions contained in EO 13514 and EO 13423. Accordingly, MCAS Yuma has developed this ISPP to:

- Institutionalize sustainability policy and EO 13514 and MCIWEST Order 5090.3 requirements.
- Document baseline year and current status regarding sustainability goals.
- Determine fiscal year (FY) 2020 goal requirements.
- Develop POA&M to achieve FY 2020 goals that include:
 - Projects, policies/procedures, and initiatives needed to meet goals;
 - Implementation schedules; and
 - Funding requirements.

The organizational framework of the MCAS Yuma ISPP follows the goal/objective structure contained in MCIWEST Order 5090.3 as follows:

- Goal 1: Accomplish Greenhouse Gas (GHG) Reductions/GHG Inventory (6 Objectives)
- Goal 2: Improve Energy Efficiency (8 Objectives)
- Goal 3: Improve Water Use Efficiency and Management (2 Objectives)
- Goal 4: Promote Pollution Prevention and Waste Reduction (10 Objectives)
- Goal 5: Advance Regional and Local Integrated Planning to Create Sustainable Communities (6 Objectives)
- Goal 6: Implement Sustainable Building Design, Construction, Operations and Maintenance, and Deconstruction (5 Objectives)
- Goal 7: Advance Sustainable Acquisition (i.e., Green Procurement) (2 Objectives)
- Goal 8: Optimize Fleet and Transportation Management/Alternative Fuels (3 Objectives)

- Goal 9: Promote Electronic Stewardship (6 Objectives)
- Goal 10: Sustain Formal Environmental Management System (EMS) (3 Objectives)

For each objective, the following analysis is included:

- Baseline through FY 2011 including identification of the authoritative data source for each objective;
- FY 2012 through FY 2020;
- Action Plan – includes the POA&M for achieving the FY 2020 sustainability goals.

3.0 MCAS YUMA SUSTAINABILITY PROGRAM

The purpose of the MCAS Yuma Sustainability Management Program is to supplement this ISPP by establishing policy and assigning responsibilities that will support the Station's implementation of the ISPP in meeting the goal and objective requirements. The MCAS Yuma sustainability program consists of the following:

- Executive Sustainability Steering Committee (recommended): The committee would establish policy and provided management oversight to ensure compliance with MCIWEST Order 5090.3 and the goals of this plan. The committee would regularly review the overall performance of the Station's status with regard to meeting the sustainability goals and identify issues/recommendations for ensuring compliance, and coordinate with the MCIWEST Sustainability Executive Steering Committee. The committee could be a stand-alone entity or combined with an existing Station committee.
- Installation Sustainability Performance Plan: The ISPP will serve as the "roadmap" for achieving the goals and objectives outlined in MCIWEST Order 5090.3.
- Sustainability Management Tool (SMT): MCIWEST has developed an automated SMT for installation-level use. The SMT will be utilized by the Station Lead Responsible Offices (LRO) to maintain current goal, objective, and target status. The SMT will be used to generate sustainability status reports as needed.
- Station Lead Responsible Office: MCAS Yuma LROs (Table ES-1) will be responsible for:
 - Developing sustainability projects, processes, and POA&Ms to implement, track, and report status and progress toward achieving the goals and objectives within their functional area of responsibility.
 - Maintain current goal/objective/target status and progress via update of the SMT.
 - Participate in MCIWEST LRO Working Groups.
 - Identify and program for funding required to implement the ISPP.

Table ES-1. MCAS Yuma Lead Responsible Offices

MCIWEST Order 5090.3 Sustainability Goal	Station Lead Responsible Office
Goal 1 – Accomplish GHG Reductions/GHG Inventory	Environmental Department
Goal 2 – Improve Energy Efficiency	Public Works
Goal 3 – Improve Water Use Efficiency and Management	Public Works
Goal 4 – Promote Pollution Prevention and Waste Reduction	Public Works
Goal 5 – Advance Regional and Local Integrated Planning to Create Sustainable Communities	Public Works
Goal 6 – Implement Sustainable Building Design, Construction, Operations and Maintenance (O&M), and Deconstruction	Public Works
Goal 7 – Advance Sustainable Acquisition	Logistics
Goal 8 – Optimize Fleet and Transportation Management/Alternative Fuels	Logistics
Goal 9 – Promote Electronic Stewardship	S-6, Communications Data Electronics Safety Department
Goal 10 – Sustain Formal EMS	Environmental Department

4.0 OVERALL SUMMARY OF THE STATION'S SUSTAINABILITY COMPLIANCE STATUS

The overall sustainability compliance status of MCAS Yuma is presented in Table ES-2. This table provides a summary of the ten MCIWEST Order 5090.3 Sustainability Goals, the projected compliance status for each goal, the ISPP estimated funding requirements to achieve compliance, and additional relevant remarks. As indicated in Table ES-2, the Station's FY 2020 sustainability compliance outlook is very positive.

One area of concern is Goal 2, Improving Energy Efficiency; specifically, the Station is not forecasted to meet the FY 2020 reduced energy intensity target mainly due to the stationing of the Joint Strike Fighter (JSF) at MCAS Yuma. A recommendation in this ISPP (see Section 2.2.1.4) is to consider the applicability of the Department of Energy's *Guidelines for Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005*, which among other criteria, excludes federal buildings from energy performance requirements for "Impracticability due to energy intensiveness or national security function." The guidance further identifies the following "assumed exclusion of structures and processes not qualified as federal buildings" to include "airplanes or other vehicles that are supplied with utility-provided power."

Figure ES-1 provides a graphical summary of the key, quantitative sustainability objectives (i.e., GHG emissions, energy, water, and fuel use). Each graph indicates the respective baseline value, the target line (increase or decrease from baseline), the actual value (baseline through FY 2011), and forecasted status from FY 2012 through FY 2020.

Table ES-2. MCAS Yuma Sustainability Status

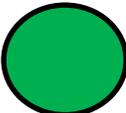
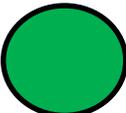
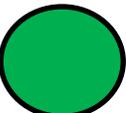
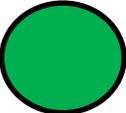
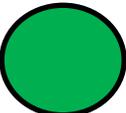
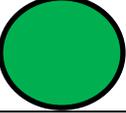
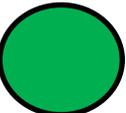
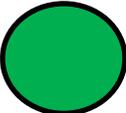
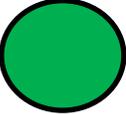
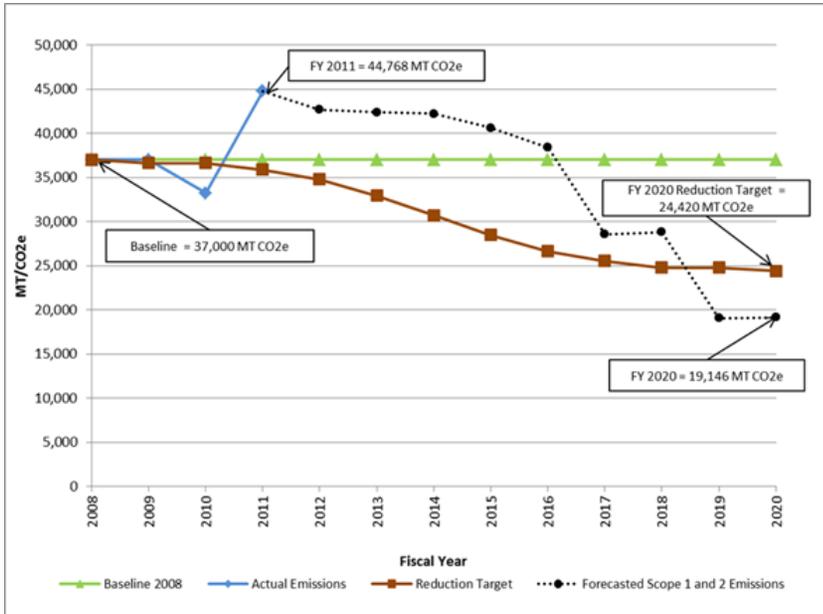
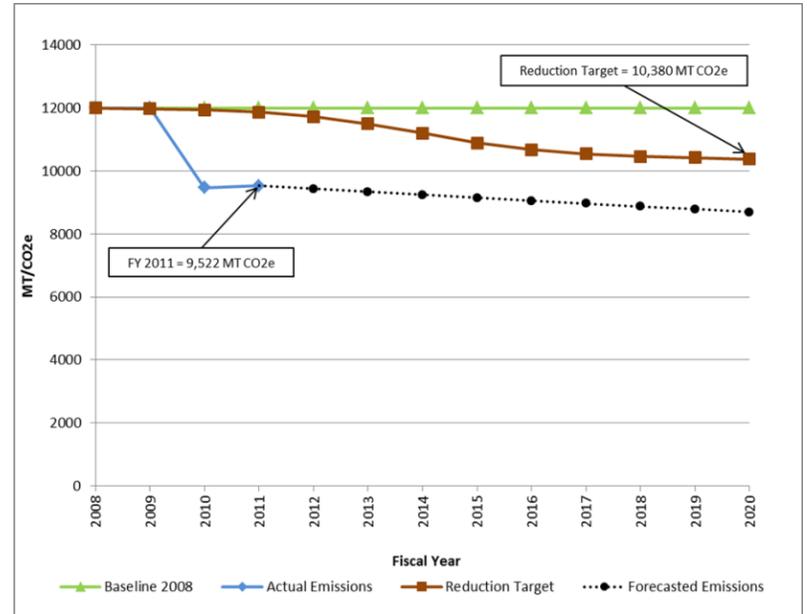
MCIWEST Order 5090.3 Sustainability Goal	Projected FY 2020 Compliance Status	ISPP Estimated Funding Requirements (2012 – 2020)	Remarks
Goal 1 – Accomplish GHG Reductions/GHG Inventory		\$1.5M	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Closely tied to Objective 2.2, renewable energy use a percent of electrical consumption.
Goal 2 – Improve Energy Efficiency		\$163M Total	<ul style="list-style-type: none"> - Not expected to meet energy intensity reduction target due to stationing of JSF and accounting for associated energy use; however, potential exclusion should be evaluated. - Will significantly surpass renewable energy generation goal. - \$110M through FY 2013 for Obj. 2.1, Energy Intensity - \$53M through FY 2013 for Obj. 2.2, Renewables
Goal 3 – Improve Water Use Efficiency and Management		\$15.8 M	<ul style="list-style-type: none"> - Expected to achieve water use intensity and industrial, landscape, and agriculture reduction goals. - Will require ongoing aggressive planning and project implementation.
Goal 4 – Promote Pollution Prevention and Waste Reduction		None additional at this time.	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Will require ongoing command emphasis and policy and procedure development. - Notable reductions in hazardous waste generation and toxic chemical releases.
Goal 5 – Advance Regional and Local Integrated Planning to Create Sustainable Communities		\$250K	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Noteworthy outreach and integration initiatives.
Goal 6 – Implement Sustainable Building Design, Construction, Operations, and Maintenance, and Deconstruction		None additional at this time.	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Goal achieve heavily dependent on NAVFAC SW support and project management.
Goal 7 – Advance Sustainable Acquisition		None additional at this time.	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Will require ongoing command emphasis and policy and procedure development.
Goal 8 – Optimize Fleet and Transportation Management/ Alternative Fuels		\$86K	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Requires E-85 fuel dispensing station (project).
Goal 9 – Promote Electronic Stewardship		None additional at this time.	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements. - Will require ongoing command emphasis and policy and procedure development.
Goal 10 – Sustain Formal EMS		None additional at this time.	<ul style="list-style-type: none"> - Expected to achieve all goal/objective requirements upon full implementation of the Station Sustainability Management Program and continued implementation of the EMS

Figure ES-1. Status of Key Installation Sustainability Performance Plan Objectives

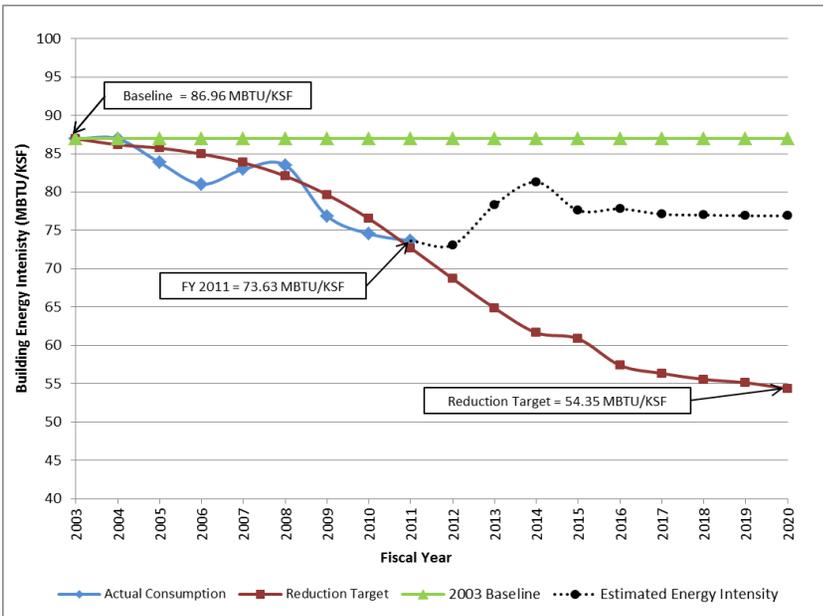
Objective 1.1: 34% Reduction of Scope 1 and 2 GHG Emissions by FY 2020



Objective 1.2: 13.5% Reduction of Scope 3 GHG Emissions by FY 2020



Objective 2.1: 37.5% Reduction in Building Energy Intensity by FY 2020



Objective 2.2: 20% of Electricity Use from Renewable Sources by FY 2020

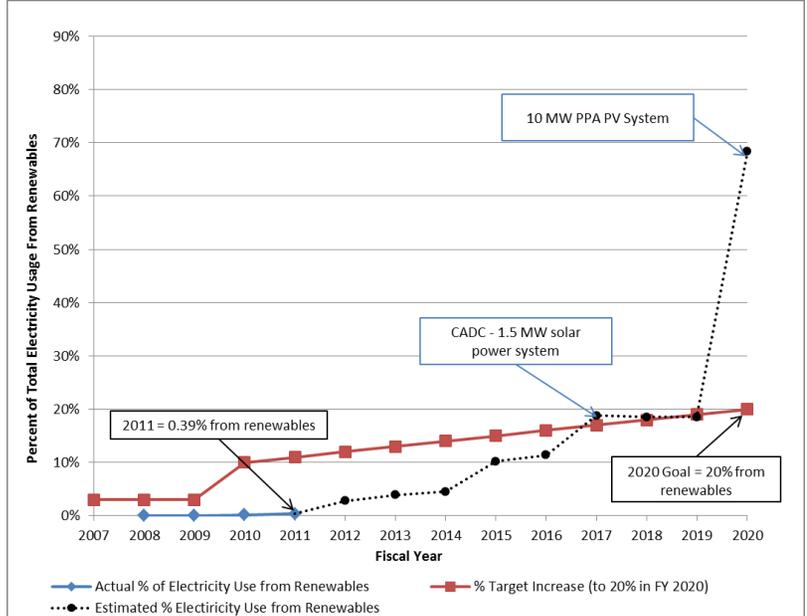
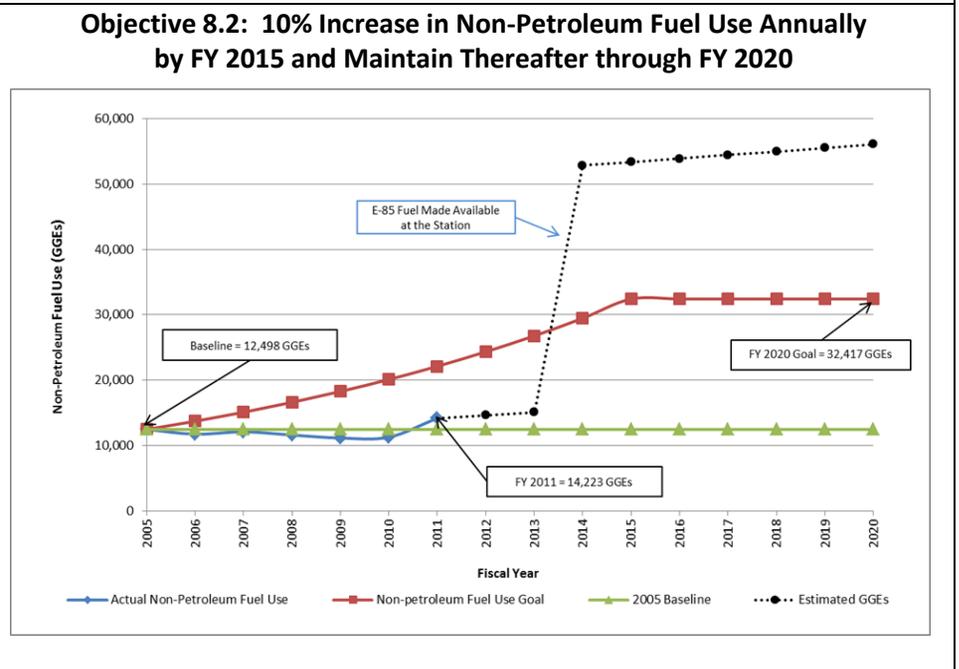
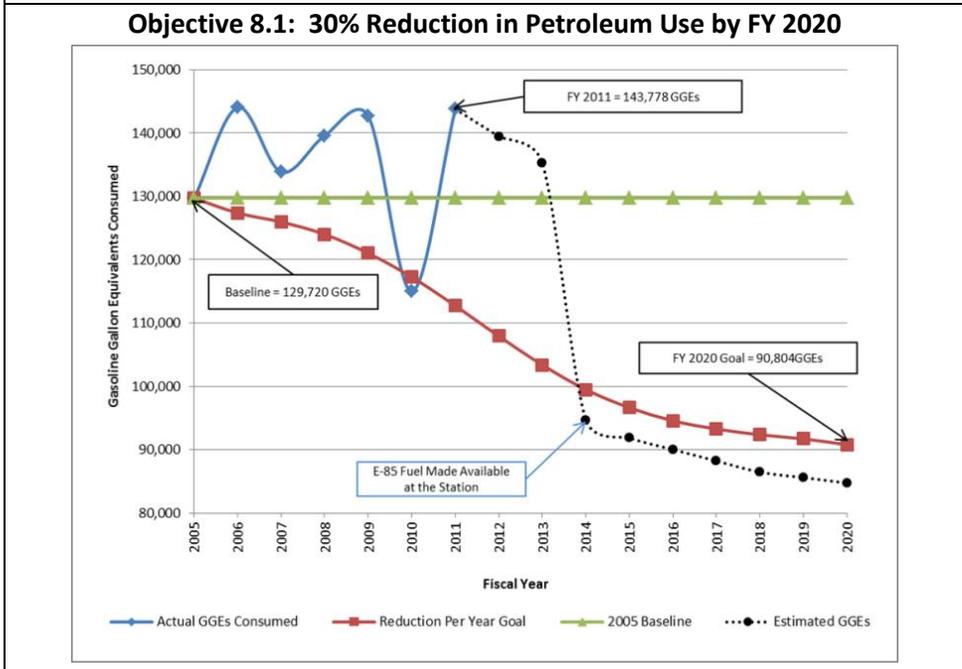
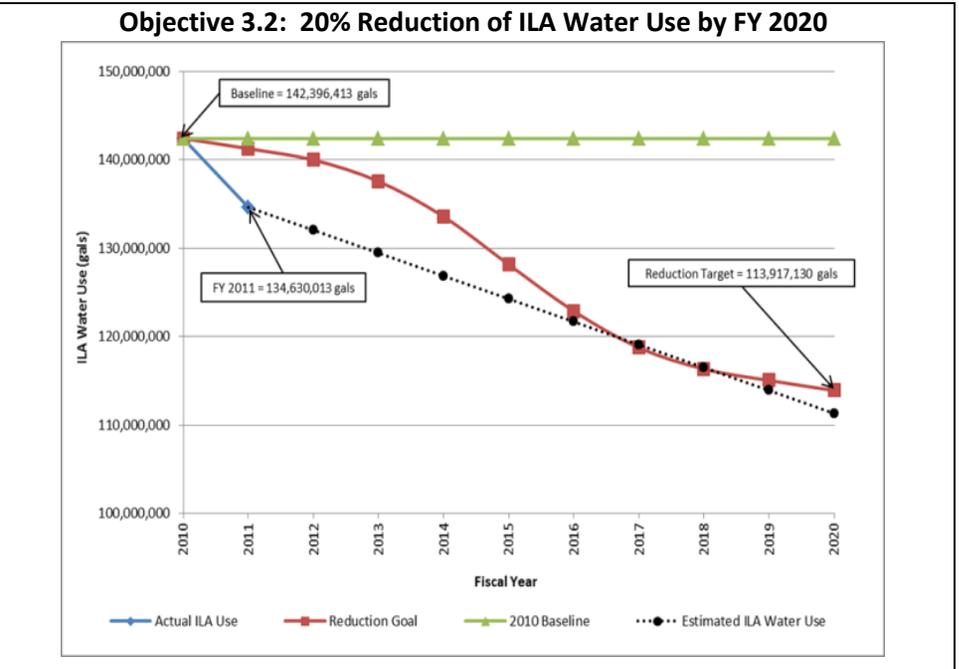
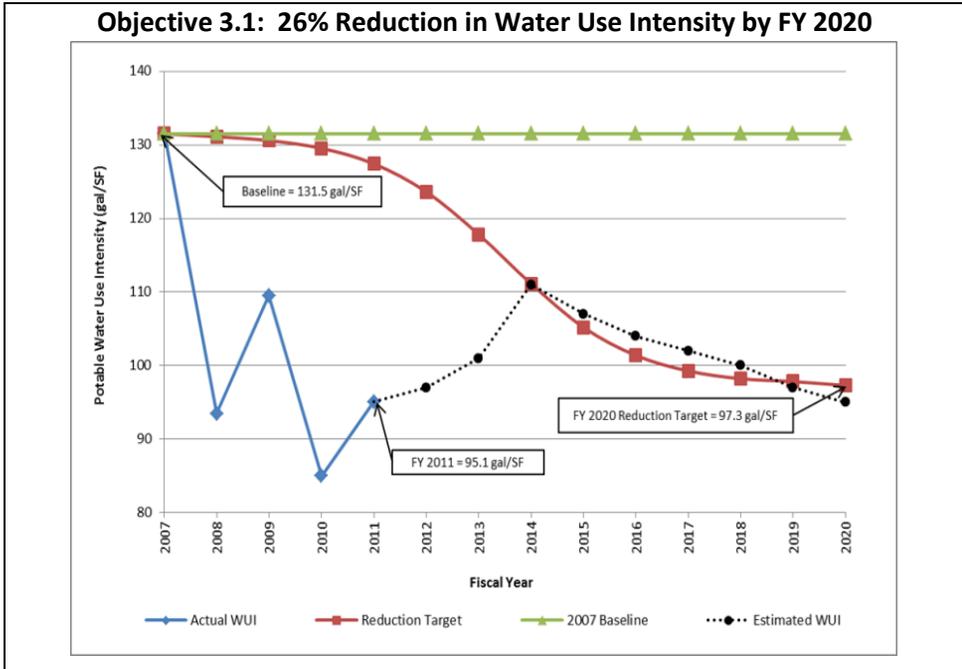


Figure ES-1. Status of Key Installation Sustainability Performance Plan Objectives



5.0 SUMMARY

Through the ongoing implementation of the MCAS Yuma Sustainability Management Program, this ISPP reflects the ability of the Station to meet the majority of the sustainability goals and objectives through continued policy development, RO management, capital investment, and the use of the SMT.

Strengths

The ISPP demonstrates aggressive and proactive management of key sustainability goals (i.e., GHG emissions, energy, water, and fuel). It is apparent that management of these key goals was initiated well before implementation of EO 13423 and EO 13514. This is reflected in the Station's current sustainability compliance status in meeting the identified goals and the Station's ability to assist MCIWEST in meeting their goals will be significant.

MCAS Yuma's abundance of solar resources (i.e., renewables) will contribute greatly to the Region's overall status with regard to meeting the renewable energy use objectives. While other MCIWEST installations are not in the most ideal geographic location to meet the renewable energy use objectives, through the Station's active implementation of photovoltaic (PV) projects and proposed large-scale PV initiatives, the Station is expected far surpass the sustainability target and contribute to the Region's achievement of this goal.

As previously indicated, Goal 5 addresses the Station's role in "Regional and Local Integrated Planning to Create Sustainable Communities." Based on the analysis conducted during the preparation of the ISPP, the Station's coordination with local and regional planning agencies (transportation, environmental, and ecosystem) is noteworthy and further enhances the Station's sustainability compliance posture.

Challenges

Through the Station's proactive management of key sustainability areas before implementation of EO 13423 and EO 13514, management of these goals and objectives has become challenging as the ISPP analysis began with an already "low baseline" value.

While the Station enjoys abundant solar resources, the inexpensive price of purchased electricity poses a challenge to justifying the capital investment (i.e., payback period) of PV projects to take full advantage of this capability which is needed not only for the Station to meet the renewable energy use goal, but to also assist MCIWEST in meeting the regional requirements for the same goal.

The stationing of the JSF at MCAS Yuma is a high-visibility operational and mission change that is expected to have significant impacts on the Station's ability to meet the energy-related sustainability goals. The JSF platform is currently projected to be a much greater energy consumer than the Station's current platform. Specifically, its maintenance and diagnostic operations at the hangars are expected to consume significantly greater amounts of energy that will challenge the Station in meeting the building energy intensity objective.

Another challenge for the Station will be its ability to meet targets in policy driven areas such as increasing sustainable procurement, improving electronic stewardship, reducing paper use, and increasing the use of 30% post-consumer recycled paper, etc. As highlighted in the ISPP, development of regional and local policies (including assigning roles and responsibilities and development of methods to track progress) and command emphasis will be required to meet the goals associated with these areas.

Marine Corps Air Station Yuma Installation Sustainability Performance Plan

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- Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (8 October 2009)
- Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management (26 January 2007)
- Department of Defense Strategic Sustainability Performance Plan, Fiscal Year 2010 (26 August 2010)
- United States Marine Corps Sustainability Plan 2011
- Marine Corps Installations West Order 5090.3, Sustainability Management Program

Appendix B – Crosswalk of Marine Corps Installations West Sustainability Goals and Objectives to Executive Order 13514 Requirements and the Department of Defense Strategic Sustainability Performance Plan Objectives and Goals

Appendix C – Additional Information Related to the Baseline and 2010 Analyses

Appendix D – Action Plan Summary

Acronyms and Abbreviations

%	Percent	DTMO	Defense Travel Management Office
4 th MAW	4 th Marine Aircraft Wing	DUERS	Defense Utility Energy Reporting Systems
AAC	Autoclaved Aerated Concrete	DVD	digital versatile disc
AAF	Army Airfield	EA	enterprise agreements
AB	California Assembly Bill	ECA	Energy Conservation Analysis
ADEQ	Arizona Department of Environmental Quality	ECB	Engineering Construction Bulletin
ADOT	Arizona Department of Transportation	ECE	Environmental Compliance Evaluation
AEWMR	Annual Energy and Water Management Report	ECIP	Energy Conservation Investment Program
AFB	Air Force Base	EDMWEB	Environmental Data and Metrics
AFV	alternative fuel vehicle	eGRID	Emissions and Generation Resource Integrated Database
AFY	acre feet per year	EIRB	Environmental Impact Review Board
AP	accredited professional	EISA	Energy Independence Security Act
APS	Arizona Public Service	EMS	Environmental Management System
ASH	Area Service Highway	EO	Executive Order
ATO	Authority to Operate	EPCRA	Emergency Planning and Community Right-to-Know Act
AUL	authorized use list	EPEAT®	Electronic Product Environmental Assessment Tool
AZ	Arizona	ERT	Enhanced Readiness Team
AZNM	Arizona/New Mexico	FAR	Federal Acquisition Regulation
BEQ	Bachelor Enlisted Quarters	FAST	Federal Automotive Statistic Tool
BLM	Bureau of Land Management	FEMP	Federal Energy Management Program
BMGR	Barry M. Goldwater Range	FISC	Fleet Industrial Supply Center
BMPs	Best Management Practices	FPDS	Federal Procurement Data System
BSTRC	Bob Stump Training Range Complex	FSC	facilities service contracts
BUREC	Bureau of Reclamation	FY	fiscal year
C&D	construction and demolition	gal	gallon(s)
CA	California	gal/SF	gallons per square feet
CADC	Cannon Air Defense Complex	GGE	gasoline gallon equivalent
Caltrans	California Department of Transportation	GHG	greenhouse gas
CBM	Camp Billy Machen	GIS	geographic information systems
CD	compact disc	GME	Garrison Mobile Equipment
CDD	Cooling Degree Days	gpd	gallons per day
CDE	Communications Data Electronics Safety Department	GPP	Green Procurement Plan
CETEP	Comprehensive Environmental Training and Education Program	GS	General Service
CFR	Code of Federal Regulation	GSA	General Services Administration
CIPs	Capital Improvement Project(s)	GSE	ground support equipment
CLC-16	Combat Logistics Company 16	HCP	Hazardous Material Consolidation Point
CMAGR	Chocolate Mountain Aerial Gunnery Range	HDD	Heating Degree Days
CNG	compressed natural gas	H&HS	Headquarters and Headquarters Squadron
CO ₂ e	carbon dioxide equivalent	HM	hazardous material
COSC	continuity of service contract	HMMS	Hazardous Materials Management System
CP&LO	Community Planning and Liaison Office	HQMC	Headquarters Marine Corps
CPUs	central processing units	HVAC	heating, ventilation, and air conditioning
CY	calendar year	I&L	Installation and Logistics
DDC	direct digital controls	ILA	industrial, landscaping, and agricultural
DLA	Defense Logistics Agency	iNFADS	Internet Naval Facilities Assets Data Store
DoD	Department of Defense	INRMP	Integrated Natural Resources Management Plan
DoDI	Department of Defense Instruction	IPMP	Installation Pest Management Plan
DoE	Department of Energy	ISO	International Organization for Standardization
DoN	Department of the Navy		

ISPP	Installation Sustainability Performance Plan	NGEN	Next Generation Enterprise Network
IT	information technology	NMCI	Navy/Marine Corps Intranet
ITPRAS	Information Technology Funding, Approval, and Procurement	NOx	nitrogen oxides
JSF	Joint Strike Fighter	NREL	National Renewable Energy Laboratory
Kgal	thousand gallons	NZEI	Net Zero Energy Installation
KSF	thousand square feet	O&M	Operations and Maintenance
kV	kilovolt	P2	Pollution Prevention
kW	kilowatts	PDA	personal digital assistant
kWh	kilowatt hour	PEO-EIS	Program Executive Office for Enterprise Information Systems
lbs	pounds	PM-10	particular matter (less than 10 micrometers)
LE	law enforcement	POA&M	Plan of Actions and Milestones
LED	light emitting diode	POM	Program Objective Memorandum
LEED	Leadership in Energy and Environmental Design	PPA	Power Purchase Agreement
LID	low impact development	PPV	Public Private Venture
LROs	Lead Responsible Offices	PRV	plant replacement value
MACS-1	Marine Air Control Squadron 1	PV	photovoltaic
MAG-13	Marine Aircraft Group 13	QRP	Qualified Recycling Program
MALS-13	Marine Aviation and Logistics Squadron-13	ROICC	Resident Officer in Charge of Construction
MARADMIN	Marine Administrative Message	SB	Senate Bill
MARCORSYSCOM	Marine Corps Systems Command	SECDEF	Secretary of Defense
MAWTS	Marine Aviation Weapons and Tactical	SECNAV	Secretary of the Navy
MAWTS-1	Marine Aviation Weapons and Tactics Squadron 1	SESC	Sustainability Executive Steering Committee
MBTU	million British thermal units	SF	square feet
MCAS	Marine Corps Air Station	SMP	Sustainability Management Program
MCB	Marine Corps Base	SMT	Sustainability Management Tool
MCCS	Marine Corps Community Services	SOx	sulfur oxides
MCHS	Marine Corps Common Hardware Suite	SSPP	Strategic Sustainability Performance Plan
MCIWEST	Marine Corps Installations West	SWRFT	Southwest Region Fleet Transportation
MCO	Marine Corps Order	T&D	Transmission and Dissipation
MILCON	military construction	TAC	Technical Advisory Committee
MIS	Management Information System	TRI	toxic release inventory
MITSC	MAGTF Information Technology Support Center	U.S.	United States
MRR	USEPA Mandatory Greenhouse Gas Reporting Rule	UPS	uninterrupted power supply
MS4	Municipal Separate Storm Sewer System	USEPA	United States Environmental Protection Agency
MSDS	material safety data sheets	USMC	United States Marine Corps
MT	metric tons	VAM	Vehicle Allocation Methodology
MW	megawatts	VCR	video cassette recorder
MWh	megawatt hour	VMU-4	Marine Unmanned Aerial Vehicle Squadron-4
MWSS-371	Marine Wing Support Squadron 371	VMFT-401	Marine Fighter Training Squadron-401
NA	not applicable	VMT	vehicle miles traveled
NAVFAC SW	Naval Facility Engineering Command Southwest	VOC	volatile organic compounds
NEAP	Natural Events Action Plan	WRP	Western Regional Partnership
NEPA	National Environmental Policy Act	WTI	Weapons and Tactical Instructor
		WWTP	wastewater treatment plant
		YCAA	Yuma County Airport Authority
		YMPO	Yuma Metropolitan Planning Organization
		YPG	Yuma Proving Ground
		ZNE	zero-net-energy

PART 1: INSTALLATION BACKGROUND AND SUSTAINABILITY PROGRAM

1.1 MCAS YUMA OVERVIEW



Marine Corps Air Station (MCAS) Yuma is a United States Marine Corps (USMC) Air Station that is currently home to approximately 4,427 Marines and Sailors and approximately 7,649 dependents, as well as home to 2,172 civilians (MCAS 2011j).

MCAS provides an annual economic impact to the community of about \$485.5 million. MCAS Yuma includes Headquarters and Headquarters Squadron (H&HS) that is responsible for the day-to-day operations of the Air Station to keep it running as a small community within the City of Yuma. A variety of departments, including Air Traffic Control, Installation and Logistics (I&L), Environmental, Range Management, Communications, Combat Camera, Military Police, Postal, Legal, Public Affairs, Financial Operations, Community Liaison, Human Resources, and personnel make up the support services needed to keep the Station operational. In addition, MCAS Yuma works with many tenant commands to perform their missions.

MCAS Yuma is also the only shared-use air station in the Marine Corps. Through an agreement between the Marine Corps and Yuma County, MCAS Yuma provides all air traffic control, airfield rescue and firefighting services, airfield security and maintains the runways and taxiways for both MCAS Yuma and the Yuma International Airport.

1.1.1 MCAS Yuma History

In 1928, at the recommendation of Colonel Benjamin F. Fly, the federal government leased 640 acres from Yuma County. Temporary dirt runways were soon installed for use by military and civilian planes – the site quickly became operational and was called *Fly Field*. It was used sporadically by private aircraft until 1941 when the United States (U.S.) government, through the Civil Aeronautics Administration, authorized expenditures for permanent runways.

The outbreak of World War II transformed the civilian airport into the Yuma Army Airfield (AAF). Construction of facilities began on June 1, 1942 and the Airfield was activated on 15 December 1942. The Yuma AAF was a single-engine flight training school operated by the Army Air Forces Flying Training Command, West Coast Training Center, with flight training beginning in January 1943. Figure 1.1-1 depicts the Yuma AAF in 1943. The AAF was closed on 1 November 1945 and, after the war, the airfield was eventually turned over to the Department of Interior Bureau of Land Reclamation for use as its headquarters for irrigation projects.

Figure 1.1-1. Yuma Army Airfield,1943

On 7 July 1951, the Air Force reactivated the base, and the 4750th Air Base Squadron resumed training as part of the Western Air Defense Forces. The airfield was named Yuma Air Base, but was subsequently renamed in October 1956 as Vincent Air Force Base (AFB). In addition to the fighter units stationed here, Vincent AFB was used by the Air Defense Command as a general surveillance radar station.

The 4750th was inactivated as Vincent AFB and on 1 January 1959 control of the base was passed over to the U.S. Navy. Nine days later,

the base was turned over to the USMC, and Colonel L.K. Davis became the first commanding officer of the newly designated Marine Corps Auxiliary Air Station. The Auxiliary Air Station was renamed MCAS Yuma on 20 July 1962.

MCAS Yuma is currently the busiest air station in the Marine Corps, offering excellent year-round flying conditions and thousands of acres of open terrain for air-to-ground weapons ranges and associated restricted airspace for military flight operations. In the 1980s, MCAS Yuma became the principal Fleet Marine Forces Pacific operating base for the AV-8 Harrier and the AV-8 Harrier II under the cognizance of Marine Aircraft Group 13 (MAG-13).

1.1.2 MCAS Yuma Mission

The MCAS Yuma mission is to provide aviation ranges, support facilities, and services that enhance the combat capability of Marine Corps and other military forces to defend the nation's defense interests. MCAS Yuma shares the airfield with the Yuma County Airport Authority (YCAA) and is the only shared use air station in the Marine Corps.

As part of this mission, MCAS Yuma supports aerial weapons training for the Atlantic and Pacific Fleet Marine Forces and Navy and serves as the basis of operations for the Marine Aviation and Weapons Tactics Squadron-1 (MAWTS-1) and Third Marine Air Wing units, including the MAG 13. MCAS Yuma is currently programmed to become an operating base for the Marine Corps' F-35B variant of the F-35 Lightning II Joint Strike Fighter (JSF).

As the scheduling authority for the Bob Stump Training Range Complex (BSTRC), MCAS Yuma provides fleet squadron access to 10,000 square miles of special-use airspace designated for military aviation training, and almost 2,000 square miles of underlying land reserved for aerial bombing and gunnery ranges.

MCAS Yuma's Master Plan indicates the Station's Strategic Plan provides the framework for meeting the Station's operational and administrative missions (MCAS 2007a):

1. Goal 1: To provide unique aviation range facilities that support the nation's aviation war-fighting requirements.
2. Goal 2: To provide the airfield and all associated operational support functions necessary for the completion of the tactical aviation of tenant and deployed units, and to support civil aviation operations in accordance with the 1956 Patent and Joint Operating Agreement (14 December 1999).
3. Goal 3: To provide the highest quality station complex through an integrated and aggressive facilities management program.
4. Goal 4: To provide continuous quality improvements in customer service for all areas of logistics support, including supply, motor transportation, billeting, and food services operations.
5. Goal 5: To proactively address quality of life challenges by improvements to all personnel support activities for Station families.
6. Goal 6: To constantly improve administrative and operational processes so resources can be directed to accomplish the mission and realize the MCAS vision.

1.2 MCAS YUMA TENANTS

MCAS Yuma is home to several tenant commands. One command is the MAG-13, which is comprised of four squadrons of AV-8B Harriers (Marine Attack Squadrons [VMA] 214, 513, 211, and 311) and one Marine Aviation and Logistics Squadron-13 (MALS-13). MAWTS-1 at MCAS Yuma conducts training for all Marine Corps tactical aviation units, most notably the Weapons and Tactical Instructor (WTI) course on a semi-annual basis.

Marine Fighter Training Squadron-401 (VMFT-401), a component of the 4th Marine Aircraft Wing (4th MAW), consists of mostly Marine Corps reserve pilots, providing aerial adversary/aggressor services and dissimilar air combat training for all U.S. Military services. VMFT-401 is the only aggressor squadron in the Marine Corps. Other tenant commands include Marine Wing Support Squadron 371 (MWSS-371) providing aviation ground support, Combat Logistics Company 16 (CLC-16) supplying combat service and maintenance support, Marine Air Control Squadron 1 (MACS-1) providing control for anti-aircraft warfare operations and continuous all-weather air traffic control services.

The newest tenant at MCAS Yuma is Marine Unmanned Aerial Vehicle Squadron -4 (VMU-4) that is comprised of unmanned aerial vehicles located at the Cannon Air Defense Complex (CADC) within the Barry M. Goldwater Range (BMGR).

MCAS Yuma is also supported by a Branch Medical and Dental Clinic.

1.3 MCAS YUMA SUSTAINABILITY VISION AND POLICY

MCAS Yuma Sustainability Policy. [Development to be determined by the Station.]

MCAS Yuma Sustainability Order. [Development to be determined by the Station.]

MCAS Yuma Station-level Sustainability Steering Committee. [Development to be determined by the Station.]

1.4 INSTALLATION SUSTAINABILITY PERFORMANCE PLAN REQUIREMENTS

MCAS Yuma has developed this Installation Sustainability Performance Plan (ISPP) to meet all current and applicable federal, Department of Defense (DoD), and USMC requirements (e.g., Executive Orders [EO] 13514 and 13423, the DoD Strategic Sustainability Performance Plan [SSPP], the USMC Sustainability Plan, and Marine Corps Installations West [MCIWEST] Order P5090.3, Sustainability Management Program [SMP]). Appendix A includes a complete copy of these documents. A brief description of these ISPP “drivers” and their requirements is provided in the following sections.

Executive Order 13514 Requirements and Guidance

On 5 October 2009, President Obama signed EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, to establish an integrated strategy towards sustainability in the federal government and make reduction of greenhouse gas (GHG) emissions a priority for federal agencies. EO 13514 requires federal agencies to set GHG emissions reduction targets, increase energy efficiency, reduce fleet petroleum consumption 30 percent (%) by 2020, conserve water, reduce waste, support sustainable communities, and leverage federal purchasing power to promote environmentally responsible products and technologies.

Under the previous administration, EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, replaced five earlier EOs addressing energy and environmental management by federal agencies and established goals, practices, and reporting requirements for environmental, energy, transportation performance, and accountability.

EO 13514 does not revoke any of the provisions of EO 13423; however, it does establish new goals and provisions, augments or expands many existing provisions, and extends some dates for compliance. Much of EO 13514 requires federal agencies to examine the environmental and social impacts of their mission, personnel, and logistical operations with regard to sustainability. EO 13514’s most significant new goal is reducing GHG emissions from fossil fuel use which constitutes the federal government’s major source of GHG emissions. GHG emission-reduction targets may require federal agency and installation managers to weigh the reduction targets to potential impacts on their missions, considering available technology and the timeframe needed for compliance.

Department of Defense Sustainability Goals

The DoD vision of sustainability is to maintain the ability to operate in the future without decline – either in the mission or in the natural and manufactured systems that support it. The DoD embraces sustainability as a means of improving mission accomplishment. DoD personnel are learning to apply this mindset to their practices to improve mission performance and reduce lifecycle costs. The DoD recognizes that many key issues facing the DoD can be addressed through smart investments that can improve sustainability, such as energy efficiency, energy management, renewable energy, water use efficiency, the reduced use of toxic and hazardous chemicals, and solid waste management.

In August 2010, the DoD published its first Agency-level SSPP (included in Appendix A) which provides an approach for complying with multiple federal requirements for sustainability and for assuring the mission.

Overall, the DoD believes that the primary path to reaching its sustainability goals will be to reduce its dependence on fossil fuels through energy efficiency and renewable energy. The core of the DoD SSPP includes a set of four objectives supported by eight goals and 21 performance-based sub-goals which are shown in Figure 1.4-1.

Figure 1.4-1. Department of Defense Strategic Sustainability Performance Plan Objectives and Goals

Vehicle Petroleum Use	Storm Water Management		Contracted Landfill Disposal
Renewable Energy	Irrigation & Industrial Water Use		Employee Teleworking
Facility Energy Use	Facility Potable Water Use		Employee Air Travel
GOAL 1 Use of Fossil Fuels Reduced	GOAL 2 Water Resources Management Improved	GOAL 3 Scope 1 & Scope 2 Greenhouse Gas (GHG) Emissions Reduced 34% by 2020, Relative to FY08	GOAL 4 Scope 3 GHGs Reduced 13.5% by 2020, Relative to FY08
OBJECTIVE 1 Continued Availability of Critical Resources		OBJECTIVE 2 DoD is a U.S. Government Leader in Reducing GHGs	
DoD FY2010 Strategic Sustainability Performance Plan			
OBJECTIVE 3 Minimize Waste and Pollution		OBJECTIVE 4 Management and Practices Built on Sustainability & Community	
GOAL 5 Solid Waste Minimized and Optimally Managed	GOAL 6 Chemicals of Environmental Concern Minimized	GOAL 7 Sustainability Practices Become the Norm	GOAL 8 Sustainability Built into DoD Management Systems
Use of Printing Paper	Release and Transfer of Toxic Chemicals	Procurement Conducted Sustainably	Effective Environmental Management Systems
Solid Waste Diverted from Waste Stream	Proper Electronics Disposal	High Performance, Sustainable Buildings	Coordination with Local and Regional Planning
Use of Landfill Gas	Certified Pesticide Application		Integrated Pest Management

United States Marine Corps Sustainability Plan

On 8 October 2010, the DoD directed DoD-wide implementation of the SSPP across the DoD mission, to include programming resources necessary to achieve sustainability goals and targets and reporting annual progress. To meet this requirement, as well as EO requirements, the Commandant of the Marine Corps developed the USMC Sustainability Plan (2011) (included in Appendix A). The purpose of the plan is to define a Marine Corps strategic framework for sustainability that fulfills the goals and requirements set forth by EO 13514 and aligns with the goals and policies of the DoD SSPP.

The Marine Corps embraces sustainability as a means of improving mission accomplishment – the essence of sustainability is using mission critical resources (i.e., energy, fuel, water equipment, facilities, etc.) with greater efficiency while enhancing warfighting capabilities and missions. In the Marine Corps' expeditionary environment, sustainability is being driven by the needs of the operating forces to increase combat effectiveness and operational flexibility, reduce mission threat, and shrink the logistics footprint by employing critical resources such as energy and water in the most efficient manner and reducing waste which supports force protection and security.

The USMC Sustainability Plan is centered on three fundamental areas of focus and priority; and provides an overall framework for sustainability performance as defined by the following three goals (Figure 1.4-2):

- Goal 1: Improve energy and water resources management and reduce GHGs.
- Goal 2: Minimize waste and prevent pollution.
- Goal 3: Improve the integration of sustainability practices across all mission areas.

Figure 1.4-2. United States Marine Corps Sustainability Plan Goals



Marine Corps Installations West Sustainability Goals

MCIWEST Order 5090.3 applies a risk-to-mission based sustainability implementation and management approach. The stated purpose of MCIWEST Order 5090.3 “is to supplement the references by providing policy and assigning responsibilities that will support MCIWEST’s implementation of the SMP and meet the objectives of references (a) and (b) [EO 13514 and EO 13423]. This order applies a risk-to-mission based Environmental Management System (EMS) approach at the regional level which establishes and verifiably manages the measureable objectives and targets as the primary mechanism for ensuring sustainable operations while identifying and resolving systemic issues which may hinder achievement of those objectives and targets.” Additionally, the Commander’s Intent statement is *“To ensure that MCIWEST and its installations prepare and implement plans that will achieve the objectives of reference (a) [EO 13514] by reducing the environmental, transportation, and energy-related footprint that supports their respective missions in an environmentally, economically, and fiscally sound and sustainable manner.”*

Key to the implementation and management of the MCIWEST SMP are the:

- MCIWEST Sustainability Executive Steering Committee (SESC)
- MCIWEST Lead Responsible Offices
- Installation Commanders
- Installation Lead Responsible Offices (LROs)

In order to meet the goals of the EOs, the MCIWEST Order 5090.3 establishes the following 10 sustainability goals along with specific goal objectives and targets (Appendix A includes MCIWEST Order 5090.3 containing the complete list of sustainability goals, objectives, and targets):

- Goal 1: Accomplish GHG Reductions/GHG Inventory
- Goal 2: Improve Energy Efficiency
- Goal 3: Improve Water Use Efficiency and Management
- Goal 4: Promote Pollution Prevention and Waste Reduction
- Goal 5: Advance Regional and Local Integrated Planning to Create Sustainable Communities
- Goal 6: Implement Sustainable, Building Design, Construction, Operations and Maintenance (O&M), and Deconstruction
- Goal 7: Advance Sustainable Acquisition (Green Procurement)
- Goal 8: Optimize Fleet and Transportation Management/Alternative Fuels
- Goal 9: Promote Electronic Stewardship
- Goal 10: Sustain Formal EMS

1.5 MCAS YUMA SUSTAINABILITY PLAN IMPLEMENTATION AND MANAGEMENT

MCIWEST Order 5090.3 states that MCIWEST Installation Commanders are responsible for the creation and implementation of Installation Sustainability Action Plans and Plan of Actions and Milestones (POA&M) to achieve the reductions contained in EO 13514 and EO 13423. Accordingly, this ISPP has been developed to achieve the following objectives:

- Institutionalize the MCAS Yuma Commanding Officer's sustainability policy and management strategy.
- Establish and assign sustainability responsibilities (i.e., management, oversight, reporting, etc.) amongst the Station organizations. This will be facilitated by the assignment of Station LROs for each MCIWEST Order 5090.3 sustainability goal (Table 1.5-1) that will:
 - Develop sustainability projects, processes, and POA&M to implement, track, and report status and progress toward achieving the goals and objectives within their functional area of responsibility.
 - Develop policy recommendations within their functional area of responsibility to enhance the Station's sustainability achievements.
 - Maintain current goal/objective/target status and progress via update of the Sustainability Management Tool (SMT).
 - Participate in MCIWEST LRO Working Groups.
 - Identify and program for funding required to implement the ISPP through the Program Objective Memorandum (POM) process and budget for and execute funds received for ISPP projects.
- Guide the use of the Station's EMS to support sustainability management.
- Document baseline year metrics for each EO goal, fiscal year (FY) 2010 performance; and, FY 2011 through FY 2020 performance analyses with associated Action Plans needed to comply with MCIWEST goals.

Table 1.5-1. MCAS Yuma Lead Responsible Offices

MCIWEST Order 5090.3 Sustainability Goal	Station Lead Responsible Office
Goal 1 – Accomplish GHG Reductions/GHG Inventory	Environmental Department
Goal 2 – Improve Energy Efficiency	Public Works
Goal 3 – Improve Water Use Efficiency and Management	Public Works
Goal 4 – Promote Pollution Prevention and Waste Reduction	Public Works
Goal 5 – Advance Regional and Local Integrated Planning to Create Sustainable Communities	Public Works
Public Works	Public Works
Goal 7 – Advance Sustainable Acquisition	Logistics
Goal 8 – Optimize Fleet and Transportation Management/Alternative Fuels	Logistics
Goal 9 – Promote Electronic Stewardship	S-6, Communications Data Electronics Safety Department
Goal 10 – Sustain Formal EMS	Environmental Department

Installation Sustainability Performance Plan Operational Areas of Inclusion

Table 1.5-2 summarizes the 10 MCIWEST sustainability goals and identifies the four MCAS Yuma “operational areas” comprising the analysis for each goal area.

Table 1.5-2. MCIWEST Sustainability Goals and MCAS Yuma Operational Areas Addressed

	Main Station	Camp Billy Machen	Cannon Air Defense Complex	Barry M. Goldwater Range
Goal 1	√	√	√	√
Goal 2	√			
Goal 3	√			
Goal 4	√	√	√	√
Goal 5	√	√	√	√
Goal 6	√			
Goal 7	√	NA	NA	NA
Goal 8	√			
Goal 9	√			
Goal 10	√	√	√	√

Note: NA = not applicable

PART 2: INSTALLATION SUSTAINABILITY PERFORMANCE REVIEW AND ACTION PLAN

The information presented in this section follows the organizational structure of MCIWEST Order 5090.3 (a crosswalk of MCIWEST goals and objectives to Executive Order 13514 requirements and the DoD SSPP objectives and goals is included in Appendix B). For each objective associated with the respective 10 sustainability goals, the following sections are included:

- Baseline Through FY 2009 Analysis
- FY 2010 Goal Performance Review
- FY 2011 Through FY 2020 Performance Review and Gap Analysis
- Action Plan

As available, additional background information related to each goal and its status is included in Appendix C.

Note Regarding Part 2 Organization: To reduce redundancy in the presentation of data, to the extent practicable, all tables and figures summarizing goal status (from the respective baseline year through FY 2011) have been placed in the FY 2011 through FY 2020 Performance Review and Gap Analysis section of each goal.

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2.1 MCIWEST GOAL 1 - ACCOMPLISH GREENHOUSE GAS REDUCTIONS/GREENHOUSE GAS INVENTORY

2.1.1 Objective 1.1: Meet DoD Fiscal Year 2020 34% Reduction Targets of Scope 1 and 2 Greenhouse Gas Emissions

Table 2.1-1. Objective 1.1 Summary

Objective 1.1 Summary	
Objective Metric	Meet DoD FY 2020 34% reduction targets of Scope 1 and 2 GHG emissions.
Objective Unit of Measure	Carbon dioxide equivalents (CO ₂ e) expressed in metric tons (MT) [MT CO ₂ e].
Objective Baseline Year	FY 2008
Baseline Scope 1 and 2 Emissions	37,000 MT CO ₂ e.
FY 2011 Scope 1 and 2 Emissions	44,768 MT CO ₂ e.
FY 2020 Reduction Goal	24,420 MT CO ₂ e.
Forecasted Status	The Air Station will meet the FY 2020 reduction goal.
Data Source	Table 2.1-2.

2.1.1.1 Objective 1.1 - Baseline Through FY 2009 Analysis

Eight GHG reports/inventories have been developed for MCAS Yuma, for a variety of regulatory drivers and for emissions from years ranging from calendar year (CY) 2007 to FY 2011 (Table 2.1-2).

Table 2.1-2. Summary of MCAS Yuma Greenhouse Gas Inventories and Reports

Document Title	Document Date	Emission Year	Purpose of Report
Greenhouse Gas Phase I Assessment for Marine Corps Installations West	12 March 2010	CY 2007	AB 32 ¹ and USEPA MRR ²
Greenhouse Gas Phase II Assessment for Marine Corps Installations West	28 September 2010	CY 2007	AB 32 and USEPA MRR
Phase III Regional Greenhouse Gas Assessment for USMC Bases in California (CA) and Arizona (AZ)	30 September 2010	FY 2008	AB 32 and USEPA MRR
Greenhouse Gas Emissions Report, MCAS Yuma	9 March 2011	FY 2010	AB 32 and USEPA MRR
Greenhouse Gas Inventory for FY 2008 for EO 13514 Compliance (PowerPoint presentation)	September 2011	FY 2008	EO 13514
Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance with Executive Order 13514 (for FY 2010 emissions)	September 2011	FY 2010	EO 13514
Greenhouse Gas Tailoring Rule Applicability Assessment	December 2011	CY 2007 and CY 2009	USEPA Tailoring Rule
Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance with Executive Order 13514 (for FY 2011 emissions)	June 2012	FY 2011	EO 13514

Notes: ¹AB 32 – California Assembly Bill 32.

²USEPA MRR – Environmental Protection Agency Mandatory Greenhouse Gas Reporting Rule.

Table 2.1-3, located in Section 2.1.1.3, summarizes the GHG emissions quantified in the emission year 2007 GHG inventory (Phases I and II) and the FY 2008 emissions described in Phase III inventory report. The MCAS Yuma FY 2008 (i.e., Baseline) Scope 1 and Scope 2 emission value is 37,000 metric tons of carbon dioxide equivalents (MT CO₂e).

Review of the existing data indicates that Scope 2 GHG emissions are much larger than Scope 1 emissions and, therefore, the likely candidate for major reductions. The relative importance of Scope 2 emissions for the Air Station is expected, given the hot, dry climate where significant electricity is used for building/space cooling. Although the FY 2008 inventory only includes the sum totals for the three categories of GHG emissions (i.e., Scope 1, Scope 3, and Scope 3), additional insight into Scope 2 emissions is provided by several years of earlier data (from 2003 through 2009) on energy efficiency projects implemented at the Station (see Appendix C for additional information on these projects). The projects completed during this time period resulted in the following estimated Scope 2 GHG emission reductions:

- 2003 – Total Reduction of 1,628 MT CO₂e
- 2004 – Total Reduction of 661 MT CO₂e
- 2005 – Total Reduction of 1,493 MT CO₂e
- 2006 – Total Reduction of 16 MT CO₂e
- 2007 – Total Reduction of 433 MT CO₂e
- 2008 – Total Reduction of 240 MT CO₂e
- 2009 – Total Reduction of 1,015 MT CO₂e

Even with Scope 2 emissions increasing from 2007 to 2008, presumably because of increased operations/occupancy in 2008, these reductions are important efforts that will save energy and reduce GHG emissions indefinitely. Documenting the year the projects are implemented is also important for recordkeeping purposes and overall GHG program management.

Figure 2.1-1, located in Section 2.1.1.3, illustrates the baseline Scope 1 and Scope 2 emissions data as well as the FY 2020 reduction target of 24,420 MT CO₂e.

2.1.1.2 Objective 1.1 – FY 2010 Goal Performance Review

As stated in Section 2.1.1.1, MCAS Yuma has limited data with consistent details on GHG emissions for the first few years of this objective's requirements. A GHG inventory was performed for 2010 emissions to support compliance with EO 13514, indicating Scope 1 and 2 emissions decreased nearly 10% between 2008 and 2010, from 37,000 MT CO₂e to 33,214 MT CO₂e (Table 2.1-3 and Figure 2.1-1).

Table 2.1-3 includes FY 2010 data from *the Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance with Executive Order 13514, September 2011*. As shown, Scope 1 emissions are broken down into stationary sources (5,745 MT CO₂e) and miscellaneous material usage (160 MT CO₂e) for a total Scope 1 value of 5,905 MT CO₂e. Another report for FY 2010 emissions, *Greenhouse Gas Emissions Report, Marine Corps Air Station Yuma, March 2011*, provides added detail to Scope 1 emissions, with distinct values for engine test cells, fire training and boilers/heaters; however, the total

for those Scope 1 emissions is only 3,502 MT CO₂e. The reason for the lower value may be related to the focus of that report on the U.S. Environmental Protection Agency (USEPA) Mandatory Reporting Rule (MRR), which does not apply to all Scope 1 sources. Accordingly, and for consistency among MCIWEST installations, the value of 5,905 is being reported.

The variety of approaches taken to quantify Scope 1 GHG emissions up to FY 2010 masks any real progress that may have been made to that point and caution is warranted in attempting to summarize any conclusions regarding the Scope 1 emissions to date. For 2007, stationary sources were described as boilers and water heaters and non-emergency generators. For 2009, stationary sources included engine test cells, boilers and water heaters, but not firefighting. For 2010 emissions, stationary sources accounted for all those types of emissions in the March 2011 report but a report later that year described them as significantly higher. Thus, the inconsistent scope of the previous years' inventories makes it difficult to fully analyze the data to observe and manage trends. This variation also points to the challenges of reducing Scope 1 emissions from sources that are operating in direct support to the overall mission/activity at the installation. The one consistently reported data point for Scope 1 – emissions associated with losses from refrigeration systems – indicates significant improvements in controlling those losses/leaks. This type of reduction can be achieved independent from operational activity at the Air Station.

Conversely, the easily calculated and well documented Scope 2 GHG emissions, which are calculated from purchased electricity records, indicates relative consistency for the data points of FY 2007, FY 2008 and FY 2010, with averages in the range of approximately 30,000 MT CO₂e. With purchased electricity contributing the majority of Scope 1 and Scope 2 GHG emissions, electricity/energy savings and renewable energy production at the Air Station will likely be best opportunity to achieve the combined Scope 1 and 2 reduction goal of 34% by FY 2020.

2.1.1.3 Objective 1.1 – FY 2011 Through FY 2020 Goal Performance Review

A GHG emission inventory was performed in 2012 for FY 2011 emissions. The Scope 1 and Scope 2 emissions from FY 2011 were greater than previous years (Table 2.1-3). As the report indicates, the reason for the increased emissions was largely due to using the EO 13514-based methodology for that inventory; whereas previous inventories were focused on a subset of emissions sources subject to other environmental regulations. The comprehensive 2012 inventory of FY 2011 emissions describes Scope 1 stationary sources at nearly three times the levels from previous years. This sharp increase in stationary source emissions created the overall increase in Scope 1 GHG emissions and the corresponding move away from the goal of reducing combined Scope 1 and 2 GHG emissions.

Progress towards the goal of reducing Scope 1 and 2 GHG emissions by 34% is difficult to gauge because the inventories FY 2008 through FY 2010 focused on a subset of stationary sources masking the true baseline value. Accordingly, progress towards the FY 2020 goal is still largely unknown, except that the Air Station continues to implement energy savings projects and onsite renewable energy generation projects that will decrease Scope 2 GHG emissions as less electricity is purchased from off-site power companies.

If one assumes the FY 2008 inventory values will be retained for this plan, additional reductions of over 20,000 MT CO₂e of Scope 1 and Scope 2 GHG emissions are still required at the end of FY 2011 to meet the FY 2020 reduction target of 24,420 MT CO₂e.

Table 2.1-3. MCAS Yuma Greenhouse Gas Emissions

	2007 ¹	2008 ²	2009	2010 ²	2011 ³
Scope 1 Emissions					
Stationary Combustions Sources					
Electrical/steam generators (boilers and water heaters)	2,852 ⁴				
Jet engine test cells	856				
Stationary sources (e.g., internal combustion engines)	2,314			5,745	15,600
Ground support equipment	2,562				
Emergency generators	144				
Firefighting training (burns)	2				
Ordnance	145				
Mobile Combustions Sources					
Non-tactical motor vehicles					1,305
Process Emissions					
Wastewater treatment (not applicable)					
Oil/water separators	1				
Fugitive Emissions					
Landfills (Southeast Station - assume zero GHGs)	--				
Refrigeration leaks/consumption	2,611			160	4
Miscellaneous material usage	5				
Scope 1 Totals	11,492	6,000	-	5,905	16,909
Scope 2 Emissions					
Purchased electricity	29,922			27,309	27,859
Purchased steam	--				--
Scope 2 Totals	29,922	31,000	--	27,309	27,859
Scope 1 + 2 Emissions					
Scope 1 & 2 Emissions	41,414	37,000	--	33,214	44,768
Scope 3 Emissions					
Contracted solid waste disposal				2,257	2,184
Contracted wastewater treatment				17	38
Employee commuting				5,397	5,465
Business travel – ground					
Business travel – air					
Electricity loss in lines (Transmission and Dissipation)				1,799	1,835
Scope 3 Totals	--	12,000	--	9,470	9,522

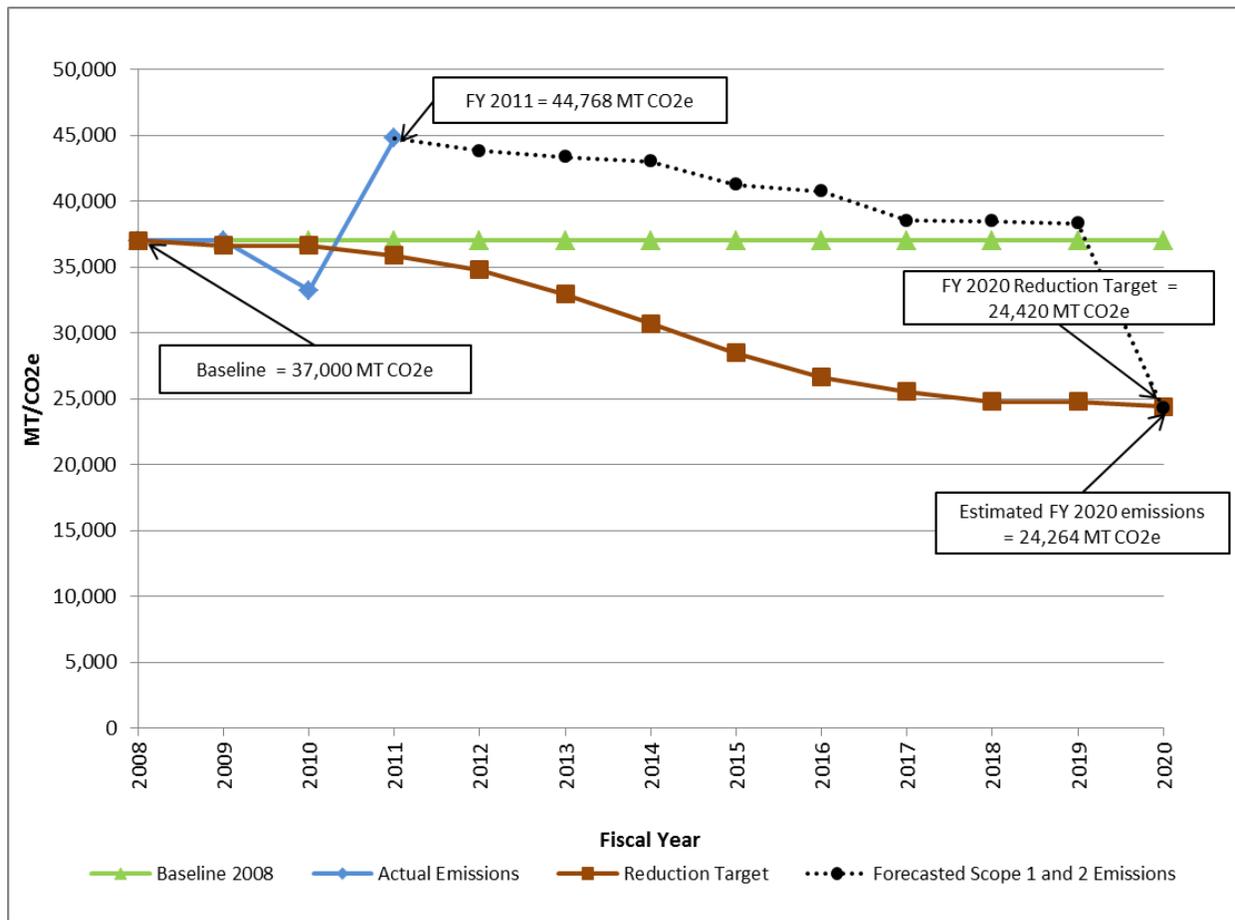
Notes: ¹Source for 2007: Phase II GHG Report.

²Source for 2008: GHG Inventory for FY 08 and FY 10 for EO 13514 compliance (September 2011).

³MCIWEST GHG Inventory for 2011 includes distinct values for CBM stationary combustion sources, purchased electricity, and T&D losses.

⁴Units are MT CO₂e.

Figure 2.1-1. MCAS Yuma Scope 1 and Scope 2 Greenhouse Gas Emissions



2.1.1.4 Objective 1.1 – Action Plan

Many Scope 1 emissions are directly related to supporting the overall mission/activity at the Station and are difficult to control and reduce. Additionally, stationing of the JSF is likely to make reductions in this category of emissions even more challenging. For these reasons, the majority of GHG reductions will most likely be associated with Scope 2 emissions (i.e., those associated with consumption of purchased power).

Baseline Inventory Status. A recommendation for consideration is to revisit the GHG emission data for the baseline year of FY 2008. Several potentially significant changes in source data and methodologies have occurred between how the FY 2008 and the FY 2010 and FY 2011 GHG inventories were conducted. The most recent inventories have followed federal guidance and will be the format repeated for the years to come. That same methodology, applied to the baseline year would likely provide a more accurate baseline value to better establish planning opportunities and future targets. For example, the relatively large amount of Scope 1 emissions in FY 2011 may not be indicative of an increase from 2008 but rather a consistent value, or even a potential decrease, from a baseline year calculated in the same manner.

Scope 1 Emissions. Taking action relative to Scope 1 emissions may be of limited value to the Air Station, as most Scope 1 emissions are directly to the military mission/activity and difficult to manage and reduce. Scope 1 emissions that vary with activity include engine test cells (noted as the largest stationary source in the most recent inventory), ground support equipment (GSE) activity, ordnance management, material use, and to a lesser extent, emergency generators, hot water heaters and boilers. These types of emissions increased significantly in FY 2011, although the specific sources are not defined by current inventory guidelines/methods.

A potential action item to take is to obtain the information needed to add the characterization for Scope 1 emissions in future GHG inventories so that sharp increases like those experienced in 2011 could be attributed directly to a mission-related activity that is difficult to control/reduce. For example, related to the JSF being stationed at MCAS Yuma, by knowing how “hush house” activity changes may occur in the upcoming years the Station would be able to at least document and justify why reductions in some areas may be overshadowed by increases in other areas. The added cost of more detailed GHG inventories and the associated fuel monitoring that may be required, should be weighed against the potential of better understanding of the Station’s GHG emissions profile.

Other Scope 1 sources that are more manageable include emergency generators, boilers associated with space heating, non-tactical motor vehicles, and fugitive sources such as miscellaneous material usage and losses from refrigeration systems. Of those sources, the Air Station has noted that some emergency generators are quite old and replacing them with more efficient units would result in less fuel burned per kilowatt-hour (KWh) of energy produced. Also, new air regulations are forcing emergency generator manufacturers to produce units that generate less pollution per unit of fuel burned. Of course, no manufacturers have developed a method of burning fuel without producing carbon dioxide – only traditional pollutants such as sulfur oxides (SO_x), nitrogen oxides (NO_x), and other products of combustion are reduced. However, changing the type of fuel burned in those units would affect GHG emissions. For example, natural gas-based units would produce slightly less CO₂e than diesel or gasoline units and new units do burn less fuel than older generators on a per-kilowatt basis. Replacing old emergency generators with newer units will reduce GHG emissions to a degree; however, the amount of fuel burned in emergency generators, and thus GHG emissions, is relatively small compared to other stationary sources. Replacing old, emergency generators with new, more efficient units is an opportunity for on-going Scope 1 emissions reductions, even if the net decrease is relatively small compared to the reduction goal of 34%. The actual GHG reductions are difficult to predict, but assuming a new generator is 10% more efficient than the unit it replaces, 10% less GHG emissions would be produced.

Assuming that capacity would essentially remain the same, Table 2.1-4 provides some insight into potential GHG reductions in this area.

Table 2.1-4. Older Emergency Generators at MCAS Yuma

ID Number	Description	Brake Horse Power	Fuel	Manufacture Year
323	Emergency Generator	64	Diesel	2002
324	Emergency Generator	40	Diesel	2002
325	Emergency Generator	110	Diesel	2002
305	Flight Line Emergency Generator	64	Diesel	2002
306	Flight Line Emergency Generator	64	Diesel	2002
318	Emergency Generator	110	Diesel	2002
334	Emergency Generator	250	Diesel	2002
315	Flight Line Emergency Generator	102	Diesel	2001
322	Emergency Generator	268	Natural Gas	Pre-2001
317	Emergency Generator	87	Diesel	2000
309	Emergency Generator	134.1	Diesel	1998
310	Emergency Generator	268	Diesel	1998
311	Emergency Generator	268	Diesel	1998
302	Flight Line Emergency Generator	550	Diesel	1998
314	Emergency Generator	469	Diesel	1998
327	Emergency Generator	202	Diesel	1998
329	Emergency Generator	415	Diesel	1998
332	Emergency Generator	68	Diesel	1997
300	Emergency Generator	135	Diesel	1992

The emergency generators in the table above represent approximately 30% of all Station generators. If these generators are all replaced before FY 2020 and the newer units save 10% on fuel consumption, the net reduction in emissions would be 3% for this subset of stationary sources. In the first GHG inventory for the Station, emergency generators accounted for 144 MT CO₂e of the 41,414 MT CO₂e total for Scope 1 and Scope 2 GHG emissions. Therefore, based on these assumptions, the Air Station may realize a 4 MT CO₂e reduction from replacing all emergency generators older than 10 years. If the emergency generators only accounted for 144 MT (less than 1% of the Scope 1 and 2 emissions), the Air Station will need to seek other, more significant ways to reduce GHG emissions. Confirming this source to be in the range identified in the first GHG inventory is also a recommended action.

Scope 2 Emissions. For Scope 2 emission reductions, the Air Station is focusing on energy efficiency and renewable energy projects, and have well established and aggressive demand-side and supply-side programs, which are discussed in the energy section (Goal 2) of this plan. This focus will directly reduce Scope 2 GHG emissions, which is the largest source for the Air Station.

The largest of the supply-side energy projects are proposed to construct new sources of photovoltaic (PV) energy:

- A proposed 10 MW PV project is currently being evaluated under the National Environmental Policy Act (NEPA) requirements and Federal Aviation Administration airport site review processes. The potential project site includes approximately 90 acres of vacant highly disturbed land southeast of the flight line and lies completely within MCAS Yuma and under the jurisdiction of the USMC. This project would permit a private company, under an outgrant instrument such as a power purchase agreement (PPA) or a license agreement to potentially produce a maximum of 10 MW for the Air Station's exclusive use (MCAS Yuma 2013a).
- A 1.5 MW solar energy project is planned for the CADC. For the purposes of this ISPP a completion date of FY 2017 has been estimated.
- Area Service Highway (ASH) project (this project is still in the preliminary planning phase).

These potential projects are planned to be online by FY 2020 and are expected to reduce purchased electricity by nearly 70%. If those projects are realized (and assuming Scope 1 emissions are reduced modestly at 1% per year from 2011 levels) those savings will support the Station in meeting the 34% reduction goal for Scope 1 and 2 emissions at the Air Station. Figure 2.1-1 represents the potential impact of these projects on the overall Scope 1 and Scope 2 emissions reductions.

Other avenues to reducing Scope 2 GHG emissions are related to advancements made by the regional power provider that would lower their GHG emission factor, and the potential purchasing of designated-renewable energy from the grid.

The Air Station will benefit from progress made by the regional power provider as the provider's emission factor improves over time with the additional use of renewable energy. The USEPA monitors GHG emissions from purchased electricity through the Emissions and Generation Resource Integrated Database (eGRID). The eGrid places the Air Station in eGRID sub-region Arizona/New Mexico (AZNM), with regional GHG emission factors for purchased electricity as shown in Table 2.1-5.

Table 2.1-5. Purchased Electricity GHG Emission Factors for Purchased Electricity - eGRID

eGRID Subregion Acronym	eGRID Subregion Name	Total Output Rates for GHGs (lbs/MWh)		
		CO2	CH4	N2O
AZNM	WECC Southwest	1191.350	.00191	0.0156
Global Warming Potential		1	21	310
Weighted GHG Emissions Factor, lbs/MWh		1191.350	0.4011	4.836
Total CO2e GHG Emissions Rate, lbs CO2e/MWh		1196		

As shown in the table above, each megawatt hour (MWh) of electricity purchased by the Station generated 1,196 pounds (lbs) of CO₂e, or 0.54 MT of CO₂e. As the regional providers increase renewable sources, decreasing their emissions factors, and USEPA updates the eGRID data, the Station should document the evolving emission factors to take-advantage of and document, how Scope 2 emissions are changing.

Another opportunity for Scope 2 GHG emission reductions for a given amount of purchased electricity exists through optional electric purchasing plans. Arizona Public Service (APS), the electricity provider for Yuma, has several “Green Choice Rates” that, for a cost, promise to emit fewer GHGs per KWh (http://www.aps.com/main/green/choice/choice_7.html?source=2007PNWreport). The Green Choice Rates are optional rates for purchased electricity where portions (by KWh, by percentage, or for special events) of purchased electricity are provided by renewable energy sources. An example choice from APS is their Green Choice Percentage Option, where an additional cost is applied to each KWh purchased (e.g., normal rate plus a vary charge of approximately \$0.004/KWh). The potential of these programs was reviewed during this analysis and merit further investigation by the Station for applicability and feasibility. Therefore, an action to be taken by the Station should be to investigate the financial feasibility of paying the higher rate for purchased electricity in order to achieve the 34% reduction goal.

Other actions plan items related to Scope 1 and 2 emissions reduction and management for consideration include:

- Ensure tracking of annual changes to federal GHG inventory requirements and modify data collection and reporting strategies accordingly.
- For future GHG inventories, utilize DUERS data for consistency in calculating and reporting of GHG emissions for natural gas combustion and electricity consumption. Since the DUERS data were used to calculate the baseline data, it should continue to be used as the primary data source for reporting GHG emissions to ensure consistency and accuracy.

2.1.2 Objective 1.2: Meet DoD Fiscal Year 2020 13.5% Reduction Targets of Scope 3 Greenhouse Gas Emissions

Table 2.1-6. Objective 1.2 Summary

Objective 1.2 Summary	
Objective Metric	Meet Department of Defense FY 2020 13.5% reduction targets of Scope 3 GHG emissions (no additional metric for this objective has been defined by MCIWEST Order 5090.3; the DoD SSPP; or the USMC Sustainability Plan).
Objective Unit of Measure	CO ₂ e expressed in MT (MT CO ₂ e).
Objective Baseline Year	FY 2008
Baseline Scope 3 Emissions	12,000 MT CO ₂ e.
FY 2011 Scope 3 Emissions	9,522 MT CO ₂ e.
FY 2020 Reduction Goal	10,380 MT CO ₂ e.
Forecasted Status	The Air Station will meet the FY 2020 reduction goal.
Data Source	See Table 2.1-2.

2.1.2.1 Objective 1.2 – Baseline Through FY 2009 Analysis

This objective is also a function of GHG emissions based on FY 2008 levels. Scope 3 GHG emissions may include all non-Scope 2 indirect sources of GHG emissions and this category of emissions has been tightly defined by the federal government to include activities for which reliable and consistent data is available. For the foreseeable future, Scope 3 emissions are to only include:

1. Federal employee business air travel;
2. Federal employee business ground travel;
3. Federal employee commuting;
4. Contracted solid waste disposal;
5. Contracted wastewater treatment; and
6. Transmission and Dissipation (T&D) losses associated with purchased electricity.

The six activities listed above are sometimes grouped into three categories: employee travel, waste disposal, and T&D losses (*The Technical Support Document for Federal GHG Accounting and Reporting* provides detailed information on inventory reporting requirements and calculation methodologies for these Scope 3 GHG emissions). The DoD SSPP (FY 2011) describes how progress is expected to be achieved between FY 2010 and FY 2020.

MCAS Yuma has not inventoried baseline Scope 3 emissions in a comprehensive manner thus far, with the exception of limited data having been estimated for potential employee telecommuting (Table 2.1-7). Scope 3 emissions were estimated in the MCIWEST Phase III Report which included a total value of 12,000 MT CO₂e. This total value did not include a specific breakdown of emissions attributed to the six classes identified above for baseline year of FY 2008. The Air Station Environmental Department staff have estimated employment activities and developed the following Scope 3 emissions estimate for a typical year (Table 2.1-7).

Table 2.1-7. MCAS Yuma Scope 3 Greenhouse Gas Emissions Estimates

Employee Category	Number of Worker	Work Schedule	Commute Days/Yr	Round Trip Distance Miles	Total Driven Miles/Yr	National Fuel Economy Average (miles/gal)	Gasoline Consumed (miles/Yr)	CO2 Emissions Factor (kg CO2/gal)	CO2 MT/Yr
Civilian	340	9/80	212	10	720,800	25	28,832	8.78	253
Civilian	1,021	40	238	10	2,429,980	25	97,199	8.78	853
Military (live off-base with families)	1,549	40	238	10	3,686,620	25	147,465	8.78	1,295
Military (live on base)	2,450	40	0	0	0	25	0	8.78	0
Rotational	13,531	40	0	0	0	25	0	8.78	0
Transient (one night)	747	40	0	0	0	25	0	8.78	0
Total	19,638				6,837,400		273,496		2,401

2.1.2.2 Objective 1.2 – FY 2010 Goal Performance Review

Progress was achieved in FY 2010 to better document Scope 3 emissions. The GHG inventory performed in 2011 for 2010 emissions includes four of the six types of Scope 3 emissions that should be measured and targeted for reduction:

- Emissions related to contracted solid waste;
- Contracted wastewater treatment;
- Employee commuting; and
- Electricity losses due to T&D.

The 2010 Scope 3 GHG emissions totaled 9,470 MT CO₂e (Table 2.1-8 and Figure 2.1-2, located in Section 2.1.2.3). Assuming the 2008 inventory total of 12,000 MT described similar data, the Air Station realized a 21% reduction in Scope 3 emissions between 2008 and 2010; however, caution is warranted as the consistency of approaches and quantity and quality of data used for those two estimates may be significantly different and account for much of the variation.

2.1.2.3 Objective 1.2 – FY 2011 Through FY 2020 Goal Performance Review

Progress continued into 2012 with the development of another GHG inventory with estimated Scope 3 emissions. The 2012 inventory described Scope 3 emissions for FY 2011 in a similar manner as the previous year and also benefitted from federal and DoD guidance developed during that period that prescribed how data was to be obtained and how GHG emissions were to be estimated. With this guidance, the inventories for emission years FY 2011 forward should provide consistent, comparable data and with a level of accuracy acceptable to MCIWEST. At the end of FY 2011, the Station's total Scope 3 emissions value was 9,522 MT CO₂e which is 8% below the FY 2020 reduction goal of 10,380 MT CO₂e (Figure 2.1-2). Therefore, if the Station maintains this level of Scope 3 GHG emissions through FY 2020, it will exceed the FY 2020 goal.

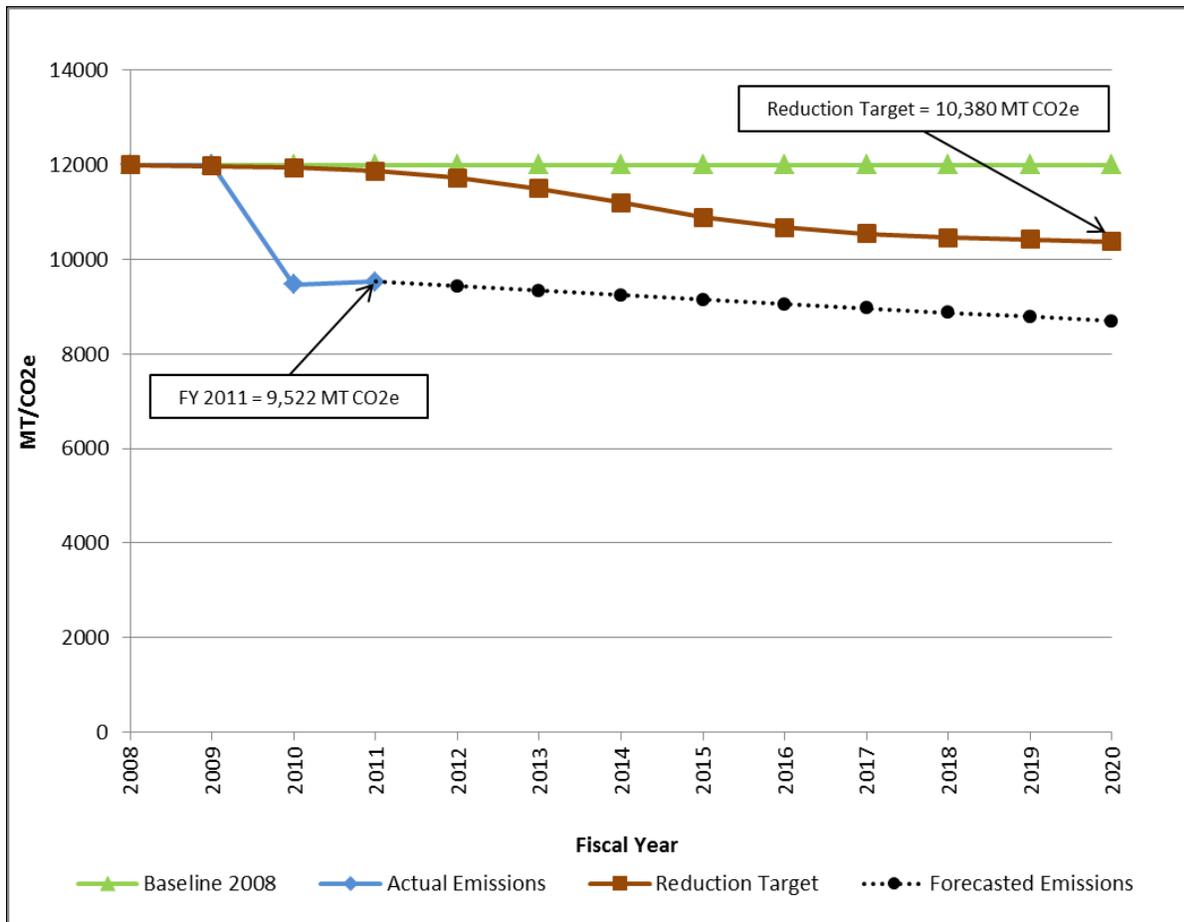
The GHG inventory performed in 2012 for 2011 emissions includes the same four types of Scope 3 emissions and the values are consistent though both years. Emissions related to contracted solid waste disposal were slightly down but slightly higher for contracted wastewater treatment - presumably from slight variations in the quantity of those waste streams. Similarly, emissions from lost energy in electricity transmissions and distribution showed a slight increase, reflective of the slight increase in electricity consumed in FY 2011. Emissions associated with employee commuting were also similar to those reported in 2010.

Table 2.1-8. MCAS Yuma San Diego Scope 3 Greenhouse Gas Emissions

Scope 3 Emissions				
	2008	2009	2010	2011
Contracted solid waste disposal	--	--	2,257 ¹	2,184
Contracted wastewater treatment	--	--	17	38
Employee commuting	--	--	5,397	5,465
Business travel - ground	--	--	--	--
Business travel - air	--	--	--	--
Electricity loss in lines (T&D)	--	--	1,799	1,835
Scope 3 Totals	12,000	--	9,470	9,522

Note: ¹ Units are MT CO₂e.

Figure 2.1-2. MCAS Yuma Total Scope 3 Greenhouse Gas Emissions



2.1.2.4 Objective 1.2 – Action Plan

At the end of FY 2011, the Station's total Scope 3 emissions value was 9,522 MT CO₂e which is 8% below the FY 2020 reduction goal of 10,380 MT CO₂e. Therefore, if the Station maintains this level of Scope 3 GHG emissions through FY 2020, it will exceed the FY 2020 goal.

The federal government and DoD are taking actions to better quantify and promote reductions in several types of Scope 3 GHG emissions. As these initiatives are further developed and implemented and as specific data is developed for the Air Station, reduction opportunities or actual reductions can be identified and contribute to this goal. Air Station staff should continue to monitor federal and DoD guidance related to inventorying Scope 3 emissions.

Similar to Objective 1.1, an action item for consideration is to revisit the Scope 3 GHG emission data for the baseline year of FY 2008. Several potentially significant changes in source data and methodologies occurred between how the FY 2008 and FY 2011 GHG inventories were conducted. The most recent inventory followed federal guidance and will be the format repeated for the years to come. That same methodology, applied to the baseline year would likely provide a more accurate baseline value to better establish planning opportunities and future targets.

An action for the Air Station could be to improve the accuracy of data associated with employee commuting. Using census data and national average commuting factors, which is in accordance with current guidance, is not likely to represent the conditions at Yuma, where the broad data suggests 5,465 MT of the 9,552 MT total Scope 3 emissions are from employee commuting. Recent GHG inventories correctly suggest that more accurate data be obtained from surveying local staff, such as through the use of an on-line survey.

The Air Station should continue to monitor Scope 3 emissions from contracted solid waste disposal and wastewater treatment. As efficiencies are gained in water use and waste minimization, the associated GHG emissions should also decrease from the lower waste generation and water use values.

2.1.3 Objective 1.3: Meet DoD Fiscal Year 2020 7% Reduction in Greenhouse Gas Emissions from Employee Air Travel

Table 2.1-9. Objective 1.3 Summary

Objective 1.3 Summary	
Objective Metric	The percent reduction of GHG emissions from employee air travel by DoD employees on DoD business, relative to FY 2011, as calculated from travel data captured by the Defense Travel Management Office (DTMO) from the FY 2011 DoD SSPP.
Objective Unit of Measure	CO ₂ e expressed in MT (MT CO ₂ e).
Objective Baseline Year	FY 2011
Baseline (FY 2011) Air Travel Emissions	Not established to date.
FY 2020 Reduction Goal	To be determined.
Forecasted Status	To be determined.
Data Source	FY 2011 Greenhouse Gas Inventory for MCIWEST to Support Compliance with EO 13514.

2.1.3.1 Objective 1.3 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2011 as the baseline year for this metric, as referenced in Section 2.1.3.3.

2.1.3.2 Objective 1.3 – FY 2010 Goal Performance Review

MCIWEST Order 5090.3 has established FY 2011 as the baseline year for this metric, as referenced in Section 2.1.3.3.

2.1.3.3 Objective 1.3 – FY 2011 Through FY 2020 Goal Performance Review

The *FY 2011 Greenhouse Gas Inventory for MCIWEST to Support Compliance with Executive Order 13514* did not address employee air travel and includes the following statement regarding this emissions category:

Although 94 federal agencies currently list their employee travel data in GSA Travel [Management Information System] MIS, DoD has chosen not to participate at this time. Mr. Leif Waller, who is the Program Analyst for the Center for Travel Management, said that he received many requests from subordinate offices and locations within DoD for travel data. Unfortunately, DoD has not agreed to provide its travel data to GSA Travel MIS and, therefore, it is not available on an aggregate basis. The enormous level of effort to retrieve and compile employee travel data for MCIWEST by individual PNRs and travel records is not cost-effective at this time. Hence, no calculations have been included for this source category.

2.1.3.4 Objective 1.3 – Action Plan

The federal government and DoD are taking actions to better quantify and promote reductions in managing several types of Scope 3 GHG emissions, including employee air travel. As these initiatives are further developed and implemented and as specific data is developed for the Station, reduction strategies and opportunities or actual reductions can be identified and contribute to this goal. Station

staff should continue to monitor federal and DoD guidance related to inventorying Scope 3 emissions including employee air travel. For example, the FY 2011 DoD SSPP includes “Implementation Methods” related to managing this emissions category which are summarized as follows:

- The Defense Travel Management Office (DTMO) is collaborating with other agencies to find the best way to reduce energy consumption and GHG emissions from employee business travel.
- DTMO is an active participant in the Green Travel Working Group, consisting of DoD, Department of Energy (DOE), USEPA, General Services Administration (GSA), and the White House Council on Environmental Quality. One of the main focuses of the group is to develop a federal Green Travel website to provide training and other educational tools on how to travel more energy efficiently.
- On 30 September 2010, GSA issued *Guidance for Sustainable Temporary Duty Travel Policies and Practices*, which provides improved guidance based on the Federal Travel Regulations regarding sustainable travel, including guidance on evaluating whether travel is mission critical or can be avoided.
- DTMO is evaluating whether to use this new guidance to modify the DoD travel regulations including the Joint Federal Travel Regulations (applicable to uniformed personnel) and Joint Travel Regulations (applicable to DoD Civilian employees and others traveling at DoD expense).
- DTMO is also evaluating the development of an online Green Travel training course.

As part of this Action Plan, utilizing available guidance as summarized above, it is recommended that the Station begin development of a strategy and procedure to determine the process by which ongoing data for this emissions category will be captured. Future GHG inventories conducted for MCAS Yuma should address this emissions category to ensure a comprehensive accounting of all Scope 3 GHG emissions.

2.1.4 Objective 1.4: Have 30% of Eligible Employees Teleworking at Least Once a Week, On a Regular Recurring Basis

Table 2.1-10. Objective 1.4 Summary

Objective 1.4 Summary	
Objective Metric	The percent of Station employees eligible to telework who are doing so at least once a week on a regular, recurring basis.
Objective Unit of Measure	Number of employees teleworking at least once a week, on a regular recurring basis.
Objective Baseline Year	FY 2008
Baseline Employees Teleworking	Data was not available to calculate the baseline status of this objective.
FY 2011 Employees Teleworking	Data was not available to calculate the 2011 status of this objective.
FY 2020 Goal	30% of eligible employees teleworking at least once a week, on a regular recurring basis.
Forecasted Status	To be determined.
Data Source	To be determined.

2.1.4.1 Objective 1.4 – Baseline Through FY 2009 Analysis

Data was not available to calculate the baseline status of this objective. Although “employee commuting” has been addressed in previous GHG inventories for the Station, employee teleworking has not been specifically addressed.

2.1.4.2 Objective 1.4 – FY 2010 Goal Performance Review

Data was not available to calculate the FY 2010 status of this objective. Although “employee commuting” was addressed in the FY 2010 MCIWEST GHG inventory that included the Station, employee teleworking was not specifically addressed.

2.1.4.3 Objective 1.4 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, several key policies/laws were implemented regarding teleworking policy:

- On 21 October 2010, the DoD issued a new telework policy via Department of Defense Instruction (DoDI) 1035.01, *Telework Policy*, which states:

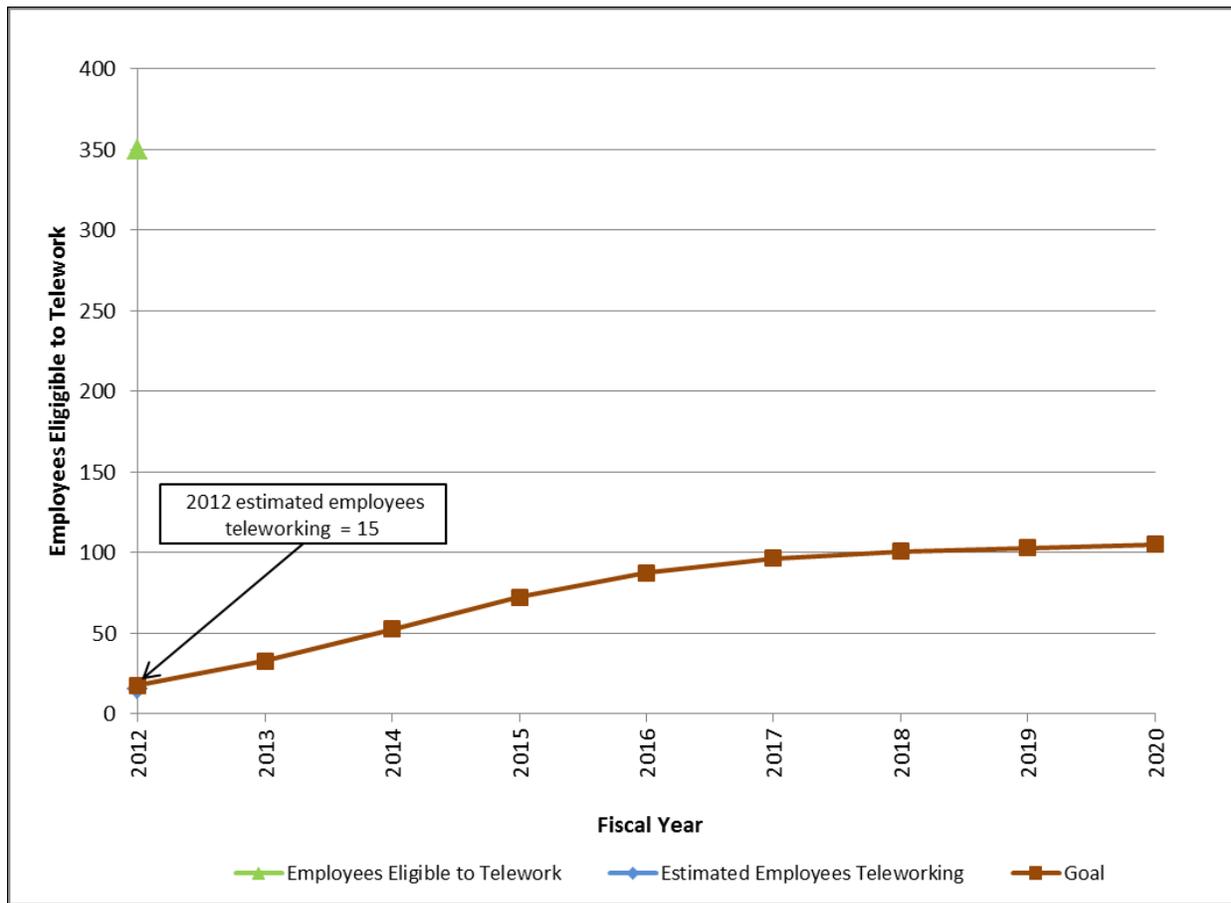
“It is DoD policy that teleworking shall be actively promoted and implemented throughout the Department of Defense in support of the DoD commitment to workforce efficiency, emergency preparedness, and quality of life. Telework is not an entitlement, but its use can serve as an effective recruitment and retention strategy; enhance DoD efforts to employ and accommodate people with disabilities; and create cost savings by decreasing the need for office space and parking facilities, and by reducing transportation costs, including costs associated with payment of transit subsidies.”

The DoDI establishes responsibilities including the development and implementation of the telework policy for the Department. The DoDI also requires that all heads of DoD components develop and implement telework programs, and provide detailed procedures to guide components in doing so.

- Public Law 111.292, *The Telework Enhancement Act of 2010*, was signed on 9 December 2010. The Act provides details on criteria need to establish a telework program and to manage the operational aspects of the program. The DoD is revision DoDI 1035.01 to incorporate the requirements of the Act into existing policy.
- On 3 October 2011, MCIWEST Commanding General Policy Letter 5-11, *Marine Corps Installations West Policy for Telework*, was issued. This policy letter provides installation commanders with the authority to pursue telecommuting where appropriate.

Regarding employee teleworking, in 2012, there were approximately 350 General Service (GS) employees at MCAS Yuma and for the purposes of the ISPP, these individuals were assumed to be those eligible to telework at least once a week on a regular, recurring basis. Using this number of GS level employees (350) and the recent guidance in the *FY 2012 United States Marine Corps Plan for Implementing the DoD Strategic Sustainability Performance Plan* that stated an estimated 4.3% of USMC employees telework (based on national census data), an estimated number of 15 employees teleworking once a week on a regular recurring basis in 2012 was established for the Station (Figure 2.1-3).

Figure 2.1-3. MCAS Yuma Percent of Eligible Employees Teleworking at Least Once a Week on a Regular, Recurring Basis



2.1.4.4 Objective 1.4 – Action Plan

The federal government and DoD are taking actions to better provide implementation guidance to quantify and promote reductions in managing several types of Scope 3 GHG emissions, including employee teleworking. As these initiatives are further developed and implemented and as specific data is developed for the Station, implementation strategies and opportunities or actual reductions can be identified and contribute to this goal. MCAS Yuma staff should continue to monitor federal and DoD guidance related to the development and implementation of teleworking policy. For example, the FY 2011 DoD SSPP includes “Implementation Methods” related to evolving teleworking policy which is summarized as follows:

- The revision to DoDI 1015.01 to incorporate the requirements of the *Telework Enhancement Act of 2010* will lay the foundation for DoD to increase the percent of eligible employees teleworking on a regular recurring basis.
- Supervisors within all DoD components will be required to determine the eligibility of all relevant employees to telework, based on position duties, performance, and conduct, and will notify employees of their eligibility to participate in telework. The Department will ensure that telework training is provided to all employees eligible to telework and their supervisors before an employee enters into a written agreement to telework.
- The DoD’s Civilian Personnel Management Service is developing an application in the Defense Civilian Personnel Data System to track DoD-wide telework eligibility among DoD’s civilian personnel, by position and employee. The application is expected to be completed by the end of FY 2012.
- The Department will mandate interactive training for all teleworkers and their managers before they enter a telework agreement. The training will facilitate an increased understanding of the elements of a successful telework agreement.
- The Department of the Navy (DoN) is also implementing several initiatives to reduce employee commuting by enhancing its telework program. One initiative is that the DoN is updating its telework policy to be consistent with the Telework Enhancement Act of 2010. DoN is also developing two online training programs (one for employees and one for supervisors), and is exploring information technology (IT) issues related to increased capacity for remote access and portable hardware solutions. The DoN is also exploring ways to improve metric collection through an automated telework management tool that will track employee telework agreements, employee eligibility to telework, and gather return on investment information on reduced commuting, increased productivity, and enhanced recruitment and retention.

Programming to Support Employee Teleworking. The basis of the calculation for the metric associated with this target is the number of employees eligible to telecommute on a regular recurring basis. The overall goal of this target is to increase the percent of eligible employees teleworking on a regular, recurring basis to 30% by FY 2020. For the purposes of estimating the number of employees that will be required to telework to meet this target, a total number of 350

employees was used as the basis of the calculation. The following are the estimated costs to provide an employee with the necessary equipment and support to be able to telework:

- **Equipment**
 - Laptop computer (with card reader)/docking station/monitor: \$2,000
 - Microsoft Office software: \$400
 - Printer: \$300
 - Total initial equipment: \$2,700
- **Additional Annual Costs**
 - Internet connection: \$80/month = \$960/year
 - Printing supplies: \$75/month = \$900/year

Table 2.1-11 summarizes the estimated costs to provide the necessary support to allow employees to telecommute.

Table 2.1-11. Estimated Cost to Support Employee Teleworking

Fiscal Year	Estimated Employees Eligible to Telework	ISPP Percent Goal	Number of Employees Goal	Equipment Cost (\$2,700/employee)	Additional Annual Costs (\$1,860/employee)	Total Cost
2013	350	9.3%	33	\$89,100	\$61,380	\$150,480
2014	350	15%	53	\$54,000 ¹	\$98,580	\$152,580
2015	350	20.6%	72	\$51,300 ¹	\$133,920	\$185,220
2016	350	25%	88	\$43,200 ¹	\$163,680	\$206,880
2017	350	27.5%	96	\$21,600 ¹	\$178,560	\$200,160
2018	350	28.8%	101	\$13,500 ¹	\$187,860	\$187,860
2019	350	29.4%	103	\$5,400 ¹	\$191,580	\$196,980
2020	350	30%	105	\$5,400 ¹	\$195,300	\$200,700
TOTAL	--	--	--	\$283,500	\$1,210,860	\$1,494,360

Note: ¹ Estimated cost based on the increased number of employees from the previous year.

2.1.5 Objective 1.5: Divert 50% of Non-Hazardous Solid Waste from Disposal in Landfills Not Owned by DoD

Table 2.1-12. Objective 1.5 Summary

Objective 1.5 Summary	
Objective Metric	The percent of the total non-hazardous solid waste generated and collected by the Station (by weight) that is diverted from disposal in landfills not owned by DoD.
Objective Unit of Measure	Tons
Objective Baseline Year	FY 2008
Baseline Diversion Rate	All non-hazardous solid waste is disposed at off-Station landfills. The baseline diversion rate is 17.2%. See Objective 4.4 for additional detail.
FY 2011 Diversion Rate	46.8%
FY 2020 Diversion Goal	50%
Forecasted Status	The Air Station will meet the FY 2020 diversion goal.
Data Source	Annual Environmental Data and Metrics (EDMWEB) Solid Waste Operations reports.

2.1.5.1 Objective 1.5 – Baseline Through FY 2009 Analysis

All non-hazardous solid waste is disposed at off-Station landfills. The baseline (FY 2008) solid waste diversion rate was 17.2%. See Objective 4.4 for additional detail.

2.1.5.2 Objective 1.5 – FY 2010 Goal Performance Review

All non-hazardous solid waste is disposed at off-Station landfills. The FY 2010 solid waste diversion rate was 19.3%. See Objective 4.4 for additional detail.

2.1.5.3 Objective 1.5 – FY 2011 Through FY 2020 Goal Performance Review

All non-hazardous solid waste is disposed at off-Station landfills. The FY 2011 solid waste diversion rate is 46.8%. See Objective 4.4 for additional detail.

2.1.5.4 Objective 1.5 – Action Plan

It is forecasted that the Station will meet the FY 2020 solid waste diversion goal. See Objective 4.4 for additional detail related to this Action Plan and recommendations regarding solid waste diversion.

2.1.6 Objective 1.6: Comprehensive Annual Inventory of Scope 1, 2, and 3 Greenhouse Gas Emissions

Table 2.1-13. Objective 1.6 Summary

Objective 1.6 Summary	
Objective Metric	Completion of an annual inventory of Scope 1, 2, and 3 GHG emissions.
Objective Unit of Measure	Completion of the annual inventory for the preceding FY by 31 January.
Objective Baseline Year	FY 2010 (report to be submitted by 31 January 2011 for FY 2010).
Objective Status	MCAS Yuma was included in the <i>Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance With Executive Order 13514</i> (September 2011). This inventory addressed FY 2010 emissions and was the first MCIWEST inventory developed specifically for evaluating EO 13514 compliance.
Forecasted Status	The Air Station will continue to meet this annual requirement.
Data Source	<i>Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance with Executive Order 13514</i> (September 2011).

2.1.6.1 Objective 1.6 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2010 as the baseline year for this metric, as referenced in Section 2.1.6.2.

2.1.6.2 Objective 1.6 – FY 2010 Goal Performance Review

This objective appears relatively simple but, in fact, requires significant planning and ongoing resources. The objective is to perform an annual inventory of Scope 1, 2, and 3 GHG emissions starting in FY 2010 and to report by 31 January 2011.

MCAS Yuma was included in the *Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance With Executive Order 13514* (September 2011). This inventory addressed FY 2010 emissions and was the first MCIWEST inventory developed specifically for evaluating EO 13514 compliance. This inventory used data sources and emissions methodologies specifically designed for DoD installations measuring progress towards the sustainability goals.

2.1.6.3 Objective 1.6 – FY 2011 Through FY 2020 Goal Performance Review

For FY 2011 emissions, the following inventory was prepared *Draft - Greenhouse Gas Inventory for Marine Corps Installations West to Support Compliance with Executive Order 13514* (June 2012). With the most recent inventory, the Air Station has met the goal and continued similar efforts will assure this goal is met through 2020.

2.1.6.4 Objective 1.6 – Action Plan

The Air Station, directly or through MCIWEST, will ensure that GHG inventories continue to be performed, are consistent with EO 13514 requirements, and provide adequate detail to be repeatable and defensible. For example, the most recent inventory for GHG emissions in FY 2011 provides a detailed explanation of the areas included in the inventory, and explanations of why some emissions at Camp Billy Machen (CBM) were assigned to Marine Corps Base (MCB) Camp Pendleton. That level of detail guides future efforts to assure consistent methodologies are applied each year. The repeatability of the inventories is critical to understanding the basis for fluctuating emissions levels and how future action plans are achieving the reduction goals. Ongoing tracking of annual changes to federal GHG

inventory requirements and policy is recommended to ensure the latest guidance is being applied to GHG inventory methodology.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation completed a FY comprehensive GHG inventory of Scope 1, 2, and 3 GHG emissions per EO 13514 requirements?
2. Were all GHG emission sources included per federal GHG accounting and reporting guidance?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Did the inventory results reflect full compliance with the installation's prior year annual reduction targets for Scope 1, 2, and 3 GHG emissions?
2. If not, which targets were not met and why not?

2.2 MCIWEST GOAL 2 – IMPROVE ENERGY EFFICIENCY

2.2.1 Objective 2.1: 3% Annual Reduction in Building Energy Intensity through Fiscal Year 2015, or 30% Total Reduction by FY 2015; 37.5% Total Reduction by FY 2020

Table 2.2-1. Objective 2.1 Summary

Objective 2.1 Summary	
Objective Metric	The percent reduction relative to FY 2003 in the total fossil fuel-generated energy consumed by the Station facilities per gross square foot of building space.
Objective Unit of Measure	Million British thermal units (MBTU)/thousand square feet (KSF).
Objective Baseline Year	FY 2003
Baseline Energy Intensity	86.96 MBTU/KSF.
FY 2011 Energy Intensity	73.63 MBTU/KSF.
FY 2020 Reduction Goal	54.34 MBTU/KSF.
Forecasted Status	<p>It is currently forecasted that the Station’s FY 2020 energy intensity will be 76.9 MBTU/KSF and that it will not meet the FY 2020 reduction goal of 54.34 MBTU/KSF.</p> <p>It should be noted that due to low overall utility costs at the Station, there are effects on the economic evaluation of energy-related projects and the ability to get them funded. When low-economic energy projects are evaluated at HQMC, they might not be scored as high as at other installations with higher utility costs. Consequently, MCAS Yuma has the ability to develop energy projects that would assist in reducing the Station’s energy intensity; however, without additional funding support, these projects often do not get programmed. Other factors impacting the ability of the Station to meet this objective’s requirement include:</p> <ul style="list-style-type: none"> - Adequate staffing to assist in energy awareness initiatives (there is currently no incentive to conserve). - The Energy Office does not control additional mission functions required at the Air Station. - The Energy Office does not control when units will work extended hours and/or weekends to meet mission requirements. - The beddown of the Joint Strike Fighter at MCAS Yuma increased overall square footage but also led to increased energy intensity in FY 2012. - The Station has no control over utility rates and economic return on investment related to project implementation.
Data Source	USMC Energy and Water Management Annual Reports and the Defense Utility Energy Reporting System (DUERS).

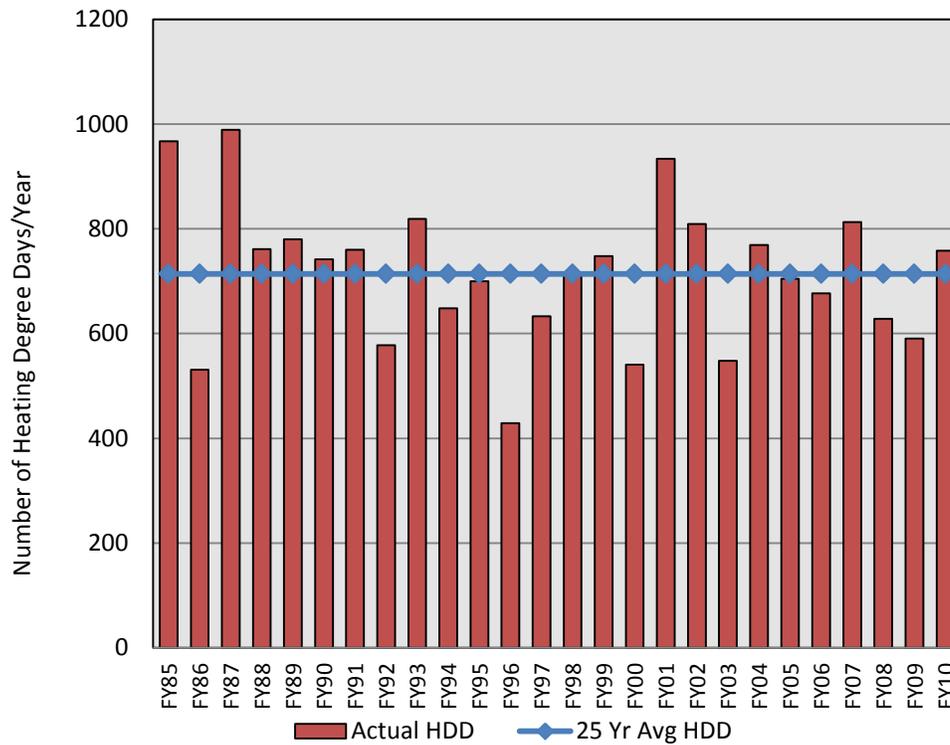
2.2.1.1 Objective 2.1 – Baseline Through FY 2009 Analysis

The Station’s energy consumption for the baseline year of FY 2003 is 86.96 Million British thermal units (MBTU)/thousand square feet (KSF). Station energy usage for years FY 2003 through FY 2009 is summarized in Table 2.2-2 and is illustrated in Figure 2.2-3 (located in Section 2.2.1.3). From FY 2003 through FY 2009 an overall reduction of 10.09 MBTU/KSF, or 11.60%, has occurred.

Exceptions include the years of 2007 and 2008 where there were above average cooling loads for 2008 (Figures 2.2-1 and 2.2-2 present historical heating degree days [HDD] and cooling degree days [CDD]¹) which could have contributed to the annual energy use increases for these years. Analysis of FY 2009 data reveals a reduction to 76.86 MBTU/KSF in building energy intensity which tracks more closely to the reduction goals for the Station.

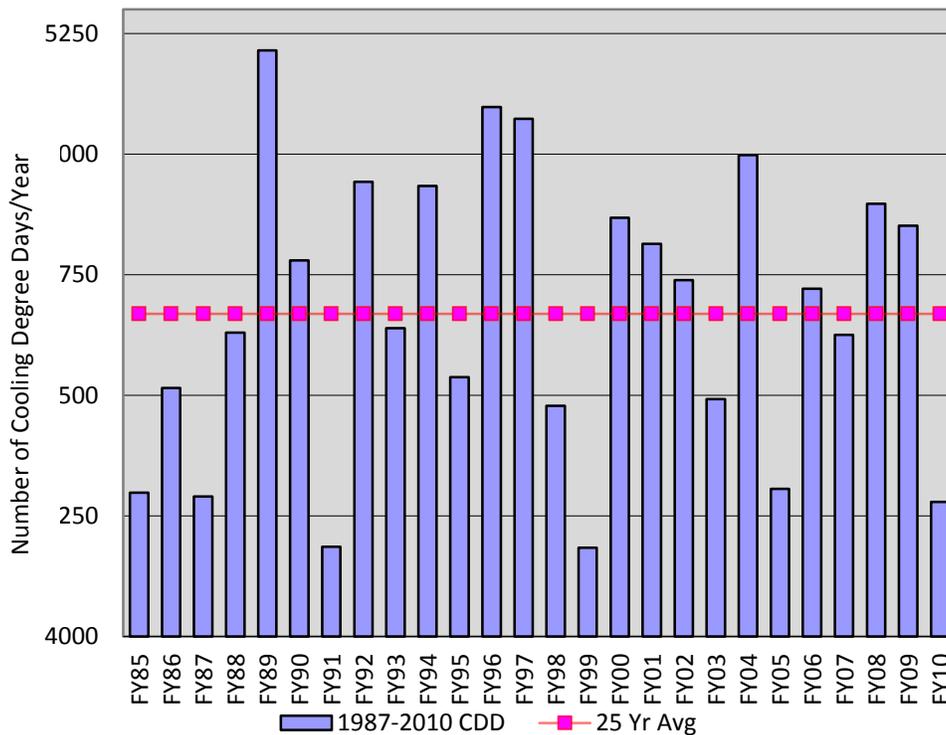
Figure 2.2-3 demonstrates energy MCAS Yuma historical energy consumption intensity as it compares to the ISPP goal.

Figure 2.2-1. MCAS Yuma Historical Heating Degree Days



¹ Degree day is a quantitative index demonstrated to reflect demand for energy to heat or cool houses and businesses. This index is derived from daily temperature observations at nearly 200 major weather stations in the contiguous United States. The "heating year" during which heating degree days are accumulated extends from July 1st to June 30th and the "cooling year" during which cooling degree data are accumulated extends from January 1st to December 31st. A mean daily temperature (average of the daily maximum and minimum temperatures) of 65°F is the base for both heating and cooling degree day computations. Heating degree days are summations of negative differences between the mean daily temperature and the 65°F base; cooling degree days are summations of positive differences from the same base. For example, cooling degree days for a station with daily mean temperatures during a seven-day period of 67,65,70,74,78,65 and 68, are 2,0,5,9,13,0,and 3, for a total for the week of 32 cooling degree days.

Figure 2.2-2. MCAS Yuma - Historical Cooling Degree Days



From FY 2003 through FY 2009, MCAS Yuma implemented a number of major energy conservation initiatives as well as other small scale projects and initiatives with overall project values ranging from \$30,000 to \$5,000,000. These projects and initiatives are summarized in Appendix C.

The numerous energy management practices and projects implemented by the knowledgeable staff at MCAS Yuma have been instrumental in lowering the Station’s overall energy intensity since the baseline. However, with the addition of the JSF program in FY 2012 and the projected increase in energy consumption associated with its implementation, careful planning and energy management will be needed to achieve the energy intensity reduction targets.

2.2.1.2 Objective 2.1 – FY 2010 Goal Performance Review

MCAS Yuma continued to be effective in meeting its overall energy reduction goal as the FY 2010 energy intensity was 74.55 MBTU/KSF. For FY 2010, the energy consumption rate is slightly below the annual reduction target requirements of 14.27% below the baseline year of FY 2003 (Table 2.2-2 and Figure 2.2-3).

2.2.1.3 Objective 2.1 – FY 2011 Through FY 2020 Goal Performance Review

Energy use intensity for FY 2011 continued to trend downward from the baseline year of FY 2003 and was at 73.63 MBTU/KSF for FY 2011; approximately 1.1% above the 2011 target. As shown in Table 2.2-2 and Figure 2.2-3 the metric of MBTU/KSF illustrates that the FY 2011 usage has decreased 1.23% from the previous year with a total of 15.31% decrease from the baseline of FY 2003. Energy related projects initiated in FY 2011 included, but were not limited to, the following:

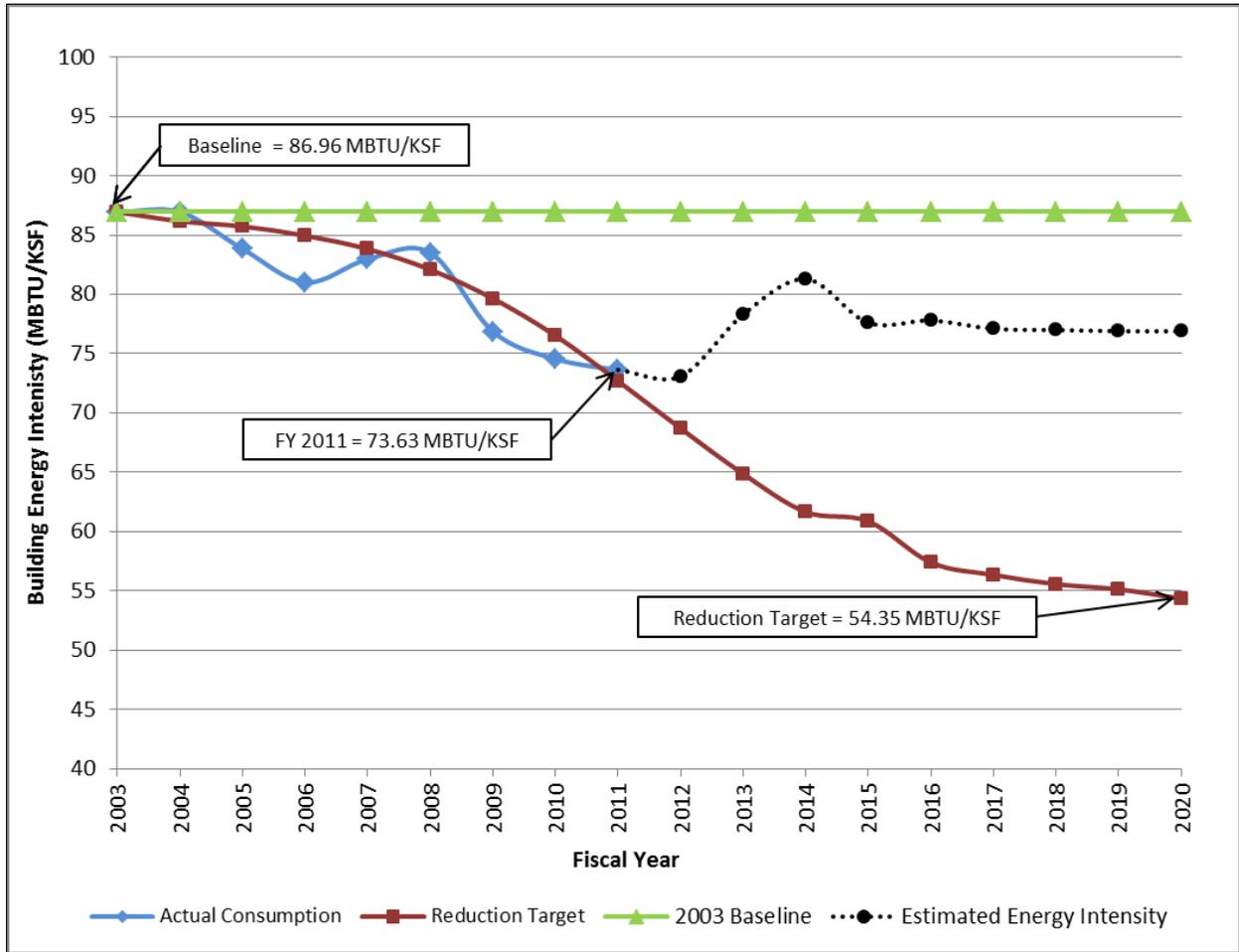
- Pump, motor, and chiller replacement throughout the Air Station;
- Lighting upgrades;
- Heating, ventilation, and air conditioning (HVAC) systems and controls;
- Hot water storage tanks; and
- Energy systems repairs and upgrades.

Renewable energy projects for FY 2011 included the re-lamping of existing low pressure sodium street lights with solar powered light emitting diode (LED) lights. Other renewable energy resources include six solar roof PV applications and three additional light projects in both residential and operational locations. There is also a continued focus on the design and construction of Leadership in Energy and Environmental Design (LEED) certified new facilities where applicable. At the conclusion of FY 2011, the Air Station was just 1.1% above the reduction target.

Table 2.2-2. MCAS Yuma Building Energy Intensity

Fiscal Year	MBTU Used	Station KSF	Building Energy Intensity (MBTU/KSF)	Actual Percent Reduction From FY 2003 Baseline	ISPP Percent Reduction Goal From FY 2003 Baseline
2003	220,352	2,534	86.96	--	--
2004	225,868	2,598	86.94	-0.02%	-0.9%
2005	217,778	2,598	83.83	-3.60%	-1.4%
2006	219,303	2,695	81.00	-6.85%	-2.3%
2007	227,433	2,806	82.98	-4.58%	-3.6%
2008	225,843	2,701	83.50	-3.98%	-5.6%
2009	195,833	2,548	76.86	-11.61%	-8.4%
2010	197,023	2,693	74.55	-14.27%	-12.0%
2011	202,547	2,751	73.63	-15.33%	-16.4%

Figure 2.2-3. MCAS Yuma Building Energy Intensity



Although energy use intensity continued to trend downward in FY 2011 from the baseline, it is anticipated that, as more facilities come online in support of the JSF mission in FY 2012, consumption based on the metric of MBTU/KSF will increase significantly in FY 2014 to 81.3 MBTU/KSF and then level out at approximately 77 MBTU/KSF through the following years to FY 2020. Table 2.2-3 provides a summary of the MCAS Yuma Energy Sustainability Plan Forecast to FY 2020. This estimate will put MCAS Yuma 22.55 MBTU/KSF over the FY 2020 goal of 54.35 MBTU/KSF (refer to Figure 2.2-3).

Table 2.2-3. MCAS Yuma Energy Intensity Forecast¹

Planning Metric	Description	Forecasted Energy Consumption (MBTU)	Forecasted Building Square Footage (KSF)	Forecasted Energy Intensity (MBTU/KSF)
FY 2012				
Baseline	--	202,547	2,751	73.6
FY 2013				
Baseline	--	204,290	2,794	73.1
Existing solar renewable	Six operating projects			
New renewable	Six rooftop shades			
JSF/Other MILCON	JSF construction plus solar			
Audits/DSM Savings	Chiller retrofits at six buildings			
Audits/DSM Savings	EIP savings realized the next FY			
FY 2014				
Baseline		239,367	3,056	78.3
New renewable	Roof top, solar shade			
JSF/Other MILCON	Per table in DUERS forecast (JSF)			
Audits/DSM Savings	Two EIP projects from FY 12 (originally SC Engineers)			
FY 2015				
Baseline		251,654	3,094	81.3
JSF/Other MILCON	Per table in DUERS forecast (JSF)			
Audits/DSM Savings	ECIP project – central chiller plant-zone (Bachelor Enlisted Quarters [BEQs])			
FY 2016				
Baseline		247,970	3,195	77.6
New renewable				
JSF/Other MILCON	Per table in DUERS forecast (JSF)			
FY 2017				
Baseline		252,428	3,246	77.8
New renewable	Installation of CADDC 1.5 MW			
JSF/Other MILCON	Per table in DUERS forecast (JSF)			
FY 2018				
Baseline		256,084	3,322	77.1
New renewable	Installation of proposed 10 MW PPA			
JSF/Other MILCON	Per table in DUERS forecast (JSF)			
FY 2019				
Baseline		256,806	3,337	77.0
New renewable	Installation of proposed 10 MW PPA			
JSF/Other MILCON	Per table in DUERS forecast (JSF)			
FY 2020				
Baseline		257,527	3,349	76.9
New renewable	Start-up of proposed 10 MW PPA			
JSF/Other MILCON	Per table in DUERS forecast (JSF)			

Notes: Assumptions - Flat building square foot expansion from FY 2017 through FY 2020 based on historical expansion before the JSF. All FY 2012 JSF buildings start energy use in FY 2013.

¹Data contained in this table provided by MCAS Yuma Engineering Department and Energy Office.

2.2.1.4 Objective 2.1 – Action Plan

The recommended action plan is to continue to focus on the existing energy efficient programs and projects that maximize the return on investment based on the current MBTU/KSF metric without sacrificing the mission goals and objectives of MCAS Yuma. Future actions and proposed projects that meet the prescribed economic analysis and feasibility for the demand-side goal of reducing energy intensity and increasing renewables should be considered as listed below. Additionally, review and evaluation of the applicability of the U.S. Department of Energy (DoE) *Guidelines for Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005* (January 2006) to the Station's operations as described further below in this section should be considered in calculating the Station's future energy intensity.

Energy Intensity Reduction Project Opportunities and Best Management Practices

- Lighting re-lamping and controls. These types of projects include replacement of incandescent bulbs, food lights, and flood lights with compact fluorescent bulbs. Lighting controls will ensure that lights will not be left on in unoccupied or naturally lit areas. Photosensors can be used in most exterior lighting applications, as well as in naturally-lit areas. Vacancy sensors and timers work well in fitness centers, restrooms, mechanical rooms, electrical and telecommunication rooms, and conference/training rooms.
- Motor replacement and upgrades. Ongoing consideration should be given to specifying high-efficiency motors for new equipment and when standard motors require replacement or repair. The primary advantage of high-efficiency motors is the energy savings they provide. These motors used from 1% to 4% less electricity than standard motors and are generally more reliable, and last longer.
- HVAC system upgrades and controls. System upgrades can include such items as installing programmable thermostats to allow for the automatic adjustment of temperature settings during times of little or no use. Setting back thermostats by 10 to 15 degrees for 8 hours per night can reduce heating and cooling costs by up to 10%.
- Thermal energy storage. Thermal energy storage is an adjunct to a central plant system that makes chilled water or ice during off-peak electricity demand periods at night and uses it during the day to supplement chiller production and serve air conditioning needs. Chilled water storage uses a well-insulated tank and pump system. Ice storage requires a more complex tank and an industrial-sized ice-making unit, with capacities to several hundred tons. Thermal energy load shifting can lower overall HVAC operating costs by 20-60%. Other advantages are that a facility can reduce chiller size and achieve the same cooling with lower operating costs.
- General building energy optimization. There is a continued focus on the design and construction of LEED certified new buildings; Navy policy requires a minimum of LEED silver-certified new construction. Additionally, demand-side energy reduction projects identified in Table 2.2-4 are targeted for execution in FY 2011 through FY 2013.

- Building Energy Monitors and conservation awareness. There is an ongoing need to continue to educate staff and to be diligent regarding energy use. One of the most effective ways to reduce energy usage is to educate staff to “treat the Station’s energy bill as if it was their own.” Assignment of Building Energy Monitors and/or ongoing instruction to staff regarding turning off unnecessary lights, minimizing the use of heating and cooling when possible, turning off equipment and appliances that are not in use, ensuring that any vacant facilities are operated efficiently, and generally being aware of situations that are wasting energy such as broken photo sensors or inefficient and/or broken equipment, can have a significant impact on the Station’s overall energy use.
- Building space utilization. Optimizing existing facilities and planning for the future (to include both new construction of more efficient buildings and demolition of obsolete/inefficient) are key components of the overall energy efficiency management program. Comprehensive analyses of all facility and space utilization requirements should be periodically conducted to ensure the Station is using its existing space as efficiently as possible and to ensure any long-term, capital investments are fully evaluated for effectiveness and meeting mission requirements. It is recommended that consideration be given to, but not limited to, the following:
 - Identifying under-utilized space;
 - Align workplace initiatives with mission requirements and goals;
 - Forecast future space requirements;
 - Simplify ongoing space analyses;
 - Streamline any significant organization/unit moves;
 - Compare actual with planned space utilization;
 - Increase efficiency (i.e., are departments that work together located near each other?); and
 - Utilize Building Information Modeling.

Comprehensive Metering Program and Energy Audits - Although metering electricity and gas and audits alone do not reduce consumption, they do enhance allow for the ability to identify inefficient or high-use energy locations and practices. As more meters are installed, the energy staff will utilize the data to prioritize efficiency projects and reduce energy consumption installation-wide.

