

# Environmental Management System (EMS)

Environmental  
Science Center

Annual  
Refresher Training  
(updated 2010)



# Introduction

At the ESC, being a good environmental steward is everyone's business.

Accomplishing your job in an environmentally safe and sound manner benefits us all by:

- \* protecting the health of the surrounding ecosystem,
- \* preserving resources for future generations,
- \* being good neighbors to surrounding communities,
- \* minimizing impacts due to non-compliance issues,
- \* and saving money by decreasing wasted resources.



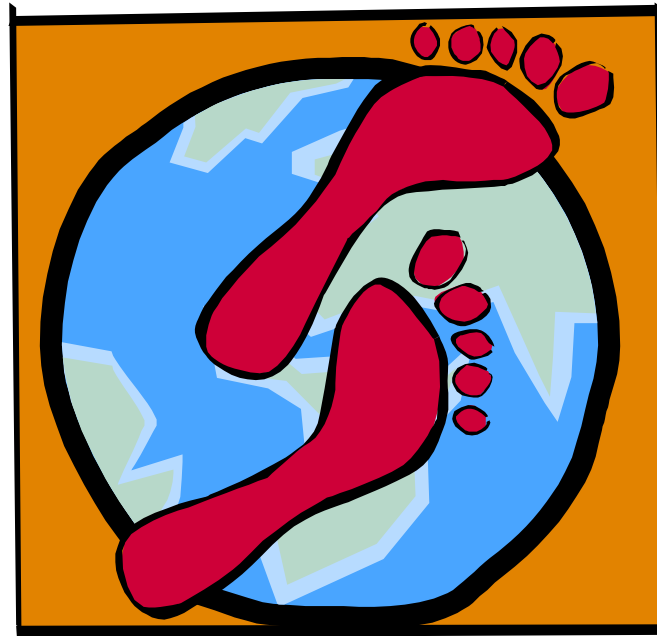
# Environmental Management System

The purpose of this training is to:

- get you familiar with EMS lingo
- explain your responsibilities in complying with ESC's EMS
- teach you how to decrease your environmental footprint during work and hopefully inspire you to carry that awareness with you to your home.



# **Purpose of EMS: minimize the impact to the environment**



# **And how is EMS supposed to accomplish this goal?**

- By following the requirements established in a series of Executive Orders that started back in 2000 with EO 13148.
- These EOs started out setting goals meant to ensure that Federal Agencies become environmentally responsible. Over the years, they have been strengthened with more specific goals.



# Then, came

# **Executive Order 13423**

*Strengthening Federal Environmental, Energy, and Transportation Management* was signed in January 2007 which requires Federal agencies to lead by example in advancing the nation's energy security and environmental performance.

- It is meant to strengthen key goals that had previously been set by the Energy Policy Act of 2005 (EPAAct 2005) and E.O. 13123 and E.O. 13149.
- These goals include numerous Federal energy and environmental management requirements in several areas, including:
  - Reducing energy intensity
  - Increasing use of renewable energy
  - Reducing water intensity
  - Designing and operating sustainable buildings
  - Managing federal fleets



nvttech.com

# Recently,

# Executive Order 13514

- On October 5, 2009 President Obama signed a [new Executive Order](#) entitled *FEDERAL LEADERSHIP IN ENVIRONMENTAL, ENERGY, AND ECONOMIC PERFORMANCE*
- EO 13514 does not supersede any other EOs but, has more specific goals and targets that build upon the previous EO 13423.
- In part, EO 13514 states that Federal agencies shall:
  - increase energy efficiency,
  - reduce their greenhouse gas emissions,
  - conserve and protect water resources,
  - eliminate waste, recycle, and prevent pollution,
  - promote sustainable technologies,
  - promote environmentally preferable materials, products, services,
  - maintain sustainable buildings,
  - strengthen livability of the communities in which Federal facilities are located,
  - and inform Federal employees about and involve them in the achievement of these goals.

# What this means to us...

- All of the Executive Orders use EMS as the vehicle to help ensure that these goals are achieved.
- EO 13514 states:
  - (j) sustain environmental management, by:
    - (i) continuing implementation of formal **environmental management systems** at all appropriate organizational levels;
    - (ii) ensuring these formal systems are appropriately implemented and maintained to achieve the performance necessary to meet the goals of this order.

Do you know which of the  
34 EPA facilities was the  
**first** to implement an EMS?

The

Environmental Science Center

of course!

# EMS

## Major Concepts

All Environmental Management Systems have many important components.

During this training we will review three main concepts:

- **Environmental Policy**
- **Environmental Aspects**
- **Environmental Targets**



# Environmental Policy

*It is the Environmental Science Center's policy to integrate environmental stewardship into our operations. We will manage our organizations and our programs in a manner that protects the environment, the safety of our employees, and public health.*

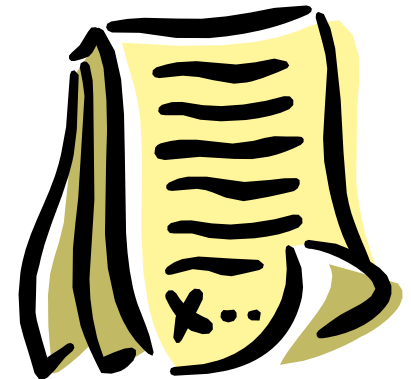


<http://www.epa.gov/region3/esc/ems/emspolicy.htm>

# Environmental Policy

The Environmental Policy describes ESC's approach to environmental management. ESC personnel should understand that the ESC's Environmental Policy:

- **Applies to all ESC personnel**
- **Commits to environmental compliance**
- **Commits to prevention of pollution**
- **Commits to continual improvement**



# Significant Environmental Aspects (SEA)

Environmental Aspects are elements of ESC's activities, products or services that can potentially interact with the environment.





# ESC's Significant Environmental Aspects

- Air Emissions
- Chemical Resources
- Energy Consumption (Electricity)
- Fuel Consumption (heating oil, natural gas)
- Fuel Consumption (gasoline, diesel) and Emissions From Mobile Sources
- Paper Consumption
- Radiation
- Storm water
- Waste Generation
- Wastewater
- Water Consumption
- Microbial Contamination

# What is done with this list of Significant Aspects?

Goals are created to continually reduce our environmental footprint (impact) in the areas of the 12 Significant Aspects.

Those goals are called Objectives & Targets.

Do you know which  
**2 Significant Aspects**  
the EMS Team created  
**Objectives & Targets**  
for this year ?



# 2009-2010 Significant Environmental Aspects

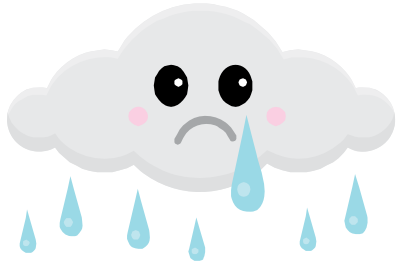


1. Stormwater



2. Waste Generation

# 1. Stormwater



## What Activities contribute