Table 2.2-4. MCAS Yuma Demand Side Energy Reduction Projects though FY 2013

Project Name/Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
Energy Upgrade B852	EIP	YU1050R	2012	\$14,000	\$1,740,000	124	423
Energy Upgrade B850	EIP	YU1051R	2012	\$5,000	\$386,000	77	113
Turbocor A/C B634	EIP	YU1203M	2012	\$18,000	\$603,700	34	402

Table 2.2-4. MCAS Yuma Demand Side Energy Reduction Projects through FY 2013

Project Name/Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
Turbocor A/C B635	EIP	YU1204M	2012	\$18,000	\$517,600	29	402
Turbocor A/C B1200	EIP	YU1210M	2012	\$18,000	\$489,700	27	402
Re-Commission B328	EIP	YU1300M	2012	\$20,000	\$4,330,000	217	499
Turbocor B722	EIP	YU1217M	2012	\$18,000	\$598,000	33	402
Re-Commission B1085	EIP	YU1205M	2012	\$20,000	\$1,995,200	100	500
B859 HVAC Repair and Renovation	EIP M2	YU1222M	2012	\$35,263	\$2,249,600	64	1,477
B1200 Replace Chiller Consolidated Club	EIP M2	YU1210M	2012	\$8,065	\$489,700	61	331
HVAC Repair Bldg. 530	EIP M2	YU1407M	2012	\$7,815	\$479,400	61	321
HVAC Repairs Bldg. 328	EIP M2	YU1408M	2012	\$71,822	\$3,581,626	50	2,836
B223 Repair Direct Digital Controls (DDC) System Paraloft Facility	EIP M1	YUFSC1253	2012	\$2,067	\$221,000	107	85
HVAC Repairs Bldg. 663	EIP M2	YU1225	2012	\$28,454	\$1,156,200	41	1,807
HVAC Repairs Bldg. 109	EIP M2	YU1226	2012	\$14,687	\$756,300	51	861
HVAC Repairs Bldg. 149	EIP M2	YU1227	2012	\$13,361	\$798,000	60	847
HVAC Repairs Bldg. 220	EIP M2	YU1228	2012	\$13,250	\$692,700	52	670
HVAC Repairs Bldg. 227	EIP M2	YU1229	2012	\$14,382	\$560,300	39	830
HVAC Repairs Bldg. 645	EIP M2	YU1230	2012	\$22,585	\$1,050,800	47	1,666
HVAC Repairs Bldg. 662	EIP M2	YU1231	2012	\$21,929	\$613,300	28	1,643
HVAC Repairs Bldg. 722	EIP M2	YU1232	2012	\$9,870	\$693,000	70	3,101
HVAC Repairs Bldg. 912	EIP M2	YU1233	2012	\$23,647	\$594,300	25	1,745

Table 2.2-4. MCAS Yuma Demand Side Energy Reduction Projects through FY 2013

Project Name/Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
HVAC Repairs Bldg. 914	EIP M2	YU1234	2012	\$22,603	\$671,900	30	1,670
HVAC Repairs Bldg. 918	EIP M2	YU1235	2012	\$23,097	\$574,800	25	1,667
HVAC Repairs Bldg. 920	EIP M2	YU1236	2012	\$22,132	\$561,400	25	1,631
HVAC Repairs Bldg. 930	EIP M2	YU1237	2012	\$21,210	\$798,100	38	1,658
HVAC Repairs Bldg. 3224	EIP M2	YU1238	2012	\$12,310	\$443,600	36	505
HVAC Repairs Bldg. 1060	EIP M2	YU1239	2012	\$17,064	\$542,500	32	1,440
Repair DDC System Bldg. 95	EIP M1	YU1240M1	2012	\$4,157	\$130,161	31	171
B144 Install DDC System Fire Admin	EIP M1	YU1240M1	2012	\$1,253	\$50,348	40	54
B146 Install DDC System Hangar	EIP M1	YU1240M1	2012	\$6,230	\$134,028	22	277
System Jet Engine Shop	EIP M1	YU1240M1	2012	\$1,564	\$54,020	35	91
B311 Install DDC System Fuels Bldg.	EIP M1	YU1240M1	2012	\$1,444	\$69,939	48	59
System Environmental Classroom	EIP M1	YU1240M1	2012	\$1,327	\$64,653	49	54
B570 Install DDC System Gas Station	EIP M1	YU1240M1	2012	\$1,497	\$39,420	26	61
B610 Install DDC System Motor T	EIP M1	YU1240M1	2012	\$1,727	\$58,777	34	112
B672 Repair DDC System Theatre	EIP M1	YU1240M1	2012	\$875	\$59,431	68	36
B673 Repair DDC System Bowling Alley	EIP M1	YU1240M1	2012	\$2,123	\$64,048	30	87
Control Optimization Air Frames	EIP M1	YU1241M1	2012	\$6,147	\$262,638	43	278

Table 2.2-4. MCAS Yuma Demand Side Energy Reduction Projects through FY 2013

Project Name/Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
Control Optimization Air Frames	EIP M1	YU1241M1	2012	\$3,032	\$243,197	80	130
B545 Repair HW Storage Tank	EIP M1	YU1241M1	2012	\$4,902	\$132,542	27	314
Control Optimization at Motor T	EIP M1	YU1241M1	2012	\$1,264	\$126,375	100	53
Control Optimization BEQ Facility	EIP M1	YU1241M1	2012	\$11,174	\$3,094,762	277	723
Control Optimization BEQ Facility	EIP M1	YU1241M1	2012	\$11,317	\$3,094,762	273	737
Control Optimization Education Center	EIP M1	YU1241M1	2012	\$1,808	\$1,336,477	739	75
Control Optimization Youth Center	EIP M1	YU1241M1	2012	\$12,695	\$174,950	14	562
B1091 Repair WH and Storage Tank	EIP M1	YU1241M1	2012	\$1,293	\$106,244	82	128
Control Optimization Battalion Squad	EIP M1	YU1241M1	2012	\$3,414	\$158,652	46	149
Control Optimization Multi-Purpose	EIP M1	YU1241M1	2012	\$6,417	\$210,998	33	278
B530 Energy Systems Repair	EIP M2	YU1407M	2012	\$26,771	\$497,500	19	322
B328 Energy Repairs	EIP M2	YU1408M	2012	\$235,785	\$4,176,200	18	2,836
Bldg. 888 Systems Optimization and Repairs	EIP M1	YU1422M	2012	\$5,000	\$2,000,000	400	75
Consolidated Chiller JSF Program	ECIP	P-598	2013	\$39,159	\$28,110,000	718	1,608

Table 2.2-4. MCAS Yuma Demand Side Energy Reduction Projects through FY 2013

Project Name/Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
Construct Chilled Water Plant Zone 1	ECIP	P-626	2013	\$200,201	\$10,340,000	52	8,219
Construct Chilled Water Plant Z-2	ECIP	P-627	2013	\$119,722	\$9,000,000	75	4,915
Backbone With EMS Upgrades	ECIP	P-628	2013	\$251,499	\$17,789,000	71	10,324
TOTAL	--	--	--	\$1,500,410	\$109,767,848	--	62,662

Source: MCAS Yuma Energy Office.

Building Exclusion Criteria. It has been documented that the stationing of the JSF at MCAS Yuma is forecasted to have a significant impact on the Station's energy intensity. Historically at the Station, energy use intensity has been calculated to include all facilities (including hangars and other mission support facilities and activities). In January, 2006 the DoE published the *Guidelines for Establishing Criteria for Excluding Buildings from the Energy Performance Requirements of 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005*, which among other criteria, excludes federal buildings from energy performance requirements for "Impracticability due to energy intensiveness or national security function."

The guidance further identifies the following "assumed exclusion of structures and processes not qualified as federal buildings:"

- Separately-metered energy intensive loads that are driven by mission and operational requirements, not necessarily buildings, and not influenced by conventional building energy conservation measures.
- Federal ships that consume "cold iron energy" and airplanes or other vehicles that are supplied with utility-provided power.

It is recommended that the Station review this guidance in its entirety, determine the applicability to the Station's facilities and operations (i.e., stationing of the JSF), and determine if any of the exclusion criteria will be adopted and applied in calculating the Station's future energy intensity. Should the Station choose to adopt the provisions of the exclusion, it is recommended that a documented response be prepared and maintained to support the Station's position on this exclusion.

2.2.2 Objective 2.2: Renewables Not Less Than 3% in Fiscal Year 2007-2009; By Fiscal Year 2020, Produce or Procure Energy from Renewable Sources in an Amount that Represents at Least 20% of Electricity Consumed by Facilities

Table 2.2-5. Objective 2.2 Summary

Objective 2.2 Summary	
Objective Metric	The percent of total electricity consumed by Station facilities that is produced or procured from renewable energy sources (the energy that is produced by the Station, produced by a Station controlled location, or procured from another source).
Objective Unit of Measure	MBTU.
Objective Baseline Year	FY 2007
Baseline Percent	0.026% for FY 2009 (no previous data was available).
FY 2011 Percent	0.39%
FY 2020 Goal	20%
Forecasted Status	The Air Station will meet the FY 2020 goal.
Data Source:	USMC Energy and Water Management Annual Reports; Station solar metering generation data.

2.2.2.1 Objective 2.2 – Baseline Through FY 2009 Analysis

There is no data available for this objective’s baseline year of FY 2007. Review of the Station’s solar metering generation data from FY 2009 indicates production of 12,219 KWh from PV systems. This equates to 0.026% of the total electricity use of 47,906 KWh for FY 2009 (Table 2.2-6 and Figure 2.2-4, located in Section 2.2.2.3).

Given the significant solar resources at the Station, the energy management staff at MCAS Yuma has been aggressive in investigating and conducting performance analysis for numerous renewable energy PV projects that will assist in meeting the renewable energy goal. Sites include the CADC site at an estimated generation capacity of 1.5 MW, the Ordnance site with an estimated total generation capacity of 14 MW (two phases), and the ASH site (capacity to be determined). However, associated return on investment rate analyses will need to be compared to the current rate of \$0.0769/KWh (supplied by APS), which given this low rate challenges the Station in justifying PV projects. Currently, solar projects consist of distributive applications that augment the utility supplied energy source. Solar assisted lighting and PV roofing applications, including solar PV sunshades, with solar charging stations will continue to reduce its purchased energy resources.

MCAS Yuma is attempting to take advantage of the abundant solar resources as evidenced by the numerous distributed solar projects that are both operational and in the planning stages. In the 2003-2009 timeframe, 42 MBTUs have been generated with seven additional solar sites planned to come online in 2010.

2.2.2.2 Objective 2.2 – FY 2010 Goal Performance Review

For FY 2010, the objective was for 10% of the total electricity used at the Station to come from renewable sources. In FY 2010, renewable electricity generation from solar sources was estimated at 77.4 KWh based on the Station's solar metering generation data, and the overall electricity use was 45,687 KWh. This equates to approximately 0.17% of the total 2010 electricity used at the Station was generated from renewables. MCAS Yuma's status towards meeting this objective is presented in Table 2.2-6 and Figure 2.2-4.

In FY 2010, MCAS Yuma awarded two significant renewable energy projects. The first was to install a "Cool Roof" on a 500,000 gallon (gal) water storage facility at Building 1958; the "Cool Roof" was then covered with a 32 KW thin solar film. The second project was executed using American Recovery and Reinvestment Act funding to install a 32 KW thin solar film to an existing sunshade at Building 233.

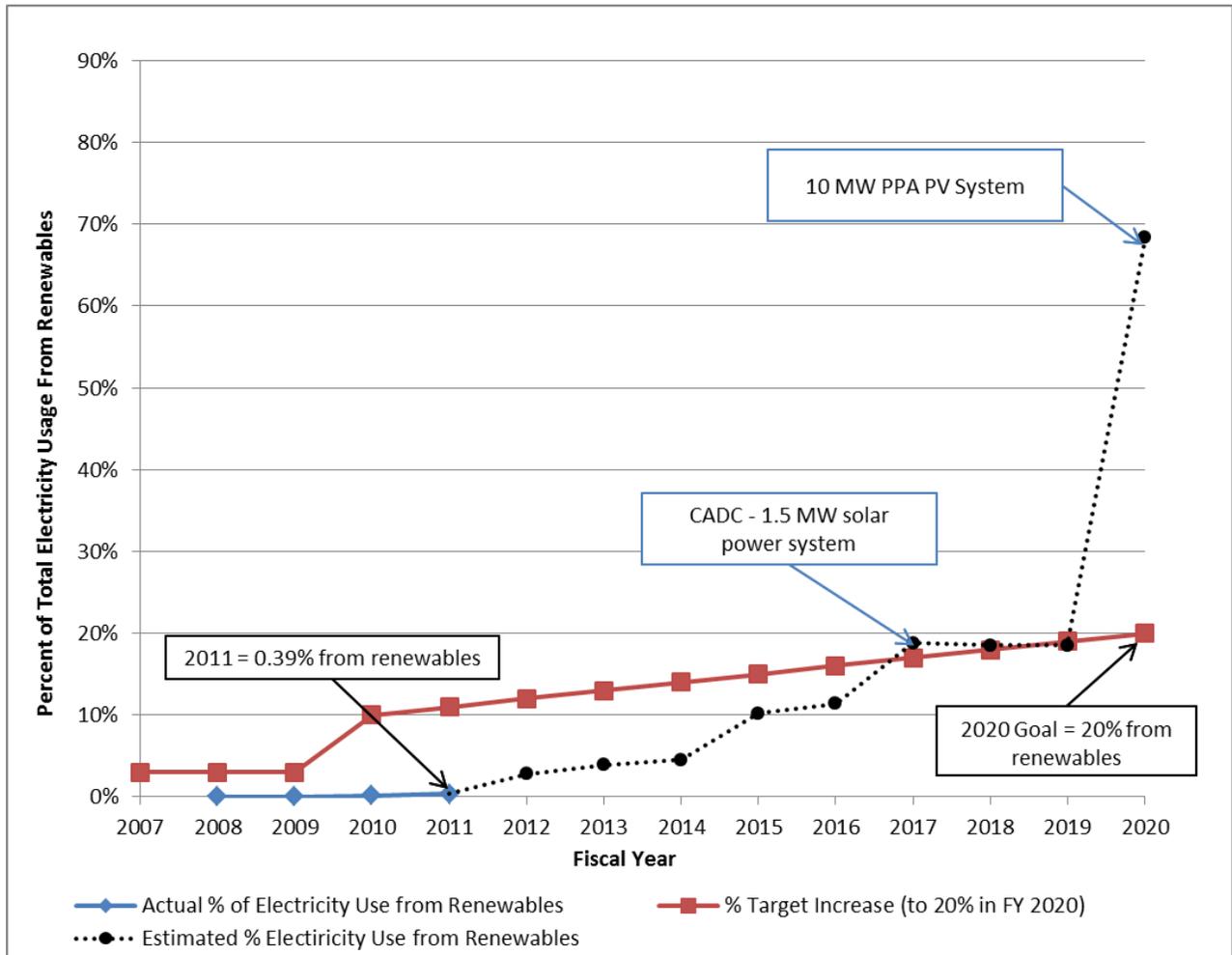
2.2.2.3 Objective 2.2 – FY 2011 Through FY 2020 Goal Performance Review

In terms of percent renewables of the total electricity consumed, the FY 2011 rate increased to 0.39% from 0.17% in FY 2010 (Table 2.2-6 and Figure 2.2-4). Renewable energy projects completed in FY 2011 included the re-lamping of existing low pressure sodium street lights with solar powered LED lights.

Table 2.2-6. MCAS Yuma Renewable Energy as a Percent of Total Electricity Consumption

Fiscal Year	Total Electricity Used	Renewable Energy Percent of Total Electricity Consumption	ISPP Percent Increase Goal
2009	47,906 KWh	0.026%	3%
2010	45,687 KWh	0.17%	10%
2011	47,827 KWh	0.39%	11%

Figure 2.2-4. MCAS Yuma Renewable Energy as a Percent of Total Electricity Consumption



MCAS Yuma has numerous supply-side renewable projects programmed through FY 2013 that will continue to assist with meeting renewable energy use goals, as referenced in Table 2.2-7.

Table 2.2-7. MCAS Yuma Supply Side Renewables Projects Identified for Execution in FY 2012 and FY 2013

Project Name/Description	Funding Source	Project Number	FY Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
Solar B530	EIP	YU1102R	2012	\$4,000	\$521,900	130	180
Solar B1200	EIP	YU1103R	2012	\$4,000	\$543,100	136	180
Solar Sunshade B980	EIP	YU1104R	2012	\$4,000	\$511,700	128	89
Solar Sunshade B888	EIP	YU114R	2012	\$4,000	\$438,800	110	89
Solar B1508	EIP	YU1013R	2012	\$4,000	\$606,000	152	89
B530 Install Solar PV Mag Warehouse	EIP R2	YU1102R	2012	\$5,196	\$497,447	96	213
B888 Install Solar PV Carport	EIP R2	YU1114R	2012	\$2,692	\$321,000	119	109
B930 Install Solar PV BEQ	EIP R2	YU1138R	2012	\$3,242	\$322,560	99	133
B980 Install Solar PV Carport	EIP R2	YU1104R	2012	\$3,326	\$386,500	116	137
B1200 Install Solar PV Consolidated Club	EIP R2	YU1103R	2012	\$5,321	\$543,151	102	218
B1508 Install Solar PV on Sunshade	EIP R2	YU1013R	2012	\$4,905	\$554,400	113	201
Hangar PV (MILCON)	MILCON	P-447	2012	\$10,976	\$545,925	49	498
Simulator PV (MILCON)	MILCON	P-533	2012	\$14,701	\$734,175	50	3,458
Hangar PV (MILCON)	MILCON	P-460	2012	\$14,475	\$775,000	55	3,628
IMA PV (MILCON)	MILCON	P-573	2012	\$11,275	\$564,750	50	1,076
Communications Facility PV (MILCON)	MILCON	P-583	2012	\$41,841	\$1,665,000	39	3,388
Install Solar PV Bldg. 328	EIP R2	YU1300R	2013	\$10,309	\$646,700	63	423
Construct 7 MW Solar PV Zone 1	ECIP	P-625	2013	\$940,979	\$42,780,000	45	38,628
Thermal Solar Hot Water Systems	ECIP	P-629	2013	\$35,881	\$865,474	24	3,639
TOTAL	--	--	--	\$1,125,119	\$53,823,582	--	56,376

In addition to the projects summarized in Table 2.2-7, there are several large scale PV solar projects in the planning stages.

Proposed 10 MW PPA Project - A proposed 10 MW PV project is currently being evaluated under the National Environmental Policy Act (NEPA) requirements and Federal Aviation Administration airport site review processes. The potential project site includes approximately 90 acres of vacant highly disturbed land southeast of the flight line and lies completely within MCAS Yuma and under the jurisdiction of the USMC. This project would permit a private company, under an outgrant instrument such as a power purchase agreement (PPA) or a license agreement to potentially produce a maximum of 10 MW for the Air Station's exclusive use, with the option of new metering. The facility would employ flat-panel PV technology and deliver the power to the Station under a rate agreement. If implemented, it is anticipated that the project would be on line by 2020 and the current estimated cost for construction is approximately \$40,000,000 (MCAS Yuma 2013a).

Proposed 1.5 MW Cannon Air Defense Complex Project - The Station has submitted a request for funding from the Energy Conservation Investment Program (ECIP) for a proposed 1.5 MW solar PV system that will supply approximately 100% of the CADC's electricity supply in 2016. It is proposed that this project will be implemented under a third party PPA and the government will not incur any capital costs.

The proposed 1.5 MW PV system will occupy approximately 7.5 acres (326,700 square feet [SF]). Approximately 6,250 mono or poly or mono crystalline solar panels will be ground mounted and set in angled mounting racks. The proposed system includes inverter housing units and all required transformers, wiring, and metering. The plant will be connected to an existing 12 kilovolt (kV) electrical substation panel and switchgear.

Overhead electrical lines will be routed approximately 400 feet to the substation to feed into the facility electrical distribution system.

Area Service Highway Solar Project - The Station is also pursuing a solar project on withdrawn land, which is approximately 1,745 acres in size, located west of the ASH and east of Avenue 4 east. This project is currently in the preliminary planning phases and estimated generation capacity is unknown at this time due to ongoing evaluation of the area available for project implementation. This additional potential increase in renewable generation capacity at the Station could help it to meet the goal of 20% by approximately 15% in FY 2020.

2.2.2.4 Objective 2.2 – Action Plan

MCAS Yuma is taking advantage of its abundant renewable resources with numerous distributive solar projects for PV. The Station's Action Plan includes implementation of 19 supply side renewable projects (see Table 2.2-7) that will assist the Station to increase its renewable energy use approximately 4% by FY 2013. Additionally, through implementation of the large scale solar projects referenced in Section 2.2.2.3, MCAS Yuma is poised far exceed the FY 2020 renewable energy use goal as it is estimated that as of FY 2020, the Station could be meeting nearly 70% of its estimated electrical demand from PV (renewable) sources (see Figure 2.2-4). However, additional continued opportunities exist to develop for both distributive and utility scale solar projects for PV and thermal heating systems. Representative potential projects and initiative include, but are not limited to:

- Utility scale solar;
- Sub-metering of high load systems;
- Energy services contracting;
- PPAs for renewable energy; and
- On-site solid waste to energy generation.

2.2.3 Objective 2.3: 50% of Statutorily Required Renewables Comes from “New” Sources

Table 2.2-8. Objective 2.3 Summary

Objective 2.3 Summary	
Objective Metric	No additional metric has been defined.
Objective Unit of Measure	MBTU.
Objective Baseline Year	FY 2007 (as stated in MCIWEST Order 5090.3).
Objective Status	All renewable energy production at the Station is from PV arrays.
Forecasted Status	It is anticipated that future renewable energy production at the Station will be focused on PV array implementation which will allow the Station to meet this objective’s requirements.
Data Source	USMC Energy and Water Management Annual Reports.

2.2.3.1 Objective 2.3 – Baseline Through FY 2009 Analysis

The Station’s status with regard to this goal is summarized in Section 2.2.3.2, FY 2010 Goal Performance Review.

2.2.3.2 Objective 2.3 – FY 2010 Goal Performance Review

MCAS Yuma staff continues to collaborate with the Bureau of Land Management (BLM) to analyze the geothermal natural resources in the West Chocolate Mountains area as part of an ongoing analysis of the proposed West Chocolate Mountains Renewable Energy Evaluation Area. Also, MCAS Yuma continues to evaluate a utility scale PV generation opportunities at the KAJI, ASH, and Ordnance sites to determine feasibility, site compatibility and operational use requirements.

The electric rate from APS is very competitive at \$0.0769 and thus makes the return on investment to be a major challenge in justifying new utility scale renewable generation sources.

Currently, all (100%) of renewable energy produced at MCAS Yuma comes from solar sources/PV arrays.

2.2.3.3 Objective 2.3 – FY 2011 Through FY 2020 Goal Performance Review

As identified in Section 2.2.2.3, there are several large scale solar projects in the planning stages (a 10 MW PPA that is expected to be operational by 2020; a 1.5 MW solar project is planned for the CADC area in FY 2017, and the ASH site). Given that all renewable energy produced at MCAS Yuma comes from PV arrays (i.e., a “new” source), the Station continues to meet this objective’s requirements.

2.2.3.4 Objective 2.3 – Action Plan

The Action Plan associated with this objective is closely tied with that presented in Section 2.2.2.4. It is anticipated that future renewable energy production at the Station will be focused on PV array implementation (i.e., a “new” source) which will allow the Station to continue to meet and exceed this objective’s requirements.

2.2.4 Objective 2.4: Phase Out the Use of Incandescent Bulbs

Table 2.2-9. Objective 2.4 Summary

Objective 2.4 Summary	
Objective Metric	No additional metric has been defined.
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	The Station has completed comprehensive relighting efforts and removed all incandescent interior and exterior lighting.
Forecasted Status	The Air Station will meet the FY 2020 goal.
Data Source	USMC Energy and Water Management Annual Reports and the DUERS.

2.2.4.1 Objective 2.4 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2010 as the baseline year for this metric, as referenced in Section 2.2.4.2.

2.2.4.2 Objective 2.4 – FY 2010 Goal Performance Review

MCAS Yuma implemented a comprehensive Station-wide lighting retrofit in early 2000 thru 2003 and removed all the incandescent lights used for interior and exterior lighting. These incandescent lamps were replaced with compact fluorescent type lamps and fixtures. In addition, the Station has installed significant solar power street lights as well as solar powered perimeter fence lighting using high efficiency LED's. The airfield lighting consists of only florescent and LED lamps in use for runways and taxiways. In 2009, the Station purchased approximately \$10,000 worth of compact fluorescent lights replacing incandescent lamps wherever found. In the design/review process of all new/repair project, plans and specifications are examined to ensure incandescent lighting is eliminated. The MCAS Yuma Energy Order 11300.2H requires elimination of incandescent lighting at the Air Station.

2.2.4.3 Objective 2.4 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, MCAS Yuma continued with change outs of incandescent bulbs as applicable and continued implementation of MCAS Yuma Energy Order 11300.2H.

2.2.4.4 Objective 2.4 – Action Plan

According to the MCAS Yuma Energy Office, all incandescent bulbs have been phased out. As part of the action plan associated with this objective, staff should continue implementation of MCAS Yuma Energy Order 11300.2H. Additionally, the Station should include coordination with the MCCA Exchange to eliminate the stocking and availability of incandescent bulbs.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Is the phase-out of incandescent bulbs 100% complete?

2. Does the current Annual Energy and Water Management Report (AEWMR) include the status of the phase-out?
3. Does the installation have a policy or directive on the phase-out of incandescent bulbs?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. What percent of the bulb inventory remained incandescent at the end of last FY?
2. If incandescent bulbs remain in the inventory, what percentage is planned for phase out this FY?
3. Based on projections, when will a 100% incandescent phase out be completed?

2.2.5 Objective 2.5: Commands Will Use Energy Management and Control Systems

Table 2.2-10. Objective 2.5 Summary

Objective 2.5 Summary	
Objective Metric	No additional metric has been defined.
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	The Station currently has over 90 buildings on the base with direct digital control systems (however, it is estimated that only 40 to 50 of those locations are equipped with active controls). The Station has filed for an Authority to Operate to allow the systems to be centrally monitored and evaluated from a central location using the Station’s fiber optic systems. It is anticipated that DICAP certification for the Alterton BacNet Control System is expected at the end of FY 2013.
Forecasted Status	The Air Station will meet the FY 2020 goal.
Data Source	Interview with Station Energy Office staff.

2.2.5.1 Objective 2.5 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2010 as the baseline year for this metric, as referenced in Section 2.2.5.2.

2.2.5.2 Objective 2.5 – FY 2010 Goal Performance Review

See Section 2.2.5.3 below for an overall description of this objective’s status.

2.2.5.3 Objective 2.5 – FY 2011 Through FY 2020 Goal Performance Review

The Station currently has over 90 buildings on the base with direct digital control systems (however, it is estimated that only 40 to 50 of those locations are equipped with active controls). The Station has filed for an Authority to Operate (ATO) to allow the systems to be centrally monitored and evaluated from a central location using the Station’s fiber optic system. This ATO approval is expected in late 2013. All new construction includes this capability.

2.2.5.4 Objective 2.5 – Action Plan

The Action Plan associated with this objective is to ensure the ATO is obtained and that all new buildings are incorporated into the EMCS as appropriate. It is anticipated that DICAP certification for the Alterton BacNet Control System is expected at the end of FY 2013.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the current AEWMR include the status of EMCS projects?
2. Are all new construction and major renovation projects evaluated for EMCS applications?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Is the installation equipped with an EMCS and is it 100% utilized?
2. If not, what percent of the installation facilities are not equipped with, or utilizing, the EMCS?
3. When does the installation plan on reaching 100% EMCS implementation for its facilities?

2.2.6 Objective 2.6: Use Distributed Energy Where it is Cost-effective

Table 2.2-11. Objective 2.6 Summary

Objective 2.6 Summary	
Objective Metric	No additional metric has been defined.
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	The Station’s primary distributive energy is provided from PV solar systems. There are currently nineteen solar systems installed on the Station.
Forecasted Status	The Air Station will meet the FY 2020 goal.
Data Source	Interview with Station Energy Office staff.

2.2.6.1 Objective 2.6 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2010 as the baseline year for this metric, as referenced in Section 2.2.6.2.

2.2.6.2 Objective 2.6 – FY 2010 Goal Performance Review

See Section 2.2.6.3 below for an overall description of this objective’s status.

2.2.6.3 Objective 2.6 – FY 2011 Through FY 2020 Goal Performance Review

The Station’s primary distributive energy is provided from PV solar systems. There are currently nineteen solar systems installed on the Station. Nine of these are solar shades whereby vehicles or equipment is located under the solar panels. The combined capacity is 1.24 MW. The Station is planning to install additional solar projects to meet a substantial part of the Station power needs.

2.2.6.4 Objective 2.6 – Action Plan

The Action Plan associated with this objective is closely tied with that presented in Section 2.2.2.4. It is anticipated that future renewable energy production at the Station will be focused on PV array implementation which will support the Station in meeting this objective’s requirements.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the current AEWMR include the status of distributed energy systems?
2. Can the installation report the number of systems currently in use/annual production in MBTU?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. How many distributed energy power generating technologies are operating aboard the installation?
2. What is their combined capacity?
3. What distributed energy technologies are planned for next year (KWH)?

2.2.7 Objective 2.7: Use Geographic Information Systems to Manage Facility Energy Levels and Assets

Table 2.2-12. Objective 2.7 Summary

Objective 2.7 Summary	
Objective Metric	No additional metric has been defined.
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	Geospatial databases are used to identify, evaluate, renewable energy potential and energy usage. GIS databases have been developed for Facility Energy Audits, Metering, Renewable Energy sites, and Real Property Accountability.
Forecasted Status	The Air Station will meet the FY 2020 goal.
Data Source	Interview with Station Energy Office staff.

2.2.7.1 Objective 2.7 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2010 as the baseline year for this metric, as referenced in Section 2.2.7.2.

2.2.7.2 Objective 2.7 – FY 2010 Goal Performance Review

MCAS Yuma's first metering project Phase 1 was completed in the summer of FY 2010. The meter data gathered from each facility is incorporated into the GIS database to identify quantities and the location of each meter. Data received is used to track energy usage and obtain energy use index data for each facility. This index can then be compared to national averages to determine how each types of facilities compare to the national average in terms of energy use.

2.2.7.3 Objective 2.7 – FY 2011 Through FY 2020 Goal Performance Review

Geospatial databases continue to be used to identify, evaluate, renewable energy potential and energy usage. GIS databases have been developed for Facility Energy Audits, Metering, Renewable Energy sites, and Real Property Accountability.

2.2.7.4 Objective 2.7 – Action Plan

The Action Plan associated with this objective is to continue to identify and evaluate the availability of renewable resources via the geospatial databases for the development of facility energy audits, metering, renewable energy locations, and real property accountability.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the current AEWMR include the status of GIS use in the management of energy levels and assets?
2. Can electric meter data be accessed via GIS?
3. Does the installation have a GIS layer that displays the location and capacity of all energy production assets?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Does the installation use GIS to enhance management of 100% of applicable facility energy levels and assets?
2. If not, what percent of the installation's applicable energy-related assets are not included as part of the GIS database?
3. When does the installation plan on including 100% of applicable energy assets in GIS?

2.2.8 Objective 2.8: Increase the Number of Energy Staff Training for Energy-efficient Operations

Table 2.2-13. Objective 2.8 Summary

Objective 2.8 Summary	
Objective Metric	No additional metric has been defined.
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	The Air Station has implemented a proactive training program for Building Energy Monitors and ensures energy office staff are afforded opportunities to obtain additional training related to their responsibilities.
Forecasted Status	The Air Station will meet the FY 2020 goal.
Data Source	Interview with Station Energy Office staff.

2.2.8.1 Objective 2.8 – Baseline Through FY 2009 Analysis

MCIWEST Order 5090.3 has established FY 2010 as the baseline year for this metric, as referenced in Section 2.2.8.2.

2.2.8.2 Objective 2.8 – FY 2010 Goal Performance Review

In FY 2010, MCAS Yuma Energy Office staff received 96 hours of documented training. Additional training provided to other Station personnel include:

- Gov Energy 2010 - Supervisory Roles – 4 staff; and
- ASHRAE 90.1, Design – 22 staff.

2.2.8.3 Objective 2.8 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, MCAS Yuma Energy Office staff received 48 hours of documented training. Additional training provided to other Station personnel include:

- Gov Energy 2011 – Management, Design, and Maintenance – 5 staff; and
- Renewables and DDC Controls – 20 staff.

In FY 2012, Building Energy Monitors assigned as Duty Sergeants for each BEQ/BOQ received on line training on roles and responsibilities of the Building Energy Manager. This training was well received by each of the Barracks Sergeants as useful information and this program would be best suited to be continued for all personnel. In FY 2013, MCAS Yuma intends to meet with each Command S-4 and train them on roles and responsibilities of this initiative so they extend the training on to their individual occupants of each of their facilities. In addition, energy office staff receives annual training through participation in the Gov Energy Conference.

2.2.8.4 Objective 2.8 – Action Plan

The MCAS Yuma Energy Office proactively plans and programs to ensure staff are properly trained. Energy Office staff should continue to program for relevant and necessary training to ensure ongoing energy efficient operations.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the current AEWMR include energy training statistics?
2. Has the number of civilian/military assigned to the installation that received energy training increased compared to the previous year?
3. Has the number of Public Works engineering staff that received energy training increased compared to the previous year?
4. Has the number of Facilities Management utilities technicians that received energy training increased compared to the previous year?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. On average, how many hours of required energy efficient operations training per individual did the staff receive during the last FY?
2. If required training hours per person were not provided, what increase is planned for this FY?
3. When do you expect to provide 100% of required energy efficient operations training to staff members?

2.3 MCIWEST GOAL 3 - IMPROVE WATER USE EFFICIENCY AND MANAGEMENT

2.3.1 Objective 3.1: 2% Annual Reduction in Potable Water Intensity by Fiscal Year 2020 or 26% Total Reduction

Table 2.3-1. Objective 3.1 Summary

Objective 3.1 Summary	
Objective Metric	The percent reduction relative to FY 2007 in total water consumption per gross square foot of total building space.
Objective Unit of Measure	Gallons per square feet (gal/SF) of enclosed building space.
Objective Baseline Year	FY 2007
Baseline Water Use Intensity	131.5 gal/SF.
FY 2011 Water Use Intensity	95.1 gal/SF.
FY 2020 Reduction Goal	97.3 gal/SF.
Forecasted Status	The Air Station will meet the FY 2020 reduction goal.
Data Sources	MCAS Yuma Water Distribution Study (2008). MCAS Yuma Energy and Water Management Annual Reports.

2.3.1.1 Objective 3.1 – Baseline Through FY 2009 Analysis

For the analysis of this objective, water use efficiency and management is quantified in gallons per square feet (gal/SF) in accordance with Federal Energy Management Program (FEMP) *Guidance for Establishing Baseline and Meeting Water Conservation Goals of EO 13423*. In 2009, the water conservation goals of EO 13423 were expanded on and further defined through EO 13514. However, MCAS Yuma has been planning for and implementing water conservation measures before 2007 (MCAS Yuma 2006), when EO 13423 was signed. In addition, MCAS Yuma has completed a Sustainable Water Resources Assessment (MCAS Yuma 2011e), which will guide future MCAS Yuma water conservation efforts. For the analysis of Objective 3.1, potable water usage intensity evaluated for the ISPP does not include usage at CADC or CBM as these sites obtain their potable water from unmetered wells and therefore usage data is not currently available.

Objective 3.1 includes annual water intensity reduction targets starting in FY 2007 and extending through FY 2020. In FY 2007, the Station reported a total potable water usage of 368,999,000 gal (MCAS Yuma 2010). This volume of potable water supplied 2,806,000 SF enclosed building space. This equates to a baseline water use intensity rate of 131.5 gal/SF (MCAS Yuma 2010) (Table 2.3-3, located in Section 2.3.1.3).

According to this objective's requirement, the goal is to reduce this baseline use of 131.5 gal/SF by 2% annually or by a total of 26% by FY 2020. Thus, a 26% reduction in water use by the end of FY 2020 equates to a goal of 97.3 gal/SF. Table 2.3-2 summarizes potable water intensity and Figure 2.3-1, located in Section 2.3.1.3, shows a graphical representation of the reduction goals.

The Station has made significant reductions to potable water usage intensity since FY 2007. Figure 2.3-1 shows the potable water consumption from FY 2007 to FY 2009.

Fluctuations in the potable water usage are primarily due to the amount of training completed by visiting units, and to a lesser extent, the temperatures in the spring and fall as well as overall rainfall (as it relates to irrigation needs). The warmer the spring and fall, the more water is required for comfort

cooling and landscape use. Therefore, water usage is expected to fluctuate based on activities and climate.

A majority of the potable water use intensity reduction projects completed at the Station were related to changing traditional landscaping approaches/practices to xeriscaping. A summary of potable water use intensity reduction projects completed at the Station from FY 2007 to early FY 2009 are shown in Table 2.3-2.

Table 2.3-2. MCAS Yuma Potable Water Intensity Reduction Projects, FY 2007 through FY 2009

Project Name	Potable Water Savings (gal)	Cost of Initiative	Cost savings (annually)
FY 2007 (MCAS Yuma 2008)			
Xeriscape Building 888, SF 3,822	201,000	\$45,633	\$333
Xeriscape Building 852, SF 9,308	489,000	\$76,849	\$811
Xeriscape Building 506, SF 2,834	149,000	\$24,970	\$247
Xeriscape Building 229, SF 921	48,000	\$2,354	\$80
Xeriscape Building 151, SF 12,812	673,000	\$46,103	\$1,117
Re-landscape Building 710, SF 1,258	66,000	\$21,647	\$110
Xeriscape Airplane Monument, SF 58,227	3,057,000	\$77,888	\$5,074
Replace DX water cooled conditioner to package heat pump, Building 144	21,000	\$24,888	\$3,000 (includes energy savings)
Xeriscape Building 505	570,000	NA	NA
FY 2008 (MCAS Yuma 2009a)			
Xeriscape Building 153	550,000	\$49,749	\$750
Xeriscape Building 505 Courtyard and North Side	570,000	\$57,579	\$750
Xeriscape Building 722	800,000	\$97,179	\$1,000
Xeriscape Building 912	500,000	\$42,655	\$750
Xeriscape Building 914	500,000	\$42,696	\$750
Xeriscape Building 916	500,000	\$42,552	\$750
FY 2009 (MCAS Yuma 2010)			
Xeriscape Building 153, DO#23	837,000	\$49,797	\$1,841
Xeriscape Building 505-509, DO#24	59,000	\$57,579	\$131
Xeriscape Building 918	226,000	\$38,677	\$660
Xeriscape Building 720	680,000	\$97,178	\$1,496
Xeriscape Building 951-952-953	167,600	NA	NA
Xeriscape Building 914	255,000	\$42,695	\$562
Xeriscape Building 916	254,000	\$42,552	\$560
Xeriscape Building 980	2,157,000	\$59,527	\$4,745
Xeriscape Building 151	798,400	NA	NA
Xeriscape Building 229	93,700	NA	NA
Xeriscape Building 506	79,200	NA	NA
Xeriscape Building 710	53,900	NA	NA
Xeriscape Building 852	416,100	NA	NA

Table 2.3-2. MCAS Yuma Potable Water Intensity Reduction Projects, FY 2007 through FY 2009

Project Name	Potable Water Savings (gal)	Cost of Initiative	Cost savings (annually)
Xeriscape Building 888	333,100	NA	NA
Total Potable Water Savings (gal) from Xeriscape Projects	15,083,000	--	--
Total Potable Water Savings (gal) from Other Projects	21,000	--	--

Note: gal = gallon; NA = not applicable.

As of FY 2009, MCAS Yuma has also developed the following plans and policies to assist in potable water use intensity reduction:

- *Water Conservation and Management Plan* (MCAS Yuma 2006). This plan assigns the Energy Manager the responsibility of monitoring potable water usage as well as lists the “10 Best Management Practices for Water Use Reductions” as summarized below:
 - Implement public information and education programs;
 - Audit the distribution system, detect and repair leaks;
 - Use water efficient landscaping;
 - Use water efficient toilets and urinals;
 - Use water efficient faucets and showerheads;
 - Inspect and maintain boiler and steam systems to prevent system losses;
 - Replace single-pass cooling systems that only use water once (as of 2006, all units that were single-pass had been replaced);
 - Implement proper cooling tower maintenance program to reduce water usage;
 - Improve miscellaneous high water using processes (e.g., reduce potable water use at vehicle washracks); and
 - Implement a water reuse and recycling program.
- *MCAS Yuma Air Station Drought and Water Shortage Preparedness Plan* (October 2007). This plan was developed to meet requirements of Arizona Drought Management Preparedness Plan and focuses on emergency water use (MCAS Yuma 2007b).
- Station Order P6280.3H, *Environmental Compliance and Protection Standard Operating Procedures*.

2.3.1.2 Objective 3.1 – FY 2010 Goal Performance Review

MCAS Yuma has continued to reduce potable water use intensity in FY 2010 to 85.0 gal/SF. Table 2.3-3 provides the Station's water use rate through FY 2010 and Figure 2.3-1 illustrates that the FY 2010 potable water usage improved upon the previous low water intensity rate of 93.54 gal/SF in FY 2008. The increase in FY 2009 and subsequent decrease in FY 2010 are the result of climate conditions and the number of training exercises. The more training exercises held at MCAS Yuma in the summer months greatly increases the demand for potable water. Therefore, the numbers will fluctuate up and down based on activity at the Station.

2.3.1.3 Objective 3.1 – FY 2011 Through FY 2020 Goal Performance Review

For FY 2011 MCAS Yuma reported a total potable water usage of 261,698,000 gal which supplied 2,751,000 SF of enclosed building space. This equates to a water use intensity of approximately 95.1 gal/SF (MCAS Yuma 2012a) and is a 28% reduction from the baseline year (FY 2007). As noted in Section 2.3.1.1, the FY 2020 goal is to reduce the baseline in FY 2007 (131.5 gal/SF) by 2% annually or by a total of 26% by FY 2020 (which equates to 97.3 gal/SF). Figure 2.3-1 illustrates that MCAS Yuma's rate of potable water use still remains below the FY 2020 reduction goal.

During FY 2011, an increase in potable water use occurred from 228,859,000 gal in FY 2010 to 261,698,000 gal in FY 2011 (Table 2.3-3). This increase was paired with an increase in enclosed building space; for FY 2010, MCAS Yuma reported 2,693,000 SF and in FY 2011 2,751,000 SF. Although water use intensity increased from FY 2010 to FY 2011, it is still below the FY 2020 goal (97.3 gal/SF). In addition, water use intensity in FY 2011 was well below the FY 2011 target of 3.1% reduction from baseline (Table 2.3-3).

The increase in potable water consumption and enclosed building space from FY 2010 to FY 2011 resulted from the following projects (MCAS Yuma 2012b):

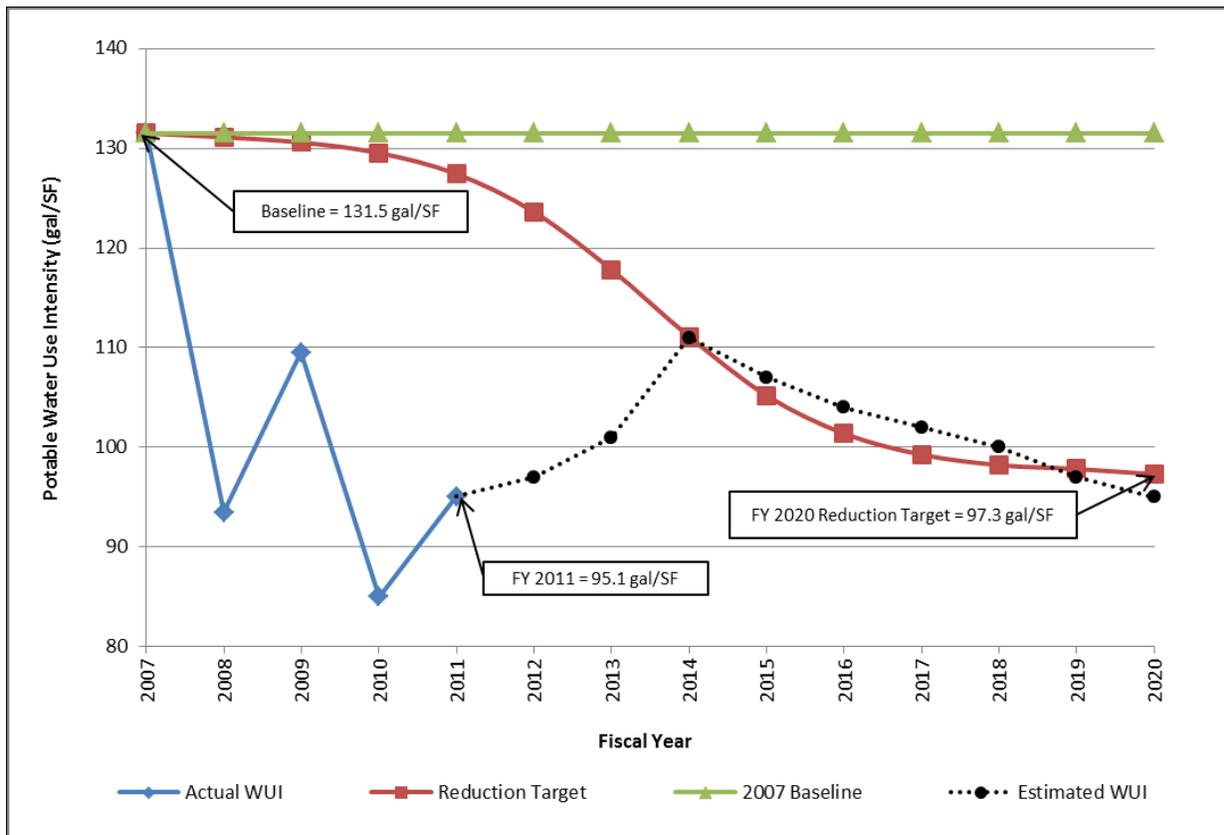
- Construction activities for the conversion of parking lots to grass mat for buildings 505, 153, and 1176 (Note: this project supports Objective 6.3 through promoting stormwater infiltration).
- Construction of the Marine Aviation Weapons and Tactical (MAWTS) building. An addition of 48,265 SF of enclosed building space.
- Slightly above mean low and high temperatures (85-110°F) increasing water use for comfort cooling and landscape irrigation (National Oceanic Atmospheric Administration 2012).

Table 2.3-3. MCAS Yuma Potable Water Intensity

Fiscal Year	Gal Used (thousands)	Station SF (thousands)	Use Intensity (gal/SF)	Actual Percent Reduction From FY 2007 Baseline	ISPP Percent Reduction Goal from FY 2007 Baseline
FY 2007	368,999	2,806	131.5	--	--
FY 2008	252,500	2,701	93.5	-28.9%	-0.3%
FY 2009	284,498	2,598	109.5	-16.7%	-0.7%
FY 2010	228,859	2,693	85.0	-35.4%	-1.5%
FY 2011	261,698	2,751	95.1	-27.7%	-3.1%

Sources: MCAS Yuma 2010, 2011a, 2012a.

Figure 2.3-1. MCAS Yuma Water Use Intensity



To ensure the Station remains on target to meet the FY 2020 goal, MCAS Yuma has continued to implement various water conservation projects and programs. Projects implemented as of the end of FY 2011 include (MCAS Yuma 2011e, 2012a, 2012b):

- Installation of a new irrigation system that will support the use of non-potable water (untreated and/or recycled water) for landscape irrigation (portions of Meyers Park and the Park Deck are being irrigated with untreated water from the Colorado River). Additionally, MCAS Yuma staff have indicated that an additional project has been programmed and approved by HQMC to expand the non-potable water irrigation system.
- Implementation of the public information and education programs through the support of the Public Affairs Office.
- Conducting water distribution system audits for leak detection and maintenance/repair needs.
- Ongoing installation of water efficient fixtures (low-flow showerheads, faucet aerators, low-volume toilets).
- Metering of aircraft wash racks to track potable water use and, thus, determine annual recycled water volume requirements.
- Reuse of water treatment plant “back flush” and on-site gray water to irrigate nearby athletic grass fields and to cool athletic artificial turf fields.

- Replacement of grassed landscapes with xeriscape or synthetic turf (where feasible and based on available funding). A list of xeriscape and landscape projects completed in FY 2011 and each project's estimated water savings are provided in Table 2.3-4.

Table 2.3-4. MCAS Yuma Xeriscaping Projects Completed in FY 2011

Project Name	Annual Savings (gal)	Capital Cost	Annual Cost Savings
Xeriscape Building 691	846,000	\$39,962	\$2,902
Xeriscape Building 918	226,000	\$19,627	\$776
Xeriscape Building 610	8,000	\$8,998	\$26
Xeriscape Building 852	13,000	\$11,864	\$45
Xeriscape Bldg. 951-952-953	168,000	\$71,520	\$575
Xeriscape Building 1020-1040	960,00	\$103,929	\$3,293
Xeriscape Building 685-694-695	436,000	\$20,952	\$1,497
Xeriscape Building 1058	431,000	\$53,625	\$2,902
Total FY 2011	3,088,000	\$330,477	\$12,016

Source: MCAS Yuma 2012a.

2.3.1.4 Objective 3.1 – Action Plan

As demonstrated throughout Section 2.3, MCAS Yuma has been proactively managing potable water use since the baseline year of FY 2007. To ensure MCAS Yuma meets the FY 2020 goal, the Station developed a *Water Conservation and Management Plan* (MCAS Yuma 2006) in FY 2006 and completed a *Sustainable Water Resources Assessment* (MCAS Yuma 2011e) in FY 2012. The *Water Conservation and Management Plan* documents recommended water conservation best management practices (BMPs). The overall objective for the *Sustainable Water Resources Assessment* “is to develop a plan that will integrate and balance all possible water resources to sustain MCAS Yuma demands for at least the next 20 years” (MCAS Yuma 2011e).

The *Sustainable Water Resources Assessment* documents water use at MCAS Yuma as on a steady decline since 2001; in contrast, the future MCAS Yuma population is expected to increase. Through aggressive implementation of water conservation programs and projects, MCAS Yuma plans to maintain water use intensity levels needed to meet the FY 2020 goal despite planned growth (MCAS Yuma 2011e, 2012b). Per the *Sustainable Water Resources Assessment*, MCAS Yuma’s population is expected to increase 20% between FY 2010 and FY 2030 (MCAS Yuma 2011e). With an increase in population, water use and enclosed building space will also increase. To ensure MCAS Yuma meets the FY 2020 potable water use intensity goal, reduction and conservation actions should be focused on high-use potable water uses, such as landscape irrigation, industrial uses, and aircraft wash racks.

With the projected FY 2030 population growth, the *Sustainable Water Resources Assessment* forecasts a 22% increase in water demand between FY 2010 and FY 2030 (MCAS Yuma 2011e). It is estimated that by FY 2030 the average annual water demand will increase to 333,997,715 gal with 28% required for landscape irrigation. This FY 2030 estimate is based on an estimated FY 2010 water demand of 273,715,201 gal. Given that the *Sustainable Water Resources Assessment* FY 2010 and FY 2030 estimates are used to predict the FY 2015 through FY 2020 water use (Table 2.3-5), it is important to

note that the FY 2010 estimate in the *Sustainable Water Resources Assessment* is greater than the actual FY 2010 water use reported by MCAS Yuma (MCAS Yuma 2011a). Thus, the FY 2015 through FY 2020 estimates presented in Table 2.3-5 are considered to be conservative.

To meet the FY 2020 water use intensity reduction goal, the rate of increase in potable water use will need to be relative to the rate of increase in enclosed building space. For purposes of developing this Action Plan, it was estimated that the FY 2020 enclosed building space (in gross SF) would increase to 3,200,000 SF by FY 2020. This is a conservative projection and is based on the enclosed building space 3,149,000 SF forecasted for FY 2014 in the *MCAS Yuma Energy and Water Management Annual Report* for FY 2011 (MCAS Yuma 2012a). With a projected FY 2030 potable water demand of 333,997,715 gal and 3,200,000 SF of enclosed building space, the FY 2030 water use intensity is projected to be 104 gal/SF. Assuming an average water use increase across years (FY 2010 through FY 2030), it is projected that the FY 2020 water use intensity will be 94 gal/SF (based on an estimated potable water demand of 333,997,715 gal relative to 3,200,000 SF of enclosed building space). It is important to note, however, that this projection assumes that future landscape irrigation needs at the Station can be met using non-potable or recycled water.

To ensure MCAS Yuma remains on target to meet the FY 2020 goal, MCAS Yuma is continuing to consider and evaluate numerous potable water conservation projects and programs as documented in the *Sustainable Water Resources Assessment* (MCAS Yuma 2011e). For example, one consideration is the use of recycled/reclaimed water to support irrigation needs at the Station either through construction of a reclamation facility designed only to serve the Station (Alternative 3A in the *Sustainable Water Resources Assessment*) or through a joint water reclamation treatment facility with the City of Yuma (Alternative 3B in the *Sustainable Water Resources Assessment*). In the 2008 Distribution System Study, it was estimated that 91,238,000 gal of potable water were used for landscape irrigation and the projected irrigation demand for FY 2030 is 93,194,000 (MCAS Yuma 2011e). This FY 2008 estimate is substantially lower than the FY 2010 estimate (142,396,413 gal, Section 2.3.2.2) using the FEMP guidelines (DoE 2010). Thus, to make a conservative potable water reduction estimate, the lower value was considered; however, actual use likely falls with the range of 93,000 thousand gallons (Kgal) to 143,000 Kgal. Assuming MCAS Yuma generates adequate volumes of wastewater for on-site treatment, potable water currently used for landscape irrigation could be replaced with MCAS Yuma recycled water.

Prior to FY 2012, MCAS Yuma did not have a separate system for the use of non-potable water for irrigation purposes. For this reason, all landscape irrigation through FY 2011 had been completed with water imported from the Colorado River (MCAS Yuma 2011e)² and treated at the MCAS Yuma potable water treatment facility. With the installation of a new irrigation system in FY 2012, a separate system is in place to allow for the use of non-potable water to support irrigation needs. This system will now allow for the distribution of non-potable water and, thus will reduce the reliance on potable water for landscape irrigation.

² MCAS Yuma has a water agreement, which was established in 1950's, with the BUREC and Navy for an annual allocation of 3,000 acre feet per year (AFY). This water source is currently secure; however, the allocation could be "subject to future overall basin-wide supply restrictions" (MCAS Yuma 2011e).

As of FY 2011, all wastewater (sanitary and industrial) generated at MCAS Yuma was treated off-site by the City of Yuma. If reclaimed water can be used to support meeting MCAS Yuma's non-potable water needs (which includes landscape irrigation and certain industrial use applications), this water conservation measure would have a substantial impact on MCAS Yuma's potable water usage and reduce utility costs (for FY 2011, potable water was provided from the Bureau of Reclamation [BUREC] and treated by MCAS Yuma at a cost of \$3.43/Kgal).

Historically, the total volume of wastewater (sanitary and industrial) sent to the City of Yuma had not been monitored and utility fees are determined using a capital and flow-based fee structure (sewage services are provided by the City of Yuma and estimated at \$2.15/gal) (MCAS Yuma 2012b). MCAS Yuma has installed metering stations at two of the three outfalls to the City to determine wastewater volumes delivered to the City for treatment and is currently metering this discharge. Collecting this data will assist in determining the annual and seasonal wastewater volume available for possible on-site treatment and reuse.

The *Sustainable Water Resources Assessment* (MCAS Yuma 2011e) estimates industrial water use at 170 acre feet per year (AFY), or a total of 55,394,743 gallons. Alone, this volume of industrial wastewater represents approximately 60% of the total FY 2008 estimate of water provided for landscape irrigation (MCAS Yuma 2011e). MCAS Yuma's industrial wastewater supply, combined with increases in the Air Station's population, could potentially provide a reliable source for recycled water use at the Station.

One action recommended for MCAS Yuma is to further explore the water source alternatives presented in the *Sustainable Water Resources Assessment* (MCAS Yuma 2011e). These alternatives combined could substantially reduce MCAS Yuma's potable water use and ensure meeting the FY 2020 goal as MCAS Yuma grows. These alternatives include:

- Use of recycled gray and wastewater for on-Station irrigation (see Alternative 3A and 3B Fact Sheets in the *Sustainable Water Resources Assessment*);
- Use of recycled gray and wastewater for industrial uses (see Alternative 3C Fact Sheet in the *Sustainable Water Resources Assessment*); and
- Installation of high efficiency clothes washers in all new single family residences and barracks (see Alternative 4 Fact Sheet in the *Sustainable Water Resources Assessment*).

In addition to the *Sustainable Water Resources Assessment* alternatives, it is recommended that MCAS Yuma continue to follow the Station's *Water Conservation and Management Plan* through the implementation of water conservation BMPs (MCAS Yuma 2012a). Projects being considered for implementation in the future include:

- Installation of water efficient (i.e., low-flow) fixtures as funding is available including, but not limited to, low-flow showerheads, faucet aerators, and low-volume toilets;
- Continue to audit the potable water distribution system for maintenance needs and low-water use improvements;
- Continue to implement public information and education programs focused on water conservation;

- Replacement (or supplemented) toilet and urinal potable water with recycled or gray water;
- Installation of drip irrigation for all landscaped areas and automation of irrigation systems to irrigate during low-water requirement periods;
- Replace grassed landscapes with xeriscape or synthetic turf as funding is available; and
- Increasing the reuse of “backwash” from the water treatment plant and on-site gray water to irrigate landscapes and cool athletic artificial turf fields. Backwash from the water treatment plant is currently being recycled back into the irrigation basin where it is used for lawn watering.

In addition to these items identified in the Station’s *Water Conservation and Management Plan*, it is also recommended that metering be installed at the CADC wells to begin tracking water use at this location. The estimated costs provide meters at this location is:

- CADC (two groundwater wells) – installation of meters and data maintenance = \$95,000.

As shown in Figure 2.3-2 and Table 2.3-5, MCAS Yuma is projected to meet the FY 2020 potable water use intensity goal if the Air Station continues with their currently funded water reduction measures and employs the reuse of gray water and recycled water (Table 2.3-6). As stated in the *Sustainable Water Resources Assessment* (MCAS Yuma 2011e), “MCAS Yuma Commander’s long-term goal is to reduce water consumption” and in addition, the Air Station is committed to continuing “good environmental stewardship.” With the MCAS Yuma’s continued dedication and efforts to water conservation and reduction projects, it is anticipated that the Objective 3.1 FY 2020 potable water goal will be met. Given that MCAS Yuma is currently below the FY 2020 goal, it is recommended that annual reviews of potable water use are continued. This will ensure that MCAS Yuma continues on target as population across the Station continues to grow from FY 2012 through FY 2020.

Table 2.3-5. MCAS Yuma Estimated Water Use Intensity, FY 2012 through FY 2020

Fiscal Year	Estimated Total Gross Square Footage (KSF)	Estimated Potable Water Use (Kgal)	Estimated Potable Water Use Intensity (gal/SF)	Estimated Percent Reduction From FY 2007 Baseline	ISPP Percent Reduction Goal from FY 2007 Baseline
FY 2012	287,867	2,967	97	-26%	-6.0%
FY 2013	316,654	3,117	101	-23%	-10.4%
FY 2014	348,320	3,149	111	-16%	-15.5%
FY 2015	340,909	3,200 ^{1,2}	107	-19%	-20.0%
FY 2016	333,499	3,200 ^{1,2}	104	-21%	-22.9%
FY 2017	326,888	3,200 ^{1,2}	102	-23%	-24.5%
FY 2018	318,678	3,200 ^{1,2}	100	-24%	-25.3%
FY 2019	311,267	3,200 ^{1,2}	97	-26%	-25.6%
FY 2020	303,857	3,200 ^{1,2}	95 ⁴	-28%	-26.0%
FY 2030	333,998	3,200 ^{1,2}	104 ⁴	---	--

Notes: Gross Square Footage = enclosed building space.

¹ For conservative water use intensity estimate, assumed no increase enclosed building space from FY 2015-2020.

² Additional information is being sought from the MCAS Yuma I&L Department.

Sources: MCAS Yuma 2011e, 2012a.

Table 2.3-6. MCAS Yuma Proposed Water Reduction Projects for FY 2012 through FY 2020

Project	Anticipated On Line Date	Capital Cost	Potential Potable Water Use Reduction	Description
Installation of new irrigation system and construct water reclamation treatment facility.*	FY 2019	\$7,100,000	94,496,914 gal/year	Allows for a separate recycled water distribution system to reclaim on-site wastewater for landscape irrigation.
Xeriscape Building 731.	FY 2012	\$23,196	652,000 gal/year	Reduces potable water use for landscape irrigation.
Xeriscape Building 693.	FY 2012	\$68,226	305,616 gal/year	Reduces potable water use for landscape irrigation.
Xeriscape Building 460.	FY 2012	\$7,428	68,936 gal/year	Reduces potable water use for landscape irrigation.
Xeriscaping as funding is available.	FY 2013 - 2020	\$10,000 per building	approx. 32 gal/SF of grass replaced.	Reduces potable water use for landscape irrigation.
Replacement of grassed landscapes with synthetic grass.	FY 2012 - 2020 Funding Dependent	\$10,000 per building	approx. 32 gal/SF of grass replaced.	Reduces potable water use for landscape irrigation.
Recycled water for industrial usage.	Funding Dependent	\$1,300,000	55,394,743 gal/year	Reduces potable water use for clothes washing.
Use of automated irrigation controls.	Funding Dependent	\$4,000 per 10,000 SF	up to 30,000 gal per 10,000 SF	Reduces potable and reclaimed water use for landscape irrigation.
Installation of low-flow fixtures (toilets, urinals, showerheads). Plumbing retrofits.	Funding Dependent	\$300-500 per toilet \$100 per faucet	2-3 gal/flush 1.5 gal/minute for faucets	Replace old fixtures with low-flow fixtures (as needed and funding allows). Reduces potable water use for utilities.
Installation of high efficiency clothes washers in single family residences.	Funding Dependent	\$520,000	5,539,474 gal/year	Reduces potable water use for clothes washing; 14-29 gallons per day (gpd) per machine per residence.
Installation of high efficiency clothes washers in barracks.				Reduces potable water use for clothes washing; 53-108 gpd per machine per barracks.
Gray water reuse in laundry facilities.	Funding Dependent	\$250,000	25 gal/load	Reduces potable water use for clothes washing.
Gray water reuse to flush low-flow toilets and urinals.	Funding Dependent	\$250,000	4.8 gpd per occupant	Use of gray water to flush low-flow toilets and urinals.
Use of water-efficient BMPs for Air Station activities.	Funding Dependent	\$4,000,000	1,000 gal/day	Reduces for water requirements for high water use activities. Includes, building cooling, boiler/steam systems, kitchen and medical facilities, etc.

Sources: MCAS Yuma 2011e, 2012a.

Note: *For reference/information purposes, a Joint Recycled Water Reclamation Project with the City of Yuma was estimated at \$24,130,000 (see MCAS Yuma Sustainable Water Resources Assessment, Alternative No. 3B Fact Sheet)..

2.3.2 Objective 3.2: Reduce Industrial, Landscaping, and Agricultural Water Intensity 2% Annually by FY 2020 or 20% Total Reduction

Table 2.3-7. Objective 3.2 Summary

Objective 3.2 Summary	
Objective Metric	The percent reduction relative to FY 2010 in total water consumed by the Station for irrigation (agricultural and/or landscaping) and industrial purposes.
Objective Unit of Measure	Gallons (gal).
Objective Baseline Year	FY 2010
Baseline Status	142,396,413 gal (estimated).
FY 2011	134,630,013 gal (estimated).
FY 2020 Reduction Goal	113,917,130 gal.
Forecasted Status	The Air Station will meet the FY 2020 reduction goal.
Data Source	MCAS Yuma Water Distribution Study (2008).

2.3.2.1 Objective 3.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.3.2.2.

2.3.2.2 Objective 3.2 – FY 2010 Goal Performance Review

This objective has an established baseline year of FY 2010; however, as previously stated, MCAS Yuma has been focusing on reducing potable water usage for landscaping use prior to FY 2005. Currently, MCAS Yuma exclusively uses potable water for irrigation of all landscaped areas. Therefore, the water usage for landscaping and irrigation is not separately metered from all other potable water use on the Station. A contracted grounds maintenance company provides landscaping services at MCAS Yuma and reports approximate water usage for specific xeriscaping projects. However, MCAS Yuma does not have a measured total usage of water (in gal) to establish a baseline usage rate for irrigation and landscaping purposes for FY 2010. Therefore, the total potable water usage for landscaping in FY 2010 has been estimated using FEMP guidelines for estimating unmetered landscape usage. Results of estimating total water usage for Objective 3.2 for FY 2010 are summarized in Table 2.3-8. Industrial water usage for mission support is not metered separately from other facility water usage. Therefore, all industrial water use is included in Section 3.1 as it relates to facilities and overall total water usage. There is an additional BUREC water allocation associated with 1,600 acres of agricultural outleases the Station manages. Water use associated with the agricultural leases is not included in the Objective 3.2 water use volumes (MCAS Yuma 2012b). Research is ongoing regarding the status of the water provided as part of these leases. For this objective, the percent reduction for industrial, landscape, and agricultural (ILA) is focused on landscape irrigation.

Table 2.3-8. Estimated MCAS Yuma Water Use for Landscaping

Total Square Footage of turfgrass at MCAS Yuma (FY 2010, approximate)	4,470,845 SF
Factor from FEMP Guidance (gal/SF/year)	31.85 (warm season)
Total estimated water use related to turfgrass maintenance	142,396,413 gal
Water reduction required to meet reduction goal	28,479,283 gal

Figure 2.3-2, located in Section 2.3.2.3, graphically illustrates the baseline volume of water used for irrigation and the objective reduction goals.

MCAS Yuma has been reducing and tracking potable water use from landscaping and agricultural uses since FY 2007; however, the MCIWEST Objective 3.2 baseline year is FY 2010. Given the amount of potable water reduction that has occurred for landscaping from FY 2007 to FY 2010 (15,083,000 gal as referenced in Table 2.3-2), MCAS Yuma has established a low baseline annual usage rate of 142,396,413 gal (beginning FY 2010).

Table 2.3-9 summarizes the MCAS Yuma xeriscaping projects completed in FY 2010. A total of 4,678,400 gal were estimated to be saved over the year.

Table 2.3-9. MCAS Yuma Xeriscaping Projects Completed in FY 2010

Project Name	Annual Savings (gal)	Water Usage before xeriscaping (gal/yr)	Current Water Usage (gal/yr)
Xeriscape Building 505	59,700	94,300	34,600
Xeriscape Buildings 660-662	300,400	305,600	5,200
Xeriscape Buildings 720 - 722	680,100	880,900	200,900
Xeriscape Building 952	133,600	142,600	8,900
Xeriscape Building 914	255,800	257,600	1,800
Xeriscape Building 916	254,700	257,500	2,800
Xeriscape Building 920	837,200	839,400	2,200
Xeriscape Building 980	2,156,900	2,182,000	25,100
Total Savings for FY 2010	4,678,400	--	--

Source: MCAS Yuma 2011c.

MCAS Yuma has made significant strides toward reaching the ILA reduction goal. However, considering the fact that MCAS Yuma has already reduced potable water usage for irrigation by a significant amount prior to FY 2010, reaching the overall 20% reduction goal by FY 2020 will be challenging. Figure 2.3-2 illustrates the Station's status with regard to Objective 3.2.

2.3.2.3 Objective 3.2 – FY 2011 Through FY 2020 Goal Performance Review

As noted in Section 2.3.2.2, the baseline (FY 2010) ILA water use was estimated at 142,396,413 gal and was determined following the FEMP guidance (DoE 2010) for estimating irrigation water usage on unmetered landscapes. Similar to previous years, during FY 2011 MCAS Yuma did not use any non-potable water for ILA purposes. Thus, in FY 2011 the ILA water usage includes potable water only.

Given that MCAS Yuma does not separately meter irrigation water usage, the FY 2011 ILA water use was based on (1) the FY 2010 water use estimate, and (2) the conversion of grassed area to xeriscape or artificial turf during FY 2011. Thus, MCAS Yuma's FY 2011 ILA water use is based on the annual water savings reported and includes eight xeriscaping projects completed in FY 2011 (MCAS Yuma 2012a). Combined, these xeriscaping projects are reported to reduce annual water use by 3,088,000 gal. A list of the FY 2011 xeriscaping projects and their estimated ILA water use reduction are listed in Table 2.3-10.

Table 2.3-10. MCAS Yuma Xeriscaping Projects Completed in FY 2011

Project Name	Annual Savings (gal)	Capital Cost	Annual Cost Savings
Xeriscape Building 691	846,000	\$39,962	\$2,902
Xeriscape Building 918	226,000	\$19,627	\$776
Xeriscape Building 610	8,000	\$8,998	\$26
Xeriscape Building 852	13,000	\$11,864	\$45
Xeriscape Buildings. 951-952-953	168,000	\$71,520	\$575
Xeriscape Building 1020-1040	960,00	\$103,929	\$3,293
Xeriscape Buildings 685-694-695	436,000	\$20,952	\$1,497
Xeriscape Building 1058	431,000	\$53,625	\$2,902
Total Water Savings for FY 2011	3,088,000	---	---

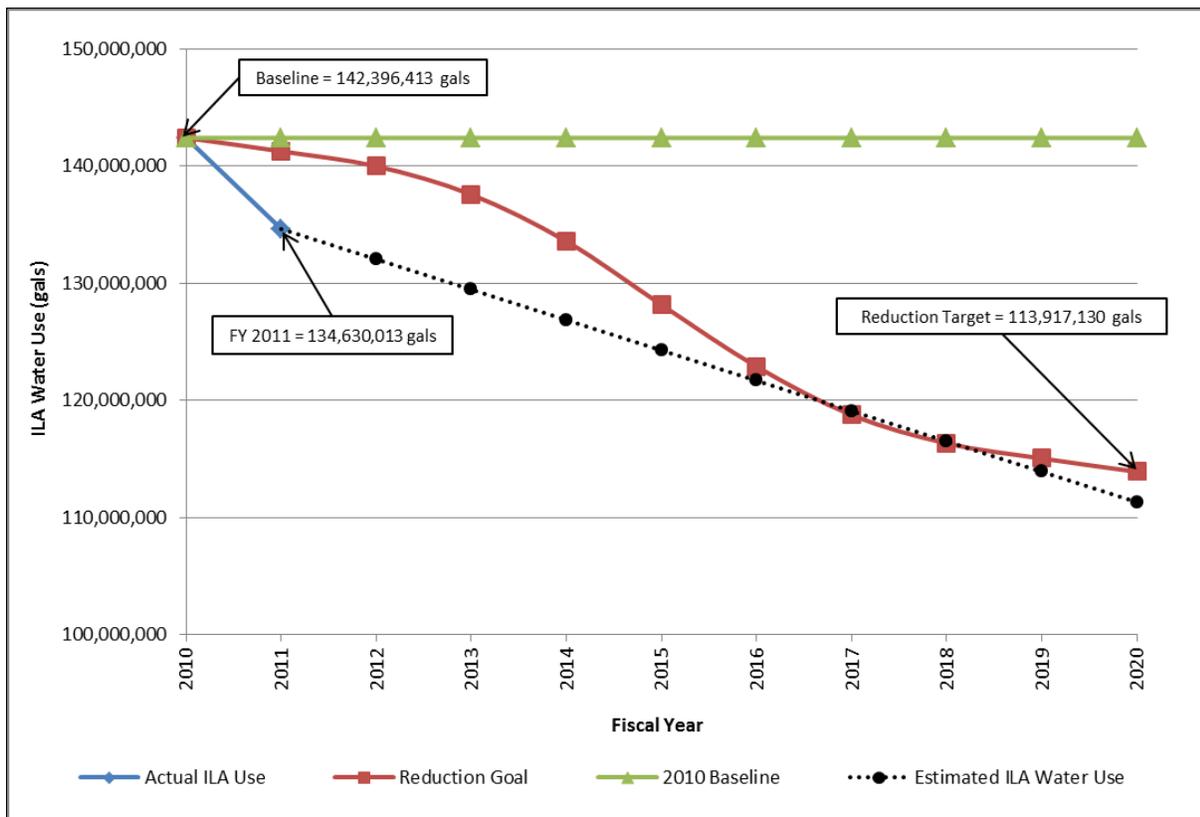
Source: MCAS Yuma 2012a.

In FY 2011, an estimated 134,630,013 gal were used for landscape irrigation (Table 2.3-11). In comparison to the baseline year, this represents a 5.5% decrease from the FY 2010 water usage of 142,396,413 gal (Table 2.3-11 and Figure 2.3-2). The ILA water reduction goal for FY 2011 is 0.8%. Thus, MCAS Yuma is currently on target to meet the FY 2020 reduction goal.

Table 2.3-11. MCAS Yuma Estimated Industrial, Landscape, and Agricultural Water Use

Fiscal Year	Estimated Total ILA Water Use (gal)	Percent Reduction from FY 2010 Baseline	ISPP Percent Reduction Goal from FY 2010 Baseline
2010	142,396,413	--	--
2011	134,630,013	5.5%	0.8%

Figure 2.3-2. MCAS Yuma Estimated Industrial, Landscape, and Agricultural Water Use



During FY 2011, MCAS Yuma continued to pursue water conservation measures through the conversion of grass landscapes to xeriscape and irrigation system maintenance and upgrades. Additional activities in FY 2011 included:

- Replacement of the grass athletic fields with synthetic turf (estimate by end of FY 2012 will have converted 108,000 SF of grass to synthetic turf).
- Installation of a new irrigation system to allow non-potable water use for irrigation activities. Construction was active in FY 2011 with completion in FY 2012 (MCAS Yuma 2011e). As previously noted, this separate system will allow for landscaped areas to be irrigated with reclaimed/recycled water and reduce potable water demand.

Based on the estimated ILA water use in FY 2011, MCAS Yuma needs to reduce annual irrigation water use by approximately 21,000,000 gal by FY 2020. This is a 15% reduction in irrigation water use from FY 2011 to FY 2020 and will ensure MCAS Yuma meets the Objective 3.2 FY 2020 goal of 113,917,130 gal per year.

2.3.2.4 Objective 3.2 - Action Plan

As noted in the Objective 3.1 Action Plan (see Section 2.3.1.4), MCAS Yuma's water use for landscape irrigation is expected to continually decrease beyond FY 2011. Through the conversion of grassed landscapes to xeriscape and artificial turf combined with increased efficiencies in the overall irrigation system, and the use of recycled/reclaimed water, MCAS Yuma can meet the FY 2020 reduction goal. Additional water conservation measures can help to meet the FY 2020 ILA water reduction goal; however, the measures identified above will have the greatest impact on the reduction of water used for landscape irrigation.

Through FY 2011, all landscape irrigation had been completed using potable water, which is supplied by the BUREC from the Colorado River. The river water is treated on-site at the MCAS Yuma water treatment facility. Thus, all ILA water is included under the potable water use intensity values reported under Objective 3.1. For this reason, a reduction in ILA water use also supports meeting the Objective 3.1 FY 2020 goal.

The distribution of potable water to specific uses (such as landscape irrigation) historically has not been metered (MCAS Yuma 2012b, 2011e). However, a new irrigation system recently installed (completed in FY 2012) will allow for the distribution and metering of irrigation water. At a minimum, reclaimed wastewater volumes should be known to determine if adequate volumes of recycled water are available to meet annual irrigation demands.

MCAS Yuma has 951,105 SF (MCAS Yuma 2012b) of grassed areas that can still be converted to xeriscape or artificial turf. Using the FEMP Guidelines for Estimating Unmetered Landscaping Water Use (DoE 2010), it is estimated that MCAS Yuma's grassed area requires approximately 46,600,000 gal of irrigation water per year. If only 50% (475,553 SF) the currently grassed areas are converted to xeriscape (i.e., low density plantings with protected microclimates), irrigation requirements would be reduced by 23,300,000 gal per year. This annual reduction alone meets the ILA FY 2020 water reduction goal.

In addition, if MCAS Yuma invests in the use of recycled/reclaimed water for irrigation, ILA water use will substantially decrease beyond the FY 2020 goal. With a separated irrigation system in place, the next step involves evaluating the alternatives presented in the *Sustainable Water Resources Assessment* (MCAS Yuma 2011e). Further assessment can determine the feasibility of (1) constructing an on-site wastewater reclamation facility, or (2) entering a joint agreement with the City of Yuma for wastewater treatment and reclamation. These alternatives will require obtaining a Reclaimed Water Individual Permit or Reclaimed Water General Permit from the Arizona Department of Environmental Quality (ADEQ). In addition, a wastewater treatment facility providing reclaimed water for reuse must have an individual Aquifer Protection Permit (MCAS Yuma 2011e).

Based on the current options available, it is projected that MCAS Yuma will meet the FY 2020 ILA water reduction goal. This projection assumes that reclaimed/recycled water is used for landscape irrigation and the conversion of grassed landscapes to xeriscape or artificial grass or xeriscape is feasible. Table 2.3-12 lists additional proposed projects and estimates for annual water savings that may be achieved. As noted previously, the FY 2020 ILA goal could be reached solely through the irrigation of all MCAS Yuma landscapes with on-site reclaimed wastewater (Table 2.3-13). However, if this is not feasible, Table 2.3-12 and Figure 2.3-3 illustrates that MCAS Yuma can meet the FY 2020 ILA goal through a combined strategy of water reduction projects.

Table 2.3-12. MCAS Yuma Proposed Water Reduction Projects for FY 2012 through FY 2020

Project	Anticipated On Line Date	Capital Cost	Potential ILA Water Use Reduction (gal/year)	Description
Wastewater reclamation treatment facility	Included as part of Action Plan for Objective 3.1.			
Replacement of 450,000 SF of grassed landscape with xeriscape (low density plantings with protected microclimate)	FY 2018	\$720,000	25,700,000	Reduces potable water use for landscape irrigation.
Irrigation system upgrades (from medium to high efficiency) for 100,000 SF	FY 2013	\$750,000	119,095-1,152,941	Reduces potable water use for landscape irrigation.
Irrigation system upgrades (from low to high efficiency) for 100,000 SF	FY 2013	\$750,000	270,941-2,622,941	Reduces potable water use for landscape irrigation.
TOTAL	--	\$2,220,000	29,275,882 (maximum)	--

Notes: Assumes current area landscaped with warm grasses (i.e. drought tolerant grass, "better suited for hot summers") and an irrigation system with "medium" efficiency (i.e. regular maintenance and proper scheduling). Water reduction estimate assumes (1) xeriscape with low water requirements (low density and protected microclimate) and, (2) no change in the current irrigation system efficiency. Range is provided based on the landscaped area. That is, warm season grasses verses xeriscape (low density plantings with protected microclimate).

Sources: MCAS Yuma 2011e, DoE 2010.

Table 2.3-13. MCAS Yuma Estimated ILA Water Use, FY 2012 through FY 2020

Fiscal Year	Estimated Potable ILA Water Use ¹ (gal)	Estimated Percent Reduction From FY 2007 Baseline	ISPP Percent Reduction Goal from FY 2007 Baseline
FY 2012	132,040,894	-7.3%	-1.7%
FY 2013	129,451,775	-9.1%	-3.4%
FY 2014	126,862,656	-10.9%	-6.2%
FY 2015	124,273,536	-12.7%	-10.0%
FY 2016	121,684,417	-14.5%	-13.7%
FY 2017	119,095,298	-16.4%	-16.6%
FY 2018	116,506,179	-18.2%	-18.3%
FY 2019	113,917,060	-20.0%	-19.2%
FY 2020	111,327,941	-21.8%	-20.0%

Note: ¹ Water savings per year interpolated between FY 2011 and FY 2020 and is based on the total water savings from converting approximately 475,000 SF of currently grassed areas to xeriscape (i.e., low density plantings with protected microclimates) between FY 2012 and FY 2020.

2.4 MCIWEST GOAL 4 – PROMOTE POLLUTION PREVENTION AND WASTE REDUCTION

2.4.1 Objective 4.1: Report According to the Emergency Planning and Community Right-to-Know Act

Table 2.4-1. Objective 4.1 Summary

Objective 4.1 Summary	
Objective Metric	Submit the Station Emergency Planning and Community Right-to-Know Act (EPCRA) report annually.
Objective Unit of Measure	Annual report submittal.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma has been submitting annual EPCRA reports since 2007, as required.
Forecasted Status	The Air Station will continue to meet this annual requirement.
Data Source	MCAS Yuma annual EPCRA reports.

2.4.1.1 Objective 4.1 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.1.2.

2.4.1.2 Objective 4.1 – FY 2010 Goal Performance Review

MCIWEST 5090.3 has established FY 2010 as the baseline year; however, MCAS Yuma has established an “internal” baseline year of 2007 regarding Emergency Planning and Community Right-to-Know Act (EPCRA) reporting and maintains all required records/reports dating back to that year. MCAS Yuma complies with annual EPCRA reporting requirements by submitting individual Tier II Hazardous Material Inventory reports at the beginning of each year to local and state emergency response offices for MCAS Yuma, the BMGR, and the Chocolate Mountain Aerial Gunnery Range (CMAGR), including CBM. The MCAS Yuma Environmental Department also submits EPCRA Toxic Release Inventory (TRI) data on the required “Form R” annually to the USEPA for those three locations, after performing extensive analyses of hazardous materials (HM) and hazardous waste use and disposal. The Tier II inventories have been relatively consistent, reflecting the large quantities of fuels and similar HMs used at the Station. The chemicals reported on Form R reports each year are also consistent for fuel and vehicle related chemical compounds such as lead, naphthalene, and xylenes. Other chemicals are closer to the reporting thresholds and reported only on an occasional basis or only at the CMAGR (e.g., glycol ethers, copper, and aluminum dust).

The required annual Tier II Hazardous Material Inventory reports were submitted in February 2010 to local and state emergency response offices. EPCRA reporting includes all Station geographic locations: MCAS Yuma, AZ; the BMGR Complex, AZ; the CMAGR, CA; and the CADC, AZ.

The December 2010 Benchmark Headquarters Marine Corps (HQMC) Environmental Compliance Evaluation (ECE) identified a positive finding for the Station’s exemplary job of complying with the reporting requirements of EPCRA Sections 312 and 313 (i.e., 40 Code of Federal Regulation [CFR] 370 Hazardous Materials Inventory and 40 CFR 372 Toxic Chemical Release Reporting), including FY 2010. In addition to comprehensive and timely report submittals, records are maintained that clearly describe the wide variety of sources of information and methodologies used in developing the reports, including assumptions where applicable. The EPCRA reporting process has become more accurate and easier over

the years because of extensive efforts to expand and improve the quality of data tracked by the Station's hazardous material minimization ("Hazmin") program, including the use of the software tool Hazardous Material Management System (HMMS).

2.4.1.3 Objective 4.1 – FY 2011 Through FY 2020 Goal Performance Review

The required annual Tier II Hazardous Material Inventory reports were submitted in February 2011 to local and state emergency response offices. EPCRA reporting includes all Station geographic locations including: MCAS Yuma, AZ; the BMGR Complex, AZ (includes the CADC); and the CMAGR, CA (includes CBM).

2.4.1.4 Objective 4.1 – Action Plan

The Station should ensure that procedures are established and documented (to include roles and responsibilities, timelines to gather data, etc.) to confirm that EPCRA Tier II reports are submitted to the appropriate state and local agencies annually by 1 March as required.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and will be used to support the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation submitted a complete and accurate EPCRA report (TRI) via TRI-MEweb?
2. Was EPCRA submitted by 1 July for the prior reporting year?

2.4.2 Objective 4.2: Minimize the Generation of Waste and Pollutants Through Source Reduction

Table 2.4-2. Objective 4.2 Summary

Objective 4.2 Summary	
Objective Metric	Minimize the generation of waste and pollutants through source reduction by implementing the SB 14 plan and the Pollution Prevention (P2) Plan.
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma originally prepared a P2 Plan in 2000. In 2012, MCAS Yuma began revising <i>Station Order 6280.1D, P2 and Hazardous Waste Minimization</i> , and the <i>Station P2 and Hazardous Waste Minimization Plan</i> ; both documents are still in draft form. The MCIWEST requirement to have and implement a CA SB 14 plan is not applicable to MCAS Yuma.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	MCAS Yuma P2 and Hazardous Waste Minimization Plan.

2.4.2.1 Objective 4.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.2.2.

2.4.2.2 Objective 4.2 – FY 2010 Goal Performance Review

MCAS Yuma established a *Pollution Prevention (P2) and Hazardous Waste Minimization Plan* in FY 2000 which established several process baselines and P2 goals for completion in December 2006 (MCAS Yuma 2000). The last formal revision of the plan was completed in May 2006, but the implementing Station Order 6280.1C was never signed. The plan is not currently used as a P2 management tool. The MCIWEST requirement to have and implement a CA SB 14 plan is not applicable to MCAS Yuma.

As part of meeting the ADEQ requirement to establish a P2 Analysis and Plan and conduct annual reporting to receive a 50% reduction in state program fees, MCAS Yuma established a 2007 hazardous HM usage baseline of 60,926 pounds (lbs), with P2 performance goals of reducing HM usage, reducing hazardous waste generated and increasing P2 opportunities by October 2009. The selected reduction method was full implementation of a HMs consolidation system using the HMMS. Specific metrics for the goals were not set, but by 2008 HM quantities had been reduced by 11,185 lbs. Under the same ADEQ program, MCAS Yuma established a 2008 P2 goal to reduce hazardous waste disposal and emissions of volatile organic compounds (VOC) containing solvents by December 2009. Neither a baseline nor specific metrics for these goals were established. The selected reduction method was the replacement of VOC containing solvents with enzyme-based bioremediation parts washers. The implementation of this project has been delayed due to funding constraints.

Nearly all HMs are purchased and managed through the Hazardous Materials Consolidation Point (HCP) which is managed by the MCAS Yuma Environmental Department. Tracking and processing of HMs is conducted through the use of the HMMS. Detailed material safety data sheets (MSDS) information on each item and robust shelf-life management is provided through HMMS. Units and organizations generate an authorized use list (AUL). Any additions to a unit's AUL must be approved before a purchase can be made. Items are received at the HCP and provided with a bar code from HMMS before distribution. Once the unit has used the HM, the unit environmental coordinator notes in HMMS that

the container is empty and the bar code is deactivated. Excess HM are identified for transfer and reuse at another units avoiding costs of disposal as hazardous waste and costs of purchasing new HM. Site-level usage of HM is generally effective, with minimal hazardous waste generation, and in compliance with all station and legal requirements. The Station has identified Marine Corps Community Services (MCCS), long-term contractors, and short-term contractors as the remaining organizations still needing to be tracked with HMMS. Table 2.4-3 demonstrates the success of the HCP in the number of line items of HMs that have been transferred for reuse.

In FY 2010, no additional progress was made regarding the specific implementation of the Station's P2 Plan. However, the Station continued with proactive HMs management practices and in general, HMs are well managed throughout the Station. Nearly all HMs continued to be purchased and managed through the HCP. Table 2.4-3 summarizes the reuse activities of the HCP through 2010.

2.4.2.3 Objective 4.2 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, progress was made expanding the use of the HCP and HMMS tracking to long-term contractors such as Sikorsky Aerospace Services, Northrup Grumman, Maytag Refueling, and TCH Grounds Maintenance. The Station now requires short-term contractors to appoint Environmental Compliance Coordinators and use the HCP and HMMS tracking if certain trigger events occur. Trigger events can include establishing a Hazardous Waste Satellite Accumulation Area, preparation of waste profiles, written solid waste determinations, or the use of large quantities of HMs. Three environmental awareness training courses (i.e., Resident Officer in Charge of Construction [ROICC] Technicians, ROICC Contractors, and General Contractors) providing general and specific local environmental requirements (such as including HM into the HCP) have been added to the MCAS Yuma website. Table 2.4-3 summarizes the reuse activities of the HCP through 2011.

Table 2.4-3. MCAS Yuma Number of Line Items of Hazardous Materials Transferred for Reuse

Fiscal Year	Line items of HM Transferred for Reuse	Pounds of HM Reused	Purchase Cost Avoided
2004	2,289	--	--
2005	34,068	--	--
2006	40,685	--	--
2007	45,238	--	--
2008	41,122	--	--
2009	43,193	8,484	\$14,901
2010	43,815	23,924	\$55,808
2011	69,503	132,348	\$79,618

In June 2011, the Station submitted a CY 2010 P2 Plan Annual Progress Report to the ADEQ. It established Goal #70 to reduce through reuse, establishing Station-wide antifreeze recycling program. This goal will eliminate the need to manage antifreeze as a waste, reduce purchasing and waste disposal cost.

In 2012, MCAS Yuma began revising *Station Order 6280.1D, P2 and Hazardous Waste Minimization*, and the *Station P2 and Hazardous Waste Minimization Plan*; both documents are still in draft form. Both of these documents address how P2, EMS, and sustainability are integrated at MCAS Yuma. Additionally, the Station submitted an amended P2 Analysis and Plan for MCAS Yuma to the ADEQ. This plan addresses the Arizona portions of MCAS Yuma and establishes the following P2 Performance Goals and Reduction Opportunities as summarized in Table 2.4-4.

Table 2.4-4. P2 Performance Goals and Reduction Opportunities

Goal Statement	Reduction Opportunity
Goal #58 - Reduce electrical power consumption for buildings 530, 888, 930, 980, and 1200. This goal contributes to the reduction of GHGs.	Install solar power system using thin film PV technology on several buildings reducing GHGs. When power is not required excess power will be transferred back into the electrical grid.
Goal #66 - Reduce power consumption and increase cooling efficiencies for buildings 634, 635, 722 and 1200. This goal contributes to the reduction of GHGs.	Replace the existing low efficiency chillers with high efficiency chiller units reducing power consumption.
Goal #67 - Reduce electrical power consumption for building 1508. This goal contributes to the reduction of GHGs.	Install PV technology over new roof system on building 1508. When power is not required excess power will be transferred back into the electrical grid.
Goal #68 - Increase electrical power consumption efficiencies for new facilities. This goal contributes to the reduction of GHGs.	Install PV technology on the new Communications Center, Flight Simulator, and two new hangars. When power is not required excess power will be transferred back into the electrical grid.
Goal #69 - Reduce water consumption on landscaped areas, for buildings 598, 634, 635, 693, 731, 1056, and 1060.	Replace existing traditional irrigation system with efficient drip irrigation watering system. Remove existing high water use landscaping and replace with low water usage xeriscaping.
Goal #70 - Reduce through reuse, establishing Base-wide antifreeze recycling program. This goal will eliminate the need to manage antifreeze as a waste, reduce purchasing and waste disposal costs.	Modification to FY 2011 goal "Implement closed loop recycling process which will remanufacture used antifreeze for reuse", to use an off-site antifreeze recycler promoting reuse for external customers still accomplishing hazardous waste minimization thereby, reducing annual waste disposal cost.
Goal #71 - Divert at least 60% (by weight) of construction and demolition materials generated aboard MCAS Yuma from landfills to meet the MCIWEST 2015 sustainability goal.	Recycle/reuse construction and demolition materials generated aboard MCAS Yuma that would otherwise become solid waste.
Goal #72 - Reduce on-site releases and off-site transfers of toxic chemicals by 15% to meet the MCIWEST FY 2020 sustainability goal 4.9.1.	As a first step, conduct an analysis of each of the process associated these toxic substances to determine possible P2 opportunities. Ensure documentation of the analysis any resulting P2 opportunities is retained indefinitely.
Goal #73 – MCIWEST established sustainability goal 4.9.2 to implement and track results of Hazardous Material Consolidation Programs (HCP). MCAS Yuma has had a HCP in place for several years, but established an additional goal of having Station-wide participation in the HCP, to include all units, organizations, tenants, and long-term contractors.	Identify any units, organizations, tenants, and long-term contractors not participating in the HCP and incorporate them into the program. This is a long-term continuous goal.

Table 2.4-4. P2 Performance Goals and Reduction Opportunities

Goal Statement	Reduction Opportunity
Goal #74 - Continue to train employees in P2 awareness as required by Arizona Revised Statutes 49-963.J.9.	By July 1 of each year (in the annual progress report), document training for current and new employees, by providing a statement of when the training occurred and how many were trained. P2 training includes employee awareness and training programs to involve employees in P2 planning and implementation to the maximum extent feasible.
Goal #75 - Maintain the Station EMS. Continue to implement the EMS which provides a framework to systematically identify, prioritize, manage, mitigate, and document the environmental aspects and impacts of the Station and promotes P2 reviews.	Continue to implement the Station EMS. Submit P2 goals developed from the EMS into the P2 plan annually by July 1. Maintain the EMS by following the internal and external audit schedules.

2.4.2.4 Objective 4.2 – Action Plan

As part of the ongoing continual improvement process associated with this objective, it is recommended that the Air Station:

- Ensure approval and implementation of Station Order 6280.1D, *P2 and Hazardous Waste Minimization*, and the *Station P2 and Hazardous Waste Minimization Plan*.
- Establish procedures (including roles and responsibilities) to ensure annual submittal of the MCAS Yuma P2 Analysis and Plan to the ADEQ is performed in accordance with requirements.
- Continue to identify and document P2 opportunities for FY 2013 and beyond and take necessary actions to begin planning for their implementation.
- Continue to expand the HCP to incorporate additional tenants/organizations.
- Continue to promote the success of the Station’s HCP through outreach materials offered at local events both on and off the Station.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have an SB 14 Plan?
2. Has the installation implemented the SB 14 Plan?
3. Does the installation have a P2 Plan?
4. Has the installation implemented the P2 Plan?
5. Have recommendations of the P2 Plan been followed for the current year?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. What percent of waste and pollutants was eliminated through the implementation of source reduction and pollution prevention initiatives during the previous FY?
2. Was the reported amount less than the previous reporting year?
3. If not, why not?

2.4.3 Objective 4.3: Implement Integrated Pest Management and Other Landscape Management Practices Which are Prepared, Reviewed, and Updated Annually by Pest Management Professionals

Table 2.4-5. Objective 4.3 Summary

Objective 4.3 Summary	
Objective Metric	Implementation of an Integrated Pest Management Program (including an Integrated Pest Management Plan [IPMP]).
Objective Unit of Measure	Not applicable.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma has developed an Integrated Pest Management Program; however, the December 2010 Environmental Compliance Evaluation identified deficiencies with the associated IPMP. In FY 2011, it was determined that all previously identified deficiencies had been corrected. All applicators performing work at MCAS Yuma continue to meet certification requirements.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	MCAS Yuma IPMP; MCAS Yuma Benchmark ECE Report.

2.4.3.1 Objective 4.3 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.3.2.

2.4.3.2 Objective 4.3 – FY 2010 Goal Performance Review

The Station's Integrated Pest Management Program is managed by the Pest Management Coordinator who is part of the Directorate, I&L and the Pest Control Shop (I&L, Base Services Department). Two trained and certified applicators perform the majority of pesticide applications. Additional pesticide applications are made by agricultural out-leases and contractors working for the MCCA exchange, MCCA food concessionaires, Commissary, Naval Federal Credit Union, and Public-Private Venture housing (MCAS Yuma 2009b). The MCAS Yuma Environmental Department provides compliance oversight and technical assistance for the program.

The December 2010 Benchmark ECE identified that MCAS Yuma has an Integrated Pest Management Plan (IPMP) (dated February 2009) that receives an annual review by the Station Pest Management Coordinator. However, the following IPMP inadequacies were identified:

- The Commanding Officer and the Senior Medical Officer have not signed the IPMP.
- Figures (1 through 10) listed in the Table of Contents do not appear in the plan.
- IPMP Table 3-1: Overview of Organizations involved in Pest Management does not depict MCAS Yuma's organization.
- IPMP Table 7-1: Endangered or threatened animal and plant species that may occur at MCAS Yuma is missing.
- Appendix J - Industrial Hygiene Survey is missing.
- Appendix L - Resources are missing.
- The IPMP has not been completely implemented in two instances:

- The Navy Federal Credit Union contracts for regularly scheduled pesticide treatments (prohibited by IPMP); and
- Agricultural out-lease pesticide applications are not being reported in accordance with the IPMP.

2.4.3.3 Objective 4.3 – FY 2011 Through FY 2020 Goal Performance Review

All of the Station IPMP inadequacies described in Section 2.4.3.2 have been corrected. Overall, the Station's Integrated Pest Management Program continues to be managed as described in Section 2.4.3.2 above. All applicators performing work at MCAS Yuma continue to meet certification requirements. All objective metrics are being met.

In FY 2013, the MCAS Yuma I&L Department was reorganized. Currently, pest management activities aboard the Station are handled by the Work Control Division and agriculture out lease pesticide reporting is handled by the NAVFAC SW Agricultural Out Lease Manager.

2.4.3.4 Objective 4.3 – Action Plan

The Station should establish procedures to ensure the Station Pest Management Plan is reviewed and updated annually by appropriate Pest Management Professionals. Ensure the review is properly documented in accordance with IPMP and Naval Facility Engineering Command Southwest (NAVFAC SW) requirements.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have an IPMP?
2. Has IPMP been reviewed or updated at least annually?
3. Is the IPMP followed or implemented?
4. Is the IPMP effective?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Was the plan updated last year and is it currently up to date (indicate date of last revision)?
2. If not, why not?

2.4.4 Objective 4.4: 50% Landfill Diversion for Waste by the End of Fiscal Year 2015 and Thereafter Through Fiscal Year 2020 (Non-Hazardous Solid Waste)

Table 2.4-6. Objective 4.4 Summary

Objective 4.4 Summary	
Objective Metric	The percent of the total non-hazardous solid waste generated and collected by the Station (by weight) that is directed away from the waste stream (not including construction and demolition debris).
Objective Unit of Measure	Tons.
Objective Baseline Year	FY 2010
Baseline Diversion Rate	19.3%
FY 2011 Diversion Rate	46.8%
FY 2015 Diversion Goal	50%
Forecasted Status	The Air Station will meet the solid waste diversion goal.
Data Source	Annual EDMWEB Solid Waste Operations reports.

2.4.4.1 Objective 4.4 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.4.2.

2.4.4.2 Objective 4.4 – FY 2010 Goal Performance Review

As part of meeting the ADEQ requirement to establish a P2 Analysis and Plan and conduct annual reporting to receive a 50% reduction in state program fees, MCAS Yuma established a 2009 solid waste generation baseline of 876.08 tons for the public-private venture housing area; with a P2 performance goal to reduce household waste disposal to landfills by December 2010. The selected reduction method was to provide curbside recycling for base housing units. The 2010 contract does not include curbside recycling since it was not seen as cost effective. A limited market for recyclables has been identified and the landfill tipping cost is low (approximately \$25.75/ton).

MCAS Yuma FY 2010 solid waste disposal information (from the EDMWEB Solid Waste Operations reports) is summarized in Table 2.4-7.

Table 2.4-7. FY 2010 MCAS Yuma Solid Waste Disposal Summary

	Tons Disposed	Tons Recycled	Cost	Revenue
Off-site Landfill	3,090.52	--	\$48,169	\$0.00
Off-site Composting	0.00	54.84	\$1,334	\$0.00
Recycled ¹	0.00	589.06	\$0.00	\$97,191
Used motor oil (waste-to-energy)	0.00	77.59	\$0.00	\$10,351
Lead-acid batteries	0.00	19.47	\$0.00	\$3,741
Ethylene Glycol Antifreeze	0.00	0.00	\$0.00	\$0.00
Totals	3,090.52	740.96	\$49,503	\$111,283
Total Disposed or Recycled	3,831.48			

Note: ¹Recycled solid waste includes food, glass, metals, other (non-food), paper and paperboard, plastic, and wood.

The data indicates a total of 740.96 tons of non-hazardous solid waste were diverted from landfill disposal in FY 2010. This equates to a diversion rate of 19.3%, which is well above the baseline goal of 1.1% (Figure 2.4-1).

2.4.4.3 Objective 4.4 – FY 2011 Through FY 2020 Goal Performance Review

In June 2011 the Station submitted a CY 2010 P2 Plan Annual Progress Report to the ADEQ. It established Goal #54 to reduce solid house waste from the Base housing areas by purchasing a glass crusher and providing containers at the recycling center to collect glass. The project was completed April 2011 and a reduction of 22,507 lbs of solid waste was reported.

There continues to be a limited market for recyclables in the area and the landfill tipping cost is low (approximately \$26.25/ton). During FY 2011 an orchard was removed from MCAS Yuma and the Station located an off-site waste-to-energy incinerator to dispose of the waste wood.

MCAS Yuma FY 2011 solid waste disposal information (from the EDMWEB Solid Waste Operations report) is summarized in Table 2.4-8. An overall summary of the Station's solid waste diversion rate with regard to the ISPP goals is included in Table 2.4-9.

Table 2.4-8. MCAS Yuma Solid Waste Disposal Summary, FY 2011

	Tons Disposed	Tons Recycled	Cost	Revenue
Off-site Landfill	2,990.96	--	\$78,513	\$0.00
Off-site Composting	0.00	270.00	\$9,000	\$0.00
Off-site Incineration wood (waste-to-energy)	0.00	1,756.53	\$0.00	\$1.00
Recycled ¹	0.00	499.89	\$500	\$122,041
Used motor oil (waste-to-energy)	0.00	86.68	\$0.00	\$11,564
Lead-acid batteries	0.00	10.74	\$0.00	\$5,055
Ethylene Glycol Antifreeze	0.00	8.49	\$1,400	\$0.00
Totals	2,990.96	2,632.06	\$89,413	\$138,660
Total Disposed or Recycled	5,623.02			

Note: ¹Recycled solid waste includes food, glass, metals, other (non-food), paper and paperboard, plastic, and wood.

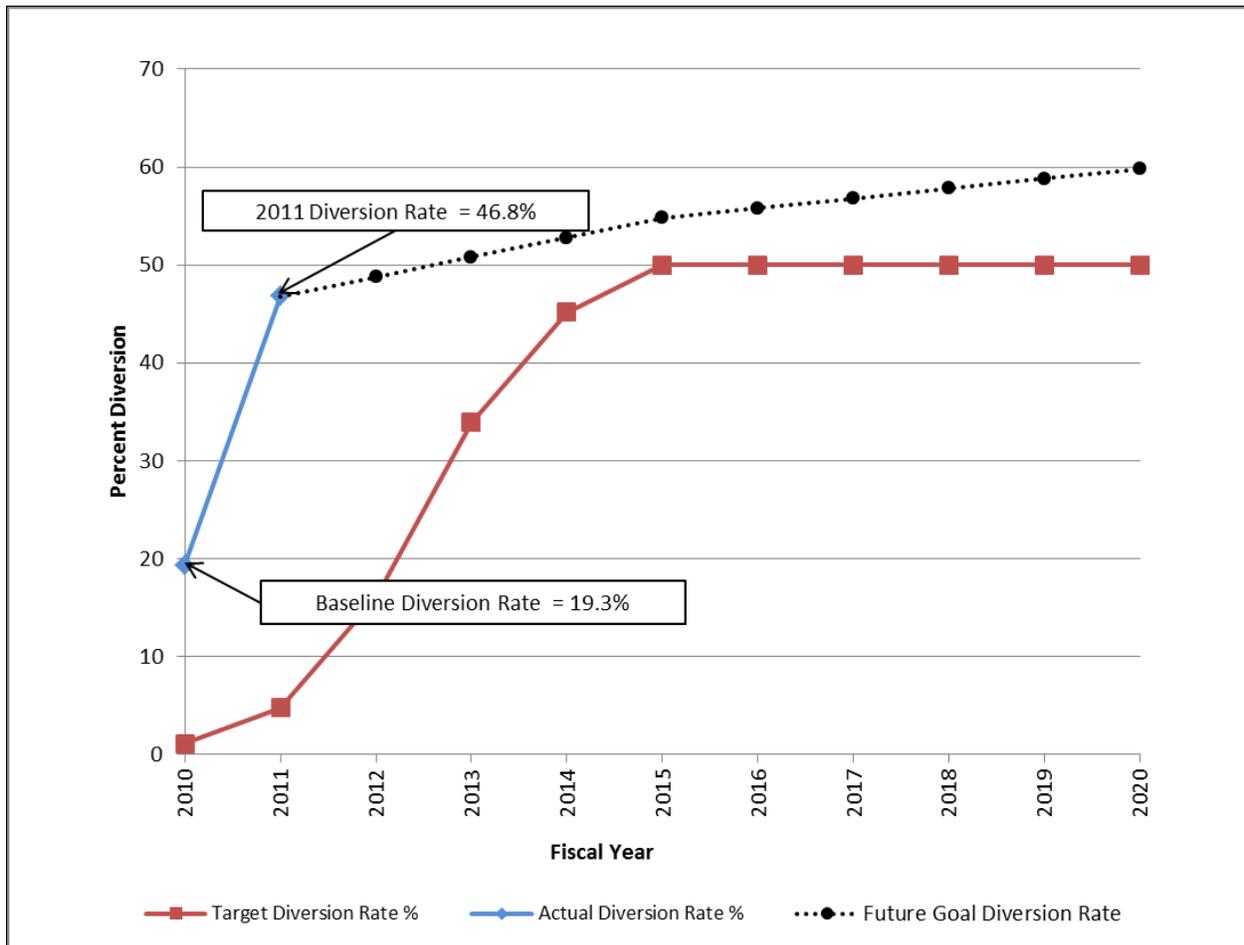
The data indicates a total of 2,632.06 tons of non-hazardous solid waste were diverted from landfill disposal in FY 2011. This equates to a diversion rate of 46.8%, which is well above the baseline goal of 4.8% and is near the 50% diversion rate goal (Figure 2.4-1).

Table 2.4-9. MCAS Yuma Solid Waste Diversion Rate Summary

Fiscal Year	Total Solid Waste Generated (tons)	Disposed (tons)	Recycled (tons)	Actual Diversion Rate	ISPP Percent Diversion Rate Goal
2008 ¹	6,618.72	5,479.57	1,139.15	17.2%	NA
2009	3,368.45	2,849.34	519.11	15.4%	NA
2010	3,831.48	3,090.52	740.96	19.3%	1.1%
2011	5,623.02	2,990.96	2,632.06	46.8%	4.8%

Note: ¹ Although FY 2010 has been established as the baseline year for this objective, FY 2008 and FY 2009 data is also available and presented here for comparison.

Figure 2.4-1. MCAS Yuma Non-Hazardous Solid Waste Diversion Rate



MCAS Yuma Qualified Recycling Program – The MCAS Yuma Qualified Recycling Program (QRP) has been revitalized in FY 2012 and has developed into a robust program. A new Station Order is currently being finalized that provides instruction for the QRP operations and recycling at the Station and that outlines participation of Station activities (e.g., MCCS) and tenant commands in the recycling program. The Order will also outline roles and responsibilities and provide direction for transferring the funds received from the local sales of recyclable materials on a regular basis to the Commanding Officer Recyclable Materials Program Account for MCAS Yuma.

2.4.4.4 Objective 4.4 – Action Plan

The Station is close to meeting the initial FY 2015 solid waste diversion goal of 50% but must continue proactive implementation of the solid waste diversion and recycling program. Further consideration should be given to:

- Finalizing and implementing the new Station Order for managing the QRP and overall Station recycling efforts. Ensure the Station Order establishes overall responsibility for all aspects of the Station’s solid waste management program. It is anticipated that through implementation of this Station Order this objective’s goals are achievable. (Figure 2.4-1 illustrates a goal of a 2%

increase per year in solid waste debris diversion through FY 2015 and an ongoing 1% increase per year in solid waste diversion through FY 2020).

- Establishing quantifiable solid waste debris diversion metrics that provide a program management goal to achieve continual improvement.
- Continuing to evaluate the Station's waste streams and market opportunities to identify other solid waste diversion opportunities.
- Continuing with solid waste management education and outreach initiatives.

2.4.5 Objective 4.5: 50% Landfill Diversion for Waste by the End of Fiscal Year 2015 and Thereafter through Fiscal Year 2020 (Construction and Demolition Waste); 60% Construction and Demolition Diversion by the End of FY 2015 and Thereafter Through Fiscal Year 2020 Per DoD SSPP

Table 2.4-10. Objective 4.5 Summary

Objective 4.5 Summary	
Objective Metric	The percent of construction and demolition (C&D) materials and debris generated and collected (by weight) that is diverted from the landfill.
Objective Unit of Measure	Tons.
Objective Baseline Year	FY 2010
Baseline Diversion Rate	60.2%
FY 2011 Diversion Rate	85.5%
FY 2015 Diversion Goal	60%
Forecasted Status	The Air Station will meet the construction and demolition debris diversion goal.
Data Source	Annual EDMWEB Solid Waste Operations reports.

2.4.5.1 Objective 4.5 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.5.2.

2.4.5.2 Objective 4.5 – FY 2010 Goal Performance Review

MCAS Yuma FY 2010 construction and demolition (C&D) disposal information (from EDMWEB Solid Waste Operations report) is summarized in Table 2.4-11. Although FY 2010 has been established as the baseline year for this objective, FY 2008 and FY 2009 data is also available and is presented in Table 2.4-11 for comparison.

The C&D debris diversion rate was 60.2% for FY 2010, which is well above the baseline goal of 1.4% and also exceeds the FY 2015 diversion goal of 60%, as indicated in Figure 2.4-2.

2.4.5.3 Objective 4.5 – FY 2011 Through FY 2020 Goal Performance Review

In June 2011 the Station submitted a CY 2010 P2 Plan Annual Progress Report to the ADEQ. It established Goal # 71 to divert solid waste from landfills by recycling C&D materials through the establishment of a partnership with Habitat for Humanity to recycle/reuse C&D Materials. The project is scheduled to be completed December 2012.

MCAS Yuma has been able to achieve high C&D diversion rates by incorporating diversion requirements into contract specifications. As a result, all contractors, vendors, and suppliers involved in C&D activities participate in diversion procedures. MCAS Yuma FY 2011 C&D disposal information (from EDMWEB Solid Waste Operations report) is summarized in Table 2.4-11.

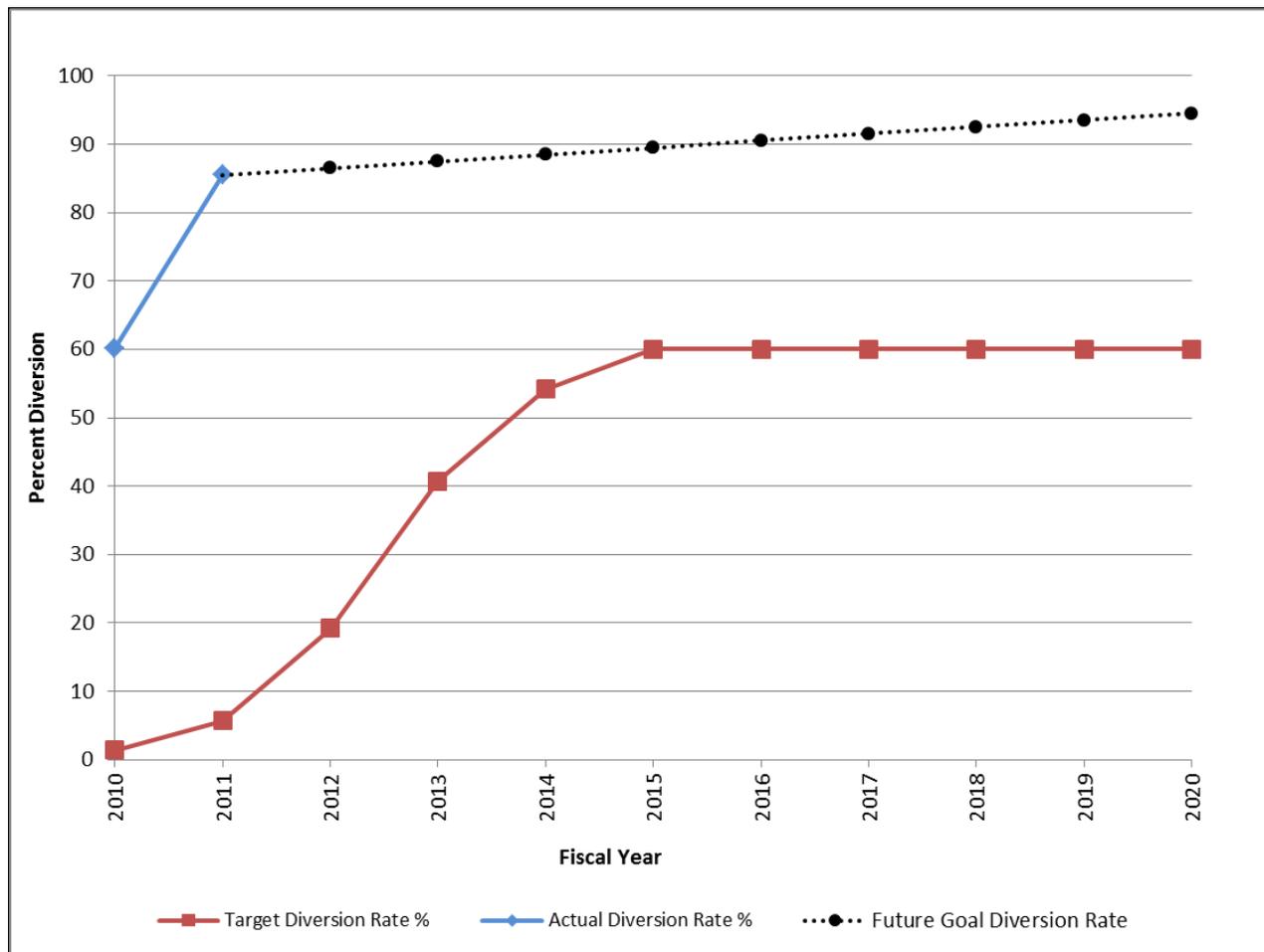
Table 2.4-11. MCAS Yuma Construction and Demolition Debris Disposal Summary

Fiscal Year	Tons Disposed	Tons Recycled	Cost of Disposal	Revenue from Recycling	Actual Diversion Rate	ISPP Percent Diversion Rate Goal
2008	611.48	300,010.69	\$37,138.51	\$1,400.00	99.8%	NA
2009	1,219.99	1,514.19	\$122,457.00	\$1,400.00	55.4%	NA
2010	1,800.10	2,721.72	\$236,127.00	\$0.00	60.2%	1.4%
2011	10,525.36	62,103.30	\$180,992.93	\$0.00	85.5%	5.7%

The C&D debris diversion rate was 85.5% for FY 2011, which is well above the FY 2011 diversion goal of 5.7% and also exceeds the FY 2015 diversion goal of 60% (Figure 2.4-2).

In July 2012 the Station revised its P2 Performance Goal #71 submission to ADEQ to remove establishing a partnership with Habitat for Humanity as a means of C&D debris diversion, stating “current policies and procedures do not support partnership agreements with non-profit agencies.”

Figure 2.4-2. MCAS Yuma Construction and Demolition Debris Diversion Rate



2.4.5.4 Objective 4.5 – Action Plan

The Station has exceeded the FY 2015 C&D debris diversion goal of 60% but should continue to proactively implement the C&D debris management program to meet this requirement through FY 2020. Consideration should be given to:

- Establishing quantifiable C&D debris diversion metrics that provide a program management goal to achieve continual improvement. Figure 2.4-2 illustrates a goal of a 1% increase per year in C&D debris diversion through FY 2020.
- Ongoing coordination with contracting staff and the ROICC to provide contractor oversight to ensure compliance with contract requirements and maximum C&D debris diversion.
- Continuing to evaluate market opportunities and other diversion opportunities for C&D debris.
- MCAS Yuma is investigating the potential use of Autoclaved Aerated Concrete (AAC) for new internal and external construction (see additional description below). This concept should be promoted to NAVFAC SW to initiate a pilot program/project at the Station to test the viability of this building material.

Autoclaved Aerated Concrete - Though largely new to the United States, AAC is not a new building material. Developed in Sweden in the 1920s, AAC is a lightweight manufactured building stone. Comprised of all natural raw materials, AAC is used in a wide range of commercial, industrial, and residential applications and has been in use in Europe for over 70 years. AAC is a precast product manufactured by combining silica, cement, lime, water, and an expansion agent (aluminum powder) and pouring it into a mold. For structurally reinforced AAC products, steel rebar or mesh is also placed in the mold. Once added to the concrete, the aluminum powder reacts with the silica, resulting in the formation of millions of microscopic hydrogen bubbles causing it to expand to roughly five times its original volume. The hydrogen subsequently evaporates, leaving a highly closed-cell aerated concrete. The aerated concrete is cut into blocks or panels which are then steamed and pressurized in an autoclave (Schnitzler 2006). The following identifies some of the reported advantages of building with AAC:

- AAC reduces additional material use and minimizes waste and pollution;
- AAC has high thermal efficiency;
- AAC reduces noise pollution and improves indoor air quality; and
- AAC structures are well-suited to withstand fires, earthquakes, and other natural disasters.

2.4.6 Objective 4.6: Increase Organic and Compostable Materials Diverted from the Waste Stream

Table 2.4-12. Objective 4.6 Summary

Objective 4.6 Summary	
Objective Metric	Is the Station composting and, if so, what is the percent of the total solid waste disposed?
Objective Unit of Measure	Tons.
Objective Baseline Year	FY 2010
Baseline Composting Diversion Rate	1.4%
FY 2011 Composting Diversion Rate	4.8%
Forecasted Status	The Air Station will meet the goal of continual improvement and annual reporting.
Data Source	Annual EDMWEB Solid Waste Operations reports.

2.4.6.1 Objective 4.6 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.6.2.

2.4.6.2 Objective 4.6 – FY 2010 Goal Performance Review

The MCAS Yuma FY 2010 EDMWEB Solid Waste Operations report summarizes the annual generation of non-hazardous solid waste, including compostable wastes. The landfill tip fee is \$25.75 per ton. This information is shown in Table 2.4-13. Figure 2.4-3 illustrates the compostable solid waste diversion rate of 1.4%. Food waste from mess hall operations is provided to an off-site pig farmer, the MCCS club and concessions do not participate. Tree and landscape clippings are sent off-site to a county transfer station for composting.

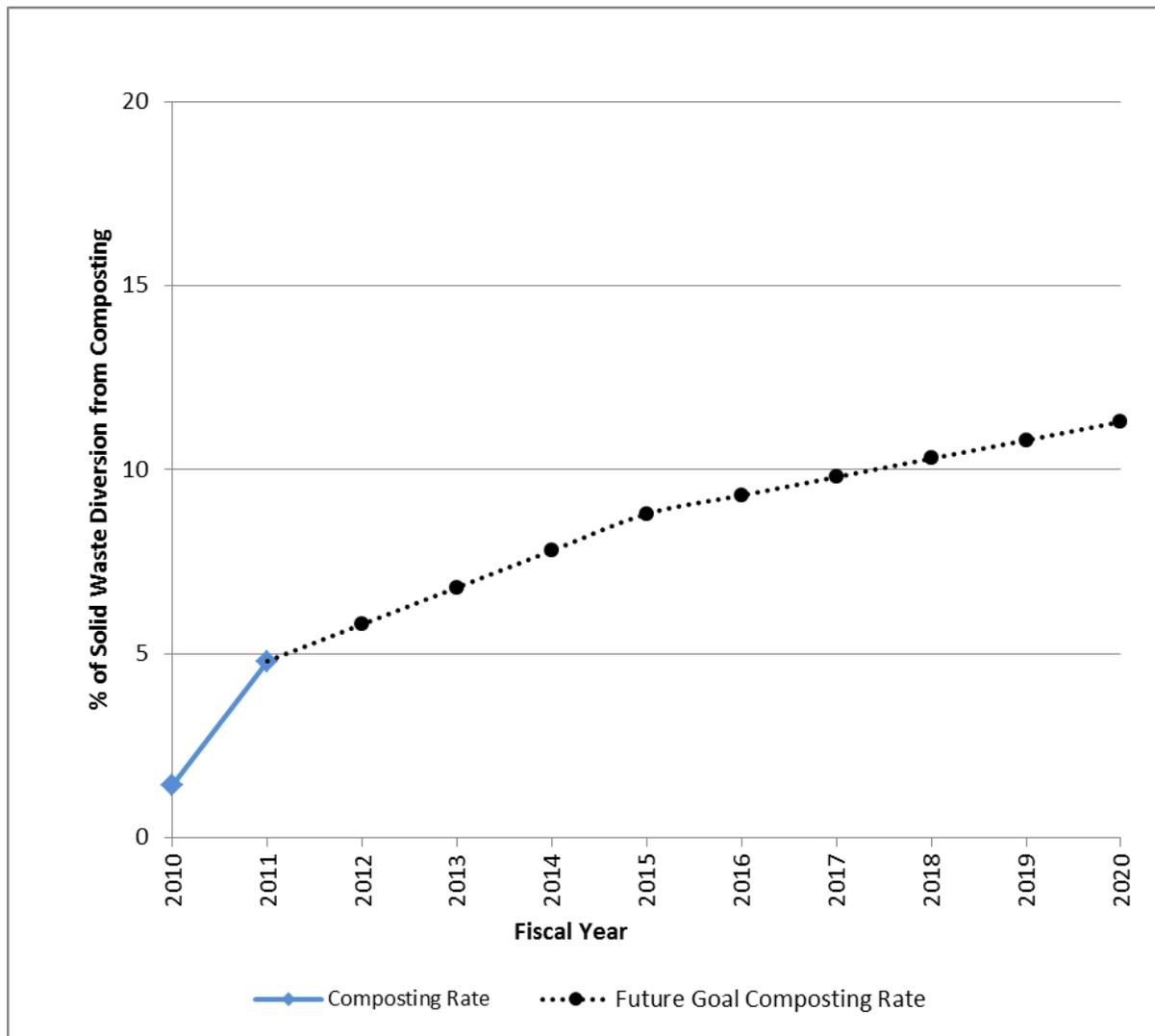
2.4.6.3 Objective 4.6 – FY 2011 Through FY 2020 Goal Performance Review

The MCAS Yuma FY 2011 EDMWEB Solid Waste Operations report summarizes the annual generation of non-hazardous solid waste, including compostable wastes. The landfill tip fee is \$26.75 per ton. Table 2.4-13 and Figure 2.4-3 illustrate the FY 2011 compostable solid waste diversion rate of 4.8%. This exceeds the FY 2010 compostable waste diversion rate of 1.4%.

Table 2.4-13. MCAS Yuma Compostable Diversion Rate

Fiscal Year	Total Solid Waste Generated (tons)	Composted (tons)	Diversion Rate
2010	3,831.48	54.84	1.4%
2011	5,623.02	270.00	4.8%

Figure 2.4-3. MCAS Yuma Compostable Waste Diversion Rate



2.4.6.4 Objective 4.6 – Action Plan

Although this objective does not have an associated metric with an ongoing increase in diverting compostable wastes, it is recommended that the Station continue to provide emphasis on this program.

The MCAS Yuma composting program could be further enhanced through the formalization of procedures and defining roles and responsibilities for all Station entities (e.g., MCCA concessions and clubs, landscape operations, mess halls, etc.) that generate compostable waste to more effectively implement diversion practices and track and document all organic and/or compostable waste diversion.

Consideration should also be given to:

- Establishing quantifiable composting diversion metrics that provide a program management goal to achieve continual improvement and that allow the Station to clearly measure progress over time. Figure 2.4-3 illustrates a goal of 1.0% increase from FY 2012 through FY 2015 and a 0.5% increase from FY 2016 through FY 2020.

- Establishing procedures to ensure that all compostable waste (including yard waste, tree clippings, etc.) disposed by the landscape maintenance contractor are directed to a composting facility and that volumes disposed are accounted for and tracked by the Station.
- Identifying any pieces of equipment to support the composting program.
- Continuing with education and outreach initiatives related to composting opportunities.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have an active composting program?
2. Has the installation increased the amount of waste (in tons) composted compared to the prior year?
3. Does the installation have a plan to increase composting activities?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. What quantity of organic and compostable materials was diverted last year (percent of total non-hazardous solid waste [from EDM Solid Waste Annual Report])?
2. Is the installation planning on increasing that amount this year?
3. If not, why not?

2.4.7 Objective 4.7: Reduce Paper Use

Table 2.4-14. Objective 4.7 Summary

Objective 4.7 Summary	
Objective Metric	Has the Station reduced paper usage (i.e., a year-over-year comparison of the amount of paper purchased)?
Objective Unit of Measure	[To be determined based on purchasing records (e.g., cases of paper, reams of paper)].
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma does not have available data to establish a baseline usage rate for this metric. The Station has developed a Green Procurement Plan (GPP) that addresses this issue; however, the plan is not fully implemented.
Forecasted Status	Through implementation of the GPP, the Air Station will meet this objective's requirement.
Data Source	None available.

2.4.7.1 Objective 4.7 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.7.2.

2.4.7.2 Objective 4.7 – FY 2010 Goal Performance Review

The Station promulgated a Green Procurement Plan (GPP) in 2004 which requires an annual review and update with the latest documented review occurring in August 2009. Section 2.0.4.1, Paper, of the GPP states that “All documents (including copies) over two pages in length will be double-sided, unless specific requirements exist that dictate otherwise (i.e., multi-part forms that require the parts to go to different personnel)” (MCAS Yuma 2004). The GPP also requires the use of 30% (minimum) postconsumer recycled paper, that any non-compliant purchases be documented, and verification by annual GPP audits; however, the GPP does not establish adequate roles and responsibilities and is not fully implemented (MCAS Yuma 2004). Consequently, there is no data available to establish a baseline usage rate related to this metric.

2.4.7.3 Objective 4.7 – FY 2011 Through FY 2020 Goal Performance Review

No significant additional actions were taken in FY 2011 regarding this objective. Sufficient data is still not available to establish a baseline usage rate or to track ongoing use to meet this Objective's requirements.

There are currently no published USMC policies specifically addressing the reduction of printing paper. There is a draft Marine Administrative Message (MARADMIN) that addresses the reduction of printing paper as well as mandatory printer settings for double-sided printing. The policy will also require mandatory duplexing to the fullest extent possible. All new copying and printing devices will be required to have duplexing capability; current devices will be used to the end of their life cycle and replaced with duplex-capable devices.

2.4.7.4 Objective 4.7 – Action Plan

As stated in Section 2.4.7.3, there are currently no USMC policies addressing the reduction of printing paper; however, a draft is under development. MCAS Yuma should continue with the development and ongoing implementation of any local procedures to attempt to document paper use throughout the Station (i.e., ensure that Ability 1 Government Purchase Card purchases are included in the tracking process to facilitate the determination of paper usage). Following release of the MARADMIN policy addressing this topic, the Station should take appropriate actions (i.e., development of a Station Order or revising the GPP) to fully implement the policy and document paper use reduction efforts.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have a plan or policy to reduce paper use?
2. Are the policies or plans to reduce paper use being followed or implemented?
3. Are the policies or plans to reduce paper use effective?
4. Was total paper usage less than the previous year?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. How much paper did the installation procure last year (pounds, boxes, reams, etc.)?
2. Is the installation planning on reducing that amount this year?
3. If so, how? If not, why not?

2.4.8 Objective 4.8: Ten Landfills or Wastewater Treatment Facilities Recovering Biogas for Use by DoD by FY 2020

Table 2.4-15. Objective 4.8 Summary

Objective 4.8 Summary	
Objective Metric	If applicable, has the Base installed a landfill or wastewater treatment facility biogas recovery system?
Objective Unit of Measure	Not applicable.
Objective Baseline Year	Not applicable.
Objective Status	MCAS Yuma does not operate any landfills or wastewater treatment facilities; therefore, this objective does not apply.
Data Source	Not applicable.

2.4.8.1 Objective 4.8 – Baseline Through FY 2009 Analysis

MCAS Yuma does not operate any landfills or wastewater treatment facilities; therefore, this objective does not apply.

2.4.8.2 Objective 4.8 – FY 2010 Goal Performance Review

MCAS Yuma does not operate any landfills or wastewater treatment facilities; therefore, this objective does not apply.

2.4.8.3 Objective 4.8 – FY 2011 Through FY 2020 Goal Performance Review

MCAS Yuma does not operate any landfills or wastewater treatment facilities; therefore, this objective does not apply.

2.4.8.4 Objective 4.8 – Action Plan

MCAS Yuma does not operate any landfills or wastewater treatment facilities; therefore, this objective does not apply. Should MCAS Yuma begin to operate landfills or wastewater treatment facilities in the future, the recovery of biogas should be considered in the scope of the project.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have a landfill or wastewater treatment plant on site?
2. Is there a biogas recovery system in place for an onsite landfill or wastewater treatment plant?
3. Is there a plan to build a biogas recovery system for an onsite landfill or wastewater treatment plant?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. If the installation operates a landfill and/or wastewater treatment facility has a biogas recovery system been installed? And, has MCIWEST been notified?
2. If yes, what quantity of biogas was captured/recovered for use last year?

2.4.9 Objective 4.9: Reduce Disposal of Toxic and Hazardous Materials and Chemicals; On-site Releases and Off-site Transfers of Toxic Chemicals Reduced 15% by Fiscal Year 2020

Table 2.4-16. Objective 4.9 Summary

Objective 4.9 Summary	
Objective Metric	Reduce disposal of toxic and HMs and chemicals. On-site releases and off-site transfers of toxic chemicals reduced 15% by FY 2020. (Note: The DoD SSPP and USMC Sustainability Plans do not include in this total releases from ammunition production, military munitions, operational range activities, and conventional and chemical military munitions demilitarization. Additionally, quantities used for energy recovery or being recycled are not included.)
Objective Unit of Measure	Pounds (lbs).
Objective Baseline Year	FY 2007
Baseline Status	On-site release and off-site transfer of toxic chemicals reporting baseline is 627 lbs of materials.
FY 2011 Status	3,581.5 lbs.
FY 2020 Reduction Goal	587 lbs.
Forecasted Status	The Air Station will meet the FY 2020 reduction goal.
Data Source	Annual Toxic Release Inventory reports.

2.4.9.1 Objective 4.9 – Baseline Through FY 2009 Analysis

For purposes of this ISPP analysis and in accordance with this objective's guidance, the TRI data reported in the following sections includes; (1) toxic chemicals mainly from fuel constituents, and (2) toxic chemicals generated from indirect mission support. This analysis does not include TRI data related to range activities or toxics being used for energy recovery or being recycled (Table 2.4-17, located in Section 2.4.9.3).

Based on MCAS Yuma's 2007 EPCRA TRI Form R submittal (which includes CY 2006 data), a total of 627 lbs of toxic chemicals were documented as being released either on-site or transferred off-site from non-range areas. This baseline Form R submittal covered three geographically separated areas that comprise the Station: MCAS Yuma, AZ; the BMGR Complex, AZ; and the CMAGR Complex, CA. A summary of CY 2006 through CY 2009 TRI data is presented in Table 2.4-17 and Figure 2.4-4, located in Section 2.4.9.3.

2.4.9.2 Objective 4.9 – FY 2010 Goal Performance Review

Based on MCAS Yuma's 2010 EPCRA TRI Form R submittal to the State of Arizona dated 16 June 2010, a total of 2,905 lbs of toxic chemicals were documented as being released on-site or transferred off-site from non-range activities in CY 2009, as referenced in Table 2.4-17. This is a 363% increase compared to the CY 2007 baseline data and 380% over the reduction goal. The 2010 Form R submittal covered four geographically separated areas that comprise the Station: MCAS Yuma, AZ; the BMGR Complex, AZ; the CMAGR, CA; and for the first time since 2006 the CADC, AZ. The CADC reported only 65 lbs of toxic chemicals released on-site or transferred off-site, less than 2% of the total reported for the Station. Figure 2.4-4 graphically demonstrates the trend line for this objective. MCAS Yuma continues to recycle batteries off-site diverting 41,663 lbs of lead from being accounted for as an on-site release or off-site transfer.

2.4.9.3 Objective 4.9 – FY 2011 Through FY 2020 Goal Performance Review

Based on MCAS Yuma's 2011 EPCRA TRI Form R submittal (which includes CY 2010 data) to the State of Arizona dated 27 June 2011, a total of 3,582 lbs of toxic chemicals were documented as being released on-site or transferred off-site from non-range activities (Table 2.4-17). This is a 471% increase compared to the CY 2007 baseline data and 499% over the reduction goal. The 2011 Form R submittal covered four geographically separated areas that comprise the Station: MCAS Yuma, AZ; the BMGR Complex, AZ; the CMAGR Complex, CA (includes CBM); and the CADC, AZ. Figure 2.4-4 graphically demonstrates the trend line for this objective. One improvement instituted this year was initiating a program for off-site energy recovery for waste fuels. This program diverted 1,505 lbs of ethylbenzene and 6,008 lbs of naphthalene from being counted as an on-site release or off-site transfer. MCAS Yuma continues to recycle batteries off-site thereby diverting 22,256 lbs of lead from being accounted for as an on-site release or off-site transfer.

Based on MCAS Yuma's 2012 EPCRA TRI Form R submittal (which includes CY 2011 data) submitted to the State of Arizona June 2012, a total of 26,273 lbs of toxic chemicals were documented as being released on-site or transferred off-site from non-range activities (Table 2.4-17). The majority of this significant increase is attributable to a pipeline leak which resulted in an on-site release of 5,232 lbs of ethylbenzene and 21,037 lbs of naphthalene. If these releases from the pipeline leak are not included in the CY 2011 release total, a total of 73 lbs of toxic chemicals were documented as being released on-site or transferred from non-range activities (Table 2.4-17). This is an 88% decrease compared to the CY 2007 baseline data and 88% below the reduction goal. The 2012 Form R submittal covered four geographically separated areas that comprise the Station: MCAS Yuma, AZ; the BMGR Complex, AZ; the CMAGR Complex, CA (includes CBM); and the CADC, AZ. The off-site energy recovery of waste fuels program diverted 1,492 lbs of ethylbenzene and 6,106 lbs of naphthalene from being counted as an on-site release or off-site transfer. MCAS Yuma continues to recycle batteries off-site diverting 9,376 lbs of lead from being accounted for as an on-site release or off-site transfer. Figure 2.4-4 graphically indicates the forecasted trend line for this objective.

Table 2.4-17. Emergency Planning and Community Right-to-Know Act Toxic Release Inventory Data

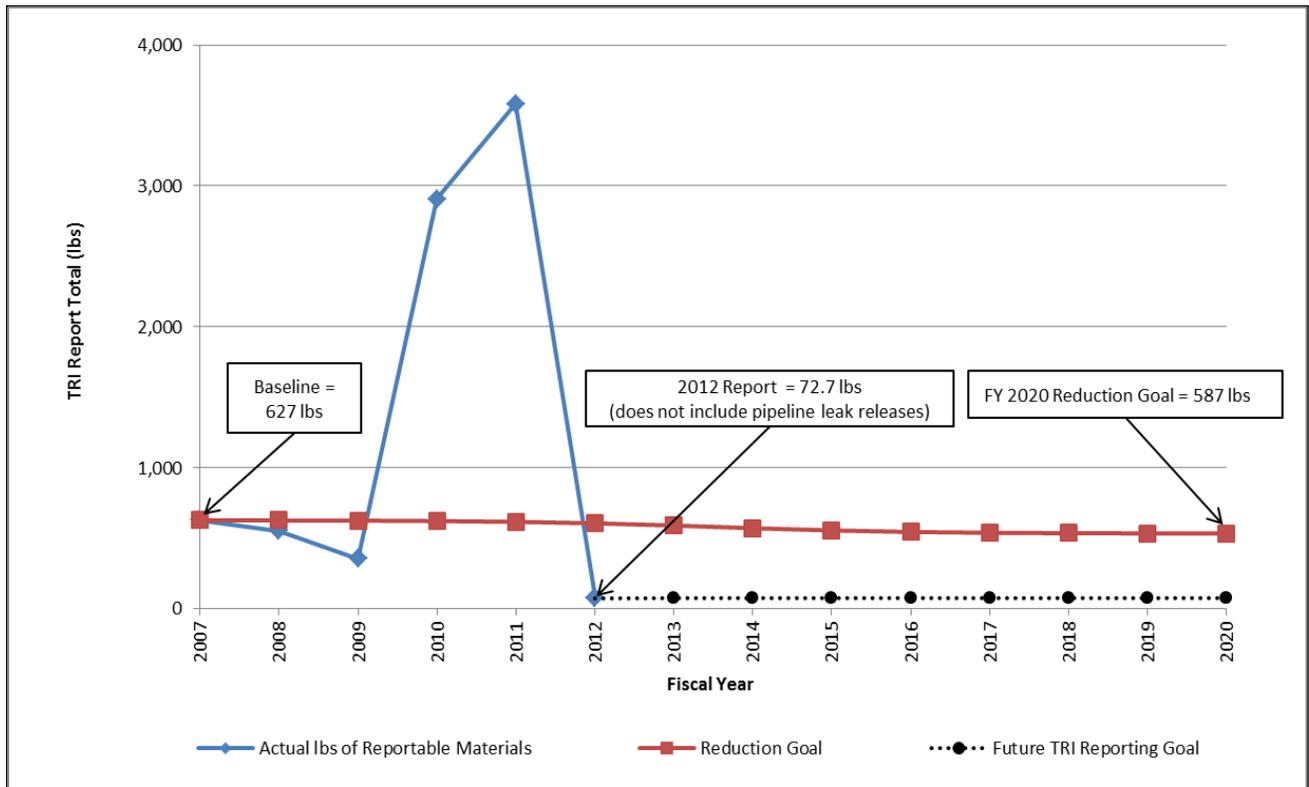
	2007 Report (CY 2006 Data)	2008 Report (CY 2007 Data)	2009 Report (CY 2008 Data)	2010 Report (CY 2009 Data)	2011 Report (CY 2010 Data)	2012 Report (CY 2011 Data)
Toxic Chemicals Generated Mainly From Fuel Constituents						
Ethylbenzene	59	46	65	1,917	3,020	32 ¹ /5,232 ²
Naphthalene	-	-	9	235	297	37 ¹ /21,037 ²
1, 2, 4 - Trimethylbenzene	86	27	-	-	-	-
Xylene	247	260	255	-	-	-
Total pounds (lbs)	392	333	329	2,152	3,317	69 ¹ /26,269 ²

Table 2.4-17. Emergency Planning and Community Right-to-Know Act Toxic Release Inventory Data

	2007 Report (CY 2006 Data)	2008 Report (CY 2007 Data)	2009 Report (CY 2008 Data)	2010 Report (CY 2009 Data)	2011 Report (CY 2010 Data)	2012 Report (CY 2011 Data)
Toxic Chemicals Generated by Indirect Mission Support						
Certain Glycol Ethers (AFFF change out)	-	-	-	628	-	-
Copper	-	-	-	-	198	2 ¹ /2 ²
Lead (primarily batteries)	-	-	19	33	66.5	1.3 ¹ /1.3 ²
Lead Compounds	-	-	6	4	-	0.4 ¹ /0.4 ²
Manganese Compounds (water treatment)	-	-	-	88	-	-
Toluene	235	219	-	-	-	-
Total lbs	235	219	25	753	264.5	3.7 ¹ /3.7 ²
TRI REPORT TOTAL (lbs)	627	552	354	2,905	3,581.5	72.7¹/26,272.7²

Notes: ¹ Reported releases not including pipeline leak. ² Reported releases including the pipeline leak.

Figure 2.4-4. MCAS Yuma Toxic Release Inventory Reporting



Note: For the purposes of maintaining the scale of the graph, the 2012 release value attributable to the pipeline leak (26,272.7 lbs) was not plotted on this figure.

2.4.9.4 Objective 4.9 – Action Plan

The Station has exceeded the FY 2020 goal to reduce disposal of toxic and HMs, and chemicals by 15% but should continue with proactive implementation of the toxic and HMs chemical management program. It is anticipated that the Station can remain at/near the FY 2012 TRI reporting levels. Figure 2.4-4 represent the Station maintaining this level through FY 2020. Ongoing program considerations should include:

- Continuing the off-site energy recovery of waste fuels program.
- Continuing to recycle lead batteries.

2.4.10 Objective 4.10: 100% of DoD Personnel and Contractors Who Apply Pesticides are Properly Certified Through FY 2020

Table 2.4-18. Objective 4.10 Summary

Objective 4.10 Summary	
Objective Metric	The percent of personnel who applied pesticides on the Station during the fiscal year who were properly certified. Direct hire employees, certified in accordance with DoD 4150-7 and DoDI 4150.7-M have a maximum of two years to become certified after initial employment. Contracted employees shall have appropriate State certification in the appropriate categories at the time the contract is effective. These certifications are in accordance with USEPA rules and regulations and are accepted.
Objective Unit of Measure	Percent of certified pesticide applicators.
Objective Baseline Year	FY 2010
Baseline Status	Not applicable.
FY 2011 Status	100%
FY 2020 Goal	100%
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	MCAS Yuma 2010 Benchmark ECE report; interviews with MCAS Yuma pesticide management personnel.

2.4.10.1 Objective 4.10 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.4.10.2.

2.4.10.2 Objective 4.10 - FY 2010 Goal Performance Review

The December 2010 Benchmark ECE identified that MCAS Yuma has two trained and certified applicators from the Pest Control Shop (I&L, Base Services Department) that perform the majority of pesticide applications. Additional pesticide applications are made by agricultural out-leases and contractors working for the MCCA exchange, MCCA food concessionaires, Commissary, Naval Federal Credit Union, and public-private venture housing. The MCAS Yuma Environmental Department provides compliance oversight and technical assistance for the program.

2.4.10.3 Objective 4.10 - FY 2011 Through FY 2020 Goal Performance Review

MCAS Yuma staff have indicated that all applicators performing work at MCAS Yuma continue to meet certification requirements; however, the actual number of certified applicators working at the Station (to include Station staff, lessees, contractors) have not been provided to date.

2.4.10.4 Objective 4.10 – Action Plan

As part of this action plan, responsible MCAS Yuma staff should continue to implement procedures to ensure that all applicators performing work at the Station are certified in accordance with DoD and state requirements. Ensure the actual numbers of applicators is tracked and documented to allow the Station to meet this objective's unit of measure requirements.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Are 100% of DoD pesticide applicator personnel certified?
2. Are 100% of contracted pesticide applicator personnel certified?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Did the installation utilize DoD personnel and/or contractor personnel to apply pesticides?
2. Were 100% of the applicators properly certified?
3. If not, why not?

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2.5 MCIWEST GOAL 5 – ADVANCE REGIONAL AND LOCAL INTEGRATED PLANNING TO CREATE SUSTAINABLE COMMUNITIES

2.5.1 Objective 5.1: Identify and Analyze Impacts from Energy Use and Alternatives Under the National Environmental Policy Act with All Proposals for New and Expanded Facilities

Table 2.5-1. Objective 5.1 Summary

Objective 5.1 Summary	
Objective Metric	Identify and analyze impacts from energy use and alternatives under the National Environmental Policy Act (NEPA) with all proposals for new and expanded facilities.
Objective Unit of Measure	Instances of reviews and documents prepared in accordance with NEPA to identify and analyze impacts from energy use and alternatives.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma ensures that energy use and alternatives analysis is conducted prior to the Request for Environmental Impact Review, where applicable.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews with Environmental Department staff (MCAS Yuma 2011f).

2.5.1.1 Objective 5.1 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.5.1.2.

2.5.1.2 Objective 5.1 – FY 2010 Goal Performance Review

The MCAS Yuma Environmental Department oversees all environmental planning activities, including the preparation of required NEPA documentation (MCAS Yuma 2009c). The Environmental Department, together with I&L Department, ensures that all proposals for new or expanded facilities identify and analyze impacts from energy use and alternatives, as applicable.

During FY 2010, the MCAS Yuma Environmental Department ensured that all proposals for new or expanded facilities identify and analyze impacts from energy use and alternatives prior to the Request for Environmental Impact Review. During FY 2010 one project required energy use and alternatives analysis which involved the cooperation of the Environmental Department and I&L Department (MCAS Yuma 2011f).

2.5.1.3 Objective 5.1 – FY 2011 Through FY 2020 Goal Performance Review

On 8 September 2011, the USMC issued an updated NEPA Manual (version 2.0). The updated USMC NEPA Manual addresses EO 13514 requirements to “identify and analyze the impacts from energy usage and alternative energy sources in all Environmental Impact Statements and Environmental Assessments for proposal or for new or expanded facilities” (USMC 2011). The NEPA Manual identifies the following steps to conduct the analysis (USMC 2011):

- Step 1 – Identify Significant Effects Associated with the Proposed Action.
- Step 2 – Establish Geographic Scope of the Analysis.
- Step 3 – Establish the Timeframe for Analysis.

- Step 4 – Identify Other Actions Affecting the Resources, Ecosystems, and Human Communities of Concern.
- Step 5 – Characterize the Ecosystems, Resources, and Human Communities Identified.
- Step 6 – Characterize the Stresses Affecting These Resources, Ecosystems, and Human Communities and Their Relationship to Regulatory Thresholds.
- Step 7 – Define a Baseline Condition for the Resources, Ecosystems, and Human Community.
- Step 8 – Identify the Effects between Human Activities and Resources, Ecosystems, and Human Communities.
- Step 9 – Determine the Significance of Cumulative Effects.
- Step 10 – Modify Alternatives to Minimize, Avoid, or Mitigate Significant Effects.
- Step 11 – Monitor the Effects of the Selected Alternative.

During FY 2012, MCAS Yuma Environmental Department ensured that all NEPA documentation met the requirements established in the USMC NEPA Manual and ensured that all new or expanded facilities identified and analyzed impacts from energy use and alternatives, as applicable. For projects seeking LEED certification, consideration of energy use and alternatives is analyzed in the LEED documentation process.

2.5.1.4 Objective 5.1 – Action Plan

The Action Plan is to consider the following recommendations to ensure ongoing ISPP implementation and compliance:

- Ensure that MCAS Yuma staff involved in project reviews (i.e., Environmental Department, I&L Department, etc.) continue to analyze impacts from energy use and alternatives, as appropriate.
- Consider establishing procedures to ensure that NEPA document reviews that analyze impacts from energy use and alternatives are documented and files are retained for future ISPP reporting years.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Per EO 13514, do 100% of the NEPA documents include an analysis of energy usage and alternatives? (If not, how many NEPA documents did not include this analysis and why?)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many NEPA documents were generated by the installation for new or expanded facilities?
2. Per EO 13514, do 100% of the NEPA documents include an analysis of energy usage and alternatives?
3. If not, how many NEPA documents did not include this analysis and why?

2.5.2 Objective 5.2: Coordinate with Regional Ecosystem Programs

Table 2.5-2. Objective 5.2 Summary

Objective 5.2 Summary	
Objective Metric	Coordinate with regional ecosystem programs.
Objective Unit of Measure	Instances of coordination.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma ensures that coordination with regional ecosystem programs is conducted.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews and data provided by MCAS Yuma's Community Planning and Liaison Office (CP&LO), the Environmental Department, and the Range Management Department.

2.5.2.1 Objective 5.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.5.2.2.

2.5.2.2 Objective 5.2 – FY 2010 Goal Performance Review

The most significant ecosystem management programs managed by MCAS Yuma are those within the boundaries of the BMGR. The BMGR is one of the region's most critical ecosystems and MCAS Yuma actively participates in the coordination of its use and management. The Station's Environmental Department and Range Management Department participate in the oversight of ecosystems, watersheds and environmental management programs throughout MCAS Yuma and the BMGR. In addition, the Arizona Military Regional Compatibility Project, consisting of a DoD multi-service stakeholder group, was established to help proactively manage the BMGR and the areas between the BMGR and the Station. Furthermore, the Arizona Military Regional Compatibility Project ensures that collaboration occurs with other stakeholders on managing areas between the BMGR and the Station, including convening with stakeholders to facilitate the purchasing of conservation easements needed to address environmental encroachment issues. See Appendix C for additional background information on the BMGR.

In FY 2010, the MCAS Yuma Environmental and Range Management Departments continued to implement the Integrated Natural Resources Management Plan (INRMP) overseeing the BMGR and CMAGR.

2.5.2.3 Objective 5.2 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, the MCAS Yuma Environmental and Range Management Departments continued to implement the INRMP overseeing the BMGR and CMAGR.

2.5.2.4 Objective 5.2 – Action Plan

The Action Plan for this objective is to consider the following recommendations to ensure ongoing ISPP implementation and compliance:

- Continue coordination with regional agencies and organizations on regional ecosystem management programs.
- Identify additional agencies, organizations, and community outreach events that will facilitate MCAS Yuma to continually meet and exceed the EO 13514 requirements for coordinating with regional ecosystem management programs.
- Develop a monitoring/tracking checklist and documentation process to annually record, account for, and ensure ongoing compliance with EO 13514 in the area of regional ecosystem management programs.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. During the FY, were there coordination actions with regional ecosystem programs conducted by the installation? (Provide examples of coordination activities or provide reasons why coordination activities were not conducted.)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many coordination actions with regional ecosystem programs were conducted by the installation?
2. Provide examples of coordination activities conducted.
3. If none, why not?

2.5.3 Objective 5.3: Participate in Regional Transportation Planning and Recognize Existing Community Transportation Infrastructure

Table 2.5-3. Objective 5.3 Summary

Objective 5.3 Summary	
Objective Metric	Participation in regional transportation planning.
Objective Unit of Measure	Instances of coordination.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma has 13 active coordination efforts with regional agencies to discuss regional transportation planning and reviews over 200 cases per year involving a variety of planning and development requests. Station personnel continue to proactively participate in, and coordinate with, regional transportation planning efforts.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews and data provided by MCAS Yuma's CP&LO.

2.5.3.1 Objective 5.3 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.5.3.2.

2.5.3.2 Objective 5.3 – FY 2010 Goal Performance Review

In 1982 the Yuma Metropolitan Planning Organization (YMPO) was formed to administer planning activities associated with the urbanized portion of Yuma County. The YMPO is governed by an Executive Board consisting of local elected officials from the jurisdictions that comprise the YMPO including the cities of Yuma, Somerton, and San Luis; the Town of Wellton; the Cocopah Indian Tribe; Yuma County; and the Arizona Department of Transportation (ADOT). The YMPO also has a Technical Advisory Committee (TAC) made up of staff from each of the member agencies including MCAS Yuma's CP&LO. As a member of the TAC, the CP&LO is a technical reviewer of regional transportation plans to ensure that consideration of the Station is consistent with future YMPO initiatives.

The relationships between the community and the CP&LO have grown and MCAS Yuma is continually involved as a stakeholder in transportation projects that impact the County, despite the fact that MCAS Yuma is an ex-officio member of YMPO. The CP&LO is involved in monthly meetings not only with the political subdivisions but with the Greater Yuma Economic Development Corporation, YMPO, Greater Yuma Port Authority, Southwest Arizona Futures Forum, Arizona Public Service, Library subcommittee, and is also involved in various transportation studies to include rail and area transit. The CP&LO has also worked extensively with the ADOT, BLM, Yuma County, Arizona Game and Fish Department, environmental organizations, and cultural resources groups for the development of the ASH within the BMGR to meet the goal of providing for a transportation corridor from the port of entry to the I-95 Canamex corridor. The result of this coordination generated limited access points along the road and eliminated access easements. The development of the road prevented incompatible development within the BMGR that would often result from the development of commercial corridors. The restriction of access points along the ASH road assists in preventing growth and development of more roads along the BMGR boundary (MCAS Yuma 2011i).

The public transit system in the City and County of Yuma consists of a fixed-route system, a dial-a-ride (paratransit) system, non-motorized/bicycle facilities, and a passenger rail system. A description of the baseline public transit system and transportation conditions in the Yuma area is included in Appendix C.

During FY 2010 the MCAS Yuma CP&LO participated in the consultation process of the YMPO development of the *2010-2033 Regional Transportation Plan* (April 2010). The review included 27 regional partners and stakeholders (YMPO 2010). A complete list of the regional partners and stakeholders is included in Appendix C. One of the major objectives of the *Regional Transportation Plan*, as it affects the Station, is to evaluate rural and agricultural transportation needs, while adequately considering possible impacts on MCAS Yuma. The transportation study, as it relates to the EO, identifies non-motorized facilities (i.e., bicycle facilities), public transit, fixed-route systems, the dial-a-ride system, and the passenger rail service. During the development of the Regional Transportation Plan, the CP&LO participated on the TAC of the YMPO as a representative member agency. Additional information on the findings generated in the Regional Transportation Plan is included in Appendix C.

In addition to MCAS Yuma's involvement in regional planning initiatives, the CP&LO has participated in the ADOT study for the Town of Wellton to develop a multimodal long-range transportation plan that considers pedestrian, bicycle, automobile, and public transit needs for 5-, 10-, and 20-year planning periods. This plan will recommend projects that will address local multimodal transportation needs and will serve as a guide for future development, project funding, and project implementation. The MCAS Yuma CP&LO is coordinating with the ADOT and the Town of Wellton to ensure that the development of the transportation plan is consistent and compatible with land use development near the BMGR.

2.5.3.3 Objective 5.3 – FY 2011 Through FY 2020 Goal Performance Review

The CP&LO continues to participate in the multimodal long-range transportation study with the ADOT for the Town of Wellton. During this coordination, the CP&LO is responsible for ensuring that the development of the transportation plan is consistent and compatible with land use development near the BMGR.

In addition, the CP&LO has participated in a number of transit studies during FY 2012, including the SR 195 Study (completed in August 2012), the Yuma County Rail Corridor and Logistics Study (ongoing), and the Yuma Expressway Study (ongoing) as further described in the sections below.

SR 195 Study - The CP&LO has been an active participant in the SR 195 study to determine the preferred route for redirecting and facilitating traffic flow volumes through year 2035, including the widening and improving of transit corridors along Avenue 3E between I-8 and US 95. In FY 2012, the SR 195 study came to a conclusion with the final determination that ADOT will financially "support the local preference to route SR 195 traffic to Avenue 3E" and will provide directional signage (ADOT 2012a).

Yuma County Rail Corridor and Logistics Study - During August 2012, the CP&LO participated in the Yuma County Rail Corridor and Logistics Study Public Open House and will proceed as a stakeholder participant during the course of the study. The study will "identify freight rail-related economic development opportunities for the Yuma Region" (YMPO 2012).

Transportation Needs Study for the Foothills and Mesa Del Sol Areas - The CP&LO participated in interviews for the Transportation Needs Study for the Foothills and Mesa Del Sol focused on the feasibility of a multi-modal transportation network. This study was in participation with ADOT and Yuma County, whereby the CP&LO participated in stakeholder interviews and “provided feedback on issues and opportunities associated with the existing and future multi-modal transportation system” (MCAS Yuma 2012c).

Yuma Expressway Study - During FY 2012, the CP&LO participated as a stakeholder in the TAC for the Yuma Expressway Study (completion of the study is expected in FY 2013 or FY 2014 [equating to approximately 12 months of CP&LO participation in the study]). As of August 2012, the CP&LO has participated in documenting current and future conditions related to transit within the expressway study area (ADOT 2012b). The purpose of the Yuma Expressway Study is to conduct a preliminary feasibility assessment of a proposed corridor along County 14 Street and Avenue D at the connection between SR 195 and I-8, with the intent to make the southern portion of Yuma County more accessible (ADOT 2012b). This is a high-level planning study, however it is anticipated that this study will serve as the basis for the future project (ADOT 2012b). The study will aim to accomplish the following initiatives (ADOT 2012b):

- Complete an inventory of current roadway, socioeconomic, multi-modal, topographic, environmental, etc. conditions and review of existing studies.
- Identify future conditions, deficiencies and preliminary expressway alignments.
- Hold public open house meetings with various stakeholders and area residents at key milestones in the process – one open house to present existing and future conditions, deficiencies and preliminary expressway alignments (Summer 2012).
- Hold a second public open house meeting in the winter of 2012 to present the evaluation criteria and plan for improvements.
- Prepare a Draft Final Report.

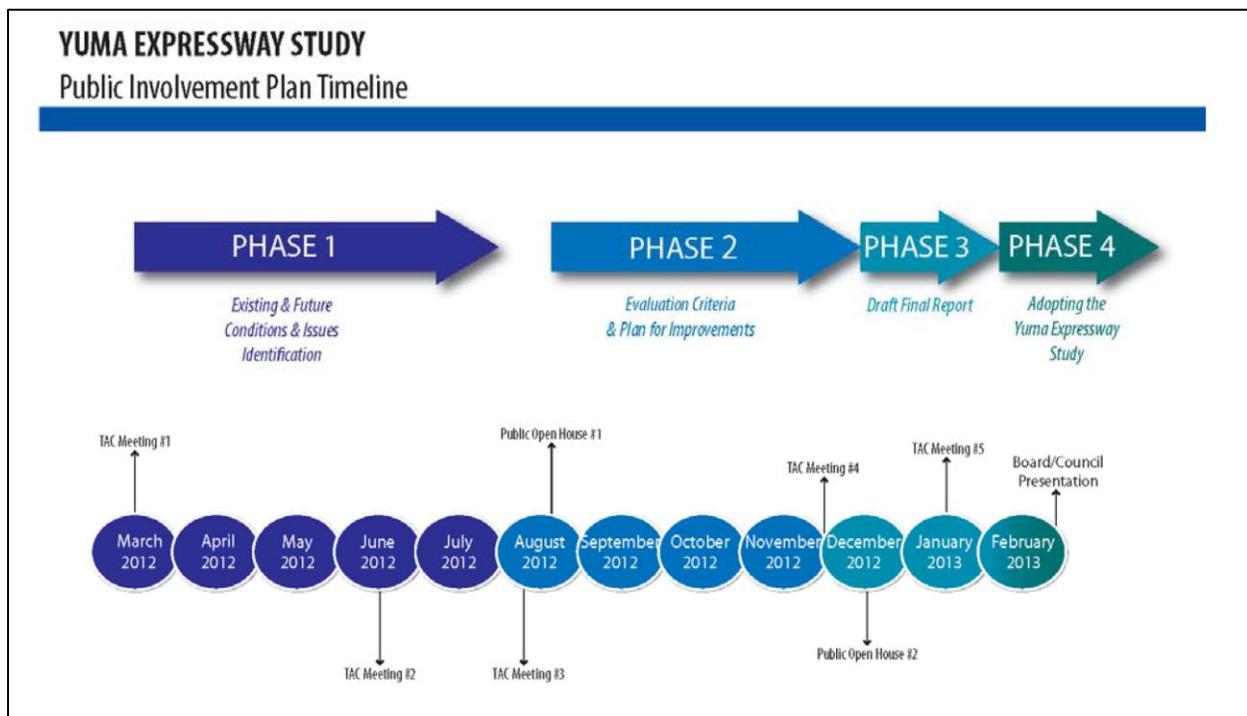
The following tasks are anticipated as a part of the Yuma Expressway Study (City of Yuma 2012):

- Work Task 1: Refine the Work Plan.
- Work Task 2: Current Conditions.
- Work Task 3: Future Conditions.
- Work Task 4: First Phase of Public Involvement and Summary Report 1.
- Work Task 5: Develop evaluation criteria and a plan for the expressway corridor.
- Work Task 6: Second Phase of Public Involvement and Summary Report 2.
- Work Task 7: Draft Final Report.
- Work Task 8: Final Report and Executive Summary.

Public Involvement Task Summary - In addition, a comprehensive Public Involvement Plan has been created as a part of the Yuma Expressway Study to ensure that all project stakeholders, at all levels of public involvement, are engaged in the study moving forward to ensure that an integrated communication strategy is implemented early and often in the process (ADOT 2012c). The following public involvement tasks have been identified for the Yuma Expressway Study, as depicted in Figure 2.5-1 (ADOT 2012c):

- TAC meetings;
- Public meeting/open house; and
- Elected official presentation(s).

Figure 2.5-1. Yuma Expressway Study Public Involvement Plan Timeline



Source: ADOT 2012b.

The TAC Members are responsible for overseeing and guiding the efforts of the technical consultants during the Public Involvement process of the Yuma Expressway Study includes the following agencies (ADOT 2012b):

- ADOT Multimodal Planning Division
- ADOT Environmental Planning Group
- Yuma Metropolitan Planning Organization
- Yuma County
- City of Somerton
- Imperial County
- ADOT Yuma District
- City of Yuma
- MCAS Yuma
- Federal Highway Administration

- Arizona Game and Fish
- Cocopah Indian Tribe
- ADOT Communications and Community Partnerships
- Quechan Indian Tribe
- City of San Luis
- California Department of Transportation (CalTrans)

In addition the following project stakeholders, the study would include the periodic support of the following agencies to provide technical details on regional planning matters in the Yuma area agencies (ADOT 2012b):

- Greater Yuma Economic Development Corporation
- Yuma Fresh Vegetables Association
- Yuma County Farm Bureau
- APS SW Division
- BLM
- Yuma County Water Users Association
- County Administrator, Yuma County
- Western Area Power Administration
- Greater Yuma Port Authority
- Yuma County Airport Authority
- Yuma Airport Authority
- Bureau of Reclamation
- Yuma Mesa Irrigation District
- City Administrator, City of Yuma
- U.S. Border Patrol

I-8/Araby Improvements Project - The CP&LO was requested to participate in a transportation-related study of the I-8/Araby interchange, including the conceptual planning of roundabouts at this interchange as well as stormwater drainage improvements and the overall design. The CP&LO anticipates participating in the study in early FY 2013.

Based on interviews with Air Station staff, it is assumed that ongoing, and new, regional transportation coordination and planning efforts will continue from FY 2013 through FY 2020.

2.5.3.4 Objective 5.3 – Action Plan

The Action Plan for this objective considers the following recommendations to ensure ongoing ISPP implementation and compliance:

- Develop a monitoring/tracking checklist to record and account for all regional transportation coordination initiatives accomplished annually by the Station to ensure ongoing compliance with EO 13514.
- Continue to identify and participate in regional transportation agencies and initiatives that would be of interest and benefit to MCAS Yuma’s engagement and accessibility to regional transportation infrastructure.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. During the FY, were there coordination actions with regional transportation entities conducted by the installation? (Provide examples of coordination activities or provide reasons why coordination activities were not conducted.)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many coordination actions with regional transportation entities were conducted by the installation?
2. Provide examples of coordination activities conducted.
3. If none, why not?

2.5.4 Objective 5.4: Ensure Planning of New Facilities and Leases are Transit-Oriented or, in Rural Communities, Emphasize Existing or Planned Town Centers

Table 2.5-4. Objective 5.4 Summary

Objective 5.4 Summary	
Objective Metric	Has the installation planned new facilities that are transit-oriented?
Objective Unit of Measure	Instances of facility planning.
Objective Baseline Year	FY 2010
Objective Status	The analysis indicated that there are no planned leases outside of the Station boundaries.
Forecasted Status	The Air Station will take appropriate actions to meet this requirement when applicable.
Data Source	Interview with CP&LO.

2.5.4.1 Objective 5.4 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.5.4.2.

2.5.4.2 Objective 5.4 – FY 2010 Goal Performance Review

All facilities planned within the Station are accessible to public transportation and are serviced by a bus stop and a bicycle path, both located at the front gate. As of FY 2010, the CP&LO indicated that there are no planned leases of land outside of the Station.

2.5.4.3 Objective 5.4 – FY 2011 Through FY 2020 Goal Performance Review

Currently there are no planned leases of land outside of the Station. However, should MCAS Yuma acquire or lease land outside of the existing fence line, consideration of transit oriented growth must be addressed to ensure ongoing compliance with EO 13514. Census data collected in December 2006 by the Arizona Department of Economic Security, Research Administration, Population Statistics Unit, projects that the population within Yuma County to reach approximately 271,000 by CY 2020, which is nearly a 16% population growth from CY 2012. Consideration of the impacts that population growth will have on accessibility to the MCAS Yuma, as well as the strategic coordination with regional transportation agencies, should be considered in the planning of new facilities and leases.

2.5.4.4 Objective 5.4 – Action Plan

The Action Plan for this objective considers the following recommendations to ensure ongoing ISPP implementation and compliance:

- Identify opportunities to enhance information and awareness on available public transportation access aboard MCAS Yuma.
- Develop a monitoring/tracking checklist to record and account for planning efforts that ensure ongoing compliance with EO 13514. The checklist should address guidance issued by the Council on Environmental Quality titled *Instructions for Implementing Sustainable Locations for Federal Facilities*.

- Conduct a feasibility study to identify the potential move of the Fairgrounds, located across the street from MCAS Yuma. The study should address, but should not be limited to, potential safety concerns and risks related to the proximity of the Fairgrounds to the Air Installation Compatible Use Zones and identify the impacts of the Fairgrounds on the ability of tenant commands, now and in the future, to perform mission-related training. Estimated cost to conduct the feasibility study: \$250,000.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Per EO 13514, were 100% of new facilities transit oriented?

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many new facilities were programmed by the installation?
2. Per EO 13514, were 100% of these programmed facilities transit oriented?
3. If not, why not?

2.5.5 Objective 5.5: Coordinate with Regional Watershed Management Programs

Table 2.5-5. Objective 5.5 Summary

Objective 5.5 Summary	
Objective Metric	Coordinate with regional watershed management programs.
Objective Unit of Measure	Instances of coordination.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma ensures that coordination with regional watershed management programs is conducted.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews and data provided by MCAS Yuma's CP&LO, the Environmental Department, and the Range Management Department.

2.5.5.1 Objective 5.5 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.5.5.2.

2.5.5.2 Objective 5.5 – FY 2010 Goal Performance Review

During FY 2009, the Environmental Department participated in Yuma County committee meetings to discuss the 2008 Wastewater Facilities Plan Update. Wastewater is carried to the City of Yuma treatment plant. To ensure that permitting requirements are met, MCAS Yuma conducts quarterly sampling and provides the results to the City.

During FY 2010, the MCAS Yuma Environmental Department continued to participate in Yuma County committee meetings and discussed regional wastewater treatment planning. In addition, MCAS Yuma's Environmental Department continued to conduct quarterly sampling of wastewater to ensure that the City's permitting requirements are met.

2.5.5.3 Objective 5.5 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, the MCAS Yuma Environmental Department continued to participate in Yuma County committee meetings and discussed regional wastewater treatment planning. In addition, MCAS Yuma's Environmental Department continued to conduct quarterly sampling of wastewater to ensure that the City's permitting requirements are met.

2.5.5.4 Objective 5.5 – Action Plan

The Action Plan for this objective is to consider the following recommendations to ensure ongoing ISPP implementation and compliance:

- Continue coordination with regional agencies and organizations on regional watershed management programs.
- Identify additional agencies, organizations, and community outreach events that will facilitate MCAS Yuma to continually meet and exceed the EO 13514 requirements for coordinating with regional watershed management programs.

- Develop a monitoring/tracking checklist and documentation process to annually record, account for, and ensure ongoing compliance with EO 13514 in the areas of watershed management.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. During the FY, were there coordination actions with regional watershed programs conducted by the installation? (Provide examples of coordination activities or provide reasons why coordination activities were not conducted.)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many coordination actions with regional watershed programs were conducted by the installation this FY?
2. Provide examples of coordination activities conducted.
3. If none, why not?

2.5.6 Objective 5.6: Coordinate with Regional Environmental Management Programs

Table 2.5-6. Objective 5.6 Summary

Objective 5.6 Summary	
Objective Metric	Coordinate with regional environmental management programs.
Objective Unit of Measure	Instances of coordination.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma ensures that coordination with regional environmental management programs is conducted.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews and data provided by MCAS Yuma's CP&LO, the Environmental Department, and the Range Management Department.

2.5.6.1 Objective 5.6 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.5.6.2.

2.5.6.2 Objective 5.6 – FY 2010 Goal Performance Review

The MCAS Yuma Environmental Department participates in a number of regional environmental management and educational programs. MCAS Yuma actively promotes the Comprehensive Environmental Training and Education Program (CETEP) to ensure necessary environmental management training to military and civilian employees, as well as residents. Prior to FY 2010, the Environmental Department began participation in a regional working group for P2. MCAS Yuma serves on the Arizona Sustainability and P2 Military Partnership as a voluntary charter member. The partnership is between the ADEQ and the DoD installations (Secretary of Defense [SECDEF] and SECNAV 2008). The P2 working group promotes “mission readiness, sustainability, and facilitates P2 innovation and information exchange” (SECDEF and SECNAV 2008).

Subsequent to a record high particulate matter 10 (PM-10) average of 170 micrograms per cubic meter of Air in 2002, MCAS Yuma's Environmental Department began coordinating with the County to facilitate the reduction of PM-10 in the Yuma region. Stakeholders in the Yuma area including MCAS Yuma's Environmental Department, the state of Arizona, City of Yuma, Yuma County, tribal agencies, law enforcement, businesses, federal agencies, and citizens formed a working group to develop a Natural Events Action Plan (NEAP) (MCAS Yuma 2011d). The NEAP focuses on the reduction and control of man-made PM-10 including information on how to communicate the effects of PM-10 to the public, construction site management, agricultural BMPs, and regulated use of canal roads and speed limits on dirt roads was enforced in August 2005 (MCAS Yuma 2011d). The Environmental Department regularly coordinates with the County to ensure BMPs aboard MCAS Yuma are in place and that PM-10 levels are monitored.

The MCAS Yuma Environmental Department also coordinates an annual Earth Week outreach event in celebration of Earth Day and coordinates the following activities:

- Youth park clean-up with youths from the Keystone, Torch club, and others in coordination with MCCS Youth Center Staff.

- Clean-up Palo Verde Street in coordination with the City of Yuma's adopt-a-street program.
- Earth Day 5K run which includes trophies made of recycled glass to the men's and women's first place finishers, initiated in FY 2008.
- Seed planting activity and Earth Day Art Activity in coordination with the Child Development Center.
- Environmental Fair to distribute educational materials related to recycling and conservation.

In addition, the Environmental Department has a booth at the annual Yuma Air Show to provide information to the community on MCAS Yuma's environmental stewardship programs.

MCAS Yuma was involved in the creation of the Western Regional Partnership (WRP) in 2007 and initiated the development of the WRP DoD Management Team. As a means for engaging MCAS Yuma in the region, the CP&LO participated on behalf of the DoD Management Team at the first WRP Principal's meeting held in November 2007. The DoD Management Team has the following role (MCAS Yuma 2011i):

- Advises the WRP Steering Committee on DoD issues.
- Coordinates and communicates with respective services in the region on military issues/concerns.
- Coordinates committee input to WRP Committees and ensures DoD issues are addressed through WRP.

Additional information related to MCIWEST Goal 5 is included in Appendix C.

During FY 2010, the Station Environmental Department continued to participate on behalf of MCAS Yuma in the regional working group for P2 as a voluntary charter member. The P2 working group continued to promote P2 information exchange and innovation to ensure mission readiness and sustainability by attending regular meetings, site visits, and information exchange with the partnership organizations including the ADEQ and regional DoD installations.

Also during FY 2010, the MCAS Yuma Environmental Department continued to coordinate with the County on PM-10 monitoring. In addition, the Environmental Department held the annual Earth Week event. Furthermore, the Environmental Department participated in the annual air show and had a booth that provided information to the community on MCAS Yuma's environmental stewardship programs.

In addition to previous involvement of MCAS Yuma on the DoD Management Team, the CP&LO continued to coordinate with the WRP on several subcommittees involving aviation, borders, energy, geographic information systems (GIS) and ranges (MCAS Yuma 2011i). In particular, this coordination included participation on the Aviation Subcommittee of the WRP on the following issues (WRP 2009):

- Coordination with aviation users to identify aviation issues and partnering with *The State Aviation Journal* to hold aviation meetings.

- Developing membership of the WRP Border Aviation Subcommittee to generate points of contact with major aviation users in Arizona, California, New Mexico, Nevada and Utah.
- Coordination with the WRP Disaster Preparedness Committee to list airspace contacts in case of disaster issues.

The CP&LO coordinates with the Border Subcommittee to address issues on the ranges including “wildlife corridors, protection of crucial habitat and preservation of key landscapes along the border” (WRP 2009). The CP&LO coordinates with the Border Subcommittee to manage border activities, including identifying existing border efforts, coordinating gaps, and creating a bibliography of related border activities (WRP 2009).

2.5.6.3 Objective 5.6 – FY 2011 Through FY 2020 Goal Performance Review

During FY 2011 MCAS Yuma’s continued to actively promote CETEP “to develop and update training and outreach in an effort to communicate environmental requirements, manage associated aspects, decrease environmental impacts through increased awareness, and to ensure compliance with laws, regulations, and policies” (MCAS Yuma 2011h). The Environmental Department continued to partner with other programs and organizations within MCAS Yuma to minimize potential environmental impacts and identify opportunities to align environmental programs to achieve common goals (MCAS Yuma 2011h). Of these partnerships, the following programs and community involvement activities were highlighted as FY 2011 Environmental Success Stories (MCAS Yuma 2011h):

- A partnership between the MCAS Yuma Recycling Center and the Army Yuma Proving Ground (YPG) was initiated due to the fact that YPG does not have a QRP. The YPG now recycles lead acid batteries through the MCAS Yuma QRP for recycling. This has resulted in a cost benefit for both YPG and MCAS Yuma, and further promotes recycling.
- New procedures as well as a partnership between a local recycling company and the Recycling Center have eliminated the need for plastics to be sorted at the Station and have further promoted waste diversion from the landfill (MCAS Yuma 2011h). This partnership has resulted in 52.5% more lbs of recyclables, cost savings due to efficiencies in staff time, and a 66.2% increase in revenue from recycled plastics as compared to FY 2010 (MCAS Yuma 2011g).
- MCAS Yuma continued to hold an annual Earth Day event for the public. The event aims to “promote sustainability and active involvement in the community, increase environmental awareness, and to encourage an earth-friendly way-of-life” (MCAS Yuma 2011h).
- Demonstrating MCAS Yuma’s commitment to the environment and surrounding community, the Environmental Department and several units and groups participated in the Adopt a Street Program through the City of Yuma. This commitment includes periodic street clean-ups as shown in Figure 2.5-2 (MCAS Yuma 2011h).

Figure 2.5-2. MCAS Yuma Adopt a Street Program



- The P2 Committee formulated by MCAS Yuma includes representatives from the environmental media programs. The P2 Committee meets on a biannual basis to discuss hazardous waste minimization and P2 aboard the Station and aims to facilitate the successful management of P2-related goals (MCAS Yuma 2011h).
- As shown in Figure 2.5-3, the Recycling Center’s “Roll-out Package” provides clear instructions and tools to broadcast program elements, including the following (MCAS Yuma 2011h):

- Station Order;
- Posters;
- Instructional brochures; and
- Points of contact and pickup times.

During FY 2012, MCAS Yuma anticipates continued Recycling Program improvements and partnerships, including coordination with Lincoln Military Housing to focus on family parks and recreation, continued partnering with MCCS, and marketing of MCAS Yuma generated media by MCCS (MCAS Yuma 2011g).

As of FY 2012, the MCAS Yuma Environmental Department is also considering the development of a CETEP program aimed at BMPs for stormwater management aboard the Station. The education program (i.e., “Rain Check”) would have an emphasis on Municipal Separate Storm Sewer Systems (MS4) management and compliance and would focus on employee and public training.

The CP&LO has initiated the development of a Strategic Outreach Communication Plan during FY 2012 which will highlight the formatting of an encroachment control team at MCAS Yuma and identify regular meetings to discuss encroachment issues. One of the goals of the Strategic Outreach Communication Plan is to look into the feasibility of acquiring the Fairgrounds land, as referenced in Section 2.5.4.4.

The CP&LO also participates on the Enhanced Readiness Team (ERT) for the Commander Navy Southwest Region. The ERT provides regular regional updates and encroachment-related issues that may be of concern to MCAS Yuma.

Based on interviews with Air Station staff, it is assumed that ongoing, and new, coordination efforts will continue with regional ecosystem, watershed, and environmental management programs from FY 2013 through FY 2020.

Figure 2.5-3. MCAS Yuma Recycling Center “Roll-out Package”



2.5.6.4 Objective 5.6 – Action Plan

The Action Plan for this objective is to consider the following recommendations to ensure ongoing ISPP implementation and compliance:

- Continue coordination with regional agencies and organizations on environmental management programs.
- Identify additional agencies, organizations, and community outreach events that will facilitate MCAS Yuma to continually meet and exceed the EO 13514 requirements for coordinating with regional watershed management programs.
- Develop a monitoring/tracking checklist and documentation process to annually record, account for, and ensure ongoing compliance with EO 13514 in the areas of environmental management.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. During the FY, were there coordination actions with environmental management programs conducted by the installation? (Provide examples of coordination activities or provide reasons why coordination activities were not conducted.)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many coordination actions with environmental management programs were conducted by the installation?
2. Provide examples of coordination activities conducted.
3. If none, why not?

2.6 MCIWEST GOAL 6 – IMPLEMENT SUSTAINABLE BUILDING DESIGN, CONSTRUCTION, OPERATIONS AND MAINTENANCE, AND DECONSTRUCTION

2.6.1 Objective 6.1: All New Buildings that Begin the Planning Process in 2020 or After are Designed to Achieve Zero-Net-Energy by 2030

Table 2.6-1. Objective 6.1 Summary

Objective 6.1 Summary	
Objective Metric	All new buildings that begin the planning process in 2020 or after are designed to achieve zero-net-energy (ZNE) by 2030.
Objective Unit of Measure	Percent of buildings that are designed to achieve ZNE.
Objective Baseline Year	FY 2010
Objective Status	The Station has begun initial planning and consideration to meet the ZNE metrics of this objective.
Forecasted Status	The Air Station will meet this requirement.
Data Source	Interviews with Public Works Department staff.

2.6.1.1 Objective 6.1 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.6.1.2.

2.6.1.2 Objective 6.1 – FY 2010 Goal Performance Review

Objective 6.1 establishes that beginning in FY 2020 all new federal buildings will be designed to achieve ZNE by 2030, assuming that sufficient competition will exist among commercially available technologies to support economically viable design solutions and acquisition strategies.

Currently, limited planning to meet this objective's requirements have been initiated at MCAS Yuma. A process for developing ZNE criteria or a timetable for developing it did not exist as of FY 2010 and there are no buildings that are currently planned to meet ZNE requirements.

2.6.1.3 Objective 6.1 – FY 2011 Through FY 2020 Goal Performance Review

In 2011, MCAS Yuma began development of the Station's strategic energy plan which has a strong emphasis on renewable energy development and the Station's energy independence status – a component of this plan will be consideration of building design and ZNE capability. In FY 2011 and FY 2012 the renewable energy development program grew modestly. It is projected that by FY 2020, the Station will be generating greater than 65% of its total energy use from renewables.

2.6.1.4 Objective 6.1 – Action Plan

The Objective 6.1 ZNE metric requires that all new buildings that begin the planning process in 2020, or after, are designed to achieve ZNE by 2030; calculated on the basis of the Station's capability rather than measured quantitatively. Preparation to begin complying with the ZNE design objective beginning in FY 2020 should address, but not be limited to the following key elements:

- Development of a comprehensive definition of ZNE and associated criteria (see below) for computing the metric.

- Assessment of planning and programming to identify candidate projects for ZNE design.
- Coordinated development of processes with NAVFAC SW for managing and tracking the design and construction of buildings to meet ZNE. Specifically, the Station should ensure participation in any ZNE-related NAVFAC SW and USMC policy development and design forums to ensure that desert environment are considered and addressed in these processes.
- Status reporting procedures (see below).
- Verification and validation procedures, as needed, to ensure credibility and consistency.

Definition of ZNE and Associated Criteria – In order to report the metric for ZNE design, several criteria issues must be addressed. For example, ZNE implies that no new energy shall be brought into the building, that is, the building generates the energy to power its essential needs through renewable sources. However, a common and pragmatic alternative for renewable energy generation is centralized solar arrays or wind farms which power multiple facilities. To receive credit for the ZNE from centralized renewable sources, metric criteria must allow the import of renewable energy from external sources. This interpretation needs further clarification as to whether the creditable renewable source is confined to the installation or alternatively may be imported from off-installation. An example of an off-installation renewable energy source is recovered methane gas from government waste in a commercial landfill used to power gas turbines.

Status reporting – Synchronization of reporting systems with NAVFAC SW directives is needed to manage and track building design and improvements, and the status of compliance with ISPP metrics. Design processes should encompass all facets of design objectives, including LEED, Guiding Principles, and ZNE.

While the renewable energy program at MCAS Yuma is modest to date, the Station is demonstrating a commitment toward conversion to renewable energy and is pursuing increased project funding to support selected initiatives. The Station is fully supported by USMC and NAVFAC SW in this endeavor. Since these are the necessary methods for compliance, through ongoing development and implementation of the strategic energy plan and other ZNE planning mechanisms already in place, MCAS Yuma is fully capable of achieving compliance with this objective.

Additional Considerations Regarding Net Zero Energy Installation (NZEI) Planning - In 2008 a joint initiative was formed between the DoD and DoE to address military energy use and examine the potential for ZNE military installations. This led to a ZNE assessment of MCAS Miramar under the direction of the National Renewable Energy Laboratory (NREL). Appendix A of the NREL report highlights the many and growing number of renewable energy sources, the extensive evaluation needed to choose from alternatives, the need for complex sensing and control systems to integrate multiple renewable sources into the grid, and the many alternatives for funding a ZNE initiative.

The approach to the study is impressively systematic and comprehensive in addressing these complexities. Also impressive are the realistic opportunities for DoD installations to approach the ZNE objective as demonstrated by the MCAS Miramar assessment. Alternative finance mechanisms and private sector partnering, such as MCAS Miramar's landfill gas PPA, are key to project execution. In

addition to attractive payback and savings, their on-site renewable energy generation enhances energy security and independence.

Two important observations arise from this report with respect to development of the MCAS Yuma ISPP and should be taken into consideration as the Station moves forward with ZNE planning:

- The assessment of NZEI potential is complicated when inadequate data compromises the analysis. From the onset, it is important to assess both near-term and long-term data requirements and begin collecting all data necessary for assessments. NREL has provided associated data needs, templates, and guidelines for the numerous analyses in a technical report entitled *Net Zero Energy Military Installations: A Guide to Assessment and Planning* (August 2010) NREL/TP-7A2-48876, available at <http://www.nrel.gov/docs/fy10osti/48876.pdf>. NREL acknowledges the benefits of expanding and refining these broad guidelines to provide needed detailed guidance, which supports both long range and detailed planning efforts, and is agreeably supporting this effort.
- As installations progress toward full compliance, they should anticipate and prepare for the issues of complex grid structures and associated control systems. Early planning that takes these issues into consideration will prove highly beneficial in terms of cost and flexibility in making best choices in the future.

2.6.2 Objective 6.2: 15% of the Existing Federal Building Inventory of the Agency (Existing and Leased) Meets the Guiding Principles by FY 2015 and Continue Towards 100% Compliance for Complete Building Inventory

Table 2.6-2. Objective 6.2 Summary

Objective 6.2 Summary	
Objective Metric	15% of the existing federal building inventory of the Agency meets the Guiding Principles by FY 2015 and continue towards 100% compliance for the complete building inventory.
Objective Unit of Measure	Percent of new and existing buildings and building leases over 5,000 SF that meet the Guiding Principles.
Objective Baseline Year	FY 2010
Objective Status	The primary role of Naval Facilities Engineering Command Southwest in managing the design of new construction and major maintenance and repair projects for the Station assures compliance with the Guiding Principles.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews with Public Works Department staff.

2.6.2.1 Objective 6.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.6.2.2.

2.6.2.2 Objective 6.2 – FY 2010 Goal Performance Review

Conformance with Guiding Principles in the design of new buildings is well established (see Appendix C for a summary of the Guiding Principles requirements). NAVFAC SW policy formally incorporates the Guiding Principles, LEED, and Energy Conservation Analysis (ECA) in the development of scopes and contract documents for design/build, major repair, and alteration projects.

NAVFAC Engineering Construction Bulletin (ECB) 2011-01, *Navy Shore Energy Building Standard* (December 2010), established Energy and Sustainability Standards for new building construction and building renovation projects, as follows:

- Beginning in FY 2013 for Navy military construction (MILCON) projects; and
- Beginning in FY 2011 for O&M funded minor construction, special projects, repair projects, and normal maintenance operations.

Projects that exceed 50% plant replacement value (PRV) but do not include design or construction requirements are excluded.

ECB 2011-01 also expanded the Requirements for Existing Buildings, as follows:

- Minor renovations projects (e.g., O&M, moral, welfare, and recreation) – incorporate energy-efficient designs, equipment, and controls to the maximum practical extent;
- All repair or alteration of existing buildings – comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings; and

- Building repair projects with project threshold exceeding \$2.5 million – these projects shall be developed to reduce the consumption of energy, water, and materials, and to identify alternatives that reduce maintenance costs.

NAVFAC SW, as the design agent for MCAS Yuma, takes the lead in managing compliance by formally incorporating the Guiding Principles, LEED, and ECA in the development of scopes and contract documents for design/build, major repair, and alteration projects. NAVFAC SW Capital Improvements Office design managers coordinate with project engineers from concept through construction. Building documentation, warranties, and certifications are provided by the construction contractor as specified and passed by the ROICC to the MCAS Yuma project engineer for record. Schedules and status reports maintained by project engineers often reflect individual style and building files are still largely paper files. The variety of formal and informal reporting systems and inconsistent practices make it difficult to identify the necessary data to ensure compliance with this objective. Building information is keyed into major databases, such as Internet Naval Facilities Assets Data Store (iNFADS), as required, but these systems do not currently encompass all information needed to report ISPP metrics or to manage performance to achieve objective goals.

The most current MCAS Yuma Master Plan is dated 2007. The Master Plan identifies numerous buildings that are recommended for construction and/or demolition prior to FY 2015 (MCAS Yuma 2007a). Subsequent amendments to the Master Plan since 2007 associated with the JSF preparations; however, have rendered the 2007 Master Plan outdated. Public Works Department Planners intend to update the Master Plan and generate the inventory of qualifying buildings from iNFADS as resources become available. Incorporation of the Guiding Principles and metrics established by the EO and this ISPP into the revised Master Plan is needed.

2.6.2.3 Objective 6.2 – FY 2011 Through FY 2020 Goal Performance Review

The primary role of NAVFAC SW in managing the design of new construction and major maintenance and repair projects for the Station assures compliance with the Guiding Principles. Since the FY 2010 analysis, there has been little change in the process or procedures.

A summary of the Guiding Principles (see Appendix C) provides the key aspects each of the five categories of the Guiding Principles for New Construction and Major Renovations:

1. Employ integrated assessment, operation, and management principles;
2. Optimize energy performance;
3. Protect and conserve water;
4. Enhance indoor air quality; and
5. Reduce environmental impacts of materials.

The Key Aspects of the Guiding Principles for New Construction and Major Renovation projects applies as well to all repair, alteration, and renovations projects.

2.6.2.4 Objective 6.2 – Action Plan

In coordination with NAVFAC SW, the Station should attempt to establish the existing status of individual building compliance. This will facilitate efficient planning needed to meet the percent compliance goals and the ability of the Station to establish reasonable costing and prioritizing of local, special, repair, or maintenance projects.

Potential project sources include construction, major maintenance and repair, environmental, energy, and those accomplished under facilities service contracts (FSC). Planning and funding of these projects are somewhat independently managed by Engineering and Architecture, Energy, Environmental, and Public Works Departments, each of which manages different fund sources, both appropriated and public private venture (PPV) initiatives. To achieve the ISPP objectives requires a shared vision of the importance and benefits of energy and environmental programs in protecting resources and national security, as well as being able to adequately document progress. In addition to independent planning and programming, departments must coordinate and collaborate on their projects to leverage financing and scope. For example, an environmental project may address clean water issues; an energy project may address PV and solar hot water; and FSC may address various energy reduction/conservation initiatives. Even if funded and contracted separately, coordination could achieve overall compliance with Guiding Principles while strengthening the justification of each individual project.

To assist in achieving the ongoing goals of this objective, it is recommended that a prioritized list of projects be developed by Station planners to satisfy both mission requirements and the goals of EO 13514. In order to develop project documents including cost estimates, the condition of existing facilities and the scope of work required to conform to the key aspects of Guiding Principles must be developed. In developing priorities for candidate projects, an understanding of the relative benefits of competing projects from both mission and sustainability perspectives are needed. A weighting system similar to the LEED certification Score Card would be well-suited to the Guiding Principles, for this purpose. In the current situation, where such information must be manually extracted and compiled from multiple sources, a procedure for recording this information is needed to comprehensively compile, report, and, subsequently, validate and verify the results. Until the current status of individual building compliance is established (if it is determined this is feasible), the challenges to meeting the percentage compliance goals and the ability to establish reasonable pricing and prioritizing of local special, repair, or maintenance projects will remain.

All staff involved in project planning and execution should pursue a shared vision by achieving a high level of coordination on projects within the Station. As part of improving the Station's compliance posture with this objective, it is recommended that an information system be developed to track coordinated project planning and execution activities, including the overall progress of individual buildings toward 100% compliance with the Guiding Principles. The primary role of NAVFAC SW in managing design of new construction and major maintenance and repair projects for MCAS Yuma will assist with future/ongoing compliance with the Guiding Principles.

2.6.3 Objective 6.3: Implement and Achieve Objectives of Stormwater Guidance

Table 2.6-3. Objective 6.3 Summary

Objective 6.3 Summary	
Objective Metric	Implement and achieve the objectives of the Stormwater Guidance.
Objective Unit of Measure	Has the Station achieved objectives of the Stormwater Guidance?
Objective Baseline Year	FY 2010
Objective Status	Development projects are being planned and designed to the maximum extent feasible with stormwater management practices with the intent to preserve predevelopment hydrology.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews with the ROICC and review of project management documents.

2.6.3.1 Objective 6.3 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.6.3.2.

2.6.3.2 Objective 6.3 – FY 2010 Goal Performance Review

When EO 13514 was signed in October 2009, the EO required that the USEPA “issue guidance on the implementation of Section 438” of the Energy Independence and Security Act (EISA). This is the “Stormwater Guidance” referenced in the objective’s title and refers to the USEPA’s *Technical Guidance on Implementing the Stormwater Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (USEPA 2009). Objective 6.3 focuses on implementation of USEPA’s technical guidance document for the implementation of EISA Section 438 (USEPA 2009). Objective 6.5 supports meeting Objective 6.3 by specifically focusing on the development and redevelopment of facilities over 5,000 SF. Jointly, the aim of Objectives 6.3 and 6.5 is to assist in sustainable watershed management, including the volume of stormwater runoff and the quality of that runoff (i.e., contaminants), by using strategies to maintain preexisting hydrologic characteristics for new development and redeveloped sites.

The USEPA Stormwater Guidance (USEPA 2009) recommends tools to implement the requirements of EISA Section 438. In contrast to “prescriptive” requirements, the Guidance recommends a “performance based approach” to provide designers flexibility in the selection of utilizing low impact development (LID strategies and stormwater BMPs. The Stormwater Guidance establishes “Performance Design Objectives” to support compliance with Section 438. The objective being to either design a site to retain the 95th percentile rainfall event or completing a site-specific hydrologic analysis to determine the stormwater management practices needed to preserve the site’s predevelopment runoff conditions. This allows designers to “design, construct, and maintain stormwater management practices that manage rainfall onsite, and prevent off-site discharge.” The best strategies to preserve a site’s predevelopment runoff conditions include those that promote infiltration into the ground, evapotranspiration, and on-site reuse. These strategies are often referred to as green infrastructure or low impact development approaches and technologies.

The goal of Section 438 is to “protect and preserve the water resources onsite and those downstream” from the developed site. To reduce and prevent discharge of pollutants into storm water runoff, BMPs

and LID practices continue to be planned for and implemented across MCAS Yuma. Since FY 2008, all capital improvement projects planned for construction have been designed to the maximum extent feasible with the intent to preserve predevelopment hydrology. During FY 2008 through FY 2009, one project greater than 5,000 SF was initiated with planning for additional projects to begin after FY 2009 (see Table 2.6.6, Objective 6.5). In FY 2010, the Air Station continued to implement LID practices to “the maximum extent technically feasible” for all development and redevelopment projects greater than 5,000 square feet.

During FY 2010, five capital improvement projects were under construction utilizing the following LID practices (see Table 2.6.6, Objective 6.5):

- use of stormwater controls for roof drains;
- installing of pervious surfaces in place of permeable, where possible (e.g., pervious parking lots);
- minimizing disturbed areas during construction; and
- planning for the removal of impermeable pavement and replacement with pervious surfaces.

2.6.3.3 Objective 6.3 – FY 2011 Through FY 2020 Goal Performance Review

During FY 2011, MCAS Yuma continued to support sustainable watershed management by planning for and implementing strategies to preserve predevelopment hydrology. To date, all capital improvement projects planned for construction have been designed to the maximum extent feasible with stormwater management LIDs and BMPS with the intent to preserve each site’s predevelopment hydrology. In FY 2011, seven capital improvement projects utilizing stormwater BMPs and LID strategies were initiated with completion planned in FY 2012 and FY 2013. These projects and the planned LIDs are summarized in Table 2.6-4 (Objective 6.5).

2.6.3.4 Objective 6.3 – Action Plan

As part of the Objective 6.3 Action Plan, it is recommended that MCAS Yuma continue to plan for, and implement, strategies to support sustainable watershed management. Because the Air Station is within an arid region with infrequent, high-intensity rainfall events, LID strategies and practices should be selected to protect and restore receiving water channels and habitat corridors. This can be achieved by employing stormwater LIDs that minimize erosion, provide opportunities for infiltration (aquifer recharge) and evaporation, or allow for runoff storage for on-site reuse (irrigation). This approach supports meeting the Arizona Pollutant Discharge Elimination System Permit Program for construction and land disturbance activities and NAVFAC SW’s policy to “require large construction projects to implement LID practices” (MCAS Yuma 2013b). In addition, this approach supports meeting the Objective 6.3 FY 2020 goal to effectively manage stormwater volume and water quality to maintain preexisting hydrologic conditions.

For the southwest region, it is most beneficial to use techniques to promote infiltration and stormwater storage for onsite reuse or evaporation. Table 2.6.7 (see Objective. 6.5) lists the capital construction projects currently planned and estimated completion years. For projects where the design is not currently complete, green infrastructure or LID strategies that could be considered are listed.

For all future projects, MCAS Yuma must continue to follow the USEPA Stormwater Guidance (USEPA 2009) Performance Design Objectives: design a site to retain the 95th percentile rainfall event or complete a site-specific hydrologic analysis to determine the stormwater management practices needed to preserve the site's predevelopment runoff conditions. Flow monitoring can be employed to measure the success of the Performance Design Objectives. Annual review and reporting through FY 2020 will ensure development planning and design meets Objective 6.3 requirements. Given Objective 6.3 and 6.5 are supporting the preservation of onsite predevelopment hydrology, annual review and reporting of these two objectives can be completed simultaneously.

In addition, it is recommended that the Air Station continue to follow regional LID guidelines and recommendations relevant to NPDES stormwater permits, DoD, and NAVFAC SW policies, the climatic region, and the proposed construction project. This approach would ensure the FY 2020 goal is met while managing stormwater to meet relevant permits and policies to protect regional water resources and habitat.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Did all projects comply with the applicable EO 13514 Stormwater Guidance Objectives? (If not, how many projects did not comply with these objectives and why?)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many projects did the installation execute that were required to comply with the Stormwater Guidance Objectives?
2. Did 100% of these projects comply with the EO 13514 Stormwater Guidance Objectives?
3. If not, why not?

2.6.4 Objective 6.4: Achieve LEED Certification of Buildings for New Construction and Major Renovations

Table 2.6-4. Objective 6.4 Summary

Objective 6.4 Summary	
Objective Metric	Achieve LEED certification of buildings for new construction and major renovations.
Objective Unit of Measure	How many buildings are inherently LEED accredited (Silver, Gold, Platinum) – percentage and number.
Objective Baseline Year	FY 2010
Objective Status	The primary role of NAVFAC SW in managing the design of new construction and major maintenance and repair projects for MCAS Yuma assures continued compliance with the LEED certification program and the requirements. In 2010 one project achieved LEED silver certification, building P-498, a 300 person bachelors enlisted quarters. In 2011 one project, the P-495 Applied Instruction Facility comprising 48,000 SF, achieved LEED silver certification.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews with I&L Department and Public Works Department staff.

2.6.4.1 Objective 6.4 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.6.4.2.

2.6.4.2 Objective 6.4 – FY 2010 Goal Performance Review

NAVFAC ECB 2008-01 established the Navy policy requiring that all projects for new buildings and major renovations where the work exceeds 50% of the building's PRV must be registered with the U.S. Green Building Council and be certified to meet a minimum LEED Silver-level rating.

The LEED certifications achieved for new construction or major renovation projects during FY 2010 comprise the metric data necessary to determine the baseline inventory and facilitate monitoring of compliance with EO requirements. The I&L Department, including the Engineering Division, at MCAS Yuma, plan and develop projects, criteria and designs for installation facilities including project support for the Energy and Environmental Departments. Project managers coordinate with the NAVFAC SW Capital Improvement Office design managers to develop project scopes and contract documents for design/build, major repair, and alterations projects at MCAS Yuma. In accordance with NAVFAC SW standard operating procedures, the project's designated LEED Accredited Professional (AP) sends design review documentation to the Public Works Department at MCAS Yuma. MCAS Yuma facilities engineers and the Energy Management office review designs to ensure energy efficient measures are incorporated into each project. The focus of the reviews has been to improve the energy efficiency of new buildings at the Station to meet LEED standards for new buildings. Upon completion of construction, the NAVFAC SW ROICC receives LEED certification as a design/build contract deliverable and forwards it for MCAS Yuma building inventory files. In 2010 one project achieved LEED Silver certification, building P-498, a 300 person BEQ.

2.6.4.3 Objective 6.4 – FY 2011 Through FY 2020 Goal Performance Review

In 2011 one project, the P-495 Applied Instruction Facility comprising 48,000 SF, achieved LEED Silver certification.

It should be noted that in 2011, the Navy announced it will be adopting a policy of building to the LEED Gold standard for new construction and major renovations. Beginning in FY 2013, LEED Gold will be required for every new Navy and Marine Corps military construction project.³

2.6.4.4 MCIWEST Objective 6.4 – Action Plan

The primary role of NAVFAC SW in managing the design of new construction and major maintenance and repair projects for MCAS Yuma assures continued compliance with the LEED certification program and the requirements of Objective 6.4. MCAS Yuma should continue to proactively plan and justify projects to meet mission essential requirements in compliance Objective 6.4.

As the number of LEED projects increases, the development of a database or other method to document and track LEED registration and certification is recommended to record project status and comments (e.g., funding status; project phase status [i.e., planning, design, construction, completion]; and documentation of overall project planning status and associated LEED credits). The development of this tracking system would support efficient and consistent reporting.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. During the FY, did all new construction and/or major renovations meet a LEED standard?

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many new construction and/or major renovation projects, eligible for LEED certification, were completed by the installation?
2. Were 100% of the eligible projects LEED certified?
3. If not, why not?

³ On May 10, 2011, Navy Secretary Ray Mabus announced that the Navy and Marine Corps will aim for LEED Gold certification for all its new buildings beginning in 2013. In this announcement, Secretary Mabus went on to indicate that by FY 2013 the Navy will require every new building to earn LEED certification without increasing the department's budget.

2.6.5 Objective 6.5: All Development and Redevelopment Projects of 5,000 Square Feet or More Maintain Predevelopment Hydrology to the Maximum Extent Technically Feasible

Table 2.6-5. Objective 6.5 Summary

Objective 6.5 Summary	
Objective Metric	Maintain predevelopment hydrology to the maximum extent technically feasible on all development and redevelopment projects of 5,000 SF or more.
Objective Unit of Measure	All development and redevelopment projects of 5,000 SF or greater maintaining pre-development hydrology to the maximum extent technically feasible.
Objective Baseline Year	FY 2008
Objective Status	LID strategies are planned for implementation with all MCAS Yuma's Capital Improvement Projects over 5,000 SF.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interviews with the ROICC and review of project management documents.

2.6.5.1 Objective 6.5 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.6.5.2.

2.6.5.2 Objective 6.5 – FY 2010 Goal Performance Review

The Objective 6.5 metric supports meeting Section 438 of EISA, which “requires federal agencies to develop and redevelop facilities with a footprint that exceeds 5,000 SF in a manner that maintains or restores the pre-development site hydrology to the maximum extent technically feasible” (USEPA 2009). Objective 6.5 focuses on the development and redevelopment of facilities over 5,000 SF. The use of LID strategies and BMPs for all new construction and redevelopment can assist Marine Corps installations in meeting this objective.

Low impact development guidelines can assist installations in meeting this sustainability objective. MCAS Yuma is in a mostly arid environment, but does experience seasonal rains in the winter months, as well as occasional large storm events that can cause flooding. MCAS Yuma began actively managing stormwater utilizing low LID measures in FY 2008. Responsibility for implementation of the program is managed by the ROICC.

In FY 2009, MCAS Yuma improved upon the requirements of the goal by returning a preexisting developed parking lot for Building 151 (the Afterburner Café) into a LID-style parking lot with pervious paving stones. The parking lot is performing well and appears to be a viable alternative for MCAS Yuma to utilize in future years.

In FY 2010, 4 out of 4 construction projects were completed utilizing LID guidelines. The guidelines implemented at MCAS Yuma as part of these development projects include:

- Including stormwater control for roof drains;
- Utilizing pervious surfaces, where possible (e.g., pervious parking lots);
- Minimizing disturbed areas during construction; and

- Planning to remove existing pavement and replace with pervious paving tiles during repaving activities.

2.6.5.3 Objective 6.5 – FY 2011 Through FY 2020 Goal Performance Review

During FY 2011, MCAS Yuma continued to plan for and implement strategies to support sustainable watershed management. For example, an extensive stormwater management system collects and manages stormwater runoff from the airfield runways and taxiways. A detention basin located at the south end of MCAS Yuma manages the release of stormwater volumes through either evaporation or infiltration into the ground. Where feasible, all construction or redevelopment projects over 5,000 SF are being planned for and constructed with stormwater BMPs and LID strategies. In FY 2011, nine Capital Improvement Projects (CIPs) utilizing stormwater BMPs and LID strategies were under construction with completion planned in FY 2012. These projects are summarized in Table 2.6-6.

Table 2.6-6. MCAS Yuma Ongoing Capital Improvement Projects in FY 2011

Construction Project	Year Initiated	Anticipated Completed Year	Building Area (SF)	Low Impact Development Stormwater Management Strategies and Practices
Building 505	FY 2010	FY 2011	16,170	Conversion from asphalt parking lot to grass mat.
Building 153	FY 2010	FY 2011	15,023	
Building 1176	FY 2010	FY 2011	21,951	
Applied Instructional Facility-MAWTS (Building 406A)	FY 2009	FY 2011	48,265	A combination of the following practices and strategies were used on these buildings: <ul style="list-style-type: none"> • Stormwater and flow-through planters; • Stormwater bump outs on curbs or tree trenches (where feasible to not impede road or walkway function); and/or • Infiltration-based BMPs (promote groundwater recharge and enable downspout disconnection).
Simulator (Building 410)	FY 2010	FY 2012	43,196	
Hangar (Building 80)	FY 2011	FY 2013	52,926	
ISMT Facility (Building 1248)	FY 2011	FY 2013	4,897	
Hangar (Building 157)	FY 2011	FY 2013	65,122	
Hangar (Building 78)	FY 2011	FY 2013	52,926	
IMA Facility (Building P-573)	FY 2011	FY 2013	38,890	
Van Pad (Building P-578)	FY 2011	FY 2013	8,998	
Comm Building (Building P-583)	FY 2011	FY 2013	38,703	

2.6.5.4 Objective 6.5 – Action Plan

It is recommended that MCAS Yuma continue to plan for and implement strategies to support sustainable watershed management. Given that MCAS Yuma exists within a desert climate with infrequent and high rainfall intensities, LID strategies and practices should be selected to protect and restore receiving water channels and habitat corridors. This can be achieved by employing stormwater LIDs that minimize erosion, provide opportunities for infiltration and evaporation, or allow for runoff storage for on-site reuse (i.e., irrigation). These initiatives will support a stormwater management

program that effectively manages stormwater volume and water quality, while supporting the goal to maintain preexisting hydrologic conditions.

Currently, all construction or redevelopment projects over 5,000 SF are being planned for and constructed with stormwater BMPs and LID strategies (MCAS Yuma 2012b). New construction for large buildings includes detention vaults located under parking lots. These vaults not only store stormwater volumes, but are designed for slow release to facilitate infiltration into nearby landscapes (MCAS Yuma 2012b). From FY 2013 and beyond, the MCAS Yuma ROICC must continue to ensure that funded and planned/proposed construction projects over 5,000 SF include stormwater management strategies and practices that promote maintaining preexisting hydrologic conditions.

For the dry and hot Yuma region, it is most beneficial to use techniques to promote infiltration and stormwater storage for reuse. It is recommended to develop LID guidelines and recommendations specific to the Yuma climate and types of construction proposed for FY 2013 through FY 2020. Table 2.6-7 identifies CIPs through FY 2018. Development of LID guidelines specific to MCAS Yuma would ensure the FY 2020 goal is met while managing stormwater to promote good environmental stewardship.

Table 2.6-7. MCAS Yuma Capital Improvement Projects for FY 2012 through FY 2018

Construction Project	Year Initiated	Anticipated Completed Year	Building Area (SF)	Potential Stormwater Management Strategies and Practices
Security Operations (P-378)	FY 2012	FY 2014	32,152	<ul style="list-style-type: none"> • Rain gardens • Stormwater and flow-through planters • Vegetated (green) pathways • Stormwater bump outs on curbs or tree trenches (where feasible to not impede road or walkway function) • Rainwater cistern (capture roof runoff for irrigation or gray water use) • Pervious (permeable) pavement • Underground structures for rain water retention basins • Infiltration-based BMPs (promote groundwater recharge and enable downspout disconnection)
ALF Training Facility (P-575)	FY 2012	FY 2014	10,924	
Maintenance Hangar (Building 75)	FY 2012	FY 2014	60,199	
Maintenance Hangar (Building 76)	FY 2012	FY 2014	60,199	
Dining Hall (P-539)	FY 2013	FY 2015	112,439	
Hangar (P-570)	FY 2016	FY 2018	89,728	

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Did all projects that exceeded a disturbance of 5,000 SF maintain pre-development hydrology per EO 13514 hydrology preservation objectives? (If not, how many projects did not maintain pre-development hydrology and why?)

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many projects exceeded a disturbance of 5,000 SF and were required to maintain pre-development hydrology?
2. Did 100% of these projects comply with the EO 13514 hydrology preservation objectives?
3. If not, why not?

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2.7 MCIWEST GOAL 7 - ADVANCE SUSTAINABLE ACQUISITION

2.7.1 Objective 7.1: 95% Procurement Conducted Sustainably

Table 2.7-1. Objective 7.1 Summary

Objective 7.1 Summary	
Objective Metric	Percent of sustainable procurement (the percent of contract actions that adhere to the principles of sustainability by containing requirements for: energy-efficient, water efficient bio-based, environmentally preferable, non-ozone depleting, containing recycled content and/or are non-toxic or less toxic alternatives).
Objective Unit of Measure	Percent of contract actions that adhere to the principles of sustainability.
Objective Baseline Year	FY 2010
Objective Status	The Station has not established procedures or policies to track data related to meeting this objective's requirements.
Forecasted Status	The Air Station will meet this requirement.
Data Source	Federal Procurement Data System (FPDS).

2.7.1.1 Objective 7.1 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.7.1.2.

2.7.1.2 Objective 7.1 – FY 2010 Goal Performance Review

Currently, there is no data available to support the establishment of a baseline value for this objective. The Station GPP initially published in in 2004 and last updated in 2008, does not establish roles and responsibilities sufficiently to ensure green procurement data is tracked and reported to meet ISPP requirements. MCAS Yuma Contracting Office staff indicated they do not maintain the appropriate records to establish a baseline percent related to the number of contract actions (new contracts and modifications) that adhere to the principles of sustainability. Although “green” purchases are generally made when available and appropriate (e.g., Energy Star®, recycled content products, etc.), presently a tracking mechanism is not in place at the Station to document the number of contract actions associated with these procurement actions. However, based on interviews with MCAS Yuma staff and review of the December 2010 ECE results, it should be noted that “green” purchases are generally made when available and appropriate (e.g., Energy Star®, recycled content products, etc.).

2.7.1.3 Objective 7.1 – FY 2011 Through FY 2020 Goal Performance Review

No additional significant actions were taken in FY 2011 to allow for a status determination with regard to this objective's metrics. As stated in previous sections, MCAS Yuma continued with a priority on “green” purchasing when available and appropriate.

Revisions to the Federal Acquisition Regulations - Effective 31 May 2011, an interim rule to the Federal Acquisition Regulations (FAR) Part 23 was issued requiring federal agencies to implement EOs 13514 and 13423 sustainable procurement requirements. With regards to the acquisition of sustainable products, FAR Subpart 23.1 was added in the interim rule.

48 CFR 23, § 23.103 – Sustainable Acquisition Policy (2011):

(a) Federal agencies shall advance sustainable acquisition by ensuring that 95% of new contract actions for the supply of products and for the acquisition of services (including construction) require that the products are:

- (1) Energy-efficient (Energy Star® or FEMP-designated);
- (2) Water-efficient;
- (3) Biobased;
- (4) Environmentally preferable (e.g., EPEAT®-registered, or non-toxic or less toxic alternatives);
- (5) Non-ozone depleting; or
- (6) Made with recovered materials.

(b) The required products in the contract actions for services include products that are—

- (1) Delivered to the Government during performance;
- (2) Acquired by the contractor for use in performing services at a Federally-controlled facility; or
- (3) Furnished by the contractor for use by the Government.

(c) The required products in the contract actions must meet agency performance requirements.

(d) For purposes of meeting the 95% sustainable acquisition requirement, the term “contract actions” includes new contracts (and task and delivery orders placed against them) and new task and delivery orders on existing contracts.

On 4 October 2011, the DoD issued a policy addressing the reporting of sustainably procured products per EO 13514 and 13423 in the FPDS. Furthermore, contractors shall provide data of USEPA designated items purchases as mandated by EO 13423, EO 13514, and EO 13221, *Energy Efficient Standby Power Devices*.

2.7.1.4 Objective 7.1 – Action Plan

The Action Plan is to consider the following recommendations to ensure ongoing ISPP implementation and compliance:

- Update the MCAS Yuma GPP to ensure the GPP establishes effective policies and defines roles and responsibilities to sufficiently implement and track green procurement actions to meet ISPP requirements. Ensure all activities/organizations with procurement responsibilities (i.e., MCCA) are included in the GPP roles and responsibilities section.
- Develop training sessions for MCAS Yuma staff on the sustainable acquisition policies (e.g., ongoing training highlighting the FPDS resources/tracking methodology, the development of a Sustainable Acquisition Desktop Reference Guide, content of the GPP regarding sustainable procurement requirements, etc.).

- Obtain annual FPDS data to document the percentage of sustainable acquisitions aboard MCAS Yuma (anticipated availability of reports is FY 2012 and subsequent years).
- Consider tracking sustainable acquisitions by Government Purchase Cards per EO 13514 requirements for future ISPP reporting years.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Did 95% of procurement actions include at least one sustainable attribute in accordance EO 13514?

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, how many procurement actions were completed by the installation's procurement office(s)?
2. Were 95% of these procurement actions "sustainable" in accordance with EO 13514?
3. If not, why not?

2.7.2 Objective 7.2: Use a Minimum of 30% Post-consumer Recycled Paper

Table 2.7-2. Objective 7.2 Summary

Objective 7.2 Summary	
Objective Metric	What percent of paper used at the Station has at least 30% post-consumer recycled paper content.
Objective Unit of Measure	Percent of paper purchased with at least 30% post-consumer recycled paper content.
Objective Baseline Year	FY 2010
Objective Status	Procedures are currently not in place to track data associated with this objective.
Forecasted Status	The Air Station will meet this requirement.
Data Source	Procurement records.

2.7.2.1 Objective 7.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.7.2.2.

2.7.2.2 Objective 7.2 – FY 2010 Goal Performance Review

Currently, there is no data available to support the establishment of a baseline value for this objective. The MCAS Yuma GPP established policy related to this objective and states that “The minimum standard for high speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and over stock is 30% post-consumer materials. If products with 30% post-consumer content are not available, do not meet performance requirements or are unreasonably priced, federal purchasers must buy products containing no less than 20% post-consumer material, without exception” (MCAS Yuma 2004).

The Ability 1 store is the mandatory Air Station source for office supplies, including paper; however, the MCAS Yuma Contracting Office has no oversight on what the store stocks, and no data is available from this operation regarding paper procurement procedures.

2.7.2.3 Objective 7.2 – FY 2011 Through FY 2020 Goal Performance Review

No additional significant actions were taken in FY 2011 to allow for a status determination with regard to this objective’s metrics. However, it was confirmed through Environmental Department staff that the paper available at the Ability 1 store is at least 30% postconsumer recycled paper.

2.7.2.4 Objective 7.2 – Action Plan

As part of the Action Plan related to this objective, it is recommended that the Air Station update the MCAS Yuma GPP to include establishing policies and roles and responsibilities related to the use and tracking of 30% post-consumer recycled paper (i.e., ensure that Ability 1 sales and any other paper procurement activities are included in the tracking process to facilitate the determination of total paper usage at the Station).

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. During the FY, did all paper products purchased by the installation contain a minimum of 30% post-consumer recycled content?

In addition to the above question included in the MCIWEST SMT, the following question is provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During the FY, if all paper products purchased by the installation did not contain a minimum of 30% post-consumer recycled-content, why not?

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2.8 MCIWEST GOAL 8 – OPTIMIZE FLEET AND TRANSPORTATION MANAGEMENT/ALTERNATIVE FUELS

2.8.1 Objective 8.1: 2% Vehicle Petroleum Reduction Annually Through Fiscal Year 2015; 20% Vehicle Petroleum Reduction by Fiscal Year 2015; 30% Petroleum Reduction by Fiscal Year 2020

Table 2.8-1. Objective 8.1 Summary

Objective 8.1 Summary	
Objective Metric	The percent reduction in petroleum product consumption by Station non-tactical motor vehicle fleets relative to FY 2005 (only fleets number 20 or more motor vehicles are covered).
Objective Unit of Measure	Gasoline gallon equivalents (GGEs).
Objective Baseline Year	FY 2005
Baseline Petroleum Consumption	129,720 GGEs.
FY 2011 Petroleum Consumption	143,778 GGEs.
FY 2020 Reduction Goal	90,804 GGEs.
Forecasted Status	The Air Station will meet the FY 2020 reduction goal.
Data Source	Federal Automotive Statistic Tool (FAST) reports; Standard Form 82, Agency Report of Motor Vehicle Data.

2.8.1.1 Objective 8.1 – Baseline Through FY 2009 Analysis

The baseline year for MCIWEST Objective 8.1 is FY 2005 with an overall goal of reducing petroleum consumption by 30% by FY 2020. Reporting data from completed Standard Form 82, Agency Report of Motor Vehicle Data (which is used to populate the Federal Automotive Statistic Tool [FAST] system) was used to establish the Station’s baseline fuel consumption as well as to report consumption over the following years. Table 2.8-2, located in Section 2.8.1.3, summarizes the Station fuel consumption from FY 2005 through FY 2009 and Figure 2.8-1, located in Section 2.8.1.3, expresses this data as it relates to the overall reduction goal of this objective. The Standard Form 82 data was also used to compile the information in Table 2.8-3, located in Section 2.8.1.3, related to the MCAS Yuma vehicle fleet composition. The Station’s fleet numbers greater than 20 vehicles requiring compliance with this objective.

During this time period, fuel consumption at the Station has varied 11% from a high total consumption of 144,043 Gasoline Gallon Equivalents (GGEs) in FY 2006 to a low of 129,720 GGEs in FY 2005. This generally corresponds to the fact that the total number of vehicles in the MCAS Yuma fleet has varied less than 10% over the same time period (Table 2.8-3). At the end of FY 2009, the Station was 10% above the baseline and 18% over the FY 2009 consumption goal.

Vehicle fleet support service at MCAS Yuma is provided by the MCIWEST Southwest Region Fleet Transportation (SWRFT) which is a regional organization that provides management of Garrison Mobile Equipment (GME) fleets located at seven Marine Corps Installations in the southwest U.S. including MCAS Yuma.

2.8.1.2 Objective 8.1 – FY 2010 Goal Performance Review

Similar to the baseline analysis, reporting data from completed Standard Form 82, Agency Report of Motor Vehicle Data, was used to establish the Station's FY 2010 fuel consumption. Table 2.8-2 summarizes the Station's fuel consumption from FY 2005 through FY 2010 and Figure 2.8-1 expresses this data as it relates to the overall reduction goal of this objective. The Standard Form 82 data was also used to compile the information in Table 2.8-3 related to the MCAS Yuma vehicle fleet composition.

In FY 2010, fuel consumption dropped significantly to 114,997 GGEs (19% reduction from FY 2009), despite the fact that the overall number of vehicles at the Station was at its second highest level (271) for the years reported. This reduction is attributable to a mission change at the Station as well as a change in policy regarding reporting. This reduction was significant at the end of FY 2010, whereby the Station had exceeded the reduction goal by approximately 2%.

2.8.1.3 Objective 8.1 – FY 2011 Through FY 2020 Goal Performance Review

Reporting data from completed Standard Form 82, Agency Report of Motor Vehicle Data, was used to document the Station's FY 2011 fuel consumption. Table 2.8-2 summarizes the Station's fuel consumption from FY 2005 through FY 2011 and Figure 2.8-1 expresses this data as it relates to the overall reduction goal of this objective. The Standard Form 82 data was also used to compile the information in Table 2.8-3 related to the MCAS Yuma vehicle fleet composition.

Table 2.8-2. MCAS Yuma Petroleum Consumption

Fuel Type	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Biodiesel (diesel component)	44,602	43,978	44,934	43,376	44,718	39,437	49,454
Diesel	0	0	0	0	0	0	1,914
Gasoline	85,118	100,065	88,914	96,213	97,964	75,560	92,420
Total GGEs	129,720	144,043	133,848	139,589	142,682	114,997	143,788
Reduced Fuel Consumption Goal (GGEs)	--	127,385	125,958	124,012	121,029	117,267	112,727
Actual % (Reduction) or Increase Compared to Baseline	--	11.0%	3.2%	7.6%	10.0%	(11.3%)	10.8%
ISPP % Reduction Goal Compared to Baseline	--	-1.8%	-2.9%	-4.4%	-6.7%	-9.6%	-13.1%

In FY 2011, overall petroleum consumption increased significantly to 143,788 GGEs (25% increase from FY 2010), which is the second highest consumption level reported since the baseline year, despite the fact that the overall number of vehicles at the Station remained relatively the same (271 vehicles in 2010 and 269 vehicles in 2011, Table 2.8-3).

This increase was significant at the end of FY 2011, as the Station's petroleum consumption was 28% above the FY 2011 reduction goal of 112,727 GGEs (Table 2.8-2, Figure 2.8-1). This FY 2011 increase in overall petroleum is difficult to explain given the total miles driven in 2011 were relatively the same as in

2010 and, as mentioned previously the total number of vehicles remained nearly the same. Possible explanations include excessive idling of vehicles and/or more miles traveled using low miles-per-gallon vehicles. Additionally of note in FY 2011, the Station began reporting diesel consumption in the FAST reports. Drivers have been issued fuel cards for travel that is not between one Marine Corps installation to another (where biodiesel is available) and often just purchase regular diesel from a commercial sources which is now accounted for and tracked in FAST.

Figure 2.8-1. MCAS Yuma Petroleum Consumption

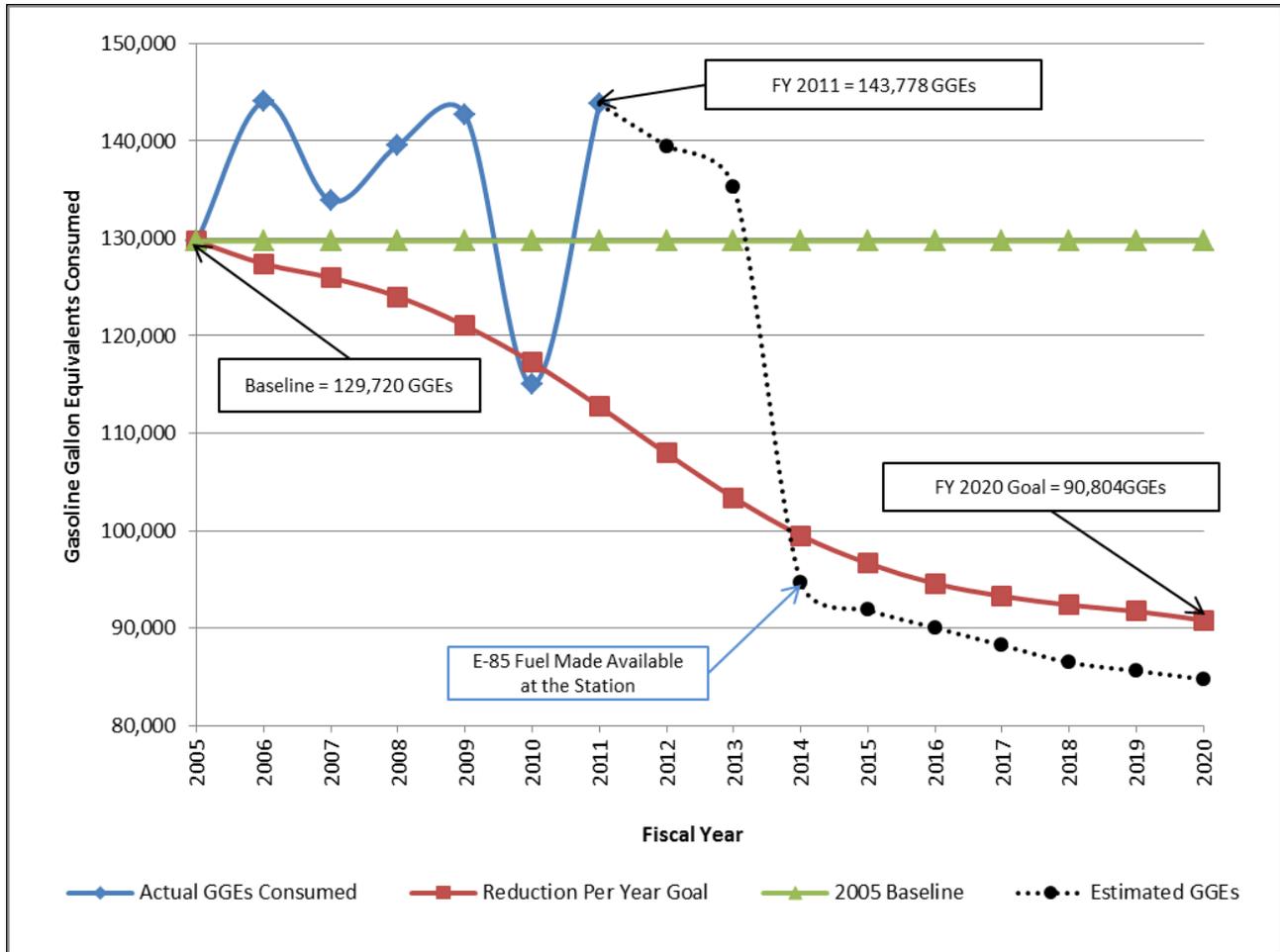


Table 2.8-3. MCAS Yuma Vehicle Fleet Composition

Fleet Composition	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Owned Vehicles							
Sedans/Station Wagons	0	0	0	0	0	0	0
Ambulances	0	0	0	0	0	0	0
Buses	0	0	0	0	0	0	0
Trucks, 4x2 (<8,500 lbs)	0	0	0	0	0	6	16
Trucks, 4x4 (>8,500 lbs)	0	0	0	6	6	0	6
Trucks (8,501 – 16,000 lbs)	30	40	43	42	16	17	0
Trucks (>16,001 lbs)	26	22	22	20	40	40	41
General Services Administration Leased Vehicles							
Sedans/Station Wagons ¹	30	29	27	27	27	28	26
Ambulances	0	0	0	0	3	3	3
Buses	9	9	9	9	9	9	0
Trucks, 4x2 (<8,500 lbs)	62	65	68	67	88	97	95
Trucks, 4x4 (>8,500 lbs)	31	38	37	38	52	55	55
Trucks (8,501 – 16,000 lbs)	60	56	59	67	11	16	18
Trucks (>16,001 lbs)	0	0	0	0	0	0	9
Total Vehicles	248	259	265	276	252	271	269

Note: ¹All sedans/station wagons are classified as either compact or mid-size.

From the baseline year of FY 2005 through FY 2011, petroleum consumption at the Station has varied greatly from year to year. At the conclusion of FY 2011, the Station petroleum consumption of 143,788 GGEs was 58% over the FY 2020 reduction goal of 90,804 GGEs and will require significant planning to meet the FY 2020 goal.

2.8.1.4 Objective 8.1 – Action Plan

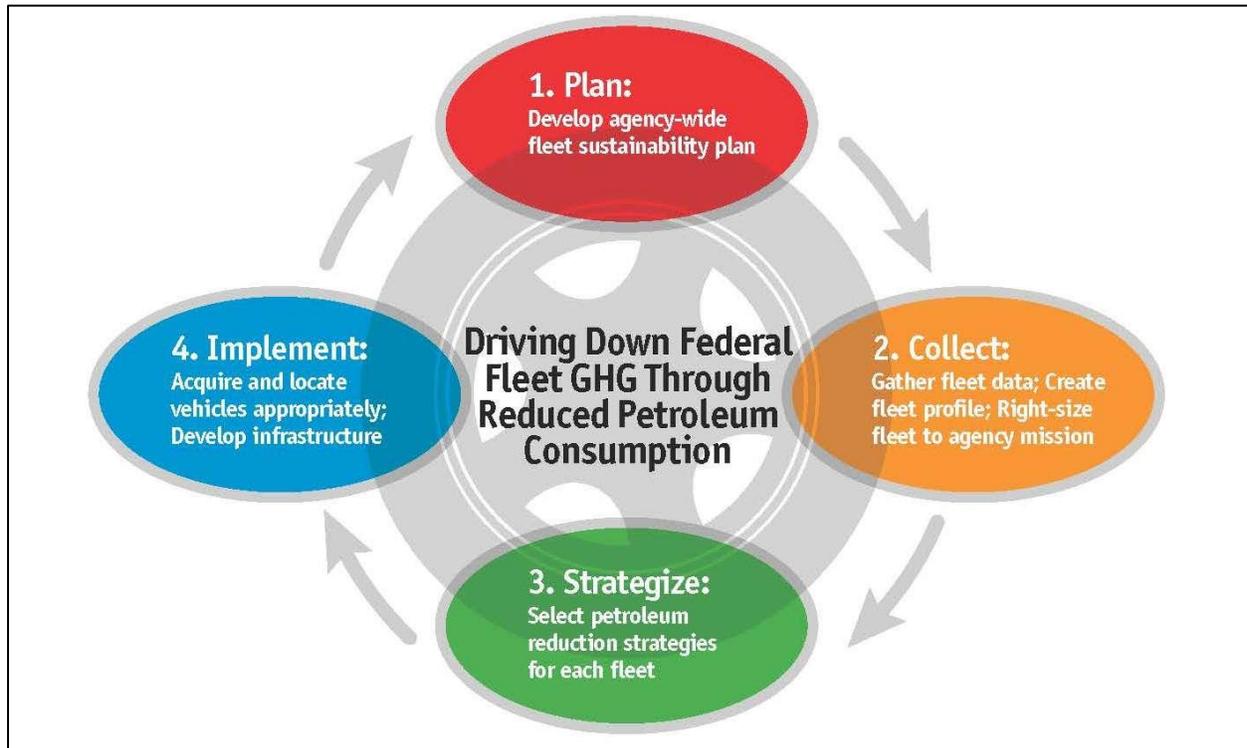
The three key petroleum reduction strategies defined by the DoE in *EO 13514 Federal Leadership in Environmental, Energy, and Economic Performance, Comprehensive Federal Fleet Management Handbook* (the Handbook), July 2011, include:

1. Reducing vehicle miles traveled;
2. Increasing fleet fuel efficiency and optimization measures; and
3. Displacing petroleum with alternative fuel use.

The FEMP further recommends development of a fleet management planning strategy around the cyclical framework presented in Figure 2.8-2. Although the majority of the requirements and

recommendations discussed in the Handbook are directed at the Agency level, there are many concepts and topics that can be applied to fleet management at the installation level, and should be considered for implementation to assist the Station in meeting the petroleum reduction goals, as well as meeting the increased non-petroleum fuel use goals.

Figure 2.8-2. Annual Fleet Strategic Planning and Implementation Process Framework for Agencies



Source: Federal Energy Management Program, EO 13514, Guidance for Federal Agencies on EO 13514 Section 12, Federal Fleet Management (April 2010).

The Handbook states that “In order to achieve the vision of EO 13514, meet mission-critical needs and comply with all Federal goals and mandates, and agency must reduce its GHG emissions and petroleum consumption through the appropriate combination of the three driving principles (i.e., reducing vehicle miles traveled, increasing fleet fuel efficiency, and increased use of alternative fuels).” These principles are briefly summarized as follows:

Reducing Vehicle Miles Traveled - An installation can reduce the overall petroleum consumption by implementing the following measures to reduce vehicle miles traveled including:

- Consolidating trips;
- Eliminating trips by using tools such as video and web conferencing for meetings;
- Taking advantage of public transportation;
- Improving routing to eliminate unneeded miles and avoid traffic conditions; and
- Using alternative modes of transportation such as bicycles and low-speed vehicles as appropriate.

Increasing Fleet Fuel Efficiency - This principle consists of tactics to increase the overall fuel efficiency of fleets (and subsequently reducing petroleum use) including:

- Acquiring higher fuel economy vehicles including by right-sizing vehicles to mission needs;
- Acquiring hybrid electric vehicles;
- Maintaining vehicles to improve vehicle fuel economy or replacing inefficient vehicles that have exceeded their useful life;
- Driving more efficiently; and
- Avoiding excessive idling.

Use of Alternative Fuels - This principle consists of strategies to maximize alternative fuel use and petroleum reduction:

- Acquire alternative fuel vehicles (AFVs), including plug-in hybrid electric vehicles;
- Run dual-fueled vehicles on alternative fuel; and
- Install alternative fuel infrastructure in areas with highest alternative fuel vehicle concentration.

MCAS Yuma Petroleum Reduction Recommendations

Maximizing Use of Alternative Fuels - MCAS Yuma is making progress in managing the vehicle fleet to meet EO 13514 petroleum reduction goals and using alternative fuels to the extent possible; for example, biodiesel is used nearly exclusively for the diesel vehicle fleet. However, the current lack of availability of E-85 fuel has limited the ability of the Station to make additional progress in reducing their overall petroleum consumption.

Since FY 2005, in anticipation of the availability of E-85, the Station has steadily increased the percentage of E-85 vehicles in the fleet from 23% in FY 2005 to 36% in FY 2011 (Table 2.8-4). It is estimated that if E-85 fuel was made available, the Station could not only meet its FY 2020 petroleum reduction goals but also meet its non-petroleum fuel use goals (see Section 2.8.2.4).

Table 2.8-4. Number and Type of E-85 Vehicles in the MCAS Yuma Fleet

Fiscal Year	Sedans/Station Wagons	Truck, <8,500 lbs, 4x2	Truck, <8,500 lbs, 4x4	Truck, 8,501 to 16,000 lbs	Total	Percent of Total Fleet
2005	19	27	10	--	56	23%
2006	21	23	18	--	62	24%
2007	20	29	20	--	69	26%
2008	20	31	22	--	73	26%
2009	20	29	22	6	77	31%
2010	16	41	23	11	91	34%
2011	15	44	25	13	97	36%

In FY 2011, it was estimated that 724,332 miles were traveled by E-85 vehicles using regular gasoline (Table 2.8-5). Based on the Station's overall FY 2011 vehicle miles traveled (VMT) per GGE rate of 11.69, this equates to 61,962 GGEs of gasoline. If E-85 was available and if this amount of GGEs were accounted for as part of the non-petroleum fuel use as E-85, it would reduce the Station's FY 2011

petroleum consumption to 88,058 GGEs and increase the non-petroleum fuel consumption to 77,742 GGEs. This estimated petroleum consumption rate of 88,058 GGEs is below the FY 2020 reduction goal of 94,737 GGEs (refer to Figure 2.8-1) and the estimated non-petroleum use rate of 77,742 GGEs is above the FY 2020 increased use goal of 58,076 GGEs (see Section 2.8.2).

The following is the FY 2011 fleet composition summary (Table 2.8-5) and calculation of estimated GGEs of gasoline used by E-85 vehicles:

Table 2.8-5. FY 2011 Fleet Composition and Estimation of GGEs

Vehicle Category	Total Vehicles (A) ¹	E-85 Capable (B) ¹	E-85 % of Total (C=B/A)	Total VMT for Vehicle Category (D) ¹	Estimated VMT by E-85 Vehicle Using Gasoline (E=C x D)
Sedans/Station Wagons	26	15	57.7%	172,715	99,643
Ambulance	3	0	0%	14,073	0
Buses	0	0	0%	126,665	0
Truck, <8,500 lbs, 4x2	111	44	39.6%	947,575	375,615
Truck, <8,500 lbs, 4x4	61	25	41.0%	377,557	154,736
Truck, 8,501 to 16,000 lbs	18	13	72.2%	130,620	94,337
Truck, >16,000 lbs	50	0	0%	168,484	0
Total	269	97	36.0%	1,937,689	724,332

Note: ¹From 2011 Standard Form 82 Report.

In FY 2011, the average VMT per GGE was 12.26 as calculated below:

- Total VMT 1,937,689/Total GGEs 158,011 (petroleum and non-petroleum) = 12.26 VMT/GGE.

The estimated GGEs of gasoline used by E-85 vehicles is 59,080 as calculated below:

- 724,332 VMT by E-85 vehicles/12.26 VMT/GGE = 59,081 GGEs.

Accounting for these GGEs as E-85 (instead of gasoline) would result in the following totals for FY 2011:

- Actual FY 2011 petroleum consumption = 143,788 GGEs
If accounted for as E-85: 143,788 GGEs – 59,081 GGEs = 84,707 GGEs of petroleum consumption; and
- Actual FY 2011 non-petroleum fuel use = 14,223 GGEs
If accounted for as E-85: 14,223 GGEs + 59,081 GGEs = 73,303 GGEs of non-petroleum fuel use.

As summarized in the previous example calculations, making E-85 available at the Station should be a priority for meeting this objective's requirements (as well as Objective 8.2, Section 2.8.2.4). Factors to consider associated with this recommendation include:

- Defense Logistics Agency (DLA) to establish E-85 fuel supply and delivery contracts to provide this fuel to Yuma.
- Install new E-85 tank and pump. Table 2.8-6 provides a cost estimate for the installation of a 10,000 aboveground storage tank to store and dispense E-85 at MCAS Yuma.
- Evaluate the feasibility of converting an existing tank to E-85.

Table 2.8-6. Cost Estimate for the Installation of an E-85 Fuel Dispensing Point

Assembly Cost Estimate								
Quantity	Description	Unit	Material O&P	Installation O&P	Total O&P	Ext. Material O&P	Ext. Installation O&P	Ext Total O&P
1	Storage tank, fuel, aboveground, double-wall, steel, 10,000 gal.	each	\$43,687.70	\$8,243.78	\$51,931.48	\$43,687.70	\$8,243.78	\$51,931.48
600	Slab on grade, 6 inches thick, light industrial, non-reinforced.	SF	\$3.50	\$3.44	\$6.94	\$2,100.00	\$2,064.00	\$4,164.00
0.33	Auto equipment product dispenser, 6 inch nozzles, with vapor recovery, not including piping, installed.	each	\$27,007.60	--	\$27,007.60	\$8,912.51	--	\$8,912.51
400	Gas service piping, 2 inch diameter, polyethylene, SDR-10, excavation and backfill excluded.	linear feet	\$3.60	\$4.48	\$8.08	\$1,440.00	\$1,792.00	\$3,232.00
TOTAL								\$68,239.99

Division Description		
A. Substructure		\$4,164.00
E. Equipment and Furnishings		\$8,912.51
G. Building Sitework		\$55,163.48
Sub Total		\$68,239.99
General Conditions	15%	\$10,236.00
Sub Total		\$78,475.99
General Contractors Overhead and Profit	10%	\$7,847.60
GRAND TOTAL		\$86,323.59

Figure 2.8-1 indicates the availability of E-85 in FY 2014 and represents a 30% reduction in gasoline GGEs for that year. Modest ongoing reductions in FY 2015 through FY 2020 are also indicated, representing ongoing implementation of strategies, such as reducing VMTs, further introduction of AFVs into the fleet, and development and implementation of policy to reduce petroleum fuel consumption.

Reducing Vehicle Miles Traveled - Evaluating opportunities to reduce the miles the fleet travels should also be a key initiative in further refining the Station's petroleum reduction strategy. This is a no cost solution with other associated benefits such as including reduced vehicle operational operation and maintenance costs and longer vehicle life before replacement. Reducing vehicle miles traveled can also enable a reduction in the number of vehicles required to accomplish a fleet's mission, and therefore is directly related to actions taken to right-size fleets. It anticipated that given budget constraints, the size of the Station fleet will be gradually decreasing over the coming years.

It is anticipated that an ongoing focus on reducing VMT by petroleum fueled vehicles, through the application of appropriate vehicle mile reduction strategies, will only serve to enhance the Station's status with regard meeting this objective's requirements.

Policy Development - As part of the development of the Station's petroleum reduction strategy, consideration should be given to development of policies to support meeting the petroleum reduction goals. Example policy development should consider:

- An anti-idling policy that addresses the amount of time internal combustion engines are permitted to idle (regardless of fuel type).
- "Use of alternative fuel vehicle" policy that would provide guidance to all Station and tenant activities concerning the use of AFVs owned or leased by the Marine Corps indicating that AFVs should be used to their fullest extent.

Development of a Southwest Region Fleet Transportation Petroleum Reduction Plan

As stated in Section 2.8.1.1, overall vehicle fleet support and management at MCAS Yuma is provided by the MCIWEST SWRFT. Based on discussion with SWRFT personnel, there is currently no overall plan in place that addresses the regional strategy on meeting the petroleum reduction goals (and increased non-petroleum fuel use goals), including implementation dates, and meeting required GHG emission reduction, petroleum reduction, and alternative fuel increase levels. It is recommended that SWRFT consider the development of a Petroleum Reduction Plan that would also provide guidance to the installation's on the overall management strategy for meeting this goals.

The Handbook suggests the key elements of a petroleum reduction plan include:

- Fleet Inventory Projections – how the installation will reach the right-sized fleet.
 - Ensure that AFVs are acquired and located where alternative fuel is available.
 - Increase overall fleet fuel economy through the acquisition of smaller-sized vehicles and/or hybrid, electric, or other advanced technology vehicles.

- Ensure the most fuel-efficient vehicle is used for the required task.
- Petroleum Reduction Projections.
- Alternative Fuel Use Increase Projections.
- GHG Emissions Reduction Projections.

Additional Planning Guidance/Pending Requirements

In performing research related to this goal, the following documents were identified related to further guidance and future requirements related to this objective. The following summaries are provided for reference only.

Presidential Memorandum – Federal Fleet Performance. The current administration has made fleet management a priority to reduce petroleum consumption and ultimately reduce GHG emissions. In Presidential Memorandum-Federal Fleet Performance (24 May 2011) it is stated that “In order to provide guidance to executive departments and agencies to help achieve the Federal fleet performance goals and to ensure that agencies are in compliance with EO 13514, I hereby direct the following:

Section 1. Vehicle Technologies.

- (a) By December 31, 2015 all new light duty vehicles leased or purchased by agencies must be AFVs such as hybrid or electric, compressed natural gas (CNG), or biofuel. Moreover, agency alternative fueled vehicles must, as soon as practicable, be located in proximity to fueling stations with alternative fuels, and be operated on the alternative fuel for which the vehicle is designed. Where practicable, agencies should encourage development of commercial infrastructure for alternative fuel or provide flex-fuel and alternative fuel pumps and charging stations at Federal fueling sites.
- (b) Executive fleets are required to achieve maximum fuel efficiency, be limited in motor vehicle body size, engine size, and optional equipment to what is essential to meet the agency mission; and be midsize or smaller sedans, except where larger sedans are essential to the mission. Within 180 days of the date of the memorandum, any executive fleet vehicles that are larger than a midsize sedan or do not comply with alternative fueled vehicle requirements must be disclosed on agency websites.

Section 2. Optimum Fleet Size. Within 90 days of the memorandum, the GSA shall develop and distribute to agencies a Vehicle Allocation Methodology (VAM) for determining the optimum inventory with emphasis placed on eliminating unnecessary or non-essential vehicles from an agency’s fleet inventory and ensuring lifecycle cost-effectiveness of maintaining such an inventory. The VAM shall assist agencies in selecting vehicle options based on lifecycle cost analysis, including projected fuel costs, warranty, operations, mileage, maintenance, and disposal. (This guidance has been developed and issued (GSA Bulletin FMR B-30 Motor Vehicle Management, Vehicle Allocation Methodology for Agency Fleets) and is summarized below.)

Section 3. Fleet Management. Within 180 days of the GSA’s dissemination of the VAM, agencies shall determine their optimal fleet inventory using the VAM and shall post their optimal fleet

inventory targets on agency websites. At the same time, agencies shall submit to the Administrator of GSA fleet management plans to achieve these targets no later than 31 December 2015.

Section 4. Applicability. With respect to law enforcement and emergency vehicles, the GSA shall, within 180 days of the date of this memorandum, and in coordination with the DoD, Homeland Security, Justice, and the Treasury, and other appropriate agencies, issue guidance to agencies on the applicability and implementation of alternative fueled vehicle requirements. (This guidance has been developed and issued [GSA Bulletin FMR B-33 Motor Vehicle Management, Alternative Fuel Vehicle Guidance for Law Enforcement and Emergency Vehicle Fleets] and is summarized below)."

GSA Bulletin FMR B-30 Motor Vehicle Management, Vehicle Allocation Methodology for Agency Fleets, 22 August 2011. The purpose of this bulletin is to provide guidance to agencies on conducting an annual VAM to determine the optimal fleet inventory to meet the agency's mission requirements and identify resources necessary to operate those fleets effectively and efficiently.

Agency VAMs must encompass the following steps:

- Establish a baseline fleet inventory profile that tracks vehicles individually;
- Develop vehicle utilization criteria to justify mission essential vehicles;
- Conduct a utilization survey;
- Determine optimal fleet inventory; and
- Review and update the VAM annually or sooner as mission needs change.

Fleet Management Plans

Once the agency VAM is complete, a fleet management plan must be developed that describes how the agency will achieve its optimal fleet inventory. Agency plans must be updated annually, or as agency missions change, and must consider and address the following items:

- The schedule the agency will follow to achieve its optimal fleet inventory, including plans for beginning to acquire all AFVs by 31 December 2015;
- Agency plans and schedules for locating alternative fueled vehicles in proximity to AFV fueling stations;
- Vehicle sourcing decisions for purchasing/owning vehicles compared with leasing vehicles through GSA Fleet or commercially; and
- Agency fleet management plans must be included in the annual SSPP.

GSA Bulletin FMR B-33 Motor Vehicle Management, Alternative Fuel Vehicle Guidance for Law Enforcement and Emergency Vehicle Fleets, 15 November 2011. The following summarizes some of the key guidance and recommendations included in this guidance with respect law enforcement and emergency vehicles.

- Agencies should implement policies that ensure their law enforcement and emergency vehicles are the smallest, most fuel efficient, and least GHG emitting vehicles necessary to execute mission requirements.
- Agencies should place AFVs into use only when the appropriate alternative fuel is available and require vehicle operators to use the alternative fuel to the maximum extent possible.
- Agencies should classify their law enforcement (LE) vehicles by one of the following three classifications:
 - LE 1: An LE 1 tiered vehicle is configured for apprehensions, arrests, law enforcement, police activities or dignitary protection, and is assigned to pursuit, protection or off-road duties. An LE 1 vehicle must be equipped with heavy duty components to handle the stress of extreme maneuvers and have the horsepower required to achieve the speeds necessary to perform these functions.
 - LE 2: An LE 2 tiered vehicle is configured to perform intelligence, investigations, security, and surveillance activities. An LE 2 vehicle may be unmarked or marked. An LE 2 vehicle is not expected to perform pursuit or protection operations either on- or off-road and does not require the heavy duty components found on an LE 1 vehicle.
 - LE 3: An LE 3 tiered vehicle is a standard vehicle of any make or model that may be used for associated LE operations, including administrative functions such as courier, mail delivery, employee shuttle or other functions not performed by LE 1 and LE 2 tiered vehicles. An LE 3 vehicle is not expected to perform pursuit or protection operations either on- or off-road.
- Agencies should consider the tier to which they have classified their LE vehicles when deciding whether or not to exempt them from AFV requirements. Agencies should not automatically exempt any vehicle from the AFV requirements solely because it is operated by law enforcement or because of the need for special equipment. Rather, the heads of agencies should be exempt from AFV requirements for only those LE vehicles which no mission-suitable AFV exists.
- Agencies should incorporate the tier to which they have classified their LE vehicles into their fleet management information systems and VAM which will help determine optimal agency-wide fleet size and composition.
- Agencies should be exempt from AFV requirements where emergency vehicles are outfitted with special equipment necessary to provide a service in response to an emergency vehicle for which no mission-suitable AFV exists. Agencies should incorporate emergency vehicles into their fleet management information systems and VAM which will help determine optimal agency-wide fleet size and composition.

2.8.2 Objective 8.2: 10% Increase in Non-Petroleum Fuel Annually by Fiscal Year 2015 and Maintain Thereafter Through Fiscal Year 2020

Table 2.8-7. Objective 8.2 Summary

Objective 8.2 Summary	
Objective Metric	10% increase of non-petroleum fuel annually through FY 2015 (measured relative to the prior year's alternative fuel use) and maintain thereafter through FY 2020.
Objective Unit of Measure	GGEs.
Objective Baseline Year	FY 2005
Baseline Non-petroleum Fuel Use	12,498 GGEs.
FY 2011 Non-petroleum Fuel Use	14,223 GGEs.
FY 2020 Increase Goal	32,417 GGEs.
Forecasted Status	The Air Station will meet the FY 2020 increase goal.
Data Source	FAST reports; Standard Form 82, Agency Report of Motor Vehicle Data.

2.8.2.1 Objective 8.2 – Baseline Through FY 2009 Analysis

Reporting data from completed Standard Form 82, Agency Report of Motor Vehicle Data was used to establish the Station's non-petroleum fuel usage baseline as well as to report usage over the following fiscal years. Table 2.8-8 summarizes the Station's non-petroleum fuel use from FY 2005 through FY 2009 and Figure 2.8-3 expresses this data as it relates to the increased usage goal of this objective.

Overall, non-petroleum fuel use at the Station has remained relatively constant since FY 2005 varying 10.5% from a high total usage of 12,498 GGEs in FY 2005 to a low of 11,180 GGEs in FY 2009. This generally corresponds to the fact that the total number of vehicles in the MCAS Yuma fleet has varied less than 10% over the same time period (see Table 2.8-3). At the end of FY 2009, the Station was 38% below the FY 2009 non-petroleum fuel use goal.

2.8.2.2 Objective 8.2 - FY 2010 Goal Performance Review

Similar to the baseline analysis, reporting data from completed Standard Form 82, Agency Report of Motor Vehicle Data, was used to establish the Station's non-petroleum fuel usage for FY 2010. Table 2.8-8, located in Section 2.8.2.3, summarizes the Station non-petroleum fuel use from FY 2005 through FY 2010 and Figure 2.8-3, located in Section 2.8.2.3, expresses this data as it relates to the increased usage goal of this objective.

Overall, non-petroleum fuel use at the Station remained relatively constant since FY 2005, with a reported value of 11,310 GGEs of non-petroleum fuel use in FY 2010. Given the aggressive goals of this objective and the relative "flatness" of non-petroleum fuel use at the Station, at the end of FY 2010, the Station was 44% short of the FY 2010 alternative fuel use goal.

During FY 2010, MCAS Yuma installed a solar charging station at Building 612 and the Station began reporting "energy" on the Annual Fuel Consumption Report section of the Standard Form 82. The charging station services all the electric vehicles and allows for up to eight electric vehicles to be charged at any one time. There are currently 51 electric carts in the Station's inventory.

2.8.2.3 Objective 8.2 – Fiscal Year 2011 Through Fiscal Year 2020 Goal Performance Review

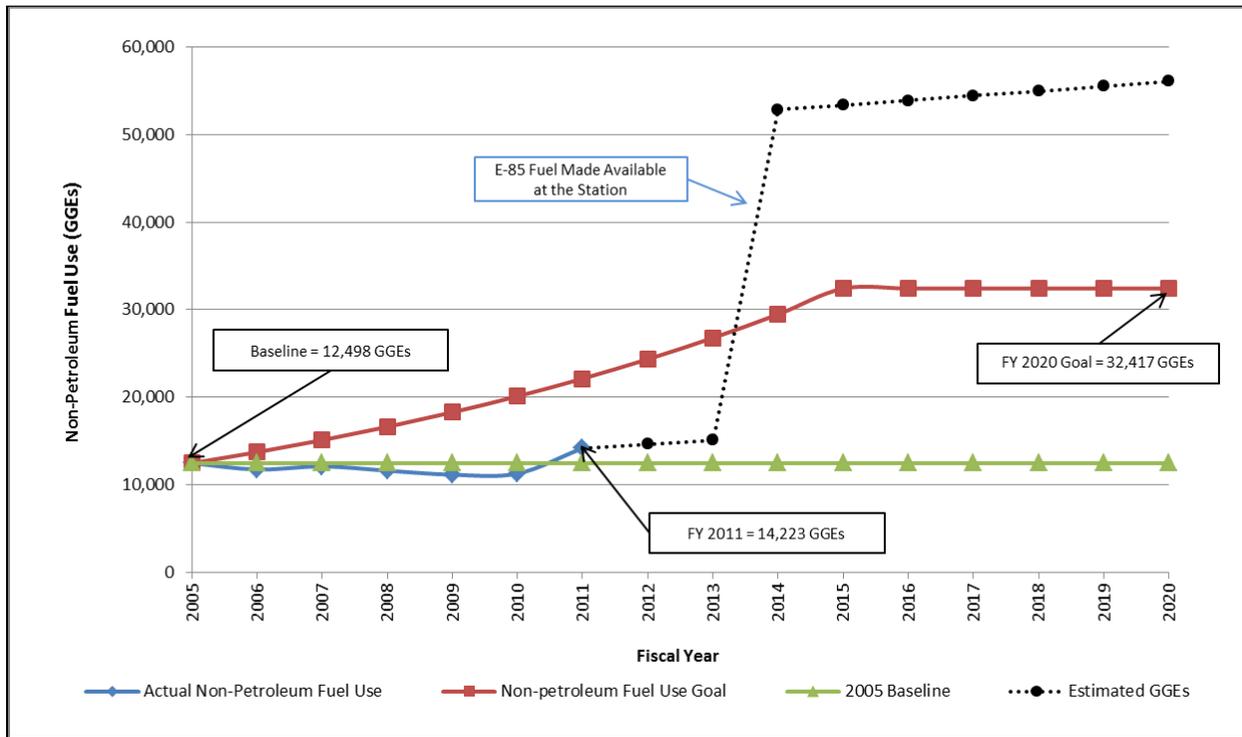
Reporting data from completed Standard Form 82, Agency Report of Motor Vehicle Data was used to establish the Station's non-petroleum fuel usage for FY 2011. Table 2.8-8 summarizes the Station non-petroleum fuel use from FY 2005 through FY 2011 and Figure 2.8-3 expresses this data as it relates to the increased alternative fuel usage goal of this objective.

Table 2.8-8. MCAS Yuma Non-petroleum Fuel Use

Non-petroleum Fuel Type Use	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Biodiesel (B20)	11,150 ¹	10,994	11,234	10,844	11,180	9,859	12,364
Electric	0	0	0	0	0	573	299
E-85	0	0	0	0	0	0	0
Hydrogen	0	0	0	0	0	0	0
M-85	0	0	0	0	0	0	0
Liquefied Petroleum Gas	0	0	0	0	0	0	0
Natural Gas	1,348	774	891	793	0	878	1,560
Other	0	0	0	0	0	0	0
Total GGEs	12,498	11,768	12,125	11,637	11,180	11,310	14,223
Increased Non-petroleum Use Goal (GGEs)	--	13,748	15,123	16,635	18,298	20,128	22,141
% Above/(Below) Goal	--	(14%)	(20%)	(30%)	(38%)	(44%)	(36%)

Note: ¹All values in this table are presented as GGEs.

Figure 2.8-3. MCAS Yuma Non-Petroleum Fuel Use



In FY 2011, non-petroleum fuel use at the Station increased 26% from FY 2010. This was primarily due to increased biodiesel use and increase natural gas use. The increase in biodiesel use was attributed to the fact that mission requirements during FY 2011 required an increase use of tractor trailers, stake-bed trucks, and buses that are use biodiesel as their fuel source. The compressed natural gas (CNG) utilization increase in FY 2011 was due to the fact the Station’s CNG pump was repaired and increased direction/emphasis to vehicle operators of all CNG vehicles that CNG be used as the primary fuel in those vehicles as opposed to unleaded gasoline. Despite these initiatives, at the end of FY 2011, the Station was 36% short of the FY 2011 non-petroleum fuel use goal.

At the conclusion of FY 2011, the Station non-petroleum fuel use was over 56% short of the FY 2020 utilization goal of 32,417 GGEs and will require significant planning to meet the FY 2020 goal.

2.8.2.4 Objective 8.2 – Action Plan

Similar to what is stated in Section 2.8.1.4, the lack of availability of E-85 fuel at the Air Station is the greatest challenge to the Station in meeting this objective’s requirements. As demonstrated in Section 2.8.1.4, it is estimated that by providing E-85 at the Station, this objective’s requirements could be fully met (see Figure 2.8-3).

Also as recommended in Section 2.8.1.4 above, development and implementation of a Station-level alternative fuel-vehicle use policy would also assist in enhancing the Station’s management of the vehicle fleet and increasing non-petroleum fuel use.

2.8.3 Objective 8.3: Purchase Low Greenhouse Gas Emitting Vehicles

Table 2.8-9. Objective 8.3 Summary

Objective 8.3 Summary	
Objective Metric	Purchase low GHG emitting vehicles.
Objective Unit of Measure	Number of vehicles purchased.
Objective Baseline Year	FY 2010
Objective Status	Low GHG-emitting vehicles are procured to the maximum extent practical. In FY 2010, MCAS Yuma procured four low GHG emitting vehicles as part of the garrison mobile equipment fleet. In FY 2011, MCAS Yuma ordered four (out of 22 total) low GHG emitting vehicles for acquisition in FY 2012.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	SWRFT Vehicle Order Reports.

2.8.3.1 Objective 8.3 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.8.3.2.

2.8.3.2 Objective 8.3 – FY 2010 Goal Performance Review

According to FEMP Guidance, low GHG emitting vehicles include those that use alternative fuels as opposed to petroleum-based fuels and includes those powered by E-85, 100% biodiesel, CNG, liquefied natural gas, liquefied petroleum gas, and electricity. Additionally, the GSA provides the following guidance related to low GHG emitting vehicles:

Low GHG Emitting Vehicles are considered AFVs if the USEPA provides a GHG score as follows:

- Passenger cars operating on gasoline, diesel or CNG – Score 7, 8, 9, or 10;
- Passenger cars that operate on the alternative fuel – Score 6, 7, 8, 9, or 10;
- Light Duty Trucks and Medium Duty Passenger Vehicles operating on gasoline, diesel, or CNG – Score 6, 7, 8, 9, or 10; and
- Light Duty Trucks and Medium Duty Passenger Vehicles that operate on the alternative fuel – Score 5, 6, 7, 8, 9, or 10.

Based on this rating system, in FY 2010 MCAS Yuma ordered four (out of 19 total) low GHG emitting vehicles for acquisition in FY 2011.

Garrison mobile equipment at MCAS Yuma is provided through the MCIWEST SWRFT. To the extent practicable, SWRFT management complies with DoD 4500.36-R, Management, Acquisition, and Use of Motor Vehicles; MCICOM G-4 (formerly HQMC LFL-2) vehicle procurement requirements; and MCIWEST Policy/Basegram, Use of AFVs Aboard MCIWEST Installations. For FY 2010, the MCAS Yuma fleet included the following AFVs: 51 electric vehicles, 7 CNG vehicles, and 91 E-85/unleaded hybrids (it should be noted however that infrastructure does not currently exist to provide E-85 fuel either on the Station or within the Yuma community).

2.8.3.3 Objective 8.3 – FY 2011 Through FY 2020 Goal Performance Review

In FY 2011, MCAS Yuma fleet management staff continued to focus on procurement of low GHG emitting vehicles. In FY 2011, MCAS Yuma ordered four (out of 22 total) low GHG emitting vehicles for acquisition in FY 2012.

2.8.3.4 Objective 8.3 – Action Plan

The MCAS Yuma fleet manager proactively manages the Station's fleet composition and, to the maximum extent possible, procures low GHG emitting vehicles while still supporting the Station's mission. Ongoing coordination with SWRFT will be required to ensure low GHG emitting vehicles are procured as they are available to meet the Station's needs.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have a low-GHG emitting vehicle inventory?
2. Has the installation purchased low-GHG emitting vehicles this year?
3. Does the installation have a plan to purchase low-GHG emitting vehicles per EISA 2007?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. What percentage of the installation's vehicle fleet is low GHG-emitting vehicles?
2. Has the installation requested an increase to the low GHG emitting vehicle inventory?
3. If yes, are you anticipating an increase for next year (number of vehicles or percent increase)?

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2.9 MCIWEST GOAL 9 - PROMOTE ELECTRONIC STEWARDSHIP

2.9.1 Objective 9.1: Ensure Electronic Product Environmental Assessment Tool-registered Electronic Product Procurement Preference; Ensure Procurement of Energy Star and Federal Energy Management Program Designated Equipment

Table 2.9-1. Objective 9.1 Summary

Objective 9.1 Summary	
Objective Metric	Has the installation developed procurement preferences for Electronic Product Environmental Assessment Tool (EPEAT®) products, Energy Star®, and FEMP-designated equipment?
Objective Unit of Measure	Percentage of EPEAT®, Energy Star®, and FEMP-designated equipment procured.
Objective Baseline Year	FY 2010
Objective Status	Consistent with the DoD, DoN and HQMC orders, MCAS Yuma procures electronics pursuant to the EO requirements.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	Interview and data provided by the I&L Department and S-6, Communications Data Electronics Safety Department.

2.9.1.1 Objective 9.1 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.9.1.2.

2.9.1.2 Objective 9.1 – FY 2010 Goal Performance Review

Objective 9.1 focuses on whether preferred procurement programs have been established for energy efficient electronic products such as EPEAT® products, Energy Star® and FEMP-designated equipment. Additional information on the procurement programs that exist for electronic products is further discussed in Appendix C.

Currently the procurement of environmentally sound products is directed under the MCAS Yuma GPP which references the requirements of EO 13423 (MCAS Yuma 2004). Additional procurement and disposal requirements are directed by DoD, DoN, and HQMC orders. Namely, the latest editions of Marine Corps Order (MCO) P5090.2A and the *DoN Green Procurement Program Implementation Guide* articulate specific Marine Corps guidance. The *DoN Green Procurement Program Implementation Guide* requires that all electronic product purchases qualify in the Energy Star® program or are designated by FEMP and also requires the use of the EPEAT® procurement tool to ensure a consistent set of performance criteria (DoN 2009). Effective FY 2009 an interim rule amended the FAR to provide for regulations for the use of EPEAT® pursuant to EO 13423 for the procurement of personal computer products such as desktops, notebooks (also known as laptops), and monitors (Federal Register 2009). Contracting Officers in the I&L Department have reported that implementation of the FAR is ensured.

MCAS Yuma procures a wide variety of electronic equipment, including but not limited to: laptop computers; computer central processing units (CPUs); computer monitors; printers; fax machines; televisions; mobile radios; mobile radio chargers; cell phones; digital versatile disc (DVD) and video cassette recorder (VCR) players; microwave ovens; refrigerators; duplicators; cable testers; uninterruptable power supplies (UPSs); projectors; scanner flat beds; cash registers; typewriters;

shredding machines; communication routers; external compact disc (CD) drives; modems; pagers; sound systems; personal digital assistants (PDAs); keyboards; mouse; circuit cards; and computer servers.

Depending on the type and use of electronic equipment, the procurement of electronic products varies. Generally speaking, appliances, including microwave ovens, refrigerators, televisions, etc., are typically procured by the I&L Department in accordance with the FAR. The I&L Department is responsible for electronic product procurement through electronic waste disposal at the Station. The I&L Department at MCAS Yuma also serves in an overall coordination role related to the procurement of electronic products by other organizations. In addition, the Logistics Officer acts as a liaison to the Base Services Division, Commissary, and other activities as appointed by the Logistics Director (MCAS Yuma 2011b).

Handheld wireless communication devices (i.e., cell phones and Blackberries), communication service plans, and the leasing of copiers must be procured via a Fleet Industrial Supply Center (FISC) Contract, as managed by the Regional Contracting Office, or through an approved waiver from Program Executive Office for Enterprise Information Systems (PEO-EIS) through the DoN (USMC 2008). Non-tactical radio requests are reviewed and approved by the HQMC C4 Spectrum Manager. Through the Continuity of Service Contract (COSC), electronic products may also be procured through the Navy/Marine Corps Intranet (NMCI). A preapproved list of electronic products that are not otherwise contractually managed can be acquired through the Marine Corps Common Hardware Suite (MCHS). All computer hardware and operating system software within the Marine Corps must be purchased from the acquisition vehicles listed on the Marine Corps Systems Command (MARCORSYSCOM) approved list for MCHS. Requests for equipment, software, etc. procured through MARCORSYSCOM that is to be used on the NMCI is reviewed by NMCI Regional Contracting Officer Representatives for the purposes of providing recommendations to the Command coordinators. IT equipment purchased through MARCORSYSCOM includes both hardware and software (i.e. desktops, laptops, servers, IT storage devices, and enterprise agreements [EA]/software), as well as support services and related resources (USMC 2008). As of 2009, MCAS Yuma command procurement of non-NMCI IT equipment may be purchased using local command expense funds (i.e., O&M). Any other procurement outside of the NMCI is reviewed by the IT Procurement Request Review/Approval System. Geospatial systems or GIS, utilizes the GEOFidelis program to comply with NMCI policies for data storage.

The MCCS procures goods through the non-appropriated funds procurement process requiring the procurement of environmentally preferable materials, products and services. According to MCO P7010.20, MCCS requires that all contracts ensure that the “requirements of law, EOs, regulations, and other applicable procedures... have been met” (USMC 2004). MCCS electronic product procurement includes the maintenance, “regular care and reconditioning of MCCS tools and equipment (including but not limited to computers, typewriters, photocopy machines, forklifts, etc.)” (USMC 2004). Electronic equipment purchases made for MCCS resale are typically made through an electronic purchase system. Typically MCCS procurement includes off-the-shelf equipment and supplies that discourage noncompetitive procurement processes.

During FY 2010 MCAS Yuma continued to employ the same electronic procurement processes as previously described. The only variation in FY 2010 was related to the NMCI procurement system. During FY 2010 the NMCI contract expired and the implementation of the Next Generation Enterprise Network (NGEN) Program was initiated. Computer hardware, software, and other electronic equipment-related requests previously procured through NMCI continue to be procured generally by the same means as the NGEN system is implemented across the DoN. Through the collaboration of the S-6, Communications Data Electronics Safety Department (CDE) at MCAS Yuma, improved collaboration with the DoN is underway to ensure that the functional processes of this new electronic procurement system resolve the challenges faced by the integrated product teams and provide a mission-oriented focus that is prepared to operate across DoN organizational structures (DoN 2011). Additional information on the NGEN system is provided in Appendix C.

2.9.1.3 Objective 9.1 – FY 2011 Through FY 2020 Goal Performance Review

Effective 31 May 2011, an interim rule to the FAR Part 23 was issued requiring federal agencies to implement EOs 13514 and 13423 sustainable procurement requirements. With regards to the acquisition of sustainable/environmentally preferable electronics, FAR Subpart 23.1 was added in the interim rule as follows:

48 CFR 23, § 23.103 – Sustainable Acquisition Policy (2011):

- (a) Federal agencies shall advance sustainable acquisition by ensuring that 95% of new contract actions for the supply of products and for the acquisition of services (including construction) require that the products are—
 - (1) Energy-efficient (Energy Star® or FEMP-designated);
 - (2) Water-efficient;
 - (3) Biobased;
 - (4) Environmentally preferable (*e.g.*, EPEAT®-registered, or non-toxic or less toxic alternatives);
 - (5) Non-ozone depleting; or
 - (6) Made with recovered materials.
- (b) The required products in the contract actions for services include products that are—
 - (1) Delivered to the Government during performance;
 - (2) Acquired by the contractor for use in performing services at a federally-controlled facility; or
 - (3) Furnished by the contractor for use by the government.
- (c) The required products in the contract actions must meet agency performance requirements.
- (d) For purposes of meeting the 95% sustainable acquisition requirement, the term “contract actions” includes new contracts (and task and delivery orders placed against them) and new task and delivery orders on existing contracts.

On 4 October 2011, the DoD issued a policy addressing the reporting of sustainably procured products per EO 13514 and 13423 in the FPDS. With regards to EPEAT® registered, Energy Star®, and FEMP designated procured equipment, reporting of sustainably procured electronic equipment is captured in

the FPDS as of January 2012 and will be available in future reporting years (subsequent to FY 2012). Furthermore, contractors shall provide data of USEPA designated items purchases as mandated by EO 13423, EO 13514, and EO 13221.

2.9.1.4 Objective 9.1 – Action Plan

The Action Plan for this objective considers the following recommendations to ensure ongoing ISPP implementation and compliance:

- Develop training sessions for MCAS Yuma staff on the sustainable acquisition policies (e.g., similar to ongoing training highlighting the FPDS resources/tracking methodology, the development of a Sustainable Acquisition Desktop Reference Guide, continued compliance and refinement of the GPP to account for electronic procurement requirements, etc.).
- Obtain annual FPDS data to document the percentage of sustainable acquisitions aboard MCAS Yuma (anticipated availability of reports is FY 2012 and subsequent years).
- Consider the development of a comprehensive Station policy for Electronics Stewardship.
- Consider tracking sustainable acquisitions completed using a Government Purchase Cards per EO 13514 requirements (for future ISPP reporting years).

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Per EO 13514, did all eligible equipment purchased by the installation in the FY meet applicable EPEAT®-registered, Energy Star®-designated, or FEMP-designated requirements?

In addition to the above question included in the MCIWEST SMT, the following question is provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. If all eligible equipment purchased by the installation in the FY did not meet applicable EPEAT®-registered, Energy Star®-designated, or FEMP-designated requirements, why not?

2.9.2 Objective 9.2: Dispose of 100% of Excess or Surplus Electronic Products in an Environmentally Sound Manner

Table 2.9-2. Objective 9.2 Summary

Objective 9.2 Summary	
Objective Metric	The percent of excess electronic products disposed in an environmentally sound manner.
Objective Unit of Measure	Percentage of excess electronic products disposed in an environmentally sound manner.
Objective Baseline Year	FY 2010
Objective Status	For items that are determined as unusable, electronic disposal at MCAS Yuma is managed by the I&L Department and processed through the DLA Disposition Services.
Forecasted Status	The Air Station will continue to meet this requirement.
Data Source	DLA Disposition Services disposal records.

2.9.2.1 Objective 9.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.9.2.2.

2.9.2.2 Objective 9.2 – FY 2010 Goal Performance Review

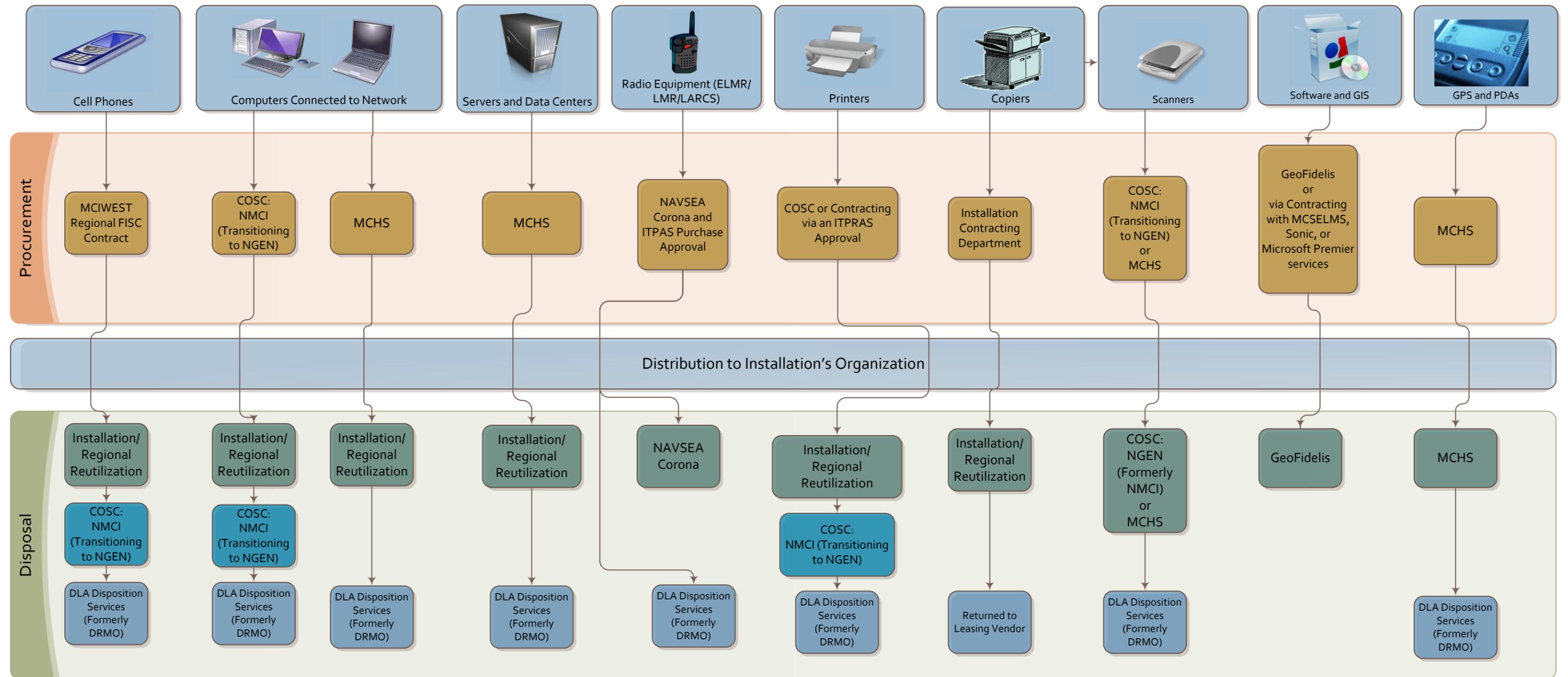
Objective 9.2 requires that 100% of excess or surplus electronic products be disposed of in an environmentally sound manner. Donation to charitable causes, manufacturer take-back or trade-in services, and recycling (including refurbishment and resale) or disposal through a properly licensed treatment and disposal facility are all consistent methods of environmentally sound disposal practices according to USEPA guidelines. According to the I&L Department, MCAS Yuma is currently meeting the 100% environmentally sound disposal goal for electronic products procured by the I&L Department. The following outlines the disposal processes of electronic products at MCAS Yuma. In addition, Figure 2.9-1 summarizes the standard operating procedures of electronic procurement and disposal at Yuma.

Before submitting waste electronics through the DLA regional center for disposal, electronics at MCAS Yuma are reutilized as much as possible to ensure that the lifecycle of the product is maximized especially when equipment is reusable or upgradable. At MCAS Yuma the S-6, CDE, is responsible for the Station-wide coordination of electronic reuse, as well as coordinating with MCIWEST for regional-wide reuse. Although a formal process has not been developed to reutilize products throughout the Station and MCIWEST, a proactive cross-organizational system has been developed which typically consists of coordination with the MCIWEST to determine if there is a regional need for the unwanted equipment.

In addition, newer electronic products that are procured or leased from the manufacturer oftentimes fall under a take-back policy with the manufacturer and are credited to the Station typically in discounted prices on new equipment. Functioning items obtained through the FISC Contract, including radios, computers, cell phones, and copiers, where reutilization is not possible, are often returned to the manufacturer by the Regional Contracting Office or are credited through the DLA Disposition Services. Electronic products like memory cards, chips and smaller electronic components are typically disposed of as solid waste.

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Figure 2.9-1. Marine Corps Standard Electronic Procurement and Disposal Processes



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For items that are determined as unusable, electronic disposal at MCAS Yuma is managed by the I&L Department and processed through the DLA Disposition Services (formerly the Defense Reutilization and Marketing Service). The DLA Disposition Services manages the disposal of all electronics and hazardous property for DoD services and follows the same priorities as other property: “reutilization within DoD, transfer to other federal agencies, donations to qualified state and nonprofit organizations, and sale to the public including recyclers” in order to minimize environmental risks and disposal costs, as well as maximize utilization (DLA Disposition Services 2011). DD Form 1348-1A is the mandatory form for turning in electronic property to the DLA Disposition Services and must be attached to all property. The DLA Disposition Services provides temporary storage facilities at the Station to ensure safety during the disposal cycle and are regularly transported to the regional DLA Disposition Services at MCB Camp Pendleton (DLA Disposition Services 2011). The I&L Department is responsible for maintaining and managing a strict compliance practice, including the stripping of sensitive material, before the processing of electronic products through the DLA web-based Electronic Turn-in Documentation system. Equipment that is registered in the DLA Disposition Services website is processed and shipped to installations within DoD at no additional cost to MCAS Yuma. Additional information on the functions of the DLA Disposition Services is included in Appendix C.

The efficiencies of the DLA Disposition Services system result in economic savings to the Station through the elimination of unnecessary repair costs and the reutilization of products that are transferred or donated.

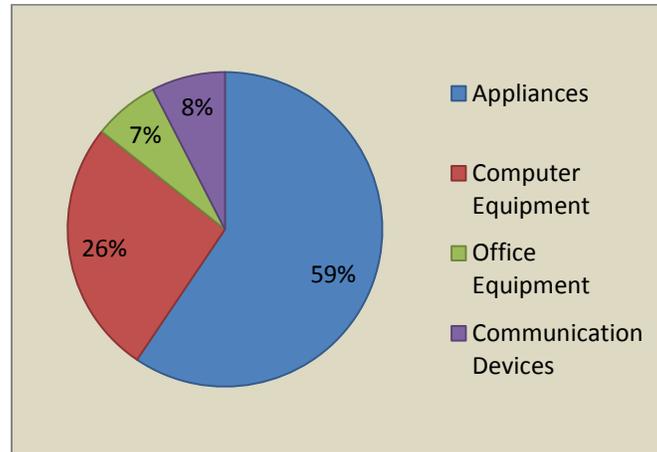
Currently MCAS Yuma does not have Station-wide disposal bins for personal cell phones and electronic equipment. The Navy Federal Credit Union located at MCAS Yuma accepts functioning cell phones for a local organization dedicated to supporting abused spouses in the local community. Additionally, cell phone providers within the city (i.e., Verizon, AT&T, etc.) have recycling/disposal bins. The lack of infrastructure for the recycling of personal electronic equipment often results in products like cell phones being thrown in the trash; however, data on the quantity of personal electronics equipment that is disposed as solid waste is not monitored.

A significant amount of electronic products were disposed in FY 2010 related to the upgrade of communications equipment by the S-6 CDE including the replacement of existing batteries in radios with gel-fill batteries that have a longer lifecycle and less off-gassing when equipment overheats. Inventoried tele-switch equipment utilizing batteries have been changed over to gel-filled batteries (48 approximately) and all conventional equipment that is not compatible with the gel-filled batteries has been replaced. The replacement of UPS batteries with a nickel-cadmium type composition is underway (approximately 72 total). The remote sites (seven sites total) have close to 280 standard 24-volt batteries that came with the equipment when it was installed. After the warranty on all existing equipment is over (2 ½ - 3 years from 2011) the Station will be looking at replacing the batteries. The older batteries are processed through the Hazardous Materials and DLA Disposition Services.

The disposal of electronic products processed through the DLA Disposition Services is represented in four major categories: appliances, computer equipment, office equipment, and communication devices. Within these four categories, MCAS Yuma disposed of the following: laptop computers, CPU, computer monitors, printers, fax machines, televisions, mobile radios, mobile radio chargers, cell phones, DVDs,

VCR tapes, microwave ovens, refrigerators, duplicators, cable testers, UPS units, projectors, scanner flat beds, cash registers, typewriters, shredding machines, communication routers, external CD drives, modems, pagers, sound systems, PDAs, keyboards, computer mice, circuit cards, and computer servers. As illustrated in Figure 2.9-2, data provided by the MCAS Yuma I&L Department indicates that the majority of recycled electronic equipment at the Station is appliances comprising 59% of the total number of recycled products.

Figure 2.9-2. Estimated Distribution of Electronic Products Disposed of Through DLA Disposition Services for FY 2010



Additional information on the number of recycled electronic products processed through the DLA Disposition Services is represented in Figures 2.9-3 through 2.9-6, represented in the previously mentioned categories.

Figure 2.9-3. Total Number of Appliances Disposed of Through the DLA Disposition Services for FY 2010

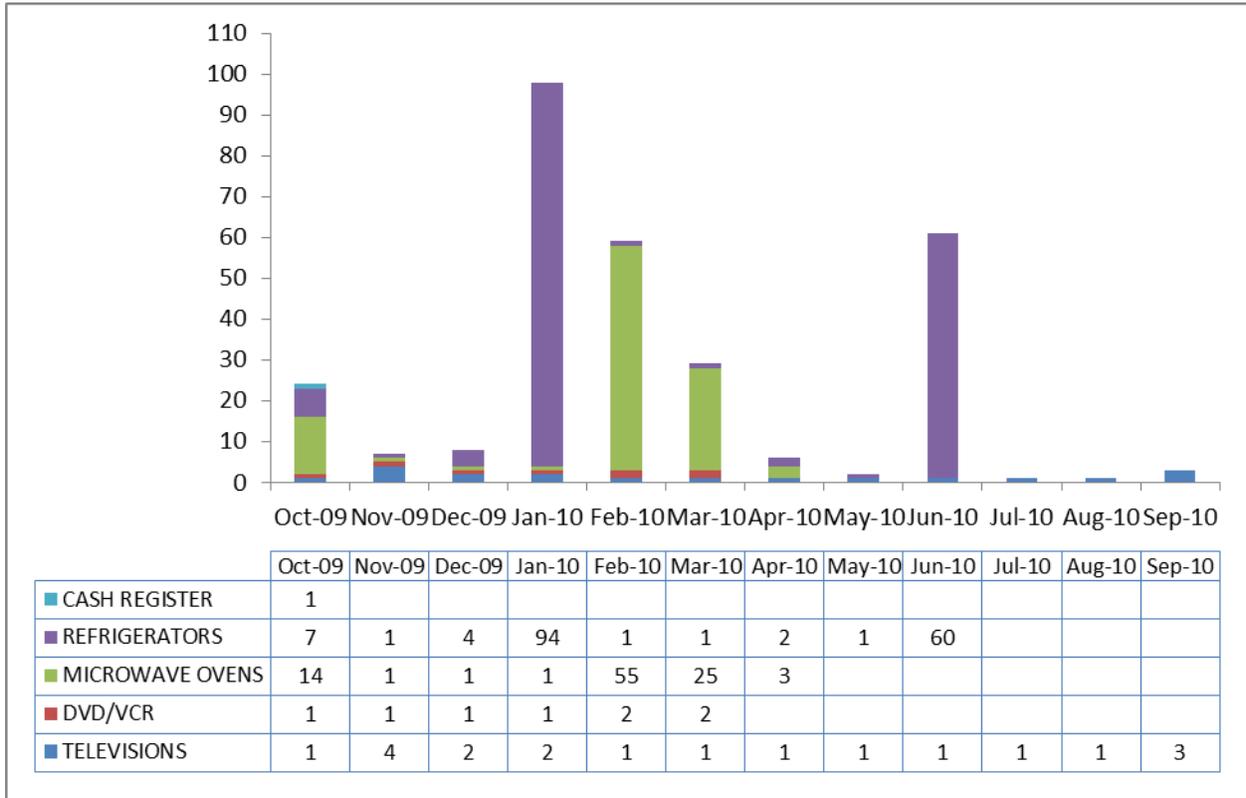


Figure 2.9-4. Total Number of Computer Equipment Disposed of Through the DLA Disposition Services for FY 2010

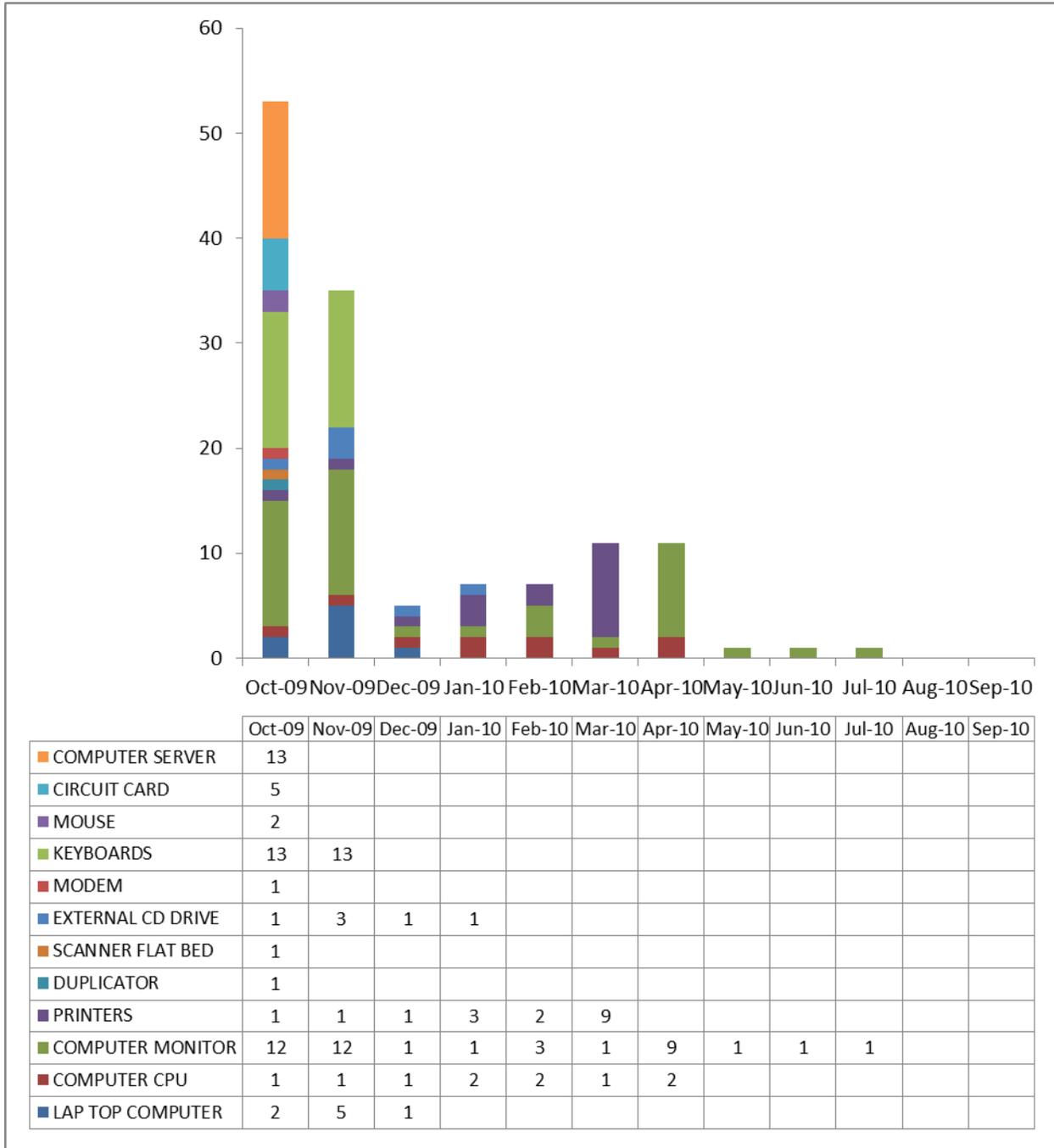


Figure 2.9-5. Total Number of Office Equipment Disposed of Through the DLA Disposition Services for FY 2010

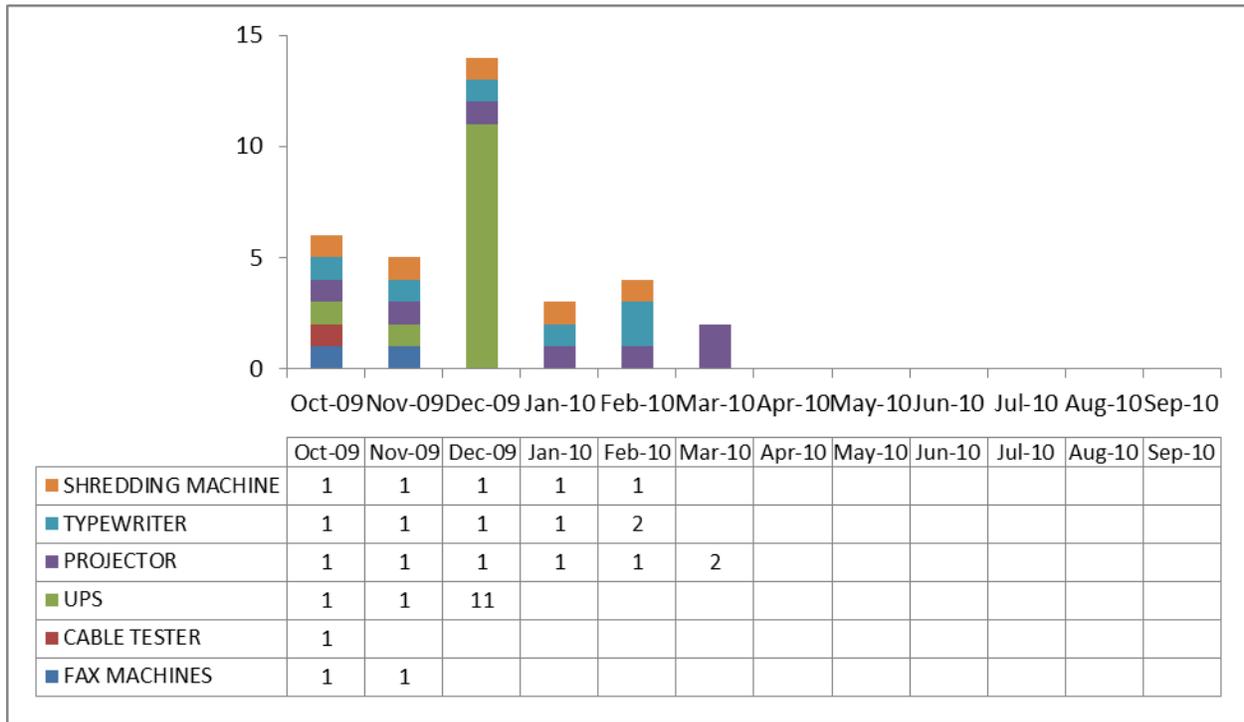
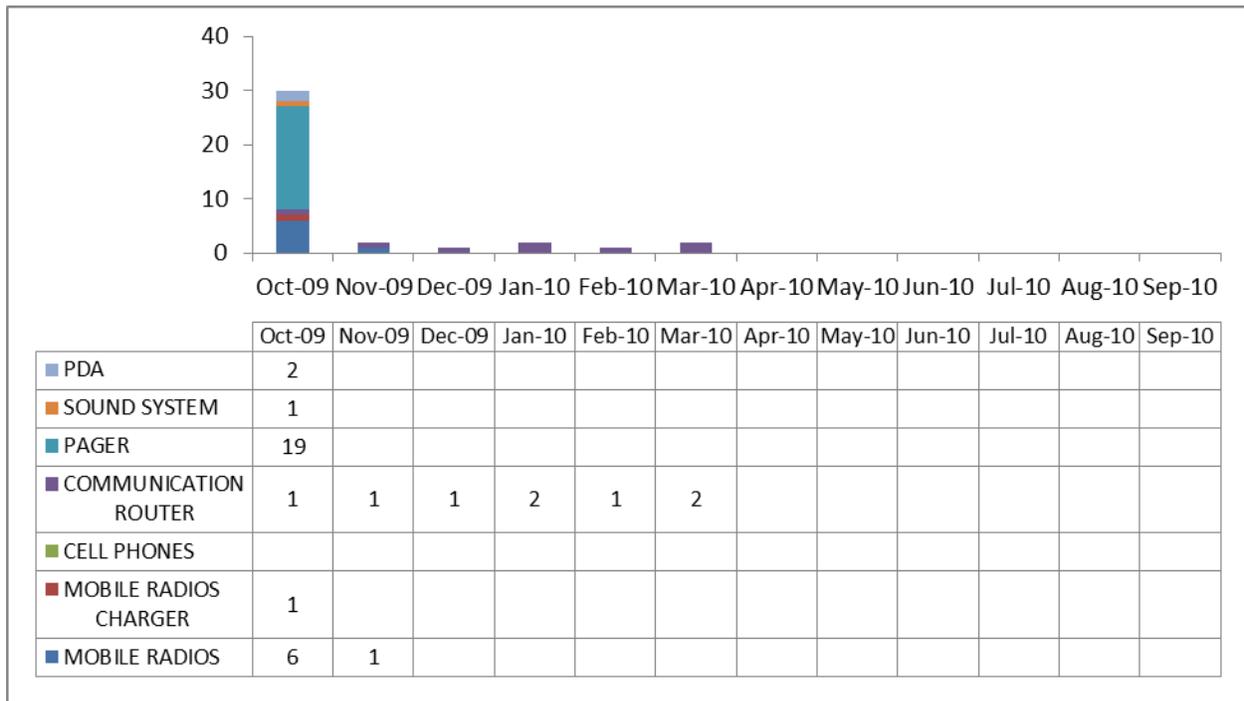


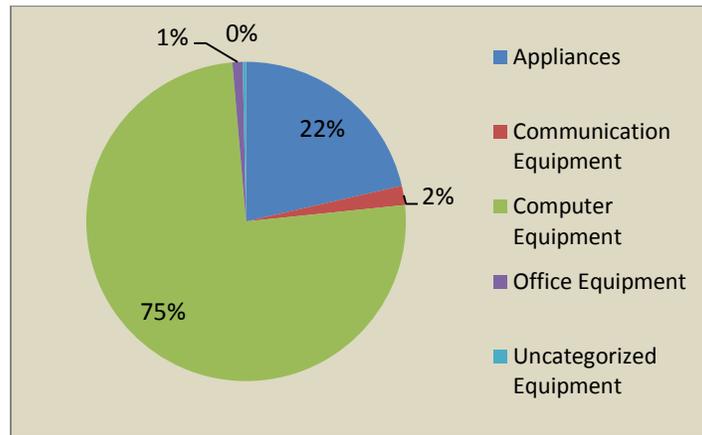
Figure 2.9-6. Total Number of Communication Equipment Disposed of Through the DLA Disposition Services for FY 2010



2.9.2.3 Objective 9.2 – FY 2011 Through FY 2020 Goal Performance Review

The disposal of electronic products processed through the DLA Disposition Services in FY 2011 is represented in five major categories: appliances, computer equipment, office equipment, communication devices, and uncategorized equipment. As illustrated in Figure 2.9-7, data provided by the DLA Disposition Services indicates that the majority of recycled electronic equipment at the Station during FY 2011 is computer equipment, comprising approximately 75% of the total number of disposed products.

Figure 2.9-7. Estimated Distribution of Electronic Products Disposed Through DLA Disposition Services for FY 2011



Additional information on the number of electronic products processed through the DLA Disposition Services is represented in Figures 2.9-8 through 2.9-11 according to the previously mentioned categories.

Figure 2.9-8. Total Number of Appliances Disposed Through the DLA Disposition Services for FY 2011

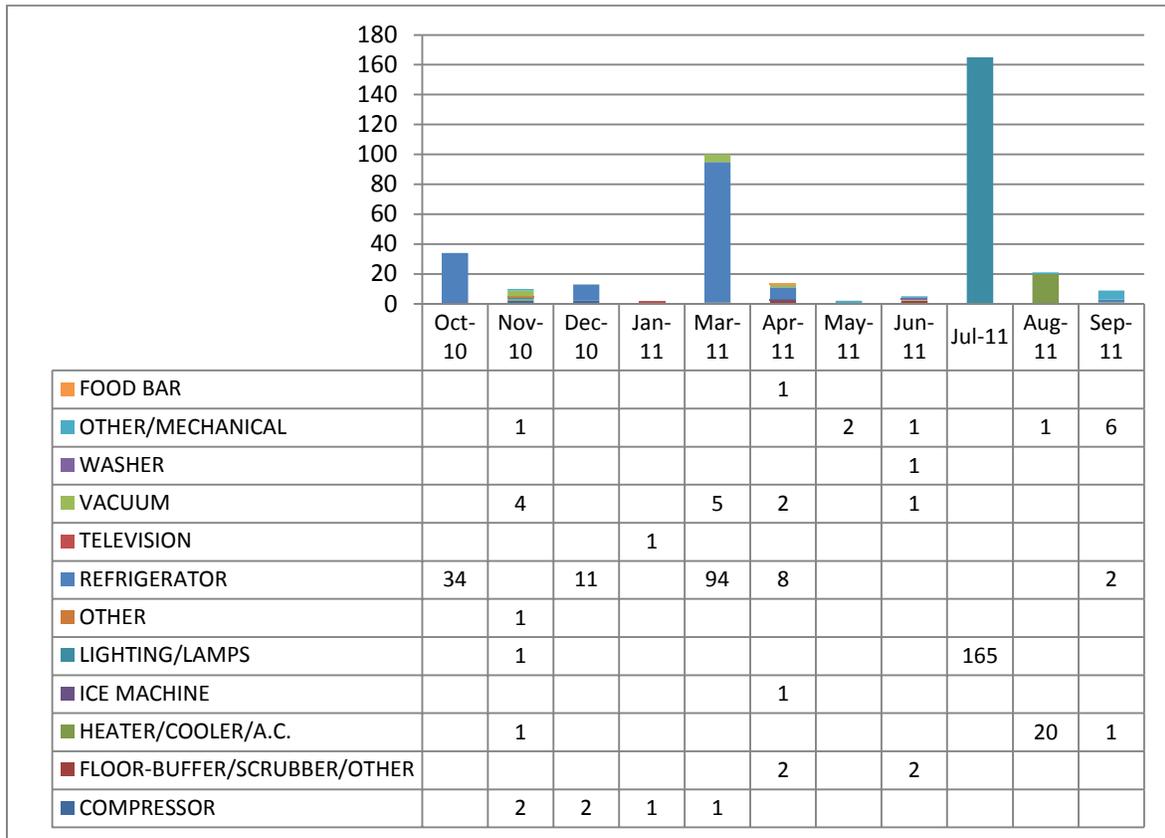


Figure 2.9-9. Total Number of Computer Equipment Disposed Through the DLA Disposition Services for FY 2011

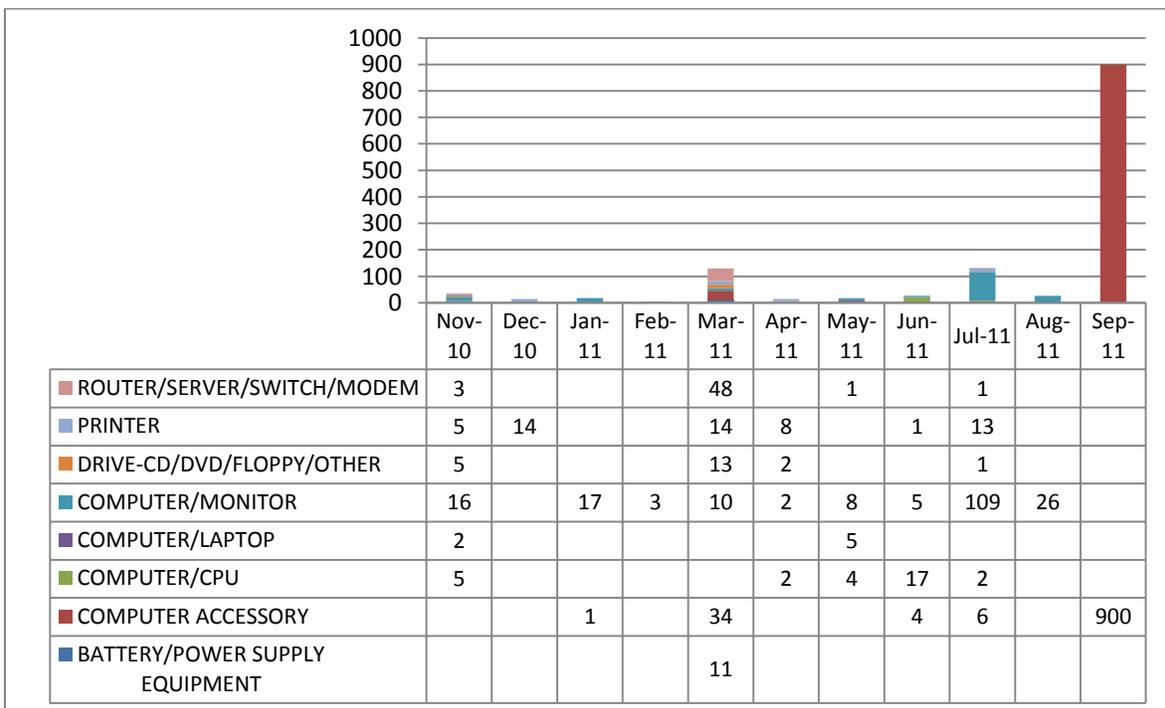


Figure 2.9-10. Total Number of Office Equipment Disposed Through the DLA Disposition Services for FY 2011

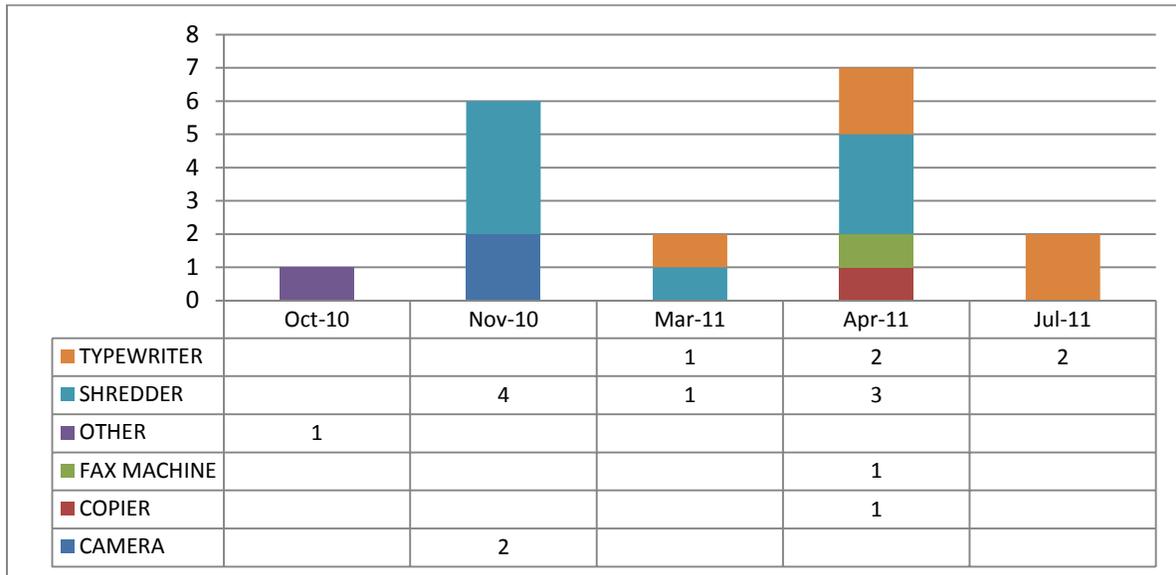


Figure 2.9-11. Total Number of Communication Equipment Disposed Through the DLA Disposition Services for FY 2011

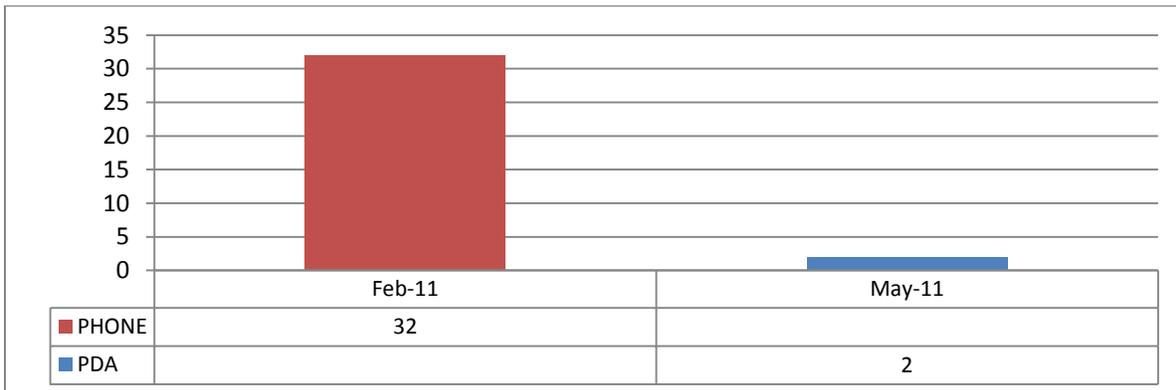
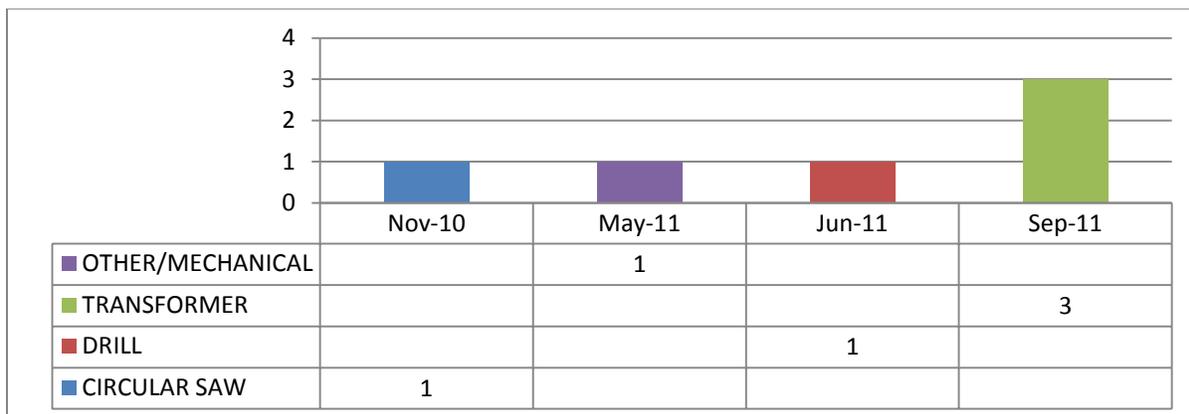


Figure 2.9-12. Total Number of Uncategorized Equipment Disposed Through the DLA Disposition Services for FY 2011



2.9.2.4 Objective 9.2 – Action Plan

The Action Plan for this objective considers the following recommendations to ensure ongoing ISPP implementation and compliance:

- Continued development of electronic recycling events and tracking of electronic products recycled through the Recycling Center for future ISPP reporting years.
- It is recommended that the Station develop an operating procedure to identify areas of responsibility and reporting processes needed to facilitate the Station-wide tracking and reporting of electronics disposed of through the DLA Disposition Services for the purposes of annual reporting in the MCIWEST SMT.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Was all electronic equipment disposed in an environmentally friendly manner?

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. During this FY, how many pieces of electronic equipment were disposed by the installation?
2. Of these items, were 100% disposed in an environmentally sound manner?
3. If not, why not?

2.9.3 Objective 9.3: Establish and Implement Policies to Enable Duplex Printing

Table 2.9-3. Objective 9.3 Summary

Objective 9.3 Summary	
Objective Metric	Establish and implement policies to enable duplex printing.
Objective Unit of Measure	Established policies and/or procedures.
Objective Baseline Year	FY 2010
Objective Status	There are currently no policies or procedures in place that specifically address duplex printing; however, actions are taken to the maximum extent possible to ensure duplex printing is conducted.
Forecasted Status	The Air Station will meet this annual requirement.
Data Source	Interview and data provided by the S-6 Communications Data Electronics Safety Department.

2.9.3.1 Objective 9.3 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.9.3.2.

2.9.3.2 Objective 9.3 – FY 2010 Goal Performance Review

On 1 August 2010 MARADMIN 0438/09 was canceled. Subsequent HQMC, or Marine Air-Ground Task Force Information Technology Support Centers (MITSC), or Station guidance has not been issued with regards to MCIWEST Objective 9.3. The S-6 CDE ensures that default double-sided printing settings are enabled on all duplication equipment.

Through the contracting agencies, the practice of duplex printing is extended to the Contractor per 48 CFR 52, § 52.204-4(b), whereby the clause states that "...the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of EO 13101, when not using electronic commerce methods to submit information or data to the Government."

2.9.3.3 Objective 9.3 – FY 2011 Through FY 2020 Goal Performance Review

As referenced in the *FY 2012 United States Marine Corps Plan for Implementing the DoD Strategic Sustainability Performance Plan*, although directed towards P2 measures on paper reduction, a draft MARADMIN is being developed to implement mandatory measures for duplex printer settings to the fullest extent possible (USMC 2012). In addition, current printing devices that do not have duplex-printing capability will be used to the end of their lifecycle and all new equipment purchased will be required to have duplex printing capability (USMC 2012).

The interim rule to the FAR effective 31 May 2011 requires Federal agencies to implement EOs 13514 and 13423 requirements with regards to acquiring compliant information technology equipment and development of policies and practices to meet the EO goals, including the requirement to enable power management, double-sided printing, and other energy- efficient or environmentally preferable features on all agency electronic products. As such, 48 CFR 39, § 39.101(b)(1)(ii-iii) are as follows:

(b)(1) In acquiring information technology, agencies shall identify their requirements pursuant to—

- (ii) EPEAT[®] standards (see 23.704); and
- (iii) Policies to enable power management, double-sided printing, and other energy-efficient or environmentally preferable features on all agency electronic products.

2.9.3.4 Objective 9.3 – Action Plan

The Action Plan for this objective considers the following recommendations to ensure ongoing ISPP implementation and compliance:

- As identified above, there are currently no USMC policies addressing duplex printing; however, a draft MARADMIN policy is being developed that, among other things, will address duplex printing. MCAS Yuma should continue with implementation of local procedures to ensure duplex printing is performed to the maximum extent practicable. Pending release of the draft MARADMIN policy addressing this topic, the Station will take appropriate actions to fully implement the policy.
- Develop an educational program and outreach activities to promote ongoing awareness of energy efficient management and electronic product use aboard the Station. Coordination between responsible offices is needed to ensure compliance with DoN Navy/Marine Corps Intranet requirements and, where feasible, identify opportunities for advancing EO 13514 energy efficiency requirements.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation implemented all applicable IT energy-efficiency policies?
2. Are any additional policies needed?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Has the installation implemented all applicable printing efficiency policies?
2. How does the installation ensure compliance with existing policies?
3. Are any additional policies needed?

2.9.4 Objective 9.4: Implement Best Practices in Energy Efficient Management of Server Data Centers

Table 2.9-4. Objective 9.4 Summary

Objective 9.4 Summary	
Objective Metric	Implement best management practices in energy efficient management of server data center.
Objective Unit of Measure	Established best management practices, policies, and/or procedures.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma follows the DoN Information Management Electronic Stewardship Criteria.
Forecasted Status	The Air Station will continue to meet this annual requirement.
Data Source	Interview and data provided by the S-6, Communications Data Electronics Safety Department.

2.9.4.1 Objective 9.4 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.9.4.2.

2.9.4.2 Objective 9.4 – FY 2010 Goal Performance Review

The MITSC West Region does not have guidance on the energy efficient management of server data centers. Likewise, MCAS Yuma does not have a formal Station policy to reinforce the energy efficient management of server data centers; however, the DoN Information Management Electronic Stewardship Criteria is followed by the S-6 CDE (MCAS Yuma 2011c). Policy and/or guidance related to the powering down of underutilized servers and storage devices does not exist at MCAS Yuma. When servers reach the end of their service life, multiplexed rack mounted servers, storage, and power storage area networks and network attached storage are placed with more efficient equipment and data center tier standards are utilized, where appropriate. MCAS Yuma, where possible, has consolidated its data centers to reduce heating, ventilation, and air conditioning loads.

On 1 August 2010, MARADMIN 0438/09 was canceled. Subsequent HQMC, or MITSC, or Station guidance has not been issued with regards to MCIWEST Objective 9.4. The S-6 CDE continued to implement the informal practice of turning off individual servers and storage devices that are underutilized, to the extent practicable and where doing so would not interfere with access data and security updates, by securely consolidating equipment in order to reduce energy use. The anticipated energy savings due to the consolidation of servers and data centers during FY 2010 is pending. It is estimated that in FY 2013-2014, MCAS Yuma will be finalizing the construction of new server rooms with the installation of energy efficient equipment. The expected construction to support the JSF is looking at consolidating the personnel of the S-6 CDE under one building. With this construction, the installation of new infrastructure and facilities has been combined into one construction project so that the reduction of materials and resources can be conserved (for example, the recycling of asphalt). This project is expected to begin in March 2011; however, this project may be pushed back to FY 2013.

2.9.4.3 Objective 9.4 – FY 2011 Through FY 2020 Goal Performance Review

The interim rule to the FAR effective 31 May 2011, under 48 CFR 39, § 39.101(b)(1)(iv), requires federal agencies to implement EOs 13514 and 13423 by requiring agencies to employ BMPs for energy-efficient management of servers and federal data centers. As such, MCAS Yuma implements the amended FAR requirements, where feasible.

2.9.4.4 Objective 9.4 – Action Plan

The Action Plan for this objective considers the following recommendations to ensure ongoing ISPP implementation and compliance:

- As previously stated, MCAS Yuma does not have a formal policy to reinforce the energy efficient management of server data centers; however, the DoN Information Management Electronic Stewardship Criteria is followed. The Station S-6 is moving into a new building (FY 2013) at which all servers will be consolidated into one location. The building will be monitored by the I&L Department's energy monitoring system further ensuring and implementing energy efficient management practices.
- Personnel responsible for the management of servers/data centers should track and document the implementation of energy-related BMPs to determine their effectiveness and facilitate annual reporting.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation implemented all applicable data server energy-efficiency policies?
2. Are any additional policies needed?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Has the installation implemented all applicable data server energy-efficiency policies?
2. How does the installation ensure compliance with existing policies?
3. Are any additional policies needed?

2.9.5 Objective 9.5: Has the Installation Utilized Power Management Features

Table 2.9-5. Objective 9.5 Summary

Objective 9.5 Summary	
Objective Metric	Has the installation utilized power management features.
Objective Unit of Measure	Implementation of power management features.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma ensures that all power management features are utilized on electronic equipment.
Forecasted Status	The Air Station will continue to meet this annual requirement.
Data Source	Interview and data provided by the S-6 Communications Data Electronics Safety Department.

2.9.5.1 Objective 9.5 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.9.5.2.

2.9.5.2 Objective 9.5 – FY 2010 Goal Performance Review

MARADMIN 0438/09 establishes policies and procedures to correctly power off Marine Corps Enterprise Network workstations, laptops, monitors, local printers, and peripheral and reproduction equipment (i.e., monitors, fax machines and printers, copiers, etc.) to meet energy reduction mandates (USMC 2009). As of April 2009, DoN NMCI had issued guidance for the energy efficient management of electronic equipment, therefore establishing policies through network-wide controls aboard the Station. Although a Station policy does not exist to reinforce the implementation of energy efficient measures associated with the use of electronic equipment, however, the DoN Information Management Electronic Stewardship Criteria is followed by the S6 CDE (MCAS Yuma 2011c). Legacy IT systems at MCAS Yuma are shut down to the extent practicable in order to reduce energy use, and servers and storage devices are securely consolidated when underutilized. Additional information on the DoN requirements is included in Appendix C.

On 1 August 2010 MARADMIN 0438/09 was canceled. Subsequent HQMC, or Marine Air-Ground Task Force Information Technology Support Centers (MITSC), or Station guidance has not been issued with regards to MCIWEST Objective 9.3. The S-6 CDE continued to implement the informal practice of turning off electronic equipment when not in use and where doing so would not interfere with access data and security updates.

2.9.5.3 Objective 9.5– FY 2011 Through FY 2020 Goal Performance Review

The interim rule to the FAR effective 31 May 2011 requires Federal agencies to implement EOs 13514 and 13423 requirements with regards to acquiring compliant information technology equipment and development of policies and practices to meet the EO goals, including the requirement to enable power management, double-sided printing, and other energy- efficient or environmentally preferable features on all agency electronic products. As such, 48 CFR 39, § 39.101(b)(1)(ii-iii) are as follows:

(b)(1) In acquiring information technology, agencies shall identify their requirements pursuant to—

- (ii) EPEAT[®] standards (see 23.704); and
- (iii) Policies to enable power management, double-sided printing, and other energy-efficient or environmentally preferable features on all agency electronic products.

2.9.5.4 Objective 9.5 – Action Plan

The Action Plan for this objective is to consider the following recommendations to ensure ongoing ISPP implementation and compliance:

- The Station S-6 ensures that all power management features on network electronic devices are automatically enabled, where possible. It is recommended that a policy be developed and implemented related to utilizing power management features on electronic devices to ensure continued compliance with this requirement.
- Develop an educational program and outreach activities to promote ongoing awareness of energy efficient management and electronic product use aboard the Station. Coordination between the MCAS Yuma S-6 CDE, Environmental Department, the Property Control Office, and Logistics Department is needed to ensure compliance with DoN NMCI requirements and, where feasible, identify opportunities for advancing EO 13514 energy efficiency requirements.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation enabled power management features into all applicable electronic equipment inventory?

In addition to the above question included in the MCIWEST SMT, the following question is provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. If the installation has not enabled power management features on all applicable electrical equipment, why not?

2.9.6 Objective 9.6: Has the Installation Utilized Any Other Energy-efficient Practices

Table 2.9-6. Objective 9.6 Summary

Objective 9.6 Summary	
Objective Metric	Has the installation utilized any other energy-efficient features?
Objective Unit of Measure	Implementation of power management features.
Objective Baseline Year	FY 2010
Objective Status	No additional data/information is included related to this objective; the status is similar to that described in the Objective 9.5.
Forecasted Status	No additional data/information is included related to this objective; the status is similar to that described in the Objective 9.5.
Data Source	Interview and data provided by the Communication Information System Department.

2.9.6.1 Objective 9.6 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.9.6.2.

2.9.6.2 Objective 9.6 – FY 2010 Goal Performance Review

No additional data/information is included related to this objective; the status is similar to that described in the Objective 9.5

2.9.6.3 Objective 9.6– FY 2011 Through FY 2020 Goal Performance Review

No additional data/information is included related to this objective; the status is similar to that described in the Objective 9.5

2.9.6.4 Objective 9.6 – Action Plan

No additional data/information is included related to this objective; the Action Plan is similar to that described in the Objective 9.5.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation developed and implemented energy-efficiency policies for the operation of electronic equipment?

In addition to the above question included in the MCIWEST SMT, the following question is provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. If the installation has not developed and implemented energy –efficiency policies for the operation of electronic equipment, why not?

2.10 MCIWEST GOAL 10 – SUSTAIN FORMAL ENVIRONMENTAL MANAGEMENT SYSTEM

2.10.1 Objective 10.1: Ensure a Formal Environmental Management System is Implemented to Meet Executive Order Goals

Table 2.10-1. Objective 10.1 Summary

Objective 10.1 Summary	
Objective Metric	Ensure a formal Environmental Management System (EMS) is implemented to meet EO 13514 goals.
Objective Unit of Measure	Incorporation of EO 13514 goals into the Station’s EMS.
Objective Baseline Year	FY 2010
Objective Status	MCAS Yuma is in the process of incorporating the EO 13514 requirements into the Station’s EMS to the extent practical.
Forecasted Status	The Air Station will meet this requirement.
Data Source	EMS Manual; interview with EMS Manager.

2.10.1.1 Objective 10.1 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.10.1.2.

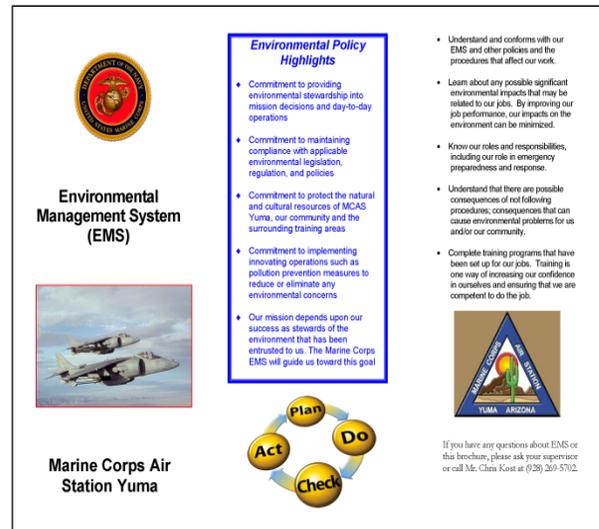
2.10.1.2 Objective 10.1 – FY 2010 Goal Performance Review

Although FY 2010 serves as the baseline year for this objective, the following provides a summary of the development of the MCAS Yuma EMS.

MCAS Yuma has been actively implementing their EMS since 2003 (Figure 2.10-1). Major early milestones associated with the EMS development up to the point of HQMC acceptance of the Station’s declaration of self-conformance include:

- December 2003 – Performed an EMS gap analysis (i.e., comparison of the International Organization for Standardization (ISO) 14001 references to the MCAS Yuma existing conditions).
- January 2004 – preparation of the Work Plan for the Development and Implementation of an EMS at MCAS Yuma.
- August 2004 – EMS Executive Leadership Training.
- January 2005 – Command Briefing of the EMS POA&M/Implementation Plan.
- March 2005 – Published the MCAS Yuma EMS Manual.
- April 2005 – EMS Implementation Team Training.
- September 2005 – EMS Self-audit (results reported to HQMC).

Figure 2.10-1. MCAS Yuma EMS Brochure



- November 2005 – Environmental Impact Review Board (EIRB) meeting (included EMS review with top management).
- July 2006 - EIRB Meeting (included EMS Review with Top Management).
- September 2006 – EMS Self-audit (results reported to HQMC).
- February 2007 – Second-party EMS Audit.
- September 2007 – Self-audit and declaration of conformance (reported to HQMC).
- October 2007 – First publication of Station Order P5090.8A, the MCAS Yuma EMS Manual.
- October 2007 – HQMC Benchmark ECE and EMS Audit.
- January 2008 – Confirmation from HQMC regarding self-declaration of conformance.

MCAS Yuma Environmental Management System Audit History

February 2007 EMS Audit - The first HQMC-sponsored audit of the MCAS Yuma EMS occurred 12-15 February 2007. The purpose of the audit was to determine the current status of conformance of the installation's EMS with EO 13148 *Greening the Government Through Leadership in Environmental Management*; USMC EMS Conformance Guide (December 2004); DoD EMS Policy; and ISO 14001.

The audit indicated that MCAS Yuma had made significant progress with the initial implementation of its EMS and, as a result, no major non-conformances were identified. Although, MCAS Yuma's EMS was not totally conformant with all of the 18 USMC EMS elements, it generally lacked only small parts of an element that would otherwise allow full conformance.

October 2007 Benchmark Environmental Compliance Evaluation and EMS Audit - A HQMC Benchmark ECE and EMS Audit was performed 15-26 October 2007 at MCAS Yuma. The 2007 EMS audit results indicated that MCAS Yuma implemented an EMS in accordance with the USMC EMS Conformance Guide and Supplemental Guidance and is progressing towards the HQMC self-declaration guideline of 31 December 2007. The Air Station's EMS meets the requirements of each of the Marine Corps' 18 EMS conformance elements. Two minor non-conformances were noted that should support the continued enhancement and improvement of the Station's EMS.

February 2008 EMS Verification Audit - From 7-8 February 2008, a second-party audit was conducted to verify the condition of the installation's EMS with regard to the HQMC full-conformance deadline of 31 December 2007, review items identified as non-conformances from previous EMS audits, and evaluate progress towards completing those items according to the timeline specified from the installation's EMS POA&M (it was not the intent of this audit to review the status of the installation's EMS with respect to all 18 EMS elements). In a letter dated 8 January 2008, MCAS Yuma was acknowledged by HQMC as being in full conformance with the established EMS implementation deadline and requirements.

In FY 2010, MCAS Yuma continued with implementation of the Station's EMS. The EMS continued to receive the required command attention and is well integrated into the Air Station's business practices. Notable developments in the program during the year included:

- Management review of the FY 2009 internal self-audit results.
- Ongoing revision of the Station Order P5090.8A (which was ultimately approved and signed by the Station Commanding Officer in November 2010, see Section 2.10.1.3).
- Planning for the development of the ISPP which identified practices, aspects, impacts, objectives, and targets.
- Preparation for the November 2010 external ECE and EMS audit.
- Performance of the FY 2010 internal self-audit and Self-Declaration of Conformance with the Marine Corps EMS (results reported to HQMC, September 2010).

2.10.1.3 Objective 10.1 – FY 2011 Through FY 2020 Goal Performance Review

On 23 November 2010, the revised Station Order P5090.8A, *Environmental Management System Manual*, was approved by the Station Commanding Officer. The revision was performed to reflect USMC conformance criteria and to provide an overall update to the MCAS Yuma EMS.

From 30 November 2010 through 10 December 2010, a HQMC Benchmark ECE and EMS Audit was performed at MCAS Yuma. The EMS audit noted that “Since declaring conformance in 2008, the Air Station’s EMS has continued to make improvements. The EMS is receiving the required command attention and is well integrated into Air Station business practices.” However, the audit did identify six minor non-conformances for current requirements and addressed one future requirement associated with anticipated publication of Change 3 to MCO P5090.2. The most noteworthy non-conformance was that not all environmental program/media managed outside the Environmental Department had been addressed by the Environmental Compliance and Protection Standard Operating Procedure or EMS Manual.

In FY 2011, the Station also conducted a required self-audit and Self-Declaration of Conformance with the Marine Corps EMS (results reported to HQMC on 26 September 2011) in which non-conformances were not identified. In 2012, the Station reviewed and revised its list of EMS Practices, Aspects, and Impacts list.

2.10.1.4 Objective 10.1 – Action Plan

As part of MCAS Yuma’s ongoing EMS implementation efforts, the following should be evaluated on a regular basis (recommended at least annually as part of the self-conformance audit or as part of any external audit):

- The status of the Station’s EMS manual and practices, aspects/impacts, and goals, objectives, and targets to ensure the requirements of EO 13514 are regularly being considered for incorporation into the Station’s EMS.
- The documented status of the Station’s efforts and progress in meeting, established goals, objectives, and targets.
- As part of the review and corrective action development process, develop and implement required actions, as necessary, to assist with meeting established goals, objectives, and targets.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Are objectives listed in in MCIWESTO 5090.3 or the USMC SSPP included in the installation's EMS element 4: Objectives, Targets, and Actions to Improve Performance, or does the procedure for EMS Element 4 note the installation's use of the MCIWEST sustainability management tool as the means to manage EO goals?

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Does the installation have a conforming EMS?
2. If yes, does the EMS address EO 13514 goals?
3. If not, why not?

2.10.2 Objective 10.2: Establish Management Review for Executive Order Implementation

Table 2.10-2. Objective 10.2 Summary

Objective 10.2 Summary	
Objective Metric	Establish a management review for EO implementation.
Objective Unit of Measure	Establishment of a management review process to review EO implementation at the Base.
Objective Baseline Year	FY 2010
Objective Status	As part of the development and implementation of the Station's Sustainability Management Program, several documents will be developed that will establish the requirement, as well as roles and responsibilities, to perform a management review related to EO 13514 implementation.
Forecasted Status	The Station will meet this requirement.
Data Source	To be determined.

2.10.2.1 Objective 10.2 – Baseline Through FY 2009 Analysis

MCIWEST 5090.3 has established FY 2010 as the baseline year for this objective, as referenced in Section 2.10.2.2.

2.10.2.2 Objective 10.2 – FY 2010 Goal Performance Review

This objective relates to the establishment of a management review process related to implementation of EO 13514 requirements. This requirement will be implemented upon completion of the Station ISPP.

2.10.2.3 Objective 10.2 – FY 2011 Through FY 2020 Goal Performance Review

As part of the development of the Station's Sustainability Management Program, several documents will be developed that will establish the requirement, as well as roles and responsibilities, to perform a management review related to EO 13514 implementation at the Station. This requirement will be implemented upon completion of the Station ISPP.

2.10.2.4 Objective 10.2 – Action Plan

The Action Plan associated with this objective's requirements will focus on implementation of the Station's sustainability policies and procedures including the requirement to perform a management review related to EO 13514 implementation.

Ongoing Management Review and Analysis

The following question is included in the MCIWEST SMT and has been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Does the installation have an annual executive management review of EO implementation?

In addition to the above question included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Does the installation have an established process to annually review EO 13514 implementation?
2. If yes, was an annual review conducted last year?
3. If not, why not?

2.10.3 Objective 10.3: Submit Updates on Progress and Performance at Least Annually if not More Often

Table 2.10-3. Objective 10.3 Summary

Objective 10.3 Summary	
Objective Metric	Submit updates on progress and performance at least annually (if not more often).
Objective Unit of Measure	Has the installation kept dashboard/all other reports current and complete?
Objective Baseline Year	To be determined based on deployment of the MCIWEST SMT.
Objective Status	This requirement of this objective is related to maintaining the MCIWEST SMT which is currently under development. Additionally, MCIWEST Order 5090.3 is in final draft review and is pending approval.
Forecasted Status	The Air Station will meet this requirement.
Data Source	Review of the MCIWEST SMT.

2.10.3.1 Objective 10.3 – Baseline Through FY 2009 Analysis

The requirement of this objective is related to maintaining the MCIWEST SMT. The SMT has not been implemented to date. See Section 2.10.3.3.

2.10.3.2 Objective 10.3 – FY 2010 Goal Performance Review

The requirement of this objective is related to maintaining the MCIWEST SMT. The SMT has not been implemented to date. See Section 2.10.3.3.

2.10.3.3 Objective 10.3 – FY 2011 Through FY 2020 Goal Performance Review

This requirement of this objective is related to maintaining the MCIWEST SMT. The SMT is currently under development but has not been implemented to date.

The MCIWEST SMT is being developed in a dashboard-style format and will serve as the Station's data management tool with regard to tracking, monitoring, and reporting the installation's status for each of the 10 MCIWEST sustainability goals.

As required by MCIWEST Order 5090.3, the Station ROs will:

- Maintain current goal/objective/target status via updates of the SMT.
- Develop sustainability projects, processes, and POA&M to implement, track, and report status and progress towards achieving goals.
- Identify and program for funding required to implement the Action Plan through the Program Objective Memorandum process as well as budget for and execute funds received for Action Plan projects.
- Staff Action Plans to MCIWEST LROs during development and provide reports, annually or as required, MCIWEST on the status towards achieving the goal.

2.10.3.4 MCIWEST Objective 10.3 – Action Plan

To be developed based on reporting requirements that will be defined at a later date.

Ongoing Management Review and Analysis

The following questions are included in the MCIWEST SMT and have been developed for the RO associated with this objective to further evaluate the qualitative aspects of this objective:

1. Has the installation updated sustainability performance data in the MCIWEST sustainability management tool for the current year?
2. Has the installation updated project data in the MCIWEST sustainability management tool for the current year?
3. Has the installation updated RO data in the MCIWEST sustainability management tool for the current year?

In addition to the above questions included in the MCIWEST SMT, the following questions are provided to assist the ROs in collecting and tracking data that over time will facilitate trend and comparative analysis against sustainability metrics associated with this objective:

1. Does the installation have an established process to annually update progress per MCIWEST Order 5090.3?
2. Did the installation update the SMT last year?
3. If not, why not?

REFERENCES

- 48 CFR 23, § 23.103 – Sustainable Acquisition Policy. 2011. Accessed on 16 May 2012. 31 March.
- 48 CFR 52, § 52.204-4(b) – Printed or Copied Double-Sided on Postconsumer Fiber Content Paper. 2011. Accessed on 16 May 2012. 31 March.
- Arizona Department of Transportation (ADOT). 2012a. ADOT SR 195 Study Meeting Minutes. Prepared by Stanley Consultants, Inc. 20 August.
- _____. 2012b. Yuma Expressway Study. Online at: http://mpd.azdot.gov/MPD/Systems_Planning/YumaExpressway.asp. Accessed on 30 August.
- _____. 2012c. Yuma Expressway Study – Public Involvement Plan. Prepared by RBF Consulting. Online at: http://mpd.azdot.gov/mpd/systems_planning/pdf/para/yumaexpressway/YumaExpresswayStudy_Public_Involvement_Plan.pdf. Accessed on 30 August.
- City of Yuma. 2012. Yuma Expressway Corridor Study – Work Plan. Prepared by Parsons Brinckerhoff. Online at: http://www.azdot.gov/para/pdf/para/yumaexpressway/Yuma_Expressway_Work_Plan.pdf. Accessed online 30 August. 22 March.
- Defense Logistics Agency Disposition (DLA) Services. 2011. Defense Reutilization and Marketing Office Yuma. Online at: <https://webfnc.dispositionservices.dla.mil/drmo/yuma.shtml>. Accessed on 15 August.
- Department of Energy (DoE). 2010. Federal Energy Management Program (FEMP). Guidelines for Estimating Unmetered Landscaping Water Use. Online at: http://www1.eere.energy.gov/femp/pdfs/est_unmetered_landscape_wtr.pdf
- Department of the Navy (DoN). 2009. Department of the Navy Strategy for Green Information Technology (IT) Electronic Stewardship and Energy Savings Strategy. 23 April.
- _____. 2011. Reshaping the DON's Approach to Buying and Managing IT Resources. Online at: <http://www.doncio.navy.mil/ContentView.aspx?ID=2512>. August 15. Accessed on 25 August.
- Federal Register. 2009. Federal Acquisition Regulation (FAR) Case 2006-030, Electronic Products Environmental Assessment Tool (EPEAT). Vol. 74, No. 10, 15 January. Online at: <http://edocket.access.gpo.gov/2009/E9-549.htm>. February 17. Accessed on 7 September 2011.
- Marine Corps Air Station (MCAS) Yuma. 2000. Pollution Prevention and Hazardous Waste Minimization Plan, MCAS Yuma. Revised May 2006.
- _____. 2004. Green Procurement Plan. March.
- _____. 2006. Water Conservation and Management Plan. March.
- _____. 2007a. MCAS Yuma Master Plan. November.
- _____. 2007b. MCAS Yuma Air Station Drought and Water Shortage Preparedness Plan. October.
- _____. 2008. Marine Corps Air Station Yuma, Energy and Water Management Annual Report for FY 2007.
- _____. 2009a. Marine Corps Air Station Yuma, Energy and Water Management Annual Report for FY 2008.
- _____. 2009b. Marine Corps Air Station Yuma Integrated Pest Management Plan. February.

- _____. 2009c. Marine Corps Air Station Yuma, Environmental Department – Environmental Engineer. Online at: <http://www.yuma.usmc.mil/services/environmental/engineering/engineer.html>. Accessed on 5 September 2011. 6 November.
- _____. 2010. Marine Corps Air Station Yuma, Energy and Water Management Annual Report for FY 2009.
- _____. 2011a. Marine Corps Air Station Yuma, Energy and Water Management Annual Report for FY 2010.
- _____. 2011b. Logistics Branch. Online at: <http://www.yuma.usmc.mil/services/installationslogistics/logistics.html>. Accessed on 21 August.
- _____. 2011c. Personal Communication with Jack Neely. MCAS Yuma Electronic Stewardship Data. 31 August.
- _____. 2011d. Air Quality Program. Online at: http://www.yuma.usmc.mil/services/environmental/support%5CPM_10.html. Accessed on 30 September.
- _____. 2011e. Sustainable Water Resources Assessment – Final Report. Prepared by Malcom Pirnie / Arcadis-US, Inc. / TEC Inc. October.
- _____. 2011f. Personal Communication with Joe Britain and Chris Kost. MCAS Yuma Environmental Department NEPA Review Process. 5 October.
- _____. 2011g. MCAS Yuma FY 11 Environmental Highlights – Brief. November.
- _____. 2011h. 2011 Secretary of Defense Environmental Award “Environmental Quality – Non-Industrial Installation” Award Category - Narrative. November.
- _____. 2011i. Personal Communication with Paula Backs. MCAS Yuma, Community Planning and Liaison Office. MCAS Yuma Sustainability Measures. 11 August.
- _____. 2011j. Marine Corps Air Station Yuma, Statistical Summary 2011.
- _____. 2012a. Marine Corps Air Station Yuma, Energy and Water Management Annual Report for FY 2011.
- _____. 2012b. Personal communications with William Gary. MCAS Yuma Resource Efficiency Manager. June through October 2012.
- _____. 2012c. Personal communications with Paula Backs. MCAS Yuma Community Planning and Liaison Office (CP&LO). 30 August.
- _____. 2013a. Technical Feasibility Study and Alternative Identification for a Renewable Energy Project for MCAS Yuma. May.
- _____. 2013b. Personal communications with Steve Fischer. MCAS Yuma Architect. March.
- Marine Corps Installations West (MCIWEST). MCIWEST Order 5090.3 (Draft), Sustainability Management Program.
- National Oceanic and Atmospheric Administration (NOAA). 2012. NOAA Online Weather Data (NOWData). Average climate from 1981 to 2007. Online at: <http://www.nws.noaa.gov/climate> and <http://ncdc.noaa.gov/oa/ncdc.html>.

Schnitzler, Stefan. 2006. Applied Research Paper: Autoclaved Aerated Concrete as a Green Building Material. University of California Davis. October 2006.

Secretary of Defense (SECDEF) and Secretary of the Navy (SECNAV). 2008. MCAS Yuma FY 2008 Secretary of Defense and Secretary of the Navy Environmental Award Narrative. Online at: <http://www.denix.osd.mil/awards/upload/6-Marine-Corps-Air-Station-Yuma.pdf>. Accessed on 30 September 2011.

United States Environmental Protection Agency (USEPA) 2009. Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act. December 2009. Online at: http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf

United States Marine Corps (USMC). 2004. Marine Corps Order (MCO) P7010.20 – Marine Corps Community Services Nonappropriated Fund (NAF) Procurement Policy. 5 August.

_____. 2008. Information Technology (IT) Funding, Approval and Procurement. Online at: <http://www.marines.mil/news/messages/Pages/MARADMIN591-08.aspx>. Accessed on 21 August.

_____. 2009. Marine Administrative Message (MARADMIN) 0438/09. Online at: <http://www.marines.mil/news/messages/Pages/MARADMIN0438-09.aspx>. Accessed on 11 August 2011. 27 July.

_____. 2011. U.S. Marine Corps National Environmental Policy Act (NEPA) Manual -Version 2.0. 8 September.

_____. 2012. FY 2012 USMC Plan for Implementing the Department of Defense (DoD) Strategic Sustainability Performance Plan. 15 March.

Western Regional Partnership (WRP). 2009. Border Committee. Online at: <https://wrpinfo.org/Pages/Committees/Border.aspx>. Accessed on 31 August 2011.

Yuma Metropolitan Planning Organization (YMPO). 2010. 2010-2033 Regional Transportation Plan: Final Report. Prepared by Ayres Associates Inc. April.

_____. 2012. Yuma County Rail Corridor and Logistics Study. Online at: <http://img-ak.verticalresponse.com/media/b/f/6/bf680179ec/f43e867923/71a427f9bc/library/Open%20House.jpg>. Accessed on 30 August 2012.

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APPENDICES

Appendix A – Sustainability Guidance Documents

- A1 Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (October 8, 2009)
- A2 Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management (January 26, 2007)
- A3 Department of Defense Strategic Sustainability Performance Plan, Fiscal Year 2010 (August 26, 2010)
- A4 United States Marine Corps Sustainability Plan 2011
- A5 Marine Corps Installations West Order 5090.3, Sustainability Management Program

Appendix B – Crosswalk of MCIWEST Sustainability Goals and Objectives to EO 13514 Requirements and the DoD Strategic Sustainability Performance Plan Objectives and Goals

Appendix C – Additional Information Related to the Baseline and 2010 Analyses

Appendix D – Action Plan Summary

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Federal Register

**Thursday,
October 8, 2009**

Part VII

The President

**Executive Order 13514—Federal
Leadership in Environmental, Energy,
and Economic Performance**

Presidential Documents

Title3—

Executive Order 13514 of October 5, 2009

The President

Federal Leadership in Environmental, Energy, and Economic Performance

By the authority vested in me as President by the Constitution and the laws of the United States of America, and to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of greenhouse gas emissions a priority for Federal agencies, it is hereby ordered as follows:

Section 1. Policy. In order to create a clean energy economy that will increase our Nation's prosperity, promote energy security, protect the interests of taxpayers, and safeguard the health of our environment, the Federal Government must lead by example. It is therefore the policy of the United States that Federal agencies shall increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and stormwater management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located; and inform Federal employees about and involve them in the achievement of these goals.

It is further the policy of the United States that to achieve these goals and support their respective missions, agencies shall prioritize actions based on a full accounting of both economic and social benefits and costs and shall drive continuous improvement by annually evaluating performance, extending or expanding projects that have net benefits, and reassessing or discontinuing under-performing projects.

Finally, it is also the policy of the United States that agencies' efforts and outcomes in implementing this order shall be transparent and that agencies shall therefore disclose results associated with the actions taken pursuant to this order on publicly available Federal websites.

Sec. 2. Goals for Agencies. In implementing the policy set forth in section 1 of this order, and preparing and implementing the Strategic Sustainability Performance Plan called for in section 8 of this order, the head of each agency shall:

(a) within 90 days of the date of this order, establish and report to the Chair of the Council on Environmental Quality (CEQ Chair) and the Director of the Office of Management and Budget (OMB Director) a percentage reduction target for agency-wide reductions of scope 1 and 2 greenhouse gas emissions in absolute terms by fiscal year 2020, relative to a fiscal year 2008 baseline of the agency's scope 1 and 2 greenhouse gas emissions. Where appropriate, the target shall exclude direct emissions from excluded vehicles and equipment and from electric power produced and sold commercially to other parties in the course of regular business. This target shall be subject to review and approval by the CEQ Chair in consultation with the OMB Director under section 5 of this order. In establishing the target, the agency head shall consider reductions associated with:

(i) reducing energy intensity in agency buildings;

- (ii) increasing agency use of renewable energy and implementing renewable energy generation projects on agency property; and
- (iii) reducing the use of fossil fuels by:
 - (A) using low greenhouse gas emitting vehicles including alternative fuel vehicles;
 - (B) optimizing the number of vehicles in the agency fleet; and
 - (C) reducing, if the agency operates a fleet of at least 20 motor vehicles, the agency fleet's total consumption of petroleum products by a minimum of 2 percent annually through the end of fiscal year 2020, relative to a baseline of fiscal year 2005;
- (b) within 240 days of the date of this order and concurrent with submission of the Strategic Sustainability Performance Plan as described in section 8 of this order, establish and report to the CEQ Chair and the OMB Director a percentage reduction target for reducing agency-wide scope 3 greenhouse gas emissions in absolute terms by fiscal year 2020, relative to a fiscal year 2008 baseline of agency scope 3 emissions. This target shall be subject to review and approval by the CEQ Chair in consultation with the OMB Director under section 5 of this order. In establishing the target, the agency head shall consider reductions associated with:
 - (i) pursuing opportunities with vendors and contractors to address and incorporate incentives to reduce greenhouse gas emissions (such as changes to manufacturing, utility or delivery services, modes of transportation used, or other changes in supply chain activities);
 - (ii) implementing strategies and accommodations for transit, travel, training, and conferencing that actively support lower-carbon commuting and travel by agency staff;
 - (iii) greenhouse gas emission reductions associated with pursuing other relevant goals in this section; and
 - (iv) developing and implementing innovative policies and practices to address scope 3 greenhouse gas emissions unique to agency operations;
- (c) establish and report to the CEQ Chair and OMB Director a comprehensive inventory of absolute greenhouse gas emissions, including scope 1, scope 2, and specified scope 3 emissions (i) within 15 months of the date of this order for fiscal year 2010, and (ii) thereafter, annually at the end of January, for the preceding fiscal year.
- (d) improve water use efficiency and management by:
 - (i) reducing potable water consumption intensity by 2 percent annually through fiscal year 2020, or 26 percent by the end of fiscal year 2020, relative to a baseline of the agency's water consumption in fiscal year 2007, by implementing water management strategies including water-efficient and low-flow fixtures and efficient cooling towers;
 - (ii) reducing agency industrial, landscaping, and agricultural water consumption by 2 percent annually or 20 percent by the end of fiscal year 2020 relative to a baseline of the agency's industrial, landscaping, and agricultural water consumption in fiscal year 2010;
 - (iii) consistent with State law, identifying, promoting, and implementing water reuse strategies that reduce potable water consumption; and
 - (iv) implementing and achieving the objectives identified in the stormwater management guidance referenced in section 14 of this order;
- (e) promote pollution prevention and eliminate waste by:
 - (i) minimizing the generation of waste and pollutants through source reduction;
 - (ii) diverting at least 50 percent of non-hazardous solid waste, excluding construction and demolition debris, by the end of fiscal year 2015;
 - (iii) diverting at least 50 percent of construction and demolition materials and debris by the end of fiscal year 2015;
 - (iv) reducing printing paper use and acquiring uncoated printing and writing paper containing at least 30 percent postconsumer fiber;

- (v) reducing and minimizing the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of;
 - (vi) increasing diversion of compostable and organic material from the waste stream;
 - (vii) implementing integrated pest management and other appropriate landscape management practices;
 - (viii) increasing agency use of acceptable alternative chemicals and processes in keeping with the agency's procurement policies;
 - (ix) decreasing agency use of chemicals where such decrease will assist the agency in achieving greenhouse gas emission reduction targets under section 2(a) and (b) of this order; and
 - (x) reporting in accordance with the requirements of sections 301 through 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. 11001 *et seq.*);
- (f) advance regional and local integrated planning by:
- (i) participating in regional transportation planning and recognizing existing community transportation infrastructure;
 - (ii) aligning Federal policies to increase the effectiveness of local planning for energy choices such as locally generated renewable energy;
 - (iii) ensuring that planning for new Federal facilities or new leases includes consideration of sites that are pedestrian friendly, near existing employment centers, and accessible to public transit, and emphasizes existing central cities and, in rural communities, existing or planned town centers;
 - (iv) identifying and analyzing impacts from energy usage and alternative energy sources in all Environmental Impact Statements and Environmental Assessments for proposals for new or expanded Federal facilities under the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*); and
 - (v) coordinating with regional programs for Federal, State, tribal, and local ecosystem, watershed, and environmental management;
- (g) implement high performance sustainable Federal building design, construction, operation and management, maintenance, and deconstruction including by:
- (i) beginning in 2020 and thereafter, ensuring that all new Federal buildings that enter the planning process are designed to achieve zero-net-energy by 2030;
 - (ii) ensuring that all new construction, major renovation, or repair and alteration of Federal buildings complies with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings*, (Guiding Principles);
 - (iii) ensuring that at least 15 percent of the agency's existing buildings (above 5,000 gross square feet) and building leases (above 5,000 gross square feet) meet the Guiding Principles by fiscal year 2015 and that the agency makes annual progress toward 100-percent conformance with the Guiding Principles for its building inventory;
 - (iv) pursuing cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials;
 - (v) managing existing building systems to reduce the consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs;
 - (vi) when adding assets to the agency's real property inventory, identifying opportunities to consolidate and dispose of existing assets, optimize the performance of the agency's real-property portfolio, and reduce associated environmental impacts; and
 - (vii) ensuring that rehabilitation of federally owned historic buildings utilizes best practices and technologies in retrofitting to promote long-term viability of the buildings;
- (h) advance sustainable acquisition to ensure that 95 percent of new contract actions including task and delivery orders, for products and services with the exception of acquisition of weapon systems, are energy-

efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water-efficient, biobased, environmentally preferable (e.g., Electronic Product Environmental Assessment Tool (EPEAT) certified), non-ozone depleting, contain recycled content, or are non-toxic or less-toxic alternatives, where such products and services meet agency performance requirements;

(i) promote electronics stewardship, in particular by:

(i) ensuring procurement preference for EPEAT-registered electronic products;

(ii) establishing and implementing policies to enable power management, duplex printing, and other energy-efficient or environmentally preferable features on all eligible agency electronic products;

(iii) employing environmentally sound practices with respect to the agency's disposition of all agency excess or surplus electronic products;

(iv) ensuring the procurement of Energy Star and FEMP designated electronic equipment;

(v) implementing best management practices for energy-efficient management of servers and Federal data centers; and

(j) sustain environmental management, including by:

(i) continuing implementation of formal environmental management systems at all appropriate organizational levels; and

(ii) ensuring these formal systems are appropriately implemented and maintained to achieve the performance necessary to meet the goals of this order.

Sec. 3. *Steering Committee on Federal Sustainability.* The OMB Director and the CEQ Chair shall:

(a) establish an interagency Steering Committee (Steering Committee) on Federal Sustainability composed of the Federal Environmental Executive, designated under section 6 of Executive Order 13423 of January 24, 2007, and Agency Senior Sustainability Officers, designated under section 7 of this order, and that shall:

(i) serve in the dual capacity of the Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management designated by the CEQ Chair pursuant to section 4 of Executive Order 13423;

(ii) advise the OMB Director and the CEQ Chair on implementation of this order;

(iii) facilitate the implementation of each agency's Strategic Sustainability Performance Plan; and

(iv) share information and promote progress towards the goals of this order;

(b) enlist the support of other organizations within the Federal Government to assist the Steering Committee in addressing the goals of this order;

(c) establish and disband, as appropriate, interagency subcommittees of the Steering Committee, to assist the Steering Committee in carrying out its responsibilities;

(d) determine appropriate Federal actions to achieve the policy of section 1 and the goals of section 2 of this order;

(e) ensure that Federal agencies are held accountable for conformance with the requirements of this order; and

(f) in coordination with the Department of Energy's Federal Energy Management Program and the Office of the Federal Environmental Executive designated under section 6 of Executive Order 13423, provide guidance and assistance to facilitate the development of agency targets for greenhouse gas emission reductions required under subsections 2(a) and (b) of this order.

Sec. 4. *Additional Duties of the Director of the Office of Management and Budget.* In addition to the duties of the OMB Director specified elsewhere in this order, the OMB Director shall:

(a) review and approve each agency's multi-year Strategic Sustainability Performance Plan under section 8 of this order and each update of the Plan. The Director shall, where feasible, review each agency's Plan concurrently with OMB's review and evaluation of the agency's budget request;

(b) prepare scorecards providing periodic evaluation of Federal agency performance in implementing this order and publish scorecard results on a publicly available website; and

(c) approve and issue instructions to the heads of agencies concerning budget and appropriations matters relating to implementation of this order.

Sec. 5. *Additional Duties of the Chair of the Council on Environmental Quality.* In addition to the duties of the CEQ Chair specified elsewhere in this order, the CEQ Chair shall:

(a) issue guidance for greenhouse gas accounting and reporting required under section 2 of this order;

(b) issue instructions to implement this order, in addition to instructions within the authority of the OMB Director to issue under subsection 4(c) of this order;

(c) review and approve each agency's targets, in consultation with the OMB Director, for agency-wide reductions of greenhouse gas emissions under section 2 of this order;

(d) prepare, in coordination with the OMB Director, streamlined reporting metrics to determine each agency's progress under section 2 of this order;

(e) review and evaluate each agency's multi-year Strategic Sustainability Performance Plan under section 8 of this order and each update of the Plan;

(f) assess agency progress toward achieving the goals and policies of this order, and provide its assessment of the agency's progress to the OMB Director;

(g) within 120 days of the date of this order, provide the President with an aggregate Federal Government-wide target for reducing scope 1 and 2 greenhouse gas emissions in absolute terms by fiscal year 2020 relative to a fiscal year 2008 baseline;

(h) within 270 days of the date of this order, provide the President with an aggregate Federal Government-wide target for reducing scope 3 greenhouse gas emissions in absolute terms by fiscal year 2020 relative to a fiscal year 2008 baseline;

(i) establish and disband, as appropriate, interagency working groups to provide recommendations to the CEQ for areas of Federal agency operational and managerial improvement associated with the goals of this order; and

(j) administer the Presidential leadership awards program, established under subsection 4(c) of Executive Order 13423, to recognize exceptional and outstanding agency performance with respect to achieving the goals of this order and to recognize extraordinary innovation, technologies, and practices employed to achieve the goals of this order.

Sec. 6. *Duties of the Federal Environmental Executive.* The Federal Environmental Executive designated by the President to head the Office of the Federal Environmental Executive, pursuant to section 6 of Executive Order 13423, shall:

(a) identify strategies and tools to assist Federal implementation efforts under this order, including through the sharing of best practices from successful Federal sustainability efforts; and

(b) monitor and advise the CEQ Chair and the OMB Director on the agencies' implementation of this order and their progress in achieving the order's policies and goals.

Sec. 7. *Agency Senior Sustainability Officers.* (a) Within 30 days of the date of this order, the head of each agency shall designate from among

the agency's senior management officials a Senior Sustainability Officer who shall be accountable for agency conformance with the requirements of this order; and shall report such designation to the OMB Director and the CEQ Chair.

(b) The Senior Sustainability Officer for each agency shall perform the functions of the senior agency official designated by the head of each agency pursuant to section 3(d)(i) of Executive Order 13423 and shall be responsible for:

(i) preparing the targets for agency-wide reductions and the inventory of greenhouse gas emissions required under subsections 2(a), (b), and (c) of this order;

(ii) within 240 days of the date of this order, and annually thereafter, preparing and submitting to the CEQ Chair and the OMB Director, for their review and approval, a multi-year Strategic Sustainability Performance Plan (Sustainability Plan or Plan) as described in section 8 of this order;

(iii) preparing and implementing the approved Plan in coordination with appropriate offices and organizations within the agency including the General Counsel, Chief Information Officer, Chief Acquisition Officer, Chief Financial Officer, and Senior Real Property Officers, and in coordination with other agency plans, policies, and activities;

(iv) monitoring the agency's performance and progress in implementing the Plan, and reporting the performance and progress to the CEQ Chair and the OMB Director, on such schedule and in such format as the Chair and the Director may require; and

(v) reporting annually to the head of the agency on the adequacy and effectiveness of the agency's Plan in implementing this order.

Sec. 8. Agency Strategic Sustainability Performance Plan. Each agency shall develop, implement, and annually update an integrated Strategic Sustainability Performance Plan that will prioritize agency actions based on lifecycle return on investment. Each agency Plan and update shall be subject to approval by the OMB Director under section 4 of this order. With respect to the period beginning in fiscal year 2011 and continuing through the end of fiscal year 2021, each agency Plan shall:

(a) include a policy statement committing the agency to compliance with environmental and energy statutes, regulations, and Executive Orders;

(b) achieve the sustainability goals and targets, including greenhouse gas reduction targets, established under section 2 of this order;

(c) be integrated into the agency's strategic planning and budget process, including the agency's strategic plan under section 3 of the Government Performance and Results Act of 1993, as amended (5 U.S.C. 306);

(d) identify agency activities, policies, plans, procedures, and practices that are relevant to the agency's implementation of this order, and where necessary, provide for development and implementation of new or revised policies, plans, procedures, and practices;

(e) identify specific agency goals, a schedule, milestones, and approaches for achieving results, and quantifiable metrics for agency implementation of this order;

(f) take into consideration environmental measures as well as economic and social benefits and costs in evaluating projects and activities based on lifecycle return on investment;

(g) outline planned actions to provide information about agency progress and performance with respect to achieving the goals of this order on a publicly available Federal website;

(h) incorporate actions for achieving progress metrics identified by the OMB Director and the CEQ Chair;

(i) evaluate agency climate-change risks and vulnerabilities to manage the effects of climate change on the agency's operations and mission in both the short and long term; and

(j) identify in annual updates opportunities for improvement and evaluation of past performance in order to extend or expand projects that have net lifecycle benefits, and reassess or discontinue under-performing projects.

Sec. 9. *Recommendations for Greenhouse Gas Accounting and Reporting.* The Department of Energy, through its Federal Energy Management Program, and in coordination with the Environmental Protection Agency, the Department of Defense, the General Services Administration, the Department of the Interior, the Department of Commerce, and other agencies as appropriate, shall:

(a) within 180 days of the date of this order develop and provide to the CEQ Chair recommended Federal greenhouse gas reporting and accounting procedures for agencies to use in carrying out their obligations under subsections 2(a), (b), and (c) of this order, including procedures that will ensure that agencies:

(i) accurately and consistently quantify and account for greenhouse gas emissions from all scope 1, 2, and 3 sources, using accepted greenhouse gas accounting and reporting principles, and identify appropriate opportunities to revise the fiscal year 2008 baseline to address significant changes in factors affecting agency emissions such as reorganization and improvements in accuracy of data collection and estimation procedures or other major changes that would otherwise render the initial baseline information unsuitable;

(ii) consider past Federal agency efforts to reduce greenhouse gas emissions; and

(iii) consider and account for sequestration and emissions of greenhouse gases resulting from Federal land management practices;

(b) within 1 year of the date of this order, to ensure consistent and accurate reporting under this section, provide electronic accounting and reporting capability for the Federal greenhouse gas reporting procedures developed under subsection (a) of this section, and to the extent practicable, ensure compatibility between this capability and existing Federal agency reporting systems; and

(c) every 3 years from the date of the CEQ Chair's issuance of the initial version of the reporting guidance, and as otherwise necessary, develop and provide recommendations to the CEQ Chair for revised Federal greenhouse gas reporting procedures for agencies to use in implementing subsections 2(a), (b), and (c) of this order.

Sec. 10. *Recommendations for Sustainable Locations for Federal Facilities.* Within 180 days of the date of this order, the Department of Transportation, in accordance with its Sustainable Partnership Agreement with the Department of Housing and Urban Development and the Environmental Protection Agency, and in coordination with the General Services Administration, the Department of Homeland Security, the Department of Defense, and other agencies as appropriate, shall:

(a) review existing policies and practices associated with site selection for Federal facilities; and

(b) provide recommendations to the CEQ Chair regarding sustainable location strategies for consideration in Sustainability Plans. The recommendations shall be consistent with principles of sustainable development including prioritizing central business district and rural town center locations, prioritizing sites well served by transit, including site design elements that ensure safe and convenient pedestrian access, consideration of transit access and proximity to housing affordable to a wide range of Federal employees, adaptive reuse or renovation of buildings, avoidance of development of sensitive land resources, and evaluation of parking management strategies.

Sec. 11. *Recommendations for Federal Local Transportation Logistics.* Within 180 days of the date of this order, the General Services Administration, in coordination with the Department of Transportation, the Department of

the Treasury, the Department of Energy, the Office of Personnel Management, and other agencies as appropriate, shall review current policies and practices associated with use of public transportation by Federal personnel, Federal shuttle bus and vehicle transportation routes supported by multiple Federal agencies, and use of alternative fuel vehicles in Federal shuttle bus fleets, and shall provide recommendations to the CEQ Chair on how these policies and practices could be revised to support the implementation of this order and the achievement of its policies and goals.

Sec. 12. *Guidance for Federal Fleet Management.* Within 180 days of the date of this order, the Department of Energy, in coordination with the General Services Administration, shall issue guidance on Federal fleet management that addresses the acquisition of alternative fuel vehicles and use of alternative fuels; the use of biodiesel blends in diesel vehicles; the acquisition of electric vehicles for appropriate functions; improvement of fleet fuel economy; the optimizing of fleets to the agency mission; petroleum reduction strategies, such as the acquisition of low greenhouse gas emitting vehicles and the reduction of vehicle miles traveled; and the installation of renewable fuel pumps at Federal fleet fueling centers.

Sec. 13. *Recommendations for Vendor and Contractor Emissions.* Within 180 days of the date of this order, the General Services Administration, in coordination with the Department of Defense, the Environmental Protection Agency, and other agencies as appropriate, shall review and provide recommendations to the CEQ Chair and the Administrator of OMB's Office of Federal Procurement Policy regarding the feasibility of working with the Federal vendor and contractor community to provide information that will assist Federal agencies in tracking and reducing scope 3 greenhouse gas emissions related to the supply of products and services to the Government. These recommendations should consider the potential impacts on the procurement process, and the Federal vendor and contractor community including small businesses and other socioeconomic procurement programs. Recommendations should also explore the feasibility of:

- (a) requiring vendors and contractors to register with a voluntary registry or organization for reporting greenhouse gas emissions;
- (b) requiring contractors, as part of a new or revised registration under the Central Contractor Registration or other tracking system, to develop and make available its greenhouse gas inventory and description of efforts to mitigate greenhouse gas emissions;
- (c) using Federal Government purchasing preferences or other incentives for products manufactured using processes that minimize greenhouse gas emissions; and
- (d) other options for encouraging sustainable practices and reducing greenhouse gas emissions.

Sec. 14. *Stormwater Guidance for Federal Facilities.* Within 60 days of the date of this order, the Environmental Protection Agency, in coordination with other Federal agencies as appropriate, shall issue guidance on the implementation of section 438 of the Energy Independence and Security Act of 2007 (42 U.S.C. 17094).

Sec. 15. *Regional Coordination.* Within 180 days of the date of this order, the Federal Environmental Executive shall develop and implement a regional implementation plan to support the goals of this order taking into account energy and environmental priorities of particular regions of the United States.

Sec. 16. *Agency Roles in Support of Federal Adaptation Strategy.* In addition to other roles and responsibilities of agencies with respect to environmental leadership as specified in this order, the agencies shall participate actively in the interagency Climate Change Adaptation Task Force, which is already engaged in developing the domestic and international dimensions of a U.S. strategy for adaptation to climate change, and shall develop approaches through which the policies and practices of the agencies can be made compatible with and reinforce that strategy. Within 1 year of the date of

this order the CEQ Chair shall provide to the President, following consultation with the agencies and the Climate Change Adaptation Task Force, as appropriate, a progress report on agency actions in support of the national adaptation strategy and recommendations for any further such measures as the CEQ Chair may deem necessary.

Sec. 17. *Limitations.* (a) This order shall apply to an agency with respect to the activities, personnel, resources, and facilities of the agency that are located within the United States. The head of an agency may provide that this order shall apply in whole or in part with respect to the activities, personnel, resources, and facilities of the agency that are not located within the United States, if the head of the agency determines that such application is in the interest of the United States.

(b) The head of an agency shall manage activities, personnel, resources, and facilities of the agency that are not located within the United States, and with respect to which the head of the agency has not made a determination under subsection (a) of this section, in a manner consistent with the policy set forth in section 1 of this order to the extent the head of the agency determines practicable.

Sec. 18. *Exemption Authority.*

(a) The Director of National Intelligence may exempt an intelligence activity of the United States, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 20, to the extent the Director determines necessary to protect intelligence sources and methods from unauthorized disclosure.

(b) The head of an agency may exempt law enforcement activities of that agency, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 20, to the extent the head of an agency determines necessary to protect undercover operations from unauthorized disclosure.

(c) (i) The head of an agency may exempt law enforcement, protective, emergency response, or military tactical vehicle fleets of that agency from the provisions of this order, other than this subsection and section 20.

(ii) Heads of agencies shall manage fleets to which paragraph (i) of this subsection refers in a manner consistent with the policy set forth in section 1 of this order to the extent they determine practicable.

(d) The head of an agency may exempt particular agency activities and facilities from the provisions of this order, other than this subsection and section 20, where it is in the interest of national security. If the head of an agency issues an exemption under this section, the agency must notify the CEQ Chair in writing within 30 days of issuance of the exemption under this subsection. To the maximum extent practicable, and without compromising national security, each agency shall strive to comply with the purposes, goals, and implementation steps in this order.

(e) The head of an agency may submit to the President, through the CEQ Chair, a request for an exemption of an agency activity, and related personnel, resources, and facilities, from this order.

Sec. 19. *Definitions.* As used in this order:

(a) “absolute greenhouse gas emissions” means total greenhouse gas emissions without normalization for activity levels and includes any allowable consideration of sequestration;

(b) “agency” means an executive agency as defined in section 105 of title 5, United States Code, excluding the Government Accountability Office;

(c) “alternative fuel vehicle” means vehicles defined by section 301 of the Energy Policy Act of 1992, as amended (42 U.S.C. 13211), and otherwise includes electric fueled vehicles, hybrid electric vehicles, plug-in hybrid electric vehicles, dedicated alternative fuel vehicles, dual fueled alternative

fuel vehicles, qualified fuel cell motor vehicles, advanced lean burn technology motor vehicles, self-propelled vehicles such as bicycles and any other alternative fuel vehicles that are defined by statute;

(d) “construction and demolition materials and debris” means materials and debris generated during construction, renovation, demolition, or dismantling of all structures and buildings and associated infrastructure;

(e) “divert” and “diverting” means redirecting materials that might otherwise be placed in the waste stream to recycling or recovery, excluding diversion to waste-to-energy facilities;

(f) “energy intensity” means energy consumption per square foot of building space, including industrial or laboratory facilities;

(g) “environmental” means environmental aspects of internal agency operations and activities, including those aspects related to energy and transportation functions;

(h) “excluded vehicles and equipment” means any vehicle, vessel, aircraft, or non-road equipment owned or operated by an agency of the Federal Government that is used in:

(i) combat support, combat service support, tactical or relief operations, or training for such operations;

(ii) Federal law enforcement (including protective service and investigation);

(iii) emergency response (including fire and rescue); or

(iv) spaceflight vehicles (including associated ground-support equipment);

(i) “greenhouse gases” means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride;

(j) “renewable energy” means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project;

(k) “scope 1, 2, and 3” mean;

(i) scope 1: direct greenhouse gas emissions from sources that are owned or controlled by the Federal agency;

(ii) scope 2: direct greenhouse gas emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency; and

(iii) scope 3: greenhouse gas emissions from sources not owned or directly controlled by a Federal agency but related to agency activities such as vendor supply chains, delivery services, and employee travel and commuting;

(l) “sustainability” and “sustainable” mean to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations;

(m) “United States” means the fifty States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, and the Northern Mariana Islands, and associated territorial waters and airspace;

(n) “water consumption intensity” means water consumption per square foot of building space; and

(o) “zero-net-energy building” means a building that is designed, constructed, and operated to require a greatly reduced quantity of energy to operate, meet the balance of energy needs from sources of energy that do not produce greenhouse gases, and therefore result in no net emissions of greenhouse gases and be economically viable.

Sec. 20. General Provisions.

(a) This order shall be implemented in a manner consistent with applicable law and subject to the availability of appropriations.

(b) Nothing in this order shall be construed to impair or otherwise affect the functions of the OMB Director relating to budgetary, administrative, or legislative proposals.

(c) This order is intended only to improve the internal management of the Federal Government and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

A handwritten signature in black ink, appearing to be Barack Obama's signature, consisting of a large 'B' followed by a circle and a horizontal line.

THE WHITE HOUSE,
Washington, October 5, 2009.



Federal Register

**Friday,
January 26, 2007**

Part II

The President

**Executive Order 13423—Strengthening
Federal Environmental, Energy, and
Transportation Management**

Presidential Documents

Title 3—**Executive Order 13423 of January 24, 2007****The President****Strengthening Federal Environmental, Energy, and Transportation Management**

By the authority vested in me as President by the Constitution and the laws of the United States of America, and to strengthen the environmental, energy, and transportation management of Federal agencies, it is hereby ordered as follows:

Section 1. Policy. It is the policy of the United States that Federal agencies conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner.

Sec. 2. Goals for Agencies. In implementing the policy set forth in section 1 of this order, the head of each agency shall:

(a) improve energy efficiency and reduce greenhouse gas emissions of the agency, through reduction of energy intensity by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of the agency's energy use in fiscal year 2003;

(b) ensure that (i) at least half of the statutorily required renewable energy consumed by the agency in a fiscal year comes from new renewable sources, and (ii) to the extent feasible, the agency implements renewable energy generation projects on agency property for agency use;

(c) beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency's water consumption in fiscal year 2007, through life-cycle cost-effective measures by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015;

(d) require in agency acquisitions of goods and services (i) use of sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products, and (ii) use of paper of at least 30 percent post-consumer fiber content;

(e) ensure that the agency (i) reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of by the agency, (ii) increases diversion of solid waste as appropriate, and (iii) maintains cost-effective waste prevention and recycling programs in its facilities;

(f) ensure that (i) new construction and major renovation of agency buildings comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings set forth in the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (2006)*, and (ii) 15 percent of the existing Federal capital asset building inventory of the agency as of the end of fiscal year 2015 incorporates the sustainable practices in the Guiding Principles;

(g) ensure that, if the agency operates a fleet of at least 20 motor vehicles, the agency, relative to agency baselines for fiscal year 2005, (i) reduces the fleet's total consumption of petroleum products by 2 percent annually through the end of fiscal year 2015, (ii) increases the total fuel consumption that is non-petroleum-based by 10 percent annually, and (iii) uses plug-in hybrid (PIH) vehicles when PIH vehicles are commercially available at

a cost reasonably comparable, on the basis of life-cycle cost, to non-PIH vehicles; and

(h) ensure that the agency (i) when acquiring an electronic product to meet its requirements, meets at least 95 percent of those requirements with an Electronic Product Environmental Assessment Tool (EPEAT)-registered electronic product, unless there is no EPEAT standard for such product, (ii) enables the Energy Star feature on agency computers and monitors, (iii) establishes and implements policies to extend the useful life of agency electronic equipment, and (iv) uses environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.

Sec. 3. Duties of Heads of Agencies. In implementing the policy set forth in section 1 of this order, the head of each agency shall:

(a) implement within the agency sustainable practices for (i) energy efficiency, greenhouse gas emissions avoidance or reduction, and petroleum products use reduction, (ii) renewable energy, including bioenergy, (iii) water conservation, (iv) acquisition, (v) pollution and waste prevention and recycling, (vi) reduction or elimination of acquisition and use of toxic or hazardous chemicals, (vii) high performance construction, lease, operation, and maintenance of buildings, (viii) vehicle fleet management, and (ix) electronic equipment management;

(b) implement within the agency environmental management systems (EMS) at all appropriate organizational levels to ensure (i) use of EMS as the primary management approach for addressing environmental aspects of internal agency operations and activities, including environmental aspects of energy and transportation functions, (ii) establishment of agency objectives and targets to ensure implementation of this order, and (iii) collection, analysis, and reporting of information to measure performance in the implementation of this order;

(c) establish within the agency programs for (i) environmental management training, (ii) environmental compliance review and audit, and (iii) leadership awards to recognize outstanding environmental, energy, or transportation management performance in the agency;

(d) within 30 days after the date of this order (i) designate a senior civilian officer of the United States, compensated annually in an amount at or above the amount payable at level IV of the Executive Schedule, to be responsible for implementation of this order within the agency, (ii) report such designation to the Director of the Office of Management and Budget and the Chairman of the Council on Environmental Quality, and (iii) assign the designated official the authority and duty to (A) monitor and report to the head of the agency on agency activities to carry out subsections (a) and (b) of this section, and (B) perform such other duties relating to the implementation of this order within the agency as the head of the agency deems appropriate;

(e) ensure that contracts entered into after the date of this order for contractor operation of government-owned facilities or vehicles require the contractor to comply with the provisions of this order with respect to such facilities or vehicles to the same extent as the agency would be required to comply if the agency operated the facilities or vehicles;

(f) ensure that agreements, permits, leases, licenses, or other legally-binding obligations between the agency and a tenant or concessionaire entered into after the date of this order require, to the extent the head of the agency determines appropriate, that the tenant or concessionaire take actions relating to matters within the scope of the contract that facilitate the agency's compliance with this order;

(g) provide reports on agency implementation of this order to the Chairman of the Council on such schedule and in such format as the Chairman of the Council may require; and

(h) provide information and assistance to the Director of the Office of Management and Budget, the Chairman of the Council, and the Federal Environmental Executive.

Sec. 4. *Additional Duties of the Chairman of the Council on Environmental Quality.* In implementing the policy set forth in section 1 of this order, the Chairman of the Council on Environmental Quality:

(a) (i) shall establish a Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management to advise the Director of the Office of Management and Budget and the Chairman of the Council on the performance of their functions under this order that shall consist exclusively of (A) the Federal Environmental Executive, who shall chair, convene and preside at meetings of, determine the agenda of, and direct the work of, the Steering Committee, and (B) the senior officials designated under section 3(d)(i) of this order, and (ii) may establish subcommittees of the Steering Committee, to assist the Steering Committee in developing the advice of the Steering Committee on particular subjects;

(b) may, after consultation with the Director of the Office of Management and Budget and the Steering Committee, issue instructions to implement this order, other than instructions within the authority of the Director to issue under section 5 of this order; and

(c) shall administer a presidential leadership award program to recognize exceptional and outstanding environmental, energy, or transportation management performance and excellence in agency efforts to implement this order.

Sec. 5. *Duties of the Director of the Office of Management and Budget.* In implementing the policy set forth in section 1 of this order, the Director of the Office of Management and Budget shall, after consultation with the Chairman of the Council and the Steering Committee, issue instructions to the heads of agencies concerning:

(a) periodic evaluation of agency implementation of this order;

(b) budget and appropriations matters relating to implementation of this order;

(c) implementation of section 2(d) of this order; and

(d) amendments of the Federal Acquisition Regulation as necessary to implement this order.

Sec. 6. *Duties of the Federal Environmental Executive.* A Federal Environmental Executive designated by the President shall head the Office of the Federal Environmental Executive, which shall be maintained in the Environmental Protection Agency for funding and administrative purposes. In implementing the policy set forth in section 1 of this order, the Federal Environmental Executive shall:

(a) monitor, and advise the Chairman of the Council on, performance by agencies of functions assigned by sections 2 and 3 of this order;

(b) submit a report to the President, through the Chairman of the Council, not less often than once every 2 years, on the activities of agencies to implement this order; and

(c) advise the Chairman of the Council on the Chairman's exercise of authority granted by subsection 4(c) of this order.

Sec. 7. *Limitations.* (a) This order shall apply to an agency with respect to the activities, personnel, resources, and facilities of the agency that are located within the United States. The head of an agency may provide that this order shall apply in whole or in part with respect to the activities, personnel, resources, and facilities of the agency that are not located within the United States, if the head of the agency determines that such application is in the interest of the United States.

(b) The head of an agency shall manage activities, personnel, resources, and facilities of the agency that are not located within the United States, and with respect to which the head of the agency has not made a determination under subsection (a) of this section, in a manner consistent with the policy set forth in section 1 of this order to the extent the head of the agency determines practicable.

Sec. 8. Exemption Authority. (a) The Director of National Intelligence may exempt an intelligence activity of the United States, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 10, to the extent the Director determines necessary to protect intelligence sources and methods from unauthorized disclosure.

(b) The head of an agency may exempt law enforcement activities of that agency, and related personnel, resources, and facilities, from the provisions of this order, other than this subsection and section 10, to the extent the head of an agency determines necessary to protect undercover operations from unauthorized disclosure.

(c) (i) The head of an agency may exempt law enforcement, protective, emergency response, or military tactical vehicle fleets of that agency from the provisions of this order, other than this subsection and section 10.

(ii) Heads of agencies shall manage fleets to which paragraph (i) of this subsection refers in a manner consistent with the policy set forth in section 1 of this order to the extent they determine practicable.

(d) The head of an agency may submit to the President, through the Chairman of the Council, a request for an exemption of an agency activity, and related personnel, resources, and facilities, from this order.

Sec. 9. Definitions. As used in this order:

(a) "agency" means an executive agency as defined in section 105 of title 5, United States Code, excluding the Government Accountability Office;

(b) "Chairman of the Council" means the Chairman of the Council on Environmental Quality, including in the Chairman's capacity as Director of the Office of Environmental Quality;

(c) "Council" means the Council on Environmental Quality;

(d) "environmental" means environmental aspects of internal agency operations and activities, including those environmental aspects related to energy and transportation functions;

(e) "greenhouse gases" means carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride;

(f) "life-cycle cost-effective" means the life-cycle costs of a product, project, or measure are estimated to be equal to or less than the base case (i.e., current or standard practice or product);

(g) "new renewable sources" means sources of renewable energy placed into service after January 1, 1999;

(h) "renewable energy" means energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project;

(i) "energy intensity" means energy consumption per square foot of building space, including industrial or laboratory facilities;

(j) "Steering Committee" means the Steering Committee on Strengthening Federal Environmental, Energy, and Transportation Management established under subsection 4(b) of this order;

(k) "sustainable" means to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling

the social, economic, and other requirements of present and future generations of Americans; and

(l) “United States” when used in a geographical sense, means the fifty states, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, and the Northern Mariana Islands, and associated territorial waters and airspace.

Sec. 10. General Provisions. (a) This order shall be implemented in a manner consistent with applicable law and subject to the availability of appropriations.

(b) Nothing in this order shall be construed to impair or otherwise affect the functions of the Director of the Office of Management and Budget relating to budget, administrative, or legislative proposals.

(c) This order is intended only to improve the internal management of the Federal Government and is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by a party against the United States, its departments, agencies, instrumentalities, entities, officers, employees or agents, or any other person.

Sec. 11. Revocations; Conforming Provisions. (a) The following are revoked:

(i) Executive Order 13101 of September 14, 1998;

(ii) Executive Order 13123 of June 3, 1999;

(iii) Executive Order 13134 of August 12, 1999, as amended;

(iv) Executive Order 13148 of April 21, 2000; and

(v) Executive Order 13149 of April 21, 2000.

(b) In light of subsection 317(e) of the National Defense Authorization Act for Fiscal Year 2002 (Public Law 107–107), not later than January 1 of each year through and including 2010, the Secretary of Defense shall submit to the Senate and the House of Representatives a report regarding progress made toward achieving the energy efficiency goals of the Department of Defense.

(c) Section 3(b)(vi) of Executive Order 13327 of February 4, 2004, is amended by striking “Executive Order 13148 of April 21, 2000” and inserting in lieu thereof “other executive orders”.



THE WHITE HOUSE,
January 24, 2007.



**Department of Defense
Strategic Sustainability Performance Plan**

FY 2010

**Public Version
26 August 2010**



The mission of the Department of Defense (DoD) is to provide the military forces needed to deter war and protect the security of our country. This, our first Departmental sustainability plan, lays out our goals and performance expectations for the next decade, establishing the path by which DoD will serve as a model of sustainability for the nation while enhancing our ability to achieve our mission.

The 2010 Quadrennial Defense Review recognizes that a strategic approach to climate change and energy is a high priority for the Department. Our military's heavy reliance on fossil fuels creates significant risks and costs at a tactical as well as a strategic level. We measure these costs in lost dollars, in reduced mission effectiveness, and in U.S. soldiers' lives. Freeing warfighters from the tether of fuel will significantly improve our mission effectiveness, as will reducing our installations' dependence on costly fossil fuels and a potentially fragile power grid. DoD takes its responsibility for sustainability seriously, and anticipates these changes will significantly improve our mission effectiveness while enhancing the environment. Furthermore, to successfully execute the DoD mission, our Military Departments must have the land, air, and water necessary to train and operate, today and into the future, in a world where there is increasing competition for resources. The Department must plan for and act in a sustainable manner now in order to build an enduring future; as such, this Strategic Sustainability Performance Plan is a critical enabler in the performance of our mission.

The Department not only commits to complying with environmental and energy statutes, regulations, and Executive Orders, but to go beyond compliance where it serves our national security needs. It is already DoD policy to address sustainability concepts in our acquisition and procurement processes, and in planning and managing our installations. We are committed to integrated risk management practices that protect the environment and promote sustainability while advancing our mission. We continue to develop and improve methodologies that ensure systematic analysis, informed decision-making, and appropriate budgeting to address these needs. For every DoD program, the Department will identify, assess, manage, and actively seek opportunities to continually improve its activities as well as to monitor its contribution towards the sustainability goals captured in this plan.

In 2010 and 2011 our priorities and significant efforts are to: (1) invest in fixed installations using a three part strategy to reduce energy demand, apply micro-grid technologies, and increase the supply of renewable energy; (2) enhance governance structures to ensure top level commitment and accountability; and (3) ensure that all DoD Components are incorporating the concepts of sustainability into their doctrine, policies, and guidance documents. Our primary path to reaching our sustainability goals will be to reduce the Department's reliance on fossil fuels through energy efficiency and renewable energy. Although we still have much to do, the Department is committed to making bold changes. Successful implementation of the Plan will help DoD continue its culture of excellence in environmental and fiscal stewardship and improve national security, both home and abroad.

DoD Senior Sustainability Officer
Under Secretary of Defense for Acquisition,
Technology, and Logistics (AT&L)

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Part I: DoD Policy and Strategy

I.1 Sustainability and the DoD Mission

The Department's vision of sustainability is to maintain the ability to operate into the future without decline – either in the mission or in the natural and manufactured systems that support it. DoD embraces sustainability as a means of improving mission accomplishment. Sustainability is not an individual Departmental program; rather, it is an organizing paradigm that applies to all DoD mission and program areas. DoD personnel are learning to apply this mindset to their practices to improve mission performance and reduce lifecycle costs. The Department has instituted many policies and practices to promote lifecycle thinking and long-term cost savings as a guard against short-term investments that often result in higher long-term operating costs. Applying a systematic framework for improving environmental performance involves a wide range of sustainability practices that span much of the Department's day to day activities and military operations. These include retrofitting and constructing buildings and expeditionary base camps to optimize sustainability, conducting procurement and engineering in the context of sustainability, using and disposing of electronics in ways that minimize energy use and environmental damage, and the use of integrated environmental management systems. The Department recognizes that many key issues facing DoD can be addressed through smart investments that improve sustainability, such as energy efficiency, energy management, renewable energy, water use efficiency, the reduced use of toxic and hazardous chemicals, and solid waste management. The 2010 Quadrennial Defense Review (QDR) specifically recognizes that DoD must address climate change and energy because of their significance to national security and mission readiness.

“Sustainability” and “sustainable” mean to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.

— Executive Orders 13423 & 13514

Executive Order (EO) [13514](#) articulates both general and specific requirements to improve federal government efficiency through the development of a green economy and a decreased dependence on fossil fuels. The DoD Strategic Sustainability Performance Plan (the Plan) provides a coherent approach both for complying with multiple federal requirements for sustainability and for assuring the mission. The linkages between sustainability and the DoD mission are strong and direct. There are four key areas of intersection that form priorities for the Department:

- 1) Energy and Reliance on Fossil Fuels
- 2) Chemicals of Environmental Concern
- 3) Water Resources Management
- 4) Maintaining Readiness in the Face of Climate Change

I.1.A Energy and Reliance on Fossil Fuels

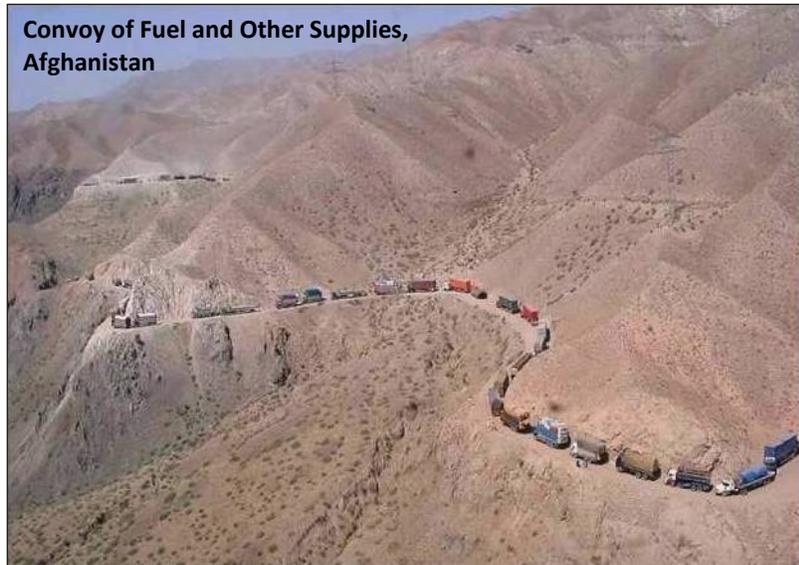
Relation to the Mission

The U.S. military's reliance on oil and other fossil fuels poses four broad security challenges:

- The first security challenge is the growing risk to operating forces. Attacks on our delivery mechanisms and fixed energy supplies in Afghanistan and Iraq are resulting in a growing number of casualties and demonstrate that fuel inefficiency endangers our troops and threatens our missions.
- A second challenge is petroleum supply insecurity. Most petroleum products are transported by sea, and much of this trade passes through vulnerable chokepoints such as the Strait of Hormuz and the Straits of Malacca. The free flow of energy through these vital channels may be threatened by piracy,

political instability and military action. Energy supply vulnerability is therefore a strategic as well as a tactical threat.

- A third challenge is oil supply, demand, and price volatility. Tightening global oil supplies and political instability within some oil-producing nations created significant price volatility in recent years, raising our costs and making budget and acquisition decisions more difficult. The challenge will increase as the growing demand for energy – particularly in Asia – outstrips projected oil production and refining capacity.
- A final challenge is grid vulnerability. DoD’s reliance on a fragile commercial grid to deliver electricity to its 500-plus major installations places the continuity of critical missions at risk. In general, our installations lack the ability to manage their demand for and supply of electrical power, making them potentially vulnerable to intermittent or prolonged power disruption caused by natural disasters, cyber attacks, and sheer overload of the grid. With the increasing reliance of U.S. combat forces on “reach back” support from installations in the United States, power failures at those installations could adversely affect our power projection and homeland defense mission capability. For example, the Department operates Predator drones in Afghanistan from a facility in the Western U.S. and analyzes battlefield intelligence at data centers here at home. This means that an energy threat to bases at home can be a threat to operations abroad.



Convoy of Fuel and Other Supplies, Afghanistan

Photo: U.S. Army

Progress to Date and Key Initiatives Going Forward

In January 2010, the Department released an aggressive target under EO 13514 for reducing direct greenhouse gas emissions from facilities and non-tactical fleet vehicles. These emissions are overwhelmingly due to direct energy use, especially electricity. Although the Department’s goal of reducing energy risks will require a long and focused campaign, DoD has made meaningful progress. In addition to the office of the Deputy Under Secretary of Defense (DUSD) Installations and Environment (I&E), which has long had a strong focus on energy, DoD created the office of Director for Operational Energy Plans and Programs (DOEP&P) within the Office of the Secretary of Defense (OSD) in October 2009. In the Military Departments, the Military Service Secretaries have made energy a high priority. For example the Air Force Energy Senior Focus Group has established goals of reducing energy demand, increasing supply, and changing energy culture. As a means of achieving these goals, the Air Force will certify all aircraft and systems against a 50/50 alternative fuel blend by 2011, and be prepared to cost competitively acquire 50 percent of its domestic aviation fuel requirements via an alternative fuel blend. This blend’s alternative fuel component must be derived from domestic sources produced in a manner that is greener than fuels produced from conventional petroleum. In October 2009, Navy Secretary Ray Mabus announced a set of ambitious energy goals for the Navy and the Marine Corps. The Secretary’s plans include fielding a carrier strike group of nuclear vessels and ships powered by biofuel – dubbed “the Great Green Fleet” – by 2016, and producing half of the Navy’s installation and operational energy requirements from alternative sources by 2020.

Energy Management in Operations

The FY 2009 National Defense Authorization Act defines "operational energy" as the energy required for training, moving, and sustaining military forces and weapons platforms for military operations; it includes energy used by tactical power systems, generators, and weapons platforms. Operational energy is necessarily exempt from the EO emission reduction targets, as providing immediate support for the

warfighter must remain our highest priority.

Nevertheless, reducing the energy demands of our operational forces is a major focus of the Department's efforts to cut energy consumption, and our combat operations will benefit as a result. The military imperative of reducing our operational energy demand will likely be a major contributor to the Department's greenhouse (GHG) emissions reductions.

DoD Energy Security

"Energy security for the Department means having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs. Energy efficiency can serve as a force multiplier, because it increases the range and endurance of forces in the field and can reduce the number of combat forces diverted to protect energy supply lines, which are vulnerable to both asymmetric and conventional attacks and disruptions."

— DoD Quadrennial Defense Review, 2010

To achieve operational energy reductions, the Department has tripled investment in energy security technology over the last four years, from \$400 million to \$1.2 billion. DoD is investing

heavily to improve the efficiency and performance of aircraft engines, which account for a large fraction of all operational energy consumption. One promising project is the Highly Efficient Embedded Turbine Engine, based on a high-pressure ratio and a high-temperature core turbine technology that should reduce fuel consumption by 25 percent. It should also be applicable to commercial aircraft. The Army is developing technology aimed at reducing the fuel consumption of tactical ground vehicles such as the High Mobility Multipurpose Wheeled Vehicle by 30 percent to 40 percent. The Air Force has an ongoing program to qualify aircraft to use alternative fuels. The Defense Advanced Research Projects Agency is spending \$100 million on an 18-month project to develop more affordable, less resource-intensive algae-based synthetic fuels. At many forward operating bases (FOBs), diesel-powered generators are used to provide nearly all power needs, and are a major consumer of operational energy. In 2008, the Department began spraying insulating foam on tents, trailers, and other temporary structures in Iraq, and later Afghanistan, with dramatic energy reduction results. Under one contract, DoD insulated 9 million square feet of temporary structures with the intention of reducing daily fuel demand by more than 77,000 gallons, which could mean 13 fewer trucks convoying fuel each day. Net Zero, a more advanced approach now being tested, would allow a FOB to create all the power it needs within its own perimeter fence, largely through renewable energy.

The Department is exploring how to integrate other sustainable practices into support operations at FOBs. The Strategic Environmental Research and Development Program (SERDP), DoD's environmental science and technology program implemented in partnership with the Department of Energy (DOE) and the Environmental Protection Agency (EPA), is in the process of identifying future research needed to enhance the sustainability of FOBs. The analysis is characterizing FOB design, construction, logistics, and current practices related to the sourcing and use of energy, water, and the disposal of waste.

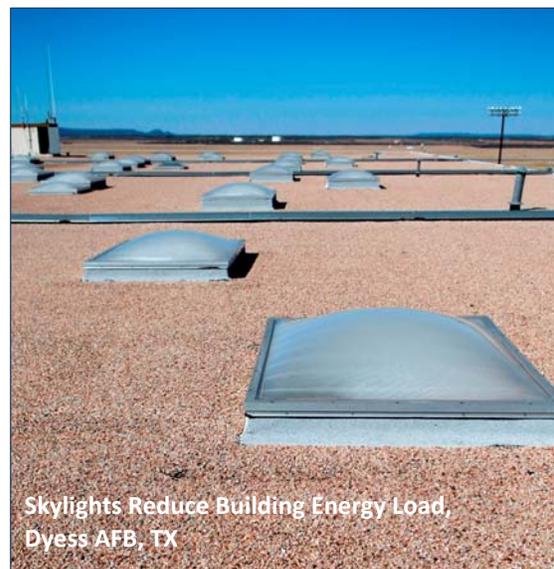


Photo: U.S. Air Force

Energy Management in Fixed Installations

The Department continues to pursue an investment strategy designed to reduce energy demand in fixed installations, and to reduce energy from traditional sources while increasing the supply of renewable energy sources. Financing for these investments comes primarily from the Energy Conservation Investment Program and mechanisms such as Energy Savings Performance Contracts, Utility Energy Services Contracts, and Power Purchase Agreements. Efforts to curb demand for energy – through conservation measures and improved energy efficiency – are by far the most cost-effective ways to improve an installation’s energy profile. A large fraction of DoD energy efficiency investments go to retrofit existing buildings. Typical retrofit projects install high efficiency heating, ventilation and cooling (HVAC) systems, energy management control systems, improved lighting, and better insulated and/or reflective roofs.

The Department is taking advantage of the opportunity to incorporate more energy efficient designs, material and equipment into new construction and major renovations, using the Silver performance level of the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) green building rating system as a guide. The Department’s Unified Facilities Criteria (UFC) system sets standards for DoD projects with regard to planning, design, construction, sustainment, restoration, and modernization. It applies to the Military Departments, Defense Agencies, and DoD Field Activities. [UFC 4-030-01 Sustainable Development](#) – dated December 2007 – reiterates current Military Department policies and instructions which generally require vertical building construction projects (as distinct from horizontal structures such as ranges, roads and airfields) to achieve the LEED Silver performance level for new construction. The UFC identifies key sections of the Energy Policy Act of 2005 ([EPAct](#)) that affect DoD buildings, including Section 109 which requires that buildings be designed to attain 30 percent lower energy consumption than either standard 90.1 of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) or that of the International Energy Code, if lifecycle cost effective. The Department will issue policy in FY 2011 that establishes a schedule for updating UFCs to ensure that the most current industry standards are incorporated. Some state and local governments in the United States and abroad have implemented building code refresh cycles. Regular review of building

codes drives improvements in construction practices and ensures that practices keep pace with advances in technology.

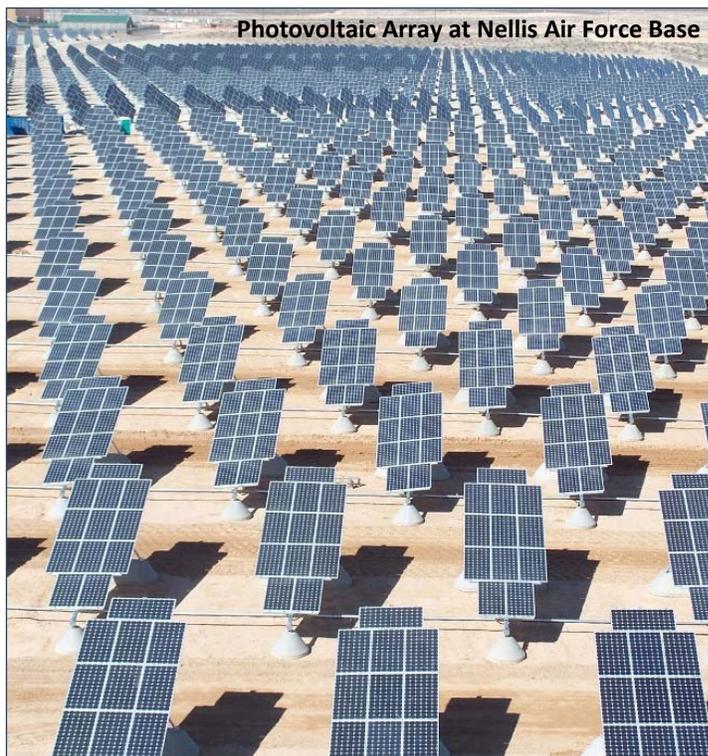


Photo: U.S. Air Force

DoD’s fixed installations offer an ideal test bed for next-generation energy technologies developed by industry, DOE, and university laboratories, filling the gap between research and deployment. DoD’s built infrastructure and lands are unique in their size and variety and encompass a diversity of building types and climates in the United States. DoD facilities afford an exceptional opportunity to assess the technical validity, operating costs, and environmental impact of these advanced, pre-commercial technologies. The Department is able to invest in sustainable projects that may not pay for themselves within the first 20 years, a timeframe that is

usually not viable in the commercial and local government sectors. DoD can help create a market for those technologies that prove effective and reliable by serving as an early adopter, as it did with aircraft, electronics and the internet. This would allow the military to later leverage both cost savings and technology advances from the private sector. Currently DoD is using the energy test bed approach on a small scale and plans to expand it, working closely with DOE among other organizations. The Department has programmed \$30 million for test bed technologies to improve the energy efficiency of buildings, distributed (on-site) energy generation, including renewables, and the control and management of local energy loads. This approach is key to meeting the Department's needs, but it is also an essential element of a national strategy to develop and deploy the next generation of energy technologies needed to support DoD's built infrastructure.

The Department is beginning what will likely be a major effort to address the risk to our installations from potential disruptions to the commercial electric grid, upon which installations are largely dependent. The Department is participating in interagency discussions on the magnitude of the threat and is investigating how to ensure that DoD has the energy needed to maintain mission-critical operations in the face of disruptions to the grid. The National Defense Authorization Act of 2010 requires the Secretary of Defense to submit to Congress a plan for identifying and addressing areas in which electricity needed for carrying out critical military missions on DoD installations is vulnerable to disruption. The on-site development of renewable and alternative energy sources will be one element of this effort. When combined with microgrid technology and energy efficiency investments that significantly reduce demand, distributed renewable energy sources will allow installations to carry out mission-critical activities independent of the grid in the event of disruption.

Renewable Energy

The Department is committed to renewable energy not only because it is dedicated to showing leadership in sustainability, but also because it improves resilience and thus mission readiness. Military installations are generally well-situated to support solar, wind, geothermal and other forms of renewable energy, as long as the type of energy facility, its siting, and its physical and operational characteristics are carefully evaluated and mitigated as needed for any possible mission or readiness impacts. For example, Nellis Air Force Base in southern Nevada built a 14.2 megawatt (MW) photovoltaic solar array using a public-private partnership power purchase agreement. More than 72,000 solar panels track the sun to generate 30 million kilowatt-hours of electricity per year – equivalent to a quarter of the total power used at the 12,000-person base. Nellis buys electricity at a lower rate thus saving \$1 million a year in electricity costs and avoiding 22,000 tons of carbon dioxide emissions. The military's interest in renewable energy is not new. Naval Air Weapons Center China Lake in California has operated a 270-MW geothermal plant since 1987. The heat from 166 wells, some of them 12,000 feet deep, is sufficient to light up 180,000 homes. The Navy is now helping the Army tap into geothermal resources at its Weapons Depot in Hawthorne, Nevada, and that project will be capable of producing 30 MW of clean power.



The Department is eager to work with its interagency partners on updating federal renewable energy regulations. For example, the generation and use of renewable energy currently counts towards the targets in EAct only if it is electrical, not thermal. Thermal renewable energy sources are often more

cost effective than electrical sources, and can have a lower carbon footprint. In FY 2009, almost 10 percent of the energy consumed by the Department came from renewable sources when thermal sources were included, such as cogeneration and geothermal (primarily ground source heat pumps). When only electric renewable resources are included, renewables accounted for only 3.6 percent of DoD consumption in FY 2009. For this reason the Department defines renewable energy in the Plan as per United States Code (U.S.C.) Title 10 §2911(e) (or the National Defense Authorization Act §2852) to be either thermal or electrical energy that is produced from renewable sources.

Energy Information Systems

The Department is in the process of addressing its lack of an enterprise-wide energy information management system for its global assets. Large commercial enterprises manage their energy portfolio using such data systems; they are essential to a firm's ability to set goals and incentives for optimal energy efficiency and to monitor subsequent performance. The Department is evaluating various commercial systems and assessing DoD needs, with the goal of having the Department develop and implement a state-of-the-art, secure, enterprise-wide energy information management system. The purpose of the system is to provide the appropriate information on energy consumption at various levels of aggregation, including individual buildings, installations, the geographic region, and the military service as a whole. With accurate management, control, collection, and analysis of energy data, DoD can more effectively monitor, measure, manage and maintain energy systems at their optimal performance levels, collect renewable energy generation and performance data, and compare performance across facilities and across the Military Departments.

Energy Efficient Acquisition

Finally, the Department is pursuing two far-reaching and complementary changes to ensure that design and acquisition of weapons systems takes into account the full cost and logistical burden of the energy required to operate the systems. The first is an Energy Efficiency Key Performance Parameter (KPP). KPPs are a set of mandatory requirements the Department specifies for any new weapons system it sets out to acquire. Although our requirements process has traditionally addressed the range, weight, and payload of any new system, decision makers have implicitly assumed that the fuel logistics available to support our combat forces were adequate and secure. Recognizing that this longstanding assumption is less valid in the future, the Energy Efficiency KPP will require personnel setting requirements for weapons systems to limit the operational burden imposed by the new system's energy needs.

Once the requirements are set, the acquisition process will take into account the financial burden that energy requirements would impose—i.e., the fully burdened cost of fuel. As discussed above, there is a significant cost to providing the logistics and force protection for those systems and platforms that require fuel, and those costs are not currently captured in the weapons acquisition decision process. The Department is developing the methodology to estimate the average cost per gallon of fuel under different scenarios and to incorporate this cost analysis into its evaluation of alternatives.

Together these two decision tools—the Energy Efficiency KPP and the fully burdened cost of fuel analysis—represent a systemic change to the way the Department makes decisions that affect our energy demand. If effectively implemented, they will facilitate a more realistic approach to planning. Availability of fuel will no longer be an unquestioned assumption; fuel requirements will be seen as a strategic and tactical vulnerability as well as an enabler. The Department is encouraged by the initial use of the fully burdened cost of fuel concept by the Army, in its analysis of alternatives for its Ground Combat Vehicle and Joint Light Tactical Vehicle programs to date. Given the long lifecycle of weapons systems, it will take years for this new approach to produce significant results. Over time, however, we believe it will result in a systematically more efficient and effective war-fighting capability.

I.1.B Chemicals of Environmental Concern

Relation to the Mission

Chemicals are essential components in DoD weapon systems, but the Department faces long-term risk from its use of hazardous and toxic chemicals and other materials. Hazardous and toxic chemicals and materials can result in cleanup and compliance costs, generate health claims, and increase the lifecycle costs of weapon systems and facilities. Moreover new restrictive laws that aim to reduce exposures to hazardous and toxic materials, such as the European Union's Registration, Evaluation and Authorization of Chemicals (REACH), have implications for DoD's supply chain. These restrictions affect the performance, cost, and schedule of the acquisition of new weapon systems, as well as their maintenance and the availability of chemicals necessary for their operation.

The Department must protect people and readiness by reducing the use of high risk contaminants and hazards, both known and emerging. Current protections include the construction of separate areas for chemical use, requirements for additional personal protective equipment, proper collection and disposal, and reporting requirements. DoD also established its emerging contaminants program as a means to minimize operational disruptions through proactive risk management of chemicals expected to be regulated more strictly in the near future. These activities come with monetary, operational, and time costs. Reducing the use and release of hazardous and toxic chemicals and materials helps avoid the operational disruptions that result from environmental protection restrictions and permitting processes, and reduces handling and disposal costs. It minimizes the degradation of local air and water quality that impairs the health of military and civilian communities. Proper management of hazardous and toxic chemicals and materials also protects the range lands needed for training, and the ecosystems under DoD's care, ensuring continued military access.

Finally, it is critical to ensure the continued availability of chemicals needed for the DoD mission. Maximizing the use of more benign or "green" chemicals is imperative to the mission in order to protect against the removal of certain substances from the market or significant increases in their cost. For example, sulfur hexafluoride (SF₆) is critical as a dielectric material in Airborne Warning and Control System radar systems, but it is also the strongest GHG known, remaining in the atmosphere for 3,200 years and having 23,000 times the warming potential over a 100-year period as carbon dioxide. It is anticipated that SF₆ will be regulated in the future, which could threaten its availability and will certainly increase its cost. In response, the Department is researching modifications to reduce SF₆ leakage and searching for alternatives to replace it.

Progress to Date and Key Initiatives Going Forward

The Department takes a lifecycle approach to the management of hazardous and toxic chemicals and materials in weapon systems and facilities, from acquisition to operations and maintenance, through to disposal. DoD has developed and implemented a three-tiered "scan-watch-action" risk management framework for identifying, assessing, and managing the risks from emerging contaminants. Hundreds of chemicals have been scanned and approximately two dozen chemicals have been evaluated. For example, DoD-wide recently issued a landmark policy to minimize the use of hexavalent chromium. This proactive risk management measure will result in significant reductions in hexavalent chromium releases and potentially save the Department millions of dollars in future liabilities. In some cases conversion to non-hexavalent chromium processes have additional benefits, as plating baths no longer have to be kept at a constant high temperature, reducing energy consumption. The Department's Emerging Contaminants program was selected as a finalist for Harvard University's 2009 "Innovations in American Government" award, ranking in the top 2 percent out of more than 600 nominations. The DoD approach to chemical risk management is illustrated in Figure I.1.

The Department released its *Agency-Level Toxic and Hazardous Chemicals Reduction Plan* in 2008, which describes the DoD programs, initiatives, and actions necessary to reduce the procurement, use, release

and disposal of toxic and hazardous chemicals. The plan represents an important step in continual long-term, DoD-wide improvement in chemical management. For hazardous and toxic chemicals and materials developed for or incorporated into items or systems acquired by DoD through the acquisition process, DoD is increasingly considering the entire lifecycle of these substances, from laboratory synthesis through to disposal. The Department is incorporating pollution prevention and lifecycle assessment language into existing policies, especially with regard to the development of new weapon systems. For example, Environmental, Safety and Occupational Health (ESOH) considerations have been steadily incorporated into the Systems Acquisition process over the last decade, providing reforms to the acquisition process that more fully reflect lifecycle considerations. New guidance and tools are being developed to guide assessment of chemical risks throughout the research, development, testing, evaluation, and acquisition process.

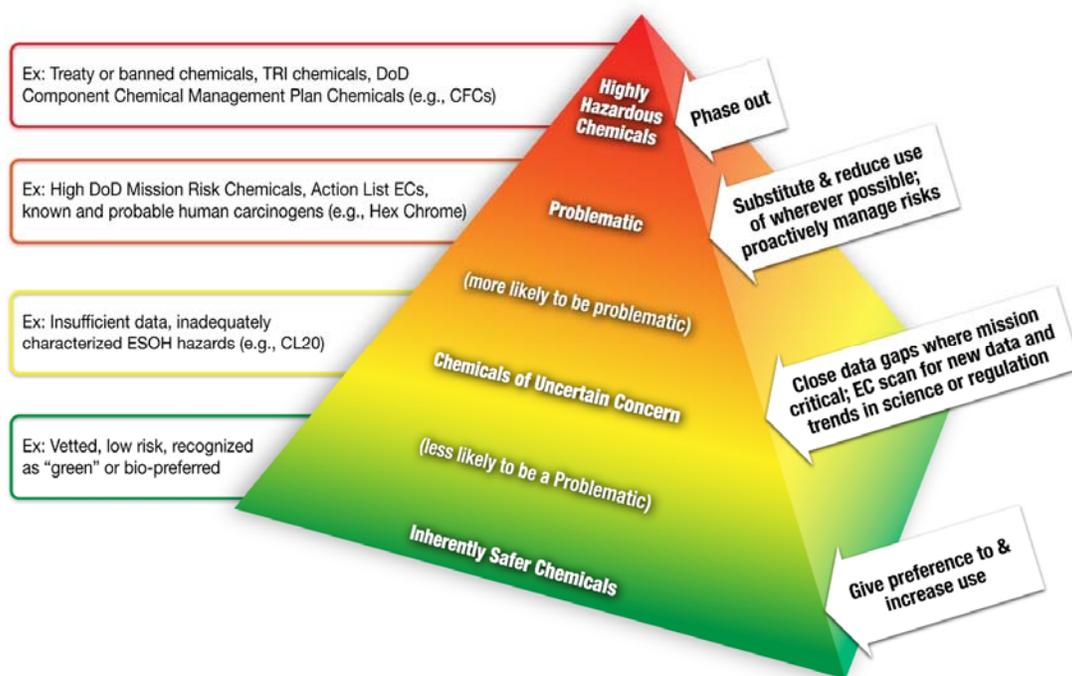


Figure I.1. DoD Chemical Risk Management Strategy

DoD’s pollution prevention programs have traditionally focused on solutions that reduce regulatory burdens, in particular those associated with the use of chemicals. DoD’s Joint Service Solvent Substitution effort has led to the development, testing, and demonstration of solutions used by DoD’s chemical depots. A current effort is showing the potential for significant reductions in DoD’s last significant use of the solvent trichloroethylene. The Green Procurement Program is another essential part of the Department’s efforts to move towards more “green” chemicals and products. The program’s foundation is a living Green Procurement Strategy that evolves as needed to accommodate emerging federal requirements on sustainable acquisition. To support its successful implementation, experts developed a program framework that includes green procurement metrics, an online Green Procurement tracking system, a venue for sharing information and best practices, and green procurement education and training.

Among the key challenges in moving towards more benign materials and chemical processes is the need for updated specifications for products used in multiple platforms. Finding the “owners” of specifications, assuring no adverse mission impact, gaining acceptance, and making enterprise-wide changes is a complicated and expensive undertaking. However, DoD has been successful in the past in implementing such changes, such as when international treaties required the phase-out of ozone

depleting substances. Since then, a lack of regulatory drivers to reduce the use of other substances has resulted in less emphasis on the program over the last decade. However, the potential mission impact of the European Union's hazardous substances regulation, REACH, is causing the Department to focus again on these issues, and DoD is developing a strategic plan to better prepare for and manage the impacts from REACH.

I.1.C Water Resources Management

Relation to the Mission

Fresh water is a limited and mission critical resource. Water is essential for military operations, drinking, hygiene, sanitation, food preparation, and medical care. In the U.S., water is a mission imperative for military installations, especially for those that need to support large influxes of troops. Water scarcity influences land management practices, such as buffer and agriculture in-leases reliant on irrigation. Such practices can affect dust levels, which in turn can impinge on training. Public concerns over base water use and expansion plans drove the Army to implement aggressive water conservation and reuse at Fort Huachuca in Arizona. Water scarcity is becoming an issue across the country, not just in the arid West.



Photo: U.S. Marine Corps

In the theater of war, water poses the same challenges as liquid fuel, requiring the protection of large, vulnerable convoys as it is transported to war fighters. In addition, protecting the local water supply is imperative. The growing scarcity of reliable supplies of fresh water is expected to increasingly lead to unrest and conflict, especially in regions of the world already prone to conflict, public discontent and radicalism. The treatment and disposal of sanitary wastewater is a human health and environmental

issue for installations as well as our soldiers and the civilian populations we are protecting in theaters of war. The release of pollutants or other materials by a FOB into a stream or groundwater might contaminate the only water supply to which native civilian populations in areas of conflict have access, making it imperative that DoD consider downstream effects.

Water supply and distribution, water use, wastewater treatment, and storm water management are inter-related and influence energy and sustainability. For example, the extraction, treatment and delivery of water to the end user is a highly energy intensive process. Measures that use and distribute potable water more efficiently and with less leakage also result in significant reductions in energy consumption and therefore emissions of carbon dioxide. A low impact development approach to storm water management reduces runoff from facilities, which reduces the flow of pollutants into water bodies and reduces the volume of water entering the wastewater treatment system. Reducing the volume of wastewater helps prevent system overload problems such as combined sewer overflows, while also reducing the consumption of energy required to operate the wastewater treatment system.

Progress to Date and Key Initiatives Going Forward

DoD has committed to meeting the water conservation requirements of [EO 12902](#) (1994), [EO 13423](#) (2007) and [EO 13514](#) (2009). For years, DoD has dominated the DOE Federal Energy Management Program (FEMP) Federal Energy and Water Management Awards for Water Conservation. Award winners include the Marine Corps Air Station Miramar, Tooele Army Depot, Naval Base Ventura County,

Picatinny Arsenal, Marine Corps Base Hawaii, and the Kirtland, Randolph and Fairchild Air Force Bases. These and other installations have been saving water and money – as well as the energy associated with pumping water – through a broad range of approaches that include: proactive leak management, the use of reclaimed water, efficient irrigation systems, metering, automated water distribution controls, water efficient fixtures in buildings such as low-flow toilets, and replacing turf grass with high water requirements with plants requiring little or no irrigation. The extensive 1997 *Military Handbook on Water Conservation* provides guidance to facility managers and project designers on water conservation and efficiency approaches relating to planning, water supply, end use, and wastewater treatment. In FY 2009, DoD reduced the gallons of water consumed per gross square foot of building space by 4.6 percent relative to the FY 2007 baseline, exceeding the EO 13413 target of 4.0 percent.

In January 2010, the Department issued a policy memo titled “[DoD Implementation of Storm Water Requirements under Section 438 of the Energy Independence and Security Act \(EISA\)](#)” that outlines low impact development techniques for maintaining the predevelopment hydrology of project sites, as required by EISA and EO 13514. In April, the UFC [3-210-10 Low Impact Development Manual](#) was issued, indicating that the UFC is under revision to comply with EISA §438 and EO 13514.

I.1.D Maintaining Readiness in the Face of Climate Change

Relation to the Mission

Climate change is predicted to impact the Department in myriad ways, not only through direct effects on installations, but also by potentially increasing demands on our men and women in uniform. The impacts of climate change may potentially destabilize regions already prone to conflict and increase the need for humanitarian assistance and disaster relief operations.

At the installation level, the more frequent and intense heat extremes projected to occur with climate change may limit outdoor training, strain personnel efficiency, degrade air quality through elevated ozone caused by higher temperatures, and strain electricity supply due to the increased demand on the grid for cooling. In some areas, reduced snow pack caused by higher temperatures and/or changes in precipitation patterns will reduce water supply, increase the frequency and intensity of wildfires, damage local ecosystems, and cause shifts in species composition or geographic range. Among the species shifts anticipated are movement of wildlife to more favorable habitat, shifts in vector-borne diseases into the United States, and expansion of invasive grasses and shrubs. These invasive plants contribute fuel load for wildfires, which in turn increases the likelihood, range, and intensity of wildfire. Because a variety of range activities can start fires, factors that affect the frequency, duration and spread of uncontrolled wildfires have mission consequences.

Department real estate and infrastructure on the coasts may be threatened by sea level rise and the possibility of more intense hurricanes. The resulting impacts can include coastal erosion, inundation, damaged or destroyed infrastructure, reduced availability of land for operational needs, and reduced water supply due to seawater intrusion. A 2008 report by the National Intelligence Council estimated that more than 30 military installations in the continental U.S. are already vulnerable to sea level rise at levels estimated by the Intergovernmental Panel on Climate Change (IPCC) in 2007. A number of scientific research studies published since that time indicate that sea level would likely rise by more than the 2007 IPCC estimates, since the latter did not include contributions from melting in the Greenland and Antarctica ice sheets.

Climate Change, Energy and DoD

“Climate change and energy will play significant roles in the future security environment. Climate change will shape the operating environment, roles, and missions that we undertake...[and]... DoD will need to adjust to the impacts of climate change on our facilities and military capabilities. The Department is developing policies and plans to manage the effects of climate change on its operating environment, missions, and facilities.”

— *DoD Quadrennial Defense Review, 2010*

These disruptions not only directly impact military operations but undermine the natural resource base upon which military training depends. The combined effects may limit the availability and quality of ranges and other lands needed for operations, while increasing fire hazards and other safety risks. It also can make it more difficult for installations to fulfill their role as stewards of the land. Threats to federally-protected species may increase, and additional species may become endangered. These challenges will be widespread, and extend far beyond DoD's coastal installations.



Photo: U.S. Navy

A key management tool the Department has and will continue to use to help deal with the effects of climate change at the installation level is the Integrated Natural Resources Management Plan (INRMP). INRMPs are planning documents that provide for effective management and multipurpose uses of natural resources, and provide public access necessary and appropriate for those uses without any net loss in the capability of an installation to

support its military mission. They help installations integrate conservation measures with military operations, and balance the management of unique natural resources with mission requirements and other land use activities affecting an installation's natural resources. DoD anticipates that INRMPs will become more valuable as planning tools should the effects of climate change become more pronounced.

Progress to Date and Key Initiatives Going Forward

The Department has started exploring the potential challenges posed by climate change and approaches to improving resiliency. The DoD Legacy Program funded some of the Department's earliest work, an assessment of the impacts of sea level rise on five North Carolina coastal installations. DoD's Natural Resources Conservation Program has partnered with the National Wildlife Federation, the U.S. Fish and Wildlife Service and others to evaluate the effectiveness of various assessment tools relating to the vulnerability of natural resources. The Natural Resources Program also is working with PRBO Conservation Science, a non-profit organization, to identify potential impacts on vulnerable bird populations. Initial work focused on impacts in California, but the work is slated to expand to Arizona and New Mexico this year. The Department is beginning to examine the issue of climate change adaptation for training ranges by supporting a project that is putting information on projected climate change into an existing adaptation model, and evaluating whether the model is suitable for developing a climate change adaptive strategy for ranges. SERDP is supporting research relating to climate change adaptation that includes: developing climate change assessment tools and research into the effects of sea level rise on DoD installation infrastructure; a variety of approaches to ecosystem management in the face of a changing climate and rising seas; and microgrid technologies that will enable installations to operate independently of the electrical grid.

In September 2009, as part of the QDR, the Department conducted a preliminary vulnerability assessment of the impacts of climate change for each installation. The Military Departments were asked to consider the vulnerability of each installation: whether it would be threatened by a rise in sea level of either less than or greater than one meter; whether the risk of a temperature increase or changing precipitation

patterns would be low, medium or high; and whether the impact of 100-year floods becoming 25-year floods would be low, medium or high. This exercise provided an initial look at the potential future vulnerability of military installations, in advance of the comprehensive assessment called for in the QDR. The Department will conduct a comprehensive assessment of all installations to assess the potential impacts of climate change on each installation's mission and natural resources base, and use this analysis to develop climate change adaptation action plans for each installation. These plans are described in more detail in Section I.5 on Climate Change Risk and Vulnerability.

Last year the Navy launched Task Force Climate Change to study how climate change could affect maritime operations. The Task Force is approaching the issue from two perspectives. One is to better assess the changes likely to occur in a warmer world through activities such as air-ocean-ice modeling, cooperative oceanographic surveys, and remote sensing. The Navy is also complementing this effort with research into the best strategies for the Navy to adapt to these changes. To address issues brought to the forefront by a more navigable Arctic, DoD will work with the Coast Guard and the Department of Homeland Security to address gaps in Arctic communications, domain awareness, search and rescue, and environmental observation and forecasting capabilities to support both current and future planning and operations.

Measures that improve sustainability can also make the Department more resilient to climate change. For example, climate change is expected to cause fluctuations and shortages in the supply of water and energy in some areas. Ongoing and future efforts by the Department to increase the generation and use of renewable energy, and to institutionalize energy and water efficiency into all DoD operations, improve the military's resiliency to these vulnerabilities.

I.2 Greenhouse Gas Reduction Goals

In January, the Department set a target to reduce Scope 1 and Scope 2 GHG emissions from facilities by 34 percent from FY 2008 to FY 2020. Recognizing DoD's potential leadership role within the federal government as well as DoD's ability to be a test bed for new technology, the Department chose an aggressive goal that exceeds the federal government's target of 28 percent by 21%. To develop the target, the Department convened a GHG Accounting Group with representation from the Military Departments and the Defense Logistics Agency (DLA). As a starting point, the group used the modeling tool specifically developed by the White House Council on Environmental Quality (CEQ) for this exercise. The calculation was based on energy consumption data that the agencies already report to FEMP.

Meeting the reduction goal will require extensive planning and capital investment, increasing short run costs in order to reduce longer run outlays for energy purchases. Investments will also be necessary in areas such as reductions in emissions from refrigerants, landfills, employee commuting, and business travel.

The Department's Scope 1 and Scope 2 target will mainly be achieved through: energy efficiency in facilities, reduced fossil fuel use by non-tactical vehicle fleets, and the use of renewable energy, including the capture and use of methane from landfills. The Plan includes the following sub-goals relating to these areas:

GHG Emission Sources by Scope

Scope 1 - Direct emissions from sources that are owned or controlled by DoD, including fossil fuel combustion from stationary and mobile sources, processes that emit GHGs, and fugitive emissions (such as leaks).

Scope 2 - Emissions resulting from the generation of electricity, heat, or steam purchased by DoD.

Scope 3 - Emissions that result from DoD activities but are from sources not owned or directly controlled by DoD.

- Energy Efficiency: The Department will reduce facility energy intensity by 3% each year from FY 2006 through 2015, and by 1.5% per year from FY 2016 through 2020.
- Renewable Energy: DoD will produce or procure 18.3% of all energy consumed within its facilities during FY 2020 from renewable energy sources (thermal as well as electrical).
- Vehicle Fleets: DoD will reduce the use of petroleum products by non-tactical vehicle fleets by 2% annually, relative to FY 2005, for a total 30% reduction by FY 2020.
- Landfill Gas: Ten landfill gas capture facilities will become operational by FY 2020 for the production, capture and use of methane from landfills (both those owned by DoD as well as through arrangements with landfills owned by other parties).

The GHG reduction strategies used by DoD are embedded in management approaches and best practices that form the foundation for DoD's commitment to sustainability: sustainable procurement, environmental management systems, high performance sustainable buildings, and coordination with regional and local planning.

The Department made a commitment to reduce its Scope 3 GHG emissions by the end of FY 2020 by 13.5%, relative to a FY 2008 baseline. Recognizing the lack of available data and the difficulty in establishing Scope 3 targets, the Federal Environmental Executive (FEE) limited the Scope 3 target for this year to three sources: transmission and delivery losses from purchased electricity; contracted waste disposal; and employee travel. To establish these targets, DoE and the FEE provided a calculation tool. Using the tool, DoD calculated separate scopes for the three subcategories. As employee travel is responsible for more than 75% of all emissions over the three sources, it is key to driving the overall goal.

For air travel, the Department established a 7% reduction goal by the end of FY 2020, relative to FY 2011, based on planned improvements in aircraft engine technology, flight routing, and a reduction in employee trips through an increased reliance on telecommunications such as video teleconferencing, and improved conference locations. Business ground travel is expected to supply an 11% decrease in emissions over the period, primarily through improved efficiency of various travel modes. Most important to this category is employee commuting. Here, the calculations set a 7% reduction target by FY 2020, based upon improvements in automobile mileage (based on increasing Corporate Average Fuel Economy standards) and increased use of telecommuting.

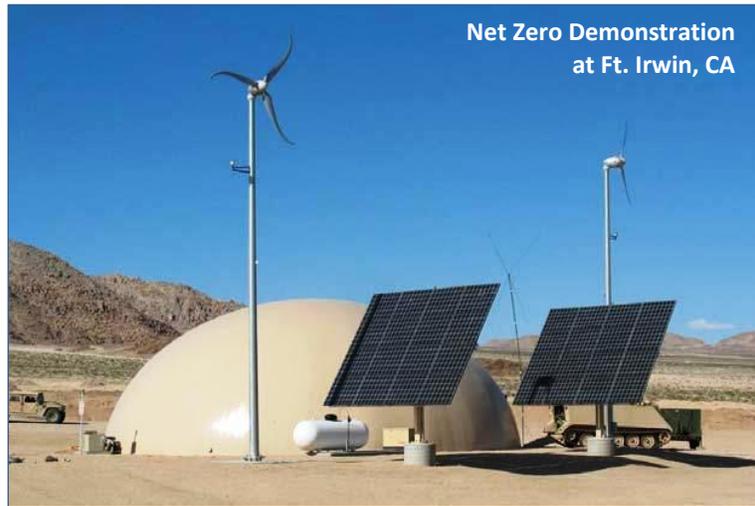
Losses during the transmission and delivery of electricity are calculated based on a factor of 6.5% (supplied by the FEE), applied to the reduction in electricity consumption calculated into DoD's previously supplied Scope 2 emissions target. The Department's solid waste goal was calculated based on a 16.7% reduction in solid waste emissions from contracted sources off-installation by FY 2020, and ties directly to Departmental goals for waste diversion for recycling. For this goal setting exercise, the Department assumed no reduction in wastewater treatment emissions, because the FEE model only permitted reductions from cuts to staff. There are no current plans to cut staff, especially as military forces are likely to come back to the U.S. from overseas duty during the target planning period. For FY 2011, the definition of contracted waste disposal is confined to non-hazardous solid waste sent off-site for disposal in landfills not owned by DoD, and does not include construction and demolition debris.

Excluded from GHG emission reduction targets are expeditionary base camps, tactical vehicles¹ and equipment owned or operated by DoD that are used for combat operations and support, or training for such operations. However, the Department recognizes that significant reductions can be achieved in these systems and we are committed to taking advantage of these opportunities. For example, the

¹ A military tactical vehicle is any motor vehicle designed to military specifications or a commercially designed motor vehicle modified to military specification to meet direct transportation support of combat, tactical or relief operations, or for training of personnel for such purposes.

Department developed the Net Zero Plus Joint Concept Technology Demonstration at Fort Irwin to test a fully operational replica of a FOB. The goal of the project is to demonstrate a self-contained system that uses less energy than it generates within its own perimeter fence. Another approach the Department is taking to reduce operational energy is to change the acquisition process to ensure that the fully burdened cost of fuel is considered in the acquisition decisions made for all weapons systems and platforms requiring fuel. Beyond energy, the Department is exploring how to integrate sustainable practices into support operations at FOBs. The Strategic Environmental Research and Development Program (SERDP), DoD's environmental science and technology program implemented in partnership with the Department of Energy (DOE) and the Environmental Protection Agency (EPA), is in the process of identifying future research needed to enhance the sustainability of FOBs. The analysis is characterizing FOB design, construction, logistics, and current practices related to the sourcing and use of energy, water, and the disposal of waste.

The Department currently has a number of broader initiatives under way that will help develop the strategic way ahead to ensure sustainable expeditionary base camps for future contingencies. In December 2009, the Army completed a collaborative study of strategic guidance, current doctrine, and lessons learned. The study identifies the capabilities required to support base camp lifecycle management during the 2015-2024 timeframe, and serves as a reference guide for future analysis and combat development efforts. DoD is focusing the study on the planning, design, construction, deconstruction, operation, and management of base camps. DoD also has a growing interest in waste stream reduction and the development of new technologies, such as waste-to-energy systems, conducive to military operations, which will also benefit GHG reductions.



The Department has started to address its emissions of GHGs that have very high global warming potentials. In October 2009, DoD's Emerging Contaminant Governance Council endorsed pursuit of several risk management measures to address SF₆, a highly potent GHG with unique military and national security uses. As a result of the Council's recommendations, DoD will: develop a mandatory leak detection, capture, and reuse policy for all DoD uses of SF₆; expand research and development efforts for SF₆ substitutes for unique military applications; and follow and leverage research being conducted by the Electric Power Research Institute regarding SF₆ substitutes for electrical transmission and distribution equipment in DoD infrastructure. DoD will initiate an assessment of mission risks associated with the continued use of hydrofluorocarbons – a class of potent GHGs used by the Department for air conditioning, refrigeration, fire suppression and explosion protection – and propose proactive risk management measures.

I.3 Plan Implementation

I.3.A Leadership and Accountability

The Deputy Secretary of Defense designated the Under Secretary of Defense for Acquisition, Technology and Logistics as the Department's Senior Sustainability Officer (SSO) to ensure the effective and successful implementation of the Plan across the Department. Each Military Department and DLA has designated a sustainability officer to ensure accountability for the Plan's implementation. Additionally, the Department established the governance structure, shown in Figure I.2, to ensure the accountability and

coordination necessary to meet the Department’s goals. Under the leadership of the SSO, the structure consists of the Senior Sustainability Council (SSC), the Sustainability Implementation Work Group, and a set of relevant committees and work groups to execute the goals of the Plan. The committees and work groups cover a wide range of sustainability topics, including: greenhouse gases; energy; transportation and fuels; solid waste and recycling; green procurement; electronic stewardship; and sustainable manufacturing. A DoD policy memorandum on DoD Infrastructure Sustainability Policy will be issued soon establishing a DoD Infrastructure Sustainability Panel that will report to the SSC and be co-chaired by the Directors of Environmental Management and Facility Investment and Management.



Figure I.2. DoD Sustainability Governance Structure

DUSD(I&E) and DOEP&P lead the SSC and report directly to the SSO. The current membership of the Committee, which may be modified at the direction of the SSO to ensure appropriate representation and participation by DoD Components, includes those identified in Table I.1. As stipulated in its charter, the SSC is responsible for ensuring that this Plan is coordinated and communicated internally within DoD. The SSC is likewise responsible for ensuring a systematic, interdisciplinary approach to meeting the Plan’s goals to advance sustainability while assuring mission accomplishment. The key tasks of the SSC are to: integrate sustainability into policies, planning, budgeting and decision-making; make recommendations on processes and procedures to implement the requirements of EO 13514 and other federal sustainability requirements; and continuously improve the Department’s approach to the Plan. The SSC also reviews the adequacy of policies, resources, and performance in meeting goals, and makes recommendations on changes required. The Sustainability Implementation Work Group reports to the SSC. It is charged with drafting input to the Plan and facilitating compliance and continual improvement in meeting the Plan goals. The Department is using its existing structure of committees and work groups to address specific issues and engage subject matter experts where appropriate.

OSD employs a number of mechanisms to ensure that sustainability factors are adequately addressed. Departmental planning and programming guidance lays out requirements that DoD Components must use to build their budgets, and environmental and sustainability requirements are a part of this guidance.

Table I.1. Senior Sustainability Council Membership

Deputy Under Secretary of Defense (Installations & Environment) - Co-Chair
Director, Operational Energy Plans and Programs ² - Co-Chair
Under Secretary of Defense (Policy)
Under Secretary of the Army
Under Secretary of the Navy
Under Secretary of the Air Force
Director, Defense Research and Engineering
Deputy Under Secretary of Defense (Logistics & Material Readiness)
Deputy General Counsel
Deputy Under Secretary of Defense, Readiness
Assistant Secretary of Defense for Networks and Information Integration/Deputy Department of Defense Chief Information Officer
Under Secretary of Defense (Comptroller) – Deputy Comptroller – Planning and Budget
Director, Defense Procurement and Acquisition Policy
Director, Defense Logistics Agency (Enterprise Support)
Director, Industrial Policy
Joint Staff (J8)

OSD is proposing specific language in these documents for the requirements in EO 13514 and related requirements. Another key feature of DoD’s planning and budgeting process is the Future Year Defense Plan (FYDP). It provides a six-year resource plan for achieving Department objectives, with major updates occurring every two years and the planning horizon “rolling forward” during each update cycle. All Department Components already incorporate performance on DoD energy-related goals in their employee performance evaluation processes for relevant energy professionals.

I.3.B DoD Policy, Planning and Budget Integration

DoD has a robust and well-functioning process for planning, programming, and budgeting. The SSC is responsible for ensuring that the Plan becomes integrated into the Department’s enterprise management structure, an ongoing way of conducting business DoD-wide that is continually maintained, evaluated, and refined for optimal performance in all aspects of the DoD mission, including sustainability. The SSC will explore optimal means to codify this Plan to ensure that relevant policies, program plans, guidance, and budget development in the Department reflect the Plan. The SSC is responsible for identifying any gaps in existing policies and plans that prevent implementation of the Plan, and drafting new policies and directives to fill those gaps. The status of incorporating sustainability into critical DoD reports and plans is summarized in Table I.2.

Almost two decades ago, DoD realized the need to plan and budget specifically for environmental protection and established the Environmental Security budgeting structure within the existing DoD planning, programming, and budgeting system. The functional categories established for environmental budgeting include: recurring and non-recurring environmental compliance, pollution prevention,

² Until such time as the Director of Operational Energy Plans and Programs (DOEP&P) position is confirmed, the Principal Deputy Director, Defense Research and Engineering, is acting as the Co-Chair. The DOEP&P will assume the role of Co-Chair upon confirmation.

cleanup, natural and cultural resources conservation, and research. More recently, DoD added a special category to capture resources budgeted for operational range sustainment. A similar process is being considered to capture facilities energy investments.

As a result of this integration into the existing DoD planning, programming, and budgeting system, environmental protection, pollution prevention, and sustainability have become commonplace but less visible in the budget as separate line items. For example, sustainable building design is part of the budget for a Military Construction project and not broken out separately. While the Environmental Security budget categories still exist today, OSD has emphasized the need for DoD Components to fully integrate environmental protection, pollution prevention, and sustainability into all DoD functions. Likewise, many pollution prevention efforts are integrated into procurement for equipment and the operations and maintenance budgets for installations. Pollution prevention equipment is also designed into new Navy vessels. OSD reviews the proposed FYDPs for the DoD Components to ensure requirements have been programmed, and holds program reviews to evaluate progress. These reviews are an effective method to ensure that appropriate resources are being applied to environmental and sustainability efforts, even if they are not shown as distinct items in the budget. In addition, the Department will prepare guidance to help explain how to plan, program and budget for FY 2012 and beyond to satisfy requirements of this Plan.

The purpose of the newly created Infrastructure Sustainability Panel is to establish guidance on sustainable infrastructure, to report progress on it, and to establish guidance on how to integrate strategic planning for sustainable infrastructure with the DoD budget process. Infrastructure in this context refers to natural infrastructure (air, land, water) as well as built infrastructure found on all DoD installations.

I.3.C Methods for Evaluating Progress

The Department will develop a Performance Management Review process and scorecard to monitor compliance with federal requirements relating to sustainability, and to monitor DoD activities and progress toward sustainability goals. The scorecard will employ a rating system to convey progress in achieving the Plan's objectives, goals, and sub-goals. The draft scorecard being considered for use in FY 2011 is found in Appendix C. The review process and rating system will allow the Department to continuously improve its sustainability efforts. The SSC will conduct biannual Performance Management Reviews designed to provide senior leadership with visibility on performance and the opportunity to make decisions on program direction as appropriate.

I.3.D Internal Coordination and Dissemination

A communication plan is being drafted to assure coordinated outreach on the plan:

- When the Plan is approved by the Office of Management and Budget (OMB), the Department will ensure that its personnel are aware of the Plan, its purpose within the DoD mission, and performance on it, using all of the usual internal channels of communication within the Department and within each individual DoD Component, such as web sites, newsletters, and announcements. The June 2010 Environment, Energy Security, and Sustainability Symposium, which is widely attended by DoD civilian and military personnel as well as Defense contractors, provides a perfect opportunity to reach out to DoD staff regarding the plan. Annual updates of the Plan will be used as opportunities to remind civilian, military, and contractor staff of the Plan's goals and the Department's expectations.
- DUSD(I&E) and DOEP&P will present the Plan to senior managers within each DoD Component at the Deputy Assistant Secretary level and higher. Possible venues are the Range Commander's Council, Sustainable Ranges Overarching Integrated Product Team, and Defense Energy Working Group. Presentations will stress the integration of sustainability activities within overall DoD strategic planning and budgeting.

Table I.2. Critical Planning Coordination

Originating Report / Plan	DoD Strategic Sustainability Performance Plan Goals							
	Scope 1 & 2 GHG Reduction	Scope 3 GHG Reduction	Reduce the Use of Fossil Fuels	Improve Potable Water Efficiency	Minimize and Optimally Manage Solid Waste	Minimize the Use and Release of Chemicals of Environmental Concern	Sustainability Practices Become the Norm	Sustainability Built into Management Systems
FY 2010 Quadrennial Defense Review (Serves as DoD's Government Performance and Results Act Strategic Plan)	Yes	No	Yes	No	No	No	No	No
DoD Future Years Defense Plan	No	No	No	No	No	No	No	No
Circular A-11 Exhibit 300s (Capital Asset Plan and Business Case Summary)	n/a	n/a	n/a	n/a	n/a	n/a	Y	n/a
EISA Section 432 Facility Evaluations Reporting	Yes	No	Yes	Yes	n/a	n/a	No	n/a
DoD FY 2010 Budget	No	n/a	Yes	Yes	No	Yes	Yes	Yes
Defense Installations Strategic Plan (the DoD Asset Management Plan) / 3 Year Timeline	No	No	Yes	No	Yes	Yes	Yes	Yes
Circular A-11 Exhibit 53 Agency IT Investment Portfolio	No	n/a	No	n/a	n/a	No	No	n/a
OMB Scorecards on Energy, Environmental Stewardship and Transportation	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Defense Environmental Programs Annual Report to Congress	No	No	n/a	n/a	Yes	Yes	Yes	Yes
DoD Toxic and Hazardous Chemicals Reduction Plan (Jan 2009)	n/a	No	n/a	n/a	n/a	Yes	No	Yes
DOE Federal Fleet Compliance Report, 2007	No	No	Yes	n/a	n/a	No	No	n/a
Data Center Consolidation Plan (Defense Information Services Agency)	No	n/a	Yes	n/a	n/a	No	No	n/a
DoD Sustainable Building Implementation Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
DoD Green Procurement Plan (2008)	n/a	Yes	n/a	n/a	No	No	Yes	n/a
Sustainable Ranges – 2009 Report to Congress	No	n/a	n/a	No	No	No	n/a	Yes
Readiness and Environmental Protection Initiative (REPI) – 3 rd Annual Report to Congress	n/a	n/a	n/a	n/a	n/a	No	No	Yes
Unified Facilities Criteria (Dec 2007)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
OMB Sustainable Practices Report	n/a	No	n/a	n/a	Yes	Yes	Yes	Yes
Environmental Management Systems	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Annual DoD Energy Management Report	Yes	No	Yes	n/a	n/a	n/a	Yes	n/a

"Yes" indicates that the Plan goal is relevant and incorporated into the report or plan; "No" indicates relevance but that it has not yet been incorporated; and "n/a" means the goal is not relevant to the report or plan.

- The Department will provide targeted training to reach personnel with specific responsibilities for implementing the Plan. OSD will work with the Defense Acquisition University and other organizations, such as the Naval Civil Engineers Corps Officer School, to develop topical training modules for use by the DoD Components. The training modules will be developed around the following DoD sustainability goals:
 - The Use of Fossil Fuels Reduced
 - Potable Water Efficiency Improve
 - Solid Waste Minimized and Optimally Managed
 - The Use and Release of Chemicals of Environmental Concern Minimized
 - Sustainability Practices Become the Norm
 - Sustainability Built into DoD Management Systems

Some relevant training courses that have already been developed, such as the Navy's DoD Sustainability Awareness Training offered by the Civil Engineer Corps Officers School, which provides practical training on high performance buildings, green procurement and electronic waste management, energy efficiency and alternative energy, innovations in pollution prevention and storm water, and best practices in sustainability. Training on Chemical Risk Management Systems is under development.

- The Department will build on its successful environmental and installation awards programs. New competitions among commands and Military Departments will be encouraged to more rapidly recognize early adopters and encourage broader adoption of new processes or technologies.
- The Department's outreach efforts will emphasize the behavioral changes required in order to achieve DoD's sustainability goals, such as shifting habits to use electronic documents instead of print versions wherever possible, setting printers and copiers to a default of double-sided printing, turning off lights and computers, practicing sustainable procurement, and conserving water. The Department will also use these general educational opportunities to give personnel hints on how to save money and become more sustainable at home.
- DoD will periodically issue policy memoranda to ensure these basic measures become ingrained in the Department's day-to-day conduct of business. For example, the Department will encourage the use of webinars and videoconferencing for training and meetings in lieu of travel, as well as providing procedures and locations for accessing these options. DUSD(I&E) will take the lead in developing a simple, brief "What You Can Do" training module for use with all DoD personnel. The training module will be posted on the DoD Environment, Safety and Occupational Health Network and Information Exchange (DENIX) web site and DUSD(I&E) will encourage each DoD Component to require the training annually.

As the Department begins implementing the Plan, we envision that we will encounter barriers to progress on sustainability in unanticipated ways, and that these will often occur at the operational level, far down in the chain of command. To effectively address these unanticipated issues, the Department will foster the communication of suggestions from all levels throughout the Department by setting up an e-mail address dedicated to this purpose.

I.4 Evaluating and Prioritizing the Use of Resources

While the objectives in the Plan are driven from the "top-down", budgeting and execution of the plan is from the "bottom-up". Programs are executed by a wide variety of commands and offices across the Department rather than through a central DoD office that reviews, prioritizes, and approves sustainability investments. Decisions on the best use of financial and human resources are made at the discretion of each command within the framework of advancing the mission, and based on

considerations specific to their geographic area. Beyond that, decisions are influenced by the goal of reducing overall costs – informed by return on investment (ROI) and lifecycle cost analysis – and by environmental, social, and community considerations. For example, the mission benefits of having an off-grid source of electricity can outweigh the higher cost of renewable energy.

1.4.A Evaluating Return on Investment

The Department, spearheaded by the Tri-Service Collaborative Group, is building sustainability into the O&M of military installations. The Tri-Service Collaborative Group is creating a streamlined, holistic approach to sustainability at installations, with a more efficient reporting methodology. Optimizing O&M can lead to significant improvements in energy and water efficiency, offering some of the most cost-effective opportunities for maximizing return on investment, while at the same time placing less

strain on energy, water and financial resources and reducing GHG emissions.



Photo: Air National Guard

DoD calculates ROI for O&M projects when there are quantitative factors that can be weighed against one another, such as initial purchase cost versus the energy or water costs associated with operating the equipment, and differing maintenance requirements and equipment lifetimes. For example, when evaluating the purchase of a pump the Department does not base its decision on purchase price alone, but on the energy efficiency of the pump (and therefore the cost of powering it over its lifetime) and its maintenance requirements. Driven largely by ROI calculations, the Department has already harvested some of the lower cost opportunities offered by O&M improvements. However, the Department recognizes that there is much more to be done, and that its maintenance backlog threatens the ability of the Department to meet its sustainability and GHG reduction goals. In order to address its maintenance backlog, the Department must have a better understanding of the energy and water savings that will result if the backlog is remedied. Therefore, the Department will survey the backlog to estimate the

potential savings that can be unleashed, and gain a better understanding of the underlying reasons for the backlog. Two likely and closely related causes behind large deferred maintenance backlogs are a lack of O&M funds for facility maintenance and an insufficient availability of staff time dedicated to O&M. As part of the study, the Department will determine whether building maintenance operations in DoD are underfunded and insufficiently staffed, and if so to what extent.

Based on the results of the study, the Department will take action to ensure that the underlying problems are corrected. Addressing the underlying issues will require long-term initiatives. These initiatives are distinct from major renovation projects with Sustainment, Restoration, and Modernization funds. The Military Construction appropriation already funds the Energy Conservation Investment Program, which supports specific energy projects, but these measures are not meant to address underlying problems. These long-term initiatives will include specialized training on topics such as the highly technical systems used in high performance sustainable buildings. This training will provide staff with the skills needed to properly optimize and maintain these complex building systems, to ensure that the benefits of high performance buildings are realized.

The Department sees little impact on its GHG reduction targets from unneeded facilities. During the time when DoD is holding such assets, they use little or no energy and therefore have no appreciable impact on GHG emissions. For example, it is not uncommon for installations with unneeded facilities to fence them off and turn off their utilities, with the possible exception for minimal exterior lighting for security. It should be noted that reducing the Department's square footage, be it through the demolition of facilities or consolidation, increases DoD's overall energy intensity (energy consumption per gross square foot).

1.4.B Factors in Acquisition and Procurement Decisions

Decisions made in the acquisition of weapon systems and the procurement of goods and services unquestionably and directly impact sustainability. The Department's choices of goods and weapons have a resource and environmental impact, during the useful life of the goods and weapons and beyond. Acquisition and procurement decisions cascade into a profound range of downstream impacts, from energy and water consumption, to the use and release of toxic and hazardous materials, to the amount of solid waste generated. Program managers develop, design, and buy major systems and weapons platforms that can last thirty years or longer and have significant impacts on human health and the environment during their lifecycle.

The Department has undertaken a number of measures to ensure that sustainability and lifecycle costs are better estimated and considered in the acquisition process. The new Energy Efficiency Key Performance Parameter will require that personnel setting requirements for weapons systems limit the operational burden imposed by the new system's energy needs. DoD is also in the process of developing sustainability criteria to guide researchers, developers, and program managers to make more environmentally sustainable decisions from an array of alternatives that meet performance requirements. The products being developed are: a set of sustainability factors to be considered at key milestones in the acquisition process; guidance on the types of lifecycle costs to be considered when analyzing alternatives, making tradeoffs, and developing designs; and guidance on how to weigh or score various non-cost factors. The first phase of the project, which began in FY 2010, is benchmarking the best practices in industry and other government agencies. OSD's Chemical and Material Risk Management office plans to develop the criteria and perform some pilot testing.

The Programmatic Environment, Safety, and Occupational Health Evaluation (PESHE) also helps program managers select more sustainable weapon systems. The PESHE is a document prepared by the program manager that lays out the strategy for integrating ESOH considerations into the systems engineering process, the approach for identifying ESOH risks and reducing or eliminating them, and managing those risks where the program cannot avoid them. It is a living document that is continually updated and maintained throughout the acquisition process. It also includes a National Environmental Policy Act (NEPA) compliance schedule. The purpose of NEPA is to identify environmental issues early in the planning process for actions by federal agencies, and evaluate alternatives and possible mitigation measures before proceeding. With EPA's finding in December 2009 that GHGs threaten the public health and welfare of current and future generations, CEQ is proposing that federal agencies consider GHG emissions in their NEPA analyses.

1.4.C Environmental, Social and Community Considerations

The Department recognizes that a number of factors influence the evaluation and prioritization of DoD activities apart from monetary and regulatory elements, notably environmental and social considerations and issues affecting local communities and regions. One example of the intersection of mission and environmental considerations is the need for DoD to protect the natural resources base of its installations, both to sustain military testing and training and to be an effective steward of protected natural and

cultural resources. It is essential to work closely inside and outside the Department to ensure that development pressures and resource competition around our installations, ranges and facilities does not compromise current or future readiness and mission capabilities.

OSD's Sustainable Ranges program coordinates with regional and local planning to ensure the availability of military training and testing ranges now and into the future while protecting the environment. It supports education and engagement of key stakeholders—such as federal agencies, state and local governments, academia and nongovernmental organizations—and strengthens regional partnerships to effect landscape-level planning. OSD partners with these stakeholders to develop solutions to shared challenges—such as land use, energy, pollution and population growth—at the national, regional and local levels. Regional partnerships convene stakeholders from federal and state governments to address natural resource management, water quantity and quality, land use, and other emerging issues like climate change in a common, collaborative framework. One of the key components of the Sustainable Ranges program is the Readiness and Environmental Protection Initiative (REPI). REPI works to ensure the long-term accessibility and capability of military training areas by collaborating with stakeholders to develop a framework of compatible land use efforts. REPI forms coordinated regional planning and community partnerships that share the costs of protecting land, for the purpose of providing continued military access to the resources necessary for training and testing while remaining excellent stewards of the environment and good neighbors to communities across America. Military Departments use REPI funding to implement partnerships and projects according to their own processes.



Partnership to protect Waianae Mountains watershed and cultural values

Photo: U.S. Army

The Department's Office of Economic Adjustment, through the Defense Economic Adjustment Program, helps state and local governments adjust community planning in response to the needs of nearby military installations, for example for military ranges, training routes, and growing military missions. The office provides technical assistance to installation and range officials, and technical and financial assistance to neighboring states, communities and interest groups to support cooperative planning efforts.

The Department's many installations work closely with local, regional, and state governments in making sustainability investment decisions. Over a decade ago, the Department established Regional Environmental Coordinators (RECs) in each of the ten federal regions on the U.S. The RECs maintain regular communication with both government and non-government entities on all environmental and sustainability matters. In many cases, the RECs provide representatives to planning boards and sustainability organizations.

Sustainability is closely tied to the well-being of personnel, DoD's most important asset. Our ability to recruit, retain, train, educate, and equip the All-Volunteer Force, and to sustain its readiness and morale is fundamental to the mission. Especially given the continuing need for sustained deployments in conflict zones, the Department must do all it can to take care of our people—physically and

psychologically. One example of how sustainability is related to human health, and how DoD can prioritize its investments in response, is the connection between heat and air quality. Ground-level ozone, which irritates and inflames the lining of the respiratory system, is one of the primary components of smog. Heat accelerates the photochemical process that forms ozone from vehicle exhaust, which is why dangerous levels of ozone in urban areas always occur during summer. In areas prone to air pollution, as levels of ozone increase in warmer weather, forces cannot train outdoors as frequently and both military personnel and their families suffer increasing medical problems. Ozone formation and its attendant health problems will worsen with the warmer temperatures resulting from climate change. In areas where air quality is a concern, then, this consideration might be given greater weight by an Installation Commander making investment decisions, leading he or she to focus more resources on reducing the heat island effect on the installation (for example by planting shade trees) or lowering vehicle emissions.

I.5 Climate Change Risk and Vulnerability

In its latest QDR, DoD highlighted the importance of climate change, citing energy security and climate change as one of four specific issues for which it is imperative that the Department reform how it operates. Section I.1.D, “Maintaining Readiness in the Face of Climate Change”, discusses the primary impacts of climate change on the DoD mission and outlines the Department’s initial efforts at assessing potential vulnerabilities and risks. This section describes how the Department intends to strategically address the risks posed by climate change to its fixed military installations, ranges, and facilities. DoD’s ability to sustain operations at its installations and facilities is critical for maintaining military readiness. DoD plans to follow a three-phase approach to ensure that over time its installations and facilities are resilient to the potential impacts of climate change. To accomplish these phases, DoD will take advantage of the science, models, and tools developed by other federal agencies, as well as leveraging the work of its own SERDP and the efforts of the individual Military Departments.

For Phase One, the Department will develop decision frameworks to outline the types of risks to the DoD mission and installations that may occur under climate change, the types of decisions DoD may need to make regarding these risks, and the spatial and temporal nature of these risks and decisions. During Phase Two, the Department will develop and apply a tool kit of impact assessment methods and models that can be used to identify vulnerabilities and risks to the mission accomplishment at the installation, regional, and DoD-wide scales. In Phase Three, DoD will build upon the learning generated during execution of the first two phases and develop guidelines for adaptation planning, again for different temporal and spatial scales. Work and product development under all three phases is intended to be adaptive; as a result, periodic checkpoints will be established to assess the current state of knowledge and to make any adjustments relative to impact assessment and adaptation planning.

Development of a Decision Framework

Global climate change projections are generated from a set of General Circulation Models (GCMs) that do not have the requisite spatial or temporal resolution to enable robust decision making at the scales needed by DoD decision-makers. Moreover, GCMs are better at predicting mean climate conditions, in particular temperature, than climate extremes or variability. Impact assessment and adaptation decisions may be particularly sensitive to extreme events or increases in climate variability.

It is not DoD’s mission or role to make projections of future climate change; however, given the significant potential consequences of climate change, the Department must be able to make robust decisions in the face of uncertainty to ensure the long-term sustainability of its mission. DoD planners and managers require actionable information about potential future climate change scenarios, in the form of the best available synthesis of what the future might hold in terms of variables such as extreme heat events, sea level rise, and reduced river flow or snow pack (important for fresh water supplies). Such

climate change scenarios offer plausible though often simplified representations of future climate and changes to the environment that result, which can be used as input to climate change impact assessments. Such scenarios are indirectly tied to GHG emission scenarios but are not directly linked to a specific climate projection. DoD plans to adopt regional climate change scenarios to ensure consistent assessments across DoD installations. The Department will assess the risks to the mission, the types of decisions to be made, and their temporal and spatial nature. The decision framework will be used by installations for impact assessment and adaptation planning, based on a robust set of regional climate scenarios. The Department will avoid a “one size fits all” approach when developing decision frameworks, enabling them to be applied flexibly by individual installations, but it will provide DoD-level standards and guidelines to ensure that an appropriate degree of consistency is applied.

DoD does not intend to make assessment and adaptation decisions in a vacuum. The Department is actively engaged with the activities of the Interagency Assessments Task Force, which is involved in planning the next National Climate Assessment, and the Interagency Climate Change Adaptation Task Force. The Department will identify its needs in coordination with other federal entities faced with similar challenges regarding the appropriate use of climate change scenarios.

Climate Change Impact Assessments

DoD’s operational readiness hinges on continued access to land, air, and sea for training and test space. Consequently, the Department must complete a comprehensive assessment of all its installations and facilities to assess the potential impacts of climate change on its mission. A comprehensive assessment is also a prerequisite for developing, prioritizing, and resourcing robust adaptation strategies.

“The Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required.”

— *DoD Quadrennial Defense Review, 2010*

To this end, DoD will continue to make use of existing impact assessment methods and models, and develop new ones as necessary. Some of these tools, associated with sea level rise and storm surge impacts, are currently under development through SERDP-funded research. The climate change scenarios upon which impact assessments are based depend on how climate as a forcing variable eventually affects changes in sea level, soil moisture, and so on. Changes in climate can lead to a cascading of physical and biological effects that have to be considered for both impact assessment and adaptation planning, in combination with the effects of other environmental stressors that also may be occurring. The Department needs models and other tools to understand how changes in physical and biological processes relate to infrastructure impacts, both natural and built. Therefore, as part of Phase Two, DoD will evaluate the availability and current utility of existing impact assessment tools and identify any gaps for which tools need to be developed. This evaluation, when appropriate, can be accomplished in coordination with other federal agencies. The Department will address gaps directly through additional research and development activities, and in coordination with other federal agencies.

With this information in hand, DoD will develop guidance consisting of an analytical methodology and associated tools for its installations to use when conducting risk-based, climate change assessments. DoD will develop a plan to conduct initial vulnerability and risk assessments at each of its installations and facilities, using the assessment guidance it develops. The plan will include processes and responsibilities to complete all impact assessments by a set deadline, and prioritize the order in which installations and facilities are assessed based in part on the decision frameworks developed during Phase One. Depending on the uniformity of the physical drivers to be considered, the types of infrastructure that may be impacted, and the decisions to be made, DoD may choose to conduct and aggregate some of the assessments across multiple installations. As the nature of the impacts and their likelihoods are better understood and tool development advances, the Department will update each of its assessments. DoD will review the assessments for their continued accuracy and relevance, and update them as needed.

The Department will emphasize to all installations and facilities the value of these self-assessments and that the results of the assessments should be incorporated into current and ongoing processes. These include the DoD Readiness Reporting System and other processes as necessary to ensure appropriate responses to the assessment findings. The Department also will develop, in conjunction with the Military Departments, a cross-DoD system for collecting assessment information, evaluating its completeness, and assisting with assessment-based resourcing decisions.

Climate Change Adaptation Planning

Adaptation planning and response relies heavily on answering the question: what are we adapting to? Moreover, it is important to know over what period of time a potential impact will manifest itself to decide if adaptation is even necessary for certain infrastructure decisions. As a result, robust adaptation planning will be dependent on the decision framework developed during Phase One and the subsequent risk-based assessments conducted as part of Phase Two. The Department is an active participant on a number of the working groups associated with the Interagency Climate Change Adaptation Task Force, which is charged with developing recommendations on the development of a national strategy on climate change adaptation. As part of Phase Three, DoD will leverage the work of the Task Force in developing its own Department-wide strategy for climate change adaptation. This strategy will be provided as guidance for use by the Military Departments and individual installations and facilities. As part of its adaptation strategy, DoD will note the state of adaptation science and identify key information gaps. Strategies that are robust across a range of potential climate change scenarios will be flagged for adoption as no-regrets strategies.

I.6 Transparency

The Department is committed to clearly communicating progress on the Plan because DoD's mission is advanced by doing so. Ongoing communication about the Plan and progress on it serves two purposes. First, the set of performance metrics in the Plan is a tool for evaluating performance to ensure that programs are on track, and for deciding how to take corrective action as needed. Second, the Plan enables the Department to continually instill into our personnel, the public, and the international community DoD's commitment to sustainability, and the fundamental principle that DoD's mission and sustainability are tightly coupled.

The Department looks forward to communicating performance on the Plan externally as an important opportunity to convey to Congress, the American public, and countries around the world that DoD is part of the solution to create a more sustainable future. DoD's proactive pursuit of sustainability is generally underappreciated and the DoD Strategic Sustainability Performance Plan provides a vehicle for communicating the sum and breadth of DoD's sustainability efforts as an integrated, cohesive story.

Internal

Each DoD Component's Sustainability Official will provide semi-annual progress reporting through the Senior Sustainability Council to the Department SSO. The annual progress report on the Plan will consist of: 1) a report on the metrics for each sub-goal in the Plan for the entire fiscal year; 2) narrative descriptions of the best success stories for the fiscal year; and 3) a brief analysis for each sub-goal on the suitability of the annual targets and any issues inhibiting performance. The mid-year review will report the metrics for each sub-goal for the period from October through March, and any explanations of problems with meeting the sub-goals. Semi-annual monitoring will bring to light any problems in achieving the sub-goals, allowing more time for corrective action to be taken. Reporting on the Plan's progress will provide OSD, as well as the senior management of each DoD Component, with the information needed to analyze Department progress for that year on its sustainability objectives, goals and sub-goals, and alter strategies and sub-goals as needed for subsequent years. The annual report will also provide the information needed for OSD to prepare Part II of the Plan each year. Although success

stories will only be required from the DoD Components annually, their submittal is encouraged on an ongoing basis throughout the year so the Department can use them in communicating with the public (as described below). DoD and Military award programs will consider outstanding achievements every year for individuals and teams for the Plan's goals. For more information on how the Department plans to engage agency staff regarding its progress and performance on the Plan, refer to Section I.3.D on "Internal Coordination and Dissemination".

External

External communication will take three forms: the media, the internet, and venues such as conferences. The Department will take full advantage of the media to disseminate messages on sustainability performance to the public. OSD will craft press releases for distribution through regular public relations channels, and will also distribute them to the Military Departments for distribution as appropriate through their local media outlets. The Department will issue a press release annually each time the Plan is submitted, and will continue to seek opportunities throughout the year to provide examples of DoD progress on its sustainability efforts.

The Department already has two platforms on the internet for communicating to the public on sustainability performance:

- DENIX (<http://www.denix.osd.mil>); and
- the "DoD Goes Green" website at www.defense.gov/home/features/2009/0809_green/.

In addition to posting stories and articles to these web sites on an ongoing basis, the Department will post summary results on the Plan's performance metrics annually. All Department external communication will comply with the DoD Open Government Plan (<http://open.dodlive.mil/open-government-plan/>).

The Department is already using, and will do so with greater frequency moving forward, venues such as conferences, seminars, workshops and external forums to raise awareness of the Plan, report on progress towards its goals, and discuss updates to it.

Part II: Performance Review and Annual Update

II.1 Summary of FY 2009 and 2010 Accomplishments

The Department was active in FY 2009 and the first part of FY 2010 in numerous areas that have advanced sustainability and reduced greenhouse gas emissions. Many examples have been described in other sections of this Plan: in the sub-sections titled "Progress to Date and Key Initiatives Going Forward" in Section I.1, and for each Goal in the "Status" sub-sections of Section II.2. Rather than repeat these, the current section provides examples of recent DoD accomplishments and lessons learned in two areas critical to forging a path to sustainability: energy and chemicals.

A paradigm shift occurred within the Department during 2009 and 2010 with regard to energy. In February of 2010, the Department issued the Quadrennial Defense Review (QDR). The QDR was the first high-level DoD strategic document to give thorough treatment to the subjects of energy and climate change. The 2010 QDR serves as a foundational document for the incorporation of energy and climate change considerations into future strategic planning documents. DoD created the office of Director for Operational Energy Plans and Programs in the Office of the Secretary of Defense (OSD), and the Military Departments have made energy a high priority. For example, the Secretary of the Navy, Ray Mabus, announced a set of ambitious goals to boost the energy efficiency of the Navy and the Marine Corps, both at sea and on land. Secretary Mabus directed that half of the energy used by installations will come from alternative sources by 2020, and by 2016 he plans to field a carrier strike group powered only by biofuel and nuclear energy.

The Department has developed an initiative that will address Expeditionary Camp Operations Sustainability by specifically focusing on base camp sustainability issues of solid waste, water, and power. The intent of the initiative is to institutionalize sustainability in order to enhance mission effectiveness for the war fighter while reducing resource demands and logistics vulnerabilities. The initiative will draw on various ongoing sustainability efforts across DoD, such as the Power Surety Task Force, the Marine Corps' Experimental Forward Operating Base, the Air Force's drive to significantly increase the use of biofuels in aircraft, and the Army's Net Zero efforts at the National Training Center, Green Warrior Project, and Base Camp Integrated Concept Development Team. Many of these efforts will identify existing commercial equipment that can be made available to our forces today, or will find gaps that need further research and development. Likewise, they will identify new environmental, health, and expeditionary sustainability skill sets required for our uniformed and civilian personnel and contracted partners.

The Department as a whole will benefit from lessons learned in energy management at the installation level. Some DoD installations have struck out ahead of the pack, setting the Department apart in the federal government as a leader in reducing the use of fossil fuels for energy. This is illustrated by the Department's continued dominance of the Department of Energy (DOE) Federal Energy Management Program (FEMP) Awards for Energy Efficiency and Energy Program Management. Award results are not yet available for 2010, but in 2009 DoD garnered nine out of 13 of these awards, and in 2008 all but one of the nine awards went to DoD. For the Department overall, in spite of increased military operations, the energy used per square foot of DoD building space declined by 10 percent in FY 2009



Photo: U.S. Air Force

relative to FY 2003. The Department is also on track to meet the Energy Policy Act of 2005 (EPAct) goal of having all eligible buildings metered for electricity by FY 2012: as of the end of FY 2009, DoD had metered 63 percent of buildings, and based on current contract commitments to continue meter installations, 86 percent of all eligible DoD building will be metered by the end of FY 2010.

The Department has made progress in increasing its use of renewable energy, producing or procuring almost 7 percent of its electricity from renewable sources in FY 2009, including geothermal (primarily ground source heat pumps), solar, wind, and biomass. DoD benefits through a power purchase agreement with the largest solar panel array in North America: a 14.2 MW installation at Nellis Air Force Base, Nevada. The array of over 72,000 solar panels provides one quarter of the necessary power for Nellis AFB and saves the Air Force about \$1 million every year in electricity costs. In the near future, the Nellis installation will be dwarfed by a new solar project currently under development: a massive solar energy venture planned for Fort Irwin, California. A combination of solar thermal and solar photovoltaic, the installed capacity of the project will be between 500 and 1,000 MW. It is being financed using enhanced use leasing, requiring no investment from DoD. The Department has learned the importance of ensuring that at least some of the installed renewable energy capacity be available to the host military installations independent of the community electrical grid. Moving forward, for purposes of mission readiness, the Department will place an increased emphasis on the ability of on-site or nearby renewable energy to ensure a supply of electricity to installations even when electricity from the grid is disrupted.

The Department's goals for reducing the environmental and mission risks associated with chemicals are to achieve better visibility into "what, where, why and how much" of chemicals of environmental concern are used by DoD, and to develop lifecycle-based chemical management policies that lead to better informed, risk-based decisions for chemical selection and usage.

Notable progress was made towards this end during FY 2009 and 2010. One example is a memorandum signed in April 2009 to minimize the use of hexavalent chromium. Hexavalent

chromium is found in a number of products used to perform a range of DoD functions, in particular corrosion protection, and it is also a known carcinogen. This policy directs the DoD Components to seek safer, more environmental responsible alternatives wherever feasible and in keeping with the DoD Mission. It is an important step forward to improve the safety of the warfighter and defense maintenance personnel, based on sound science. In October 2009 the Deputy Under Secretary of Defense for Installations and the Environment, DUSD(I&E), agreed to a voluntary arrangement with the National Institute for Safety and Occupational Health to measure the potential exposure of nanomaterials to DoD research personnel. While the science of nanotechnology offers very real benefits to the warfighter for protection and armament, a strategic approach is needed to mitigate the risks of this promising new science. Even where uncertainty of risk is very high, the greatest risk to DoD is to do nothing.

In 2010, the Department coordinated on a strategic plan to prepare DoD for the potential impacts of the European Union Registration, Evaluation, Authorisation, and Restriction of Chemical Substances (REACH) regulation. The plan for REACH promotes military readiness by developing goals and objectives necessary to address global defense supply chain concerns as a result of REACH implementation, as well as identifying lead DoD and support offices. Chief among the plan's goals are to protect the availability of substances with significance to the mission, guard against disruptions to the supply chain, and ensure the performance and reliability of substitutes. Some of REACH's effects are expected to exert a positive influence on DoD's efforts in green procurement.



Photo: U.S. Army

II.2 FY 2010 Goal Performance Review

Introduction

The DoD Strategic Sustainability Performance Plan consists of four high-level Departmental strategic Objectives, each of which has two Goals. Under the set of eight Goals are 21 sub-goals, as summarized in Table II.1. The hierarchy of Objectives and Goals is as follows:

Objective #1: The Continued Availability of Resources Critical to the DoD Mission is Ensured

Goal #1: The Use of Fossil Fuels Reduced

Goal #2: Water Resources Management Improved

Objective #2: DoD is a U.S. Government Leader in Reducing Greenhouse Gas Emissions

Goal #3: Greenhouse Gas Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020, Relative to FY 2008

Goal #4: Greenhouse Gas Emissions from Scope 3 Sources Reduced 13.5% by FY 2020, Relative to FY 2008

Objective #3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution

Goal #5: Solid Waste Minimized and Optimally Managed

Goal #6: The Use and Release of Chemicals of Environmental Concern Minimized

Objective #4: Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community

Goal #7: Sustainability Practices Become the Norm

Goal #8: Sustainability Built into DoD Management Systems



Photo: U.S. Marine Corps

The goals and sub-goals in the Plan are designed to be based on performance to allow flexibility in the methods used to achieve them. The sub-goals are quantitative and carefully defined by a performance metric that provides an objective, rigorous means of reporting and tracking progress against the sub-goal. The full definition of each sub-goal is provided by the combination of the sub-goal title and its defining performance metric.

Table II.1. Summary of the DoD Objectives, Goals and Sub-Goals Comprising the Strategic Sustainability Performance Plan

#	Sub-Goal	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Objective #1: The Continued Availability of Resources Critical to the DoD Mission is Ensured											
GOAL #1: The Use of Fossil Fuels Reduced											
1.1	Energy Intensity of Facilities Reduced by 30% of FY 2003 Levels by FY 2015 and 37.5% by FY 2020	18%	21%	24%	27%	30%	31.5%	33%	34.5%	36%	37.5%
1.2	18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by FY 2020	6.5%	7.5%	8.8%	10.2%	11.5%	12.9%	14.2%	15.6%	16.9%	18.3%
1.3	Use of Petroleum Products by Vehicle Fleets Reduced 30% by FY 2020 Relative to FY 2005	12%	14%	16%	18%	20%	22%	24%	26%	28%	30%
GOAL #2: Water Resources Management Improved											
2.1	Potable Water Consumption Intensity by Facilities Reduced by 26% of FY 2007 Levels by FY 2020	8%	10%	12%	14%	16%	18%	20%	22%	24%	26%
2.2	Industrial and Irrigation Water Consumption Reduced by 20% of FY 2010 Levels by FY 2020	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%
2.3	All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Objective #2: DoD is a U.S. Government Leader in Reducing Greenhouse Gas Emissions											
GOAL #3: Greenhouse Gas Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020, Relative to FY 2008											
3			10%			19%			28%		34%
GOAL #4: Greenhouse Gas Emissions from Scope 3 Sources Reduced 13.5% by FY 2020, Relative to FY 2008											
4		0%	1%								13.5%

#	Sub-Goal	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
4.1	Greenhouse Gas Emissions from Employee Air Travel Reduced 7% by FY 2020 Relative to FY 2011	0%	0%	1%	2%	2%	3%	4%	5%	6%	7%
4.2	30% of Eligible Employees Teleworking at Least Once a Week, on a Regular, Recurring Basis, by FY 2020	10%	15%	17%	19%	21%	23%	25%	27%	29%	30%
4.3	50% of Non-Hazardous Solid Waste Diverted from Disposal in Landfills Not Owned by DoD by FY 2015 and Thereafter Through FY 2020	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%
Objective #3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution											
GOAL #5: Solid Waste Minimized and Optimally Managed											
5.1	All DoD Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper	1	6	24	31	31	31	31	31	31	31
5.2	50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by FY 2015 and Thereafter Through FY 2020	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%
5.3	60% of Construction and Demolition Debris Diverted from the Waste Stream by FY 2015, and Thereafter Through FY 2020	52%	54%	56%	58%	60%	60%	60%	60%	60%	60%
5.4	Ten Landfills Recovering Landfill Gas for Use by DoD by FY 2020	0	2	3	4	5	6	7	8	9	10
GOAL #6: The Use and Release of Chemicals of Environmental Concern Minimized											
6.1	On-Site Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% by FY 2020, Relative to FY 2007					5%			10%		15%
6.2	100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
6.3	100% of DoD Personnel and Contractors Who Apply Pesticides Are Properly Certified Through FY 2020	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

#	Sub-Goal	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Objective #4: Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community											
GOAL #7: Sustainability Practices Become the Norm											
7.1	95% of Procurement Conducted Sustainably	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
7.2	15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings By FY 2015, Holding Through FY 2020	7%	9%	11%	13%	15%	15%	15%	15%	15%	15%
GOAL #8: Sustainability Built into DoD Management Systems											
8.1	All Environmental Management Systems Effectively Implemented and Maintained	green									
8.2	The Sustainability of Transportation and Energy Choices in Surrounding Areas Optimized by Coordinating with Related Regional and Local Planning	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8.3	All DoD Installations Have Integrated Pest Management Plans Prepared, Reviewed, and Updated Annually by Pest Management Professionals	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

The set of sub-goals tracks closely with the sustainability requirements of Executive Order (EO) 13514, EO 13423, the Energy Independence and Security Act of 2007 (EISA), and EPAct. Appendix D summarizes these federal requirements by subject area, while Appendix E provides the federal requirements relating to each sub-goal.

Scorecard for Tracking Progress

Each year, beginning with FY 2011 results, performance on the objectives, goals and sub-goals will be summarized using a DoD sustainability scoring system. The Department’s current vision for the system is provided in Appendix C. Although only the DoD-wide scoring summary will be reported in the Plan each year, separate scoring summaries will also be used for each Military Department and the Defense Logistics Agency (DLA) to foster competition. Every year the Department will use this performance monitoring system to evaluate the efficacy of its approaches to each goal and sub-goal, and revise its Plan and the approaches to achieving it as needed.

OBJECTIVE 1

Ensure the Continued Availability of Resources Critical to the DoD Mission

GOAL 1 The Use of Fossil Fuels Reduced

Goal 1 Sub-Goals

SUB-GOAL 1.1 Energy Intensity of Facilities Reduced by 30% of FY 2003 Levels by FY 2015 and 37.5% by FY 2020

Metric

The percent reduction relative to FY 2003 in the total fossil fuel-generated energy consumed by DoD facilities per gross square foot of total DoD building space. A facility is defined as per the Energy Independence and Security Act of 2007 (EISA) §432(1)(C) to be any building, installation, structure, or other property (including any applicable fixtures) owned or operated by, or constructed or manufactured and leased to, DoD. The term facility includes a group of facilities at a single location or multiple locations managed as an integrated operation, and contractor-operated facilities owned by DoD. It does not include any land or site for which the cost of utilities is not paid by DoD.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 1.1 Targets	18%	21%	24%	27%	30%	31.5%	33%	34.5%	36%	37.5%

SUB-GOAL 1.2 18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by FY 2020

Metric

The percent of total energy consumed by DoD facilities that is produced or procured from renewable energy sources. The energy is produced by DoD, produced from a DoD controlled location, or procured from another source. Renewable energy is defined as per 10 U.S.C. §2911(e) to be either thermal or electrical energy that is produced from renewable sources, including solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal (including electricity and heat pumps), municipal solid waste, and new hydroelectric generation capacity if achieved from increased efficiency or additions of new capacity at existing hydroelectric projects. A facility is defined as per EISA §432(1)(C).

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 1.3 Targets	6.5%	7.5%	8.8%	10.2%	11.5%	12.9%	14.2%	15.6%	16.9%	18.3%

SUB-GOAL 1.3 Use of Petroleum Products by Vehicle Fleets Reduced 30% by FY 2020 Relative to 2005

Metric

The percent reduction in petroleum product consumption by DoD non-tactical motor vehicle fleets relative to FY 2005. Only fleets numbering 20 motor vehicles or more are covered.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 1.1 Targets	12%	14%	16%	18%	20%	22%	24%	26%	28%	30%

Goal 1 Responsible OSD Office

AT&L/I&E

Goal 1 Status

Facility Energy Intensity

DoD reduced the energy intensity of its buildings by 10 percent in FY 2009 relative to FY 2003 (measured in Btu per gross square foot), 20 percent shy of its FY 2009 goal of a 12 percent reduction (Figure II.1). As shown in Figure II.2, DoD facility energy consumption is dominated by the Military Departments, which accounted for 94 percent of consumption in FY 2009. The 2009 increase shown in Figure II.1 is due to an overall increase in energy intensity compared to last year, driven by increased energy consumption due to realignment and increased troop strength in FY 2009.

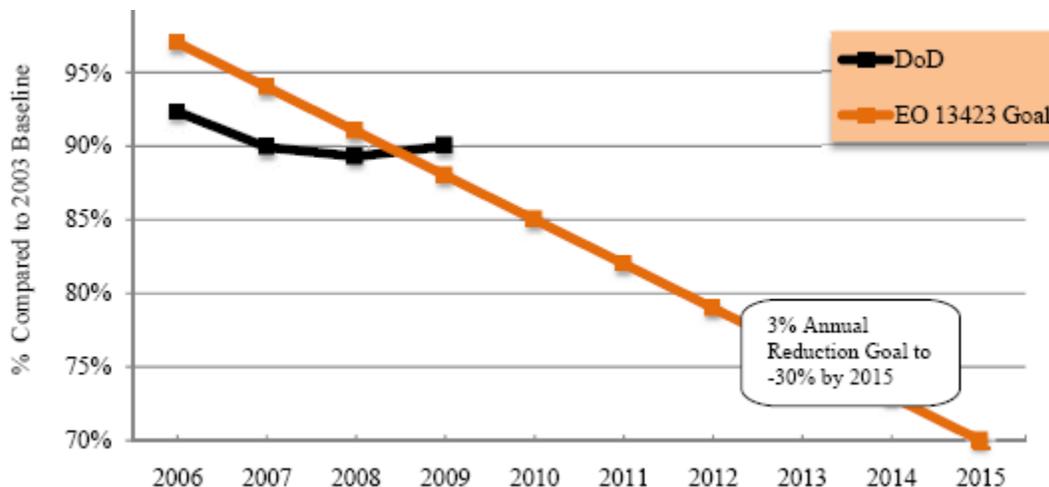


Figure II.1. DoD Energy Intensity Compared to the EO 13423 Goal, Relative to FY 2003

One of the fundamental approaches for improving energy efficiency is through the metering of end use. As of the end of FY 2009, DoD had metered 63 percent of those buildings eligible for standard and

advanced metering. Eligible buildings are those for which the DoD Component has determined that metering will be cost effective and practical as a management enhancement tool to identify energy cost savings.

With regard to electronic stewardship, the DoD Deputy Chief Information Officer (CIO) issued a policy memo in October 2009 to all DoD Component CIO offices, calling for the implementation of personal computer power management and Energy Star features on all eligible DoD desktops, laptops, and monitors, and encouraged all DoD Components to extend the useful life of electronics equipments to four years or more.

Another critical energy efficiency tool is performance contracting, where the energy savings from a project are used to pay for the costs of the project. DoD makes extensive use of this financing mechanism, and set a FY 2009 goal for investments using performance contracting to equal 10 percent of total utility costs. Investments in FY 2009 using performance contracting totaled \$113.4 million, or 9.1 percent of utility costs, made by the Army in the form of Energy Savings Performance Contracts and Utility Energy Services Contracting.

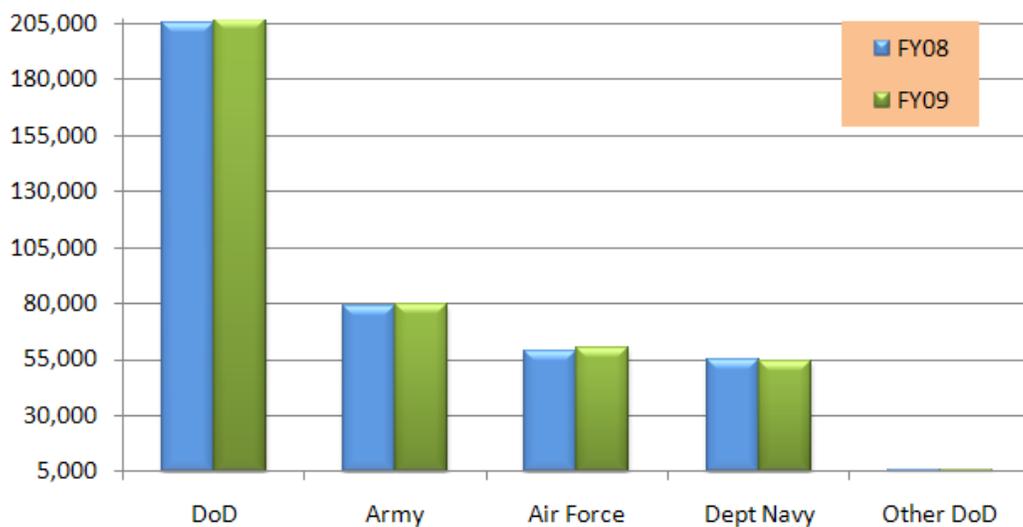


Figure II.2. DoD Facility Energy Consumption (in total energy delivered, billion Btu)

While much remains to be done to reduce overall energy consumption by the Department, notable achievements have been made by some installations. As mentioned in Section II.I, DoD was awarded nine out of 13 of the FEMP Awards for Energy Efficiency and Energy Program Management in 2009, and in 2008 all but one of the nine awards went to DoD. Details on the innovative and cost-effective measures taken by these installations can be found at the [FEMP award web site](#). One example is the Dyess Air Force Base in Texas, which through a series of energy efficiency measures reduced energy consumption in FY 2008 by 16.5 percent relative to FY 2007, producing annual savings of more than \$1 million in energy costs in the process.

Renewable Energy

In FY 2009 DoD produced or procured 6.8 percent of its electric energy from renewable sources, including cogeneration, geothermal (primarily ground source heat pumps), solar, wind, and biomass. The requirements of 10 U.S.C. 2911(e) for DoD are to produce or procure 25 percent of its electric energy consumption from renewable resources by the end of FY 2025. The 2010 National Defense Authorization Act, however, changes the metric starting in 2010, requiring the measurement of all types of renewable

energy rather than only electricity. The new metric will dramatically reduce DoD's reported progress because including all energy consumed rather than only electricity will nearly double the percentage denominator. A recalibration of the baseline is necessary to adjust for the new metric.

DoD earned two of the DOE FEMP Awards for renewable energy in 2009. The winners were building-integrated solar photovoltaic projects at Naval Air Weapons Station China Lake and Marine Corps Base Hawaii.

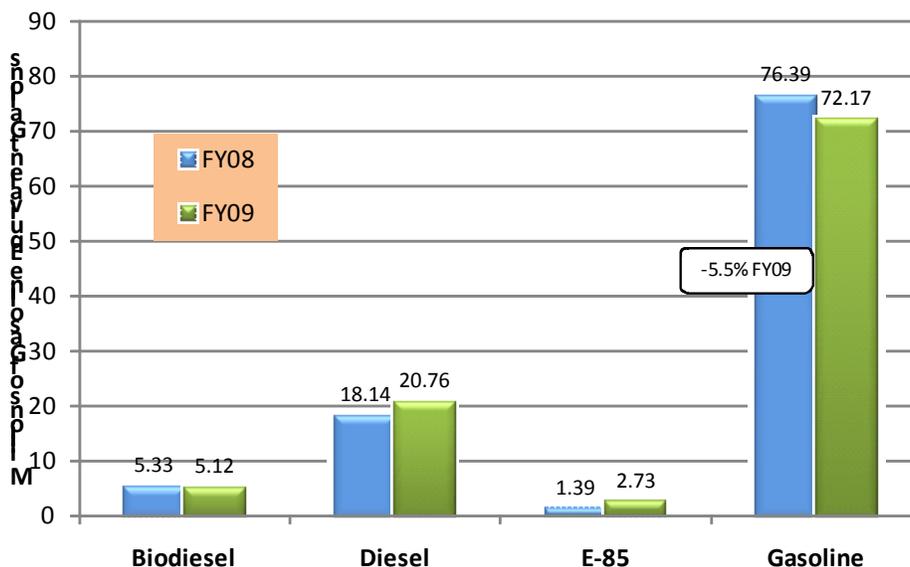


Figure II.3. DoD Vehicle Fleet Use By Fuel Type, FY 2008 and 2009

Vehicle Fleets

DoD continued efforts in FY 2009 to acquire high efficiency vehicles and those with the ability to use alternative fuels. FY 2009 additions to the fleet consisted of 105 neighborhood electric vehicles, 863 low-speed or mini-utility vehicles, 150 hybrid electric vehicles, and 1,485 E85 vehicles (capable of using a blend of 85 percent ethanol and 15 percent gasoline); 800 low-speed electric vehicles were ordered. The Department's use of alternative fuels was 4.9 percent in FY 2009, an increase of 72 percent from the FY 2005 baseline. DoD fleet vehicle fuel consumption in FY 2009 shifted gasoline use to E85 and diesel compared to FY 2008 (Figure II.3). These measures reduced overall petroleum use by non-tactical vehicles by 9 percent compared to FY 2005.



Photo: U.S. Navy

To provide the necessary supporting infrastructure for alternative fuels, the Department completed the infrastructure for 16 alternative fueling stations to dispense E85 and B20 (a blend of 20 percent biodiesel and 80 percent petroleum diesel). It also installed a solar photovoltaic charging station and upgraded a compressed natural gas station. By way of new alternative fueling infrastructure, the Department initiated construction of three E85 stations, permitted two, and placed contracts for one E85 station and one hydrogen reformer. EISA §246 requires that fuel sites dispensing 100,000 gallons or more per year be

modified to support alternative fuel infrastructure. DoD has identified 137 sites over this threshold, and completed the necessary modifications to 83 of them (63 percent). Of the remaining 51 sites, 34 are in the planning phase to install new fuel infrastructure in the near future.

Goal 1 Implementation Methods

Metering. The Department will continue on its path to have all eligible buildings metered for electricity by FY 2012 (where eligible buildings are those for which the DoD Component has determined that metering will be cost effective and practical as a management enhancement tool to identify energy cost savings). Based on current contract commitments to continue meter installations, the forecast for FY 2010 is to have 86 percent of all eligible DoD building metered (Figure II.4).

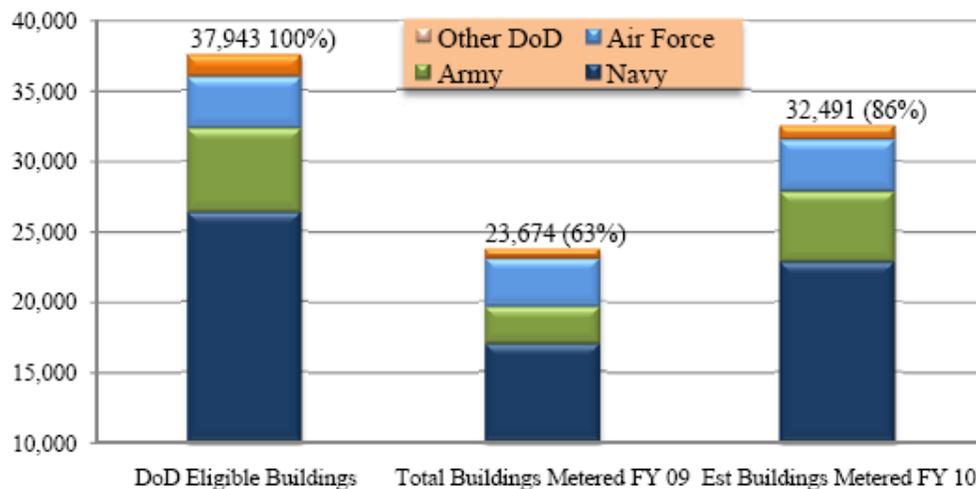


Figure II.4. Number of Eligible DoD Buildings Metered for Electricity Use

Sustainable Building Design and High Performance Buildings. See the Implementation Methods for Goal 7 for information on how the Department plans to make its building inventory more sustainable.

Leased Buildings. A significant portion of the energy consumed by DoD facilities occurs in leased buildings. The Department will place an increased emphasis on incorporating energy efficiency and sustainable design into lease provisions. Efforts to reduce energy consumption in leased facilities have already begun. The Army, for example, emphasizes that energy and water conservation be included in all facility leases and requires that these leased facilities meet energy and water goals. The intent is to have the landlord make appropriate investments in energy efficiency and amortize them in the lease, as long as the new total cost (energy costs plus lease cost) does not exceed total costs without improvements. In July 2009, the General Services Administration signed a lease on behalf of the Defense Advanced Research Projects Agency for a new headquarters building being constructed to meet LEED Silver specifications.

Facility Energy Audits. The Department will continue to use facility energy audits to identify energy efficiency opportunities. For example, in FY 2009 energy audits were performed by the Tricare Management Agency's Navy Bureau of Medicine and Surgery at three Naval Medical Centers: Portsmouth, Jacksonville, and San Diego. The audits resulted in 47 recommendations with an estimated savings of \$5.4 million. Several of the recommendations will be used in the submission of FY 2011 projects under the Energy Conservation Investment Program. When conducting facility efficiency improvements, the Department will ensure that no changes are made to humidity, temperature, air exchange and lighting that are known to harm health, safety and productivity. It will do so by evaluating

all proposed modifications against the relevant guidelines of ASHRAE, IESNA, and other recognized, authoritative sources.

Electronic Stewardship and Data Centers. Under the Federal Data Center Consolidation Initiative, the Department will strive to reduce the overall energy and real estate footprint of its data centers, consistent with the guidance provided by the Office of Management and Budget. The Department will use the data center metrics shown in Table II.2 to drive the Department’s Data Center consolidation effort, improve energy efficiency, and reduce energy demand. Targets for the metrics will be determined after further analysis, and in coordination with the new DoD Data Center Consolidation Plan completed in late August 2010.

Table II.2. Metrics to Drive the DoD Data Center Consolidation Effort

	FY11	FY12	FY13
% of cloud activity hosted in a data center	TBD	TBD	TBD
% of agency data centers independently metered or advanced metered and monitored on a weekly basis	TBD	100%	hold
Reduction in the number of agency data centers	TBD	TBD	TBD
% of agency, eligible electronic products with power management and other energy-environmentally preferable features (duplexing) actively implemented and in use	95%	100%	hold
% of agency data centers operating with an average CPU utilization of 60-70%	TBD	TBD	TBD
% of agency data centers operating at a power usage effectiveness range of 1.3 to 1.6	TBD	TBD	TBD
% of agency data center activity implemented via virtualization	TBD	TBD	TBD

Other aspects of electronic stewardship are handled under the following separate sub-goals:

- ✓ sub-goal 5.1: “All DoD Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper”;
- ✓ sub-goal 6.2: “100% of DoD Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner”; and
- ✓ sub-goal 7.1: “95% of Procurement Conducted Sustainably”, which covers the procurement of Energy Star and EPEAT-registered electronics.

Last October, DoD’s Deputy Chief Information Officer issued a policy memo to all DoD Component CIO offices calling for the implementation of power management and Energy Star features, and encouraging all DoD Components to extend the useful life of electronics equipments to at least four years. To follow up on that memo, during FY 2010 the OSD CIO office will be reviewing the plan of each DoD Component to enable power management features on its eligible electronics equipment. The Department has partnered with the Environmental Protection Agency (EPA) and the Office of the Federal Environmental Executive to satisfy the electronics stewardship goals of EO 13423 and EO 13514 in all three phases of the electronics lifecycle: acquisition, use, and end of life. In addition, DoD will shift information technology investments to more efficient computing platforms and technologies such as desktops, laptops, and monitors that have the Energy Star label and/or are registered with the Electronic Product Environmental Assessment Tool (EPEAT).

Vehicle Fleets. The Department will reduce the amount of petroleum used by its non-tactical vehicle fleet through four approaches. It will:

- 1) Increase the use of alternative fuels not based on petroleum by 159% by the end of FY 2015, relative to 2005 levels, as required by EO 13423 §2(g). The Department will do so by continuing to expand the number of alternative fuel vehicles in the fleet and the supporting infrastructure

for alternative fuels (through the modification of fueling stations to dispense alternative fuels and the construction of new fueling facilities).

- 2) Continue to grow the number of low emission and high fuel efficiency vehicles, and encourage personnel to use the most efficient vehicle possible for a given purpose.
- 3) Downsize (“right-size”) the fleet by eliminating unnecessary vehicles.
- 4) Optimize the operational efficiency of vehicles, by keeping vehicles properly maintained (including tire pressure) and encouraging efficient driving techniques.

By the first quarter of FY 2011, the Department will launch a study of approaches that will accelerate its progress in reducing petroleum use by its vehicles, including incorporating the transportation elements of EO 13423 into relevant position descriptions and performance evaluations.

Renewable Energy. For reasons of mission readiness and national security, the Department is committed to increasing the amount of renewable energy generated on DoD property that can be consumed by installations independent of the local electrical grid. By the third quarter of FY 2011, the Department will conduct an analysis of the potential for renewable energy generation on different properties in the U.S. Each location will be evaluated based on the availability of renewable energy resources, energy-related risk assessments, and the possibility of any mission or readiness impacts of the energy facility. In addition to increasing on-site generation that can be accessed independently of the grid, the Department will continue to support the development of large renewable energy projects that benefit the nation as a whole. For example, a massive solar energy venture is planned for Fort Irwin. With a combination of solar thermal and solar photovoltaic, the installed capacity of the project will be between 500 and 1,000 MW. It is being financed using enhanced use leasing, requiring no investment from DoD.



Photo: U.S. Navy

Prototype Wave Energy Buoy,
MCB Hawaii



Photo: U.S. Navy

On-Site Solar Power at Naval Base San Diego

Installation Energy Test Bed Initiative. DoD’s fixed installations offer an ideal test bed that could help fill a gap between research and development, and the deployment of next-generation energy technologies developed by industry, DOE, and university laboratories. DoD’s built infrastructure and land are unique

in their size and variety, and encompass the diversity of building types and climates in the United States. The Department has programmed \$30 million to explore test bed technologies (included in the FY 2011 leveraged investments in the Resources Planning Table), working on a small scale now with plans to expand. The program uses DoD installations to test advanced, pre-commercial technologies aiming to improve the energy efficiency of buildings and distributed (on-site) energy generation, including renewables, and to improve the control and management of local energy loads. The test bed approach accelerates the deployment of innovative energy technologies across DoD installations. It provides the real life scenarios for testing technologies in the final development stage (alpha versions) and the performance of emerging commercial technologies (beta versions), while providing direct benefits to the host installation.

The test bed process for a given technology begins with a competitive selection by the Department in partnership with DOE and the private sector. DoD creates partnerships with the developer and end user to test the technology at DoD facilities. The performance of the technologies is evaluated and the associated operating costs and environmental impacts assessed, using independent testing and evaluation. The Department transfers the lessons learned in design and procurement across all Military Departments and installations to identify DoD market opportunities. For those technologies that prove effective and reliable, DoD can help create a market by serving as an early adopter, as it did with aircraft, electronics and the internet. This would allow the military to later leverage both cost savings and technology advances from the private sector.

GOAL 2 Water Resources Management Improved

Goal 2 Sub-Goals

SUB-GOAL 2.1 Potable Water Consumption Intensity by Facilities Reduced by 26% of FY 2007 Levels by FY 2020

Metric

The percent reduction relative to FY 2007 in total water consumed by DoD facilities per gross square foot of total building space. Consumption includes the loss of water after it is delivered (for example through leaking or malfunctioning fixtures such as toilets). A facility is defined as per EISA §432(1)(C).

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 2.1 Targets	8%	10%	12%	14%	16%	18%	20%	22%	24%	26%

SUB-GOAL 2.2 Industrial and Irrigation Water Consumption Reduced by 20% of FY 2010 Levels by FY 2020

Metric

The percent reduction relative to FY 2010 in total water consumed by DoD for irrigation (agricultural and/or landscaping) and industrial purposes.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 2.2 Targets	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%

SUB-GOAL 2.3 All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible

Metric

The percent of covered projects (those development and redevelopment projects of 5,000 square feet or greater) that can demonstrate with documentation that storm water design objectives were met through practices that infiltrate, evapotranspire and/or harvest and use the rainfall to the maximum extent technically feasible. The criterion for maximum extent technically feasible is the full employment of accepted and reasonable storm water infiltration and reuse technologies subject to site and applicable regulatory constraints.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 2.3 Targets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Goal 2 Responsible OSD Office

AT&L/I&E

Goal 2 Status

Water Consumption

Potable water consumption intensity by DoD facilities declined by 1.1 percent from FY 2008 to 2009 (in gallons per gross square foot), for a 4.6 percent decrease in water intensity relative to FY 2007, exceeding the EO 13423 goal of 4.0 percent (Figure II.5). For industrial and irrigation uses of water, FY 2010 is the first year the Military Departments will be asked to collect this data.

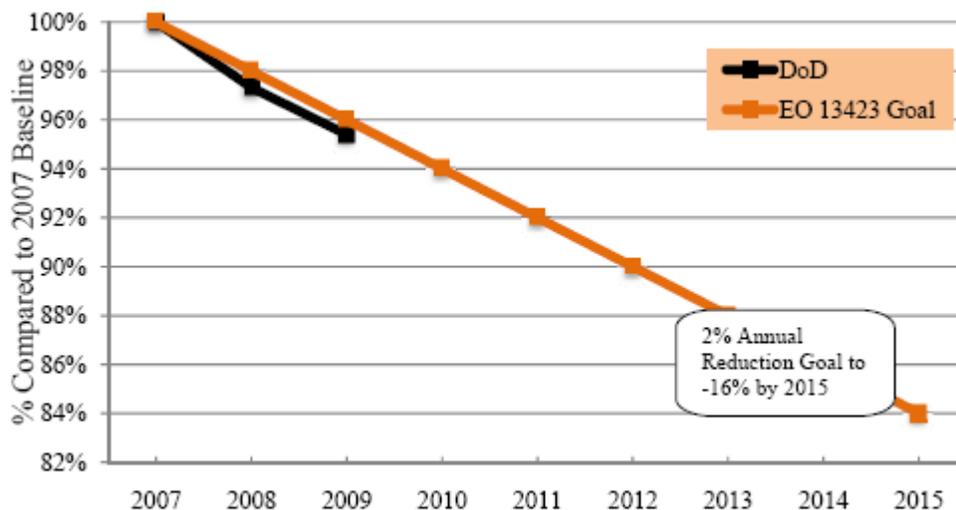


Figure II.5. DoD Water Consumption Intensity Compared to the EO 13423 Goal, Relative to 2007

All of the Military Departments are implementing water efficiency programs on an ongoing basis, installing water efficient toilets and urinals, and low-flow faucets and showerheads. Some installations have instituted aggressive leak detection surveys, and followed up with repair programs of leaky valves and damaged pipelines, significantly reducing water consumption. These water efficiency measures have the added benefit of helping these buildings comply with the “Guiding Principles for Federal

Leadership in High Performance and Sustainable Buildings Memorandum of Understanding” ([Guiding Principles](#)).

Good examples of recent DoD accomplishments in water efficiency can be found in the FEMP Federal Awards for Water Conservation. The results of the 2010 awards are not yet available, but more than half of these awards went to DoD in 2009. One of the awardees was Marine Corps Air Station Miramar, which in FY 2008 reduced water consumption by 18 percent compared to the prior year, greatly exceeding the 2 percent reduction target. The savings of 22 million gallons of water and \$371,000 was achieved by installing a dual piping system to use reclaimed water for toilets, urinals and large landscaped areas, and by installing a central irrigation control system. Another California awardee was Naval Base Ventura County, which repaired leaking pools and water lines and installed evapotranspiration controlled irrigation systems, waterless urinals, and low-flow showerheads. Savings in 2008 totaled \$337,000 and 225 million gallons, a 36 percent reduction in water use compared to 2007. The Tooele Army Depot in Utah located and repaired leaks in 12 water lines, saving 12 million gallons of water in just six months with a payback period of about two and a half years.

The fourth award went to Picatinny Arsenal in New Jersey, which operates its own water supply plant. When the plant reached capacity, rather than building another plant, the facility manager instituted an aggressive leak detection and repair program combined with automation and sub-metering that reduced water use 14 percent below 2007 levels and saved \$127,000. The decline is significant because over the same period the population of the installation increased 30 percent. These water efficiency awards are just some of the projects demonstrating DoD’s leadership in water efficiency. Naval Base Kitsap Bangor, for example, is saving 53 million gallons and more than \$80,000 every year from an investment of only \$12,500. The installation reduced water consumption by installing freeze protection devices, which reduced the water flow rate needed to protect critical equipment. These successes provide case studies to inspire and guide other installations to take advantage of the wealth of untapped opportunities in water efficiency.

Storm Water Runoff

EO 13514 §2(d) calls on federal agencies to implement and achieve the metrics identified in the storm water management guidance issued by EPA, as per EISA §438. Sub-goal 2.3 was written to align with the Department’s new policy memo on storm water management, “[DoD Implementation of Storm Water Requirements under Section 438 of the Energy Independence and Security Act \(EISA\)](#)”, which was issued by DUSD(I&E) in January 2010. The memo incorporates the storm water management requirements under EISA §438 for development and redevelopment construction projects, and is based on the technical guidance issued in December 2009 by EPA.

Military installations have already been incorporating low impact development features, including bioretention swales (or bioswales) to treat parking lot runoff, biofiltration planters for rooftop runoff, vegetated filter strips, infiltration basins, permeable pavers for roads, permeable paver strips and patios underlain with gravel chips, disconnected downspouts to allow roof runoff to infiltrate, and rain gardens (including some that collect runoff from old copper downspouts on historic

DoD Unified Facilities Criteria for Sustainable Development on Managing Storm Water Runoff

“When precipitation rate exceeds infiltration rate or when soil is saturated, water begins to move down slope on ground surface, carrying with it soaps, detergents, oil, antifreeze, fertilizers, pesticides, animal bacteria, and other pollutants. Most of the surface runoff enters streams and rivers and eventually flows back into oceans, contaminating the waterways along the way. Use low impact development (LID) technologies (e.g., bio-retention cells, permeable paving) and natural or man-made site features (e.g., roofs of buildings, parking lots, and other horizontal surfaces) to infiltrate, treat/filter, store, evaporate, and detain runoff close to its source to the maximum extent feasible.”

— UFC 4-030-01, December 2007, excerpt from §C-2.5

buildings).

In December 2007, the Department of the Navy announced a new policy on low impact development (LID) to reduce storm water runoff at all Navy and Marine installations in the U.S. starting in FY 2011. The policy applies to all new construction projects exceeding \$750,000 and renovation projects over \$5 million, and calls for all such projects to retain their pre-development hydrology such that no additional storm water flows from the site. The Naval Facilities Engineering Command Engineering Service Center developed the [Storm Water Best Management Practices Decision Support Tool](#) to evaluate different best management practices for reducing storm water runoff and the resulting pollution from it.

Goal 2 Implementation Methods

Water Consumption

An important part of DoD's approach to reducing potable water use by facilities will be through the high performance building requirements of EO 13514, including:

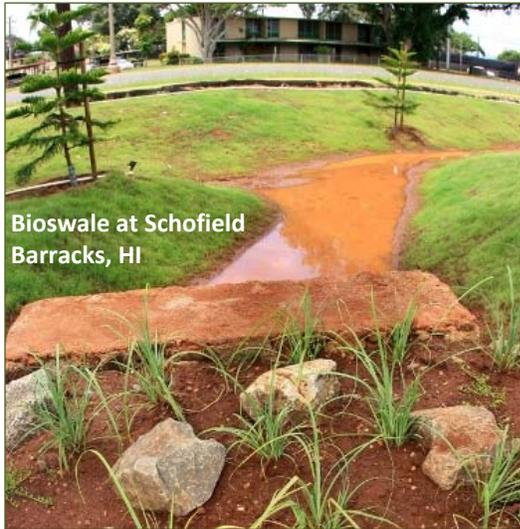
- complying with the Guiding Principles for all new construction and major renovation of DoD buildings;
- ensuring that at least 15 percent of DoD's existing buildings and building leases over 5,000 ft² meet the Guiding Principles by FY 2015;
- demonstrating annual progress toward 100 percent conformance with the Guiding Principles for the entire building inventory; and
- operating, maintaining and managing installations and facilities to reduce water consumption.

One of the main avenues through which the Department envisions meeting Goal 2 is through improved leak management on its military installations. Leak management for DoD facilities involves proactively finding and repairing leaks on an ongoing basis in the water distribution systems, starting at the point(s) where water is received from the community water provider into the installation.

Another path to achieving Goal 2 is to substitute non-potable, reclaimed water for needs currently being met with potable water, especially landscaping and industrial uses. Reclaimed water is defined as previously used water that has been processed with at least a secondary level of wastewater treatment to produce water that has a high quality but is not meant for drinking. The Department will evaluate opportunities for water reuse in wastewater treatment systems it operates during FY 2011, and will participate with community-sponsored water reclamation projects in cases where lifecycle cost-benefit analyses are favorable. For new construction of DoD-owned wastewater treatment plants, the Department will incorporate wastewater reclamation when lifecycle cost-effective.

Storm Water Runoff

The Department plans to develop and distribute storm water general awareness training, and require specialized storm water construction training for inspectors, contract managers, and related personnel. Using this training, Military Departments will develop or update their storm water management policies. DoD will revise the 2004 Unified Facilities Criteria (UFC) 3-210-10 on LID to reflect recent DoD storm water policy and incorporate design requirements for the use of LID to manage storm water. DoD is working with federal agencies to incorporate storm water management requirements on federal lands into the Federal Coordinated Strategy required under EO 13508, "Chesapeake Bay Protection and Restoration" (2009).



Bioswale at Schofield Barracks, HI

Photo: U.S. Army



Bioswale to Capture Parking Lot Runoff, Little Creek Amphibious Base, Norfolk, VA

Photo: U.S. Navy

OBJECTIVE 2

DoD is a U.S. Government Leader in Reducing Greenhouse Gas Emissions

In letters to the White House Council on Environmental Quality (CEQ) and the Office of Management and Budget (OMB) dated January 7, 2010, the Department committed to reducing greenhouse gas (GHG) emissions from Scope 1 and Scope 2 sources by 34 percent by FY 2020, relative to levels in FY 2008. The target of 34 percent applies to each Military Department.

As per Section 19(h) of EO 13514, emissions from any vehicle, vessel, aircraft, or non-road equipment owned or operated by DoD that is used in combat support, combat service support, tactical or relief operations, or training for such operations are excluded from Department reduction targets. However, the Department recognizes that significant reductions can be achieved in these systems and it is committed to taking advantage of these opportunities.

This first Plan does not specifically address reductions associated with gases having very high global warming potentials, such as sulfur hexafluoride, due to the lack of a comprehensive GHG inventory at this time, but emission from these compounds are included in the GHG inventory and the Scopes 1 and 2 reduction target of 34%. The Department will evaluate the best approach to these gases once the inventory provides the information needed for analysis.

The Department's FY 2020 target for Scope 3 GHG emissions was being developed in parallel with this Plan, and submitted at the same time as the Plan but separately. A comprehensive GHG inventory is needed to evaluate the best approach to making reductions to Scope 3 emissions. Since FY 2010 will be the first comprehensive GHG inventory for DoD, and it cannot be completed until after the fiscal year ends, details on how the Department will address Scope 3 emissions will not be available until the FY 2011 Plan. However, the Department's approach to Scope 3 emissions in FY 2011 and 2012 are described below under Goal #4.

Development and Management of the GHG Inventory

The Department is committed to conducting a comprehensive GHG inventory, starting with FY 2010.

The inventory is a valuable planning tool to enable the Department to understand the highest priority areas to be targeted for emissions reductions. It is anticipated that the Department will want to revisit its set of sub-goals next year once it has a more accurate understanding of its GHG profile. Also, once the FY 2010 inventory has been conducted, DoD will have the experience needed to refine its procedures for collecting data and estimating emissions, particularly for the Scope 3 emissions with which the Department has little experience at this stage.

GOAL 3 Greenhouse Gas Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020, Relative to FY 2008

Annual Planning Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Goal 3		10%			19%			28%		34%

Goal 3 Responsible OSD Office

AT&L/I&E

Goal 3 Status

The Department does not yet have the FY 2009 or 2010 data needed to quantify the change in its Scopes 1 and 2 GHG emissions in FY 2009 or 2010 relative to FY 2008.

Goal 3 Implementation Methods

The lion's share of Scope 1 and 2 GHG emission reductions will come from Goal #1, the reduced use of fossil fuels. The three Goal 1 sub-goals reduce fossil fuel consumption by DoD facilities and vehicle fleets, and increase energy consumed from renewable sources:

Sub-Goal 1.1: Energy Intensity of Facilities Reduced by 30% of FY 2003 Levels by FY 2015 and 37.5% by FY 2020

Sub-Goal 1.2: 18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by 2020

Sub-Goal 1.3: Use of Petroleum Products by Vehicle Fleets Reduced 30% by 2020 Relative to 2005

In addition, sub-goal 5.4 aims to increase the amount of landfill gas used by the Department:

Sub-Goal 5.4: Ten Landfills Recovering Landfill Gas for Use by DoD by 2020

Many of the other sub-goals will also reduce GHG emissions, such as: reducing water consumption, the use of printing paper, and the amount of solid waste going to landfills; retrofitting and constructing buildings for sustainability; and the procurement and use of energy-efficient electronic equipment.

GOAL 4 Greenhouse Gas Emissions from Scope 3 Sources Reduced 13.5% by FY 2020, Relative to FY 2008

Annual Planning Targets

Fiscal year	2011	2012
Goal 4	0%	1%

SUB-GOAL 4.1 Greenhouse Gas Emissions from Employee Air Travel Reduced 7% by FY 2020

Relative to FY 2011

Metric

The percent reduction of GHG emissions from air travel by DoD employees on DoD business, relative to FY 2011, as calculated from travel data captured by the Defense Travel Management Office.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 4.1 Targets	0%	0%	1%	2%	2%	3%	4%	5%	6%	7%

SUB-GOAL 4.2 30% of Eligible Employees Teleworking at Least Once a Week, on a Regular, Recurring Basis, by FY 2020

Metric

The percent of DoD employees eligible to telework who are doing so at least once a week on a regular, recurring basis. Telework can be at any approved location: home, a regular General Services Administration telework Center, and/or a secure telework site meeting the additional requirements for facility construction, network security, and access control for employees needing access to classified networks. An employee's day off during a compressed work schedule cycle does not count as a telework day.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 4.2 Targets	10%	15%	17%	19%	21%	23%	25%	27%	29%	30%

SUB-GOAL 4.3 50% of Non-Hazardous Solid Waste Diverted from Disposal in Landfills Not Owned by DoD by FY 2015 and Thereafter Through FY 2020

Metric

The percent of the non-hazardous solid waste stream generated and collected by DoD facilities (by weight), without construction and demolition debris, that by reuse, recycling, and/or composting is directed away from disposal in landfills not owned by DoD.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 4.3 Targets	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%

Goal 4 Responsible OSD Office

Sub-Goals 4.1 and 4.2: AT&L/Personnel and Readiness (P&R)

Sub-Goal 4.3: AT&L/I&E

Goal 4 Status

Employee Air Travel

The Department has not been tracking the miles travelled by employees flying on DoD business, but it does capture the information needed to track this sub-goal in the future. The General Services Administration is developing a tool in order to calculate emissions from airline travel, based upon such factors as length of the flight and eventually type of aircraft and load factors. The Defense Travel System already includes a rail travel option for booking travel between cities on major rail corridors. Rental car

miles driven could be calculated based upon already captured information on gasoline purchased, with a price per gallon assumed.

Teleworking

Of those eligible, 4.8 percent of DoD employees teleworked in FY 2009, up from 3.0 percent in FY 2008. In FY 2009, 19 percent of employees who were teleworking were doing so three or more days per week, 35 percent were teleworking one or two days per week, 20 percent were teleworking at least once a month, and the remainder (26 percent) were doing so on an ad hoc or situational basis. The Department is committed to increasing participation, and as of June 2009 it assigned a staff member dedicated to teleworking. DoD is also in the process of reissuing Department of Defense Instruction (DoDI) 1035.01 on Telework Policy to update the version issued in April 2007. The aim of the draft DoDI is to ensure that teleworking is actively promoted and implemented throughout DoD, in recognition that teleworking benefits workforce efficiency, emergency preparedness, and quality of life. DoD also recognizes that teleworking is an effective means of continuing operations in the event of a crisis or national emergency, such as a pandemic influenza. The Department plans to include in the new DoDI enhanced guidance on implementation and a standardized telework agreement form that includes checklists for safety and technology/equipment.

Contracted Solid Waste Disposal

The current status of the Department's reduction in solid waste disposal is covered under Goal 5.

Goal 4 Implementation Methods

Employee Air Travel

The Department will reduce GHG emissions from employee air travel through a variety of approaches. One is to include evaluation criteria in the City Pair contracts negotiated by the General Services Administration to provide vendors with a higher evaluation result when they provide more efficient routes and equipment. DoD will also alter its automated travel tools, such as the Defense Travel System, to flag the most "green" travel options. The Department will issue a policy memo that highlights the importance of being as efficient as possible with travel and avoiding it where possible, and that calls on employees to incorporate the goal of reduced GHG emissions from travel into their everyday course of business. The memo will cite specific changes employees can embrace toward this end, such as considering the minimization of participant miles travelled in the decision on where to site a conference, using rail for travel between cities on major rail corridors, and the increased use of virtual telecommunications tools. The Department will implement an education and communication campaign to help DoD employees understand how they can help reduce emissions. To reduce the need for travel, DoD will conduct a cost-benefit analysis to inform a program to increase the availability of high quality virtual tools and facilities in DoD, such as videoconferencing, teleconferencing, web conferencing, webinars, and internet broadcasting (webcasting). The Department also plans to post on-line training for employees on the effective use of these tools and facilities.

Teleworking

The Department's goal is to increase the visibility and usage of the telework program and to integrate and embed its use in our mainstream operations where appropriate. The current DoD teleworking rate is not commensurate with the U.S. Government average and Administration priorities, and sub-goal 4.2 is an important step to overcoming the barriers that have limited participation. The latest Strategic Plan of P&R – the OSD office responsible for telework – set targets to increase the percentage of employees who are teleworking by 5 percent per year from FY 2010 through FY 2012, relative to the FY 2009 baseline, for a rate of 15 percent by the end of FY 2012. This goal does not restrict telework frequency to at least once a week on a regular and recurring basis, so the Plan sub-goal represents a stretch beyond the P&R goal.

The Department has identified the main barriers to teleworking and is in the process of remedying them. It has a plan in place to develop a long-term solution of a web-based electronic telework tracking system to facilitate accurate and consistent reporting of telework data and a coding system that will clearly define the positions eligible for teleworking. The Department is also developing a targeted marketing campaign and revised telework policy that requires telework training to educate leaders, managers and employees on telework benefits, performance in a telework environment, and the value of integrating telework into continuity of operations activities. Finally, the inclusion of sub-goal 4.2 in the Plan will contribute significantly to addressing one of the main barriers to teleworking: cultural resistance.

Contracted Solid Waste Disposal

The Department’s planned methods for reducing solid waste disposal into landfills (not including construction and demolition debris) are covered under the solid waste diversion sub-goal 5.2. There are no plans at this time to emphasize reductions in waste streams based on whether they are sent to DoD landfills or off-site landfills not owned by DoD. The purpose of sub-goal 4.3 is to document that waste going to off-site landfills not owned by DoD, for purposes of tracking Scope 3 GHG emissions, and the Department will modify its record keeping methods to track solid waste sent to off-site landfills not owned by DoD.

OBJECTIVE 3 The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution

GOAL 5 Solid Waste Minimized and Optimally Managed

Goal 5 Sub-Goals

SUB-GOAL 5.1 All DoD Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper

Metric

The number of DoD organizations that: 1) have issued a policy that establishes a program for reducing the use of printing paper, where the program consists of two or more initiatives that drive the transition to a culture of reduced paper; and 2) are actively implementing that program. Organizations counted are the Departments of the Army, Navy and Air Force, the 17 National Agencies, and the 11 DoD Field Activities.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 5.1 Targets	1	6	24	31	31	31	31	31	31	31

SUB-GOAL 5.2 50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by 2015 and Thereafter Through 2020

Metric

The percent of the total non-hazardous solid waste stream generated and collected by DoD facilities (by weight), without construction and demolition debris, that is directed away from the waste stream, for example by reuse, recycling, and/or composting.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 5.2 Targets	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%

SUB-GOAL 5.3 60% of Construction and Demolition Debris Diverted from the Waste Stream by FY 2015, and Thereafter Through FY 2020

Metric

The percent of construction and demolition materials and debris generated and collected by DoD facilities (by weight) that is directed away from the waste stream, for example by reuse, recycling, and/or mulching.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 5.3 Targets	52%	54%	56%	58%	60%	60%	60%	60%	60%	60%

SUB-GOAL 5.4 Ten Landfills Recovering Landfill Gas for Use by DoD by FY 2020

Metric

Cumulative number of qualifying landfills (starting in FY 2011):

- a) landfills owned by DoD that became operational for the production, capture and use of methane from landfill gas; and
- b) landfills owned by other parties, with which DoD has entered agreements to buy landfill gas (or energy from it), that became operational for the production and capture of methane from landfill gas for use by DoD.

Landfill projects will only be counted towards the sub-goal when it results in the collection of at least 50,000 standard cubic feet per day of landfill gas, on average.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 5.4 Targets	0	2	3	4	5	6	7	8	9	10

Goal 5 Responsible OSD Office

Sub-Goal 5.1: OSD Director of Administration

Sub-Goal 5.2 to 5.4: AT&L/I&E

Goal 5 Status

Increasing Solid Waste Diversion

In FY 2008, DoD released the "[DoD Integrated \(Non-Hazardous\) Solid Waste Management](#)" (ISWM) Policy Memorandum and established corresponding DoD ISWM Guidelines. The ISWM policy set a diversion goal for non-hazardous solid waste of 40 percent by 2010, excluding construction and demolition (C&D) waste. DoD achieved a diversion rate of 39 percent for non hazardous solid waste (excluding C&D) in FY 2009 (Figure II.6). Development of a DoD Instruction (DoDI) on ISWM is underway. DoD has developed a Qualified Recycling Program Managers training course approved by the Interservice Environmental Education Review Board that includes guidance for C&D diversion. All Military Departments and DLA have recently updated their ISWM program policy, including for C&D diversion.

The current goal for C&D diversion is 50 percent by FY 2010 and DoD achieved a 65 percent diversion rate in FY 2009. However, it should be noted that C&D diversion can be highly variable from year to year since it depends on construction schedules. Individual Military Department diversion rates ranged from 42 to 73 percent in FY 2009.

Recovery of Landfill Gas

DoD currently has three landfill methane-to-energy projects. One of these landfills, the West Miramar Sanitary Landfill, is owned by DoD and operated by the City of San Diego. The Miramar landfill gas (LFG) collection system is in place and operational, collecting 6.4 million standard cubic feet per day (mmscfd) of LFG that generates 9 MW of electricity.

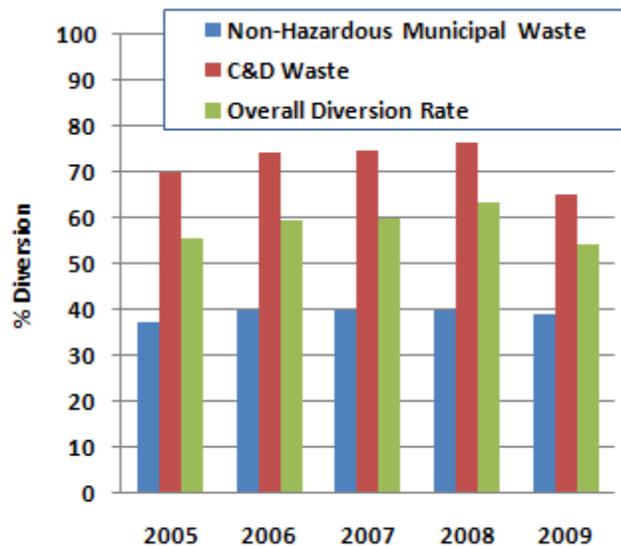


Figure II.6. DoD Solid Waste Diversion Rates, 2005 - 2009

The other two LFG-to-energy projects are contractual arrangements where DoD buys the gas, or energy made from it, from nearby landfills. One of these is with the Hill Air Force Base (Utah), which buys LFG from the Davis County Landfill adjacent to the base. The landfill is owned and operated by the Wasatch Waste Management District, but the LFG-to-energy project was developed and is operated by Ameresco. The other is with the Marine Corps Logistics Base Albany (Georgia), which will buy a minimum of 153,640 million Btu per year from a facility that will be online by 2011, under a 20-year contract between the Navy and the Dougherty County Commission. The gas is expected to provide 22 percent of the base's energy needs. Camp Lejeune has an LFG collection in place but not yet operational. Other DoD landfills already identified as candidates for LFG recovery are Fort Lewis landfill #5 and the landfills at Vandenberg Air Force Base and Fort Bragg.

Goal 5 Implementation Methods

Reducing the Use of Paper

No solid waste reduction effort can be successful without addressing paper, which on average accounts for more than 60 percent of office waste. By the end of FY 2011, the Department will issue a policy stating that reducing the use of printing paper is a priority for DoD, and directing the DoD organizations specified in the sub-goal 5.1 performance metric to issue and implement a policy for minimizing the use of paper. Also by this time, the Department will develop and issue DoD-wide guidance on effective strategies for reducing the use of paper, for example by encouraging the use of digital documents in lieu of paper, requiring printers with automatic duplexing capability to default to this setting, and modifying routine office tasks to reduce paper use. The Military Departments and DLA are expected to meet the requirements of sub-goal 5.1 by no later than the end of FY 2012.

Increasing Solid Waste Diversion

The Department will evaluate the effectiveness of procuring waste disposal contracts that use a weight ticket-based payment system rather than one based on volume. Weight is a much more accurate representation of actual waste totals than volume, thus a weight-based system is critical to accomplishing solid waste reduction goals. The Department will also investigate the development of technologies or strategies that support more composting options, such as facilitating community and/or installation composting infrastructure or increasing the purchase of biodegradable products and packaging materials. The guidance would draw attention to the fact that many natural and manufactured materials do degrade, and to the connection between purchasing decisions and disposal options such as

composting. In support of sub-goal 5.2, DoD will begin tracking landscape and food waste composting operations.

The Department will evaluate the feasibility of requiring solid waste recycling and diversion contracts to conduct programs that support DoD's solid waste diversion goals, and to routinely report to DoD installations. This would align solid waste management contracts with DoD's solid waste goals, and should resolve the problem at some installations where solid waste data is not reported for privatized housing even though the waste is disposed in installation landfills. The Department will also evaluate the need for environmental assessment protocols to be revised to ensure that EO 13514 requirements and DoD goals for non-hazardous solid waste diversion are reflected.

To improve the rate at which C&D debris is recycled, the Department will incorporate language into C&D contracts that requires diversion of materials and debris in line with the Department's C&D debris diversion goals. The Department will also develop and implement a DoDI to strengthen C&D diversion requirements. Environmental assessment protocols will be evaluated and revised, as appropriate, to incorporate EO 13514 requirements and DoD goals for C&D diversion. The Department will provide resources and training to all installation solid waste managers and unit-level staff to raise awareness of DoD solid waste diversion goals and related requirements.



Photo: U.S. Army

The Department will review the myriad practices that can be implemented to reduce waste generation and promote source reduction. General practices such as reusing materials, procuring products with less packaging (through contract language), using closed loop systems for the return of products or packaging, and procedural changes that result in less waste all achieve a reduction in waste generation. The Department will identify techniques that affect behavioral changes, such as establishing role models (leadership support), prompts, promotion, incentives, and training. Existing training programs specific to various types of activities – such as health care and food service – will be evaluated for opportunities to incorporate source and waste reduction training.

Recovery of Landfill Gas

The Department will conduct analyses to determine the best options for landfill gas projects. First DoD will survey the landfills it owns to develop a short list of landfills that present the most promise for LFG projects, in terms of return on investment. A more rigorous financial analysis will be conducted on this short list to identify the two best options for moving forward. Using the EPA Landfill Methane Outreach Program database, the Department will also identify the set of military installations located adjacent to communities with large landfills, and then discuss with these installations the potential suitability of buying LFG from their community landfill. This analysis will allow the Department to determine where the greatest potential lies for producing and/or procuring energy from LFG.

GOAL 6 The Use and Release of Chemicals of Environmental Concern Minimized

Goal 6 Sub-Goals

SUB-GOAL 6.1 On-Site Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% by FY 2020, Relative to FY 2007

Metric

The total release of toxic chemicals to the environment and off-site transfers of such chemicals, in terms of the Toxics Release Inventory (TRI) Reportable Quantity (in pounds released or transferred), relative to the calendar year 2007 baseline for EPCRA Section 313 toxic chemicals reported between January 1 - December 31, 2006. DoD reports this information to EPA annually. The sub-goal does not include releases from ammunition production, military munitions, operational range activities, mission critical weapon system support activities, and conventional and chemical military munitions demilitarization.

Annual Targets

Calendar year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 6.1 Targets					5%			10%		15%

SUB-GOAL 6.2 100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner

Metric

The percent of excess or surplus DoD electronic products disposed of in an environmentally sound manner, where environmentally sound is defined as either:

- donating to a charitable cause;
- using a manufacturer's take-back or trade-in service; or
- trading-in, recycling (including refurbishment and resale) or disposal through a facility that is fully licensed for treatment and disposal, and in a manner consistent with the EPA guide titled "Plug-In to eCycling: Guidelines for Materials Management" (<http://www.epa.gov/osw/partnerships/plugin/pdf/guide.pdf>).

Electronic products are defined as per the [DoD Electronics Stewardship Plan](#): devices that are dependent on electric currents or electromagnetic fields in order to work properly.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 6.2 Targets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

SUB-GOAL 6.3 100% of DoD Personnel and Contractors Who Apply Pesticides Are Properly Certified

Metric

Percent of personnel who applied pesticides on DoD installations during the fiscal year who were properly certified. Direct hire employees, certified in accordance with DoD [4150.7-P](#) and DoDI [4150.7-M](#), have a maximum of two years to become certified after initial employment. Contracted employees shall have appropriate State or host-nation certification in the appropriate categories at the time the contract is effective. These certifications are in accordance with Environmental Protection Agency rules and regulations and are accepted as valid certifications.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 6.3 Targets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Goal 6 Responsible OSD Offices

Sub-Goal 6.1: AT&L/I&E

Sub-Goal 6.2: DLA

Sub-Goal 6.3: Armed Forces Pest Management Board (AFPMB)

Goal 6 Status

Chemical Use, Releases and Transfers

Objective 2.2 of the 2007 [Defense Installations Strategic Plan](#) required the development of goals and an action plan for pollution prevention and toxic or hazardous materials management to meet the sustainability requirements in EO 13423. As a result, DoD submitted to the Office of the Federal Environmental Executive in February 2008 its *Toxic and Hazardous Chemicals Reduction Plan*, centered on lifecycle chemical management. Each Military Department subsequently committed to reduce three chemicals.

The Department has been working on reducing the use of hazardous and toxic chemicals, as well as proactively addressing risks from emerging contaminants, for several years. The text box on the next page illustrates the breadth of DoD policies that address pollution prevention and the minimization of waste from toxic and hazardous materials. The Department's Joint Group on Pollution Prevention and Joint Service Solvent Substitution, Environmental Security Technology Certification Program, and Technology Transfer Program all address different aspects of hazardous and toxic material reduction. The work of these groups covers a wide range of topics, spanning the development of new materials and processes, testing and validation of substitute processes and materials, demonstrations at DoD facilities, development of specifications, and ultimately, the transfer of new solutions to the commercial sector.

The Department's Emerging Contaminants Program, launched in 2006, identifies chemicals with evolving science and regulatory standards, assesses the likelihood and severity of risks to the environment, health and safety, and assesses the mission considerations associated with their continued use. For certain contaminants of interest, the program identifies proactive risk management measures which may include research, development, and testing of substitute materials; means to minimize release and exposure; and means to minimize use. To date, the program has scanned over 300 chemicals and conducted detailed risk analyses on 21 of them, and DoD's Emerging Contaminants Governance Council has endorsed risk management measures for seven of the chemicals. As a result, and perhaps most noteworthy, in 2009 the Department issued a policy memo titled [Minimizing the Use of Hexavalent Chromium](#). Hexavalent chromium, a known carcinogen, is found in a number of products used to perform a range of DoD functions, in particular corrosion protection. Feasible substitutes have been found for some uses of hexavalent chromium. This policy directs the DoD Components to seek safer, more environmentally responsible alternatives wherever feasible and in keeping with the DoD mission. Harvard University's Kennedy School of Government recognized the Emerging Contaminants Program as a finalist in its 2009 Innovation in American Government Award. The Department has codified program responsibilities related to Emerging Contaminants in [DoDI 4715.18](#).

The Department supported the establishment of the Water and Environmental Technology Center in partnership with Temple University, the University of Arizona, Arizona State University, pharmaceutical and aerospace industries, equipment manufactures, and analytical laboratories. This National Science Foundation University-Industrial Cooperative Research Center is addressing emerging contaminants issues, including among other topics the development and evaluation of substitute materials.

DoD Policies, Procedures, and Instructions for Preventing Pollution and Minimizing Waste from Toxic and Hazardous Chemicals and Other Materials

Policy Memos

[Minimizing the Use of Hexavalent Chromium \(2009\)](#)

[Consolidated Emergency Planning and Community Right-to-Know Act \(EPCRA\) Policy for DoD Installations, Munitions Activities, and Operational Ranges \(2006\)](#)

Defense Federal Acquisition Regulation Supplements:

223.3 [Hazardous Material Identification and Material Safety Data \(2005\)](#)

223.71 [Storage and Disposal of Toxic and Hazardous Materials \(2005\)](#)

223.72 [Safeguarding Sensitive Conventional Arms, Ammunition and Explosives \(2005\)](#)

252.223-7001 [Hazard Warning Labels \(2005\)](#)

252.223-7006 [Prohibition on Storage and Disposal of Toxic and Hazardous Materials \(2005\)](#)

Department of Defense Directives:

4715.1E [Environment, Safety, and Occupational Health \(2005\)](#)

4715.11 [Environmental and Explosives Safety Management on Operational Ranges Within the United States \(2007\)](#)

4715.12 [Environmental and Explosives Safety Management on Operational Ranges Outside the United States \(2007\)](#)

5000.01 [The Defense Acquisition System \(2007\)](#)

Department of Defense Instructions:

4150.07 [DoD Pest Management Program \(2008\)](#)

4715.02 [DoD Regional Environmental Coordination \(2009\)](#)

4715.3 [Environmental Conservation Program \(1996\)](#)

4715.4 [Pollution Prevention \(1998\)](#)

4715.5 [Management of Environmental Compliance at Overseas Installations \(1996\)](#)

4715.6 [Environmental Compliance \(1996\)](#)

4715.7 [Environmental Restoration Program \(1996\)](#)

4715.8 [Environmental Remediation for DoD Activities Overseas \(1998\)](#)

4715.9 [Environmental Planning and Analysis \(1996\)](#)

4715.10 [Environmental Education, Training and Career Development \(1996\)](#)

4715.14 [Operational Range Assessments \(2005\)](#)

4715.15 [Environmental Quality Systems \(2006\)](#)

4715.18 [Emerging Contaminants \(2009\)](#)

5000.02 [Operation of the Defense Acquisition System \(2008\)](#)

Military Standard

882D [DoD Standard Practice for System Safety \(2000\)](#)

The Department's efforts to manage the potential impacts from the European Union REACH regulation will also benefit DoD's hazardous and toxic chemical reduction goals. DoD is drafting a strategic plan to promote military readiness by addressing global defense supply chain concerns expected to result from REACH implementations. Included in the plan are measures to prevent disruptions to the supply chain



Practice Fighting Fire Simulated with Propane Rather Than Open Burning of Diesel

Photo: U.S. Navy

by ensuring the performance and reliability of substitutes for DoD mission purposes. DoD's efforts in association with REACH will exert a positive influence on DoD's efforts to adopt materials that are inherently more environmentally responsible.

The DoD Business Enterprise Integration Office is leading the DOD Hazardous Material (hazmat) Business Transformation, a process re-engineering effort for the purpose of providing accurate and reliable information for our warfighters, installations, and the ESOH

community to support better decision making in evaluating the use and reduction of hazardous chemicals. Integrated into the DoD Business Enterprise Architecture in 2006, it establishes requirements for reliable hazmat information and a common business process for hazmat management within a rigorous environmental management system framework. The effort is establishing common hazmat management architectures, processes, terminologies, data standards and attributes for the Military Departments, and upgrading existing infrastructure such as Material Safety Data Sheets for defense ESOH professionals. It will also establish standardized and authoritative Product Hazard Data sources for all of DoD and a centralized Hazmat Data Steward to ensure accurate and up-to-date linkages between data on hazardous materials and the exact hazardous product being used on an installation.

Electronics Disposal

The Department already has a rigorous system in place to dispose of excess or surplus electronic products in an environmentally sound manner, either donating to a charitable cause; using a manufacturer's take-back or trade-in service; or trading-in, recycling or disposal through a facility that is fully licensed for treatment and disposal. DoD uses the DLA Defense Reutilization and Marketing Services (www.drms.dla.mil) to turn over its surplus or excess electronics, ensuring that environmentally sound and best practices are applied to the handling of electronics equipments at the end of their life in the Department. The Defense Reutilization and Marketing Services has a web-based Electronic Turn-in Document system for submitting electronics for proper disposal, facilitating the disposal of electronics by making the process less labor-intensive. The system replaces the hard copy submissions of the disposal turn-in document, DD Form 1348-1A, making the submission of information easier by providing drop down menus and pre-populating many of the fields, such as DoD National Stock Number items, nomenclature, the demilitarization code (which specifies how the item is to be destroyed and/or disposed), and unit price. DoD facilities are also active participants in the Federal Electronics Challenge and the Electronics Recycle and Reuse Challenge run by EPA.

Pesticide Use

Pesticides encompass a variety of substances used to control pests, including insects, weeds and fungus. DoD has reported pesticide use since 1993. That rate has declined from using approximately 892,000 pounds of active ingredient in 1993 to the point where DoD now uses less than one-half the amount of active ingredient (approximately 400,000 pounds). However, the issue of overall pesticide use is a sensitive one. While the goal for the Military Departments and their respective installations is to use the

absolute minimum amount of pesticides, there are often cases where pesticides are the only choice. Examples include the need to conduct control operations where pests such as aggressive weeds encroach upon mission sensitive areas such as runways, or where Zebra Mussels invade water bodies. It is likely that the need for invasive species management and control in the United States will continue to increase. These situations require quick, effective, and safe management and control. The Armed Forces Pest Management Board (AFPMB) and senior pest management professionals are evaluating approaches to address future reductions while continuing to support the current mission.

The overall rate for certification of pesticide applicators has remained consistently above 95 percent since 1994. However, due to normal personnel turnover across the DoD and due to the amount of time it takes to achieve the required certifications, the 100 percent goal proves an elusive target. By working with the EPA to address the issue, DoD ensured that new personnel now have up to two years to achieve the requisite certifications. During that time period, these personnel are allowed to apply pesticides as long as they are under the direct onsite supervision of someone who is appropriately certified. The numbers and percentages of applicators certified by the Military Departments and the Defense Logistics Agency are forwarded to the AFPMB annually where they are collated and provided to the EPA and other DoD offices as necessary.

Goal 6 Implementation Methods

Chemical Use, Releases, and Transfers

The Department will develop training on chemical management systems that will be offered through the Defense Acquisition University (DAU). This training will provide information on existing systems used by the Army and Navy to make informed choices based on the environmental, health, and safety risks of chemicals and materials during the design of weapons system platforms.

The Department will issue a DoDI for Sustainable Chemical and Material Management to create an overarching, integrated chemicals policy. This policy will assist the Department with regulatory compliance and acquisition requirements, as well as Agency obligations under EO 13514 and EO 13423. With regard to toxic chemicals, DoD recognizes that developing alternatives will likely involve major changes in projects and/or processes with an extended transition period. This transition could result in temporary annual increases in toxic chemical releases prior to reaching the 2020 goal.

The Department will evaluate lessons learned from successful accomplishments by the Joint Group on Acquisition Pollution Prevention to address the need to rapidly develop and deploy alternatives to ozone depleting substances. Building on these lessons, the Department will explore the development of a new group to develop joint technology requirements, joint proposals for funding from the DoD Environmental Security Technology Certification Program, and pursue improvements to facilitate more rapid adoption and commercialization of substitute materials and processes. The Department will coordinate these efforts and where appropriate involve federal agencies with mission responsibilities that align with this effort, such as EPA, the National Aeronautics and Space Administration, and the Department of Commerce.

The Department will monitor the progress of DoD Components on toxic and hazardous chemical reduction plans, and will continue to evaluate risks from emerging contaminants. It will develop proactive risk management measures where they are determined to be necessary based on risks and lifecycle cost advantages.

Electronics Disposal

The Department will maintain its strict compliance system on environmentally sound electronic disposal.

Pesticide Management

It is critical that the personnel who apply pesticides on DoD installations are certified, and the current DoD processes for certification and reporting are efficient and effective. However, the AFPMB and the Military Departments will continue to interact with EPA to ensure that DoD remains in compliance with future EPA requirements, and that EPA remains aware of the unique needs of DoD and its installations. See sub-goal 8.3 for more information on the Department's plans for the use of pesticides.

OBJECTIVE 4

Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community

GOAL 7 Sustainability Practices Become the Norm

Goal 7 Sub-Goals

SUB-GOAL 7.1 95% of Procurement Conducted Sustainably

Metric

The percent of contract actions (new contracts and modifications) that adhere to the principles of sustainability by containing requirements for (as relevant and where such products and services meet DoD performance requirements): energy-efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water-efficient, bio-based, environmentally preferable (e.g., certified by the Electronic Product Environmental Assessment Tool), non-ozone depleting, containing recycled content, and/or are non-toxic or less-toxic alternatives. The sub-goal applies to products and services, including task and delivery orders, but excluding the acquisition of weapon systems and their components and spare parts. The Federal Procurement Data System will be used as the source of data on contracts meeting these requirements.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 7.1 Targets	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

SUB-GOAL 7.2 15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings By FY 2015, Holding Through FY 2020

Metric

The percent of existing buildings over 5,000 ft² (combined owned and leased) that meet the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles), as per the December 2008 implementation guidance developed by the Interagency Sustainability Work Group.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 7.2 Targets	7%	9%	11%	13%	15%	15%	15%	15%	15%	15%

Goal 7 Responsible OSD Offices

Sub-Goal 7.1: AT&L/DP&AP

Sub-Goal 7.2: AT&L/I&E

Goal 7 Status

Procuring Goods and Services That Are Sustainable

DoD has been a leader in sustainable procurement, becoming the first agency to establish a Green Procurement Program (GPP), in 2004. The objective of the DoD GPP is to achieve 100% compliance with mandatory federal green procurement programs in all procurement transactions. Under the program DoD:

- has developed a Green Procurement Strategy, designed as a living document in order to accommodate emerging federal requirements on sustainable procurement and acquisition, with the most recent update being November 2008;
- has developed a set of green procurement metrics;
- offers training for employees;
- established an online Green Procurement tracking system on the Defense Logistics Agency's web-based Green Procurement Report (<http://www.dlis.dla.mil/erlsgpr/>); and
- set up a site on the Defense Environmental Network & Information eXchange ([DENIX](#)) to share green procurement and bio-based best practices.

In addition, DoD facilities actively participate in the [Federal Electronics Challenge](#) to help ensure that DoD purchases electronics that are registered with EPEAT.

DoD makes available the online Green Procurement training, Continuous Learning Module for Contracts, CLC 046, at the DAU website. The module is being updated to provide information for all types of users and actions required to be in compliance with sustainable procurement requirements. For example:

- requirements staff will understand the steps needed when building a requirement;
- buyers will know which questions to ask of vendors and which suggestions to make to customers;
- contract administrators will know what to look for when checking performance; and
- managers will understand how their performance and that of DoD is being monitored.



DoD is in the process of incorporating sustainability into DoD acquisition processes by developing sustainability criteria to guide researchers, developers, contracting officials and program managers to make more environmentally sustainable decisions from an array of alternatives that meet performance

requirements. The products being developed are: a set of sustainability factors to be considered at key milestones in the acquisition process; guidance on the types of lifecycle costs that need to be considered when analyzing alternatives, making tradeoffs, and developing designs; and guidance on how to weigh or score various non-cost factors. The first phase of the project, which began in FY 2010, is benchmarking the best practices in industry and other government agencies. OSD's Chemical and Material Risk Management office plans to develop the criteria and perform some pilot testing.

High Performance and Sustainable Buildings

The FY 2008 [Federal Real Property Report](#) shows that 75,740 buildings – approximately one-fourth of the total DoD building inventory – have areas exceeding the EO 13514 Section 2(g)(iii) threshold of 5,000 ft². In order to comply with the EO 13514 mandate for sustainable buildings by FY 2015, the Department must renovate 11,361 (15 percent) of these buildings to meet the Guiding Principles. An assessment of the Department's current compliance with the Guiding Principles is underway, slated for completion later this calendar year.

Goal 7 Implementation Methods

Procuring Goods and Services That Are Sustainable

Procuring goods and services that are sustainable presents an enormous opportunity for the Department to make better decisions on matters that often have long lasting environmental impacts. For this reason,

DoD has identified a wide range of improvements to its procurement system and the training of DoD personnel in charge of procurement. The OSD Defense Procurement and Acquisition Policy office will develop an annual reporting requirement of specific green procurement policy implementation to ensure compliance with 95 percent procurement conducted sustainably. One of the first steps the Department will take will be to update the Federal Procurement Data System to adequately track green procurement data and progress and capture specific information on products. The Department will develop a DoDI by the end of FY 2011 that designates lead offices for oversight over the Green Procurement Program, and defines responsibilities, requirements, and procedures for establishing and implementing sustainable procurement programs across DoD functional areas and organizations. The Department will also explore the option of establishing a multi-discipline working group to develop a value engineering approach (see Federal Acquisition Regulation (FAR) Part 48) in the procurement conducted for sustainability products and services on the part of contractors.

By the third quarter of FY 2011, the Department will develop standard contract language to reflect the need for products and services (apart from the acquisition of weapon systems and their components and spare parts) to be energy-efficient, water-efficient, bio-based, environmentally preferable, non-ozone depleting, and containing recycled content or non-toxic or less toxic alternatives, where such products and services meet agency performance requirements. Contract language will include a requirement to acquire uncoated printing and writing paper containing at least 50 percent postconsumer fiber for use at DoD installations, as per U.S.C. 10 §2378. The Department intends to incorporate standard contract language into all new contract actions by FY 2012.

The Department will modify contract planning and development tools and forms to alert users – especially specification writers and requirements developers – to comply with green purchasing requirements. The modifications will also give consideration to further greening products and services associated with the contract beyond what is mandated. In addition, DoD will modify tools, forms, and checklists used by contracting officers and contract specialists to ensure that contract documents such as requests for proposals and solicitations comply with green procurement requirements.

DoD will request revisions to the relevant FAR clauses to mandate specific sustainable procurement requirements. In FY 2011, DoD will initiate Defense Federal Acquisition Regulation Supplement

(DFARS) Cases and appropriate guidance to the Procedures, Guidance and Information in DFARS Parts 212, 214, 215 and Part 237, to add the following language:

1. FAR Part 12 – add evaluation factor language for the procurement of commercial items that address the acquisition of green procurement products and services.
2. FAR Part 14.201-8 – add price related evaluation factor language for sealed bids that address the acquisition of green procurement products and services.
3. FAR Part 15.304 – add evaluation factor language for contracting by negotiation that addresses the acquisition of green procurement products and services.
4. FAR Part 37.601 – add language that encourages the development of performance incentives for contractors that encourages them to acquire green procurement products and services.

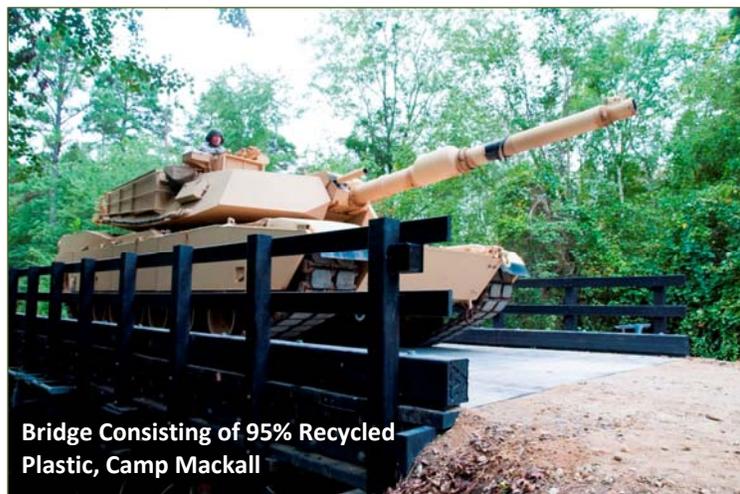
In addition, the Department will improve the guidance it provides on procurement. By the first quarter of FY 2011, the Department will develop and disseminate guidance on how to address green product mandates and other sustainability requirements in procurement and contract audits, and considerations of green procurement mandates with Small Business Set-Asides. Also by this time the Department will add guidance to the Procedures, Guidance and Information on approaches to green service and supply contracts (aside from those for facilities), and it will provide guidance specific to the purchase card program for integrating green procurement or sustainability requirements. DoD will examine existing procurement systems, such as the DoD Standard Procurement System and Army Acquiline PRWeb system, to ensure that sustainability considerations are incorporated into decision criteria.

An underlying issue that the Department will address is that many purchasing actions are conducted according to specifications prepared by others. To solve this problem the Department will ensure that the Specification Preparing Activities (SPAs) have updated specifications that are in line with the requirements of sub-goal 7.1 and its underlying federal requirements. The Department will require the Military Departments to identify the specifications needing to be reviewed or updated, and it will develop a schedule by which the changes will be completed. As a start, the Department will direct the SPAs to complete the work to incorporate the energy efficiency requirements of EAct by the end of first quarter of FY 2012. DoD will develop internal metrics to track the review of specifications for application of green procurement requirements or sustainability provisions.

Another key area for promoting sustainable procurement is how exceptions are handled. The

Department will provide DoD-wide guidance on how to treat exceptions to green product mandates, including specific directions on signature authority for exceptions to the EAct requirements on energy efficient products. The Department will also develop a standard form for use DoD-wide to document how and why an exception applies. The exact format of the form is yet to be determined, but it will be modeled after one already in use by DLA and the Navy.

Revisions are also needed to the National Stock Number (NSN) system. The Department will direct that NSN items not conforming to EAct will be eliminated from the inventory by a set time (the end of FY 2012 is being considered). As a result, any user wanting a non-conforming NSN to remain available will



Bridge Consisting of 95% Recycled Plastic, Camp Mackall

Photo: U.S. Army

have to perform the analysis and documentation for exceptions described in the preceding paragraph.

A critical path to sustainable procurement is a rigorous review of progress and compliance. By FY 2012, the Department will incorporate the requirements of its GPP into protocols for compliance inspection, management system audits, contract audits, and Government Commercial Purchase Card audits. It will perform GPP reviews at 5 percent of installations and facilities, and for 33 percent of new contract actions, by FY 2013, using FY 2012 as the baseline. The Department will also incorporate sustainable procurement into the periodic reviews that each DoD Component conducts on their respective contracting organizations, with the goal of ensuring that 100 percent of reviews have incorporated sustainability over the course of a three year period.

To meet the goal of 95 percent sustainable procurement, it will be necessary for the Department to integrate green procurement into all appropriate audit and training programs, and to ensure that training reaches the lowest level of implementation. The Department will update existing procurement training courses and provide them annually to all relevant DoD personnel:

- technical and requirements planners;
- contracting specialists;
- contracting and procurement officers;
- personnel requisitioning products or services through any source of supply (e.g., facilities managers, construction managers, fleet managers, and information technology managers);
- government-wide commercial purchase card holders; and
- environmental managers.

The Department will also provide targeted training for the following audiences:

- Contracting Officer's Representatives – their training will be augmented with modules on procurement conducted sustainability and the Military Departments automated requisition (such as the Army PRWeb program).
- Personnel preparing specifications – training will be provided on green procurement requirements and how to properly use contracting mechanisms with respect to green specifications.
- Purchase card holders – training will be updated to ensure that the green procurement provisions are adequately addressed.
- Purchase Card managers at the DoD and DoD Component level – the Department is considering requiring expanded training, beyond the two hours DAU training, to provide a more comprehensive understanding of green mandates and the implementation of a conforming program for the unique purchase card business area, including audit provisions tailored for sustainability.

An essential component to sustainable acquisition and procurement is sustainable manufacturing. The Department will seek to incorporate sustainable manufacturing into the acquisition practices used at its organic manufacturing facilities (arsenals, depots, and shipyards) and its procurement of components and systems. It will do so by incorporating sustainable manufacturing into three guidance and directive documents pertaining to acquisition: the guidance provided in the [Defense Acquisition Guidebook](#); the direction in [DoDI 5000.2, Operation of the Defense Acquisition System](#), and the instruction at Defense Acquisition University. Sustainable manufacturing has numerous practical benefits, including cost savings, an improved ability to comply with regulations and avoid environmental liability, and an improved perception of DoD with Congress and the public. The Department of Commerce defines sustainable manufacturing as “the creation of manufactured products that use processes that are non-polluting, conserve energy and natural resources, are economically sound, and are safe for employees,

communities, and consumers”. This definition touches upon many concepts that already operate independently within DoD among the environmental, engineering, financial, safety, and occupational health circles. Sustainable manufacturing is a keystone concept that integrates sustainability practices from these different functional spheres in such a way that issues can be addressed holistically and transparently. For example, if a depot engineer wants to install a less polluting machine into a production process, he or she should also consider proper disposal of the old machine, energy consumption of the new machine, the costs and benefits of the capital investment, and worker safety.

Electronic Stewardship Component of Sustainable Procurement

See the sub-section on *Electronic Stewardship and Data Centers* under Implementation Methods for Goal 1 for information on energy-related electronic stewardship topics.

High Performance and Sustainable Buildings

A major part of DoD’s approach to reducing energy use by facilities will be through the high performance building requirements of EO 13514, including:

- All new construction and major renovation of DoD buildings complying with the Guiding Principles.
- Ensuring that at least 15 percent of DoD’s existing buildings and building leases over 5,000 ft² meet the Guiding Principles by FY 2015.
- Demonstrating annual progress toward 100 percent conformance with the Guiding Principles for the entire building inventory.
- Operating, maintaining and managing facilities to reduce energy consumption.
- Having all new buildings designed to achieve “zero net energy” (using no more energy than they generate) beginning in FY 2020.
- Ensuring that rehabilitation of DoD-owned historic buildings utilizes best practices and technologies to promote long-term viability of the buildings.



[High Performance and Sustainable Buildings Guidance](#), issued in December 2008 by the Interagency Sustainability Working Group, provides guidance on implementing the Guiding Principles. For new construction and major renovations with a design contract that was awarded prior to October 1, 2008, this guidance allows a building to meet its high performance requirements through a third-party certification such as LEED in lieu of complying with the Guiding Principles.

DUSD(I&E) will soon issue policy that directs new buildings, structures, and major renovations be

designed and built to conform to the Guiding Principles *and* a minimum LEED Silver level rating. This new DoD policy is designed to complement and reinforce existing Military Department policies from a DoD-level: through the UFC program (DoD’s building codes), the policy dictates that all new vertical construction and major renovations will not only conform to the Guiding Principles, but LEED as well. Since policy memos have a relatively short lifespan, the next policy step will be to codify the policy by issuing a DoD Directive or Instruction that will govern sustainable buildings actions for the future. The Department will begin preparing a Sustainable Buildings Implementation Plan in FY 2010, based on the existing 2007 *Defense Installations Strategic Plan*. Also, the Department will issue policy in FY 2011 that establishes a schedule for updating the UFC to ensure that the most current industry standards are incorporated, drive improvements in construction practices, and ensure that practices keep pace with advances in technology.

DoD manages the largest portfolio of historic properties in the federal government, and has an opportunity to highlight the inherently sustainable qualities of many of its historic buildings. As stewards of some of the nation's most significant historic resources, the Department will continue to adaptively reuse and renovate these historic buildings, reducing landfill demolition and construction waste, and setting an example for achieving the goals of Section 2(g) and 10(b) of the Executive Order.

GOAL 8 Sustainability Built into DoD Management Systems

Goal 8 Sub-Goals

SUB-GOAL 8.1 All Environmental Management Systems Effectively Implemented and Maintained

Metric

Overall DoD status using the Federal Environmental Management System Metrics as reported in the Defense Environmental Programs Annual Report to Congress. The overall DoD status is a color rating (Green, Yellow or Red) for all DoD facilities and organizations for which an environmental management system (EMS) is appropriate. Status is based on the color ratings for individual facilities determined using the Federal EMS Metrics. An overall Green rating requires at least 80% of all EMS-appropriate facilities and organizations to have Green EMSs, with no more than 5% total Red EMSs. An overall Yellow requires no more than 10% Red EMSs. An overall Red is assigned when the status is neither Green nor Yellow.

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 8.1 Targets	green									

SUB-GOAL 8.2 The Sustainability of Transportation and Energy Choices in Surrounding Areas Optimized by Coordinating with Related Regional and Local Planning

Metric

Instances of coordination by DoD, at any level, which ensured that all relevant factors, including GHG emissions, were considered in making the best decisions in the interest of sustainable transportation and energy choices in the area. This engagement can take the form of coordinating its own transportation, energy, and/or facility planning with surrounding communities, and/or participating in regional- or community-level planning related to transportation or energy (including environmental impact statements and environmental assessments).

SUB-GOAL 8.3 All DoD Installations Have Integrated Pest Management Plans Prepared,

Reviewed, and Updated Annually by Pest Management Professionals

Metric

The percent of DoD installations that maintained integrated pest management plans that were prepared, reviewed and updated annually by a DoD-certified pest management consultant and/or the installation pest management coordinator. These plans describe how the installation will prevent, manage and control animal and plant pests while following the principles of integrated pest management and Federal, State and local laws. The plans are generated by the installation, are updated annually and are reviewed and approved by the respective Military Department senior pest management professional(s).

Annual Targets

Fiscal year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sub-Goal 8.3 Targets	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Goal 8 Responsible OSD Offices

Sub-Goals 8.1 and 8.2: AT&L/I&E

Sub-Goal 8.3: AFPMB

Goal 8 Status

Environmental Management Systems

DoD made significant progress in 2009 implementing Environmental Management Systems (EMSs) and in strengthening already existing EMSs. Compared with 2008, the Department increased the percentage of EMSs that were “fully implemented” from 28 percent to 95 percent. Additionally, the Department increased its performance level on the Federal EMS Metrics from ratings of 32 percent Green, 38 percent Yellow and 30 percent Red in FY 2008, to ratings of 48 percent Green, 38 percent Yellow and 14 percent Red in 2009. This 50 percent increase in Green ratings and corresponding 50 percent decrease in Red ratings demonstrates the Department’s continued commitment and emphasis on EMS performance. Additionally, 2009 saw DoD complete a thorough update of its Compliance Management Plan, and issue formal EMS guidance to the DoD Components via DoDI [4715.17](#), *Environmental Management Systems*.

Local and Regional Integrated Planning

The Office of Economic Adjustment (OEA), through the Defense Economic Adjustment Program, helps state and local governments adjust community planning in response to the needs of nearby military installations, for example for military ranges, training routes, and growing military missions. OEA provides community planning assistance to achieve compatibility between the military mission and neighboring civilian communities, supporting a cooperative planning effort to identify and assess community impacts and develop a strategic action plan to respond to these impacts.

In response to the growth of military missions, OEA guides a participatory stakeholder process involving the installation and state and local government officials to develop a growth management plan that responds to community impacts. The Joint Land Use Study process is used to prevent the introduction of incompatible civilian development that may impair the military mission, for example by diminishing the availability of resources in the vicinity of a military installation, such as air, land, water, and the electromagnetic spectrum. The planning process promotes a partnership among the military and host communities through an open, continuous dialogue to address community impacts while assuring that community activities and development are compatible with the DoD mission.

The Department has provided technical and financial assistance to state and local government to support regional transportation planning in response to major DoD activities. The need to ensure that community development does not interfere with military installation missions can pose important challenges and opportunities for communities in ways that cross jurisdictional boundaries. However, many regions lack sufficient staff and other resources to undertake cooperative, long-term, strategic regional planning. Through the Defense Economic Adjustment Program, the Department provides technical and financial assistance to enhance the planning capacity of local communities. This support enables the region, with DOD input, to develop land use and transportation plans that promote mixed-use development, centralize public infrastructure, and support housing diversity and multi-modal transportation, especially regional rapid transit.



Photo: U.S. Army

Another good example of DoD coordination with regional and local planning is OSD's Sustainable Ranges program. The purpose of the program is to ensure the availability of military training and testing ranges now and into the future while protecting the environment. It does so by supporting education and engagement of key stakeholders and strengthening regional partnerships to effect landscape-level planning. OSD partners with federal agencies, state and local governments, academia, nongovernmental organizations and other stakeholders to develop solutions at the national, regional and local levels to shared challenges such as land use, energy, pollution and population growth. Regional partnerships convene stakeholders from federal and state governments to address natural resource management, water quantity and quality, land use, and other emerging issues like climate change in a common, collaborative framework. One of the key components of the program is the Readiness and Environmental Protection Initiative (REPI). REPI forms coordinated regional planning and community partnerships that share the costs of protecting land, providing continued military access to the resources

necessary for training and testing while remaining excellent stewards of the environment and good neighbors in communities across America. The program works to ensure the long-term accessibility and capability of military training areas by working with stakeholders to develop a framework of compatible land use efforts. Military Departments use REPI funding to implement partnerships and projects according to their own processes.

Pesticide Use Management

Pesticide use at the installation level is recorded and reported to the Military Departments' respective chains of command. The Military Departments and DLA also submit an annual report to the AFPMB on their respective overall annual pesticide use. The second measure of merit in DoD 4150.07 specifically states that 100 percent of DoD installations shall have an approved Pest Management Plan. This metric has been recorded by the AFPMB since 1994 when barely half of all installations had such plans in place. While DoD has significantly improved this percentage, it has yet to achieve its stated goal of 100 percent (the average for 2008 and 2009 was 80 percent). There are multiple reasons for not achieving the goal related to the ongoing Base Realignment and Closure process, but key among them are the current conflicts in Iraq and Afghanistan, which have resulted in a lack of qualified personnel at many installations to develop and annually review the plans, and at the headquarters level to review and approve the plans.

Goal 8 Implementation Methods

Environmental Management Systems

EMSs are important tools for the Department to achieve the objectives, goals and sub-goals of its Strategic Sustainability Performance Plan. DoD now has a solid guidance structure in place on Environmental Management Systems. In April 2009, the Department issued DoDI [4715.17](#), *Environmental Management Systems*, which sets standard and assigns responsibilities throughout the Department for EMS implementation and maintenance. Additionally, in November 2009 the Department completed a revision to its Compliance Management Plan, which augments the DoDI by further clarifying how the EMS approach is used in DoD. Combined with DoD Component-level guidance, the Department is well positioned to continue efforts to fully implement and thoroughly maintain EMS as the primary management approach to environmental programs.



The Army Garrison Grafenwoehr EMS Preserves this Ecosystem

Photo: U.S. Army

Local and Regional Integrated Planning

The Department has long been proactively advancing regional and local integrated planning and will continue to do so. Moving forward, an increased emphasis will be placed on ensuring that sustainability factors such as transportation, energy and GHG emissions are considered when coordinating on planning with surrounding communities and regional entities, especially planning relating to transportation, energy, and facility siting. For example, sustainable transportation can be optimized through transit-oriented planning that designs bus routes to be close to large employment centers such as military installations or DoD office buildings. For proposed new or expanded Federal facilities, the Department will update its guidance to ensure that all Environmental Impact Statements and Environmental Assessments required under the National Environmental Policy Act (NEPA) identify and analyze any impacts associated with energy usage and alternative energy sources.

Pesticide Use Management

The primary method to accomplish reductions in the use of pesticides is for all DoD installations to continue to adhere to the principles of integrated pest management, where all available control and management tools are examined and only those that are the most environmentally sound, effective, efficient and safe are used. DoD continues to strive for every installation to have an approved Pest Management Plan. This information is then forwarded to EPA as well as other appropriate DoD offices. As per DoDI [4150.07](#), the Department established a goal of reducing its pesticide usage by both government and contractor pesticide applicators on DoD installations by 50 percent from its average rate between FY 2002 and 2003 (measured in pounds of active ingredient, where usage was 389,000 pounds in 2002/2003). This goal is in the process of being re-evaluated by the AFPMB and senior pest management professionals from all of the Military Departments and DLA.

A potential major driver in attaining this goal in the near future is the EPA's implementation of the National Pollutant Discharge Elimination System (NPDES) permitting process for applying pesticides in and around water, as a part of the Clean Water Act. This process is scheduled to begin in 2011. A significant portion of NPDES involves having integrated control plans which follow best management practices and the principles of integrated pest management. These EPA-directed plans are directly

aligned with the Pest Management Plans generated by DoD installations. With the EPA's increased emphasis on monitoring pesticide applications, the Military Departments are reviewing their current personnel and mission requirements and are revising them where needed to meet the EPA's directives. As a part of this, the Military Departments will continue to have their pest management professionals assist the installations in building the DoD mandated pest management plans, which in turn will be used to support their respective NPDES permit processes. The overall results of these efforts will be reported to the AFPMB on an annual basis.

Part III: Agency Self Evaluation

As requested, the Department provides Yes/No answers to the following questions regarding critical aspects of the Plan:

Does your plan provide/consider overarching strategies and approaches for achieving long-term sustainability goals?	Yes
Does your plan identify milestones and resources needed for implementation?	Yes
Does your plan align with your agency's 2011 budget submission?	Yes
Is your plan consistent with your agency's FY 2011 budget and appropriately aligned to reflect your agency's planned FY 2012 budget submission?	Yes
Does your plan integrate existing EO and statutory requirements into a single framework and align with other existing mission and management related goals to make the best use of available resources?	Yes
Does your plan provide methods for obtaining data needed to measure progress, evaluate results, and improve performance?	Yes

Planned Actions Relevant to OMB Scorecards

The strategies and approaches for achieving all goals and sub-goals are described in the "Implementation Methods" sections, laying out a clear path for the Department to make the transformation to sustainability in way that advances the DoD mission. Milestones are provided for each sub-goal in the form of annual targets from FY 2011 through FY 2020, charting a path to reach 2020 objectives. Provided below are brief summaries of the Department's planned actions from July 2010 through June 2011 for achieving the goals of the OMB scorecards on electronic stewardship, transportation management, and energy management. For more detailed information, please see the individual Implementation Methods sections for each goal.

Energy Management Scorecard

Facility Energy Efficiency (sub-goals 1.1 and 7.2) – The Department will issue policy in FY 2011 that establishes a schedule for updating the UFC to ensure that the most current industry standards are incorporated, to drive improvements in construction practices and ensure that practices keep pace with advances in technology. The Department will begin preparing a Sustainable Buildings Implementation Plan in FY 2010. On metering electricity, DoD is well along to meeting the goal of 100 percent by FY 2012 based on current contract commitments to meter installations, with a forecast to have 86 percent of all eligible DoD buildings metered in FY 2010.

Use of Renewable Energy (sub-goal 1.2) – By the third quarter of FY 2011, the Department will conduct an analysis of the potential for renewable energy generation on different properties in the U.S. Each location will be evaluated based on the availability of renewable energy resources, energy-related risk assessments, and the possibility of any mission or readiness impacts of the energy facility.

Facility Water Consumption Intensity (sub-goal 2.1) – The Department will evaluate opportunities for water reuse in wastewater treatment systems it operates during FY 2011.

Environmental Stewardship Scorecard

Environmental Management Systems (sub-goal 8.1) – DoD is already implementing the guidance

recently put into place on EMSs: DoDI [4715.17](#), “Environmental Management Systems”, issued in April 2009; and the November 2009 revision to the DoD Compliance Management Plan.

Green Procurement Program (sub-goal 7.1) – Extensive information on planned DoD actions are described in the Methods section. A few examples:

- 1) By the first quarter of FY 2011, the Department will develop and disseminate guidance on how to address green product mandates and other sustainability requirements in procurement and contract audits, and considerations of green procurement mandates with Small Business Set-Asides.
- 2) By the end of calendar year 2010, the Department will add guidance to the Procurement Guidance Instruction on approaches to green service and supply contracts and it will provide guidance specific to the purchase card program.
- 3) By the third quarter of FY 2011, the Department will develop standard contract language to reflect the need for products and services to comply with the required sustainability criteria.
- 4) The Department will develop a DoDI by the end of FY 2011 that designates lead offices for oversight of the Green Procurement Program, and defines responsibilities, requirements, and procedures for establishing and implementing sustainable procurement programs across DoD functional areas and organizations.
- 5) The Department intends to incorporate standard contract language into all new contract actions by FY 2012.

Sustainable Buildings (sub-goal 7.2) – The Department will begin preparing a Sustainable Buildings Implementation Plan in FY 2010. An assessment of the Department’s current compliance with the Guiding Principles is underway, slated for completion later this calendar year.

Electronic Stewardship (sub-goals 1.1, 5.1 and 6.2) – In FY 2010 the OSD CIO office will be reviewing the each DoD Component’s plan to enable power management features on its eligible electronics equipment. The Department will maintain its strict compliance system regarding environmentally sound electronic disposal.

Also relating to electronic stewardship is sub-goal 5.1 on reducing the use of printing paper. By the end of FY 2011, the Department will issue a policy stating that reducing the use of printing paper is a priority for DoD, and directing the DoD organizations specified in the sub-goal 5.1 performance metric to issue and implement a policy for minimizing the use of paper. Also by this time, the Department will develop and issue DoD-wide guidance on effective strategies for reducing the use of paper, for example by encouraging the use of digital documents in lieu of paper, requiring printers with automatic duplexing capability to default to this setting, and modifying routine office tasks to reduce paper use. The Military Departments and DLA are expected to meet the requirements of sub-goal 5.1 by no later than the end of FY 2012.

Transportation Management Scorecard

(Sub-goal 1.3) The Department will launch a study by the first quarter of FY 2011 on approaches that will accelerate its progress in reducing petroleum use by its vehicles, including incorporating the transportation elements of EO 13423 into relevant position descriptions and performance evaluations.

Appendix A

Acronyms

AFB	Air Force Base
AFPMB	Armed Forces Pest Management Board
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
AT&L	Acquisition, Technology and Logistics
Btu	British thermal unit
C&D	construction and demolition
CEQ	Council on Environmental Quality
CIO	Chief Information Officer
CO ₂	carbon dioxide
DAU	Defense Acquisition University
DENIX	Defense Environmental Network & Information eXchange
DFARS	Defense Federal Acquisition Regulation Supplement
DLA	Defense Logistics Agency
DoD	Department of Defense
DOE	Department of Energy
DoDI	Department of Defense Instruction
DOEP&P	Director of Operational Energy Plans and Programs
DP&AP	Defense Procurement and Acquisition Policy
DR&E	Defense Research and Engineering
DUSD	Deputy Under Secretary of Defense
EISA	Energy Independence and Security Act of 2007
EO	Executive Order
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 2005
EPCRA	Emergency Planning and Community Right-to-Know Act
EPEAT	Electronic Product Environmental Assessment Tool
ESOH	Environment, Safety, and Occupational Health
FAR	Federal Acquisition Regulation
FEE	Federal Environmental Executive
FEMP	Federal Energy Management Program
FOB	forward operating base
FY	fiscal year
FYDP	Future Year Defense Plan
GCM	General Circulation Model
GHG	greenhouse gas
GPP	Green Procurement Program

HVAC	heating, ventilation and cooling
I&E	Installations & Environment
IESNA	Illuminating Engineering Society of North America
INRMP	Integrated Natural Resources Management Plan
IPCC	Intergovernmental Panel on Climate Change
ISWM	Integrated Solid Waste Management
JLUS	Joint Land Use Study
KPP	Key Performance Parameter
L&MR	Logistics & Materiel Readiness
LEED	Leadership in Energy and Environmental Design
LFG	landfill gas
LID	low impact development
mmscfd	million standard cubic feet per day
MW	megawatt
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NSN	National Stock Number
O&M	operations and maintenance
OEA	Office of Economic Adjustment
OEP&P	Operational Energy Plans and Programs
OMB	Office of Management and Budget
OSD	Office of the Secretary of Defense
P&R	Personnel and Readiness
PESHE	Programmatic Environment, Safety, and Occupational Health Evaluation
QDR	Quadrennial Defense Review
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical Substances
REC	Regional Environmental Coordinator
REPI	Readiness and Environmental Protection Initiative
ROI	return on investment
SERDP	Strategic Environmental Research and Development Program
SPA	Specification Preparing Activities
SSC	Senior Sustainability Council
SSO	Senior Sustainability Officer
SF ₆	sulfur hexafluoride
TRI	Toxics Release Inventory
UFC	Unified Facilities Criteria
U.S.C.	United States Code
USD	Under Secretary of Defense

Appendix B

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Appendix C. Draft DoD Sustainability Scoring System to be Used in FY 2011

Colors are illustrative only to show the red/yellow/green color coding concept being considered for the scoring system.

SUB-GOALS		2011 Target	2011 Actual	SCORE (red/yellow/green)	
Objective #1: The Continued Availability of Resources Critical to the DoD Mission is Ensured					
GOAL #1: The Use of Fossil Fuels Reduced					
1.1	Energy Intensity of Facilities Reduced by 30% of FY 2003 Levels by FY 2015 and 37.5% by FY 2020	18%	X%		
1.2	18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by FY 2020	6.5%	X%		
1.3	Use of Petroleum Products by Vehicle Fleets Reduced 30% by FY 2020 Relative to FY 2005	2%	X%		
GOAL #2: Water Resources Management Improved					
2.1	Potable Water Consumption Intensity by Facilities Reduced by 26% of FY 2007 Levels by FY 2020	8%	X%		
2.2	Industrial and Irrigation Water Consumption Reduced by 20% of FY 2010 Levels by FY 2020	8%			
2.3	All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible	100%	X%		

SUB-GOAL		2011 Target	2011 Actual	SCORE (red/yellow/green)	
Objective #2: DoD is a U.S. Government Leader in Reducing Greenhouse Gas Emissions					
GOAL #3: GHG Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020 Relative to FY 2008					X%
GOAL #4: GHG Emissions from Scope 3 Sources Reduced 13.5% by FY 2020 Relative to FY 2008				TBD	X%
4.1	Greenhouse Gas Emissions from Employee Air Travel Reduced 7% by FY 2020 Relative to FY 2011	0%	X%		
4.2	30% of Eligible Employees Teleworking at Least Once a Week, on a Regular, Recurring Basis, by FY 2020	10%	X%		
4.3	50% of Non-Hazardous Solid Waste Diverted from Disposal in Landfills Not Owned by DoD by FY 2015 and Thereafter Through FY 2020	42%	X%		
Objective #3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution					
GOAL #5: Solid Waste Minimized and Optimally Managed					
5.1	All DoD Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper	1	X		
5.2	50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by FY 2015 and Thereafter Through FY 2020	42%	X%		
5.3	60% of Construction and Demolition Debris Diverted from the Waste Stream by FY 2015, and Thereafter Through FY 2020	52%	X%		
5.4	Ten Landfills Recovering Landfill Gas for Use by DoD by FY 2020	0	X		

SUB-GOAL		2011 Target	2011 Actual	SCORE (red/yellow/green)
GOAL #6: The Use and Release of Chemicals of Environmental Concern Minimized				
6.1	On-Site Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% by 2020, Relative to 2007	n/a	X%	
6.2	100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner	100%	X%	
6.3	100% of DoD Personnel and Contractors Who Apply Pesticides Are Properly Certified	100%	X%	
Objective #4: Continuous Improvement in DoD Mission Achieved through Management and Practices Built on Sustainability & Community				
GOAL #7: Sustainability Practices Become the Norm				
7.1	95% of Procurement Conducted Sustainably	95%	X%	
7.2	15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings By FY 2015, Holding Through FY 2020	7%	X%	
GOAL #8: Sustainability Built into DoD Management Systems				
8.1	All Environmental Management Systems Effectively Implemented and Maintained	green	X	
8.2	The Sustainability of Transportation and Energy Choices in Surrounding Areas Optimized by Coordinating with Related Regional and Local Planning	<i>qualitative assessment</i>		
8.3	All DoD Installations Have Integrated Pest Management Plans Prepared, Reviewed, and Updated Annually by Pest Management Professionals	100%	X%	

Appendix D

Requirements of EO 13514 and Other Recent Federal Requirements Relating to Sustainability

Area	EO 13514	EO 13423	EISA	EPAct, Farm Bill
Energy Use	§2(a)(i): Reducing energy intensity in agency buildings should be considered.		§431 (existing federal bldgs): 3% reduction per year in fossil fuel use from 2008 through 2015, or 30% total by 2015, relative to FY03. §433 (new or majorly renovated buildings): fossil-fuel use halved by 2030 relative to FY03, and sustainable design principles applied to their siting, design, and construction. DOE Secretary to establish a federal green certification program. In addition to water conservation required by this section, "water conservation technologies shall be applied to the extent that the technologies are life-cycle cost-effective". §434 (large capital energy investments such as HVAC): must employ "the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective". Natural gas and steam must be metered. §434 (leasing): as of 3 years after signing, all leases must be for Energy Star buildings.	EPAct §102: Agencies can keep savings from energy and water reductions. EPAct §103: Bldgs must be metered for electricity. EPAct §701: Vehicles with dual fuel capabilities shall be operated on alternative fuels.
	§2(g)(i): All new buildings entering planning in 2020 or later designed to achieve zero-net-energy use by 2030.			
	§2(g)(ii),(iii): At least 15% of existing agency buildings (including leased) meet the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings by FY15, as well as all new construction, major renovation and repair. Annual progress will be made towards 100% compliance for the building inventory.			
	§2(g)(iv): Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.			
	§2(g)(v): Manage existing building systems to reduce consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs.			
	§2(g)(vi): When adding assets to the agency's real property inventory, identifying opportunities to consolidate and dispose of existing assets, optimize the performance of the agency's real property portfolio, and reduce associated environmental impacts.			
	§2(g)(vii): Ensuring that rehabilitation of federally owned historic buildings utilizes best practices and technologies in retrofitting to promote long-term viability.			

Area	EO 13514	EO 13423	EISA	EPA Act, Farm Bill
Renewable Energy	§2(a)(ii): Consider increasing agency use of renewable energy and implementing renewable energy generation projects on agency property. (Note, however, that U.S.C. 10 §2911(e) requires DoD to produce or procure not less than 25% of the total energy consumed within its facilities from renewable sources during FY 2025.)	§2(b): Ensure that (i) at least half of the statutorily required renewable energy consumed by the agency in a FY comes from new renewable sources, and (ii) to the extent feasible, implement renewable energy generation projects on agency property for agency use.	§523: If lifecycle cost-effective, as compared to other reasonably available technologies, not less than 30% of the hot water demand for each new Federal building or Federal building undergoing a major renovation be met through the installation and use of solar hot water heaters.	EPA Act §203: Renewable energy ≥3% in FY07-09; 5% in FY10-12; 7.5% in FY13 and beyond (compared to total electricity consumption).
Vehicle Fleets	§2(a)(iii): (A) Use low greenhouse gas emitting vehicles including alternative fuel vehicles; (B) Optimize the number of vehicles in the agency fleet; (C): If the agency operates a fleet of at least 20 motor vehicles, reduce the agency fleet's total consumption of petroleum products by a minimum of 2% annually through the end of FY20 relative to FY05.	§2(g): (i) reduce the "fleet's total consumption of petroleum products by 2% annually through the end of fiscal year 2015" relative to FY05 (if at least 20 motor vehicles); (ii) 10% increase in non-petroleum fuel annually relative to FY05; (iii) plug-in hybrids once economically viable.	§141: purchase only low GHG-emitting vehicles. §142: 20% reduction in vehicle petroleum use, 10% increase in non-petroleum fuel use, annually by FY15 relative to FY05. §246: a renewable fuel pump for every fleet by 1/1/10. §526: alternative fuels cannot be used if lifecycle GHG emissions are greater than from petroleum sources.	
Scope 3 GHG Emissions	§2(b): in setting the Scope 3 target, consider: (i) Supply Chain - opportunities with vendors and contractors to address and incorporate incentives to reduce GHG emissions. (ii) Employee Travel - implementing strategies for transit, travel, training, and conferencing that actively support lower-carbon commuting and travel by agency staff. (iii) GHG emission reductions associated with pursuing other relevant goals in this section. (iv) Developing and implementing innovative policies and practices to address scope 3 emissions unique to agency operations.			

Area	EO 13514	EO 13423	EISA	EPA Act, Farm Bill
Water Use Efficiency and Mngt	§2(d)(i): Reduce potable water use intensity by 2% annually through FY20, or 26% by the end of FY20, relative to FY07.	§2(c): Beginning in FY08, reduce water consumption intensity, relative to the baseline of the agency's water consumption in FY07, through life-cycle cost-effective measures by 2% annually through the end of FY15 or 16% by the end of FY15.		
	§2(d)(ii): Reduce agency industrial, landscaping, and agricultural water consumption by 2% annually or 20% by the end of FY20 relative to FY10.			
	§2(d)(iii): Consistent with State law, identify, promote, and implement water reuse strategies that reduce potable water consumption.			
	§2(d)(iv): Storm Water Management - implement and achieve the objectives identified in the storm water management guidance (issued by EPA as required under §14).		EISA §438: Maintain or restore the pre-development hydrology of the property with regard to the temperature, rate, volume, and duration of storm water flow for development and redevelopment footprints exceeding 5,000 sq ft.	
Sustainable Procurement	<p>Ensure that 95% of new contract actions, excluding weapon systems, are:</p> <ul style="list-style-type: none"> - energy-efficient (Energy Star or FEMP) - water-efficient - biobased - environmentally preferable (e.g., certified by the Electronic Product Environmental Assessment Tool, EPEAT) - non-ozone depleting - contain recycled content - non-toxic or less-toxic alternatives <p>where such products meet agency performance requirements.</p>	<p>§2(d): Requires acquisitions of goods and services to: (i) use sustainable practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products; and (ii) use of paper ≥30% post-consumer fiber content. §3(e): Ensure that contracts for contractor operation of government-owned facilities or vehicles require the contractor to comply with the provisions of this order to the same extent as if the agency operated the facilities or vehicles.</p>	<p>EISA §524: must purchase appliances whose stand-by mode uses 1 watt or less, or the best available if <1 W not available. EISA §525: must purchase products designated by Energy Star or the Federal Energy Management Program.</p>	<p>EPA Act §104: requires procurement of energy-efficient products. §108: amends Solid Waste Disposal Act to increase use of waste in products such as fly ash in cement in federal projects. Farm Bill Title IX, §9002: procurement preference for the highest bio-based content.</p>

Area	EO 13514	EO 13423	EISA	EPAct, Farm Bill
Regional and Local Integrated Planning	§2(f)(i): Transportation Planning - Participate in regional transportation planning and recognizing existing community transportation infrastructure.			
	§2(f)(ii): Energy Planning - Align federal policies to increase effectiveness of local planning for energy choices.			
	§2(f)(iii): Transit-Oriented Community Planning - Ensure that planning of new Federal facilities or new leases includes consideration of sites that are pedestrian friendly, near existing employment centers, and accessible to public transit, and emphasizes existing central cities and, in rural communities, existing or planned town centers.			
	§2(f)(iv): New/Improved Facilities - Identify and analyze impacts from energy usage and alternatives in all EISs and EAs for proposed new or expanded facilities.			
	§2(f)(v): Regional Coordination - Coordinate with regional programs for Federal, State, tribal, and local ecosystem, watershed, and environmental management.			
Environmental Management Systems	§2(j)(i),(ii): Continue implementation of existing environmental management systems (EMSs) to achieve the performance necessary to meet the goals of this order.	§3(b)(i): Ensure use of EMS as the primary management approach for addressing environmental aspects of internal agency operations and activities.		

Area	EO 13514	EO 13423	EISA	EPA Act, Farm Bill
Pollution Prevention and Waste Minimization	§2(e)(i): Source Reduction - minimize the generation of waste and pollutants through source reduction.			
	§2(e)(iii): Construction - Divert at least 50% of construction and demolition materials and debris by the end of FY15.			
	§2(e)(iv): Paper - reduce printing paper use and acquiring uncoated printing and writing paper containing at least 30% postconsumer fiber.	§2(d)(ii): Use of paper of at least 30% post-consumer fiber content.		
	§2(e)(v): Toxics - Reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of.	§2(e)(i): Ensure that the agency reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of.		
	§2(e)(viii),(ix): Chemical Use - Increase agency use of acceptable alternative chemicals and processes in keeping with the agency's procurement policies; and decrease agency use of chemicals where such decrease will assist the agency in achieving GHG targets.			
	§2(e)(vi): Organics - Increase diversion of compostable and organic material from the waste stream.	§2(e): (ii) Ensure that the agency increases diversion of solid waste as appropriate; and (iii) maintains cost-effective waste prevention and recycling programs in its facilities.		
	§2(e)(ii): Divert at least 50% of non-hazardous solid waste, excluding construction and demolition debris, by the end of FY15.			
	§2(e)(vii): Pest Mngt - Implement integrated pest management and other appropriate landscape management practices.			
	§2(e)(x): Reporting in accordance with the requirements of §301 - §313 of the Emergency Planning and Community Right-to-Know Act of 1986.			

Area	EO 13514	EO 13423	EISA	EPA Act, Farm Bill
Electronics Stewardship	§2(i)(i): Ensure procurement preference for EPEAT products.	§2(h): Ensure that the agency (i) when acquiring an electronic product, meets at least 95% of those requirements with an Electronic Product Environmental Assessment Tool (EPEAT)-registered electronic product, unless there is none; (ii) enables the Energy Star feature on agency computers and monitors, (iii) establishes and implements policies to extend the useful life of agency electronic equipment, and (iv) uses environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.		
	§2(i)(ii): Establish and implement policies to enable power management, duplex printing, and other environmentally preferable features.			
	§2(i)(iii): Employ environmentally sound practices with respect to the agency's disposition of all agency excess or surplus electronic products.			
	§2(i)(iv): Ensure the procurement of Energy Star and FEMP designated electronic equipment.			
	§2(i)(v): Implement best practices in energy efficient management of servers and Federal data centers.			

Appendix E

Federal Requirements Relating to Each Sub-Goal

A summary of which federal requirements are addressed by each sub-goal is provided in Table A.1, shown in terms of the section numbers of Executive Orders and legislation.

Sub-Goal 1.1 Energy Intensity of Facilities Reduced by 30% of FY 2003 Levels by FY 2015 and 37.5% by FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 1.1

- **EO 13423 §2(a):** Improve energy efficiency and reduce GHG emissions of the agency through reduction of energy intensity by 3 percent annually through FY 2015 or 30 percent by the end of FY 2015, relative to FY 2003.
- **EISA §431:** In existing federal buildings, 3 percent reduction per year in fossil fuel use from FY 2008 through FY 2015, or 30 percent total by FY 2015, relative to FY 2003.

New Construction and Major Renovation

- *Standards:* EO 13514 §2(g) requires all new buildings entering planning in 2020 or later designed to achieve zero-net-energy use by 2030, and new construction to be 30 percent more efficient than ASHRAE and IESNA standards, and major renovations 20 percent below pre-renovation 2003 baseline.
- *Guiding Principles:* EO 13514 §2(g) requires all new agency construction, major renovation and repair are to comply with the [Guiding Principles](#) set forth in the 2006 Memorandum of Understanding on Federal Leadership in High Performance and Sustainable Buildings (see below), which [implementation guidance](#) provided by the Interagency Sustainability Working Group.
- *Guiding Principles:* EO 13423 §2(f) requires that new construction and major renovation of agency buildings comply with the Guiding Principles.
- *Design Principles:* EISA §433: For new or majorly renovated buildings, fossil-fuel use halved by 2030 relative to FY 2003, and sustainable design principles are to be applied to their siting, design, and construction.

Existing Buildings

- *Guiding Principles:* EO 13514 §2(g): At least 15 percent of existing agency buildings (including leased) are to meet the Guiding Principles (see below) by FY 2015. Annual progress will be made towards 100 percent compliance for the agency's building inventory.
- *Guiding Principles:* EO 13423 §2(f): 15 percent of the existing Federal capital asset building inventory of the agency as of the end of FY 2015 incorporates the sustainable practices in the Guiding Principles(see below).
- *Replacement of Large Energy Equipment in Buildings:* EISA §434 requires the replacement of installed equipment, such as HVAC systems or components, to use the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective.
- *Metering Natural Gas and Steam:* EISA §434 requires natural gas and steam to be metered by October 16, 2016.

Both New and Existing

- *Leased Buildings:* EISA §434 requires all buildings with new leases to be certified Energy Star beginning in FY 2010.

Table A.1. Federal Requirements Related to the Sub-Goals of the DoD Strategic Sustainability Performance Plan

#	Sub-Goal	Key Federal Requirements Addressed
Objective #1: The Continued Availability of Resources Critical to the DoD Mission is Ensured		
GOAL #1: The Use of Fossil Fuels Reduced		
1.1	Energy Intensity of Facilities Reduced by 30% of FY 2003 Levels by FY 2015 and 37.5% by FY 2020	EO 13423 §2(g), (i); EO 13423 §2(a), (f); EISA §431, 433, 434; EPAAct §102, 103.
1.2	18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by FY 2020	U.S.C. 10 §2911(e)
1.3	Use of Petroleum Products by Vehicle Fleets Reduced 30% by FY 2020	EO 13514 §2(a) (iii); EO 13423 §2(g); EISA §141, 142, 246, 526; EPCAT §701
GOAL #2: Water Resources Management Improved		
2.1	Potable Water Consumption Intensity by Facilities Reduced by 26% of FY 2007 Levels by FY 2020	EO 13514 §2(d), (g); EO 13423 §2(c), (f); EISA §433; EPAAct §102
2.2	Industrial and Irrigation Water Consumption Reduced by 20% of FY 2010 Levels by FY 2020	EO 13514 §2(d)(ii)
2.3	All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible	EO 13514 §2(d), (g); EO 13423 §2(f); EISA §438

#	Sub-Goal	Key Federal Requirements Addressed
Objective #2: DoD is a U.S. Government Leader in Reducing Greenhouse Gas Emissions		
GOAL #3: Greenhouse Gas Emissions from Scope 1 and 2 Sources Reduced 34% by FY 2020, Relative to FY 2008		
GOAL #4: Greenhouse Gas Emissions from Scope 3 Sources Reduced 13.5% by FY 2020, Relative to FY 2008		
4.1	Greenhouse Gas Emissions from Employee Air Travel Reduced 7% by FY 2020 Relative to FY 2011	CEQ guidance on EO 13514 §2(b)(ii)
4.2	30% of Eligible Employees Teleworking at Least Once a Week, on a Regular, Recurring Basis, by FY 2020	CEQ guidance on EO 13514 §2(b)(ii)
4.3	50% of Non-Hazardous Solid Waste Diverted from Disposal in Landfills Not Owned by DoD by FY 2015 and Thereafter Through FY 2020	CEQ guidance on EO 13514 §2(b)(ii)
Objective #3: The Ongoing Performance of DoD Assets Ensured by Minimizing Waste and Pollution		
GOAL #5: Solid Waste Minimized and Optimally Managed		
5.1	All DoD Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper	EO 13514 §2(e)(iv), 2(i)
5.2	50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by FY 2015 and Thereafter Through FY 2020	EO 13514 §2(e); EO 13423 §2(e)
5.3	60% of Construction and Demolition Debris Diverted from the Waste Stream by FY 2015, and Thereafter Through FY 2020	EO 13514 §2(e); EO 13423 §2(e)
5.4	Ten Landfills Recovering Landfill Gas for Use by DoD by FY 2020	EO 13514 §1, §2(a)
GOAL #6: The Use and Release of Chemicals of Environmental Concern Minimized		
6.1	On-Site Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% by FY 2020, Relative to FY 2007	EO 13514 §2(e)
6.2	100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner	EO 13514 §2(i); EO 13423 §2(h)
6.3	100% of DoD Personnel and Contractors that Apply Pesticides Properly Certified	EO 13514 §2(e)(vii)

#	Sub-Goal	Key Federal Requirements Addressed
Objective #4: Continuous Improvement in the DoD Mission Achieved through Management and Practices Built on Sustainability and Community		
GOAL #7: Sustainability Practices Become the Norm		
7.1	95% of Procurement Conducted Sustainably	EO 13514 §2(h), (g), (i); EO 13423 §2(h), (d), (e); EISA §524, 525; EPAAct §104, 108; Farm Bill Title IX, §9002; Resource Conservation and Recovery Act §6002
7.2	15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings By FY 2015, Holding Through FY 2020	EO 13514 §2(g); EO 13423 §2(f)
GOAL #8: Sustainability Built into DoD Management Systems		
8.1	All Environmental Management Systems Effectively Implemented and Maintained	EO 13514 §2(j); EO 13423 §3(b)(i)
8.2	The Sustainability of Transportation and Energy Choices in Surrounding Areas Optimized by Coordinating with Related Regional and Local Planning	EO 13514 §2(f)
8.3	All DoD Installations Have Integrated Pest Management Plans Prepared, Reviewed, and Updated Annually by Pest Management Professionals	EO 13514 §2(e)(vii)

- *Electrical Metering:* EO 13514 §2(g) mandates that federal agencies comply with the Guiding Principles, which require that all federal buildings be metered for electricity by October 1, 2012 (as per EAct §103), and the information used to optimize and verify electrical energy efficiency performance using the Energy Star Benchmarking Tool as described in the Guiding Principles (see below).
- *Fate of Savings:* EAct §102 allows agencies can keep savings from energy and water reductions.
- *Metering Electricity:* EAct §103 requires buildings to be metered for electricity by October 1, 2012.
- *Use of Electronic Equipment:* EO 13514 §2(i) requires agencies to establish and implement policies to enable power management on electronic equipment, and to implement best practices in energy efficient management of servers and Federal data centers. EO 13423 §2(h) requires agencies to ensure that the agency enables the Energy Star feature on agency computers and monitors.

Guiding Principles

The Guiding Principles specifically pertaining to energy use are:

- Employ total building commissioning practices tailored to the size and complexity of the building and its system components in order to verify performance of building components and systems and help ensure that design requirements are met.
- Establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the Energy Star voluntary labeling program targets for new construction and major renovation where applicable.
- *Measurement and Verification:* In accordance with DOE guidelines issued under section 103 of the Energy Policy Act of 2005, install building level utility meters in new major construction and renovation projects to track and continuously optimize performance. Compare actual performance data from the first year of operation with the energy design target. After one year of occupancy, measure all new major installations using the Energy Star Benchmarking Tool for building and space types covered by Energy Star. Enter data and lessons learned from sustainable buildings into the High Performance Buildings Database.
- Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.
- Manage existing building systems to reduce consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs.

Sub-Goal 1.2 18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by FY 2020

Federal Statutory Requirements Addressed by Sub-Goal 1.2

U.S.C. 10 §2911(e) (or the 2010 National Defense Authorization Act §2852): DoD will produce or procure not less than 25 percent of the total energy consumed within its facilities during FY 2025 and each fiscal year thereafter from renewable energy sources, where renewable energy includes thermal as well as electric sources.

EO 13514 §2(a)(ii): Consider increasing agency use of renewable energy and implementing renewable energy generation projects on agency property.

EO 13423 §2(b): Ensure that, to the extent feasible, the agency implements renewable energy generation projects on agency property for agency use.

EISA §523: If lifecycle cost-effective, as compared to other reasonably available technologies, not less

than 30 percent of the hot water demand for each new Federal building or Federal building undergoing a major renovation be met through the installation and use of solar hot water heaters.

EPAct §204: The Administrator of General Services may establish a photovoltaic energy commercialization program for the procurement and installation of photovoltaic solar electric systems for electric production in new and existing public buildings. The acquisition of photovoltaic electric systems shall be at a level substantial enough to allow use of low-cost production techniques with at least 150 megawatts (peak) cumulative acquired during the 5 years of the program.

Sub-Goal 1.3 Use of Petroleum Products by Vehicle Fleets Reduced 30% by FY 2020 Relative to FY 2005

Federal Statutory and EO Requirements Addressed by Sub-Goal 1.3

EO 13514 §2(a) (iii)(C): For agencies operating a fleet of at least 20 motor vehicles, the fleet's total consumption of petroleum products will be reduced by a minimum of 2 percent annually through the end of FY 2020 relative to FY 2005. §2(a) (iii)(A) and (B) contribute to (C): use low greenhouse gas emitting vehicles including alternative fuel vehicles, and optimize the number of vehicles in the agency fleet.

EO 13423 §2(g)

- (i) Reduce the fleet's total consumption of petroleum products by 2 percent annually through the end of FY 2015 relative to FY 2005 (if at least 20 motor vehicles).
- (ii) 10 percent annual increase in the use of non-petroleum fuel, relative to FY 2005.
- (iii) Use plug-in hybrids once cost reasonably comparable, on the basis of life-cycle cost.

EISA

- §141: only low GHG-emitting vehicles will be purchased, if available.
- §142: 20 percent reduction in vehicle petroleum use, and a 10 percent increase in non-petroleum fuel use annually, by 2015 relative to FY 2005.
- §246: a renewable fuel pump must be installed for every fleet by January 1, 2010, except for DoD fueling centers with a fuel turnover rate of less than 100,000 gallons of fuel per year.
- §526: alternative fuels cannot be used if lifecycle GHG emissions are greater than from conventional petroleum sources.

EPAct §701: Vehicles with dual fuel capabilities shall be operated on alternative fuels.

Sub-Goal 2.1 Potable Water Consumption Intensity by Facilities Reduced by 26% of FY 2007 Levels by FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 2.1

EO 13514 §2(d):

- Reduce potable water consumption intensity by 2 percent annually through fiscal year 2020, or 26 percent by the end of FY 2020, relative to FY 2007.
- Reduce industrial, landscaping, and agricultural water consumption by 2 percent annually or 20 percent by the end of FY 2020 relative to FY 2010.
- Consistent with State law, identify, promote, and implement water reuse strategies that reduce potable water consumption.

EO 13514 §2(g)

- At least 15 percent of existing agency buildings (including leased) meet the Guiding Principles by FY 2015, as well as all new agency construction, major renovation and repair. Annual progress

will be made towards 100 percent compliance for the agency's building inventory. The 2006 Memorandum of Understanding on Federal Leadership in High Performance and Sustainable Buildings set forth a set of Guiding Principles. That specifically pertaining to water consumption:

- Indoor water use is to be reduced 20 percent below baseline calculated for the building by FY 2015, on top of Energy Policy Act of 1992 fixture performance requirements.
- Outdoor use of potable water is to be at least 50 percent less than that consumed by conventional means (in terms of plant species and plant densities) by FY 2015.
- Manage existing building systems to reduce consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs.

EO 13423

- §2(c): Beginning in FY 2008, reduce water consumption intensity, relative to the baseline of the agency's water consumption in FY 2007, through life-cycle cost-effective measures by 2 percent annually through the end of FY 2015 or 16 percent by the end of FY 2015.
- §2(f): Ensure that new construction and major renovation...comply with the Guiding Principles..., and that 15 percent of the existing Federal capital asset building inventory of the agency as of the end of FY 2015 incorporates the sustainable practices in the Guiding Principles.

EISA §433: For new or majorly renovated buildings, sustainable design principles are to be applied to their siting, design, and construction. In addition to any use of water conservation technologies otherwise required by this section, water conservation technologies shall be applied to the extent that the technologies are life-cycle cost-effective.

EPAct §102: Agencies can keep savings from energy and water reductions.

Sub-Goal 2.2 Industrial and Irrigation Water Consumption Reduced by 20% of FY 2010 Levels by FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 2.2

EO 13514 §2(d)(ii): Reduce industrial, landscaping, and agricultural water consumption by 2 percent annually or 20 percent by the end of FY 2020 relative to FY 2010.

Sub-Goal 2.3 All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintain Pre-Development Hydrology to the Maximum Extent Technically Feasible

Federal Statutory and EO Requirements Addressed by Sub-Goal 2.3

EO 13514 §2(d): Implement and achieve the metrics identified in the storm water management guidance (issued by EPA as required under §14).

EO 13514 §2(g)

- At least 15 percent of existing agency buildings (including leased) meet the Guiding Principles by FY 2015, as well as all new agency construction, major renovation and repair. Annual progress will be made towards 100 percent compliance for the agency's building inventory. The 2006 Memorandum of Understanding on Federal Leadership in High Performance and Sustainable Buildings set forth a set of Guiding Principles. That specifically pertaining to storm water management:
 - Employ design and construction strategies that reduce storm water runoff and polluted

site water runoff.

- Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.
- Manage existing building systems to reduce consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs.

EO 13423 §2(f): Ensure that new construction and major renovation...comply with the Guiding Principles..., and that 15 percent of the existing Federal capital asset building inventory of the agency as of the end of FY 2015 incorporates the sustainable practices in the Guiding Principles.

EISA §438: Maintain or restore the pre-development hydrology of the property with regard to the temperature, rate, volume, and duration of storm water flow for development/redevelopment footprints exceeding 5,000 sq ft.

Sub-Goal 4.1 Greenhouse Gas Emissions from Employee Air Travel Reduced 7% by FY 2020 Relative to FY 2011

Federal Statutory and EO Requirements Addressed by Sub-Goal 4.1

EO 13514 §2(b)(ii): Implement strategies and accommodations for transit, travel, training, and conferencing that actively support lower-carbon commuting and travel by agency staff.

Sub-Goal 4.2 30% of Eligible Employees Teleworking at Least Once a Week, on a Regular, Recurring Basis, by FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 4.2

EO 13514 §2(b)(ii): Implement strategies and accommodations for transit, travel, training, and conferencing that actively support lower-carbon commuting and travel by agency staff.

Sub-Goal 4.3 50% of Non-Hazardous Solid Waste Diverted from Disposal in Landfills Not Owned by DoD by FY 2015, and Thereafter Through FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 4.3

EO 13514 §2(e)

- Divert at least 50 percent of non-hazardous solid waste, excluding construction and demolition debris, by the end of FY 2015.
- Increase diversion of compostable and organic material from the waste stream.

Sub-Goal 5.1 All DoD Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper

Federal Statutory and EO Requirements Addressed by Sub-Goal 5.1

EO 13514 §2(e)(iv): Reduce printing paper use.

EO 13514 §2(i): Establish and implement policies to enable duplex printing.

Sub-Goal 5.2 50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by FY 2015 and Thereafter Through FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 5.2

EO 13514 §2(e)

- Divert at least 50 percent of non-hazardous solid waste, excluding construction and demolition debris, by the end of FY 2015.
- Increase diversion of compostable and organic material from the waste stream.

EO 13423 §2(e): Ensure that the agency increases diversion of solid waste as appropriate and maintains cost-effective waste prevention and recycling programs in its facilities.

Sub-Goal 5.3 60% of Construction and Demolition Debris Diverted from the Waste Stream by FY 2015, and Thereafter Through FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 5.3

EO 13514 §2(e)

- Divert at least 50 percent of construction and demolition materials and debris by the end of FY 2015.

EO 13423 §2(e): Ensure that the agency increases diversion of solid waste as appropriate and maintains cost-effective waste prevention and recycling programs in its facilities.

Sub-Goal 5.4 Ten Landfills Recovering Landfill Gas for Use by DoD by FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 5.4

EO 13514 §1, §2(a).

Sub-Goal 6.1 On-Site Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% by 2020, Relative to 2007

Federal Statutory and EO Requirements Relating to Addressed by Sub-Goal 6.1

EO 13514 §2(e)

- Source Reduction: minimize the generation of waste and pollutants through source reduction.
- Reduce the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of.
- Increase agency use of acceptable alternative chemicals and processes in keeping with the agency's procurement policies.
- Ensure that the agency reduces the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of.

Sub-Goal 6.2 100% of Excess or Surplus Electronic Products Disposed of in Environmentally Sound Manner

Federal Statutory and EO Requirements Addressed by Sub-Goal 6.2

EO 13514 §2(i): (iii) Employ environmentally sound practices with respect to the agency's disposition of all agency excess or surplus electronic products.

EO 13423 §2(h)

- (iii) Ensure that the agency uses environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.
- (iv) Ensure that the agency establishes and implements policies to extend the useful life of agency electronic equipment.

Sub-Goal 6.3 100% of DoD Personnel and Contractors Who Apply Pesticides Are Properly Certified

Federal Statutory and EO Requirements Addressed by Sub-Goal 6.3

EO 13514 §2(e): promote pollution prevention and eliminate waste by implementing integrated pest management and other appropriate landscape management practices.

Sub-Goal 7.1 95% of Procurement Conducted Sustainably

Federal Statutory and EO Requirements Addressed by Sub-Goal 7.1

EO 13514 §2(h): Ensure that 95 percent of new contract actions, excluding weapon systems, are:

- energy-efficient (Energy Star or Federal Energy Management Program)
- water-efficient
- bio-based
- environmentally preferable (e.g., certified by the Electronic Product Environmental Assessment Tool (EPEAT))
- non-ozone depleting
- contain recycled content
- non-toxic or less-toxic alternatives

where such products meet agency performance requirements.

(EO 13514 has the same criteria for products and services as given in the Federal Green Procurement Preference Program established under EO 13423, but it adds this new quantitative requirement that 95 percent of new acquisitions must meet these criteria.)

EO 13423 §2(h): When acquiring an electronic product, ensure that it meets at least 95 percent of those requirements with an EPEAT-registered electronic product, unless there is none.

EO 13514 §2(g)

- **Real Property Inventory:** When adding assets to the agency's real property inventory, identifying opportunities to consolidate and dispose of existing assets, optimize the performance of the agency's real property portfolio, and reduce associated environmental impacts.
- **Historic Buildings:** Ensure that rehabilitation of federally owned historic buildings utilizes best practices and technologies in retrofitting to promote long-term viability of the buildings.

EO 13514 §2(i):

- Ensure procurement preference for EPEAT products.
- Ensure the procurement of electronic equipment designated Energy Star and/or Federal Energy Management Program.

EO 13423

- **§2(d):** Require in agency acquisitions of goods and services: (i) the use of sustainable environmental practices, including acquisition of bio-based, environmentally preferable, energy-efficient, water-efficient, and recycled-content products; and (ii) the use of paper with at least 30 percent post-consumer fiber content.
- **§3(e):** Ensure that contracts for contractor operation of government-owned facilities or vehicles require the contractor to comply with the provisions of this order to the same extent as if the agency operated the facilities or vehicles.

EISA

- **§524:** must purchase appliances whose stand-by mode uses 1 watt or less, or the best available if <1

W not available.

- §525: must purchase products designated by Energy Star or the Federal Energy Management Program.

EPAct

- §104 regarding procurement of energy-efficient products: Energy Star products and FEMP designated products shall be clearly identified and prominently displayed in any federal inventory or listing of products; General Services Administration and DLA shall supply only Energy Star products or FEMP designated products where possible and cost-effective; electric motors between 1 and 500 horsepower will be premium efficient motors. Agencies encouraged to maximize the efficiency of air conditioning and refrigeration equipment.
- §108: Amends the Solid Waste Disposal Act to increase the use of waste such as furnace slag and fly ash in cement or concrete in federal projects.

Farm Bill Title IX, §9002: Procurement preference for the highest bio-based content, for products costing >\$10,000, based on guidance to be written.

Resource Conservation and Recovery Act (RCRA) §6002 requires federal agencies to procure products composed of the highest percentage of recovered materials practicable.

Sub-Goal 7.2 15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings By FY 2015, Holding Through FY 2020

Federal Statutory and EO Requirements Addressed by Sub-Goal 7.2

EO 13514 §2(g): At least 15 percent of existing agency buildings (including leased) are to meet the Guiding Principles (see below) by FY 2015. Annual progress will be made towards 100 percent compliance for the agency's building inventory.

EO 13423 §2(f): 15 percent of the existing Federal capital asset building inventory of the agency as of the end of FY 2015 incorporates the sustainable practices in the Guiding Principles(see below).

Guiding Principles

The Guiding Principles pertaining to energy use are:

- Employ total building commissioning practices tailored to the size and complexity of the building and its system components in order to verify performance of building components and systems and help ensure that design requirements are met.
- Establish a whole building performance target that takes into account the intended use, occupancy, operations, plug loads, other energy demands, and design to earn the Energy Star voluntary labeling program targets for new construction and major renovation where applicable.
- Measurement and Verification: In accordance with DOE guidelines issued under section 103 of the Energy Policy Act of 2005, install building level utility meters in new major construction and renovation projects to track and continuously optimize performance. Compare actual performance data from the first year of operation with the energy design target. After one year of occupancy, measure all new major installations using the Energy Star Benchmarking Tool for building and space types covered by Energy Star. Enter data and lessons learned from sustainable buildings into the High Performance Buildings Database.
- Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.
- Manage existing building systems to reduce consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs.

Those pertaining to water consumption:

- Indoor water use is to be reduced 20 percent below baseline *{of unspecified year}* by FY 2015, on top of Energy Policy Act of 1992 fixture performance requirements.
- Outdoor use of potable water is to be at least 50 percent less than that consumed by conventional means (in terms of plant species and plant densities) by FY 2015.

Those pertaining to storm water management:

- Employ design and construction strategies that reduce storm water runoff and polluted site water runoff.
- Pursue cost-effective, innovative strategies, such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials.
- Manage existing building systems to reduce consumption of energy, water, and materials, and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs.

Sub-Goal 8.1 All Environmental Management Systems Effectively Implemented and Maintained

Federal Statutory and EO Requirements Addressed by Sub-Goal 8.1

EO 13514 §2(j): Continue implementing existing environmental management systems (EMSs) to achieve the performance necessary to meet the objectives of this order.

EO 13423 §3(b)(i): Ensure use of EMS as the primary management approach for addressing environmental aspects of internal agency operations and activities.

Sub-Goal 8.2 The Sustainability of Transportation and Energy Choices in Surrounding Areas Optimized by Coordinating with Related Regional and Local Planning

Federal Statutory and EO Requirements Addressed by Sub-Goal 8.2

EO 13514 §2(f) - advance regional and local integrated planning:

- Transportation Planning: participate in regional transportation planning and recognizing existing community transportation infrastructure.
- Transit-Oriented Community Planning: ensure that planning of new Federal facilities or new leases includes consideration of sites that are pedestrian friendly, near existing employment centers, and accessible to public transit, and emphasizes existing central cities and, in rural communities, existing or planned town centers.
- Energy Planning: align federal policies to increase effectiveness of local planning for energy choices.
- New/Improved Facilities: Identify and analyze impacts from energy usage and alternatives in all environmental impact statement and environmental assessments for proposed new or expanded facilities.

Sub-Goal 8.3 All DoD Installations Will Have Integrated Pest Management Plans Prepared, Reviewed, and Updated Annually by Pest Management Professionals

Federal Statutory and EO Requirements Addressed by Sub-Goal 8.3

EO 13514 §2(e): promote pollution prevention and eliminate waste by implementing integrated pest management and other appropriate landscape management practices.



United States Marine Corps

Sustainability Plan | 2011



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A Message from the Commandant of the Marine Corps

The success of the Marine Corps in accomplishing our mission starts and ends with the individual Marine. In turn, every Marine depends on essential natural and built resources to ensure this success, both on the battlefield and at our bases, to include: energy, fuel, water, equipment, facilities, landscapes, airspace, and sea access. We must ensure our warfighters continue to have what they need to be successful, while recognizing the challenging reality that these resources are not unlimited. By using these critical resources effectively and efficiently we can meet this challenge and enhance our warfighting capability -- this is the essence of sustainability, and why attainment is a strategic, operational and tactical imperative for the Marine Corps.

Our Marine Corps Sustainability Plan focuses on leveraging innovation and opportunity at our bases and stations to ensure their capacity to enhance and endure the training and operational mission into the future. The Plan defines the goals and metrics, and roles and responsibilities to achieve this vision, and aligns with the priorities, direction and scope of the Department of Defense Strategic Sustainability Performance Plan.

Sustainability supports our continuing resolve to be resourceful and innovative while meeting our mission. As Marines, we take pride in our legacy of “doing more, with less.” Implementing sustainability practices and using our resources prudently, not only supports using our taxpayer dollars wisely, it supports and protects our most valued warfighting resource, our Marines.

Semper Fidelis,

(CMC signature)

James F. Amos

General, U.S. Marine Corps

Commandant of the Marine Corps

Part I: USMC Sustainability Policy and Strategy

Introduction

On October 5, 2009, President Barack Obama signed Executive Order (EO) 13514 that challenged Federal agencies to lead by example in making improvements in environmental, energy and economic performance by establishing an integrated strategy towards sustainability. The EO sets sustainability goals that require agencies to meet several energy, water, waste and pollution reduction targets; and requires agencies to develop Strategic Sustainability Performance Plans (SSPP) to define agency sustainability strategies, policies, implementation and progress to achieve sustainability goals and requirements. The Department of Defense (DoD) developed and published, on August 26, 2010, a DoD SSPP to meet EO 13514 and 13423 requirements and be in harmony with existing Federal statutory requirements such as those on energy and water efficiency in the Energy Policy Act of 2005, and the Energy Independence and Security Act of 2007, and others such as the Resource Conservation and Recovery Act, and the Farm Bill.

The DoD SSPP establishes a strategic framework for implementing sustainability across the DoD mission. It defines DoD sustainability policies, goals, performance targets and metrics, progress reporting protocols, investment priorities, integration with resource planning/budget processes, describes implementation methods and accomplishments, and establishes governance and functional roles and responsibilities. On October 8, 2010, the DoD directed DoD-wide implementation of the SSPP across the DoD mission, to include programming resources necessary to achieve sustainability goals and targets and reporting annual progress.

To meet DoD and Federal sustainability requirements, the Commandant of the Marine Corps has developed the United States Marine Corps (USMC) Sustainability Plan (the "Plan") presented in this document.



Purpose and Scope

The purpose of the Plan is to define a Marine Corps strategic framework for sustainability that fulfills the goals and requirements set forth by EO 13514 and aligns with the goals and policies of the DoD SSPP. The Plan accomplishes several objectives for USMC:

- 1) Defines sustainability performance goals, objectives, targets and metrics;
- 2) Identifies organizational functional roles and responsibilities;
- 3) Describes implementation strategies, policies, methods and progress; and
- 4) Serves as a guide/template for regional/installation sustainability plans.

In accordance with DoD and CMC policy, the scope and ethos of sustainability applies to all USMC mission and program areas, as discussed in the following section.

However, for purposes of this Plan, the scope of sustainability performance goals, objectives, metrics and targets defined in Part II of the Plan apply directly to USMC bases and stations, to include activities, personnel, resources, facilities, ranges, installations and non-tactical vehicles, systems and equipment, in the United States and overseas, consistent with EO 13514. Sustainability performance as it applies to the battlefield, that is the operational mission and expeditionary environment, is not covered in this plan, but rather, embedded in energy, water and waste reduction goals in the USMC Expeditionary Energy Strategy.

“Sustainability is not an individual Departmental program; rather, it is an organizing paradigm that applies to all DoD mission and program areas.”

--DoD SSPP

Sustainability Supports the Marine Corps Mission

The Marine Corps embraces sustainability as a means of improving mission accomplishment. The essence of sustainability is using mission-critical resources (i.e., energy, fuel, water, equipment, facilities, etc.) with greater efficiency while enhancing warfighting capabilities and mission. Operating more efficiently is a universal concept that can be achieved by better integrating sustainable practices across every facet of the USMC mission and capabilities, from: bases to battlefield, acquisition to fielding, concept to application.

In an expeditionary environment, sustainability is being driven by the needs of our operating forces to increase combat effectiveness and operational flexibility, reduce mission threat, and shrink the logistics footprint by employing critical resources such as energy and water in the most efficient manner and reducing waste which supports force protection and security. Sustainability is integral to the approach employed by the CMC



Expeditionary Energy Office (E2O) in articulating the USMC Expeditionary Energy Strategy and the USMC Integrated Process Team chartered to develop a Joint Capabilities Integration and Development System (JCIDS) Capabilities Based Assessment (CBA) on USMC Expeditionary Energy, Water, and Waste (E2W2). The CBA will provide analysis to support development of an E2W2 Initial Capabilities Document.

At our bases and stations, sustainability ensures the capacity of installations and ranges to enhance and endure the training and operational mission into the future. The focus of sustainability for USMC is leveraging innovation and opportunity to effectively and more efficiently use natural and manmade mission-critical resources. At our installations, sustainability drives us to continue to explore and implement resource conservation methods that meet mission needs. Sustainability supports energy security at home and abroad--ensuring a secure and reliable energy source is critical to our ability to maintain readiness.

The Marine Corps has been successful over the years due in part to Marines' ability to continuously assess their situations and adjust to the environments in which they must perform while concurrently preserving those core values and professional capabilities that help Marines to succeed in both war and in peace. Sustainability supports our continuing resolve to be resourceful and innovative while meeting our mission, now and into the future. As Marines, we must continue our legacy of "doing more with less." Lightening our load on the battlefield and at our bases--staying lean--will sustain our ability to be the Nation's expeditionary force of choice. As Marines, we are good stewards of the natural and built resources entrusted to us and needed to meet mission. Using these resources prudently, not only supports using taxpayer dollars wisely, it supports and protects our most valuable warfighting resource, our Marines.

"The Department's vision of sustainability is to maintain the ability to operate into the future without decline—either in the mission or in the natural and manufactured systems that support it."

--DoD SSPP

Sustainability Goals -- Focus and Priority Areas

The Plan is centered on three fundamental areas of focus and priority supporting an overall framework for sustainability performance, and defined by the following three sustainability goals to:

1. Improve energy and water resources management and reduce greenhouse gases;
2. Minimize waste and prevent pollution; and
3. Improve the integration of sustainability practices across all mission areas.

The sustainability performance goals and subordinate hierarchy of objectives and metrics/targets meet Federal sustainability requirements and align with the scope and metrics defined in the DoD SSPP.

GOAL 1: Improve Energy and Water Resources Management and Reduce Greenhouse Gases

The DoD recognizes that there are broad security challenges that result from the military's reliance on fossil fuels which must be addressed by the reduction of fossil fuel and non-renewable energy usage. The Marine Corps is aggressively pursuing plans to move away from traditional energy sources while increasing the use of renewable sources. The Marine Corps Expeditionary Energy Strategy provides a plan to increase combat effectiveness by reducing the energy, water and waste—the logistics footprint--of our operating forces; to improve energy and water efficiency at our bases and stations; and to emphasize an ethos to change behavior across the USMC to manage these critical resources more efficiently and prudently. Installations are retrofitting old buildings to increase energy-efficiency, and all new facilities buildings are constructed to meet LEED Silver certification standards. The Marine Corps is also testing the effectiveness of solar, wind, geothermal, and other types of renewable energy at various installations. To reduce the amount of fossil fuels consumed by garrison mobile equipment and vehicles, the USMC is increasing the number and type of alternative fuel vehicles used at our installations. By breaking our dependence upon fossil fuels, the Marine Corps becomes a more sustainable and mission-ready force.

The Marine Corps realizes that responsible water resource management is critical to mission success. Water is essential for military operations, drinking, hygiene, sanitation, food preparation, and medical care. The growing threat of water scarcity affects many Marine Corps installations. As a result, many fixed installations have developed efficient water management practices that include xeriscaping and using reclaimed water to reduce the



amount of potable water used for irrigation purposes. Installations have also been incorporating storm water management practices into their environmental programs to prevent wastewater treatment system overloads and to reduce the amount of pollutants entering bodies of water. At forward operating bases, the Marine Corps is developing new strategies to provide drinkable water in places of conflict without endangering our Marines in vulnerable convoys.

The reduction of GHG emissions goes hand-in-hand with employing energy strategies that conserve energy, reduce reliance on fossil fuels, and increase the use of renewables. Meeting the GHG reduction goals will also require investments in technologies and management practices to reduce GHG emissions from refrigerants, landfills, employee commuting, and business travel.

GOAL 2: Minimize Waste and Prevent Pollution

Many Marine Corps installations have well-established recycling and waste minimization programs. The most economically and environmentally effective program is one where as little waste is generated as possible by preventing pollution through source reduction, or as necessary, recycling what is economically feasible to support the mission. By effectively managing hazardous materials and wastes, the Marine Corps reduces the risk of contamination and financial liability that result from accidental spills, and provides a safer environment for our Marines and civilian workforce. The Marine Corps' Sustainable Acquisition program is an approach to purchase less hazardous materials and reduce life cycle costs and impacts. By buying sustainable products, the Marine Corps can be a good environmental steward, and a good neighbor to surrounding communities, while being fiscally-efficient.



GOAL 3: Improve Integration of Sustainability Practices across All Mission Areas

To achieve the Marine Corps sustainability goals and EO 13514 requirements, all program areas and personnel must work together to incorporate and integrate sustainable management practices into their everyday activities. The Plan and performance targets do not create a new Sustainability program; rather it acts as an “organizing paradigm” encompasses all mission and existing program areas and leverages sustainable opportunities in each. Integrated regional planning practices, for example, may create incentives that increase the use of alternative fuel vehicles or other transportation options, greater use of efficient travel routes which may also result in a reduction of GHG emissions and other environmental impacts, and ultimately, benefit the mission. Successful implementation of the Plan will allow the Marine Corps to continue its culture of excellence in environmental and fiscal stewardship and improve national security, both home and abroad.



Plan Implementation

The goal of sustainability is to use mission-critical resources such as energy, fuel, water, equipment, land, and facilities efficiently while enhancing warfighting capabilities. Achieving the sustainability goals of the Plan requires implementation and accountability by the responsible functional area owners. The matrix depicted in Table 1.1 depicts the organizational functional areas which have the lead responsibility or assist role for each Sustainability Goal and Objective.

Table 1.1 USMC Sustainability: Organizational Roles and Responsibilities Matrix							
	Sustainability Objectives	Environmental	Facilities	Logistics/Supply	Acquisition/Contracts	Transportation (GME/non-tactical)	Others
Goal 1: Improve Energy and Water Resources Management and Reduce GHG	1.1 Reduce Uses of Fossil Fuels	O	X	O	O	X	O MCCS
	1.2 Improve Water Resources Management	O	X		O		
	1.3 Reduce GHGs	X	O	O	O	O	O Expeditionary Energy
Goal 2: Minimize Waste and Prevent Pollution	2.1 Minimize Solid Waste	O	X	O	O		O MCCS
	2.2 Prevent Pollution	X	O	X	O		O LOGCOM
	2.3 Improve Integrated Pest Management	O	X		O		O MCCS
Goal 3: Improve Integration of Sustainability Practices Across All Mission Areas	3.1 Sustainable Buildings	O	X		O		O MCCS
	3.2 Sustainable Acquisition & Procurement	O		O	X		O MCCS/ C4
	3.3 Integrated Regional Planning	O	O			O	X CP&LO
	3.4 Environmental Management Systems (EMS)	X	O	O	O	O	
	3.5 Sustainable Ranges	O	O				X Ops & Training
Key	X: Lead			O: Assist			

USMC Policy, Planning, and Budget Integration

The Marine Corps framework for implementing the sustainability requirements reflected in the goals and objectives contained in the Plan relies upon their allocation and integration into existing functional programs, as outlined under the organizational matrix in Table 1.1. Per DoD policy, and as noted earlier in the Plan, sustainability is not a separate Departmental program itself (i.e., no individual, separate budget is established for sustainability), but rather, it is spread across, and an integral part of, existing, established programs. For each USMC functional program, applicable sustainability requirements will be integrated into the respective policies, planning and budget to support meeting these requirements and achieving the goals, objectives, and targets/metrics defined in the Plan. The incremental investment to meet these requirements may not necessarily be visible in the individual respective programs budgets until, and if, DoD creates the capability to track sustainability requirements as separate budget line items under each applicable, respective program.

Methods of Evaluating Progress

The Marine Corps is required to track and report progress to the Department of the Navy (DoN) and the DoD, on each of the sustainability targets defined in the Plan. Subsequently, the DoD will report annual progress on the DoD SSPP to the Office of Management and Budget (OMB) and the White House Council on Environmental Quality (CEQ) in accordance with EO 13514. DoD is aware that the Marine Corps, along with other DoD components, may not have the systems in place to collect data on every new metric/requirement, and plans to issue additional guidance as necessary.

Internal Coordination and Dissemination

The Marine Corps will ensure that all USMC personnel are aware of the USMC Sustainability Plan and its purpose to support the mission by using internal channels of communication. USMC sustainability policy will be issued to define objectives, direct procedures and responsibilities, and ensure accountability. Training will be provided to reach installation personnel with specific responsibilities for implementing the Sustainability Plan. The Marine Corps will conduct outreach efforts to Marine Corps families and civilians that emphasize how behavioral changes can support achievement of sustainability goals, as well as individual goals at home, such as conserving energy and water to save money and resources.

Evaluating and Prioritizing the Use of Resources

Evaluating Return on Investment

The Marine Corps is building sustainability into Operations and Maintenance (O&M) procedures and budgets for installations. By creating well-organized O&M practices, the Marine Corps can significantly improve energy and water efficiency and reduce GHG emissions. All USMC decisions or projects should calculate the return on investment as part of their approach to considering and selecting sustainability solutions. The calculation should include quantitative factors that can be weighed one against another, such as the initial purchase cost versus the energy or water costs associated with operating the equipment, differing maintenance requirements, and/or equipment lifetimes.

Factors in Acquisition and Procurement Decisions

Decisions made in the acquisition of weapon systems and the procurement of goods and services directly impact sustainability performance—for example, the demand for supporting resources to sustain these systems/products over their useful life and ensuring responsible disposal decisions. DoD is currently developing sustainability criteria



to aid researchers, developers, and program managers to make better, sustainability decisions during the acquisition process. The criteria offer many suggestions and explore opportunities for alternative products that meet DoD requirements. The criteria being developed include a set of sustainability factors to be considered at key milestones in the acquisition process; guidance on the types of lifecycle costs to be considered when analyzing alternatives, making trade-offs, and developing designs; and guidance on how to weigh or score various non-cost performance factors.

Environmental, Social, and Community Considerations

The Marine Corps recognizes that its decisions and activities affect local communities and regions, and demonstrating leadership in protecting the natural and cultural resources within our purview is an important part of our mission. Sustainable practices promote the health, safety and welfare of our Marines, their families, our civilian workforce, and our neighboring communities. The Marine Corps makes the evaluation and prioritization of its activities based upon factors beyond simply financial and regulatory elements, to include environmental, social, and community concerns and considerations as well. USMC program planning activities coordinate with key stakeholders to develop solutions to shared challenges such as:

- land use
- energy
- pollution
- population growth

We engage with stakeholders at all levels for which we operate: international, national, regional and local. The Marine Corps strives to be a good steward of the environment, and respects the protection of natural and cultural resources while ensuring the capability to conduct our operational training and testing mission. The Marine Corps also works to ensure that encroachment and resource competition surrounding our installations and ranges does not compromise training and mission capabilities. All of these considerations must be balanced to maintain sustainable practices while supporting mission readiness.



Climate Change Strategy – Mitigation and Adaptation

The DoD has outlined a strategic approach to climate change in the Congressionally-mandated Quadrennial Defense Review (QDR), published in February 2010. The USMC climate change strategy will align with the DoD policy direction provided in the QDR and address two general facets of climate change—mitigation and adaptation. Mitigation is generally defined by plans and actions to

reduce GHG emissions and the causes of, or contributors to, climate change; whereas, adaptation generally focuses on plans and actions to cope with, and adjust to, the effects and consequences of climate change.

“The Department must complete a comprehensive assessment of all installations to assess the potential impacts of climate change on its missions and adapt as required.”

-- 2010 DoD QDR

Mitigation

Climate change mitigation is primarily achieved through one of two general methods: reduction of GHG emissions from GHG sources (which produce carbon), or increases in carbon sequestration from sinks (which remove carbon from the atmosphere). GHG emissions are primarily attributable to fossil fuel combustion activities, and USMC reduction opportunities generally rely upon energy strategies that conserve energy, reduce reliance on fossil fuels, and increase the use of renewables. These strategies require investments in both technological and management practices. A small percentile of GHG emissions are attributable to non-energy USMC activities, such as methane

gas generated from landfills and wastewater treatment, and the use of refrigerants. Carbon sequestration activities may include agricultural, forestry and other land use and management practices that occur at USMC installations and ranges. Climate change mitigation efforts are covered under Goal 3 of the Plan.

Adaptation – Risks and Vulnerabilities

In the QDR, DoD identified how climate change will affect our national security mission in two broad ways while shaping the operating environment, roles, and missions we undertake. First, it will affect the deployment of our forces—both for purposes of responding to contingencies and resolving conflicts for which climate change may act as an accelerant of instability or cause geopolitical impacts; and when called upon to support humanitarian assistance or disaster relief and response both abroad or here in the United States. Second, DoD will need to adjust to the impacts of climate change on our facilities and military capabilities. Although the United States and the DoD has significant capacity to adapt and cope with climate change, it will pose challenges to both, especially given our extensive coastal infrastructure. Accordingly, consistent with DoD policy direction in the QDR, and forthcoming interagency guidance prompted by EO 13514 climate change requirements (i.e., a National Climate Change Adaptation Strategy), the USMC must complete a comprehensive assessment of all installations and ranges to assess the potential impacts of climate change on its mission and adapt as required.



General Planning Approach. The USMC is constantly assessing, planning and implementing projects and activities that support our ability to meet the mission of the USMC. Some of these activities, although not primarily directed to support climate change adaptation, nonetheless may assist in these efforts and provide mutual benefits. The effects of climate change are characterized by a degree of variability and uncertainty for a range of forecasting and modeling scenarios. Although specific climate change effects and outcomes cannot be predicted with accuracy and certainty, there are general attributes and trends in climate change that are reasonably expected to occur and can be considered in planning and conducting USMC activities. Some examples of USMC activities at installations which, indirectly or otherwise, support climate change adaptation efforts include: 1) wildfire preparation management; 2) water conservation; 3) hurricane preparedness; and 4) natural resources management.



Adaptation to Increased Risk of Wildfires. Several climate change predictive modeling scenarios include an increase in the frequency and severity of wildfires in some geographic regions affected by climate change. In Southern California for example, after increased frequency and severity of wildfires over the past few years, the USMC has initiated replacement of select aboveground communications and utilities lines to underground as much as economically feasible, so that they are clear of any fire damage should they occur, and to avoid recapitalization costs to replace fire-damaged infrastructure.

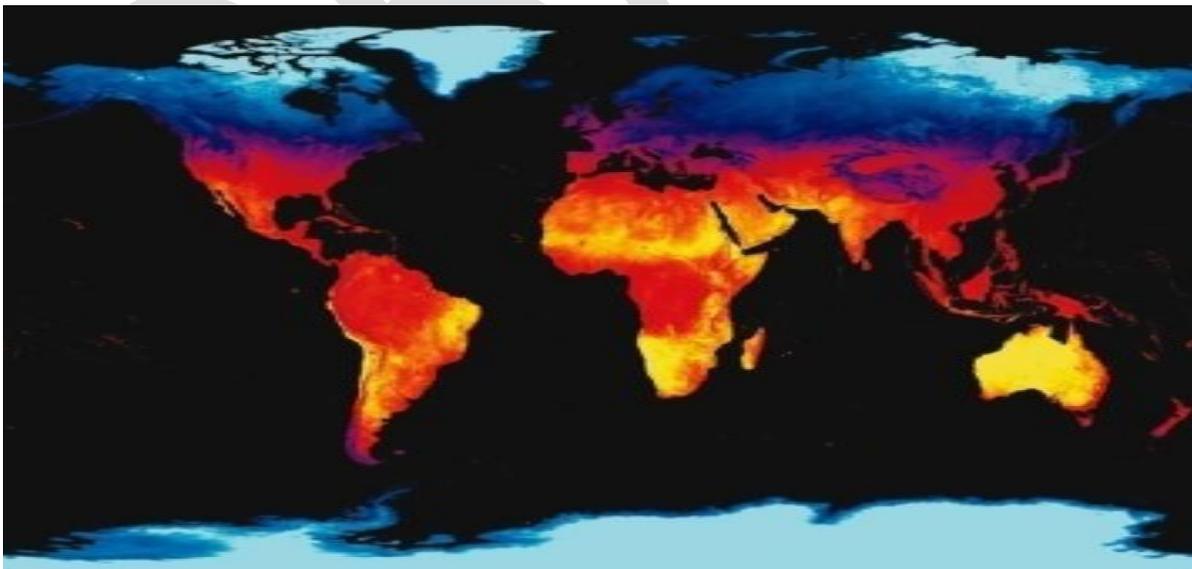
Adaptation to Increased Risk of Drought. Under a changing climate, water resources in some areas will be less abundant and face increasing pressures for demand. We are specifically seeing the early stages of this event in Southern California, where frequent drought conditions coupled with ever increasing population growth has severely taxed clean water supplies. Consequently, the USMC is expanding our use of recycled water at our installations, primarily for irrigation and other non-potable water use requirements.

Adaptation to Increased Risk of Severe Storms. The majority of USMC installations are located in coastal areas where amphibious landing and other mission critical training and operational exercises are conducted to directly support the USMC mission and our Naval mission. The forecasted increase in frequency and severity of hurricanes and tropical storms on the Eastern seaboard of the United States could directly impact this mission. Consequently, the USMC continues to consider hurricane damage vulnerability and base evacuation requirements in all facilities and operational contingency planning.



Adaptation to Changing Ecosystems. Characteristics of climate change include changing temperatures and precipitation patterns. These changes would undoubtedly alter wildlife and habitat patterns and distributions. Associated changes in ecosystems and land use decisions will also result to varying degrees in some geographic regions. The USMC monitors ecosystem conditions and trends and has adopted an adaptive management strategy for implementing Integrated Natural Resource Management Plans (INRMP) for our installations. The USMC also actively participates in numerous broader, regional partnerships to better integrate conservation strategies throughout a given region of ecosystem.

As climate science advances, the CMC will regularly reevaluate climate change risks, vulnerabilities and opportunities in order to develop USMC policies and plans to manage its effects on our operating environment, missions, and facilities. Managing national security effects of climate change will require the USMC to work jointly with other DoD components, and collaboratively with Federal agencies and traditional allies and new partners, through a whole-of-government approach.



Part II: Performance Review and Annual Update

Introduction

The Marine Corps Sustainability Plan hierarchy consists of three performance goals, eleven objectives, and twenty-three targets, as follows:

Goal 1: Improve Energy and Water Resources Management and Reduce Greenhouse Gases

- Objective 1.1: Reduce Uses of Fossil Fuels
- Objective 1.2: Improve Water Resources Management
- Objective 1.3: Reduce GHGs

Goal 2: Minimize Waste and Prevent Pollution

- Objective 2.1: Minimize Solid Waste
- Objective 2.2: Prevent Pollution
- Objective 2.3: Improve Integrated Pest Management

Goal 3: Improve Integration of Sustainability Practices across All Mission Areas

- Objective 3.1: Sustainable Buildings
- Objective 3.2: Sustainable Acquisition and Procurement
- Objective 3.3: Integrated Regional Planning
- Objective 3.4: Environmental Management System (EMS)
- Objective 3.5: Sustainable Ranges

For each objective, the following section provides:

- A narrative description of progress and accomplishments,
- Planned initiatives, and
- Applicable Targets, Metrics and Annual Target table

The performance targets in the Plan allow flexibility in the methods used to achieve them. The Targets are quantitative and are carefully defined by a performance metric that provides a neutral, rigorous means of reporting and tracking progress against the Target.

Goal 1: Improve Energy and Water Resources Management and Reduce Greenhouse Gases

Objective 1.1 Reduce Uses of Fossil Fuels

Progress and Accomplishments

The Marine Corps is committed to reducing the United States' dependence upon petroleum products and fossil fuels by implementing sustainable practices. The Marine Corps Expeditionary Energy Strategy for installations and facilities focuses aggressively upon reducing energy intensity of existing facilities, increasing energy efficiency in new construction, expanding the use of renewable resources, installing advanced meters, and procuring energy efficient products with the intent to reduce operational costs and pollutant emissions associated with completing missions. The Marine Corps Garrison Mobile Equipment (GME) program focuses upon procuring, maintaining, and managing, in a cost-effective and environmentally conscious manner, the 15,000 non-tactical vehicles that support day-to-day operations at Marine Corps installations. Both programs have had significant success in implementing sustainable policies during the past few years. Some examples of successful projects include:

- A new hydrogen facility at MCB Hawaii that services hydrogen-powered SUVs
- A facility at MCB Camp Pendleton that provides compressed natural gas (CNG) and an Internal Combustion bus that runs between two installations

- Photovoltaic panels at MCAS Yuma that charge electric vehicles and almost all fuel sites on base
- Training swimming pool at MCB Camp Pendleton heated by solar energy whose motors are powered by thermal energy
- Landfill gas recovery project at MCLB Albany

Planned Initiatives

In accordance with EO 13514 and the DoD SSPP, the Marine Corps continues to actively pursue energy-efficient and economical practices consistent with achieving mission success. It is becoming increasingly important to lessen our dependence upon fossil fuels, and the Marine Corps is determined to achieve these targets by:

- Procuring hybrid vehicles for the recruiting fleet, converting medium and heavy duty vehicles from diesel to CNG, downsizing the fleet by using smaller vehicles, and reducing the varying amounts of vehicles per installation and replacing candidate vehicles with plug-in vehicles
- Implementing facilities and GME energy strategies identified in the Marine Corps Expeditionary Energy Strategy
- Continuing to investigate and implement opportunities to promote renewable and alternative energy

Target 1.1.1 Energy Intensity of Facilities Reduced by 30 % of FY 2003 Levels by FY2015 and 37.5% by FY 2020

Define Requirement: EO 13514 §2(a)(i), §2(g)(vi); DoD SSPP Sub-Goal 1.1

Responsible CMC Office: Facilities

Metric

The percent reduction relative to FY 2003 in the total fossil fuel-generated energy consumed by USMC facilities per gross square foot of totally USMC building space. A facility is defined as per the Energy Independence and Security Act of 2007 (EISA) §432(1)(C) to be any building, installation, structure, or other property (including any applicable fixtures) owned or operated by, or constructed or manufactured and leased to, USMC. The term facility includes a group of facilities at a single location or multiple locations managed as an integrated operation, and contractor-operated facilities owned by USMC. It does not include and land or site for which the cost of facilities is not paid by USMC.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.1.1	18%	21%	24%	27%	30%	31.5%	33%	34.5%	36%	37.5%

Target 1.1.2 18.3% of Energy Consumed by Facilities is Produced or Procured from Renewable Sources by FY 2020

Define Requirement: EO 13514 §2(g)(iv), §2(g)(v), §2(a)(ii); DoD SSPP Sub-Goal 1.2

Responsible CMC Office: Facilities

Metric

The percent of total energy consumed by USMC facilities that is produced or procured from renewable energy sources. The energy is produced by USMC, produced from a USMC controlled location, or procured from another source. Renewable energy is defined as per 10 U.S.C. §2911(e) to be either thermal or electrical energy that is produced from renewable sources, including solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal (including electricity and heat pumps), municipal solid waste, and new hydroelectric generation capacity if achieved from increased efficiency or additions of new capacity at existing hydroelectric projects. A facility is defined as per EISA §432(1)(C).

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.1.2	6.5%	7.5%	8.8%	10.2%	11.5%	12.9%	14.2%	15.6%	16.9%	18.3%

Target 1.1.3 Use of Petroleum Products by Vehicle Fleets Reduced 30% by FY 2020 Relative to FY 2005

Define Requirement: EO13514 §2(a)(iii); DoD SSPP Sub-Goal 1.3
 Responsible CMC Office: LFS-2

Metric

The percent reduction in petroleum product consumption by USMC non-tactical motor vehicle fleets relative to FY 2005. Only fleets numbering 20 motor vehicles or more are covered.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.1.3	12%	14%	16%	18%	20%	22%	24%	26%	28%	30%

Objective 1.2 Water Resources Management Improved

Progress and Accomplishments

The Marine Corps recognizes the importance that water conservation practices can have upon the impact of training and mission accomplishment. The Marine Corps water management program has been implementing water conservation practices and policies for many years prior to Federal sustainability initiatives. The water management program focus is to reduce water intensity of existing facilities, increase water efficiency in new construction, install advanced meters, and procure products that use water efficiently. Some recent Marine Corps accomplishments include:

- 2009 SecNav Energy and Water Management Award given to MCAS Miramar for their water conservation efforts that resulted in an 18 percent reduction per square foot and a savings of more than 50 million gallons of water
- Successful replacement of water-thirsty plants with plants that minimize the need for irrigation, called xeriscaping, at MCIWEST installations

Planned Initiatives

In accordance with EO 13514 and the DoD SSPP, the Marine Corps is continuing to pursue high water efficiency targets and economical practices. With this Plan, the Marine Corps is reaffirming its standing commitment to develop and implement resourceful water management procedures. The Marine Corps is aiming to meet the following targets by:

- Completing a comprehensive water evaluation of facilities every four years to fix problems and promote innovation
- Updating water metering systems
- Continuing to xeriscape, especially in desert areas

Target 1.2.1 Potable Water Consumption Intensity by Facilities Reduced by 26% of FY 2007 Levels by FY 2020

Define Requirement: EO 13514 §2(d)(i), §2(d)(iii); DoD SSPP Sub-Goal 2.1
 Responsible CMC Office: Facilities

Metric

The percent reduction relative to FY 2007 in total water consumed by USMC facilities per gross square foot of total building space. Consumption includes the loss of water after it is delivered (for example though leaking or malfunctioning fixtures such as toilets). A facility is defined as per EISA §432(1)(C).

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.2.1	8%	10%	12%	14%	16%	18%	20%	22%	24%	26%

Target 1.2.2 Industrial and Irrigation Water Consumption Reduced by 20% of FY 2010 Levels by FY 2020

Define Requirement: EO13514 §2(d)(ii); DoD SSPP Sub-Goal 2.2

Responsible CMC Office: Facilities

Metric

The percent reduction relative to FY 2010 in total water consumed by USMC for irrigation (agricultural and/or landscaping) and industrial purposes.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.2.2	2%	4%	6%	8%	10%	12%	14%	16%	18%	20%

Target 1.2.3 All Development and Redevelopment Projects of 5,000 Square Feet or Greater Maintaining Pre-Development Hydrology to the Maximum Extent Technically Feasible

Define Requirement: EO 13514 §2(d)(iv); DoD SSPP Sub-Goal 2.3

Responsible CMC Office: Facilities

Metric

The percent of covered projects (those development and redevelopment projects of 5,000 square feet or greater) that can demonstrate with documentation that storm water design objectives were met through practices that infiltrate, evapotranspire and/or harvest and use the rainfall to the maximum extent technically feasible. The criterion for maximum extent technically feasible is the full employment of accepted and reasonable storm water infiltration and reuse technologies subject to site and applicable regulatory constraints.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.2.3	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Objective 1.3 Reduce GHGs

Progress and Accomplishments

The Marine Corps continues to strive to reduce GHG emissions through energy conservation and efficiency projects, and the promotion of renewables and alternative energy sources. GHG emissions have been reduced by implementing renewable energy projects for installations and alternative fuels for vehicle fleets. Some accomplishments include:

- An eight percent reduction since FY 2003 in GHG emissions from energy intensity as of FY 2009

Planned Initiatives

Plan and implement energy policies and projects to support achievement of this and other Marine Corps energy and environmental goals.

Target 1.3.1 GHG Emissions from Scope 1 and Scope 2 Sources Reduced 34% by FY 2020 Relative to FY 2008

Define Requirement: DoD SSPP Goal 3

Responsible CMC Office: Environmental

Metric

N/A

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.3.1		10%			19%			28%		34%

Target 1.3.2 GHG Emissions from Scope 3 Sources Reduced 13.5% by FY 2020 Relative FY 2008

Define Requirement: EO13524 §2(b); DoD SSPP Goal 4
 Responsible CMC Office: Environmental

Metric
 N/A

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.3.2	0%	1%								13.5%

Target 1.3.2.1 GHG Emissions from Employee Air Travel Reduced by 7% by FY 2020 Relative to FY 2011

Define Requirement: CEQ guidance on EO 13514 §2(b)(ii); DoD SSPP Sub-Goal 4.1

Responsible CMC Office: Environmental/Defense Travel System

Metric

The percent reduction of GHG emissions from air travel by MC employees on MC business, relative to FY 2011, as calculated from travel data captured by the Defense Travel Management Office.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.3.2.1	0%	0%	1%	2%	2%	3%	4%	5%	6%	7%

Target 1.3.2.2 30% of Eligible Employees Teleworking at Least Once a Week on a Regular, Recurring Basis by FY 2020

Define Requirement: CEQ guidance on EO 13514 §2(b)(ii); DoD SSPP Sub-Goal 4.2

Responsible CMC Office: Human Resources

Metric

The percent of MC employees eligible to telework who are doing so at least once a week on a regular, recurring basis. Telework can be at any approved location: home, a regular General Services Administration telework Center, and/or a secure telework site meeting the additional requirements for facility construction, network security, and access control for employees needing access to classified networks. An employee's day off during a compressed work schedule cycle does not count as a telework day.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.3.2.2	10%	15%	17%	19%	21%	23%	25%	27%	29%	30%

Target 1.3.2.3 50% of Non-Hazardous Solid Waste Diverted from Disposal in Landfills Not Owned by USMC by FY 2015, and Thereafter Through FY 2020

Define Requirement: CEQ guidance on EO 13514 §2(b)(ii); DoD SSPP Sub-Goal 4.3

Responsible CMC Office: Facilities

Metric

The percent of the non-hazardous solid waste stream generated and collected by USMC facilities (by weight), without construction and demolition debris, that by reuse, recycling, and/or composting is directed away from disposal in landfills not owned by the Marine Corps.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 1.3.2.3	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%

Goal 2: Minimize Waste and Prevent Pollution

Objective 2.1 Minimize Solid Waste

Progress and Accomplishments

The Marine Corps will continue to follow Federal and DoD requirements to achieve our goals of reducing solid waste (SW) generation and increasing the number of recycling programs. The Marine Corps has followed and will continue to follow the hierarchy approach for SW management: source reduction, reuse, donation, recycling, composting/mulching, incineration for volume reduction with energy recovery, other forms of volume reduction, and landfilling. All installations have implemented a Qualified Recycling Program (QRP) where income is gained from recycling brass, cardboard, and plastic. Fifty percent of the money is reinvested into pollution prevention programs while the remaining fifty percent is devoted to welfare and recreation projects. In recent years, the Marine Corps accomplishments include:

- Increased revenue by \$700,000 per FY on average at MCB Butler by applying a more streamlined recycling process
- Achieved an average Construction and Demolition (C&D) diversion rate of over ninety-four percent at MCAS Yuma during the period of FY05 thru FY08
- Integrated C&D waste into training exercises to replicate demolished town buildings at MCB Camp Lejeune and MAGTFTC Twentynine Palms

Planned Initiatives

The Marine Corps is planning to implement several initiatives to support installation efforts to increase diversion of SW, other solid waste (OSW), and C&D debris. These efforts include:

- Periodically publishing a newsletter to engage the installation SW community in discussions to increase awareness of SW diversion goals, current and future initiatives, and installation success stories.
- Conducting a review of installation solid waste management plans to identify areas for improvement as well as initiatives that can be shared across USMC installations.
- Surveying a representative set of installations to identify areas where Headquarters Marine Corps can provide support by issuing policy or guidance to help improve SW diversion. Initial efforts could focus on the largest generators of SW.

Target 2.1.1 All USMC Organizations Implementing Policies by FY 2014 to Reduce the Use of Printing Paper

Define Requirement: EO 13514 §2(e)(iv), §2(i); DoD SSPP Sub-Goal 5.1

Responsible CMC Office: Facilities

Metric

The number of USMC facilities that: 1) have issued a policy that establishes a program for reducing the use of printing paper, where the program consists of two or more initiatives that drive the transition to a culture of reduced paper; and 2) are actively implementing that program.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.1.1	1	6	24	31	31	31	31	31	31	31

Target 2.1.2 50% of Non-Hazardous Solid Waste Diverted from the Waste Stream by FY 2015, and Thereafter though FY 2020

Define Requirement: §2(e)(ii); DoD SSPP Sub-Goal 5.2

Responsible CMC Office: Facilities

Metric

The percent of the total non-hazardous solid waste stream generated and collected by USMC facilities (by weight), without construction and demolition debris, that is directed away from the waste stream, for example by reuse, recycling, and/or composting.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.1.2	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%

Target 2.1.3 60% of Construction and Demolition Debris Diverted from the Waste Stream by FY2015, and Thereafter through FY 2020

Define Requirement: §2(e)(iii); DoD SSPP Sub-Goal 5.3

Responsible CMC Office: Facilities

Metric

The percent of construction and demolition materials and debris generated and collected by USMC facilities (by weight) that is directed away from the waste stream, for example by reuse, recycling, and/or mulching.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.1.3	42%	44%	46%	48%	50%	50%	50%	50%	50%	50%

Objective 2.2 Prevent Pollution

Progress and Accomplishments

The Marine Corps Pollution Prevention program focuses upon source reduction through increased efficiency in the use of raw materials, energy, water, and other resources; the purchase of sustainable goods; improved hazardous material management; and the support of recycling programs onsite. One critical aspect of the Pollution Prevention program is hazardous material and waste management. The Marine Corps follows all Federal requirements under CERCLA, RCRA, HSWA, and all other applicable regulations. Some accomplishments of the Pollution Prevention program include:

- The hosting of annual Earth Day celebrations at all installations to emphasize the importance of sustainable practices while at work and opportunities at home
- A twenty-four percent reduction in Toxic Release Inventory (TRI) chemicals as of CY 2008 primarily attributable to a decrease in nitrates as a by-product of wastewater treatment

Planned Initiatives

The Marine Corps will continue to explore and implement compliance and pollution prevention opportunities to reduce TRI chemicals and reportable releases. To support hazardous materials reduction, the Marine Corps has recently implemented the Authorized Use List (AUL) policy which prohibits installations from purchasing or using hazardous materials that are not found on an approved list. By buying sustainable materials and increasing the amount of hazardous material tracking and visibility, will reduce costs as well as environmental pollution and occupational health risks.

Target 2.2.1 On-Site Releases and Off-Site Transfers of Toxic Chemicals Reduced 15% by FY 2020, Relative to FY 2007

Define Requirement: EO 13514 §2(e)(v); DoD SSPP Sub-Goal6.1

Responsible CMC Office: Environmental

Metric

The total release of toxic chemicals to the environment and off-site transfers of such chemicals, in terms of the Toxics Release Inventory (TRI) Reportable Quantity (in pounds released or transferred), relative to the calendar year 2007 baseline for EPCRA Section 313 toxic chemicals reported between January 1 - December 31, 2006. DoD reports this information to EPA annually. The sub-goal does not include releases from ammunition production, military munitions, operational range activities, mission critical weapon system support activities, and conventional and chemical military munitions demilitarization.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.2.1					5%			10%		15%

Target 2.2.2 100% of Excess or Surplus Electronic Products Disposed of in an Environmentally Sound Manner
 Define Requirement: EO §2(i)(iii); DoD SSPP Sub-Goal 6.2
 Responsible CMC Office: Facilities

Metric

The percent of excess or surplus USMC electronic products disposed of in an environmentally sound manner, where environmentally sound is defined as either:

- donating to a charitable cause;
- using a manufacturer’s take-back or trade-in service; or
- trading-in, recycling (including refurbishment and resale) or disposal through a facility that is fully licensed for treatment and disposal, and in a manner consistent with the EPA guide titled “Plug-In to eCycling: Guidelines for Materials Management” (<http://www.epa.gov/osw/partnerships/plugin/pdf/guide.pdf>).

Electronic products are defined as per the DoD Electronics Stewardship Plan: devices that are dependent on electric currents or electromagnetic fields in order to work properly.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.2.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Objective 2.3 Integrated Pest Management

Progress and Accomplishments

In accordance with Marine Corps policy, installations have established Integrated Pest Management (IPM) programs that conform to DoD requirements and assure compliance with applicable laws and regulations. NAVFAC Atlantic is supporting the Marine Corps by collecting information on the percentage of USMC installations with current IPM Plans.

Planned Initiatives

The Marine Corps is strengthening established compliance audit mechanisms (i.e., through the Marine Corps Environmental Compliance Evaluation Program) to ensure USMC installations are complying with IPM requirements and regulations, and have implemented an effective IPM program.

Target 2.3.1 100% of USMC Personnel and Contractors Who Apply Pesticides Are Properly Certified Through 2020
 Define Requirement: EO §2(e)(vii); DoD SSPP Sub-Goal 6.3
 Responsible CMC Office: Facilities

Metric

Percent of personnel who applied pesticides on USMC installations during the fiscal year who were properly certified. Direct hire employees, certified in accordance with DoD 4150.7-P and DoDI 4150.7-M, have a maximum

of two years to become certified after initial employment. Contracted employees shall have appropriate State or host-nation certification in the appropriate categories at the time the contract is effective. These certifications are in accordance with Environmental Protection Agency rules and regulations and are accepted as valid certifications.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.3.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Target 2.3.2 All USMC Installations Have Integrated Pest Management Plans Prepared, Reviewed, and Updated Annually by Pest Management Professionals

Define Requirement: EO §2(e)(vii); DoD SSPP Sub-Goal 8.3

Responsible CMC Office: Facilities

Metric

The percent of USMC installations that maintained integrated pest management plans that were prepared, reviewed and updated annually by a USMC-certified pest management consultant and/or the installation pest management coordinator. These plans describe how the installation will prevent, manage and control animal and plant pests while following the principles of integrated pest management and Federal, State and local laws. The plans are generated by the installation, are updated annually and are reviewed and approved by the respective Military Department senior pest management professional(s).

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 2.3.2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Goal 3: Improve Integration of Sustainability Practices Across All Mission Areas

Objective 3.1 Sustainable Buildings

Progress and Accomplishments

The Marine Corps implements sustainable building performance criteria through facilities maintenance and construction standards provided by NAVFAC. The NAVFAC Engineering Construction Bulletin (ECB) 2011-01 (20 December 2010) was recently issued to require that all repair or alteration of existing buildings comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings. Per ECB 2011-01, building repair projects with project thresholds exceeding \$2.5M shall be developed to reduce the consumption of energy, water, and materials and to identify alternatives that reduce maintenance costs.

Planned Initiatives

The Marine Corps Order for Energy will be revised to incorporate this requirement and facilitate tracking performance.

Target 3.1.1 15% of Existing Buildings Conform to the Guiding Principles on High Performance and Sustainable Buildings by FY 2015, Holding Through FY 2020

Define Requirement: EO 13514 §2(g)(ii), §2(g)(iii); DoD SSPP Sub-Goal 7.2

Responsible CMC Office: Facilities

Metric

The percent of existing buildings over 5,000 ft² (combined owned and leased) that meet the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles), as per the December 2008 implementation guidance developed by the Interagency Sustainability Work Group.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 3.1.1	7%	9%	11%	13%	15%	15%	15%	15%	15%	15%

Objective 3.2 Sustainable Acquisition and Procurement

Progress and Accomplishments

The Marine Corps Sustainable Acquisition and Procurement program (formally known as “Green Procurement”) follows the directive and Federal requirements in Executive Orders 13423 and 13514 to promote sustainable purchasing practices. This program requires the purchase of sustainable, federally-mandated products and services. Types of products include: recycled content, bio-based, energy-efficient, EPEAT-registered, alternatives to hazardous and toxic chemicals, renewable energy sources, alternative fuels, and alternative fuel vehicles.

Planned Initiatives

The Marine Corps will continue to work with the General Services Administration (GSA) and the Defense Logistics Agency (DLA) to procure sustainable products at all installations purging all unnecessary products like Styrofoam from the supply chain. The Marine Corps will also educate contract writers, vendors, and product purchasers about sustainability requirements and mandates. Federal Procurement Data System (FPDS) data is available for contract actions on recycled content products. However, FPDS currently does not have the ability to track or report contract actions for products that are energy/water efficient, environmentally preferable, bio-based, less toxic/non-toxic, and/or non-ozone depleting. The General Services Administration expects that updates to FPDS will be completed in FY 2012 to incorporate contract actions for these other types of green products.

Target 3.2.1 95% of Procurement Conducted Sustainably

Define Requirement: EO 13514 §2(h), EO 13514 §2(g), EO 13514 §2(i); DoD SSPP Sub-Goal 7.1

Responsible CMC Office: Acquisition/Contracts

Metric

The percent of contract actions (new contracts and modifications) that adhere to the principles of sustainability by containing requirements for (as relevant and where such products and services meet USMC performance requirements): energy-efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water efficient, bio-based, environmentally preferable (e.g., certified by the Electronic Product Environmental Assessment Tool), non-ozone depleting, containing recycled content, and/or are non-toxic or less-toxic alternatives. The sub-goal applies to products and services, including task and delivery orders, but excluding the acquisition of weapon systems and their components and spare parts. The Federal Procurement Data System will be used as the source of data on contracts meeting these requirements.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 3.2.1	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

Objective 3.3 Integrated Regional Planning

Progress and Accomplishments

The Community Plans and Liaison Office’s (CPLO) primary purpose is mission sustainment. This takes the form of cooperative community planning across the board for installations, ranges, and military training routes by working with Federal, regional and local planning agencies on a continuous basis. Efforts involve planning for transportation and energy resource development to include partnerships in developing environmental and energy/utility sustainment projects. HQMC CPLO provides policy and funding to the Regions in support of its sustainment mission, the Regional CPLO’s work with states on regional planning initiatives such as the SouthEast

Regional Partnership for Planning and Sustainability, and the installations' work with local and sub-regional communities.

The USMC ensures that Environmental Impact Statements (EIS) and Environmental Assessments (EA) for proposals under NEPA comply with regional and local integrated planning requirements contained in E.O. 13514 and reflected in the DoD SSPP.

Planned Initiatives

The USMC NEPA Manual is currently being updated to reflect the EIS/EA requirements contained in E.O. 13514.

Target 3.3.1 Sustainability of Transportation and Energy Choices in Surrounding Areas Optimized by Coordinating with Related Regional and Local Planning

Define Requirement: EO13514 §2(f); DoD SSPP Sub-Goal 8.2

Responsible CMC Office: CP&LO

Metric

Instances of coordination by USMC, at any level, which ensured that all relevant factors, including GHG emissions, were considered in making the best decisions in the interest of sustainable transportation and energy choices in the area. This engagement can take the form of coordinating its own transportation, energy, and/or facility planning with surrounding communities, and/or participating in regional- or community-level planning related to transportation or energy (including environmental impact statements and environmental assessments).

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 3.3.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Objective 3.4 Environmental Management System (EMS)

Progress and Accomplishments

The Marine Corps has effectively implemented a well-established and integrated EMS at all USMC installations.

Planned Initiatives

The Marine Corps will continue to implement EMS at all appropriate organizational levels. We will also ensure that that EMS is appropriately maintained to achieve the performance necessary to meet the goals of Executive Order 13514. While Marine Corps installations continued to improve their EMS, Headquarters Marine Corps (HQMC) has undertaken several initiatives to improve EMS performance under this objective.

Target 3.4.1 All Environmental Management Systems Effectively Implemented and Maintained

Define Requirement: EO13514 §2(j)(i), §2(j)(ii), §2(e)(x), §2(i)(v), §2(g)(vii); DoD SSPP Sub-Goal 8.1

Responsible CMC Office: Environmental

Metric

Overall USMC status using the Federal Environmental Management System Metrics as reported in the Defense Environmental Programs Annual Report to Congress. The overall USMC status is a color rating (Green, Yellow or Red) for all USMC facilities and organizations for which an environmental management system (EMS) is appropriate. Status is based on the color ratings for individual facilities determined using the Federal EMS Metrics. An overall Green rating requires at least 80% of all EMS-appropriate facilities and organizations to have Green EMSs, with no more than 5% total Red EMSs. An overall Yellow requires no more than 10% Red EMSs. An overall Red is assigned when the status is neither Green nor Yellow.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 3.4.1	green									

Objective 3.5 Sustainable Ranges

Progress and Accomplishments

Marines must train on operational ranges that will prepare them to execute their mission using modern warfare tactics. This training requires sufficient land area, airspace, sea space, frequency spectrum, and training range infrastructure to safely and effectively accomplish the full spectrum of mission-essential training. Increasingly, however, encroachment near training areas may potentially impact current and future military training. Encroachment assessments were performed to evaluate the effects of factors such as threatened and endangered species, munitions restrictions, noise restrictions, and adjacent land use have upon the training mission. The Marine Corps is confident, however, that it will continue to meet the rigorous training demands required to properly prepare Marines despite challenges placed upon training and limited resources.

The Range Environmental Vulnerability Assessment (REVA) Program is a sustainable ranges program that has completed baseline assessments of all USMC operational ranges and training areas for potential threats to human health and the environment. No such threats have been found or determined.

Planned Initiatives

The Marine Corps will continue to aggressively invest in range modernization and correct range-accessibility shortfalls. Land acquisition and the mitigation of encroachment are top priorities. To maintain ranges capable of preparing our Marines to achieve mission success abroad, the Marine Corps will focus upon achieving the following six objectives:

- Preserve and enhance live-fire combined arms training, including the capability to support large-scale exercises
- Recapture littoral training capabilities at Camp Lejeune and Camp Pendleton
- Leverage technology and provide feedback for better training
- Mitigate encroachment
- Facilitate cross-service utilization
- Support the Joint National Training Capability

Target 3.5.1 Range Environmental Vulnerability Assessments

Define Requirement: CMC Policy (MCO P5090.2 Rev.)

Responsible CMC Office: LFL Environmental

Metric

Percent completion of scheduled subsequent Marine Corps REVA assessments to update baseline REVA assessments to be completed, at a minimum, every five years (from the baseline or previous assessment) or whenever significant changes occur that may affect the determinations made during the previous assessment (e.g., a major orientation change in the operational range, or the operational range undergoes a modification).

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 3.5.1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Target 3.5.2 (TBD by TECOM SRI Mgmt Office)

Define Requirement: DoD's Sustainable Ranges Initiative (SRI)

Background: The Marine Corps Sustainable Ranges milestone goals are contained in the DoD Comprehensive Training Range Sustainment Plan (2010). In addition, the USMC Mission Capable Ranges Program provides a

strategy for defining and executing the range management program to meet the needs and capabilities of the warfighter. For guidance about implementation and priorities of the Mission Capable Ranges program, see the Marine Corps Reference Publication (MCRP) 3-0C, *Marine Corps Operational Training Ranges Required Capabilities*.
Responsible CMC Office: Ops & Training (TECOM)

Metric

TBD by TECOM.

Annual Targets

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Target 3.5.2										

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UNITED STATES MARINE CORPS
MARINE CORPS INSTALLATIONS WEST
BOX 555200
CAMP PENDLETON, CALIFORNIA 92055-5200

IN REPLY REFER TO:
MCIWESTO 5090.3
ENVSEC

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MARINE CORPS INSTALLATIONS WEST ORDER 5090.3

From: Commanding General
To: Distribution List

Subj: MCIWEST SUSTAINABILITY MANAGEMENT PROGRAM (SMP)

Ref: (a) Executive Order 13514 (74 Fed.Reg.194; Oct.8, 2009)
(b) Executive Order 13423 (72 Fed.Reg.3919; Jan. 24, 2007)
(c) Section 748 of Public Law No: 111-8 H.R.1105 Omnibus Appropriations Act of 2009
(d) Department of Defense Strategic Sustainability Performance Plan dtd 2 Jun 2010
(e) Department of the Navy Green Procurement Program Implementation Guide dtd 5 Feb 2009(notal)
(f) 40 Code of Federal Regulations (CFR) 247
(g) HQMC-LFL ltr dtd 19 MAR 2007 USMC Environmental Management System Conformance and self-declaration supplemental guidance
(h) MCIWEST Order 5090.1
(i) Information Quality Act: Section 515 of the Treasury and General Government Appropriations Act of 2001 (PL 106-544, H.R. 5658) 66 Fed. Reg. 49718

Encl: (1) EO 13423/13514 Goals Summary Matrix
(2) Sustainability Executive Steering Committee (SESC) Charter
(3) Definitions

1. Situation. References (a) thru (f) provide the specific requirements that must be met in implementing the Executive Orders intended to: 1) Accomplish Absolute Reductions in Green House Gas(GHG) Emissions and GHG Inventories; 2) Improve Energy Efficiency; 3) Improve Water Use efficiency and management; 4) Promote Pollution Prevention & Waste Reduction; 5) Advance Regional & Local Integrated Planning to create sustainable communities; 6) Implement Sustainable Building Design, Construction, O&M, & Deconstruction; 7) Advance Sustainable Acquisition (Green Procurement); 8) Optimize Fleet & Transportation Management/Alternative Fuels; 9) Promote Electronics Stewardship; 10) Utilize an Environmental Management System (EMS) approach. Enclosure (1), expanded, provides a summary of the specific goal requirements established for the

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above listed areas of interest. References (a) and (b) direct Federal agencies to implement formal Environmental Management Systems (EMS) at all appropriate organizational levels and to use the EMS as the primary management approach for implementing the sustainability requirements contained therein. In April 2009, reference (c) enacted EO 13423 into law. Reference (i) requires that influential fiscal or scientific data actively provided to the public must undergo a rigorous robustness check and meet a reproducibility standard. Since the sustainability management data collected per this order may be used in Strategic Communications Planning and Outreach, reference (i) provides a standard that should be used as guidance before this data is released to the public.

2. Mission. The purpose of the Sustainability Management Program (SMP) is to supplement the references by providing policy and assigning responsibilities that will support MCIWEST's implementation and meet the objectives of references (a) and (b). This order applies a risk-to-mission based EMS approach at the regional level which establishes and verifiably manages the measurable objectives and targets as the primary mechanism for ensuring sustainable operations while identifying and resolving systemic issues which may hinder achievement of those objectives and targets.

3. Execution

a. Commander's Intent and Concept of Operations

(1) Commander's Intent. To ensure that MCIWEST and its installations prepare and implement plans that will achieve the objectives of reference (a) by reducing the environmental, transportation, and energy-related footprint that supports their respective missions in an environmentally, economically and fiscally sound and sustainable manner. The regional EMS approach will be used to document and support related reporting and decision-making. Sustainable management recognizes the short term, long term, direct and indirect cumulative impacts of day-to-day installation operations and ensures that neither current nor future installation Title 10 military missions are unduly degraded by impacts to or from the environment. Thus, the MCIWEST SMP ensures that efforts and resources are properly deployed in regard to sustainability training, monitoring and measuring, and reporting. The SMP also ensures that senior management plays an active role in evaluating status, trends, and progress and decision-making towards the commitment to

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reduce the consumption of energy and resources and to sustain installation military missions.

(a) *Applicability.* This Order is applicable to all MCIWEST installations, the MCIWEST staff offices designated as Lead Responsible Office (LRO), and to the members of the Sustainability Executive Steering Committee (SESC).

(b) *Responsibilities.* MCIWEST installation commanders are responsible for creation and implementation of Installation Sustainability Action Plans (ISAP) and POA&Ms to achieve mandated reductions of references (a) and (b). Those MCIWEST functional area managers designated as LRO by this Order are responsible for support, oversight, and advocacy for ISAPs. LROs also are responsible for the development of Regional sustainability action strategies, plans, and processes that will ensure realization of the mandated goals across the Region, per enclosure (1). Departments or Branches designated as LRO will i) establish appropriate Regional performance measures, targets, and Plans of Actions & Milestones(POA&Ms), ii) maintain and report data on achieving objectives/targets and performance metrics, iii) identify and resolve any systemic issues in each functional area; iv) provide prioritization of advocacy for installation projects and programming of initiatives necessary to achieve established goals, (v) report, semi-annually or as required, to the MCIWEST Sustainability Executive Steering Committee on progress toward goal achievement.

(c) *Oversight.* A Sustainability Executive Steering Committee (SESC) will be chartered to i) ensure compliance with the provisions of this instruction, ii) exercise oversight of status and progress toward realization of regional/installation objectives and targets and POA&Ms through periodic briefings and/or reports by installations and LROs; and iii) support advocacy and prioritization of initiatives to achieve sustainability goals. The MCIWEST SESC will annually review the overall performance of the regional SMP and identify issues and/or trends of concern and commendation.

(d) *Funding.* Each objective owner will ensure the programming of funds to implement the related POA&M through the LRO's HQMC sponsor. Reference (h) establishes that environmental funds will not be used to fund non-environmental initiatives/projects.

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(e) *Outreach*. Establish data quality and strategic communications review requirements/procedures to: i) determine which, if any, sustainability data should be actively disseminated to the public; ii) confirm the adequacy of data actively provided to the public by ensuring the data is precise, substantively accurate and complete, and sufficient to withstand public scrutiny and legal challenge; and iii) prepare a strategic communications plan by which the sustainability data will be communicated.

(2) Concept of Operations. To support realization of the goals established by the references, this Order provides implementing policies, assigns responsibilities and action to goal owners, Installation Commanders, and MCIWEST staff, and establishes the MCIWEST Sustainability Executive Steering Committee (SESC). The goals established by references (a) and (b) are consolidated into 10 overarching goals, as reflected at enclosure (1). As described above, the owner (Commanding Officer through the Lead Responsible Office) generates the projects and the POA&M to achieve the mandated goals, objectives and, per references (c) and (h), ensures adequate funding and resources are requested to implement the POA&M.

a. MCIWEST Lead Responsible Office (LRO) Goal Owner will:

(1) Develop and implement a Regional Sustainability Implementation Plan (RSIP) that integrates Installation Sustainability Action Plans (ISAP) with Regional initiatives to assure realization of reference (a) and (b) goals, objectives, and targets.

(2) Provide in process reviews of installation ISAPs during development; monitor and report installation and MCIWEST overall status and progress in meeting specified sustainability goals, per enclosure (1).

(3) Advocate for MCIWEST and installation funding requirements to implement RSIPs and ISAPs and meet related Plans of Action and Milestones (POA&M) for goals designated by enclosure (1).

(4) Establish a Regional Sustainability Working Group made up of the MCIWEST and installation LROs for each goal to enhance the cross-installation communication of available technologies and business processes and conduct in progress reviews of status of POA&Ms.

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(5) Utilize the MCIWEST EMS Sustainability Management Tool (SMT) to support planning, execution, monitoring and adaptation of the RSIP to achieve goal mandates

(6) Provide status and progress reviews via update of the SMT and periodic reporting to the SESC.

b. Installation Commanding Officers will:

(1) Develop and implement an Installation Sustainability Action Plan (ISAP) that will achieve the goals and objectives established by references (a) and (b).

(2) Designate Installation Lead Responsible Offices (LRO) per enclosure (1) to:

(a) Develop sustainability projects, processes, and Plans of Action and Milestones (POA&M) to implement, track, and report status and progress toward achieving references (a) and (b) goals and objectives within their functional area of responsibility.

(b) Maintain current goal/objective/target status and progress via update of the Sustainability Management Tool (SMT).

(c) Participate in MCIWEST LRO working groups.

(d) Identify and program for funding required to implement the ISAP through the Program Objective Memorandum (POM) process; budget for and execute funds received for ISAP projects.

(3) Staff ISAPs to MCIWEST LROs during development and provide reports, annually or as required, to MCIWEST on status progress toward achieving reference (a) and (b) targets and objectives.

(4) Utilize the installation EMS capabilities and processes to plan, execute, monitor and adapt the ISAP to achieve goal mandates and to assemble and maintain the administrative record.

(5) Ensure that NEPA/permit conditions are met when implementing ISAP initiatives as required.

c. The MCIWEST Chief of Staff serves as the chairman of the MCIWEST SESC, per enclosure (2).

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d. G-3:

(1) Serve as an advisory member of the MCIWEST SESC per enclosure (2).

(2) Maintain and provide the SESC with situational awareness of Marine Corps tactical and range sustainability initiatives and issues.

e. G-4 (Facilities):

(1) Act as the LRO requirement owner for Energy and Water conservation, Green Building and Sustainable Development, and Pollution Prevention and Waste Reduction goals, per enclosure (1).

(2) Ensure projects and targets and POA&Ms are generated as well as development and/or implementation of other program elements, to include programming of funds to support the goals and objectives as summarized at enclosure (1).

(3) Serve as a standing member of the MCIWEST SESC, per enclosure (2).

f. G-4 (Regional Services):

(1) Act as the LRO requirement owner for Transportation and Green Procurement goals, per enclosure (1).

(2) Ensure projects and targets and POA&Ms are generated as well as development/implementation of other program elements, to include programming of funds to support the goals and objectives as summarized at enclosure (1).

(3) Ensure adequate training resources are made available to support green procurement program requirements.

(4) Serve as a standing member of the MCIWEST SESC per enclosure (2).

g. G-4 (Environmental Security):

(1) Act as the LRO, requirement owner for Green House Gas and Environmental Management Systems goals, per enclosure (1).

(2) Serve as a standing member of the MCIWEST SESC, per enclosure (2).

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(3) Facilitate an annual review of sustainability activities on MCIWEST using criteria set forth in references (a) and (g) and enclosure (1).

(4) Coordinate the agenda and activities of the MCIWEST SESC to include distribution of all documents for staff review, facilitate SESC meetings, prepare meeting minutes and ensure publication and distribution as directed by the SESC and the CG MCIWEST.

(5) Ensure that the MCIWEST SMP and source documents supporting the sustainability metrics is assembled and maintained.

(6) Establish and coordinate a Regional Sustainability Working Group of MCIWEST LROs to review RSIP status and progress and identify issues that require engagement of MCIWEST or higher headquarters for resolution.

(7) Maintain an updated summary matrix of active objectives/targets/POA&Ms for MCIWEST and its installations; oversee and report the status and progress toward Goal mandates to the SESC, semi-annually unless otherwise directed.

(8) Maintain an updated regional inventory of green house gases emissions and reductions, and other pollution prevention performance metrics, as required by reference (b), in the MCIWEST area of operations/responsibility.

(9) Develop and oversee a contracted information technology capability to collect and store sustainability data that will monitor and report status and progress of RSIP and ISAP implementation relative to established goals, objectives, and targets.

(10) Incorporate sustainability training modules into the Regional Comprehensive Environmental Training and Education Program(CETEP) to systematically provide essential training requirements for commanders, LROs, and other key personnel and offices.

h. G-5:

(1) Serve as an advisory member of the MCIWEST SESC, per enclosure (2).

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i. G-6:

(1) Act as the LRO, requirement owner for the Electronic Stewardship goal, per enclosure (1).

(2) Serve as a standing member of the MCIWEST SESC, per enclosure (2).

(3) Establish contract specifications requiring procurement of office electronic equipment such as desktop and laptop/portable computers, computer monitors, computer peripherals, televisions, printers, fax and copy machines, and mobile phones, and procure these items in accordance with the FEC goals in reference (c).

(4) Ensure projects and targets and POA&Ms are generated as well as development/implementation other program elements, to include programming of funds to support the goals and objectives as summarized at enclosure (1).

j. G-7: Serve as an advisory member of the MCIWEST SESC, per enclosure (2).

k. G-8: Serve as an advisory member of the MCIWEST SESC, per enclosure (2).

l. Business Management Office: Serve as an advisory member of the MCIWEST SESC, per enclosure (2).

1. Human Resources Office:

1. Serve as an advisory member of the MCIWEST SESC, per enclosure (2).

2. Develop and implement a telework plan to support attainment of Green House Gas reductions, per enclosure (1).

m. Public Affairs Office:

3. Serve as an advisory member of the MCIWEST SESC, per enclosure (2).

4. Develop and maintain a strategic communications plan for dissemination of sustainability data.

n. The MCIWEST Staff Judge Advocate serves as counsel to the MCIWEST SESC, per enclosure (1) and ensure that contracts,

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agreements, permits, leases, licenses, or other legally-binding obligations entered into after the date of this order require compliance with the provisions of this order with respect to such facilities or vehicles to the extent deemed appropriate by reference (c).

o. The Western Area Counsel Office serves as environmental counsel to the SESC, per enclosure (2).

p. Although Green Procurement requirements do not apply to tactical military vehicles and equipment, representatives of the Commander, Marine Corps Bases Pacific and the Commanding General, I Marine Expeditionary Force (MEF) are invited to participate in any SMB reviews of activities of interest to their commands or operations.

4. Administration and Logistics. Directives issued by this Command are published and distributed electronically via the MCIWEST web page at:

<https://intranet.MCIWEST.usmc.mil/manpower/Adjutant/MCIWO/default.aspx>.

5. Command and Signal

(a) This Order is applicable to all federal and non-federal commands, tenants, organizations, units and activities operating aboard Marine Corps West Installations.

(b) This Order is effective on the date signed.

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T. A. CAUGHLAN
Chief of Staff

Distribution:

DC I&L (LFL)
COMMARCOPRBASESPAC (ENV)
MCIWEST Branch Heads
CG, MCAGCC Twenty-nine Palms
CO, MCB Camp Pendleton
CO, MCAS Camp Pendleton
CO, MCAS Miramar
CO, MCAS Yuma
CO, MLB Barstow
CO, MWTC Bridgeport

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DEFINITIONS

Acquisition - the acquiring of supplies and services including construction, using appropriated funds, and for the use of the Federal government through purchase or lease, whether the supplies or services are already in existence or must be created, developed, or demonstrated and evaluated. Acquisition begins when agency needs are established and includes the description of requirements to satisfy agency needs, solicitation, selection of sources, award of contracts, contract financing, contract performance, contract administration, and those technical and management functions directly related to the process of fulfilling agency needs by contract.

Activity/Installation - any Federal facility or organization that is formally accountable for compliance under environmental regulation or conducts activities that can have a significant impact on the environment, either directly or indirectly, individually or cumulatively, due to the operations of that facility's or organization's mission, processes, or functions.

Affirmative Procurement - assuring Comprehensive Procurement Guidelines items composed of recovered materials (U.S. Environmental Protection Agency [US EPA]-designated items) will be purchased to the maximum extent practicable, consistent with Federal law and procurement regulations.

Biobased Product - a commercial or industrial product (other than food or feed) that uses biological products, or renewable domestic agricultural (plant, animal, and marine) or forestry materials. Farm Security and Rural Investment Act of 2002 mandated that U.S. Department of Agriculture biobased products also be included in Federal Environmentally Preferable Products.

Certification - provided by offerors/bidders/vendors, written documentation certifying the percentage of recovered materials contained in products or to be used in the performance of the contract is at least the amount required by applicable specifications or other contractual requirements. Certification on multi-component or multi-material products should verify the percentage of post consumer waste and recovered material contained in the major constituents of the product.

Components of the Federal Green Procurement Program - Recovered materials (Affirmative Procurement); Energy efficient (Federal Energy Management Program, Energy Star®, Electronic Product Environmental Assessment Tool); Alternative fuels/

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Alternative Fuel Vehicles; Biobased Products; Non-Ozone Depleting Substances; and Environmentally Preferable Products.

Comprehensive Procurement Guidelines - regulations issued by US EPA pursuant to section 6002 of Resource Conservation and Recovery Act (RCRA): (1) identifying items produced (or can be produced) with recovered materials and where procurement of such items will advance the objectives of RCRA; and (2) providing recommended practices for the procurement of such items.

Electronic Product Environmental Assessment Tool - is a system to help agencies evaluate, compare, and select desktop computers, notebook computers, and monitors based on 51 environmental attributes.

Energy Efficient - measures, practices, or programs that reduce the energy used by specific devices and systems, typically without affecting the services provided. Such savings are generally achieved by substituting technically more advanced equipment or operating procedures to produce the same level of end-use services (e.g., lighting, heating, motor drive) with less energy input.

Energy Star - is a joint program of the US EPA and the US Department of Energy that provides energy efficient products and practices to aid in protecting the environment.

Environmental Management System (EMS) - a set of processes and practices that enable an organization to increase its operating efficiency, continually improve overall environmental performance and better manage and reduce its environmental impacts, including those environmental aspects related to energy and transportation functions. EMS implementation reflects accepted quality management principles found in the ISO 14001:2004(E) International Standard and using a standard process to identify and prioritize current activities, establish goals, implement plans to meet the goals, evaluate progress, and make improvements to ensure continual improvement.

Environmentally Preferable - products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, product, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of the product or service.

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Green Procurement - purchase of products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services that serve the same purpose. This comparison may consider raw materials acquisition, production, manufacturing, packaging, distribution reuse, operation, maintenance or disposal of the product or service. Green Procurement is also known as Affirmative Procurement or Environmentally Preferable Purchasing.

Green Products/Services - products and services meeting the requirements of one or more of the components of Federal green procurement preference programs: RCRA Section 6002; Executive Order (EO) 13423, (including traditional Affirmative Procurement and Environmentally Preferable Products); Electronic Stewardship requirements; the Buy-Bio requirements of the 2002 Farm Bill (Public Law 107-171); and any Federal procurement preference programs implemented after the date of this document.

Installation Sustainability Action Plans (ISAP) and POA&Ms - Provides the Installation CO's vision, strategies, resources, and guidance of how an installation will meet the goals/objectives of this order. The ISAP should also designate LROs and assign the roles, responsibilities, targets, actions, and milestones the installation will accomplish which connect and support the goals/objectives of this order.

Life-Cycle Cost - in accordance with EO 13423, "life-cycle costs" means the sum of the present values of investment costs, capital costs, installation costs, energy costs, operating costs, and maintenance.

Ozone-Depleting Substances (ODSs) - any chemical listed as a Class I or Class II substance as defined by the Clean Air Act and 40 Code of Federal Regulations 82. Class I ODSs most prevalent in Navy applications include chlorofluorocarbons (CFC)-11, CFC-12, CFC-113, CFC-114, Halon 1211, Halon 1301, methylchloroform (1,1,1, trichloroethane) and carbon tetrachloride. Class II ODSs most prevalent in Navy applications include hydrochlorofluorocarbons (HCFC)-22, HCFC-123, and HCFC-14b. CFCs and HCFCs are commonly referred to as Freons. While production of Class I ODS has ceased, production phase-outs of Class II ODSs will begin over the next several years.

Pollution Prevention - "source reduction" as defined in the Pollution Prevention Act of 1990 (42 U.S.C. 13102), and other practices that reduce or eliminate the creation of pollutants

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through (a) increased efficiency in the use of raw materials, energy, water, or other resources, or (b) the protection of natural resources by conservation.

Practicable - capable of performing in accordance with applicable specifications, available at a reasonable price and within a reasonable period of time, while maintaining a satisfactory level of competition with other products.

Preference - when two products or services are equal in performance characteristics and price, the Government, in making purchasing decisions, will favor the more environmentally-sound or energy efficient product.

Recovered Material - waste materials and by-products recovered or diverted from solid waste, excluding those materials and by-products generated from, and commonly reused within, an original manufacturing process.

Recycled Material - Previously used materials, substitutable for a raw or source material in the manufacturing process. If not so used, this material would become waste.

Recycling - Using, reusing, or reclaiming materials, including processes that regenerate a material or recover a useable product from it.

Renewable Energy - energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.

Solid Waste - garbage, refuse, sludge, and other discarded solid materials, including those from industrial, commercial, and agricultural operations, and from community activities. This excludes solids or dissolved materials in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flow, etc.

Specification - a clear and accurate description of the. In general, specifications are in the form of written descriptions, drawings, prints, commercial designations, industry standards, and other descriptive references.

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Sustainable - of or pertaining to creating and maintaining conditions under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations of Americans.

Tactical Vehicles - as operating military tactical vehicles and equipment to include weapon systems used on the battle ground, portable equipment to support logistics and combat aircraft, vehicles to transport combat and support personnel during military operations, and other military equipment weapon systems. Tactical vehicles are exempt from Green Procurement requirements.

Unreasonable Cost - the cost of a green product is considered unreasonable if it significantly exceeds the cost of a comparable non-green item. (See life cycle cost definition above.)

US EPA-Designated Item - an item designated by the US EPA in a Comprehensive Procurement Guideline and for which US EPA recommended procurement practices, including recovered materials content levels, in a Recovered Materials Advisory Notice.

Verification - procedures used by procuring agencies to confirm both vendor estimates and certifications of the percentages of recovered material contained in the products supplied to them or to be used in the performance of a contract.

Waste Minimization - prevention or decreasing the amount of waste being generated through waste prevention, recycling or purchasing recycled and environmentally preferable products

**APPENDIX B
INSTALLATION SUSTAINABILITY PERFORMANCE PLAN REQUIREMENTS CROSSWALK**

MCIWEST Sustainability Performance Plan Goals, Objectives, and Targets (December 2012)		EO 13514 - Federal Leadership in Environmental, Energy, and Economic Performance (October 8, 2009)	DoD Strategic Sustainability Performance Plan Goals (FY 2011)	
Goal 1, Objective 1.1	Meet DoD FY2020 34% reduction targets of scope 1 and 2 GHG emissions (baseline FY 2008).	Sec 2(a) Establish a percent reduction target (agency-wide) for reductions of scope 1 and 2 GHG emissions in ABSOLUTE TERMS by FY 2020, relative to a FY2008 baseline (scope 1 - direct GHG emissions from sources owned/controlled by the Fed agency; scope 2 - direct GHG emissions from the generation of electricity, heat, steam purchased by the Fed agency). In establishing the target, shall consider reductions associated with:	Objective 2, Goal 3	GHG emissions from Scope 1 and 2 sources reduced 34% from FY 2008 by FY 2020
Goal 1, Objective 1.2	Meet DoD FY2020 13.5% reduction targets of scope 3 GHG emissions by FY 2020 (baseline FY 2008).	Sec 2(b) Establish a percent reduction target (agency wide) for reduction of scope 3 GHG emissions in absolute terms by FY2020, relative to a FY2008 baseline (scope 3 - GHG emissions from sources not owned or directly controlled by a Fed agency, but related to agency activities such as vendor supply chains, delivery services, and employee travel and commuting). In establishing the target, shall consider reductions associated with:	Objective 2, Goal 4	GHG emissions from Scope 3 sources reduced 13.5% by FY 2020 relative to FY 2008
Goal 1, Objective 1.3	Meet DoD 7% reduction in GHG emissions from employee air travel by FY 2020 (baseline FY 2011).	Sec 2(b)(ii) Implementing strategies and accommodations for transit, travel, training, and conferencing that supports lower-carbon commuting and travel by agency staff	Objective 2, Goal 4.1	GHG emissions from employee air travel reduced 7% from FY 2011 by FY 2020
Goal 1, Objective 1.4	Have 30% of eligible employees teleworking at least once a week on a regular recurring basis (from baseline FY 2008).	---	Objective 2, Goal 4.2	30% of eligible employees teleworking at least once a week, on a regular, recurring basis, by FY 2020
Goal 1, Objective 1.5	Divert 50% of nonhazardous solid waste from disposal in landfills not owned by DoD (from baseline FY 2008).	---	---	---
Goal 1, Objective 1.6	Comprehensive annual inventory of the Scope 1, 2, and 3 emissions (baseline FY 2008, initial inventory 2010).	Sec 2(c) Annual inventory of absolute GHG emissions for scope 1, 2, and 3 (by the end of January for the preceding year)	---	---
---	---	Sec 2(b)(i) Pursuing opportunities with vendors/contractors to address/incorporate incentives to reduce GHG emissions	---	---
---	---	Sec 2(b)(iii) GHG emission reductions associated with pursuing other goals of this section	---	---
---	---	Sec 2(b)(iv) Developing and implementing innovative policies and practices to address scope 3 GHG emissions unique to agency operations	---	---
Goal 2, Objective 2.1	3% annual reduction in building energy intensity through FY2015, or 30% total reduction by FY2015. 37.5% total reduction by 2020 (DoD SSPP) (baseline FY 2003).	Sec 2(a)(i) Reducing energy intensity in agency buildings	Objective 1, Goal 1.1	Energy intensity of facilities reduced by 30% of FY2003 levels by 2015 and 37.5% by FY 2020
Goal 2, Objective 2.2	By FY 2020, produce or procure energy from renewable sources in an amount that represents at least 20% of electricity consumed by facilities.	Sec 2(a)(ii) Increasing agency use of renewable energy and implementing renewable energy generation projects on agency property	Objective 1, Goal 1.2	By FY 2020, produce or procure energy from renewable sources in an amount that represents at least 20% of electricity consumed by facilities.
Goal 2, Objective 2.3	50% of statutorily required renewables comes from new sources (as of 1999).	---	---	---
Goal 2, Objective 2.4	Phase out the use of incandescent bulbs.	---	---	---
Goal 2, Objective 2.5	Commands will use Energy Management and Control Systems.	---	---	---
Goal 2, Objective 2.6	Use distributed energy where it is cost effective.	---	---	---
Goal 2, Objective 2.7	Use GIS to manage facility energy levels and assets.	---	---	---
Goal 2, Objective 2.8	Increase the number of energy staff training for energy-efficient operations.	---	---	---
Goal 3, Objective 3.1	2% annual reduction in potable water intensity by FY2020 or 26% total reduction (baseline FY 2007).	Sec 2(d)(i) Reducing potable water consumption intensity by 2% annually through FY2020 or 26% by the end of FY2020	Objective 1, Goal 2.1	Potable water consumption intensity by facilities reduced by 26% from FY 2007 by FY 2020
Goal 3, Objective 3.2	Reduce industrial, landscaping, and agricultural water intensity 2% annually by FY2020 or 20% total reduction (baseline FY 2010).	Sec 2(d)(ii) Reducing agency industrial, landscaping, and agriculture water consumption by 2% annually or 20% by the end of FY2020 relative to the baseline of FY2010	Objective 1, Goal 2.2	Industrial and irrigation water consumption reduced by 20% from FY 2010 by FY 2020
---	---	Sec 2(d)(iii) Consistent with state law, identifying, promoting, and implementing water reuse strategies that reduce potable water consumption	---	---
Goal 4, Objective 4.1	Report according to Emergency Planning and Community Right-to-Know Act.	Sec 2(e)(x) Reporting in accordance with EPCRA	---	---
Goal 4, Objective 4.2	Minimize the generation of waste and pollutants through source reduction.	Sec 2(e)(j) Minimizing waste generation through source reduction	---	---
Goal 4, Objective 4.3	Implement integrated pest management and other landscape management practices, which are prepared, reviewed, and updated annually by Pest Management Professionals.	Sec 2(e)(vii) Implementing Integrated Pest Management and other appropriate landscape management practices	Objective 4, Goal 8.3	All DoD installations have integrated pest management plans prepared, reviewed, and updated annually by pest management professionals
Goal 4, Objective 4.4	50% landfill diversion for waste by end of FY2015 and thereafter through FY 2020 (non-hazardous solid waste).	Sec 2(e)(ii) Diverting at least 50% of non-haz solid waste (excluding C&D debris) by the end of FY2015	Objective 3, Goal 5.2	50% of non-haz solid waste diverted from the waste stream by FY 2015 and thereafter through FY 2020
Goal 4, Objective 4.5	50% landfill diversion for waste by end of FY2015 and thereafter through 2020 (Construction & Demolition Waste) (EO 13514). 60% Construction & Demolition diversion by end of FY 2015 and thereafter through 2020 per DoD SSPP.	Sec 2(e)(iii) Diverting at least 50% of C&D materials by the end of FY2015	Objective 3, Goal 5.3	60% of C&D debris diverted from the waste stream by FY 2015 and thereafter through FY 2020
Goal 4, Objective 4.6	Increase organic and compostable materials diverted from waste stream.	Sec 2(e)(vi) Increasing diversion of compostable and organic material	---	---
Goal 4, Objective 4.7	Reduce paper use.	Sec 2(e)(v) Reducing printing paper use and acquiring uncoated printing and writing paper containing at least 30% postconsumer fiber	Objective 3, Goal 5.1	All DoD components implementing policies by 2014 to reduce the use of printing paper
Goal 4, Objective 4.8	Ten landfills or wastewater treatment facilities recovering biogas for used by DoD by FY2020.	---	Objective 3, Goal 5.4	Ten landfills or wastewater treatment facilities recovering biogas for used by DoD by FY2020.
Goal 4, Objective 4.9	Reduce disposal of toxic and hazardous materials and chemicals. On-site releases and off-site transfers of toxic chemicals reduced 15% by FY 2020, relative to FY 2007.	---	Objective 3, Goal 6.1	On-site releases and off-site transfers of toxic chemicals reduced 15% from CY 2006 by FY 2020
Goal 4, Objective 4.10	100% of DoD Personnel and contractors who apply pesticides are properly certified through 2020.	---	Objective 3, Goal 6.3	100% of DoD personnel and contractors who apply pesticides are properly certified
---	---	Sec 2(e)(v) Reducing and minimizing the quantity of toxics and HMs acquired, used, disposed	---	---
---	---	Sec 2(e)(viii) Increasing use of acceptable alternative chemicals	---	---
---	---	Sec 2(e)(ix) Decreasing agency use of chemicals where such decrease will assist the agency in achieving GHG emission reduction targets	---	---
Goal 5, Objective 5.1	Identify and analyze impacts from energy use and alternatives under NEPA with all proposals for new and expanded facilities.	Sec 2(f)(iv) Identifying and analyzing impacts from energy use and alternative energy sources in all EISs and EAS in accordance with NEPA	---	---
Goal 5, Objective 5.2	Coordinate with regional ecosystem programs.	Sec 2(f)(v) Coordinating with regional programs for Federal, State, tribal and local ecosystem, watershed, and environmental management	---	---
Goal 5, Objective 5.3	Participate in regional transportation planning and recognize the existing community transportation infrastructure.	Sec 2(f)(i) Participating in regional transportation planning and recognizing existing community transportation infrastructure	Objective 4, Goal 8.2	The sustainability of transportation and energy choices in surrounding areas optimized by coordinating with related regional and local planning
Goal 5, Objective 5.4	Verify that all planning of new facilities and leases are transit oriented or, in rural communities, emphasize existing or planned town centers.	Sec 2(f)(ii) Planning for new Fed facilities or new leases includes consideration of sites that are pedestrian friendly, near employment centers, accessible to public transit, and emphasizes existing central cities, and in rural communities, existing or planned town centers	---	---
Goal 5, Objective 5.5	Has the installation coordinated with watershed programs?	Sec 2(f)(v) Coordinating with regional programs for Federal, State, tribal and local ecosystem, watershed, and environmental management	---	---
Goal 5, Objective 5.6	Has the installation coordinated with environmental management programs?	Sec 2(f)(v) Coordinating with regional programs for Federal, State, tribal and local ecosystem, watershed, and environmental management	---	---
---	---	Sec 2(f)(i) Aligning Federal policies to increase effectiveness of local planning for energy choices such as locally generated renewables	---	---
Goal 6, Objective 6.1	All new buildings that begin the planning process in 2020 or after are designated to achieve zero-net-energy by 2030.	Sec 2(g)(i) Beginning in 2020, ensuring that all new Federal buildings entering the planning process are designed to achieve zero-net-energy by 2030	---	---
Goal 6, Objective 6.2	15% of existing Federal building inventory of the agency (existing and leased) meet the Guiding Principles by FY2015, and continue towards 100% compliance for complete building inventory.	Sec 2(g)(ii) Ensuring all new construction, major renovation, or repair/alt of Fed buildings complies with the Guiding Principles Sec 2(g)(iii) Ensuring that at least 15% of the agency's existing buildings and building leases (>5,000 gross SF) meet the Guiding Principles by FY2015 and that the agency makes annual progress toward 100% conformance with the Guiding Principles for its inventory	Objective 4, Goal 7.2	15% of existing buildings conform to the Guiding Principles on High Performance and Sustainable Buildings by FY 2015 and thereafter through FY 2020
Goal 6, Objective 6.3	Implement and achieve objectives of stormwater guidance.	Sec 2(d)(iv) Implementing and achieving storm water objectives	---	---
Goal 6, Objective 6.4	Achieve LEED-accredited buildings for new construction and major renovations.	---	---	---
Goal 6, Objective 6.5	All development and redevelopment projects of 5,000 square feet or more maintain predevelopment hydrology to the maximum extent technically feasible.	---	Objective 1, Goal 2.3	All development and redevelopment projects of 5,000 SF or greater maintain pre-development hydrology to the maximum extent technically feasible
---	---	Sec 2(g)(iv) Pursuing cost effective, innovative strategies such as highly reflective and vegetated roofs, to minimize consumption of energy, water, and materials	---	---
---	---	Sec 2(g)(v) Managing existing building systems to reduce the consumption of energy, water, and materials and identifying alternatives to renovation that reduce existing assets' deferred maintenance costs	---	---
---	---	Sec 2(g)(vi) When adding assets to the agency's real property inventory, identifying opportunities to consolidate and dispose of existing assets, optimize performance of the agency's real property portfolio, and reduce associated environmental impacts	---	---
---	---	Sec 2(g)(vii) Ensuring that rehabilitation of Federally owned historic buildings utilizes best practices and technologies in retrofitting to promote long-term viability of the buildings	---	---
Goal 7, Objective 7.1	95% of procurement conducted sustainably.	Sec 2(h) Advance sustainable acquisition to ensure the 95% of new contract actions including task and delivery orders for products and services are energy efficient, water efficient, bio-based, environmentally preferable (e.g., EPEAT), non-ozonedepleting, contain recycled content, or are non-toxic or less toxic, where such products and services meet agency performance requirements	Objective 4, Goal 7.1	95% of procurement conducted sustainably
Goal 7, Objective 7.2	Use a minimum of 30% postconsumer recycled paper.	Sec 2 (e)(v) Reducing printing paper use and acquiring uncoated printing and writing paper containing at least 30% postconsumer fiber	---	---
Goal 8, Objective 8.1	2% vehicle petroleum reduction annually through FY 2015. 20% vehicle petroleum reduction by FY2015. 30% petroleum reduction by FY2020 (DoD SSPP) (baseline FY 2005).	Sec 2(a)(iii)(C) If a fleet >20 vehicles, reducing the fleets total consumption of petroleum by a minimum of 2% annually through the end of FY 2020 relative to 2005	Objective 1, Goal 1.3	Use of petroleum products by vehicle fleets reduced 30% from FY 2005 by FY 2020
Goal 8, Objective 8.2	10% increase (over the previous year) in non-petroleum fuel annually through FY 2015 and maintain through FY 2020 (baseline FY 2005).	---	---	---
Goal 8, Objective 8.3	Purchase low GHG-emitting vehicles.	Sec 2(a)(iii)(A) Using low GHG emitting vehicles including AFVs	---	---
---	---	Sec 2(a)(iii)(B) Optimizing the number of vehicles in the fleet	---	---
Goal 9, Objective 9.1	Ensure EPEAT-registered electronic product procurement preference; ensure procurement of Energy Star and FEMP designated equipment.	Sec 2(i)(i) Ensuring procurement preference for EPEAT-registered products Sec 2(i)(iv) Ensuring the procurement of Energy Star and FEMP designated equipment	---	---
Goal 9, Objective 9.2	Dispose of 100% of excess or surplus electronic products disposed of in environmentally sound manner.	Sec 2(i)(iii) Employing environmentally sound practices with respect to the agency's disposition of all excess or surplus electronic products	Objective 3, Goal 6.2	100% of excess of surplus electronic products disposed in an environmentally sound manner
Goal 9, Objective 9.3	Establish and implement policies to enable duplex printing.	Sec 2(i)(ii) Establishing and implementing policies to enable power management, duplex printing, and other energy efficient or environmentally preferable features on all eligible agency electronic products	---	---
Goal 9, Objective 9.4	Implement best practices in energy-efficient management of server data centers.	Sec 2(i)(v) Implementing BMPs for energy-efficient management of servers and data centers	---	---
Goal 9, Objective 9.5	Has the installation utilized power management features?	Sec 2(i)(ii) Establishing and implementing policies to enable power management, duplex printing, and other energy efficient or environmentally preferable features on all eligible agency electronic products	---	---
Goal 9, Objective 9.6	Has the installation utilized any other energy-efficient practices?	Sec 2(i)(ii) Establishing and implementing policies to enable power management, duplex printing, and other energy efficient or environmentally preferable features on all eligible agency electronic products	---	---
Goal 10, Objective 10.1	Ensure a formal EMS is implemented to meet EO goals.	Sec 2(j)(i) Continuing implementation of EMSs Sec 2(j)(ii) Ensuring these formal systems are appropriately implemented and maintained to achieve the performance necessary to meet the goals of this order	Objective 4, Goal 8.1	All EMSs effectively implemented and maintained
Goal 10, Objective 10.2	Establish Management Review for EO implementation.	---	---	---
Goal 10, Objective 10.3	Submit updates on progress and performance at least annually, if not more often (sustainability plan).	---	---	---

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Additional Information Related to the Baseline and 2010 Analyses

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Acronyms and Abbreviations

%		percent	FY	fiscal year
ADEQ	Arizona Department of Environmental Quality		gal	gallons
ADOC	Arizona Department of Commerce		GHG	greenhouse gas
AFV	alternative fuel vehicle		GME	Garrison Mobile Equipment
AGFD	Arizona Game and Fish Department		GPP	Green Procurement Plan
AICUZ	Air Installation Compatible Use Zone		GPS	global positioning system
ANSI	American National Standards Institute		GSA	General Services Administration
APZs	accident potential zones		GSE	ground support equipment
ARS	Arizona Revised Statute		GWP	global warming potential
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers		HQMC	Headquarters Marine Corps
AUX-2	Auxiliary Airfield-2		HVAC	heating, ventilation, and air conditioning
BEQ	bachelor enlisted quarters		Hz	hertz
BLM	Bureau of Land Management		I&L	Installation and Logistics
BMGR	Barry M. Goldwater Range		IEEE	Institute of Electrical and Electronics Engineers
BSTRC	Bob Stump Training Range Complex		IGB	Information Enterprise Governance Board
C&D	construction and demolition		IM	information management
CADC	Cannon Air Defense Complex		iNFADS	Internet Naval Facilities Assets Data Store
CFL	compact fluorescent		INRMP	Integrated Natural Resources Management Plan
CH ₄	methane		IPTs	integrated product teams
CNG	compressed natural gas		ISO	International Standards Organization
CO ₂	carbon dioxide		ISPP	Installation Sustainability Performance Plan
CO ₂ e	carbon dioxide equivalent		IT	information technology
CP&LO	Community Planning and Liaison Office		IV&V	independent validation and verification
CY	calendar year		JLUP	Joint Land Use Plan
DC	Determination of Compliance		JLUS	Joint Land Use Study
DDC	Direct Digital Controls		JSF	Joint Strike Fighter
DFARS	DoD supplement to the FAR		kgs	kilograms
DLA	Defense Logistics Agency		kV	kilovolt
DoD	Department of Defense		lbs	pounds
DoE	Department of Energy		LED	light emitting diode
DoN	Department of the Navy		LEED	Leadership in Energy and Environmental Design
du	dwelling unit		LNG	liquefied natural gas
ECA	Energy Conservation Analysis		LPG	liquefied petroleum gas
ECE	Environmental Compliance Evaluation		MAPS	Marine Corps Acquisition Procedures Supplement
ECPSOP	Environmental Compliance and Protection Manual		MBTU	million British thermal units
EDM	Enterprise Digital Media		MCAS	Marine Corps Air Station
EISA	Energy Independence and Security Act		MCCS	Marine Corps Community Services
EMI	electromagnetic interference		MCIWEST	Marine Corps Installations West
EMPs	Environmental Management Procedures		MCO	Marine Corps Order
EMS	Environmental Management System		MRR	mandatory reporting rule
EO	Executive Order		MT	metric tons
EPEAT®	Electronic Product Environmental Assessment Tool		N ₂ O	nitrous oxide
ESOPs	Environmental Standard Operating Procedures		NAVFAC	Naval Facility Engineering Command
F	Fahrenheit		NAVFAC SW	Naval Facility Engineering Command Southwest
FAR	Federal Acquisition Regulation		NGEN	Next Generation Enterprise Network
FEMP	Federal Energy Management Program			

NMCARS	Navy Marine Corps Acquisition	USMC	Protection Agency
	Regulation Supplement	United States Marine Corps	
P2	Pollution Prevention	VMT	vehicle miles traveled
ppm	parts per million	WAPA	Western Area Power Administration
PPV	public-private venture	YBFMP	Yuma Bicycle Facilities Master Plan
PV	photovoltaic	YCAT	Yuma County Area Transit
QRP	qualified recycling program	YMPO	Yuma Metropolitan Planning Organization
SBIP	Sustainable Buildings Implementation Plan	YRDP	Yuma Regional Development Plan
SECNAV	Secretary of the Navy	YRMD	Yuma Range Management Department
SF ₆	sulfur hexafluoride	ZNE	zero net energy
SWRFT	Southwest Region Fleet Transportation		
USEPA	United States Environmental		

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C.1 MCIWEST GOAL 1 - ACCOMPLISH GREENHOUSE GAS REDUCTIONS/GREENHOUSE GAS INVENTORY

Overview of Greenhouse Gas Emissions

High frequency solar radiation passes through the earth's atmosphere and warms the earth. That energy is emitted from the earth as lower frequency infrared energy. Certain gases in the atmosphere absorb that lower frequency infrared radiation, causing the "greenhouse effect." The greenhouse effect is essential, as it maintains the earth's average global temperature at approximately 20° Fahrenheit (F) warmer than it would be (60°F instead of 40°F) without this effect.

Although the earth's climate is continuously changing, an overwhelming majority of scientists believe the rate of change (increase) in the earth's temperature is abnormal/unnaturally fast and is being caused by increases in greenhouse gases (GHGs) created by human activities. For example, burning carbon-based fuel creates carbon dioxide (CO₂) which is a GHG. The average atmospheric concentration of CO₂ has risen from 315 to 390 parts per million (ppm) in the past 60 years and the current level is believed to be higher than ever before.

GHGs include CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF₆). These six types of GHGs have different heat-absorbing capacities, also known as global warming potential, or GWP. The GWP of each GHG is typically normalized to the GWP of carbon dioxide with the units of CO₂ equivalents, or CO₂e. For example, N₂O has a global warming potential 310 times that of CO₂ so a GHG inventory would describe each ton of N₂O emitted as 310 CO₂e. Standard units for GHG emissions throughout the world, including in the United States (and the United States Marine Corps [USMC]), are metric tons, which are defined as 1,000 kilograms (kgs), or 2,200 pounds (lbs).

Many regional, national, and international efforts are underway to slow-down the rate at which our climate is changing, primarily through reductions in GHG emissions. The Federal Government established GHG goals in Executive Order (EO) 13412 and 13514. Marine Corps Installations West (MCIWEST) established goals, objectives and targets to meet the EO goals and the related Department of Defense (DoD) goals. MCIWEST's GHG objectives are closely related to energy and fuel efficiency, which reduce CO₂ emissions.

GHG emissions from any facility are categorized as follows:

- **Scope 1** GHG emissions are directly from the facility or from mobile sources that are owned or operated by the facility. Thus, Scope 1 emissions encompass the sources of air pollution that are heavily regulated (i.e., stationary sources) plus mobile sources that may be generated at the facility or outside, but are under the direct control of the facility.
- **Scope 2** GHG emissions are indirect emissions from purchased electricity or steam. They are indirect because they occur outside the facility, under the control of a different organization (e.g., the local power company or an outside source of steam). Scope 2 emissions are relatively easy to quantify and can be reduced by using less electricity, or by obtaining energy from power sources that generate less GHG emissions (e.g., renewal energy sources).

- **Scope 3** GHG emissions are any emissions that are related to the facility but are not Scope 1 or 2. Scope 3 GHG emissions are indirect emissions, encompassing a very broad spectrum of activities such as employee transportation and vendor deliveries. Fortunately, federal guidance provides clear direction on which Scope 3 GHG emissions are to be included in sustainability plans. Additional details on Scope 1, 2 and 3 emissions are provided in the applicable sections below.

Objective 1.1 Meet Department of Defense Fiscal Year 2020 34% Reduction Targets of Scope 1 and 2 Greenhouse Gas Emissions

MCAS Yuma and Greenhouse Gas Management

This objective establishes fiscal year (FY) 2008 as the baseline year. Marine Corps Air Station (MCAS) Yuma has realized numerous GHG reductions, primarily through Scope 2 reductions from energy efficiency projects. Although numerous reductions have been quantified, a comprehensive GHG inventory has not been developed to date. Two GHG inventories were developed for MCAS Yuma in 2010 and 2011, but those inventories focused only on emissions that are potentially regulated by the United States Environmental Protection Agency (USEPA) Mandatory Reporting Rule (MRR) and the California Assembly Bill 32. Those regulations target stationary combustion sources of GHG emissions, which are a subset of Scope 1 GHG emissions. Consequently, the inventories do not adequately address the full spectrum of GHG emissions that are to be measured for inclusion in the Installation Sustainability Performance Plan (ISPP). The main GHG inventory projects performed at MCAS Yuma are listed below. Notably, the Phase I report did encompass GHG emissions related to purchased electricity (a Scope 2 emissions source), which will be helpful as the Station begins full GHG monitoring.

- GHG Emissions for Calendar Year (CY) 2007, Phase I Report (March 2010);
- GHG Emissions for CY 2007, Updated in Phase II Report (September 2010);
- GHG Emissions for FY 2008 described in Phase III (slides) (September 2010); and
- FY 2010 GHG Emissions, MCAS Yuma Greenhouse Gas Emissions Report, dated March 2011.

MCAS Yuma Energy Saving and Greenhouse Gas Emission Reduction Projects

The energy savings and equivalent GHG reductions include projects from 2003 through 2009 are presented in Table C-1 below which describes the energy saved in kilowatt hours in terms of GHG emissions, their GWP relative to CO₂, and the resulting CO₂e emissions reductions.

Table C-1. GHG Emission Reductions from Energy-related Projects at MCAS Yuma, 2003 through 2009

Year	Energy Efficiency Project Description	Greenhouse Gas	Electricity Savings (MWh)	Emission Factor (lbs/MWh)	lbs GHG per year	lbs/Metric Ton	Metric Tons of GHG	GWP	CO2e Reduction (MT/year)
2003	Lighting Retrofit	CO ₂	467	1,201.44	560,771	2,204.62	254.36	1	254.36
	Lighting Retrofit	CH ₄	467	0.021	10	2,204.62	0.00	21	0.09
	Lighting Retrofit	N ₂ O	467	0.009	4	2,204.62	0.00	310	0.56
	DDC in 17 Buildings	CO ₂	2,359	1,201.44	2,834,480	2,204.62	1,285.70	1	1,285.70
	DDC in 17 Buildings	CH ₄	2,359	0.021	49	2,204.62	0.02	21	0.47
	DDC in 17 Buildings	N ₂ O	2,359	0.009	20	2,204.62	0.01	310	2.82
	LED Obstruction Lighting	CO ₂	11	1,201.44	13,729	2,204.62	6.23	1	6.23
	LED Obstruction Lighting	CH ₄	11	0.021	0	2,204.62	0.00	21	0.00
	LED Obstruction Lighting	N ₂ O	11	0.009	0	2,204.62	0.00	310	0.01
	Lighting Controls, Occupancy Sensors	CO ₂	23	1,201.44	27,810	2,204.62	12.61	1	12.61
	Lighting Controls, Occupancy Sensors	CH ₄	23	0.021	0	2,204.62	0.00	21	0.00
	Lighting Controls, Occupancy Sensors	N ₂ O	23	0.009	0	2,204.62	0.00	310	0.03
	Transformer Switching	CO ₂	52	1,201.44	62,308	2,204.62	28.26	1	28.26
	Transformer Switching	CH ₄	52	0.021	1	2,204.62	0.00	21	0.01
	Transformer Switching	N ₂ O	52	0.009	0	2,204.62	0.00	310	0.06
	400 Hz Converter Replacement	CO ₂	67	1,201.44	80,965	2,204.62	36.73	1	36.73
	400 Hz Converter Replacement	CH ₄	67	0.021	1	2,204.62	0.00	21	0.01
	400 Hz Converter Replacement	N ₂ O	67	0.009	1	2,204.62	0.00	310	0.08
TOTAL REDUCTION FOR 2003 = 1,628.04 MT									
2004	Lighting Upgrades	CO ₂	220	1,201.44	264,016	2,204.62	119.76	1	119.76
	Lighting Upgrades	CH ₄	220	0.021	5	2,204.62	0.00	21	0.04
	Lighting Upgrades	N ₂ O	220	0.009	2	2,204.62	0.00	310	0.26
	DDC Controls	CO ₂	910	1,201.44	1,093,028	2,204.62	495.79	1	495.79
	DDC Controls	CH ₄	910	0.021	19	2,204.62	0.01	21	0.18
	DDC Controls	N ₂ O	910	0.009	8	2,204.62	0.00	310	1.09
	LED Technologies	CO ₂	1	1,201.44	1,760	2,204.62	0.80	1	0.80
	LED Technologies	CH ₄	1	0.021	0	2,204.62	0.00	21	0.00
	LED Technologies	N ₂ O	1	0.009	0	2,204.62	0.00	310	0.00
	Solid State Converter	CO ₂	81	1,201.44	96,806	2,204.62	43.91	1	43.91
	Solid State Converter	CH ₄	81	0.021	2	2,204.62	0.00	21	0.02

Year	Energy Efficiency Project Description	Greenhouse Gas	Electricity Savings (MWh)	Emission Factor (lbs/MWh)	lbs GHG per year	lbs/Metric Ton	Metric Tons of GHG	GWP	CO2e Reduction (MT/year)
	Solid State Converter	N ₂ O	81	0.009	1	2,204.62	0.00	310	0.10
TOTAL REDUCTION FOR 2004 = 661.94 MT									
2005	Lighting Upgrades	CO ₂	797	1,201.44	957,500	2,204.62	434.32	1	434.32
	Lighting Upgrades	CH ₄	797	0.021	17	2,204.62	0.01	21	0.16
	Lighting Upgrades	N ₂ O	797	0.009	7	2,204.62	0.00	310	0.95
	Solid State Converter	CO ₂	380	1,201.44	456,924	2,204.62	207.26	1	207.26
	Solid State Converter	CH ₄	380	0.021	8	2,204.62	0.00	21	0.08
	Solid State Converter	N ₂ O	380	0.009	3	2,204.62	0.00	310	0.45
	DDC Controls	CO ₂	1,514	1,201.44	1,818,545	2,204.62	824.88	1	824.88
	DDC Controls	CH ₄	1,514	0.021	31	2,204.62	0.01	21	0.30
	DDC Controls	N ₂ O	1,514	0.009	13	2,204.62	0.01	310	1.81
	Airfield Lighting LED	CO ₂	43	1,201.44	51,395	2,204.62	23.31	1	23.31
	Airfield Lighting LED	CH ₄	43	0.021	1	2,204.62	0.00	21	0.01
	Airfield Lighting LED	N ₂ O	43	0.009	0	2,204.62	0.00	310	0.05
TOTAL REDUCTION FOR 2005 = 1,493.57 MT									
2006	Building 913 Fan Coils	CO ₂	29	1,201.44	35,202	2,204.62	15.97	1	15.97
	Building 913 Fan Coils	CH ₄	29	0.021	1	2,204.62	0.00	21	0.01
	Building 913 Fan Coils	N ₂ O	29	0.009	0	2,204.62	0.00	310	0.04
TOTAL REDUCTION FOR 2006 = 16.01 MT									
2007	Evap Cooler to Fans B-220	CO ₂	118	1,201.44	142,217	2,204.62	64.51	1	64.51
	Evap Cooler to Fans B-220	CH ₄	118	0.021	2	2,204.62	0.00	21	0.02
	Evap Cooler to Fans B-220	N ₂ O	118	0.009	1	2,204.62	0.00	310	0.14
	Replace Fan Coils B-661	CO ₂	237	1,201.44	284,434	2,204.62	129.02	1	129.02
	Replace Fan Coils B-661	CH ₄	237	0.021	5	2,204.62	0.00	21	0.05
	Replace Fan Coils B-661	N ₂ O	237	0.009	2	2,204.62	0.00	310	0.28
	Replace Fan Coils B-660	CO ₂	237	1,201.44	284,434	2,204.62	129.02	1	129.02
	Replace Fan Coils B-660	CH ₄	237	0.021	5	2,204.62	0.00	21	0.05
	Replace Fan Coils B-660	N ₂ O	237	0.009	2	2,204.62	0.00	310	0.28
	Install DDC B-1056 and B-1058	CO ₂	201	1,201.44	241,839	2,204.62	109.70	1	109.70

Year	Energy Efficiency Project Description	Greenhouse Gas	Electricity Savings (MWh)	Emission Factor (lbs/MWh)	lbs GHG per year	lbs/Metric Ton	Metric Tons of GHG	GWP	CO2e Reduction (MT/year)
	Install DDC B-1056 and B-1058	CH ₄	201	0.021	4	2,204.62	0.00	21	0.04
	Install DDC B-1056 and B-1058	N ₂ O	201	0.009	2	2,204.62	0.00	310	0.24
TOTAL REDUCTION FOR 2007 = 433.34 MT									
2008	Buildings 153, 505, 660, 662, 722, 912, 914, 916, 918, 920, 952 and 980 xeriscape	CO ₂	0	1,201.44	0	2,204.62	0.00	1	0.00
	Buildings 153, 505, 660, 662, 722, 912, 914, 916, 918, 920, 952 and 980 xeriscape	CH ₄	0	0.021	0	2,204.62	0.00	21	0.00
	Buildings 153, 505, 660, 662, 722, 912, 914, 916, 918, 920, 952 and 980 xeriscape	N ₂ O	0	0.009	0	2,204.62	0.00	310	0.00
	DDC Controls in BEQs: 662, 740, 912, 914, 918, 920, 1020, 1040, 1060	CO ₂	323	1,201.44	388,632	2,204.62	176.28	1	176.28
	DDC Controls in BEQs: 662, 740, 912, 914, 918, 920, 1020, 1040, 1060	CH ₄	323	0.021	7	2,204.62	0.00	21	0.06
	DDC Controls in BEQs: 662, 740, 912, 914, 918, 920, 1020, 1040, 1060	N ₂ O	323	0.009	3	2,204.62	0.00	310	0.39
	Install CFL "Operation Changeout"	CO ₂	117	1,201.44	141,161	2,204.62	64.03	1	64.03
	Install CFL "Operation Changeout"	CH ₄	117	0.021	2	2,204.62	0.00	21	0.02
	Install CFL "Operation Changeout"	N ₂ O	117	0.009	1	2,204.62	0.00	310	0.14

Year	Energy Efficiency Project Description	Greenhouse Gas	Electricity Savings (MWh)	Emission Factor (lbs/MWh)	lbs GHG per year	lbs/Metric Ton	Metric Tons of GHG	GWP	CO2e Reduction (MT/year)
TOTAL REDUCTION FOR 2008 = 240.92 MT									
2009	PV Cells on B603, B228, B1239, B223, B1958, B1508, B530, B1200, B980, B930, B888	CO ₂	1,859	1,201.44	2,233,227	2,204.62	1,012.98	1	1,012.98
	PV Cells on B603, B228, B1239, B223, B1958, B1508, B530, B1200, B980, B930, B888	CH ₄	1,859	0.021	39	2,204.62	0.02	21	0.37
	PV Cells on B603, B228, B1239, B223, B1958, B1508, B530, B1200, B980, B930, B888	N ₂ O	1,859	0.009	16	2,204.62	0.01	310	2.22
TOTAL REDUCTION FOR 2009 = 1,015.57 MT									

Notes: GHG = greenhouse gas; MWh = megawatt hour; lbs = pounds; MT = metric tons; DDC = Direct Digital Controls; LED = light emitting diode; Hz = hertz; BEQ = bachelor enlisted quarters; CFL = compact fluorescent light; PV = photovoltaic.

Although the lack of a comprehensive GHG inventory prevents analysis of net increases or decreases, through the execution of these projects, GHG emission reductions were realized. As Table C-1 indicates, energy efficiency projects in 2008 reduced GHG emissions by 241 metric tons (MT) and 1,015 MT in 2009, for a total of 1,256 MT. Depending on how MCAS Yuma determines its overall GHG emissions for the baseline year of FY 2008, the reductions described above for 2008 may apply to the 34 percent (%) reduction goal. More likely, a portion (e.g., 50%) of that year’s reductions would apply, because the projects were presumably completed throughout the year. Of special note is that all of the projects in Table C-1 above reduced electricity consumption, which are GHG Scope 2 reductions. The GHG inventory performed for CY 2007 determined that Scope 2 emissions for MCAS Yuma in CY 2007 were 29,922 MT. If the Air Station-wide electrical demand was constant in 2007, 2008, and 2009, the energy efficiency projects in 2008 and 2009 would have reduced Scope 2 emissions by 4.2%.

Nevertheless, it is clear from the CY 2007 data that purchased electricity, which are Scope 2 GHG emissions, is the largest contributor to the overall inventory and, therefore, the likely candidate for major reductions. Additional details on GHG emission scopes, how certain emissions are counted in inventories but exempt from reduction goals, are described below.

Scope 1 includes all GHG emissions from sources that are owned or controlled by MCAS Yuma. These emissions are primarily:

- Generation of electricity, heat, cooling, or steam. For MCAS Yuma, this group includes the Station owned/operated boilers and heaters, which were thoroughly addressed in previous inventories. The main GHG from these sources is CO₂ but CH₄ and N₂O are also emitted from these stationary combustion sources.

- **Mobile Sources.** Mobile sources are emissions from vehicles, ships, aircraft and automobiles that are controlled by MCAS Yuma, which are essentially all vehicles for which MCAS Yuma buys fuel. These sources include General Services Administration (GSA)-leased vehicles, commercially-leased vehicles, and vehicles and mobile equipment owned by the Air Station (e.g., ground support equipment [GSE]). Tactical equipment is excluded from the reduction goals but their emissions are expected to be included in GHG inventories. For MCAS Yuma, GHG emissions from military aircraft operations would be a significant quantity.
- **Fugitive emissions.** These emissions are intentional or unintentional releases of GHGs from within the MCAS Yuma organizational boundary, such as leaking refrigeration units, landfill gas venting, wastewater treatment methane emissions, and the minute methane emissions from oil/water separators. These emissions were generally included in the previous inventories.
- **Process emissions** are from manufacturing or processing of chemicals and materials and from laboratory activities. MCAS Yuma has no process emissions, although past inventories described some fugitive emissions with this category.

Scope 2 GHG emissions are the indirect emissions associated with purchased electricity, steam, heating, or cooling. The GHG emissions are released off-site but are the consequence of activities within the organizational boundaries of the Air Station. Scope 2 GHG emissions also include electricity used in electric vehicles, even if that energy is reported differently for energy savings purposes.

Scope 2 GHG emissions must clearly identify where off-site electricity is provided by combustion of biomass or biofuels (biogenic sources). Combustion of biomass and biofuels is a unique activity, because the carbon in those fuels has been active in the current earth's environment, as opposed to fossil fuels which release carbon that has been trapped for millions of years. The CO₂ emitted from biomass and biofuels is excluded from GHG inventories and the reduction targets. However, the smaller quantities of CH₄ and N₂O generated when biofuels are burned are new additions to the atmosphere and must be included in GHG inventories and reduction targets.

MCIWEST Objective 1.2: Meet Department of Defense Fiscal Year 2020 13.5% Reduction Targets of Scope 3 Greenhouse Gases, Relative to Fiscal Year 2008

No additional information.

MCIWEST Objective 1.3: Comprehensive Annual Inventory of Scope 1, 2, and 3 Greenhouse Gas Emissions

No additional information.

C.2 MCIWEST GOAL 2 – IMPROVE ENERGY EFFICIENCY

MCIWEST Objective 2.1: 3% Annual Reduction in Building Energy Intensity through Fiscal Year 2015 or 30% Total Reduction by Fiscal Year 2015. 37.5% Total Reduction by Fiscal Year 2020

Additional Baseline Information

From 2003 through 2009, MCAS Yuma implemented a number of major energy conservation initiatives (i.e., those having project costs greater than \$100,000). These initiatives and their annual million British thermal units (MBTU) savings are summarized in Table C-2.

Table C-2. MCAS Yuma Major Energy Conservation Initiatives, FY 2003-2009

Project Name/Description	Fiscal Year Executed	Project Cost	Annual Cost Savings	Annual MBTU Savings
Lighting Retrofit	2003	\$158,626	\$28,618	1,593
DDC Building Controls	2003	\$1,302,377	\$168,310	8,052
DDC Building Controls	2004	\$500,000	\$64,395	3,105
DDC Building Controls*	2005	\$1,006,003	\$134,063	5,166
Airfield LED Lighting	2005	\$1,577,000	\$9,432	146
Lighting Upgrades	2005	\$523,396	\$9,432	2,720
Replace Building Fan Coils	2006	\$340,000	\$2,500	100
Replace Building Fan Coils	2007	\$853,510	\$25,000	2020
DCC Building Controls	2007	\$126,434	\$8,500	687
Solar PV – Street Lighting	2009	\$1,812,000	\$33,088	565
Building Controls	2009	\$584,000	\$20,602	647

Notes: DDC = Direct Digital Controls; LED = light emitting diode; PV = photovoltaic.

In addition to the major initiatives summarized in Table C-2, MCAS Yuma implemented a number of other smaller scale (i.e., those having project costs less than \$100,000) energy management initiatives and projects during FY 2003 through FY 2009 including:

- An initiative was put in place to ensure doors and windows were closed when heat or air conditioning was on.
- De-lamping and re-lamping with light emitting diode (LED) fixtures.
- Installation and increased use of window shades and blinds to block sun heating on hot days.
- Replacing air conditioner filters, excluding window units, on a regular basis (quarterly during operating season, or as recommended by manufacturer).

- Installation of photo cells and timers where possible.
- All steam lines were checked for leaks and repairs were completed or scheduled.
- All compressor air lines were checked for leaks and repairs were completed or scheduled.

Phase-out of Incandescent Bulbs - The Energy Independence and Security Act (EISA) of 2007 imposes new restrictions on energy use and GHG emissions. The EISA provides for phasing out today's general service incandescent light bulbs in favor of lower-wattage, energy-saving bulbs. Lighting can account for up to 30% of the electrical use in commercial facilities. The following ongoing energy saving initiatives and programs will continue to reduce the overall energy consumption at the Station:

- Re-lamping with energy efficient LED fixtures where applicable.
- "Operation Changeout" – installation of compact florescent bulbs throughout the Station.
- Phase out of incandescent exit signs.
- Limit incandescent lights with a greater than 20 hour per week use rate (may exclude retail).
- Ensuring inside lights are turned off during unoccupied times through the use of timers, motion detectors, etc.
- Exterior lights turned off during the day (use of photo cells).

Commands to Use Energy Management and Control Metering Systems - Installation of Direct Digital Controls (DDC) in various facilities continues to be the future for MCAS Yuma in the quest to reduce energy. These DDCs are providing maintenance and management personnel the tools to correct problems (e.g., inefficient temperature settings, improper run times, etc.), and reduce energy usage without affecting the quality of life of the occupant or operational functionality. Benefits include electrical metering, space temperature sensors, scheduling of start/stop of chillers, pumps, boilers, and air handling units with remote alarming and predictive preventative maintenance of heating, ventilation, and air conditioning (HVAC) equipment that all contribute to energy efficiency.

The metering and control systems will provide valuable data and information for diagnostics, analysis and prioritization of investments for energy conservation as well provide data for demand control opportunities and goal validation. Additional ongoing control systems implemented at the Station include the following.

- Ensuring occupied room temperatures conform to OPNAV 4100.5D or USMC guidelines.
- Ensuring office equipment was in sleep-mode or off during unoccupied times.
- Testing all HVAC controls systems for run schedule/temperature; making adjustments as necessary.
- Ensuring temperatures are set back during unoccupied times.

Energy Staff Training for Continued Energy Efficient Operations - MCAS Yuma ensures its energy management staff has opportunities to attend training course and other venues to discuss and learn

about the future of energy management and encourages the best application of practices and services as they relate to energy intensity reduction and building efficiency. MCAS Yuma energy staff regularly explores projects and opportunities to maximize energy conservation as well as implementing renewable energy projects where applicable and cost effective.

The numerous energy management practices and projects implemented by the knowledgeable staff at MCAS Yuma have put the Station on the right path to meeting the MCIWEST sustainability targets. However, with the addition of the Joint Strike Fighter (JSF) program and the projected increase in energy consumption associated with its implementation careful planning and energy management will be needed to achieve the aggressive mandated energy reduction sustainability targets.

Additional Fiscal Year 2010 Information

In FY 2010, MCAS Yuma continued with implementation of a number of major energy conservation initiatives (i.e., those having project costs >\$100,000). These projects and their annual MBTU savings are summarized in Table C-3.

Table C-3. MCAS Yuma Major Energy Conservation Initiatives, FY 2010

Name/Description	Fiscal Year Awarded	Project Cost	Annual Cost Savings	Annual MBTU Savings
High Efficiency Coils B146	2010	\$200,000	\$7,000	162
High Efficiency Chiller B852	2010	\$174,000	\$6,000	141
Replaced Chiller B980	2010	\$176,000	\$6,000	142
EMS Controls B661	2010	\$147,000	\$5,000	118
EMS Controls B913	2010	\$168,000	\$6,000	136
EMS Controls B919	2010	\$338,000	\$12,000	274
Metering Phase II	2010	\$641,600	\$0	0*
Total		\$1,844,000	\$42,000	973

Notes: MBTU = million British thermal units; EMS = Energy Management System.

The Energy Policy Act of 2005 requires federal agencies to meter buildings for electricity use by 1 October 2010 to the maximum extent practicable, using advanced meters and metering devices that provide data at least daily and measure consumption at least hourly.

As of 30 September 2010, 28 buildings at MCAS Yuma were metered with standard meters and 38 buildings were metered with advanced meters. Projects are programmed to install additional standard and advanced meters with the ability to measure electricity facility usage at 90% of the Station's facilities.

Energy Staff Training for Continued Energy Efficient Operations

MCAS Yuma Energy Awareness Program for FY 2010 - Displays and posters are updated and distributed as new information is made available, or at minimum, on a quarterly basis. Banners and signs were used for Earth Day Celebrations and MCAS Yuma Energy Awareness Week (October 2009). Presentations to the Command are made on a regularly basis to keep senior staff informed of the Station's energy program status, and presentations have been utilized to support community awareness. Local "E-News"

displays energy-related events and energy information to Station personnel. Earth Day and Energy Awareness Week are the primary energy awareness and information distribution opportunities. MCAS Yuma continuously utilizes the assistance of the Public Affairs Office to document energy projects and activities the Air Station is promoting and to increase overall public awareness of these initiatives. The Public Affairs Office continues to collaborate with the MCAS Yuma Environmental Department for Earth Day to promote energy conservation which has become a huge success and receives a large audience.

Energy Focused Personnel Training for FY 2010 - The following summarizes energy-related training for MCAS Yuma staff in FY 2010:

- Energy Program Staff Training;
- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) 90.1 (two individuals – 32 hours each);
- Gov Energy – Dallas, TX (one individual – 32 hours);
- Energy Training for Other Personnel;
- ASHRAE 90.1 Design – Yuma, AZ (22 individuals); and
- Gov Energy 2010- Supervisory Roles – Dallas, TX (four individuals)

MCIWEST Objective 2.2: Renewables Not Less Than 3% in Fiscal Year 2007-2009; Increasing to 5% in Fiscal Year 2010-2012; Increasing to 7.5% in Fiscal Year 2013 and Beyond

No additional information.

MCIWEST Objective 2.3: 50% of Statutorily Required Renewables Comes from “New” Sources

No additional information.

C.3 MCIWEST GOAL 3 – IMPROVE WATER USE EFFICIENCY AND MANAGEMENT

MCIWEST Objective 3.1: 2% Annual Reduction in Potable Water Intensity by Fiscal Year 2020 or 26% Total Reduction

Background

MCAS Yuma is located in arid southeast Arizona where average rainfall is less than four inches per year (NOAA 2011). Potable water for MCAS Yuma is provided by a drinking water treatment plant and distribution system owned and operated by the Station. The Colorado River is the drinking water source for MCAS Yuma as well as surrounding commercial, agricultural, and residential areas. Water from the river is delivered through a supply canal operated by the Yuma Mesa Irrigation and Drainage District, who also sets the price of water (MCAS Yuma 2006). MCAS Yuma has two backup water systems: (1) a tie-in to the City of Yuma drinking water distribution system, and (2) a 200-foot deep groundwater well which is occasionally used as a supplemental water source. The MCAS Yuma drinking water system is operated by the Director, Base Services Department and qualified operators. The treatment plant treats water via settling basins, filtration via sand filter, and disinfection by addition of sodium hypochlorite (MCAS Yuma 2008). MCAS Yuma is currently in the process of upgrading their water treatment plant to meet drinking water quality standards.

After treatment, the potable water is pumped into one of two storage tanks; each with a storage capacity of 500,000 gallons (gal) (MCAS Yuma 2008). The potable water then enters the Station distribution system which includes an underground network of pipes, backflow prevention devices, and irrigation systems. The water distribution system is operated by MCAS Yuma's Certified Distribution System Operator (the Arizona Department of Environmental Quality [ADEQ] is the certification agency). Currently MCAS Yuma does not generally meter potable water usage. However, there are several exceptions where buildings have been metered in an effort to identify usage statistics.

Cannon Air Defense Complex (CADC), a 160 acre complex utilized for training and deployment of unmanned aircraft, is located east of MCAS Yuma proper. The CADC depends on two groundwater wells for potable water supply at the complex. No treatment is required for the wells as they are of sufficient quality for consumption. There is little to no landscaping and no housing units at the CADC. MCAS Yuma also provides support to Camp Billy Machen for environmental and energy needs. Camp Billy Machen receives drinking water from the City of Imperial's (California) municipal drinking water system. Potable water use at Camp Billy Machen is limited to three resident officers and visiting Navy SEALs during training exercises.

MCIWEST Objective 3.2: Reduce Industrial, Landscaping, and Agricultural Water Intensity 2% Annually

No additional information.

C.4 MCIWEST GOAL 4 – PROMOTE POLLUTION PREVENTION AND WASTE REDUCTION

MCIWEST Objective 4.1: Report According to the Emergency Planning and Community Right-to-Know Act

No additional information.

MCIWEST Objective 4.2: Minimize the Generation of Waste and Pollutants Through Source Reduction

No additional information.

MCIWEST Objective 4.3: Implement Integrated Pest Management and Other Landscape Management Practices Which are Prepared, Reviewed, and Updated Annually by Pest Management Professionals

No additional information.

MCIWEST Objective 4.4: 50% Landfill Diversion for Waste by the End of Fiscal Year 2015 (Non-hazardous Solid Waste)

Solid waste is presently managed through Facilities Management and trash pick-up and off-station disposal is contracted. *Station Order 4010.2B Solid Waste (non-hazardous) Recyclable Materials Program Standard Operating Procedure*, dated 10 March 2005, establishes procedures for operating, managing, and enhancing MCAS Yuma's solid waste recycling program. This Order establishes roles and responsibilities to include management by the Recycling Program Manager under the Director, Base Services Department and establishment of a qualified recycling program (QRP). Annual Solid Waste Operations Reports are made to Naval Facility Engineering Command (NAVFAC) Engineering Service Center Port Hueneme using an Enterprise Digital Media (EDM) hosted website. The Station QRP pays for one wage grade employee and one additional employee is furnished by the Logistics Department. Planning is underway to redesign the recycling yard for manned operations (currently, only unmanned drop-off containers are available).

Although, FY 2010 has been established as the baseline year for this objective, FY 2008 and FY 2009 data is also available and presented in Table C-4 below for comparison purposes.

Table C-4. MCAS Yuma FY 2008 and 2009 Solid Waste Disposal Summary

FY 2009				
	Tons Disposed	Tons Recycled	Cost	Revenue
Off-site Landfill	2,849.34	-	\$50,075.35	\$0.00
Off-site Composting	0.00	0.00	0.00	\$0.00
Recycled*	0.00	519.11	\$78,314.00	\$95,570.70
C&D	1,219.99	1,514.19	\$122,457	\$1,400.00
Used motor oil (waste-to-energy)	0.00	123.28	\$0.00	\$16,445.00
Lead-acid batteries	0.00	74.84	\$0.00	\$1,347.47
Ethylene Glycol Antifreeze	0.00	10.93	\$0.00	\$200.00
Total Reported Disposed or Recycled	6,311.68			

Table C-4. MCAS Yuma FY 2008 and 2009 Solid Waste Disposal Summary

FY 2008				
	Tons Disposed	Tons Recycled	Cost	Revenue
Off-site Landfill	5,479.57	-	\$42,000.78	\$0.00
Off-site Composting	0.00	0.00	0.00	\$0.00
Recycled*	0.00	1,139.15	\$53,432.00	\$55,152.29
C&D	611.48	300,010.69	\$0.00	\$1,400.00
Used motor oil (waste-to-energy)	0.00	87.64	\$0.00	\$11,699.94
Lead-acid batteries	0.00	8.80	\$0.00	\$439.00
Total Reported Disposed or Recycled	307,337.33			

Notes: C&D = construction and demolition.

*Recycled solid waste includes food, glass, metals, other (non-food), paper and paperboard, plastic, and wood.

MCIWEST Objective 4.5: 50% Landfill Diversion for Waste by the End of 2015 (Construction and Demolition Waste); 60% Construction and Demolition Diversion Per Department of Defense Strategic Sustainability Performance Plan

The December 2010 Environmental Compliance Evaluation (ECE) identified that the Station has taken a proactive approach to ensure that new construction and major renovation of its buildings and facilities comply with the Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings. During the upfront acquisition phase of construction projects MCAS Yuma has requested NAVFAC Southwest (NAVFAC SW) to incorporate contract requirements pursuing cost-effective and innovative strategies to reuse or divert construction and demolition debris from landfills. This responsible role in the management of construction and demolition materials requires all contractors, vendors, and suppliers to participate in this effort. A major part of MCAS Yuma's construction and demolition (C&D) debris is concrete and asphalt such as foundations, curbs and gutters, roads, highways, and airport runways. The debris is crushed and reused for many applications such as foundations for buildings and roadways, clean fill, landscaping, and the reinforcement of storm water retention basins. Asphalt has also been processed and reused as aggregate base course for roadways and access roads on the main Station and training ranges.

MCIWEST Objective 4.6: Increase Organic and Compostable Materials Diverted from the Waste Stream

The Installation and Logistics (I&L) Department is responsible for Station solid waste management and recycling programs. Grounds maintenance and landscape waste from the Station landscape contractor is sent off-station to a no-cost county transfer station for a cost avoidance averaging \$1,410 annually. Marine Corps Community Services (MCCS) and public-private venture (PPV) housing do not participate in this program and their grounds maintenance waste volumes generated and resulting disposal costs have not been documented.

Food waste from the Station dining facility has been provided to a local pig farmer for over 10 years equating to an estimated cost avoidance averaging \$5,300 annually. The MCCS and its concessions do

not participate in this program and the food waste volumes generated and resulting disposal costs have not been documented.

MCIWEST Objective 4.7: Reduce Paper Use by Fiscal Year 2014

No additional information.

MCIWEST Objective 4.8: Ten Landfills Recovering Landfill Gas for Use by Department of Defense by Fiscal Year 2020

MCAS Yuma does not operate any landfills; therefore this objective does not apply.

MCIWEST Objective 4.9: Reduce Disposal of Toxic and Hazardous Materials and Chemicals; On-site Releases and Off-site Transfers of Toxic Chemicals Reduced 15% by Fiscal Year 2020

No additional information.

C.5 MCIWEST GOAL 5 – ADVANCE REGIONAL AND LOCAL INTEGRATED PLANNING TO CREATE SUSTAINABLE COMMUNITIES

MCAS Yuma Planning Overview

MCAS Yuma has a long and successful on-going relationship with the surrounding communities. On behalf of MCAS Yuma, the Community Planning and Liaison Office (CP&LO) regularly works with the political subdivisions on community planning and land use issues that impact the Station's compatible use zones including Noise Exposure Contours, range boundaries, and airfield safety surfaces, with some of these interactions dating back to the 1970s. The surrounding communities regularly request CP&LO review and comment on land use cases that include, but are not limited to, rezoning, special use, variance, minor and major amendments to the general or comprehensive plans, building and conditional use permits.

The CP&LO works on over 200 cases per year involving a myriad of planning and development requests. Typically the CP&LO works towards equitable solutions in the majority of the cases, however, some cases, which involve either aviation safety or the protection of the public from health concerns involving noise, the CP&LO has had to deny increased residential development or uses that are not acceptable within the Noise Exposure Contours or adjacent to the range boundaries.

The MCAS Yuma CP&LO reviews all local and regional requests related to cellular tower siting and height restrictions, as well as requests for determining the placement of telecommunication signal facilities, and other transmitters, to reduce electromagnetic interference (EMI) with military operations. Likewise, military operations can transmit electromagnetic energy that can inadvertently affect civilian activities, including computers, televisions, and radio reception (The Arizona Department of Commerce [ADOC] 2006). MCAS Yuma is also involved with water management-related issues such as the planning of retention basins, fire suppression ponds, and waste water collection areas from cooling plants that are within five miles of the Station (MCAS Yuma 2011b).

The CP&LO also reviews plans for all renewable energy and energy distribution projects in the Yuma region that include solar arrays, thermal energy, wind turbines, and transmission lines. The CP&LO participation in regional planning initiatives extends into other areas the Station is responsible for managing including the Chocolate Mountains Aerial Gunnery Range located in Riverside and Imperial Counties, California. The CP&LO reviews renewable energy projects, in particular solar array projects, located within the low level routes that crisscross the Imperial valley. The number of solar array projects in this area has greatly increased in the past year, with a majority of the projects occurring across open space in the valley and on agricultural land. The development of renewable energy projects is not only being looked at on private and public lands, but also on military installations and within ranges. All these issues need to be looked at and coordinated between stakeholders and agencies to reach an agreement and to provide solutions of which the CP&LO plays a key role on behalf of MCAS Yuma.

The Station and the community of Yuma have had a collaborative relationship for many years and in December of 2000 this relationship was reinforced by Arizona Revised Statute 28-8481 related to compatible planning and zoning around a military airport. The City of Yuma's Land Use Matrix was used

as a guideline for State regulations, and has since been adopted into the City and County of Yuma's Zoning Regulations, as well as, the Cities of Somerton and San Luis, and the Town of Wellton. MCAS Yuma has worked with the local communities to adhere to state zoning regulations. Likewise, state regulations provide for a Determination of Compliance (DC) process if the political subdivision and the military airport mutually agree that an individual use is compatible and consistent with the high noise or accident potential of the military airport. The CP&LO has issued DCs for land uses that were not included in the Land Use Matrix, such as storage facilities and warehouses that were allowed by previous regulations but restricted by the increase in the clear zone area. Likewise, some residential development within the Noise Exposure Contours have been issued a DC; however, developments are limited to two acres. Determination of Compliance petitions are reviewed on a case by case basis with all details carefully analyzed. For a majority of the cases, MCAS Yuma and the community have established conditions of approval to allow the proposed land use. These conditions have been in the form of disclosure statements, noise reduction standards, height reductions, the limiting of lighting, the relocation of structures, etc. MCAS Yuma has also worked with residential development agencies to allow homes to be clustered on larger parcels within the Noise Exposure Contours with the intent to limit land development to a two acre parcel size minimum.

Yuma Joint Land Use Plan

The Yuma Joint Land Use Plan (JLUP) was developed in the 1990s for the preservation of military and agriculture land uses and has been in place for over 20 years. The JLUP is a land use agreement between the County of Yuma, the City of Yuma, and MCAS Yuma. The Plan became an amendment to the Yuma County and the City of Yuma General Plans in 2005 and was amended again in 2007. The JLUP responds to the need for compatible land use around MCAS Yuma, as well as areas extending beyond the Station and on the periphery of the Barry M. Goldwater Range (BMGR). Altogether, the JLUP includes the CADC and areas between MCAS Yuma and BMGR, extending from County 17th Street on the south to Avenue 10E on the east (ADOC 2005).

The CP&LO is responsible for coordinating with the City and County to determine appropriate development adjacent to the Station's Air Installation Compatible Use Zone (AICUZ). The MCAS Yuma Master Plan provides the AICUZ composite as shown in Figure C-1. An AICUZ report was prepared for MCAS Yuma in 1976 when A-4 and F-4 aircraft were deployed at the Station; however, the Yuma community did not agree with the findings and hired their own consultant to do a noise study in 1978. The results of this noise study, completed by the consultant, have been recognized by the City and County in their land use plans and zoning ordinances and are still used today for land use planning as shown in Figure C-2. This map reflects the results of the DoD AICUZ study recommending dimensions for avoidance zones within the historically distributed areas of aircraft accidents and debris scatter as well as a the studies of the noise consultant hired by the City of Yuma. The JLUP identifies the overlap of land uses with Noise Exposure Contours and accident potential zones (APZs). Zones are numbered according to their level of risk, with the highest risk areas having the most restrictions. The arrival of the JSF will result in the preparation of a new AICUZ study.

Furthermore, the JLUP delineates the Implementation Measures generated in coordination with the Office of Economic Adjustment and establishes the Potentially Responsible Party (or Parties) for the

implementation of the measures (ADOC 2005). Per the implementation measures identified in the JLUP, MCAS Yuma, the City, County, DoD, and private land owners, are responsible for ensuring that the purchase of conservation easements around military installations transpire in order to address environmental and encroachment issues (ADOC 2005). In FY 2003, the Bob Stump National Defense Authorization Act (Public Law 107-314) (the Act) established statutory authority, permitting the DoD to enter into agreements with eligible entities as “encroachment partners,” including states, political subdivisions, or private conservation organizations (“conservators”), to purchase land for conservation easements. The Act authorizes partnering agreements between the DoD and eligible entities to acquire buffer zones to prevent incompatible land use from impacting military missions and reduce conflicts between military activities and surrounding urban areas. In addition, the Act is intended to preserve off-base habitat and enhance habitat connectivity in order to relieve current or avoid future environmental restrictions on operations. The acquisition of real estate for the purposes of military operations is not authorized under the Act, nor is the real estate managed directly by the DoD. Under this Act, the real estate must be managed by a non-governmental, state or local government partner. Proposed projects on the property must respond to specific constraints that ensure the protection of current and future military capabilities and demonstrate compliance with the encroachment relief plan for the installation. With regard to the areas within the JLUP, MCAS Yuma works with the City and County to acquire conservation easements and areas within the APZs.

Arizona Military Regional Compatibility Project

ADOC was established in 2001 to initiate the development of the Arizona Military Regional Compatibility Project. The purpose of the Arizona Military Regional Compatibility Project is to facilitate the communication between stakeholders working with and around active military installations to address compatible development (ADOC 2006). The stakeholders who participate in the Arizona Military Regional Compatibility Project include “relevant political jurisdictions, landowners, base personnel, developers, environmental groups and other interested parties to address land use compatibility issues” (ADOC 2005). The foundation principles of the Arizona Military Regional Compatibility Project include the following (ADOC 2006):

- Create feasible and sustainable solutions that are consistent with Arizona’s compatibility legislation, including Title 28, Article 7, *Airport Zoning and Regulation and the Growing Smarter and Growing Smarter Plus* legislation;
- Address areas within the vicinity of military installations in municipal general plans and county comprehensive plans to ensure development is compatible with areas of high-noise or accident potential or other impacts from installation operations, including those defined under Arizona Revised Statute (ARS) §28-8481;
- Ensure openness to varying viewpoints throughout the process;
- Focus on fair and equitable solutions for all affected parties;
- Establish, maintain, and enhance consistency and continuity in the decision-making process;
- Achieve consent among the stakeholders on the means to control encroachment; and

- Devise compatible land use solutions that accommodate reasonable development while preserving the installations' military missions.

As a result, ADOC developed a Joint Land Use Study (JLUS) for the BMGR with the objective to protect the range area. The study determined that there should be no development within one mile of the BMGR boundary. Since development along the range is a combination of private property and state land, enforcing no development along the BMGR is nearly impossible to accomplish. Ultimately MCAS Yuma worked with the County and came up with consensus for the area along the boundary that lies east of the Gila Mountains and south of County 17th Street and allows development of one dwelling unit (du) per five acres for the first half mile and one du per two acres for the second half mile (MCAS Yuma 2011b).

The Arizona Military Regional Compatibility Project also establishes sustainable solutions to sound levels in compatible land use areas around MCAS Yuma (ADOC 2006). Beyond protection of the Noise Exposure Contours around MCAS Yuma, the CP&LO also has to protect the Noise Exposure Contours for Auxiliary Airfield-2 (AUX-2) located within the BMGR. The County included protection for this area in their zoning ordinance when ARS 28-8481 was passed in early 2000. Development within the Noise Exposure Contours for AUX-2 remains limited at this time; however, with the development of the south mesa and the growth of the City of San Luis, pressure to intensify development may occur in the future.

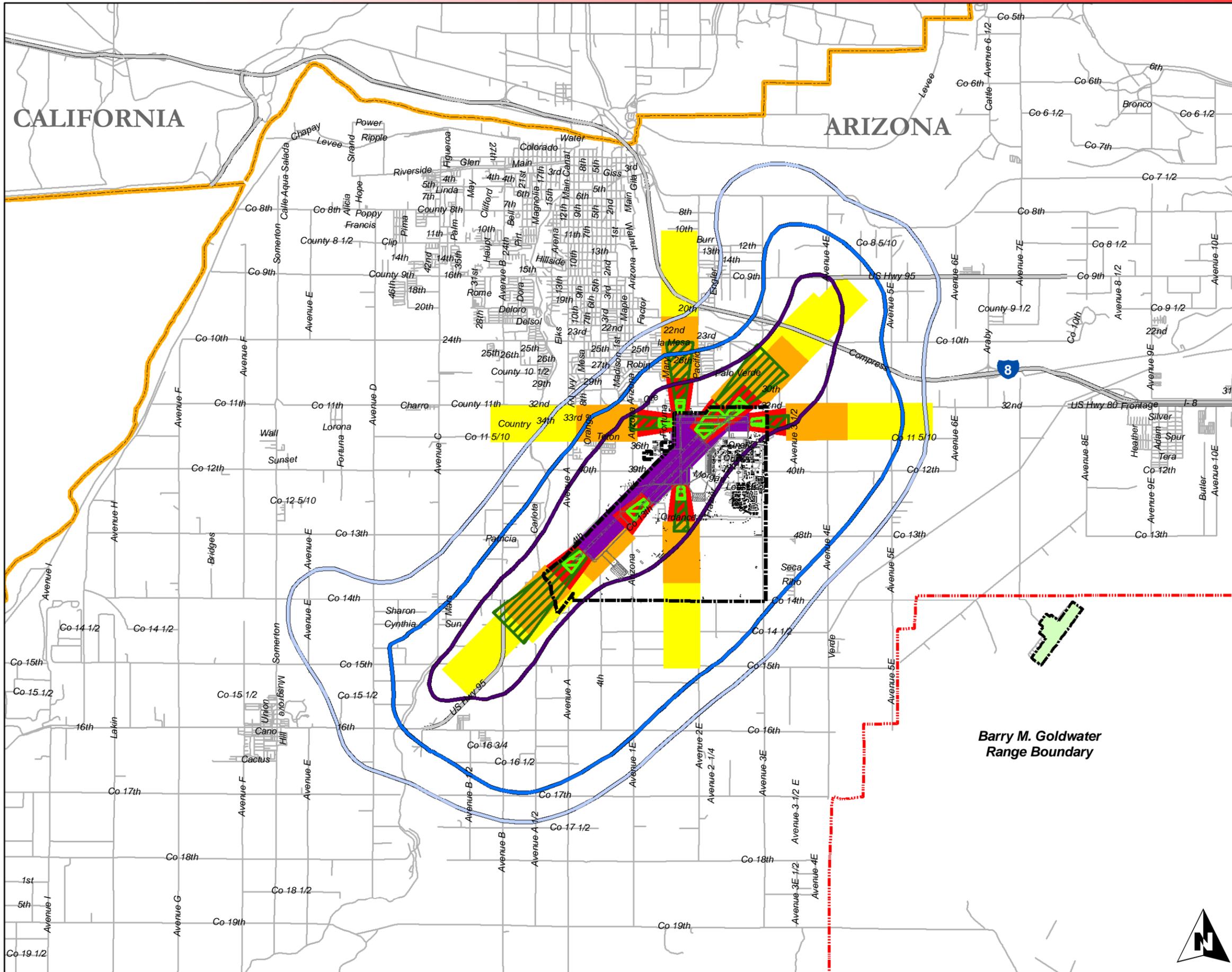
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MCAS YUMA MASTER PLAN

Air Installation Compatibility Use Zone (AICUZ) Composite

- MCAS Yuma Boundary
- Cannon Air Defense Complex
- State Boundaries
- Barry M. Goldwater Range Boundary (USMC)
- Freeways
- Roads
- Noise Levels**
 - 65 Ldn
 - 70 Ldn
 - 75 Ldn
- City/County Runway Safety Areas**
 - FAA APZ I
 - FAA Clear Zone
- Accident Potential Zones**
 - Primary Surface
 - Clear Zone
 - Accident Potential Zone I
 - Accident Potential Zone II

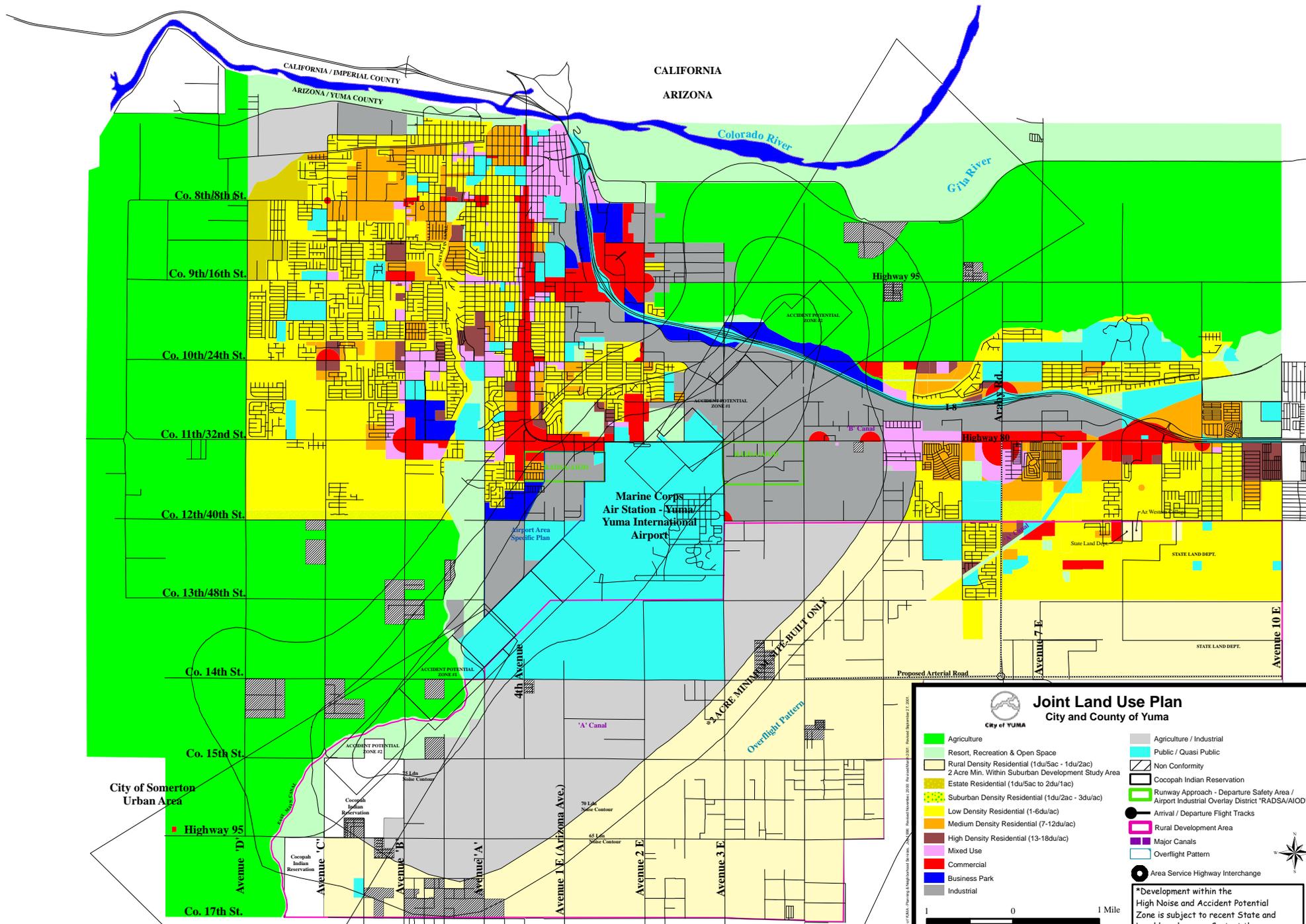


Barry M. Goldwater Range Boundary



Figure C-1

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Joint Land Use Plan City and County of Yuma

- | | |
|--|--|
| Agriculture | Agriculture / Industrial |
| Resort, Recreation & Open Space | Public / Quasi Public |
| Rural Density Residential (10u/5ac - 1du/2ac) | Non Conformity |
| 2 Acre Min. Within Suburban Development Study Area | Cocopah Indian Reservation |
| Estate Residential (1du/5ac to 2du/1ac) | Runway Approach - Departure Safety Area / Airport Industrial Overlay District "RADSA/AIOD" |
| Suburban Density Residential (1du/2ac - 3du/ac) | Arrival / Departure Flight Tracks |
| Low Density Residential (1-6du/ac) | Rural Development Area |
| Medium Density Residential (7-12du/ac) | Major Canals |
| High Density Residential (13-18du/ac) | Overflight Pattern |
| Mixed Use | Area Service Highway Interchange |
| Commercial | |
| Business Park | |
| Industrial | |

Adopted: City Resolution R96-38 9/12/96
Adopted: County Resolution R96-65 9/12/96

*Development within the High Noise and Accident Potential Zone is subject to recent State and Local law changes. Contact the appropriate local government agency for clarification on development options.



Prepared by City of Yuma, Planning & Development Services, 2006. Revised November 2008. Re-issued 12/2011. Revised November 27, 2013.

2010 Planning Overview

The MCAS Yuma CP&LO continually consults with other installation CP&LOs to review issues of concern and compare impacts on military issues where encroachment and incompatible development near the installation and ranges are similar (MCAS Yuma 2011b). The CPL&O relies on the importance of providing a common voice for the Station and relies on the continued partnership and relationship that is generated by working with other CP&LOs.

During FY 2010, “the CPL&O worked on legislation regarding the disposition of State Trust Land and the procedures that should be accomplished with the military” and continued to analyze the issue of real estate disclosures under military operations areas (MCAS Yuma 2011b). To facilitate this coordination, MCAS Yuma had a legislative analyst review matters that are primarily State of Arizona legislative issues. Real estate disclosures will continue to be looked at in the future.

In addition, the CP&LO initiated the review of the following proposed Western Area Power Administration (WAPA) construction projects during FY 2010:

- A new 230 kilovolts (kV) transmission line between the existing North Gila Substation (north-east of MCAS Yuma on County 6th Street) and the TS-8 substation (south of MCAS Yuma on County 14-1/2 Street), with regards to the height and the location of the towers. The expected completion of this project is in 2012.
- Construction of new 500 kV transmission line between existing Palo Verde Hub (west of Phoenix) and the Gila Substation (to the north), including a review of the position of alternative routes. The expected completion is 2012.

The following real estate and planning actions were reviewed by the CP&LO during FY 2010:

- The MCAS Yuma acquisition of 35 acres adjacent to the Air Traffic Control Buildings 1521, 1522, and 1523.
- The MCAS Yuma acquisition of 129 acres of Yuma County land following the 2009 expiration of the lease on the land.
- Proposed Land Use Plan changes limiting residential development near the Air station to lot sizes of a two acres minimum.
- Major development projects, including residential development, utility projects, building construction projects for height requirements, and renewable energy projects throughout the City and County of Yuma within areas adjacent to the Air Station regularly request the CP&LO’s involvement in their review.
- Ongoing coordination of PV project siting (averaging in excess of 200 projects per FY), and review of development projects in the areas of geothermal drilling wells, cooling towers, re-zoning requests (e.g., changing a property with a second dwelling to a split property), sewer and water related issues through the City, and wells and septic tanks throughout the County.

Yuma Regional Development Plan

The JLUP is currently being expanded into a Yuma Regional Development Plan (YRDP) which involves all the communities surrounding MCAS Yuma and the military ranges within Arizona to include the City and County of Yuma, the Cities of San Luis and Somerton, the Town of Wellton, and the Yuma Proving Ground. During FY 2010, on behalf of the Station, the CP&LO began collaborating on the YRDP. The YRDP builds on the previous planning efforts of the City/County JLUP, the JLUS for the BMGR, the General Plans of Somerton, San Luis, Wellton, and Yuma, and the Yuma County Comprehensive Plan (YRDP 2010). The YRDP outlines a multi-jurisdictional vision for 2020 and represents the collaboration of the Cities of San Luis, Somerton, and Yuma, the Town of Wellton, and Yuma County to achieve the following (Yuma County 2010):

- A common set of land use development policies for the future economic growth and development of lands within the incorporated and unincorporated areas in Yuma County.
- A foundation for the compatibility of land use activities in the vicinity of the following military facilities and ancillary airfields: MCAS Yuma/Yuma International Airport, the BMGR, and the Yuma Proving Grounds.
- A means to promote and preserve the primary economic assets of the area: agriculture, military and tourism.

As indicated by the CP&LO, the goal of preserving the military within the community of Yuma will continue in the YRDP (MCAS Yuma 2011b). The six overall policies of the YRDP focuses on the following (YRDP 2010):

- Coordinated and compatible planning;
- Concentrated urban development;
- Military and general aviation preservation;
- Valley agricultural preservation;
- Industrial and commercial development; and
- Rural development and lifestyle preservation.

The YRDP is similar to the JLUP and was created in response to the need for the City of Somerton to become a participant in the JLUP area, and also includes the new areas impacted by AUX-2 of BMGR in the City of San Luis and the Town of Wellton. The YRDP is similar to the JLUP in that it focuses on the following (YRDP 2010):

- Protection of the agricultural valley, military operations, and tourism;
- Industrial and commercial development is encouraged through the goals and objectives;
- Utilizes key military map elements;
- Promotes sustainable and contiguous development; and

- Preserves the rural areas where warranted.

In addition, the YRDP updates the JLUP in the following areas (YRDP 2010):

- Includes updated military and agricultural valley maps;
- Involves a regional planning meeting to replace the Joint Planning and Zoning Commission and Board of Supervisors/Council meetings;
- Includes all of the regional municipal, county, and military entities;
- Incorporates county-wide planning goals for agriculture, military, and tourism;
- Incorporates the JLUS elements;
- Includes the Yuma Proving Ground area;
- Includes airfields of significance;
- Requires the local control of land uses without a common map;
- Builds on commonalities of regulations and plans; and
- Fosters economic development policies.

The YRDP is currently under review by the City of Yuma and Board of Supervisors. Following the adoption of the plan by respective Councils and Boards of Supervisors, the YRDP will go to the voters for consent. If approved, the YRDP will be incorporated into respective general plans and map amendments followed by implementation strategies for the short- and long-term.

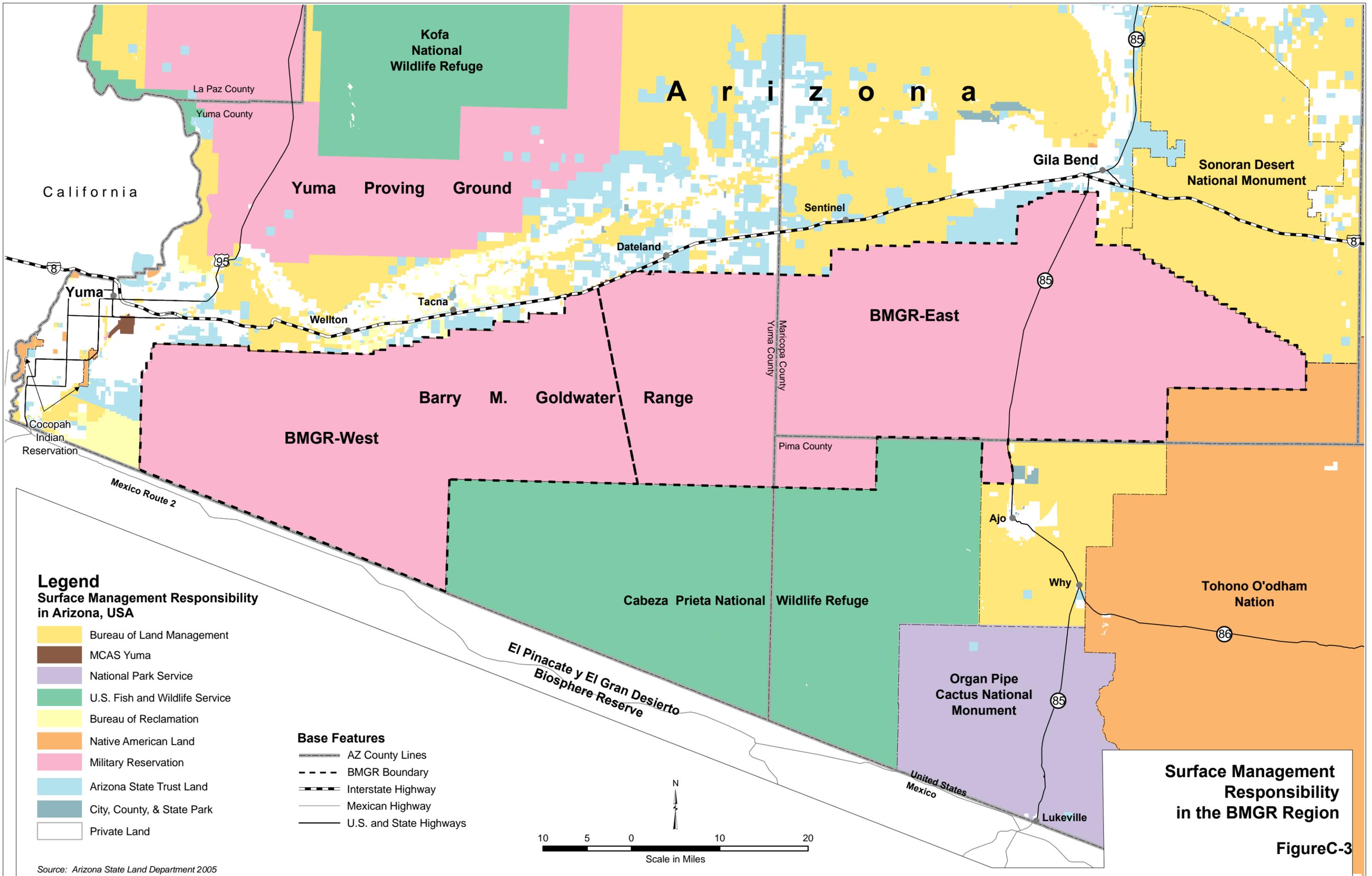
MCIWEST Objective 5.1: Identify and Analyze Impacts from Energy Use and Alternatives Under the National Environmental Policy Act with All Proposals for New and Expanded Facilities

No additional information.

MCIWEST Objective 5.2: Coordinate with Regional Ecosystem, Watershed, and Environmental Management Programs

Baseline Analysis

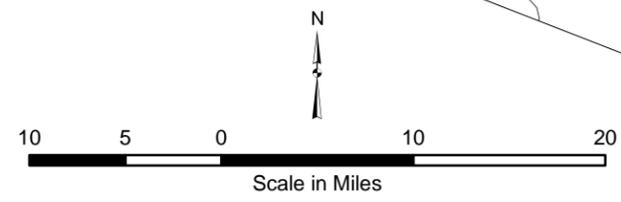
Regional Ecosystem Management Programs - As described in Section 2.5.2.1 of the MCAS Yuma ISPP, management of the BMGR is a key multi-service initiative. The BMGR is a relatively un-fragmented expanse of the Sonoran Desert in the United States, and is predominantly free of development, with the exception of State Route 85 (USAF LAFB and MCAS Yuma 2007). The BMGR is a 5,000 square mile ecologically connected area with links to the Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge, and other lands administered by the Bureau of Land Management (BLM), as shown in Figure C-3 (USAF LAFB and MCAS Yuma 2007). In addition, the BMGR shares approximately 37 miles of international border with the state of Sonora, Mexico.



Legend
Surface Management Responsibility
in Arizona, USA

- Bureau of Land Management
- MCAS Yuma
- National Park Service
- U.S. Fish and Wildlife Service
- Bureau of Reclamation
- Native American Land
- Military Reservation
- Arizona State Trust Land
- City, County, & State Park
- Private Land

- Base Features**
- AZ County Lines
 - BMGR Boundary
 - Interstate Highway
 - Mexican Highway
 - U.S. and State Highways



Surface Management Responsibility
in the BMGR Region

FigureC-3

Source: Arizona State Land Department 2005

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The major adverse ecological affects in the BMGR are associated with illegal cross-border traffic and off-road driving, whereby “soils, surface drainage hydrology, wildlife, wildlife habitat, cultural resources, visual resources, and public safety” are adversely disturbed (USAF LAFB and MCAS Yuma 2007). The ecological management of the BMGR and adjacent regions are unstable due to the cross-border smuggling and undocumented immigrant transit. The DoD, Department of Homeland Security, and MCAS Yuma are collaborating with the Border Patrol to control illegal cross-border traffic and “minimize the adverse effects on the range’s natural resources” (USAF LAFB and MCAS Yuma 2007).

Environmentally sensitive and federally protected areas within the BMGR are actively monitored by MCAS Yuma. The areas of critical environmental concern, as summarized in Table C-5, are managed by the MCAS Yuma Range Management Department (YRMD) under the Range-wide Management Strategy, and include monitoring of the Chocolate Mountains Aerial Gunnery Range and the BMGR.

The YRMD oversees all planning, construction, maintenance, and natural resource management of the training facilities on the BMGR and at the Chocolate Mountains Aerial Gunnery Range (MCAS Yuma 2011a). The Director of the YRMD prepares plans and programs in the areas of MCAS Yuma’s training range development, recreation, wildlife management, protection of cultural resources, soil conservation, endangered species, etc. within military and civilian counterparts (MCAS Yuma 2011a).

Table C-5. Regional Areas of Critical Environmental Concern

Environmentally Sensitive and Federally Protected Areas Within and Surrounding the BMGR	
Gran Desierto de Altar Biosphere Reserve	<ul style="list-style-type: none"> • Located primarily in the state of Sonora, Mexico. • Established as a cooperative agreement between the U.S. and Mexico to help preserve and manage this fragile ecosystem. • Binational focus on increasing coordination, and scientific/technological exchange in the management of important trans-border natural resources.
Tinaja Atlas	<ul style="list-style-type: none"> • Area is encompassed within the BMGR. • Classified as an area of critical environmental concern by the BLM. • Total area is approximately 82 square miles (21,000 hectares).
Mohawk Mountains/Sand Dunes Areas	<ul style="list-style-type: none"> • Area is encompassed within the BMGR. • Classified as an area of critical environmental concern by the BLM. • Total area is approximately 175 square miles (45,200 hectares).

Source: MCAS Yuma 2007

As such, the YRMD Director is responsible for “implementing public policies that mandate the protection of natural and cultural resources, and environmental quality without adversely affecting the overall effectiveness and efficiency of the military missions” (MCAS Yuma 2011a). The YRMD’s Mission Statement requires the Department to “safely and responsibly manage the ranges which comprise the Bob Stump Training Complex (BSTRC), by controlling all ground activities, conducting range sweep operations, performing target maintenance, ensuring environmental compliance and documentation,

providing natural resource management, monitoring legislative actions affecting the BSTRC, coordinating joint range activities with federal, state and local authorities, and supporting the training of military units utilizing the BSTRC” (MCAS Yuma 2011a).

In January 2001, the U.S. Department of the Air Force, Department of the Navy (Don), and Department of Interior, and the State of Arizona entered into a cooperative agreement to facilitate the joint preparation and implementation of an ecosystem-based Integrated Natural Resources Management Plan (INRMP) for the BMGR. The purpose of this INRMP was to provide an implementing framework to meet the provisions of the Military Lands Withdrawal Act of 1999 and the Sikes Act. The INRMP is a comprehensive plan for the integrative management of natural resources and sustainable public use of the BMGR to the extent that is consistent with the military purposes of the range and is consistent with ecosystem management principles (USAF LAFB and MCAS Yuma 2007). The INRMP supports management practices consistent with federal and state actions for threatened and endangered species.

The INRMP for the BMGR outlines the project activities planned from 2007 to 2012 to improve the ecological areas co-managed by MCAS Yuma and other jurisdictional authorities. The project activities are categorized into five general types of actions (USAF LAFB and MCAS Yuma 2007):

1. Resource Management – Development and implementation of a natural resources inventory and monitoring plan.
2. Motorized Access – Implementation of a process to close roads identified as redundant or negatively affecting resources, and establishment of signs and other tools to direct the public to using roads remaining open to public access.
3. Public Use – Implementation of several management elements for providing recreational opportunities while protecting resources and the military mission requirements of the BMGR.
4. Manage Realty – Address the public utility and transportation corridors that pass through the range.
5. Perimeter Land Use – Monitor land uses beyond the range to prevent encroachment, and work with other agencies in regional planning.

The predominant Surface Management responsibilities of BMGR are held by the Air Force and the Marine Corps, although the Arizona Game and Fish Department (AGFD) and Secretary of the Interior manage natural resources on the range and the State of Arizona manages resident wildlife, with the exemption of wildlife that is pre-empted by federal law. As an important guiding principle of the INRMP, “the goal of DoD ecosystem management is to maintain and improve the sustainability and native biological diversity of ecosystems while supporting human needs, including the DoD mission” (USAF LAFB and MCAS Yuma 2007).

Regional Environmental Management Programs - The goals of the Sustainability and Pollution Prevention (P2) Military Partnership include (SECDEF and Secretary of the Navy [SECNAV] 2008):

- Collaborate to identify opportunities and exchange techniques to conserve resources and achieve common goals;

- Promote P2 as the preferred method of doing business by exploring and identifying opportunities that provide solutions to environmental issues;
- Foster a spirit of cooperation through site visits, open dialogue, and information exchange among participants;
- Promote sustainability and innovation for continuous improvement;
- Compliance through P2; and
- Support Environmental Management System (EMS) objectives.

MCIWEST Objective 5.3: Participate in Regional Transportation Planning and Recognize Existing Community Transportation Infrastructure

Baseline

The Yuma Metropolitan Planning Organization (YMPO) is “primarily responsible for regional transportation planning, including the adopted 1995-2015 Countywide Transportation Plan, the annual Transportation Improvement Program, and the annual Air Quality Conformity Analyses” (MCAS Yuma 2007). The YMPO manages the contracting of special economic, environmental and design studies, conducting traffic counts, and coordinating census data for the City, as well as coordinating county support services (MCAS Yuma 2007). Currently the YMPO has been charged with administering and funding the Yuma County Area Transit (YCAT); however, the City of Yuma was considering funding the YCAT and a decision has gone to the voters. The result of the City not funding the YCAT has resulted in the removal of YCAT stops at City buildings. The continued funding and management of the YCAT is undetermined. The regional transportation corridors are highlighted in Figure C-4. Additional information on the existing transportation system are provided in the subsequent paragraphs including the Public Transit Fixed-Route System, Dial-a-Ride (Paratransit) System, Non-motorized/Bicycle Facilities, and Passenger Rail.

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MCAS YUMA MASTER PLAN

Regional Transportation

- Expressway Interchanges
- Existing Freeway Interchanges
- Planned Freeway Interchanges
- Freeways
- Expressways
- Prime Arterial Streets
- Major Arterial Streets
- Collector Streets
- MCAS Yuma Boundary
- City of Yuma
- Cannon Air Defense Complex
- State Boundaries
- Colorado River

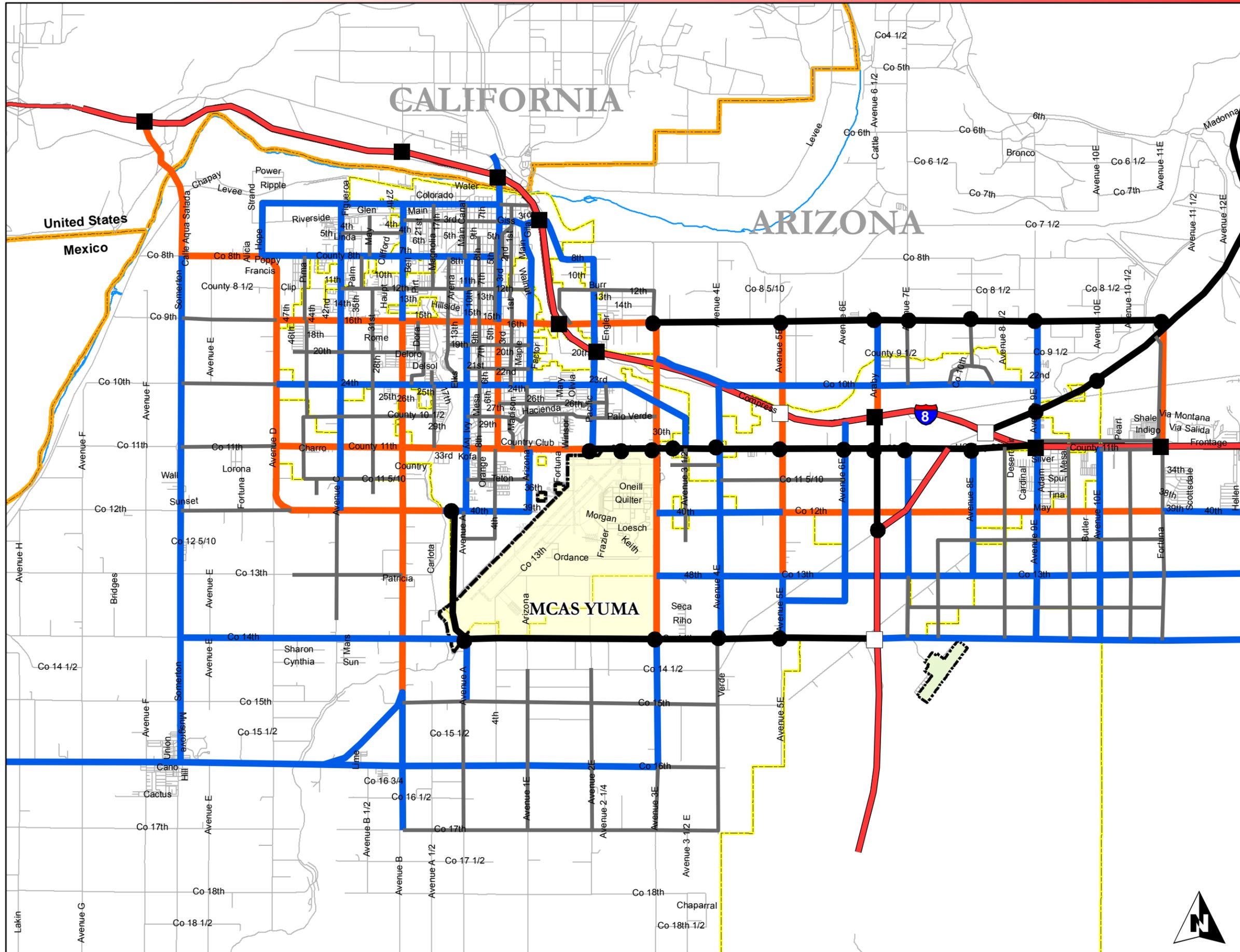
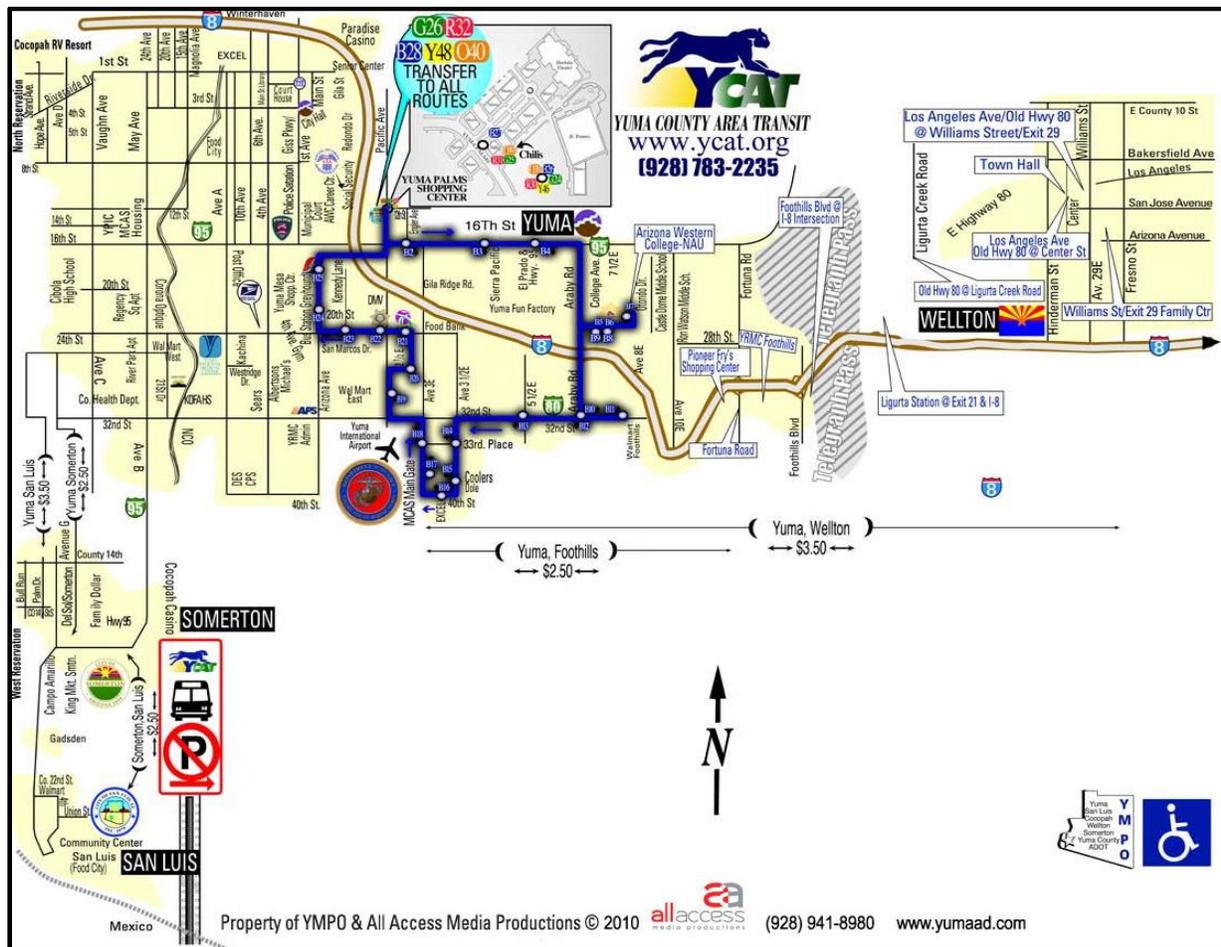


Figure C-4

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Public Transit Fixed-Route System -Prior to 1999 only private companies operated transit services in Yuma County with taxis providing service to urbanized areas and private vans servicing areas between San Luis and Yuma (YCAT 2011a). A paratransit service began in 1999, which was a call-response transportation service on an as-needed basis (YMPO 2010). In 2000 a fixed-route service was offered by YCAT to service areas between San Luis and Yuma (YCAT 2011a). In 2003 the YCAT faced financial and operating difficulties and the fixed-route transit service was terminated until the City and a “consortium of local groups contributed additional funding to the system” (YCAT 2010). Subsequent to the YCAT closure, YMPO selected a new operating contractor and the transit service was reinitiated with two routes added in 2004 and an additional route to Wellton added in January 2006 (YCAT 2011a). The YCAT system has expanded since the implementation of the paratransit service to a mix of “demand-responsive service and fixed-route, which reached a peak of 34,000 riders in October 2008, with an annual operating budget of \$2.0 million” (YMPO 2010). The paratransit service still exists as a Dial-A-Ride system as described below. The fixed-route system currently consists of seven separate routes with three circular one-way routes center-city routes (blue, red and green routes) and three long-distance routes (orange, purple and yellow routes). The Cocopah Indian tribe funds the short-distance line service (grey route). The blue route services the MCAS Yuma main gate as shown in Figure C-5.

Figure C-5. YCAT Service at MCAS Yuma (YCAT 2011b)



Dial-a-Ride (Paratransit) System - The YMPO currently administers and funds the YCAT Dial-a-Ride service; however, First Transit, operates the service (YCAT 2011a). The Dial-a Ride has 13 vehicles total and provides service to disabled County residents and residents that are 60 years and older with transit service throughout the County, the Cities of San Luis, Somerton, and Gadsden, the Foothills, and the Town of Wellton. In June 2009, ridership was approximately 3,100 people and in FY 2008, the operating budget was \$586,000. The service consists of nine fare areas ranging from \$4.00 to \$15.00 (YCAT 2011a).

Non-motorized/Bicycle Facilities - The Yuma Bicycle Facilities Master Plan (YBFMP) was adopted by the City Council of Yuma in 2009 as an amendment to the 1995 Bicycle Element in the City of Yuma General Plan. The YBFMP is based on input from the general public and from the Internal Bicycle Working Group to establish a basis for future bicycle facilities and advises the City of Yuma on park and recreation facility standards (City of Yuma 2009). The City currently has approximately 44 miles of bicycle facilities divided into four separate types: Bike Route, Bike Lane, Bike Path, and Multi-use Path (City of Yuma 2009), see Figure C-6. The existing plans have significant gaps in a continuous bicycle path. The City has plans to incorporate bicycle facilities, including the redesign of street systems and construction of new bicycle paths, to accommodate the growing need for all modes of travel (City of Yuma 2009).

Passenger Rail - Passenger trains are offered by Amtrak that travel between Los Angeles, California and Orlando, Florida with three trains running in each direction on a weekly basis (YMPO 2010). A Yuma train stop is located at the Amtrak Station, located at 281 Gila Street.

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FY 2010 Goal Performance Review

2010-2033 Regional Transportation Plan - The YMPO development of the 2010-2033 Regional Transportation Plan (April 2010) included the following regional partners and stakeholders (YMPO 2010):

- U.S. Department of Energy and WAPA;
- U.S. Army Yuma Proving Grounds;
- U.S. Fish and Wildlife Services;
- USEPA;
- U.S. Army Corps of Engineers;
- U.S. Department of the Interior (Bureaus of Reclamation and Land Management);
- U.S. Forest Service;
- U.S. GSA;
- BLM;
- National Park Service;
- Federal Aviation Administration;
- Federal Highway Administration;
- Bureau of Indian Affairs;
- Cocopah Indian Tribe;
- Quechan Indian Tribe;
- Arizona Department of Transportation Office of Environmental Services;
- ADEQ;
- AGFD;
- Arizona State Historic Preservation Office;
- Arizona State Land Department;
- Arizona State Historic Preservation Office;
- Arizona State Land Department;
- Arizona State Parks;
- Arizona Department of Transportation;
- Arizona Department of Water Resources;
- MCAS Yuma; and
- YMPO Technical Advisory Committee Members.

The following is a summary of the findings generated in the April 2010 *Regional Transportation Plan* (YMPO 2010):

- Mobility and convenience are limited due to transit services that occur on an hourly basis;
- The current transportation network has service gaps (e.g., between 8th Street and 16th Street);
- Transit options are not offered to seasonal workers on Sundays and holidays;
- Seasonal service around the planting, harvest, and school year may not be adequate for demand;
- Outside of the urbanized areas demand-response service is not well known; and
- In remote areas, the demand-response service is more expensive.

The Regional Transportation Plan also addresses other factors which may affect the advancement of the current transit system (YMPO 2010):

- Predicting the demand growth of public transit and non-motorized transit is difficult;
- Public perception of the YCAT system is that the system is not an established and successful system;
- Once the region's population reaches 200,000 individuals, reliance on state and federal sources of funding is not guaranteed and will change; and
- Current ridership trends are not reflected in the contractor reimbursement rates of 96,000 annual passengers for fixed-route service and 64,000 annual passengers for demand-response service.

MCIWEST Objective 5.4: Ensure Planning of New Facilities and Leases are Transit Oriented or, in Rural Communities, Emphasize Existing or Planned Town Centers

No additional information.

C.6 MCIWEST GOAL 6 – IMPLEMENT SUSTAINABLE BUILDING DESIGN, CONSTRUCTION, OPERATIONS AND MAINTENANCE, AND DECONSTRUCTION

MCIWEST Objective 6.1: All New Buildings that Begin the Planning Process in 2020 or After Are Designed to Achieve Zero-Net-Energy by 2030

In addition to complying with the Guiding Principles (see Objective 6.2 below and Table C-6 for a summary of the Guiding Principles) and achieving Leadership in Energy and Environmental Design (LEED) Silver rating, MCIWEST Objective 6.1, establishes that beginning in FY 2020 all new federal buildings will be designed to achieve “zero-net-energy” (ZNE). In such a building, the net annual energy needs are supplied with renewable energy technologies (NREL 2009).

The new building ZNE design requirement takes effect in FY 2020, when it is assumed sufficient competition will exist among commercially available technologies to support economically viable design solutions and acquisition strategies. Accordingly, there is no established baseline year for this objective, and there are no interim targets prior to the 2020 effective date. Notwithstanding, preparation is needed prior to 2020 to implement Objective 6.1. Methodologies and metrics must be developed to effectively pursue ZNE.

While no defined metric has been established, for purposes of development of the ISPP, the metric is assumed to be the ratio of buildings at MCAS Yuma meeting the ZNE design requirement to the total number of buildings beginning the design process in or after 2020. To measure conformance, it will require that criteria for ZNE are clearly described beginning with its definition. The definition of ZNE should clarify, for example, whether the metric is based on cost of energy or net energy consumed. When defining ZNE, consideration should be given to the following: (1) A grid-tied government PV system that sells excess capacity to the power company and purchases energy from the power company when demand exceeds the government’s solar supply. By 2020 the power company energy supplied will be a combination of renewable and non-renewable sources. Can the renewable component be included toward meeting the ZNE goal? Will it be measured in cost or kilowatts? (2) Similarly, if building waste is disposed of in a commercial landfill that recovers CH₄ gas to power gas turbines, can this component be credited toward meeting the ZNE goal? Again, the measure of such credits requires definition.

MCIWEST Objective 6.2: 15% of the Existing Federal Building Inventory of the Agency Meets the Guiding Principles by Fiscal Year 2015 and Continue Towards 100% Compliance for Complete Building Inventory

EO 13514 (g)(ii) requires all new construction and major renovation projects comply with the Guiding Principles and, section (g)(iii) requires at least 15% of the existing buildings and building leases over 5,000 square feet meet the Guiding Principles by FY 2015 (see Table C-6 below for a summary of the Guiding Principles).

The most current MCAS Yuma Master Plan is dated 2007. The Master Plan identifies numerous buildings that are recommended for construction and/or demolition prior to FY 2015. The plan identifies three types of projects: (1) Programmed projects are probable capital improvement projects that have an assigned program year and a proposed project location; (2) Planned projects are capital improvement

projects that have been postponed due to programming of more critical mission-essential construction projects or are newly generated projects. Planned projects may have been assigned a program year, but these assignments are subject to change, and these projects may or may not have a proposed project site; and (3) Master Plan projects are the least certain and all have been assigned a program year of FY 2015. Subsequent amendments since 2007 associated with the JSF preparations, however, have rendered the 2007 Master Plan outdated and no longer a useful source of metric data. Public Works Department Planners intend to update the Master Plan and generate the inventory of qualifying buildings from Internet Naval Facilities Assets Data Store (iNFADS) as resources become available.

Table C-6. Summary of Guiding Principles for New Construction and Major Renovations to Existing Buildings

Guiding Principle	Key Aspects
New Construction	
Employ Integrated Design Principles	<ul style="list-style-type: none"> - Integrate the use of Capital Asset Plan and Business Case Summary¹ - Establish performance goals for siting energy, water, materials, and indoor environmental quality - Consider all stages of buildings lifecycle - Employ commissioning to verify performance of building components and systems
Optimize Energy Performance	<ul style="list-style-type: none"> - Establish whole building performance target. For new construction reduce energy 30% compared to Standard 90.1-2007 baseline building performance rating.² For major renovations, reduce energy by 20% below pre-renovations 2003 baseline - Implement on-site renewable energy generation, when lifecycle cost effective - Install building level meters and continuously optimize performance
Protects and Conserve Water	<ul style="list-style-type: none"> - Reduce indoor potable water use by 20% compared to building baseline - Reduce outdoor potable water use by 50% compared to conventional means - Specify EPA’s WaterSense-labeled products (or equivalent)
Enhance Indoor Air Quality	<ul style="list-style-type: none"> - Meet ASHRAE Standard 55-2004³ - Meet ASHRAE Standard 62.1-2007⁴ - Establish/implement a moisture control strategy - Achieve a minimum daylight factor of 2% in 75% of space occupied for critical visual tasks - Provide automatic dimming controls and appropriate glare control - Specify materials and products with low pollutant emissions - Protect indoor air quality during construction per guidance⁵ - Prohibit smoking within building and within 25 feet of doors, windows, and ventilation intakes
Reduce Environmental Impact of Materials	<ul style="list-style-type: none"> - Specify products that meet/exceed EPA’s recycled content recommendations⁶ - Specify products with the highest content level per USDA biobased-content recommendations, or made from rapidly renewable resources and certified sustainable wood products - Use environmentally preferable products⁷ - Recycle/salvage at least 50% of C&D waste - Eliminate use of ozone-depleting compounds
Guiding Principle	Key Aspects
Major Renovations	
Employ Integrated Assessment, Operation and Management Principles	<ul style="list-style-type: none"> - Incorporate sustainable practices with the EMS - Establish performance goals for energy, water, materials, and indoor environmental quality - Develop a building management plan, and augment operations based on occupant feedback - Employ recommissioning to verify performance of building components and systems. Building recommissioning must be completed every four years to qualify as meeting the Guiding Principles

Guiding Principle	Key Aspects
Optimize Energy Performance	<ul style="list-style-type: none"> - Receive an Energy Star® rating of 75 or higher, or reduce energy use by 20% compared to 2003 baseline, or reduce energy use by 20% compared to ASHRAE 90.1-2007 baseline - Implement on-site renewable energy generation, when lifecycle cost effective. - Install building level meters and continuously optimize performance.
Protects and Conserve Water	<ul style="list-style-type: none"> - Reduce indoor potable water use by 20% compared to building baseline, or 20% compared to 2003 baseline - Reduce outdoor potable water use by 50% compared to conventional means, or 50% compared to 2003 baseline, or use no potable irrigation water. Installation of water meters is encouraged. Reduce offsite stormwater discharges of polluted water
Enhance Indoor Air Quality	<ul style="list-style-type: none"> - Meet ASHRAE Standard 55-2004 - Meet ASHRAE Standard 62.1-2007 - Establish/implement a moisture control strategy - Provide automated lighting controls in restrooms, conference/meeting rooms, break rooms, training rooms, and offices. - Achieve a minimum daylight factor of 2% in 50% of space occupied for critical visual tasks, or provide occupant controlled lighting for 50% of regularly occupied spaces - Provide automatic dimming controls and appropriate glare control - Use materials and products with low pollutant emissions - Use integrated pest management techniques and EPA-registered pesticides only when needed.
Reduce Environmental Impact of Materials	<ul style="list-style-type: none"> - Use products that meet/exceed EPA’s recycled content recommendations - Use products with the highest content level per USDA biobased-content recommendations, or made from rapidly renewable resources and certified sustainable wood products - Use environmentally preferable products - Provide reuse and recycling services for building occupants, recycle/salvage waste generated from building O&M, minor renovations, and discarded furnishings/equipment - Eliminate use of ozone-depleting compounds

Notes: EPA = Environmental Protection Agency; ASHRAE = American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; USDA = U.S. Department of Agriculture; C&D = construction and demolition; EMS = Environmental Management System; O&M = Operations and Maintenance.

- ¹ OMB A-11, Section 7, Exhibit 3000: Capital Asset Plan and Business Case Summary.
- ² American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE)/Illuminating Engineering Society of North America (IESNA). 2007. Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential.
- ³ ASHRAE. 2004. Standard 55-2004, Thermal Environmental Conditions for Human Occupancy.
- ⁴ ASHRAE. 2007. Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality.
- ⁵ Sheet Metal and Air Conditioning Contractor’s National Association (SMACNA). 2007. Indoor Air Quality Guidelines for Occupied Buildings under Construction.
- ⁶ Per section 6002 of the Resource Conservation Recovery Act (RCRA).
- ⁷ National Institute of Building Sciences. 2010. Federal Green Construction Guide for Specifiers. Available at <http://www.wbdg.org>. January.

The NAVFAC SW Capital Improvement Office design managers support MCAS Yuma in developing scopes and contract documents for design/build, major repair, and alterations projects at MCAS Yuma. NAVFAC SW policy requires formal incorporation of Guiding Principles, LEED, and Energy Conservation Analysis (ECA) into these projects (NAVFAC Engineering Construction Bulletins from 2007 to present require the incorporation of Guiding Principles to meet the EPAct 2005, EO 13423 and EO 13514 requirements in design/build projects). All design reviews are sent to MCAS Yuma for comment. There are many projects currently at various stages in support of the JSF stationing at MCAS Yuma, and each of these projects may involve multiple buildings.

The Guiding Principle Optimize Energy Performance requires installation of building level meters to continuously optimize performance. The majority of buildings at the Station are not currently metered and key information required to meet the Guiding Principles energy requirements is not available. Tracking installation performance against the objective targets through the planning horizon is likely to be facilitated by guidance on the independent validation and verification (IV&V) process to ensure compliance with the Guiding Principles included in the DoD's forthcoming Sustainable Buildings Implementation Plan (SBIP).

MCIWEST Objective 6.3: Implement and Achieve Objectives of Stormwater Guidance

No additional information.

MCIWEST Objective 6.4: Achieve LEED Certification of Buildings for New Construction and Major Renovations

No additional information.

C.7 MCIWEST GOAL 7 - ADVANCE SUSTAINABLE ACQUISITION

MCIWEST Objective 7.1: 95% Procurement Conducted Sustainably

The Air Station promulgated a Green Procurement Plan (GPP) in 2004 and conducts a review and update of the plan annually (last reviewed in August 2009). The GPP establishes Air Station policy on green procurement which states:

“The purchase and use of products and services can have a profound impact on the environment. The Commanding Officer, MCAS Yuma recognizes the positive impact the installation can make on the environment through the purchasing decisions employees make. Increasing the acquisition of environmentally preferable products and services, to identify and incorporate “green” thinking into acquisition. MCAS Yuma shall integrate environmental considerations into every aspect of the Station acquisition programs and our mission.”

The GPP includes requirements for personnel to reduce the environmental damages associated with their purchases by increasing their acquisition of environmentally preferable products and services to the maximum extent practicable, that personnel be trained on a regular basis, that contract language includes GPP requirements as stipulated in the Federal Acquisition Regulations (FAR), to document non-compliant purchases, and perform annual GPP audits. However, the GPP does not establish adequate roles and responsibilities and is not fully implemented.

The Ability 1 store is the mandatory Air Station source for office supplies; however, the Station Contracting Office has no oversight of the items the store stocks. The Environmental Department indicates they have difficulty providing technical guidance and helping buyers identify green products without an environmental preferable database/cross-reference tool.

MCIWEST Objective 7.2: Use 30% Postconsumer Recycled Paper

No additional information.

C.8 MCIWEST GOAL 8 – OPTIMIZE FLEET AND TRANSPORTATION MANAGEMENT/ALTERNATIVE FUELS

Overview

EO 13514 makes the reduction of GHGs a priority for federal agencies. Overall reduced petroleum consumption and improved vehicle fleet management is an important part of meeting these aggressive GHG reduction goals. The EO tasked the Department of Energy (DoE), in coordination with the GSA with issuing comprehensive guidance on Federal fleet management. In response, the DoE, Federal Energy Management Program (FEMP) developed two important documents for federal vehicle fleet managers – the *Guidance for Federal Agencies on EO 13514, Section 12, Federal Fleet Management* (April 2010) and the *Comprehensive Federal Fleet Management Handbook* (June 2010).

The overarching goal of fleet management regarding the EO is to reduce GHG emissions. The GHG emissions associated with fuel use (Scope I emissions) depend on the volume of fuel combusted, the density of the fuel, the lifecycle carbon emissions of the fuel, and the fraction of carbon that is oxidized to GHGs. Therefore, GHG emissions for the installation are measured based on the amount and type of fuel burned in fleet vehicles.

Reducing petroleum consumption is the principal means to reduce these emissions. The aforementioned guidance documents emphasize the following three key petroleum reduction strategies:

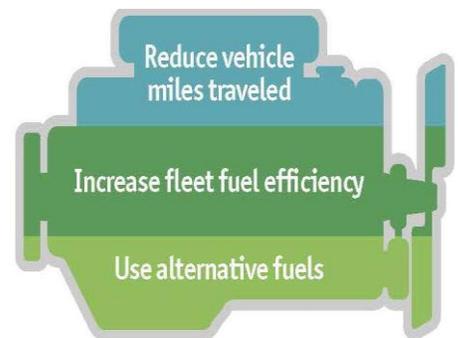
- Reducing vehicle miles traveled (VMT);
- Increasing fleet fuel efficiency and optimization measures; and
- Displacing petroleum with alternative fuel use.

In order to achieve the MCIWEST objectives related to GHG emission reductions through petroleum reduction, and meet mission-critical needs, and comply with all federal goals and mandates, an installation can meet the GHG emission reduction goals and petroleum reduction goals through a combination of the three driving principles described above. Each principle is summarized below.

Reduce Vehicle Miles Traveled - Installations can reduce their fuel consumption by implementing the following procedures to reduce VMT, including:

- Consolidating trips;
- Eliminating trips by using tools such as video and web conferencing for meetings;
- Taking advantage of mass transportation and agency shuttles;
- Improving routing to eliminate unneeded miles and avoid traffic conditions; and

Figure C-7. The Driving Principles of GHG and Petroleum Reduction (from Guidance for Federal Agencies on EO 13514 Section 12 Federal Fleet Management, April 2010)



- Using alternative modes of transportation such as bicycles and low-speed vehicles as appropriate.

Increase Fleet Fuel Efficiency - Approaches to increase the overall fuel efficiency of fleets (and subsequently reduce petroleum use) include:

- Acquiring higher fuel economy vehicles and “right sizing” vehicles to mission needs;
- Acquiring hybrid electric vehicles;
- Maintaining vehicles to improve fuel economy or replace inefficient vehicles that have exceeded their useful life;
- Driving more efficiently (e.g., observing the speed limit and avoiding aggressive driving); and
- Avoiding excessive idling.

Use Alternative Fuels - This principle focuses on maximizing the displacement of petroleum with alternative fuels which include, but are not limited to: E-85 (a blend of 85% ethanol and gasoline), 100% biodiesel, compressed natural gas (CNG), liquefied natural gas (LNG), liquefied petroleum gas (LPG), and electricity. When possible, installations should consider the use of low carbon alternative fuels whenever possible and should decide on the type of alternative fuel vehicle (AFV) and infrastructure based on the fleet location characteristics:

- E-85, CNG, and other alternative fuels that require dedicated infrastructure and AFVs should be used at fleet locations, where alternative fuel is currently available or at high-use locations where alternative fuel sites are planned in the near-term.
- Biodiesel blends, which require dedicated infrastructure but can be used in conventional diesel vehicles, are ideal for locations with high diesel fuel use.
- Hybrid electric vehicles and the required charging infrastructure are best used in addition to other alternative fuels or in locations without access to other alternative fuels.

MCIWEST Objective 8.1: 2% Vehicle Petroleum Reduction Annually through Fiscal Year 2015; 20% Vehicle Petroleum Reduction by Fiscal Year 2015; 30% Petroleum Reduction by Fiscal Year 2020

Vehicle fleet support service at MCAS Yuma is provided by the Southwest Region Fleet Transportation (SWRFT) which is a regional organization that provides management of Garrison Mobile Equipment (GME) fleets located at seven Marine Corps Installations in the southwest U.S. including MCAS Yuma. The SWRFT fleet managers at each of these locations comprise a team that is dedicated to reducing petroleum fuel usage. The driving factors behind this effort are to reduce GHG emissions, reduce other transportation waste streams, reduce the dependence on foreign oil, and increase the efficiency of each vehicle operated to support the mission.

Although fuel consumption has remained relatively constant between FY 2005 and FY 2009, SWRFT staff at MCAS Yuma are continuously looking for ways to reduce overall fuel consumption and increase fuel efficiency. For example, at the Station, a comprehensive program has been instituted related to the installation of on-board integrated wireless location and performance monitoring devices. These

devices attach to the vehicle's computer monitoring engine performance and speed while using global positioning system (GPS) technology to monitor location. This information is collected 24 hours a day, seven days a week, and is transmitted wirelessly via cellular transmission to a collection point that is readily accessible via a web-based interface. Monitoring engine performance has allowed managers to quickly identify and repair a vehicle's engine that is not performing properly and emitting excessive pollutants. Monitoring the vehicle's speed has also provided a tool to improve driving habits, reduce excessive speeds, and reduce fuel consumption and associated hazardous emissions. Location monitoring has reduced unnecessary trips and improved route planning which also results in efficient fuel consumption and reduction of pollutants.

In large part, the SWRFT staff adheres to USMC, MCIWEST, Air Station, and organizational policy to guide the vehicle fleet management activities.

MCIWEST Objective 8.2: 10% Increase in Non-petroleum Fuel Annually

For the purposes of this analysis, it was assumed that this requirement is based on the requirement of EO 13423 Section 2(g) which requires agencies that operate a fleet of at least 20 motor vehicles to increase the total alternative fuel consumption by 10% annually relative the baseline of FY 2005. The requirement to annually increase the use of alternative fuels by 10% is measured relative to the prior year's alternative fuel usage levels through 2015. It is also assumed for the purposes of this analysis that the 10% annual increase in alternative fuel use be carried through FY 2020.

Alternative fuels are defined by Section 301 of the EPAAct 1992, and may be modified by the Secretary of Energy by rule. The following fuels are currently defined or designated as alternative fuels:

- Pure methanol, denatured alcohol, and other alcohols;
- Blend of 85% or more of methanol, denatured ethanol, and other alcohols with gasoline or other fuels (including E-85 and M-85);
- Natural gas and liquid fuels domestically produced from natural gas (including CNG and LNG);
- LPG including propane;
- Coal-derived liquid fuels;
- Electricity;
- Biodiesel (B100);
- Fuels (other than alcohol) derived from biological materials;
- Hydrogen; and
- P-Series fuels (clear liquid fuels between 89 and 93 octane, designed for use in flex fuel vehicles containing 35% natural gas liquids, 45% ethanol, and 25% biomass-derived fuel).

MCIWEST Objective 8.3: Purchase Low Greenhouse Gas Emitting Vehicles

No additional information.

C.9 MCIWEST GOAL 9 - PROMOTE ELECTRONIC STEWARDSHIP

MCIWEST Objective 9.1: Ensure Electronic Product Environmental Assessment Tool-registered Electronic Product Procurement Preference; Ensure Procurement of Energy Star and Federal Energy Management Program Designated Equipment

Background

The following provides a summary of the types of products addressed as part of this objective – Electronic Product Environmental Assessment Tool (EPEAT®), Energy Star® and FEMP designated equipment.

EPEAT®-registered electronic products meet environmental measures referred to as criteria. All criteria used in EPEAT® are based on American National Standards Institute (ANSI)-approved public standards which provide technical details for every criterion and specify how a manufacturer must demonstrate compliance. Currently, EPEAT® registration is based on the Institute of Electrical and Electronics Engineers (IEEE) 1680 Family of Environmental Assessment Standards. Products are measured against both *required* criteria and *optional* criteria. A product must meet all of the *required* criteria to be added to the registry.

EPEAT® criteria reflect several categories or environmental attributes that cover the full lifecycle of electronic products. Specifically, the personal computer and display standard addresses:

- Reduction/elimination of environmentally sensitive materials;
- Material selection;
- Design for end of life;
- Product longevity/life extension;
- Energy conservation;
- End-of-life management;
- Corporate performance; and
- Packaging.

The FAR requires specific contract language for purchases or leases of products that can apply EPEAT® standards. As of December 2007, for example, the model contract language for personal computer products is (EPEAT 2011):

“Contractor shall deliver, furnish for Government use, or furnish for contractor use at a Government-owned facility, only personal computer products that at the time of submission of proposals were EPEAT Bronze registered or higher. Bronze is the first level discussed in clause 1.4 of the IEEE 1680 Standard for the Environmental Assessment of Personal computer Products.”

Alternate contract language is provided for the substitution of Silver registered or higher, instead of a minimum Bronze requirement.

Energy Star® is a government-backed symbol and standard for energy efficiency helping to save money and protect the environment through energy-efficient products and practices. The Energy Star® label was established to (1) reduce GHG emissions and other pollutants caused by the inefficient use of energy, and (2) make it easy for consumers to identify and purchase energy-efficient products that offer savings on energy bills without sacrificing performance, features, and comfort. Products earn the Energy Star® label by meeting the energy efficiency requirements set forth in Energy Star® product specifications. EPA establishes these specifications based on the following set of key guiding principles:

- Product categories must contribute significant energy savings nationwide;
- Qualified products must deliver the features and performance demanded by consumers, in addition to increased energy efficiency;
- If the qualified product costs more than a conventional, less-efficient counterpart, purchasers will recover their investment in increased energy efficiency through energy bill savings, within a reasonable period of time;
- Energy efficiency can be achieved through broadly available, non-proprietary technologies offered by more than one manufacturer;
- Product energy consumption and performance can be measured and verified with testing; and
- Labeling would effectively differentiate products and be visible for purchasers.

The FEMP supports federal agencies in identifying energy- and water-efficient products that meet federal acquisition requirements, conserve energy, save taxpayer dollars, and reduce environmental impacts. These procurement requirements are identified in the FAR Part 23. FAR Part 23 also requires agencies to include a clause from FAR Part 52.223.-15 in all contracts and solicitations when acquiring or specifying energy-consuming products. The DoE and the EPA sponsor four programs with the authority to identify appropriate product types and set performance levels according to those requirements. These programs include FEMP-designated products, Energy Star®, low standby power products, and WaterSense labeled products. In addition to the FAR, procurement guidance for the Station is provided in the DoD Supplement to the FAR (DFARS), the Navy Marine Corps Acquisition Regulation Supplement (NMCARS), and the Marine Corps Acquisition Procedures Supplement (MAPS).

FY 2010 Goal Performance Review

Next Generation Enterprise Network Electronic Procurement Preference

The focus of the Next Generation Enterprise Network (NGEN) is to develop a reliable, adaptable, and secure information service to support the mission. NGEN supplies a secure information technology infrastructure that will eventually become an “integrated enterprise-wide networking environment where data and services” available to the DoN in its entirety (DoN 2008). The DoN has been reevaluating the approach of information technology (IT) initiatives and the centralization of consolidated systems that “[support the] DoD IT Enterprise Strategy and Roadmap consolidation and efficiency initiatives” (DoN 2011). The DoN announced “in a memo dated 20 December 2010, ‘DoN Information Technology/Cyberspace Efficiency Initiatives and Realignment Tasking,’ ... the establishment

of a new department IT policy and governance board, the Information Enterprise Governance Board (IGB), as well as eight new integrated product teams (IPTs)" (DoN 2011). The initiatives formed under the IPTs are (DoN 2011):

- Data center consolidation;
- Application rationalization;
- Enterprise software licensing/hardware and software commodity purchases/IT services;
- Navy and Marine Corps portal environment;
- Near-, mid- and long-term initiatives;
- Current and planned IT acquisition programs;
- DoN telecommunications environment; and
- IT/cyberspace workforce and training.

On 5 May 2011 a memo titled *DON Information Management (IM)/IT/ Cyberspace Campaign Plan* outlined the vision for FY 2011-2013 under the theme: "Be Enterprise, Be Effective, and Be Efficient" with a framework built on the following four goals (DoN 2011):

- Goal 1: Sustain an operationally effective, integrated, secure, and efficient information management (IM)/IT/cyberspace and resource management capability.
- Goal 2: Ensure protection of sensitive information, including personally identifiable information, and timely access to trusted authoritative information to enable effective decision making and mission support.
- Goal 3: Attract, develop and retain a highly competent IM/IT/cyberspace and resource management Total Force.
- Goal 4: Ensure all IM/IT/cyberspace and resource management investments are effective, efficient, planned, aligned and acquired to support DoN enterprise strategies.

MCIWEST Objective 9.2: 100% of Excess or Surplus Electronic Products Disposed of in an Environmentally Sound Manner

The Regional Defense Logistics Agency (DLA) Disposition Services office in Yuma performs the following functions (DLA Disposition Services 2010):

- Disposal, integration and analysis, environmental, controlled property, and demilitarization.
- The following additional functions may be performed if no warehouses are at a field office (DLA Disposition Services 2010):
 - Unload generator's conveyance. Loads and seals conveyance for transportation to the warehouse;

- Provide customer service during each pick up, including assistance completing documentation, resolving rejected property problems, and providing ongoing instruction regarding turn-in procedures;
- Reject unsafe loads and educates the generator’s representative on proper packing methods to avoid future rejections; and
- Arrange for the return of rejected property to the generator.

MCIWEST Objective 9.3: Establish and Implement Policies to Enable Power Management; Duplex Printing, and Other Energy Efficient or Environmentally Preferable Features

In January 2007, EO 13423 was signed and included a provision to consolidate “existing preference purchasing programs, energy-efficient and water-conserving programs, and sustainable design requirements into one program” (DoN 2009a). EO 13423 implemented electronic stewardship practices to ensure that Energy Star® features are enabled on Station computers and monitors, and practices are established to extend the useful life of agency electronic equipment. In 2008 the DoD issued the Electronic Stewardship Implementation Plan. Following this plan, the SECNAV Instruction 500.36A established the DoN Information Management Electronic Stewardship Criteria in 2009. The DoN Information Management Electronic Stewardship Criteria established criteria for information technology assets including the following:

- 95% of new electronics to be purchased as EPEAT® registered;
- Enable Energy Star® features on 100% of computers and monitors where possible;
- Requirements to turn off equipment when not in use where doing so would not interfere with access data and security updates; and
- Requirements to ensure default double-sided printing settings were enabled on all duplication equipment.

The criteria also establishes requirements for ensuring that monitors and workstations maximize energy efficient properties as much as possible where doing so does not impact productivity, data access, or security (DoN 2009b). With the exception of the MCAS GPP, Section 2.0.4.1. Paper, which states “All documents (including copies) over two pages in length will be double-sided, unless specific requirements exist that dictate otherwise”, a Station policy does not exist to reinforce the implementation of energy efficient measures associated with the use of electronic equipment. However, MCAS Yuma generally follows the requirements established by the DoN.

MCIWEST Objective 9.4: Implement Best Practices in Energy Efficient Management of Server Data Centers

No additional information.

C.10 MCIWEST GOAL 10 – SUSTAIN FORMAL ENVIRONMENTAL MANAGEMENT SYSTEM

MCIWEST Objective 10.1: Ensure a Formal Environmental Management System is Implemented to Meet Executive Order 13514 Goals

Headquarters Marine Corps Environmental Management System Policy

The Headquarters Marine Corps (HQMC) policy for EMS implementation references the International Organization for Standardization (ISO) 14001 Standard and is based on components and elements of the Standard, but includes a stronger emphasis on regulatory compliance and assumes that environmental programs (per Marine Corps Order [MCO] P5090.2A) are in place. Beginning in 2005, the HQMC ECE Program began serving as the mechanism for evaluating, self-declaring, and reporting conformance with the HQMC EMS requirements. The initial deadline for full conformance with the Marine Corps EMS requirements was 31 December 2007. The requirements prescribed in MCO P5090.2A incorporate most major EMS components and elements. In addition, MCO 5090.2A requires and authorizes the development of an Environmental Compliance and Protection Manual (ECPSOP), which was intended to lay the foundation for an EMS to meet requirements of EO 13148 (22 April 2000) and emerging DoD and Marine Corps EMS policy. The ECPSOP is intended to enable the installation to document, track, and improve environmental management continuously throughout commands and units; document existing installation environmental functions; and, place them within the Marine Corps EMS framework.

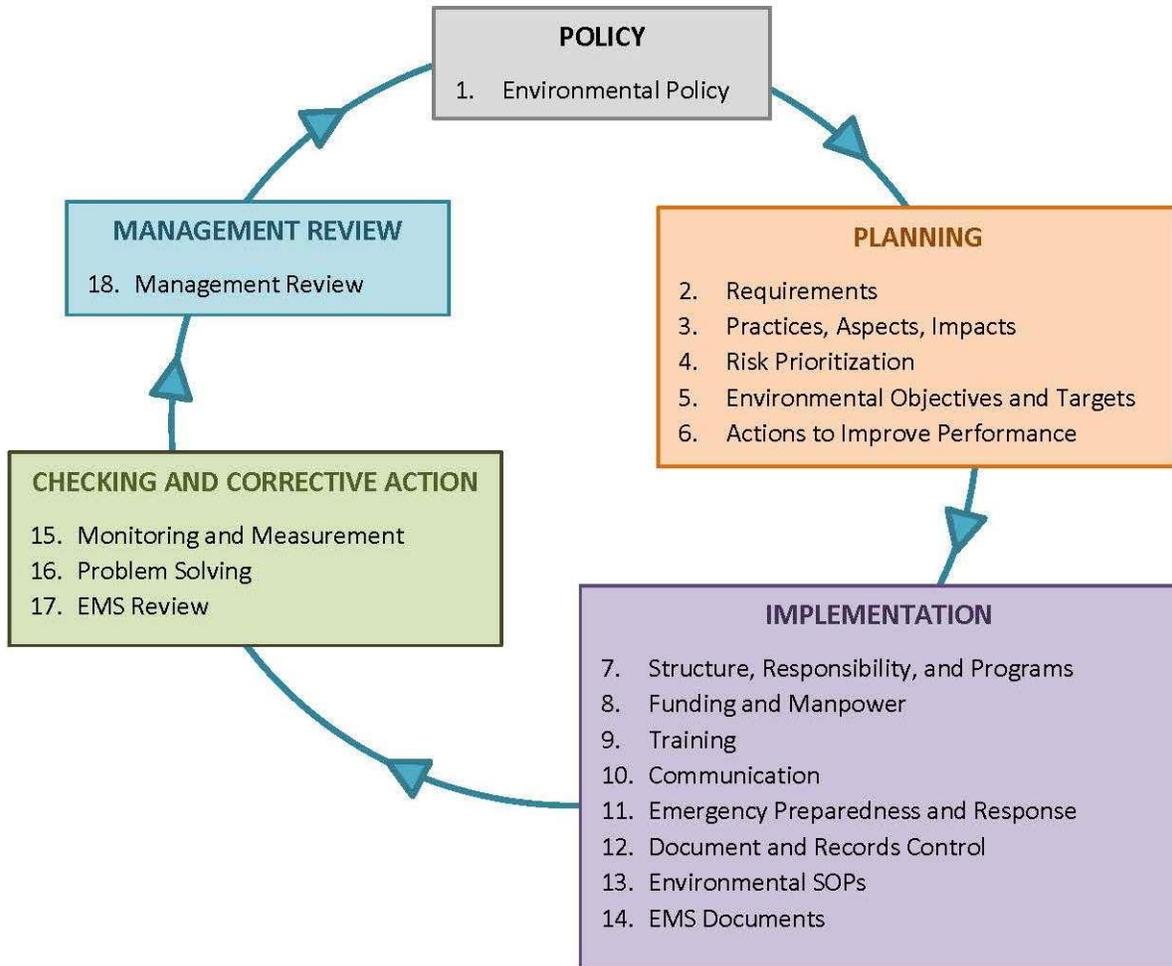
In a letter from the Commandant of the Marine Corps (dated 3 March 2004), the Marine Corps EMS and related policy on applicability, implementation criteria, and reporting requirements are defined. Furthermore, guidance from HQMC in a letter from the Commandant of the Marine Corps (dated 29 December 2004) establishes the USMC EMS Conformance Guide which sets the foundation of the Marine Corps policy on EMS conformance and associated procedures for evaluating, certifying, and self-declaring, and reporting such conformances.

The Marine Corps EMS approach is based on components common to existing, accepted EMS frameworks (i.e., the “Plan, Do, Check, Act” model); however, the HQMC EMS adds a policy component so that there are five components, as follows (Figure C-7):

- **Policy** - public commitment by senior leaders to the management of the organization's environmental affairs, including environmental compliance, pollution prevention, natural/cultural resource management, cleanup, risk to mission and continual improvement of the management system.
- **Planning** - integrated planning including inventorying practices, their aspects and impacts; inventorying environmental resources and assessing their vulnerabilities; analyzing and prioritizing risks to missions resulting from environmental impacts; developing objectives and targets for reducing environmental impacts and risks to mission; and identifying/implementing actions to achieve the targets.
- **Implementation** - definition, documentation and implementation of responsibilities and procedures for sustaining the EMS, managing media programs, controlling practices, and managing environmental resources to enhance mission capabilities.

- **Checking and Preventive/Corrective Action** - execution of procedures for self-evaluation and preventive/corrective action of the EMS, media programs, practice controls, and resource management.
- **Management Review** - periodic review of the management system by senior leadership, followed up by actions, including changes to the EMS as indicated by the review.

Figure C-8. Marine Corps EMS Model



Each of the five components is comprised of one or more of the 18 elements that comprise the HQMC EMS. To fully conform to the Marine Corps EMS requirements, an installation must meet the requirements of the following 18 EMS Elements (the corresponding ISO 14001 Standard requirement is included for reference) (see Table C-7).

Table C-7. Marine Corps EMS Elements Cross Referenced to the ISO 14001 Standard

Marine Corps EMS Element	ISO 14001 Standard
Policy	4.2 Policy
Element 1 Environmental Policy Statement	
Planning	4.3 Planning
Element 2 Requirements	4.3.2 Legal and Other Requirements
Element 3 Practices, Aspects, and Impacts	4.3.1 Environmental Aspects
Element 4 Risk Prioritization	
Element 5 Environmental Objectives and Targets	4.3.3 Objectives and Targets
Element 6 Actions to Improve Performance	
Implementation	4.4 Implementation and Operation
Element 7 Structures, Responsibilities, and Programs	4.4.1 Structure and Responsibility
Element 8 Funding and Manpower	
Element 9 Training	4.4.2 Training/Awareness/Competence
Element 10 Communication	4.4.3 Communication
Element 11 Emergency Preparedness and Response	4.4.7 Emergency Preparedness and Response
Element 12 Document and Record Control	4.4.5 Document Control
Element 13 Environmental SOPs	4.4.6 Operational Control
Element 14 EMS Document	4.4.4 EMS Documentation
Checking and Preventive/Corrective Action	4.5 Checking and Corrective Action
Element 15 Monitoring and Measurement	4.5.1 Monitoring and Measurement
Element 16 Problem Solving	
Element 17 EMS Review	
Management Review	4.6 Management Review
Element 18 Management Review	

Notes: EMS = Environmental Management System; ISO = International Standards Organization.

Key Elements of the MCAS Yuma EMS

Station Order P5090.8A, MCAS Yuma Environmental Management System Manual - Station Order P5090.8A, the MCAS Yuma EMS Manual, was first published in October 2007 and was revised in November 2010. The manual describes the Station's EMS and its elements and provides direction to related environmental documentation. The core of the manual is a set of 18 Environmental Management Procedures (EMPs) that guide the operation and maintenance of elements of the EMS. Each EMP describes the element, provides key terminology, establishes roles and responsibilities, and references related EMPs and environmental documentation. Station Order P5090.8A is organized as follows:

- Chapter 1 Introduction to the EMS
- Chapter 2 MCAS Yuma Environmental Management Procedure
- Chapter 3 EMP Requirements

- Chapter 4 EMP Practices, Aspects, and Impacts
- Chapter 5 EMP Risk Prioritization
- Chapter 6 EMP Environmental Objectives and Targets
- Chapter 7 EMP Actions to Improve Performance
- Chapter 8 EMP Structure, Responsibilities, and Programs
- Chapter 9 EMP Funding and Management
- Chapter 10 EMP Training
- Chapter 11 EMP Communication
- Chapter 12 EMP Emergency Preparedness and Response
- Chapter 13 EMP Document and Record Control
- Chapter 14 EMP Environmental SOPs
- Chapter 15 EMP Environmental Management System Document
- Chapter 16 EMP Monitoring and Measurement
- Chapter 17 EMP Problem Solving
- Chapter 18 EMP Environmental Management System Review
- Chapter 19 EMP Management Review

Environmental Compliance and Protection Standard Operating Procedure - Station Order P6280.3H (October 2010), is the Station's ECPSOP. This Station Order "establishes procedures to fully implement the requirements of MCO P5090.2A and ensure the continuity of effort and coherency between various environmental medial programs at all areas under the purview of the Commanding Officer, MCAS Yuma, Arizona." This document is important as it contains compliance-related standard operating procedures for many programs that are included as part of the EMS. Chapter 3, Environmental Audits, states that "An effective audit and inspection program is a key part of the MCAS Yuma EMS" and that "Environmental Compliance Evaluation (ECE) data shall be used to support the MCAS Yuma EMS." Included in the ECPSOP are the following chapters:

- Chapter 1 Definitions
- Chapter 2 Responsibilities
- Chapter 3 Environmental Audits
- Chapter 4 Hazardous Waste Identification, Accumulation, and Disposal
- Chapter 5 Petroleum Recycling and Universal Wastes
- Chapter 6 Air Quality Management
- Chapter 7 Drinking Water Quality
- Chapter 8 Aquifer Protection and Stormwater Pollution Management
- Chapter 9 Waste Water Management
- Chapter 10 Storage Tanks
- Chapter 11 Lead-based Paint and Asbestos

Chapter 12 Training Plans and Coordination

Chapter 13 Environmental Procedures for Recovering Military Munitions

Chapter 14 Hazardous Material Consolidation Program

Chapter 15 Ranges

Environmental Standard Operating Procedures (ESOPs) - The EMS Manual, Chapter 14, addresses the establishment of Environmental Standard Operating Procedures to provide operational controls over identified EMS practices with potential environmental impacts, to ensure and maintain compliance, and to minimize associated risks to mission. The ESOPs serve as a conduit for internal communication between practice owners, the EMS team, and the Station Environmental Department.

Environmental Management System Audit History

February 2007 EMS Audit - The first HQMC-sponsored audit of the MCAS Yuma EMS occurred 12-15 February 2007. The purpose of the audit was to determine the current status of conformance of the installation's EMS with EO 13148 *Greening the Government Through Leadership in Environmental Management*; USMC EMS Conformance Guide (December 2004); DoD EMS Policy; and ISO 14001.

The audit indicated that MCAS Yuma had made significant progress with the initial implementation of its EMS and as a result, no major non-conformances were identified. Although, MCAS Yuma's EMS was not totally conformant with all of the 18 USMC EMS elements it generally lacked only small pieces of an element that would otherwise allow full conformance. At the time, the expectation was not for MCAS Yuma to have already implemented an EMS that is 100% conformant to the USMC EMS elements. The expectation was that for MCAS Yuma to have met the 2005 DoD Self Declaration requirements and progressed forward to meet the individual elements of the USMC EMS and use the process of continual improvement to implement the remaining elements of a mission-focused EMS that is fully conformant to the USMC EMS requirements no later than 31 December 2007.

During the 2007 audit, it was verified that MCAS Yuma had developed an EMS Manual (March 2005) with the intent to describe the local, MCAS Yuma-specific implementation of policies and requirements contained in the MCO P5090.2A; provide an overview of the EMS; ensure continuity of effort between various environmental media programs; and provide guidance for relevant personnel involved in environmental compliance, protection, and annual ECEs.

October 2007 Benchmark Environmental Compliance Evaluation and EMS Audit - A HQMC Benchmark ECE and EMS Audit was performed 15-26 October 2007 at MCAS Yuma. The following is a summary of the 2007 EMS audit results.

MCAS Yuma implemented an EMS in accordance with the USMC EMS Conformance Guide and Supplemental Guidance and is progressing towards the HQMC self-declaration guideline of 31 December 2007. The Air Station's EMS meets the requirements of each of the Marine Corps' 18 EMS conformance elements. The following two minor non-conformances were noted that should support the continued enhancement and improvement of the Station's EMS:

- Element 3 requires the installation to inventory its environmental resources and assess each resource's vulnerability to the aspects of existing and planned activities. MCAS Yuma is currently in the process of conducting and refining this analysis; however, at the time of the audit, this was not complete.
- Element 13 requires that the installation prepare and distribute to each practice owner an ESOP for each practice under the practice owner's control. Currently, approximately 30 ESOPs have been developed and distributed to practice owners; however, this is not all inclusive.

February 2008 EMS Verification Audit - From 7-8 February 2008, a second-party audit was conducted to verify the condition of the installation's EMS with regard to the HQMC full-conformance deadline of 31 December 2007, review items identified as non-conformances from previous EMS audits, and evaluate progress towards completing those items according to the timeline specified from the installation's EMS POA&M (it was not the intent of this audit to review the status of the installation's EMS with respect to all 18 EMS elements). In a letter dated 8 January 2008, MCAS Yuma was acknowledged by HQMC as being in full conformance with the established EMS implementation deadline and requirements.

As noted in the previous section, two minor non-conformances were identified in October 2007 EMS audit. The following summarizes the actions taken on behalf of the Station to correct those non-conformances as documented in the February 2008 verification audit.

- Element 3 – The corrective action status was identified as “complete.” The Station developed the MCAS Yuma Environmental Resources Vulnerability Assessment (7 January 2008) that identifies the Station's eight most significant environmental resources, associated key vulnerabilities, assigns a ranking, and provides additional justification regarding the ranking.
- Element 13 – The corrective action status was identified as “in progress.” The Station previously did not use PRISM as a resource to define its practices, aspects, and impacts; however, it was in the process of converting the previously identified practices into PRISM. The driver behind this conversion was the fact the MCIWEST had developed and distributed an electronic library of ESOPs that are based on PRISM practices/codes. MCAS Yuma was in the process of reviewing the ESOPs and making them specific to Station operations. At the time of the audit, it was determined that approximately 30 ESOPs had been completed, it was estimated that a total of approximately 120 ESOPs will require development, and the EMS Manager expected to develop 5-6 ESOPs per month. This topic was still considered a minor non-conformance.

MCIWEST Objective 10.2: Establish Training, Review, and Audit Programs for Executive Order Implementation

No additional information.

MCIWEST Objective 10.3: Submit Updates on Progress and Performance at Least Annually if not More Often

No additional information.

References

- ADOC. 2005. City of Yuma/Yuma County Joint Land Use Plan, Implementation Strategies Review, Potential Implementation Measures. Arizona Military Regional Compatibility Project. November. Online at:
<http://www.azcommerce.com/doclib/commasst/yuma%20implementation%20strat.%20rev/yuma%20isr%20final%2011-3-05.pdf>. Prepared by Parsons. Accessed on: 6 June 6 2011.
- _____. 2006. Policy Guidebook: Arizona Military Regional Compatibility Project. Prepared by Parsons. July.
- City of Yuma. 2006. Joint Land Use Plan: City and County of Yuma. Online at:
http://www.yumaaz.gov/Documents/COY_JointLandUsePlan.pdf. Accessed on 16 June 2011.
- _____. 2009. Bicycle Facilities Master Plan. Prepared by Olsson Associates. 1 April.
- Defense Logistics Agency (DLA) Disposition Services. 2010. DLA Disposition Services Field Operation Areas of Responsibility. Online at: <http://www.dla.mil/dlaps/mf/dispfieldops.pdf>. Accessed on 21 August.
- Department of the Navy (DoN). 2008. Next Generation Enterprise Network. Online at:
<http://www.doncio.navy.mil/ContentView.aspx?ID=588>. February 14. Accessed on 21 August 2011.
- _____. 2009a. Green Procurement Program Implementation Guide.
- _____. 2009b. Department of the Navy Strategy for Green Information Technology (IT) Electronic Stewardship and Energy Savings Strategy. 23 April.
- _____. 2011. 2011. Reshaping the DON's Approach to Buying and Managing IT Resources. Online at:
<http://www.doncio.navy.mil/ContentView.aspx?ID=2512>. August 15. Accessed on 25 August.
- Electronic Product Environmental Assessment Tool (EPEAT). 2011. U.S. Federal Purchaser Resources. Online at: <http://www.epeat.net/us-federal-purchaser-resources/>. Accessed on 6 September.
- Marine Corps Air Station (MCAS) Yuma. 2006. Water Conservation and Management Plan. March.
- _____. 2007. MCAS Yuma Master Plan. November.
- _____. 2008. MCAS Yuma Water Distribution Study. December.
- _____. 2011. Logistics Branch. Online at:
<http://www.yuma.usmc.mil/services/installationslogistics/logistics.html>. Accessed on 21 August.
- _____. 2011b. Personal Communication with Paula Backs. MCAS Yuma, Community Planning and Liaison Office. MCAS Yuma Sustainability Measures. 11 August.
- National Institute of Building Sciences. 2010. Federal Green Construction Guide for Specifiers. Available at <http://www.wbdg.org>. January.
- National Oceanic and Atmospheric Administration (NOAA). 2011. NOAA Online Weather Data (NOWData). Average climate from 1971 to 2000. Online at:
<http://www.nws.noaa.gov/climate> and <http://ncdc.noaa.gov/oa/ncdc.html>.
- National Renewable Energy Laboratory. 2009. Getting to Net Zero. NREL/JA-550-46382. Published in ASHRAE Journal. September.

SECDEF and SECNAV. 2008. MCAS Yuma FY 2008 Secretary of Defense and Secretary of the Navy Environmental Award Narrative. Online at: <http://www.denix.osd.mil/awards/upload/6-Marine-Corps-Air-Station-Yuma.pdf>. Accessed on 30 September 2011.

United States Department of Air Force Luke Air Force Base and MCAS Yuma. 2007. Barry M. Goldwater Range Integrated Natural Resources Management Plan. March.

Yuma County. 2010. Yuma Regional Development Plan. 13 December.

Yuma County Area Transit (YCAT). 2011a. About YCAT. Online at: http://www.ycat.org/about_ycat/aboutycat_home.html. Accessed on 15 August.

_____. 2011b. YCAT Blue Route. Online at: http://www.ycat.org/maps_routes/routes/blue_route.html. Accessed on 30 September.

Yuma Metropolitan Planning Organization (YMPO). 2010. 2010-2033 Regional Transportation Plan: Final Report. Prepared by Ayres Associates Inc. April.

APPENDIX D
ACTION PLAN SUMMARY

Appendix D summarizes all MCAS Yuma ISPP Action Plan items including projects, policies and/or procedures, and initiatives for each ISPP goal. Table 1 provides an indexed list of all Action Plan Items. The remaining sections of Appendix D provide additional detail for each of the indexed Action Plan items.

The indexing system is represented as follows. For example, project PR.1.2-1 in Goal 1 is identified as:

PR.1.2-1: PR = Project (IN = initiative, PO = Policy or Procedure)

PR.1.2-1: The objective number within the goal. In this example, this references objective 1.2, Meet DoD FY 2020 13.5% Reduction Targets of Scope 3 Greenhouse Gas Emissions.

PR.1.2-1: Indicates the sequential listing of projects for an objective. In this example, this is project number “1” (for objective 1.2).

Table 1. MCAS Yuma Action Plan Projects, Procedures/Policies, and Initiatives

GOAL 1 – ACCOMPLISH GREENHOUSE GAS REDUCTIONS/GREENHOUSE GAS INVENTORY	
Projects	
PR.1.4-1. Employee Teleworking Support Equipment.	\$1,494,360
Initiatives	
IN.1.1-1. Reevaluate Baseline Scope 1 and 2 GHG Emissions Inventory Status.	
IN.1.1-2. Additional Characterization of Scope 1 Emissions.	
IN.1.1-3. Develop Emergency Generator Replacement Strategy.	
IN.1.1-4. Evaluate Feasibility of Potential GHG Reductions Available through the Electrical Utility Provider.	
IN.1.1-5. Track Federal Government Policy/Guidance Development for Scope 1 and 2 Emissions.	
IN.1.1-6. Utilize Defense Utility Energy Reporting System (DUERS) Data for Future GHG Inventories.	
IN.1.2-1. Track Federal Government Policy/Guidance Development for Scope 3 Emissions.	
IN.1.2-2. Reevaluate Baseline Scope 3 Emissions Data.	
IN.1.2-3. Improve Accuracy of Commuting Data.	
IN.1.2-4. Monitor Scope 3 Emissions from Contracted Solid Waste Disposal and Wastewater Treatment.	
IN.1.3-1. Track Employee Air Travel Policy Development.	
IN.1.3-2. Develop Data Collection Strategy for Employee Air Travel.	
IN.1.4-1. Track Employee Telework Policy Development.	
IN.1.6-1. Preparation of Annual Emissions Inventory.	
GOAL 2 – IMPROVE ENERGY EFFICIENCY	
Projects	
PR.2.1-1. Energy Upgrade B852.	\$1,740,000
PR.2.1-2. Energy Upgrade B850.	\$386,000
PR.2.1-3. Turbocor A/C B634.	\$603,700
PR.2.1-4. Turbocor A/C B635.	\$517,600
PR.2.1-5. Turbocor A/C B1200.	\$489,700
PR.2.1-6. Re-Commission B328.	\$4,330,000

Table 1. MCAS Yuma Action Plan Projects, Procedures/Policies, and Initiatives

PR.2.1-7. Turbocor B722.	\$598,000
PR.2.1-8. Re-Commission B1085.	\$1,995,200
PR.2.1-9. B859 HVAC Repair and Renovation.	\$2,249,600
PR.2.1-10. B1200 Replace Chiller Consolidated Club.	\$489,700
PR.2.1-11. HVAC Repair Bldg. 530.	\$479,400
PR.2.1-12. HVAC Repairs Bldg. 328.	\$3,581,626
PR.2.1-13. B223 Repair DDC System Paraloft Facility.	\$221,000
PR.2.1-14. HVAC Repairs Bldg. 663.	\$1,156,200
PR.2.1-15. HVAC Repairs Bldg. 109.	\$756,300
PR.2.1-16. HVAC Repairs Bldg. 149.	\$798,000
PR.2.1-17. HVAC Repairs Bldg. 220.	\$692,700
PR.2.1-18. HVAC Repairs Bldg. 227.	\$560,300
PR.2.1-19. HVAC Repairs Bldg. 645.	\$1,050,800
PR.2.1-20. HVAC Repairs Bldg. 662.	\$613,300
PR.2.1-21. HVAC Repairs Bldg. 722.	\$693,000
PR.2.1-22. HVAC Repairs Bldg. 912.	\$594,300
PR.2.1-23. HVAC Repairs Bldg. 914.	\$671,900
PR.2.1-24. HVAC Repairs Bldg. 918.	\$574,800
PR.2.1-25. HVAC Repairs Bldg. 920.	\$561,400
PR.2.1-26. HVAC Repairs Bldg. 930.	\$798,100
PR.2.1-27. HVAC Repairs Bldg. 3224.	\$443,600
PR.2.1-28. HVAC Repairs Bldg. 1060.	\$542,500
PR.2.1-29. Repair DDC System Bldg. 95.	\$130,161
PR.2.1-30. B144 Install DDC System Fire Admin.	\$50,348
PR.2.1-31. B146 Install DDC System Hangar.	\$134,028
PR.2.1-32. System Jet Engine Shop.	\$54,020
PR.2.1-33. B311 Install DDC System Fuels Bldg.	\$69,939
PR.2.1-34. System Environmental Classroom.	\$64,653
PR.2.1-35. B570 Install DDC System Gas Station.	\$39,420
PR.2.1-36. B610 Install DDC System Motor T.	\$58,777
PR.2.1-37. B672 Repair DDC System Theatre.	\$59,431
PR.2.1-38. B673 Repair DDC System Bowling Alley.	\$64,048
PR.2.1-39. Control Optimization Air Frames.	\$262,638
PR.2.1-40. Control Optimization Air Frames.	\$243,197
PR.2.1-41. B545 Repair HW Storage Tank.	\$132,542
PR.2.1-42. Control Optimization at Motor T.	\$126,375
PR.2.1-43. Control Optimization BEQ Facility.	\$3,094,762
PR.2.1-44. Control Optimization BEQ Facility.	\$3,094,762
PR.2.1-45. Control Optimization Education Center.	\$1,336,477
PR.2.1-46. Control Optimization Youth Center.	\$174,950
PR.2.1-47. B1091 Repair WH and Storage Tank.	\$106,244
PR.2.1-48. Control Optimization Battalion Squad.	\$158,652
PR.2.1-49. Control Optimization Multi-Purpose.	\$210,998
PR.2.1-50. B530 Energy Systems Repair.	\$497,500
PR.2.1-51. B328 Energy Repairs.	\$4,176,200

Table 1. MCAS Yuma Action Plan Projects, Procedures/Policies, and Initiatives

PR.2.1-52. Bldg. 888 Systems Optimization and Repairs.	\$2,000,000
PR.2.1-53. Consolidated Chiller JSF Program.	\$28,110,000
PR.2.1-54. Construct Chilled Water Plant Zone 1.	\$10,340,000
PR.2.1-55. Construct Chilled Water Plant Z-2.	\$9,000,000
PR.2.1-56. Backbone With EMS Upgrades.	\$17,789,000
PR.2.2-1. Solar B530.	\$521,900
PR.2.2-2. Solar B1200.	\$543,100
PR.2.2-3. Solar Sunshade B980.	\$511,700
PR.2.2-4. Solar Sunshade B888.	\$438,800
PR.2.2-5. Solar B1508.	\$606,000
PR.2.2-6. B530 Install Solar PV Mag Warehouse.	\$497,447
PR.2.2-7. B888 Install Solar PV Carport.	\$321,000
PR.2.2-8. B930 Install Solar PV BEQ.	\$322,560
PR.2.2-9. B980 Install Solar PV Carport.	\$386,500
PR.2.2-10. B1200 Install Solar PV Consolidated Club.	\$543,151
PR.2.2-11. B1508 Install Solar PV on Sunshade.	\$554,400
PR.2.2-12. Hangar PV (MILCON).	\$545,925
PR.2.2-13. Simulator PV (MILCON).	\$734,175
PR.2.2-14. Hangar PV (MILCON).	\$775,000
PR.2.2-15. IMA PV (MILCON).	\$564,750
PR.2.2-16. Communications Facility PV (MILCON).	\$1,665,000
PR.2.2-17. Install Solar PV Bldg. 328.	\$646,700
PR.2.2-18. Construct 7 MW Solar PV Zone 1.	\$42,478,000
PR.2.2-19. Thermal Solar Hot Water Systems.	\$865,474
PR.2.2-20. Proposed 1.5 MW Cannon Ari Defense Complex - PPA.	PPA
PR.2.2-21. Proposed 10 MW PV Project - PPA.	PPA
PR.2.2-22. Area Service Highway Solar Project.	NA
Total	Estimated Cost: \$163,289,430
Initiatives	
IN.2.1-1. Building Energy Monitors and Conservation Awareness.	
IN.2.1-2. Evaluate Building Exclusion Criteria Applicability.	
IN.2.4-1. Continue implementation of MCAS Yuma Energy Order 11300.2H.	
IN.2.5-1. Ensure the Authority to Operate (ATO) is Obtained and that All New Buildings are Incorporated into the EMCS as Appropriate.	
IN.2.7-1. Continue to Identify and Evaluate the Availability of Renewable Resources via the Geospatial Databases for the Development of Facility Energy Audits, Metering, Renewable Energy Locations, and Real Property Accountability.	
IN. 2.8-1. Continue to Program for Relevant and Necessary Training to Ensure Ongoing Energy Efficient Operations.	
GOAL 3 – IMPROVE WATER USE EFFICIENCY AND MANAGEMENT	
Projects	
PR.3.1-1. Installation of new irrigation system and construct water reclamation treatment facility.	\$7,100,000
PR.3.1-2. Xeriscape Building 731.	\$23,196
PR.3.1-3. Xeriscape Building 693.	\$68,226

Table 1. MCAS Yuma Action Plan Projects, Procedures/Policies, and Initiatives

PR.3.1-4. Xeriscape Building 460.	\$7,428
PR.3.1-5. Xeriscaping as funding is available.	\$10,000 per building
PR.3.1-6. Replacement of grassed landscapes with synthetic grass.	\$10,000 per building
PR.3.1-7. Recycled water for industrial usage.	\$1,300,000
PR.3.1-8. Use of automated irrigation controls.	\$4,000 per 10,000 SF
PR.3.1-9. Installation of low-flow fixtures (toilets, urinals, showerheads). Plumbing retrofits.	\$300-500 per toilet \$100 per faucet
PR.3.1-10. Installation of high efficiency clothes washers in single family residences.	\$520,000
PR.3.1-11. Installation of high efficiency clothes washers in barracks.	Combined with PR.3.1-12
PR.3.1-12. Gray water reuse in laundry facilities.	\$250,000
PR.3.1-13. Gray water reuse to flush low-flow toilets and urinals.	\$250,000
PR.3.1-14. Use of water-efficient BMPs for Air Station activities.	\$4,000,000
PR.3.1-15. Cannon Air Defense Complex – Installation of water meters.	\$95,000
PR.3.2-1. Replacement of 450,000 SF of grassed landscape with xeriscape (low density plantings with protected microclimate)	\$720,000
PR.3.2-2. Irrigation system upgrades (from medium to high efficiency) for 100,000 SF.	\$750,000
PR.3.2-3. Irrigation system upgrades (from low to high efficiency) for 100,000 SF.	\$750,000
Initiatives	
IN.3.1-1. Ongoing Evaluation and Implementation of the <i>Sustainable Water Resources Assessment</i> .	
IN.3.1-2. Ongoing Implementation of the <i>Water Conservation and Management Plan</i> .	
GOAL 4 – PROMOTE POLLUTION PREVENTION AND WASTE REDUCTION	
Policies and Procedures	
PO.4.1-1. Develop Annual Emergency Planning and Community Right-to-Know Act (EPCRA) Reporting Procedure.	
PO.4.2-1. Submittal of P2 Analysis and Plan.	
PO.4.3-1. Develop Integrated Pest Management Program Management Review Procedure.	
PO.4.6-1. Develop a Composting Policy/Procedure.	
PO.4.6-2. Establish Procedures to Track the Disposal of All Compostable Wastes.	
PO.4.7-1. Develop and Implement Policy Related to Reduced Paper Use.	
Initiatives	
IN.4.2-1. Implementation of Station Order 6280.1D and the P2 and Hazardous Waste Minimization Plan.	
IN.4.2-2. Identify P2 Opportunities.	
IN.4.2-3. Expand the Station HCP.	
IN.4.2-4. Awareness and Outreach for the HCP.	
IN.4.4-1. Finalizing and Implementing the Station Order for Managing the QRP and Overall Station Recycling Efforts.	
IN.4.4-2. Establish Quantifiable Solid Waste Diversion Metrics.	
IN.4.4-3. Evaluate Ongoing and Additional Diversion Opportunities.	
IN.4.4-4. Ongoing Education and Outreach Initiatives.	
IN.4.5-1. Establish Quantifiable C&D Diversion Metrics.	

Table 1. MCAS Yuma Action Plan Projects, Procedures/Policies, and Initiatives

IN.4.5-2. Ongoing Coordination with the Resident Officer in Charge of Construction (ROICC).	
IN.4.5-3. Evaluate Ongoing and Additional C&D Diversion Opportunities.	
IN.4.5-4. Use of Autoclaved Aerated Concrete.	
IN.4.6-1. Establish Quantifiable Composting Metrics.	
IN.4.6-2. Identify Additional Composting Equipment Support.	
IN.4.6-3. Ongoing Education and Outreach Initiatives.	
IN.4.9-1. Continue Waste Fuels Program.	
IN.4.9-2. Continue to Recycle Lead Acid Batteries.	
IN.4.10-1. Ensure all Pesticide Applicators are Properly Certified.	
GOAL 5 – ADVANCE REGIONAL AND LOCAL INTEGRATED PLANNING TO CREATE SUSTAINABLE COMMUNITIES	
Projects	
PR.5.4-1. Conduct Feasibility Study Related to Moving to the Fairgrounds.	\$250,000
Policies and Procedures	
PO.5.1-1. Develop a Procedure to Document Reviews for Impacts from Energy Use and Alternatives.	
Initiatives	
IN.5.1-1. Continue to Ensure Project Review for Impacts from Energy Use and Alternatives.	
IN.5.2-1. Identification of Additional Agencies, Organizations, and Events for Ongoing Coordination.	
IN.5.2-2. Develop a Tracking System for Regional Ecosystem Management Program Coordination.	
IN.5.2-3. Continue Agency/Organization Coordination.	
IN.5.3-1. Develop a Tracking System for Regional Transportation Planning Coordination.	
IN.5.3-2. Identification of Additional Transportation-related Agencies for Ongoing Coordination.	
IN.5.4-1. Increase Public Transportation Awareness.	
IN.5.4-2. Develop a Tracking System for Transportation Planning Efforts.	
IN.5.5-1. Identification of Additional Agencies, Organizations, and Events for Ongoing Coordination.	
IN.5.5-2. Develop a Tracking System for Regional Watershed Management Program Coordination.	
IN.5.5-3. Continue Agency/Organization Coordination.	
IN.5.6-1. Identification of Additional Agencies, Organizations, and Events for Ongoing Coordination.	
IN.5.6-2. Develop a Tracking System for Regional Watershed Management Program Coordination.	
IN.5.6-3. Continue Agency/Organization Coordination.	
GOAL 6 – IMPLEMENT SUSTAINABLE BUILDING DESIGN, CONSTRUCTION, O&M, AND DECONSTRUCTION	
Initiatives	
IN.6.1-1. Initiate Zero-Net-Energy (ZNE) Planning.	
IN.6.2-1. Planning to Meet Guiding Principles for 100% of Building Inventory.	
IN.6.2-2. Develop a Tracking System for Guiding Principles Compliance.	
IN.6.3-1. Continue to plan for, and implement, strategies to support sustainable watershed management.	
IN.6.3-2. Continue to follow regional LID guidelines and recommendations relevant to NPDES stormwater permits, DoD, and NAVFAC SW policies, the climatic region, and the proposed construction project.	
IN.6.4-1. Ongoing Coordination with NAVFAC SW to Ensure LEED Certification to the Maximum Extent Practicable.	
IN.6.4-2. Develop a Tracking System for LEED Certification Status.	

Table 1. MCAS Yuma Action Plan Projects, Procedures/Policies, and Initiatives

GOAL 7 – ADVANCE SUSTAINABLE ACQUISITION (GREEN PROCUREMENT)	
Initiatives	
IN.7.1-1. Update the Green Procurement Plan (GPP).	
IN.7.1-2. Training for Sustainable Acquisition.	
IN.7.1-3. Utilize the Federal Procurement Data System (FPDS) to Support Reporting/Tracking.	
IN.7.1-4. Develop a Tracking System for Government Purchase Card Procurement Actions.	
IN.7.2-1. Update the GPP to Address Tracking of Postconsumer Recycled Content of Paper.	
GOAL 8 – OPTIMIZE FLEET TRANSPORTATION MANAGEMENT / ALTERNATIVE FUELS	
Projects	
PO.8.1-1. Installation of E-85 Fuel Point.	\$86,324
Policies and Procedures	
PO.8.1-1. Develop an Alternative Fuel Vehicle Use Policy.	
PO.8.1-2. Develop an Anti-idling Policy.	
PO.8.2-1. Develop an Alternative Fuel Vehicle Use Policy.	
Initiatives	
IN.8.1-1. Develop a Reduce Vehicle Miles Traveled Strategy.	
IN.8.1-2. Track New Policy Development.	
IN.8.3-1. Continue to Purchase Low GHG Emitting Vehicles to the Maximum Extent Possible.	
GOAL 9 – PROMOTE ELECTRONIC STEWARDSHIP	
Policies and Procedures	
PO.9.1-1. Electronics Stewardship Policy.	
PO.9.2-1. Develop a Procedure for Excess or Surplus Electronic Product Management.	
PO.9.3-1. Develop a Policy Related to Enabling Duplex Printing.	
PO.9.4-1. Develop a Policy Related to Energy Efficient Management of Server Data Centers.	
PO.9.5-1. Develop a Policy Related to Enabling Power Management Features.	
Initiatives	
IN.9.1-1. Develop Training For Sustainable Electronics Procurement.	
IN.9.1-2. Utilize FPDS to Support Reporting/Tracking.	
IN.9.1-3. Develop a Tracking System for Government Purchase Card Procurement Actions.	
IN.9.2-1. Ongoing Electronic Recycling Events.	
IN.9.4-1. Track Effectiveness of Implemented BMPs.	
IN.9.5-1. Develop Power Management Training and Education Program.	
GOAL 10 – SUSTAIN FORMAL ENVIRONMENTAL MANAGEMENT SYSTEM	
Policies and Procedures	
PO.10.2-1. Establish Procedures to Ensure Management Review of EO 13514 Implementation.	
Initiatives	
IN.10.1-1. Regularly Evaluate Environmental Management System (EMS) Implementation with Regard to EO 13514 Goals.	

GOAL 1 – ACCOMPLISH GREENHOUSE GAS REDUCTIONS/GREENHOUSE GAS INVENTORY**Objective 1.1 – Meet DoD FY 2020 34% Reduction Targets of Scope 1 and 2 Greenhouse Gas Emissions*****Initiatives***

IN.1.1-1. Reevaluate Baseline Scope 1 and 2 GHG Emissions Inventory Status. A recommendation for consideration is to revisit the GHG emissions data for the baseline year of FY 2008. Several potentially significant changes in source data and methodologies have occurred between how the FY 2008 and the FY 2010 and the FY 2011 GHG inventories were conducted. The most recent inventories have followed federal guidance and will be the format repeated for years to come. The same methodology applied to the baseline year would likely provide a more accurate baseline value to better establish planning opportunities and future targets.

IN.1.1-2. Additional Characterization of Scope 1 Emissions. A recommendation for consideration is to obtain information needed to add the characterization of Scope 1 emissions in future GHG inventories so that sharp increases like those experienced in 2011 could be attributed directly to a mission-related activity that is difficult to control/reduce.

IN.1.1-3. Develop Emergency Generator Replacement Strategy. The Air Station has noted that that some emergency generators are quite old and replacing them with more efficient units would result in less fuel burned per kilo-watt hour (KWh) of energy produced. Also, new air regulations are forcing emergency generator manufacturers to produce units that generate less pollution per unit of fuel burned.

Replacing old, emergency generators with new, more efficient units is an opportunity for on-going Scope 1 emissions reductions, even if the net decrease is relatively small compared to the overall Scope 1 and 2 reduction goal of 34%. The actual GHG reductions are difficult to predict, but assuming a new generator is 10% more efficient than the unit it replaces, 10% less GHG emissions would be produced.

IN.1.1-4. Evaluate Feasibility of Potential GHG Reductions Available through the Electrical Utility Provider. Another potential source of GHG reductions for purchased electricity exists through optional electricity purchasing plans. Arizona Public Service (APS), the electricity provider for Yuma, has several “Green Choice Rates” that, for a cost, promise to emit fewer GHGs per KWh. The Green Choice Rates are optional rates for purchased electricity where portions (by KWh, by percentage, or for special events) of purchased electricity are provided by renewable energy sources. An example choice from APS is their Green Choice Percentage Option, where an additional cost is applied to each KWh purchased (e.g., normal rate plus a vary charge of approximately \$0.004/KWh). The potential of these programs was reviewed during this analysis and merits further investigation by the Station for applicability and feasibility. A recommended action for the Station is to investigate the financial feasibility of paying the higher rate for purchased electricity in order to assist in achieving the 34% reduction goal.

IN.1.1-5. Track Federal Government Policy/Guidance Development for Scope 1 and 2 Emissions. The federal government and DoD are taking actions to better quantify and promote reductions in Scope 1 and 2 GHG emissions. As these initiatives are further developed and implemented and as specific data is developed for the Station, reduction opportunities or actual reductions can be identified and contribute to this goal.

IN1.1.-6. Utilize Defense Utility Energy Reporting System (DUERS) Data for Future GHG Inventories. It is recommended that the Station continue to utilize DUERS data for consistency in calculating and reporting of GHG emissions for natural gas combustion and electricity consumption.

Objective 1.2 – Meet DoD FY 2020 13.5% Reduction Targets of Scope 3 Greenhouse Gas Emissions

Initiatives

IN.1.2-1. Track Federal Government Policy/Guidance Development for Scope 3 Emissions. The federal government and DoD are taking actions to better quantify and promote reductions in several types of Scope 3 GHG emissions. As these initiatives are further developed and implemented and as specific data is developed for the Station, reduction opportunities or actual reductions can be identified and contribute to this goal. MCAS Yuma staff should continue to monitor federal and DoD guidance related to inventorying Scope 3 emissions.

IN.1.2-2. Reevaluate Baseline Scope 3 Emissions Data. Consider revisiting the Scope 3 GHG emission data for the baseline year of FY 2008. Several significant changes in source data and methodologies have occurred between how the FY 2008 and FY 2011 GHG inventories were conducted. The most recent inventory followed federal guidance and will be the format repeated for years to come. That same methodology, applied to the baseline year would likely provide a more accurate baseline value to better establish planning opportunities and future targets

IN.1.2-3. Improve Accuracy of Commuting Data. An action for the Station is to improve the accuracy of data associated with employee commuting practices. Using census data and national average commuting factors, which is in accordance with the current guidance, is not likely to represent conditions at Yuma, where the broad data suggests 5,465 MT of the 9,552 MT total Scope 3 emissions are from employee commuting. Recent GHG inventories for the Station correctly suggest that more accurate data be obtained from surveying local staff, such as through the use of an on-line survey.

IN1.2-4. Monitor Scope 3 Emissions from Contracted Solid Waste Disposal and Wastewater Treatment. As efficiencies are gained in water use and waste minimization, the associated GHG emissions should also decrease from the lower waste generation and water use values.

Objective 1.3 – Meet DoD FY 2020 7% Reduction in GHG Emissions from Employee Air Travel**Initiatives**

IN.1.3-1. Track Employee Air Travel Policy Development. The federal government and DoD are taking actions to better quantify and promote reductions in managing several types of Scope 3 GHG emissions, including employee air travel. As these initiatives are further developed and implemented and as specific data is developed for the Station, reduction strategies and opportunities or actual reductions can be identified and contribute to this goal. Station staff should continue to monitor federal and DoD guidance related to inventorying Scope 3 emissions including employee air travel.

IN.1.3-2. Develop Data Collection Strategy for Employee Air Travel. Using available guidance as summarized in section 2.1.3.4 of this ISPP, it is recommended that the Station begin development of a strategy and procedure to determine the process by which ongoing data for this emissions category will be captured. Future GHG inventories for MCAS Yuma should address this emissions category to ensure a comprehensive accounting of all Scope 3 GHG emissions.

Objective 1.4 – Have 30% of Eligible Employees Teleworking at Least Once a Week on a Regular Recurring Basis**Projects**

PR.1.4-1. Employee Teleworking Support Equipment. For the purposes of estimating the number of employees that will be required to telework to meet this target, a total number of 350 employees was used as the basis of the calculation (based on the number of FY 2012 General Schedule [GS] employees). The following are the estimated costs to provide an employee with the necessary equipment and support to be able to telework:

Equipment

- Laptop computer (with card reader)/docking station/monitor: \$2,000
- Microsoft Office software: \$400
- Printer: \$300
- Total initial equipment: \$2,700

Additional Annual Costs

- Internet connection: \$80/month = \$960/year
- Printing supplies: \$75/month = \$900/year

Table 2 summarizes the estimated costs to provide the necessary support to allow employees to telecommute.

Table 2. Estimated Cost to Support Employee Teleworking

Fiscal Year	Estimated Employees Eligible to Telework	ISPP Percent Goal	Number of Employees Goal	Equipment Cost (\$2,700/employee)	Additional Annual Costs (\$1,860/employee)	Total Cost
FY 2013	350	9.3%	33	\$89,100	\$61,380	\$150,480
FY 2014	350	15%	53	\$54,000 ¹	\$98,580	\$152,580
FY 2015	350	20.6%	72	\$51,300 ¹	\$133,920	\$185,220
FY 2016	350	25%	88	\$43,200 ¹	\$163,680	\$206,880
FY 2017	350	27.5%	96	\$21,600 ¹	\$178,560	\$200,160
FY 2018	350	28.8%	101	\$13,500 ¹	\$187,860	\$187,860
FY 2019	350	29.4%	103	\$5,400 ¹	\$191,580	\$196,980
FY 2020	350	30%	105	\$5,400 ¹	\$195,300	\$200,700
TOTAL	--	--	--	\$283,500	\$1,210,860	\$1,494,360

Note: ¹ Estimated cost based on the increased number of employees from the previous year.

Initiatives

IN.1.4-1. Track Employee Telework Policy Development. The federal government and DoD are taking actions to better quantify and promote reductions in managing several types of Scope 3 GHG emissions, including employee teleworking. As these initiatives are further developed and implemented and as specific data is developed for the Station, reduction strategies and opportunities or actual reductions can be identified and contribute to this goal. Station staff should continue to monitor federal and DoD guidance related to inventorying Scope 3 emissions including employee teleworking.

Objective 1.5 – Divert 50% of Non-hazardous Solid Waste from Disposal in Landfills Not Owned by DoD

All non-hazardous solid waste is disposed at off-Station landfills. See Objective 4.4 in the ISPP for additional detail related to this objective.

Objective 1.6 – Comprehensive Annual Inventory of Scope 1, 2, and 3 Greenhouse Gas Emissions

Initiatives

IN.1.6-1. Preparation of Annual Emissions Inventory. The Station, directly or through MCIWEST, will ensure that GHG inventories continue to be performed, are consistent with EO 13514 requirements, and provide adequate detail to be repeatable and defensible. The repeatability of the inventories is critical to understanding the basis for fluctuating emissions levels and how future action plans are achieving the reduction goals. Ongoing tracking of annual changes to federal GHG inventory requirements and policy is recommended to ensure the latest guidance is being applied to GHG inventory methodology.

GOAL 2 – IMPROVE ENERGY EFFICIENCY

Objective 2.1 – 3% Annual Reduction in Building Energy Intensity Through FY 2015, or 30% Total Reduction by FY 2015; 37.5% Total Reduction by FY 2020

Projects**Table 3. MCAS Yuma Demand Side Energy Reduction Projects**

ISPP Identifier	Project Name/ Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
PR.2.1-1	Energy Upgrade B852	EIP	YU1050R	2012	\$14,000	\$1,740,000	124	423
PR.2.1-2	Energy Upgrade B850	EIP	YU1051R	2012	\$5,000	\$386,000	77	113
PR.2.1-3	Turbocor A/C B634	EIP	YU1203M	2012	\$18,000	\$603,700	34	402
PR.2.1-4	Turbocor A/C B635	EIP	YU1204M	2012	\$18,000	\$517,600	29	402
PR.2.1-5	Turbocor A/C B1200	EIP	YU1210M	2012	\$18,000	\$489,700	27	402
PR.2.1-6	Re-Commission B328	EIP	YU1300M	2012	\$20,000	\$4,330,000	217	499
PR.2.1-7	Turbocor B722	EIP	YU1217M	2012	\$18,000	\$598,000	33	402
PR.2.1-8	Re-Commission B1085	EIP	YU1205M	2012	\$20,000	\$1,995,200	100	500
PR.2.1-9	B859 HVAC Repair and Renovation	EIP M2	YU1222M	2012	\$35,263	\$2,249,600	64	1,477
PR.2.1-10	B1200 Replace Chiller Consolidated Club	EIP M2	YU1210M	2012	\$8,065	\$489,700	61	331
PR.2.1-11	HVAC Repair Bldg. 530	EIP M2	YU1407M	2012	\$7,815	\$479,400	61	321
PR.2.1-12	HVAC Repairs Bldg. 328	EIP M2	YU1408M	2012	\$71,822	\$3,581,626	50	2,836
PR.2.1-13	B223 Repair DDC System Paraloft Facility	EIP M1	YUFSC1253	2012	\$2,067	\$221,000	107	85
PR.2.1-14	HVAC Repairs Bldg. 663	EIP M2	YU1225	2012	\$28,454	\$1,156,200	41	1,807
PR.2.1-15	HVAC Repairs Bldg. 109	EIP M2	YU1226	2012	\$14,687	\$756,300	51	861
PR.2.1-16	HVAC Repairs Bldg. 149	EIP M2	YU1227	2012	\$13,361	\$798,000	60	847

Table 3. MCAS Yuma Demand Side Energy Reduction Projects

ISPP Identifier	Project Name/Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
PR.2.1-17	HVAC Repairs Bldg. 220	EIP M2	YU1228	2012	\$13,250	\$692,700	52	670
PR.2.1-18	HVAC Repairs Bldg. 227	EIP M2	YU1229	2012	\$14,382	\$560,300	39	830
PR.2.1-19	HVAC Repairs Bldg. 645	EIP M2	YU1230	2012	\$22,585	\$1,050,800	47	1,666
PR.2.1-20	HVAC Repairs Bldg. 662	EIP M2	YU1231	2012	\$21,929	\$613,300	28	1,643
PR.2.1-21	HVAC Repairs Bldg. 722	EIP M2	YU1232	2012	\$9,870	\$693,000	70	3,101
PR.2.1-22	HVAC Repairs Bldg. 912	EIP M2	YU1233	2012	\$23,647	\$594,300	25	1,745
PR.2.1-23	HVAC Repairs Bldg. 914	EIP M2	YU1234	2012	\$22,603	\$671,900	30	1,670
PR.2.1-24	HVAC Repairs Bldg. 918	EIP M2	YU1235	2012	\$23,097	\$574,800	25	1,667
PR.2.1-25	HVAC Repairs Bldg. 920	EIP M2	YU1236	2012	\$22,132	\$561,400	25	1,631
PR.2.1-26	HVAC Repairs Bldg. 930	EIP M2	YU1237	2012	\$21,210	\$798,100	38	1,658
PR.2.1-27	HVAC Repairs Bldg. 3224	EIP M2	YU1238	2012	\$12,310	\$443,600	36	505
PR.2.1-28	HVAC Repairs Bldg. 1060	EIP M2	YU1239	2012	\$17,064	\$542,500	32	1,440
PR.2.1-29	Repair DDC System Bldg. 95	EIP M1	YU1240M1	2012	\$4,157	\$130,161	31	171
PR.2.1-30	B144 Install DDC System Fire Admin	EIP M1	YU1240M1	2012	\$1,253	\$50,348	40	54
PR.2.1-31	B146 Install DDC System Hangar	EIP M1	YU1240M1	2012	\$6,230	\$134,028	22	277
PR.2.1-32	System Jet Engine Shop	EIP M1	YU1240M1	2012	\$1,564	\$54,020	35	91
PR.2.1-33	B311 Install DDC System Fuels Bldg.	EIP M1	YU1240M1	2012	\$1,444	\$69,939	48	59
PR.2.1-34	System Environmental Classroom	EIP M1	YU1240M1	2012	\$1,327	\$64,653	49	54

Table 3. MCAS Yuma Demand Side Energy Reduction Projects

ISPP Identifier	Project Name/ Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
PR.2.1-35	B570 Install DDC System Gas Station	EIP M1	YU1240M1	2012	\$1,497	\$39,420	26	61
PR.2.1-36	B610 Install DDC System Motor T	EIP M1	YU1240M1	2012	\$1,727	\$58,777	34	112
PR.2.1-37	B672 Repair DDC System Theatre	EIP M1	YU1240M1	2012	\$875	\$59,431	68	36
PR.2.1-38	B673 Repair DDC System Bowling Alley	EIP M1	YU1240M1	2012	\$2,123	\$64,048	30	87
PR.2.1-39	Control Optimization Air Frames	EIP M1	YU1241M1	2012	\$6,147	\$262,638	43	278
PR.2.1-40	Control Optimization Air Frames	EIP M1	YU1241M1	2012	\$3,032	\$243,197	80	130
PR.2.1-41	B545 Repair HW Storage Tank	EIP M1	YU1241M1	2012	\$4,902	\$132,542	27	314
PR.2.1-42	Control Optimization at Motor T	EIP M1	YU1241M1	2012	\$1,264	\$126,375	100	53
PR.2.1-43	Control Optimization BEQ Facility	EIP M1	YU1241M1	2012	\$11,174	\$3,094,762	277	723
PR.2.1-44	Control Optimization BEQ Facility	EIP M1	YU1241M1	2012	\$11,317	\$3,094,762	273	737
PR.2.1-45	Control Optimization Education Center	EIP M1	YU1241M1	2012	\$1,808	\$1,336,477	739	75
PR.2.1-46	Control Optimization Youth Center	EIP M1	YU1241M1	2012	\$12,695	\$174,950	14	562
PR.2.1-47	B1091 Repair WH and Storage Tank	EIP M1	YU1241M1	2012	\$1,293	\$106,244	82	128
PR.2.1-48	Control Optimization Battalion Squad	EIP M1	YU1241M1	2012	\$3,414	\$158,652	46	149

Table 3. MCAS Yuma Demand Side Energy Reduction Projects

ISPP Identifier	Project Name/ Description	Funding Source	Project Number	Fiscal Year Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
PR.2.1-49	Control Optimization Multi-Purpose	EIP M1	YU1241M1	2012	\$6,417	\$210,998	33	278
PR.2.1-50	B530 Energy Systems Repair	EIP M2	YU1407M	2012	\$26,771	\$497,500	19	322
PR.2.1-51	B328 Energy Repairs	EIP M2	YU1408M	2012	\$235,785	\$4,176,200	18	2,836
PR.2.1-52	Bldg. 888 Systems Optimization and Repairs	EIP M1	YU1422M	2012	\$5,000	\$2,000,000	400	75
PR.2.1-53	Consolidated Chiller JSF Program	ECIP	P-598	2013	\$39,159	\$28,110,000	718	1,608
PR.2.1-54	Construct Chilled Water Plant Zone 1	ECIP	P-626	2013	\$200,201	\$10,340,000	52	8,219
PR.2.1-55	Construct Chilled Water Plant Z-2	ECIP	P-627	2013	\$119,722	\$9,000,000	75	4,915
PR.2.1-56	Backbone With EMS Upgrades	ECIP	P-628	2013	\$251,499	\$17,789,000	71	10,324
	TOTAL	--	--	--	\$1,500,410	\$109,767,848	--	62,662

Source: MCAS Yuma Energy Office.

Initiatives

IN.2.1-1. Building Energy Monitors and Conservation Awareness. There is an ongoing need to continue to educate staff and to be diligent regarding energy use. One of the most effective ways to reduce energy usage is to educate staff to “treat the Station’s energy bill as if it was their own.” Assignment of Building Energy Monitors and/or ongoing instruction to staff regarding turning off unnecessary lights, minimizing the use of heating and cooling when possible, turning off equipment and appliances that are not in use, ensuring that any vacant facilities are operated efficiently, and generally being aware of situations that are wasting energy such as broken photo sensors or inefficient and/or broken equipment, can have a significant impact on the Station’s overall energy use.

IN.2.1-2. Evaluate Building Exclusion Criteria Applicability. It has been documented that the stationing of the Joint Strike Fighter (JSF) at MCAS Yuma is forecasted to have a significant impact on the Station’s energy intensity. Historically at the Station, energy use intensity has been calculated to include all facilities (including hangars and other mission support facilities and activities). In January, 2006 the DoE published the *Guidelines for Establishing Criteria for Excluding Buildings from the Energy Performance*

Requirements of 543 of the National Energy Conservation Policy Act as Amended by the Energy Policy Act of 2005, which among other criteria, excludes federal buildings from energy performance requirements for “Impracticability due to energy intensiveness or national security function.”

The guidance further identifies the following “assumed exclusion of structures and processes not qualified as federal buildings:”

- Separately-metered energy intensive loads that are driven by mission and operational requirements, not necessarily buildings, and not influenced by conventional building energy conservation measures.
- Federal ships that consume “cold iron energy” and airplanes or other vehicles that are supplied with utility-provided power.

It is recommended that the Station review this guidance in its entirety, determine the applicability to the Station’s facilities and operations, and determine if any of the exclusion criteria will be adopted and applied in calculating the Station’s future energy intensity. Should the Station choose to adopt the the provisions of the exclusion, it is recommended that a documented response be prepared and maintained to support the Station’s position on this exclusion.

Objective 2.2 – Renewables Not Less Than 3% in FY 2007-2009; By FY 2020, Produce or Procure Energy from Renewable Sources in an Amount that Represents at Least 20% of Electricity Consumed by Facilities

Projects

MCAS Yuma has the following supply-side renewable projects programmed that will continue to assist with meeting renewable energy use goals.

Table 4. MCAS Yuma Supply Side Energy Reduction Projects

ISPP Identifier	Project Name/ Description	Funding Source	Project Number	FY Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
PR.2.2-1	Solar B530	EIP	YU1102R	2012	\$4,000	\$521,900	130	180
PR.2.2-2	Solar B1200	EIP	YU1103R	2012	\$4,000	\$543,100	136	180
PR.2.2-3	Solar Sunshade B980	EIP	YU1104R	2012	\$4,000	\$511,700	128	89
PR.2.2-4	Solar Sunshade B888	EIP	YU114R	2012	\$4,000	\$438,800	110	89
PR.2.2-5	Solar B1508	EIP	YU1013R	2012	\$4,000	\$606,000	152	89
PR.2.2-6	B530 Install Solar PV Mag Warehouse	EIP R2	YU1102R	2012	\$5,196	\$497,447	96	213
PR.2.2-7	B888 Install Solar PV Carport	EIP R2	YU1114R	2012	\$2,692	\$321,000	119	109
PR.2.2-8	B930 Install Solar PV	EIP R2	YU1138R	2012	\$3,242	\$322,560	99	133

Table 4. MCAS Yuma Supply Side Energy Reduction Projects

ISPP Identifier	Project Name/Description	Funding Source	Project Number	FY Planned for Execution	Total Annual Savings (\$)	Total Project Cost (\$)	Simple Payback (years)	Annual MBTU Savings
	BEQ							
PR.2.2-9	B980 Install Solar PV Carport	EIP R2	YU1104R	2012	\$3,326	\$386,500	116	137
PR.2.2-10	B1200 Install Solar PV Consolidated Club	EIP R2	YU1103R	2012	\$5,321	\$543,151	102	218
PR.2.2-11	B1508 Install Solar PV on Sunshade	EIP R2	YU1013R	2012	\$4,905	\$554,400	113	201
PR.2.2-12	Hangar PV (MILCON)	MILCON	P-447	2012	\$10,976	\$545,925	49	498
PR.2.2-13	Simulator PV (MILCON)	MILCON	P-533	2012	\$14,701	\$734,175	50	3,458
PR.2.2-14	Hangar PV (MILCON)	MILCON	P-460	2012	\$14,475	\$775,000	55	3,628
PR.2.2-15	IMA PV (MILCON)	MILCON	P-573	2012	\$11,275	\$564,750	50	1,076
PR.2.2-16	Communications Facility PV (MILCON)	MILCON	P-583	2012	\$41,841	\$1,665,000	39	3,388
PR.2.2-17	Install Solar PV Bldg. 328	EIP R2	YU1300R	2013	\$10,309	\$646,700	63	423
PR.2.2-18	Construct 7 MW Solar PV Zone 1	ECIP	P-625	2013	\$940,979	\$42,780,000	45	38,628
PR.2.2-19	Thermal Solar Hot Water Systems	ECIP	P-629	2013	\$35,881	\$865,474	24	3,639
TOTAL	--	--	--	--	\$1,125,119	\$53,823,582	--	56,376

In addition to the projects summarized above, there are three large scale PV solar projects in the planning stages.

PR.2.2-20 - Proposed 1.5 MW Cannon Air Defense Complex Project. The Station has submitted a request for funding from the Energy Conservation Investment Program (ECIP) for a proposed 1.5 MW solar PV system that will supply approximately 100% of the CADC's electricity supply. It is proposed that this project will be implemented under a third party power purchase agreement (PPA) and the government will not incur any capital costs. For the purposes of the ISPP, an estimated completion date of 2017 is included.

PR.2.2-21 - Proposed 10 MW PV Project. A proposed 10 MW PV project is currently being evaluated under the National Environmental Policy Act requirements and Federal Aviation Administration airport site review processes. The potential project site includes approximately 90 acres of vacant highly disturbed land southeast of the flight line and lies completely within MCAS Yuma and under the jurisdiction of the USMC. This project would permit a private company, under an outgrant instrument such as a power purchase agreement (PPA) or a license agreement to potentially produce a maximum of 10 MW for the Air Station's exclusive use, with the option of new metering. The facility would employ

flat-panel PV technology and deliver the power to the Station under a rate agreement. If implemented, it is anticipated that the project would be on line by 2020 and the current estimated cost for construction is approximately \$40,000,000.

PR.2.2-22 - Area Service Highway Solar Project. The Station is also pursuing a solar project on withdrawn land, which is approximately 1,745 acres in size, located west of the ASH and east of Avenue 4 east. This project is currently in the preliminary planning phases and estimated generation capacity is unknown at this time due to ongoing evaluation of the area available for project implementation. This additional potential increase in renewable generation capacity at the Station could help it to meet the goal of 20% by approximately 15% in FY 2020.

Objective 2.3 – 50% of Statutorily Required Renewables comes from “New” Sources by FY 2020

No additional Action Plan recommendations. The Action Plan associated with this objective is closely tied with that presented for Objective 2.2. It is anticipated that future renewable energy production at the Station will be focused on PV array implementation (i.e., a “new” source) which will allow the Station to continue to meet and exceed this objective’s requirements.

Objective 2.4: Phase Out the Use of Incandescent Bulbs

IN.2.4-1. According to the MCAS Yuma Energy Office, incandescent bulbs have been phased out. As part of the action plan associated with this objective, staff should continue implementation of MCAS Yuma Energy Order 11300.2H. Additionally, the Station should coordinate with the MCCS Exchange to eliminate the stocking and availability of incandescent bulbs.

Objective 2.5: Commands Will Use Energy Management and Control Systems

IN.2.5-1. The Action Plan associated with this objective is to ensure the Authority to Operate (ATO) is obtained and that all new buildings are incorporated into the EMCS as appropriate.

Objective 2.6: Use Distributed Energy Where it is Cost-effective

No additional Action Plan recommendations. The Action Plan associated with this objective is closely tied with that presented in Objective 2.2. It is anticipated that future renewable energy production at the Station will be focused on PV array implementation which will support the Station in meeting this objective’s requirements.

Objective 2.7: Use Geographic Information Systems to Manage Facility Energy Levels and Assets

IN.2.7-1. The Action Plan associated with this objective is to continue to identify and evaluate the availability of renewable resources via the geospatial databases for the development of facility energy audits, metering, renewable energy locations, and real property accountability.

Objective 2.8: Increase the Number of Energy Staff Training for Energy-efficient Operations

IN. 2.8-1. The MCAS Yuma Energy Office proactively plans and programs to ensure staff are properly trained. The Energy Office staff should continue to program for relevant and necessary training to ensure ongoing energy efficient operations.

GOAL 3 – IMPROVE WATER USE EFFICIENCY AND MANAGEMENT**Objective 3.1 –2% Annual Reduction in Potable Water Intensity by FY 2020 or 26% Total Reduction****Projects**

To ensure MCAS Yuma meets the FY 2020 goal, the Station developed a *Water Conservation and Management Plan* in FY 2006 and completed a *Sustainable Water Resources Assessment* in FY 2012. The following projects are identified in the Sustainable Water Resources Assessment as a means to assist the Station in meeting the FY 2020 water intensity goals:

Table 5. MCAS Yuma Proposed Water Reduction Projects for FY 2012 through FY 2020

ISPP Identifier	Project	Anticipated On Line Date	Capital Cost	Potential Potable Water Use Reduction	Description
PR.3.1-1	Installation of new irrigation system and construct water reclamation treatment facility.*	FY 2019	\$7,100,000	94,496,914 gal/year	Allows for a separate recycled water distribution system to reclaim on-site wastewater for landscape irrigation. Also supports Objective 3.2.
PR.3.1-2	Xeriscape Building 731.	FY 2012	\$23,196	652,000 gal/year	Reduces potable water use for landscape irrigation.
PR.3.1-3	Xeriscape Building 693.	FY 2012	\$68,226	305,616 gal/year	Reduces potable water use for landscape irrigation.
PR.3.1-4	Xeriscape Building 460.	FY 2012	\$7,428	68,936 gal/year	Reduces potable water use for landscape irrigation.
PR.3.1-5	Xeriscaping as funding is available.	FY 2013 - 2020	\$10,000 per building	approx. 32 gal/SF of grass replaced.	Reduces potable water use for landscape irrigation.
PR.3.1-6	Replacement of grassed landscapes with synthetic grass.	FY 2012 - 2020 Funding Dependent	\$10,000 per building	approx. 32 gal/SF of grass replaced.	Reduces potable water use for landscape irrigation.
PR.3.1-7	Recycled water for industrial usage.	Funding Dependent	\$1,300,000	55,394,743 gal/year	Reduces potable water use for clothes washing.
PR.3.1-8	Use of automated irrigation controls.	Funding Dependent	\$4,000 per 10,000 SF	up to 30,000 gal per 10,000 SF	Reduces potable and reclaimed water use for landscape irrigation.
PR.3.1-9	Installation of low-flow fixtures (toilets, urinals, showerheads). Plumbing retrofits.	Funding Dependent	\$300-500 per toilet \$100 per faucet	2-3 gal/flush 1.5 gal/minute for faucets	Replace old fixtures with low-flow fixtures (as needed and funding allows). Reduces potable water use for utilities.
PR.3.1-10	Installation of high efficiency clothes washers in single family residences.	Funding Dependent	\$520,000	5,539,474 gal/year	Reduces potable water use for clothes washing; 14-29 gallons per day (gpd) per machine per residence.
PR.3.1-11	Installation of high efficiency clothes washers in barracks.				Reduces potable water use for clothes washing; 53-108 gpd per machine per barracks.
PR.3.1-12	Gray water reuse in laundry facilities.	Funding Dependent	\$250,000	25 gal/load	Reduces potable water use for clothes washing.

Table 5. MCAS Yuma Proposed Water Reduction Projects for FY 2012 through FY 2020

ISPP Identifier	Project	Anticipated On Line Date	Capital Cost	Potential Potable Water Use Reduction	Description
PR.3.1-13	Gray water reuse to flush low-flow toilets and urinals.	Funding Dependent	\$250,000	4.8 gpd per occupant	Use of gray water to flush low-flow toilets and urinals.
PR.3.1-14	Use of water-efficient BMPs for Air Station activities.	Funding Dependent	\$4,000,000	1,000 gal/day	Reduces for water requirements for high water use activities. Includes, building cooling, boiler/steam systems, kitchen and medical facilities, etc.

Note: *For reference/information purposes, a Joint Recycled Water Reclamation Project with the City of Yuma was estimated at \$24,130,000 (see MCAS Yuma Sustainable Water Resources Assessment, Alternative No. 3B Fact Sheet).

In addition to the projects summarized above from the *Sustainable Water Resources Assessment*, it is also recommended that meters be installed at CADC and the CBM wells to begin tracking water use at these locations:

PR.3.1-15. CADC - Installation of meters and data maintenance for two groundwater wells. Estimated cost: \$95,000.

Initiatives

IN.3.1-1. Ongoing Evaluation and Implementation of the *Sustainable Water Resources Assessment*. It is recommended that Station further evaluate water source alternatives presented in the *Sustainable Water Resources Assessment*. These alternatives combined could substantially reduce MCAS Yuma’s potable water use and ensure meeting the FY 2020 goal. These alternatives include:

- Use of recycled gray and wastewater for on-Station irrigation (see Alternative 3A and 3B Fact Sheets in the *Sustainable Water Resources Assessment*);
- Use of recycled gray and wastewater for industrial uses (see Alternative 3C Fact Sheet in the *Sustainable Water Resources Assessment*);
- Installation of high efficiency clothes washers in all new single family residences and barracks.

IN.3.1-2. Ongoing Implementation of the Water Conservation and Management Plan. Opportunities and BMPs being considered for future implementation include:

- Installation of water efficient (i.e., low-flow) fixtures as funding is available including, but not limited to, low-flow showerheads, faucet aerators, and low-volume toilets.
- Continue to audit the potable water distribution system for maintenance needs and low-water use improvements.
- Continue to implement public information and education programs focused on water conservation.
- Replacement (or supplemented) toilet and urinal potable water with recycled or gray water.

- Installation of drip irrigation for all landscaped areas and automation of irrigation systems to irrigate during low-water requirement periods.
- Replace grassed landscapes with xeriscape or synthetic turf as funding is available.
- Increasing the reuse of “backwash” from the water treatment plant and on-site gray water to irrigate landscapes and cool athletic artificial turf fields. Backwash from the water treatment plant is currently being recycled back into the irrigation basin where it is used for lawn watering.

Objective 3.2 – Reduce Industrial, Landscaping, and Agricultural Water Intensity 2% Annually by FY 2020 or 20% Total Reduction

As noted in the Objective 3.1 Action Plan MCAS Yuma’s water use for landscape irrigation is expected to continually decrease beyond FY 2011. This reduction is projected because of the Air Station’s commitment to finding an alternative water supply source (to the Colorado River) while practicing good environmental stewardship. Through the conversion of grassed landscapes to xeriscape and artificial turf combined with on-site wastewater reclamation, MCAS Yuma can meet the FY 2020 ILA reduction goal.

Projects

Table 6. MCAS Yuma Proposed Water Reduction Projects for FY 2012 through FY 2020

ISPP Identifier	Project	Anticipated On Line Date	Capital Cost	Potential ILA Water Use Reduction (gal/year)	Description
PR.3.2-1	Replacement of 450,000 SF of grassed landscape with xeriscape (low density plantings with protected microclimate)	FY 2018	\$720,000	25,700,000	Reduces potable water use for landscape irrigation.
PR.3.2-2	Irrigation system upgrades (from medium to high efficiency) for 100,000 SF	FY 2013	\$750,000	119,095-1,152,941	Reduces potable water use for landscape irrigation.
PR.3.2-3	Irrigation system upgrades (from low to high efficiency) for 100,000 SF	FY 2013	\$750,000	270,941-2,622,941	Reduces potable water use for landscape irrigation.
	TOTAL	--	\$2,220,000	29,475,882 (maximum)	

Note: Assumes current area landscaped with warm grasses (i.e. drought tolerant grass, “better suited for hot summers”) and an irrigation system with “medium” efficiency (i.e. regular maintenance and proper scheduling). Water reduction estimate assumes (1) xeriscape with low water requirements (low density and protected microclimate) and, (2) no change in the current irrigation system efficiency. Range is provided based on the landscaped area. That is, warm season grasses verses xeriscape (low density plantings with protected microclimate).

Sources: MCAS Yuma 2011e, DoE 2010.

GOAL 4 – PROMOTE POLLUTION PREVENTION AND WASTE MANAGEMENT**Objective 4.1 – Report According to the Emergency Planning and Community Right-to-Know Act*****Policies and Procedures***

PO.4.1-1. Develop Annual Emergency Planning and Community Right-to-Know Act (EPCRA) Reporting Procedure. The Station should ensure that procedures are established and documented (to include roles and responsibilities, timelines to gather data, etc.) to confirm that EPCRA Tier II reports are submitted to the appropriate state and local agencies annually by 1 March as required.

Objective 4.2 – Minimize the Generation of Waste and Pollutants through Source Reduction***Policies and Procedures***

PO.4.2-1. Submittal of P2 Analysis and Plan. Establish procedures (including roles and responsibilities) to ensure annual submittal of the MCAS Yuma P2 Analysis and Plan MCAS Yuma to the ADEQ is performed in accordance with requirements.

Initiatives

IN.4.2-1. Implementation of Station Order 6280.1D and the P2 and Hazardous Waste Minimization Plan. Ensure approval and implementation of Station Order 6280.1D, P2 and Hazardous Waste Minimization, and the Station P2 and Hazardous Waste Minimization Plan.

IN.4.2-2. Identify P2 Opportunities. Continue to identify and document P2 opportunities for FY 2013 and beyond and take necessary actions to begin planning for their implementation.

IN.4.2-3. Expand the Station HCP. Continue to expand the HCP to incorporate additional tenants/organizations.

IN.4.2-4. Awareness and Outreach for the HCP. Continue to promote the success of the Station's HCP through outreach materials offered at local events both on and off the Station.

Objective 4.3 – Implement Integrated Pest Management and Other Landscape Management Practices Which are Prepared, Reviewed, and Updated Annually by Pest Management Professionals***Policies and Procedures***

PO.4.3-1. Develop Integrated Pest Management Program Management Review Procedure. The Station should establish procedures to ensure the Station Pest Management Plan is reviewed and updated annually by appropriate Pest Management Professionals. Ensure the review is properly documented in accordance with IPMP and NAVFAC SW requirements.

Objective 4.4 – 50% Landfill Diversion by the End of FY 2015 and Thereafter Through FY 2020 (Non-Hazardous Solid Waste)

The Station is close to meeting the initial FY 2015 solid waste diversion goal of 50% but must continue proactive implementation of the solid waste diversion and recycling program. Further consideration should be given to the following initiatives:

Initiatives

IN.4.4-1. Finalizing and Implementing the Station Order for Managing the QRP and Overall Station Recycling Efforts. Ensure the Station Order establishes overall responsibility for all aspects of the Station's solid waste management program. It is anticipated that through implementation of this Station Order this objective's goals are achievable.

IN.4.4-2. Establish Quantifiable Solid Waste Diversion Metrics. Establish quantifiable, annual recycling/solid waste diversion metrics that provide a program management goal to achieve continual improvement.

IN.4.4-3. Evaluate Ongoing and Additional Diversion Opportunities. Continue to evaluate the Station's waste streams and market opportunities to identify other solid waste diversion opportunities.

IN.4.4-4. Ongoing Education and Outreach Initiatives. Continue with ongoing solid waste management education/outreach initiatives.

Objective 4.5 – 50% Landfill Diversion for Waste by the End of FY 2015 and Thereafter Through FY 2020 (Construction and Demolition Waste). 60% Construction and Demolition Diversion by the End of FY 2015 and Thereafter Through FY 2020 Per DoD SSPP

The Station has exceeded the FY 2015 construction and demolition (C&D) debris diversion goal of 60% but should continue to proactively implement the C&D debris management program.

Initiatives

IN.4.5-1. Establish Quantifiable C&D Diversion Metrics. Establish quantifiable, C&D debris diversion metrics that provide a program management goal to achieve continual improvement.

IN.4.5-2. Ongoing Coordination with the Resident Officer in Charge of Construction (ROICC). Maintain ongoing coordination with contracting staff and the ROICC to provide contractor oversight to ensure compliance with contract requirements and maximum C&D debris diversion.

IN.4.5-3. Evaluate Ongoing and Additional C&D Diversion Opportunities. Continue to evaluate market opportunities for C&D debris.

IN.4.5-4. Use of Autoclaved Aerated Concrete. The Station is investigating the potential use of AAC for new internal and external construction. This concept should be promoted to NAVFAC SW to initiate a pilot program/project at the Station to test the viability of this building material.

Objective 4.6 – Increase Organic and Compostable Materials Diverted from the Waste Stream***Policies and Procedure***

PO.4.6-1. Development of a Composting Policy/Procedure. The MCAS Yuma composting program could be further enhanced through the formalization of procedures and defining roles and responsibilities for all Station entities (e.g., MCCS concessions and clubs, landscape operations, mess halls, etc.) that generate compostable waste to more effectively implement diversion practices and track and document all organic and/or compostable waste diversion.

PO.4.6-2. Establish Procedures to Track the Disposal of All Compostable Wastes. The Station should establish procedures to ensure that all compostable waste (including yard waste, tree clippings, etc.) disposed by the landscape maintenance contractor are directed to a composting facility and that volumes disposed are accounted for and tracked by the Station.

Initiatives

IN.4.6-1. Establish Quantifiable Composting Metrics. Establish a quantifiable composting rate goal through FY 2020 (e.g., a percent increase in composting over the previous year) that will allow the Station to clearly measure progress over time.

IN.4.6-2. Identify Additional Composting Equipment Support. Identify any pieces of equipment to support the composting program.

IN.4.6-3. Ongoing Education and Outreach Initiatives. Continue with ongoing education/outreach initiatives related to the composting program.

Objective 4.7 – Reduce Paper Use***Policies and Procedure***

PO.4.7-1. Develop and Implement Policy Related to Reduced Paper Use. There are currently no USMC policies addressing the reduction of printing paper; however, a draft is being developed. MCAS Yuma should continue with implementation of local procedures to attempt to document paper use throughout the Station. Following release of the draft MARADMIN policy addressing this topic, the Station should take appropriate actions to fully implement the policy and document paper use reduction efforts.

Objective 4.8 – Ten Landfills or Wastewater Treatment Facilities Recovering Biogas for Use by DoD by FY 2020

MCAS Yuma does not operate any landfills or wastewater treatment facilities; therefore, this objective does not apply.

Objective 4.9 – Reduce Disposal of Toxic and Hazardous Materials and Chemicals. On-site Releases and Off-Site Transfers of Toxic Chemicals Reduced by 15% by FY 2020

The Station has exceeded the FY 2020 goal to reduce disposal of toxic and HMs, and chemicals by 15% but should continue with proactive implementation of the toxic and HMs chemical management program.

Initiatives

IN.4.9-1. Continue Waste Fuels Program. Continue the off-site energy recovery of waste fuels program as a means to ensure ongoing compliance with this objective.

IN.4.9-2. Continue to Recycle Lead Acid Batteries. Continue to recycle lead batteries as a means to ensure ongoing compliance with this objective.

Objective 4.10 – 100% of DoD Personnel and Contractors Who Apply Pesticides are Properly Certified Through FY 2020***Initiative***

IN.4.10-1. Ensure all pesticide applicators are properly certified. Responsible MCAS Yuma staff should continue to implement procedures to ensure that all applicators performing work at the Station are certified in accordance with DoD and state requirements. Ensure the actual numbers of applicators is tracked and documented to allow the Station to meet this objective's unit of measure requirements.

GOAL 5 – ADVANCE REGIONAL AND LOCAL INTEGRATED PLANNING TO CREATE SUSTAINABLE COMMUNITIES**Objective 5.1 – Identify and Analyze Impacts from Energy Use and Alternatives Under NEPA with All Proposals for New or Expanded Facilities*****Policies and Procedures***

PO.5.1-1. Develop Procedure to Document Reviews for Impacts from Energy Use and Alternatives. Consider establishing procedures to ensure that NEPA document reviews that analyze impacts from energy use and alternatives are documented and files are retained for future ISPP reporting years.

Initiative

IN.5.1-1. Continue to Ensure Project Review for Impacts from Energy Use and Alternatives. Ensure that MCAS Yuma staff involved in project reviews (i.e., Environmental Department, I&L Department, etc.) continue to analyze impacts from energy use and alternatives, as appropriate.

Objective 5.2 – Coordinate with Regional Ecosystem Programs***Initiatives***

IN.5.2-1. Identification of Additional Agencies, Organizations, and Events for Ongoing Coordination. Identify additional agencies, organizations, and community outreach events that will facilitate MCAS Yuma meeting the EO 13514 requirements for coordinating with regional ecosystem management programs.

IN.5.2-2. Develop a Tracking System for Regional Ecosystem Management Program Coordination. Develop a monitoring/tracking checklist to record, account for, and ensure ongoing compliance with EO 13514 and document annual regional coordination and outreach initiatives accomplished by the Station in the area of ecosystem management programs.

IN.5.2-3. Continue Agency/Organization Coordination. Continue coordination with regional agencies and organizations on regional ecosystem management programs.

Objective 5.3 – Participate in Regional Transportation Planning and Recognize Existing Community Transportation Infrastructure***Initiatives***

IN.5.3-1. Develop a Tracking System for Regional Transportation Planning Coordination. Develop a monitoring/tracking checklist to record and account for all regional transportation planning coordination initiatives accomplished annually by the Station to ensure ongoing compliance with EO 13514.

IN.5.3-2. Identification of Additional Transportation-related Agencies for Ongoing Coordination. Continue to identify and participate in regional transportation agencies and initiatives that would be of interest and benefit to MCAS Yuma's engagement and accessibility to regional transportation infrastructure.

Objective 5.4 – Ensure Planning of New Facilities and Leases are Transit Oriented or, in Rural Communities, Emphasize Existing or Planned Town Center

Projects

PR.5.4-1. Feasibility Study Related to Moving to the Fairgrounds. Conduct a feasibility study to identify the potential move of the Fairgrounds, located across the street from MCAS Yuma. The study should address, but should not be limited to, potential safety concerns and risks related to the proximity of the Fairgrounds to the Air Installation Compatible Use Zones and identify the impacts of the Fairgrounds on the ability of tenant commands, now and in the future, to perform mission-related training. Estimated cost to conduct the feasibility study: \$250,000.

Initiatives

IN.5.4-1. Increase Public Transportation Awareness. Identify opportunities to enhance information and awareness on available public transportation access aboard MCAS Yuma.

IN.5.4-2. Develop a Tracking System for Transportation Planning Efforts. Develop a monitoring/tracking checklist to record and account for planning efforts that ensure ongoing compliance with EO 13514. The checklist should address guidance issued by the Council on Environmental Quality titled *Instructions for Implementing Sustainable Locations for Federal Facilities*.

Objective 5.5 – Coordinate with Regional Watershed Management Programs

IN.5.5-1. Identification of Additional Agencies, Organizations, and Events for Ongoing Coordination. Identify additional agencies, organizations, and community outreach events that will facilitate MCAS Yuma meeting the EO 13514 requirements for coordinating with regional watershed management programs.

IN.5.5-2. Develop a Tracking System for Regional Watershed Management Program Coordination. Develop a monitoring/tracking checklist to record, account for, and ensure ongoing compliance with EO 13514 and document annual regional coordination and outreach initiatives accomplished by the Station in the area of watershed management programs.

IN.5.5-3. Continue Agency/Organization Coordination. Continue coordination with regional agencies and organizations on regional watershed management programs.

Objective 5.6 – Coordinate with Regional Environmental Management Programs

IN.5.6-1. Identification of Additional Agencies, Organizations, and Events for Ongoing Coordination. Identify additional agencies, organizations, and community outreach events that will facilitate MCAS Yuma meeting the EO 13514 requirements for coordinating with regional environmental management programs.

IN.5.6-2. Develop a Tracking System for Regional Watershed Management Program Coordination. Develop a monitoring/tracking checklist to record, account for, and ensure ongoing compliance with EO 13514 and document annual regional coordination and outreach initiatives accomplished by the Station in the area of environmental management programs.

IN.5.6-3. Continue Agency/Organization Coordination. Continue coordination with regional agencies and organizations on regional environmental management programs.

GOAL 6 – IMPLEMENT SUSTAINABLE BUILDING DESIGN, CONSTRUCTION, O&M, AND DECONSTRUCTION**Objective 6.1 – All New Buildings that Begin the Planning Process in 2020 or After are Designed to Achieve Zero-Net-Energy by 2030*****Initiatives***

IN.6.1-1. Initiate Zero-Net-Energy (ZNE) Planning. MCAS Yuma should begin preparation/planning to comply with the ZNE design objective beginning in FY 2020. Consideration should be given to, but limited to the following elements:

- Development of a comprehensive definition of ZNE and associated criteria for computing the metric.
- Assessment of planning and programming to identify candidate projects for ZNE design.
- Coordinated development of processes with NAVFAC SW for managing and tracking the design and construction of buildings to meet ZNE. Specifically, the Station should ensure participation in any ZNE-related NAVFAC SW and USMC policy development and design forums to ensure that desert environment are considered and addressed in these processes.
- Status reporting procedures (see below).
- Verification and validation procedures, as needed, to ensure credibility and consistency.

Objective 6.2 – 15% of Existing Federal Building Inventory of the Agency (Existing and Leased) Meet the Guiding Principles by FY 2015 and Continue Towards 100% Compliance for Complete Building Inventory***Initiatives***

IN.6.2-1. Planning to Meet Guiding Principles for 100% of Building Inventory. To achieve this objective requires a shared vision of the importance and benefits of energy and environmental programs in protecting resources and national security, as well as being able to adequately document progress. In addition to independent planning and programming, departments must coordinate and collaborate on their projects to leverage financing and scope. To assist in achieving the ongoing goals of this objective, it is recommended that a prioritized list of projects be developed by facilities planners to satisfy both mission requirements and the goals of EO 13514. In order to develop project documents including cost estimates, the condition of existing facilities and the scope of work required to conform to the key aspects of Guiding Principles must be developed. A weighting system similar to the Leadership in Energy and Environmental Design (LEED) Score Card for certification would be well-suited to the Guiding Principles, for this purpose.

IN.6.2-2. Develop a Tracking System for Guiding Principles Compliance. All staff involved in project planning and execution should pursue a shared vision by achieving a high level of coordination on

projects within the Station. As part of improving the Station's compliance posture with this is objective, it is recommended that an information system be developed to track coordinated project planning and execution activities, including the overall progress of individual buildings toward 100% compliance with Guiding Principles. The primary role of NAVFAC SW in managing design of new construction and major maintenance and repair projects for MCAS Yuma will assist with future, ongoing compliance with the Guiding Principles.

Objective 6.3 – Implement and Achieve Objectives of Stormwater Guidance

Initiatives

IN.6.3-1. Continue to plan for, and implement, strategies to support sustainable watershed management. Because the Air Station is within an arid region with infrequent, high-intensity rainfall events, LID strategies and practices should be selected to protect and restore receiving water channels and habitat corridors.

IN.6.3-2. Continue to follow regional LID guidelines and recommendations relevant to NPDES stormwater permits, DoD, and NAVFAC SW policies, the climatic region, and the proposed construction project. This approach would ensure the FY 2020 goal is met while managing stormwater to meet relevant permits and policies to protect regional water resources and habitat.

Objective 6.4 – Achieve LEED Certification of Buildings for New Construction and Major Renovations

Initiatives

IN.6.4-1. Ongoing Coordination with NAVFAC SW to Ensure LEED Certification to the Maximum Extent Practicable. The primary role of NAVFAC SW in managing the design of new construction and major maintenance and repair projects for MCAS Yuma assures continued compliance with LEED and the requirements of Objective 6.4. MCAS Yuma should continue to proactively plan and justify projects to meet mission essential requirements in compliance with Objective 6.4.

IN.6.4-2. Develop a Tracking System for LEED Certification Status. As the number of projects at the Station increase, the development a database or other method to document and track LEED registration and certification is needed to record project status and comments (e.g., funding status; phase – design, construction, completion; and documentation of overall project planning status and associated LEED credits) would support efficient and consistent reporting.

Objective 6.5 – All Development and Redevelopment Projects of 5,000 Square Feet or More Maintain Predevelopment Hydrology to the Maximum Extent Technically Feasible

Action plan recommendations are similar to those in Objective 6.3

GOAL 7 – ADVANCE SUSTAINABLE ACQUISITION**Objective 7.1 – 95% of Procurement Conducted Sustainably*****Initiatives***

IN.7.1-1. Update the Green Procurement Plan (GPP). Update the MCAS Yuma GPP to ensure the GPP establishes effective policies and defines roles and responsibilities to sufficiently implement and track green procurement actions to meet ISPP requirements. Ensure all activities/organizations with procurement responsibilities (i.e., MCCS) are included in the GPP roles and responsibilities section.

IN.7.1-2. Training for Sustainable Acquisition. Develop training sessions for MCAS Yuma staff on the sustainable acquisition policies (e.g., ongoing training highlighting the FPDS resources/tracking methodology, the development of a Sustainable Acquisition Desktop Reference Guide, content of the GPP regarding sustainable procurement requirements, etc.).

IN.7.1-3. Utilize FPDS to Support Reporting/Tracking. Obtain annual FPDS data to document the percentage of sustainable acquisitions aboard MCAS Yuma (anticipated availability of reports is FY 2012 and subsequent years).

IN.7.1-4. Develop a Tracking System for Government Purchase Card Procurement Actions. Consider tracking sustainable acquisitions by Government Purchase Cards per EO 13514 requirements for future ISPP reporting years.

Objective 7.2 – Use a Minimum of 30% Postconsumer Recycled Paper***Initiatives***

IN.7.2-1. Update the GPP to Address Tracking of Postconsumer Recycled Content of Paper. Update the MCAS Yuma GPP to include establishing policies and roles and responsibilities related to the use and tracking of 30% post-consumer recycled paper (i.e., ensure that Ability 1 sales and any other paper procurement activities are included in the tracking process to facilitate the determination of total paper usage at the Station).

GOAL 8 – OPTIMIZE FLEET TRANSPORTATION MANAGEMENT / ALTERNATIVE FUELS

Objective 8.1 – 2% Vehicle Petroleum Reduction Annually Through FY 2015; 20% Vehicle Petroleum Reduction by FY 2015; 30% Petroleum Reduction by Fiscal Year 2020

Project

PO.8.1-1. Installation of E-85 Fuel Point. MCAS Yuma is making progress in managing the vehicle fleet to meet EO 13514 petroleum reduction goals and using alternative fuels to the extent possible; for example, biodiesel is used nearly exclusively for the diesel vehicle fleet. However, the current lack of availability of E-85 fuel has limited the ability of the Station to make additional progress in reducing their overall petroleum consumption. Making E-85 available at the Station should be a priority for meeting this objective's requirements. The cost estimate for the installation of an E-85 fuel dispensing point is presented below:

Assembly Cost Estimate								
Quantity	Description	Unit	Material O&P	Installation O&P	Total O&P	Ext. Material O&P	Ext. Installation O&P	Ext Total O&P
1	Storage tank, fuel, aboveground, double-wall, steel, 10,000 gal.	each	\$43,687.70	\$8,243.78	\$51,931.48	\$43,687.70	\$8,243.78	\$51,931.48
600	Slab on grade, 6 inches thick, light industrial, non-reinforced.	SF	\$3.50	\$3.44	\$6.94	\$2,100.00	\$2,064.00	\$4,164.00
0.33	Auto equipment product dispenser, 6 inch nozzles, with vapor recovery, not including piping, installed.	each	\$27,007.60	--	\$27,007.60	\$8,912.51	--	\$8,912.51
400	Gas service piping, 2 inch diameter, polyethylene, SDR-10, excavation and backfill excluded.	linear feet	\$3.60	\$4.48	\$8.08	\$1,440.00	\$1,792.00	\$3,232.00
TOTAL								\$68,239.99

Division Description		
A. Substructure		\$4,164.00
E. Equipment and Furnishings		\$8,912.51
G. Building Sitework		\$55,163.48
Sub Total		\$68,239.99
General Conditions	15%	\$10,236.00
Sub Total		\$78,475.99
General Contractors Overhead and Profit	10%	\$7,847.60
GRAND TOTAL		\$86,323.59

Policies and Procedures

PO.8.1-1. Develop an Alternative Fuel Vehicle Use Policy. Development and implementation of alternative fuel vehicle use policy, as well as educating alternative fuel vehicle users on the operation of these vehicles, will strengthen the Station’s overall ability to continue maximizing the use of alternative fuels in the fleet.

PO.8.1-2. Develop an Anti-idling Policy. It is recommended that an anti-idling policy be developed for the Station that addresses the amount of time internal combustion engines are permitted to idle (regardless of fuel type).

Initiatives

IN.8.1-1. Develop a Reduce Vehicle Miles Traveled Strategy. Evaluating opportunities to reduce the miles the fleet travels should also be a key initiative in further refining the Stations’s petroleum reduction strategy. This is a no cost solution with other associated benefits such as including reduced vehicle operational operation and maintenance costs and longer vehicle life before replacement. Reducing vehicle miles traveled can also enable a reduction in the number of vehicles required to accomplish a fleet’s mission, and therefore is directly related to actions taken to right-size fleets.

IN.8.1-2. Track New Policy Development. In performing research related to this goal, the following documents were identified related to further guidance and future requirements related to this objective. The Station should review and evaluate the potential impacts to the fleet management program:

- Presidential Memorandum – Federal Fleet Performance.
- General Services Administration (GSA) Bulletin FMR B-30 Motor Vehicle Management, Vehicle Allocation Methodology for Agency Fleets.
- GSA Bulletin FMR B-33 Motor Vehicle Management, Alternative Fuel Vehicle Guidance for Law Enforcement and Emergency Vehicle Fleets.

Objective 8.2 – 10% Increase in Non-petroleum Fuel Annually by FY 2015 and Maintain Thereafter Through FY 2020***Project***

See PO.8.1-1 above.

Policies and Procedures

PO.8.2-1. Develop an Alternative Fuel Vehicle Use Policy. Development and implementation of alternative fuel vehicle use policy, as well as educating alternative fuel vehicle users on the operation of these vehicles, will strengthen the Station's overall ability to continue maximizing the use of alternative fuels in the fleet (see also PO.8.1-1).

Objective 8.3 – Purchase Low Greenhouse Gas Emitting Vehicles***Initiatives***

IN.8.3-1. Continue to Purchase Low GHG Emitting Vehicles to the Maximum Extent Possible. The MCAS Yuma fleet manager proactively manages the Station's fleet composition and to the maximum extent possible, procures low-GHG emitting vehicles while still supporting the Station's mission. Ongoing coordination with SWRFT will be required to ensure low GHG emitting vehicles are procured as they are available to meet the Station's need.

GOAL 9 – PROMOTE ELECTRONIC STEWARDSHIP**Objective 9.1 – Ensure Electronic Product Environmental Assessment Tool-registered Electronic Product Procurement Preference; Ensure Procurement of Energy Star and Federal Energy Management Program Designated Equipment*****Policy and Procedures***

PO.9.1-1. Electronics Stewardship Policy. Consider the development of a comprehensive Station policy addressing electronic stewardship.

Initiatives

IN.9.1-1. Develop Training For Sustainable Electronics Procurement. Develop training sessions for MCAS Yuma staff on the sustainable acquisition policies (e.g., similar to ongoing training highlighting the FPDS resources/tracking methodology, the development of a Sustainable Acquisition Desktop Reference Guide, continued compliance and refinement of the GPP to account for electronic procurement requirements, etc.).

IN.9.1-2. Utilize FPDS to Support Reporting/Tracking. Obtain annual FPDS data to document the percentage of sustainable acquisitions aboard MCAS Yuma including electronic products (anticipated availability of reports is FY 2012 and subsequent years).

IN.9.1-3. Develop a Tracking System for Government Purchase Card Procurement Actions. Consider tracking electronic product acquisitions by Government Purchase Cards per EO 13514 requirements for future ISPP reporting years.

Objective 9.2 – Dispose of 100% of Excess or Surplus Electronic Products in an Environmentally Sound Manner***Policies and Procedures***

PO.9.2-1. Develop a Procedure for Excess or Surplus Electronic Product Management. It is recommended that the Station develop a procedure to identify areas of responsibility and reporting processes needed to facilitate the Station-wide tracking and reporting of electronics disposed of through the Defense Logistics Agency (DLA) Disposition Services for the purposes of annual reporting in the MCIWEST SMT

Initiative

IN.9.2-1. Ongoing Electronic Recycling Events. Continue development and implementation of electronic recycling events and tracking of electronic products recycled through the Station Recycling Center.

Objective 9.3 – Establish and Implement Policies to Enable Duplex Printing***Policy and Procedures***

PO.9.3-1. Develop Policy Related to Enabling Duplex Printing. There are currently no USMC policies addressing duplex printing; however, a draft MARADMIN policy is being developed that among other things, will address duplex printing. MCAS Yuma should continue with implementation of local

procedures to ensure duplex printing is performed to the maximum extent practicable. Pending release of the draft MARADMIN policy addressing this topic, the Station will take appropriate actions to fully implement the policy.

Objective 9.4 – Implement Best Practices in Energy Efficient Management of Server Data Centers

Policies and Procedures

PO.9.4-1. Develop a Policy Related to Energy Efficient Management of Server Data Centers. MCAS Yuma does not have a formal policy to reinforce the energy efficient management of server data centers; however, the DoN Information Management Electronic Stewardship Criteria is followed. The Station S-6 is moving into a new building (FY 2013) at which all servers will be consolidated into one location. The building will be monitored by the I&L Department's energy monitoring system further ensuring and implementing energy efficient management practices.

Initiatives

IN.9.4-1. Track Effectiveness of Implemented BMPs. Personnel responsible for the management of servers/data centers should track and document the implementation of energy-related BMPs to determine their effectiveness.

Objective 9.5 – Has the Installation Utilized Power Management Features

Policy and Procedures

PO.9.5-1. Develop Policy Related to Enabling Power Management Features. The Station S-6 ensures that all power management features on network electronic devices are automatically enabled, where possible. It is recommended that a policy be developed and implemented related to utilizing power management features on electronic devices to ensure continued compliance with this requirement.

Initiatives

IN.9.5-1. Develop Power Management Training and Education Program. Develop an educational program and outreach activities to promote ongoing awareness of energy efficient management and electronic product use aboard the Station. Coordination between the MCAS Yuma S-6 CDE, Environmental Department, the Property Control Office, and Logistics Department is needed to ensure compliance with DoN NMCI requirements and, where feasible, identify opportunities for advancing EO 13514 energy efficiency requirements.

Objective 9.6 – Has the Installation Utilized Any Other Energy-efficient Practices

No additional data/information is included related to this objective; the Action Plan is similar to that described in Objectives 9.3 through 9.5.

GOAL 10 – SUSTAIN A FORMAL ENVIRONMENTAL MANAGEMENT SYSTEM**Objective 10.1 – Ensure a Formal Environmental Management System is Implemented to Meet Executive Order Goals*****Initiatives***

IN.10.1-1. Regularly Evaluate Environmental Management System (EMS) Implementation with Regard to EO 13514 Goals. As part of MCAS Yuma’s ongoing EMS implementation efforts, the following should be evaluated on a regular basis (recommended at least annually as part of the self-conformance audit or as part of any external audit):

- The status of the Station’s EMS practices, aspects/impacts, and goals, objectives, and targets to ensure the requirements of EO 13514 are regularly being considered for incorporation into the Station’s EMS.
- The documented status of the Station’s efforts and progress in meeting established goals, objectives, and targets.
- As part of the review and corrective action development process, develop and implement required actions, as necessary, to assist with meeting the established goals, objectives, and targets.

Objective 10.2 – Establish Management Review for Executive Order Implementation***Policy and Procedures***

PO.10.2-1. Establish Procedures to Ensure Management Review of EO 13514 Implementation. The Action Plan associated with this objective’s requirements will focus on implementation of the Station’s sustainability policies and procedures including the requirement to perform a management review related to EO 13514 implementation.

Objective 10.3 – Submit Updates on Progress and Performance at Least Annually if Not More Often

To be developed based on reporting requirements that will be defined at a later date.

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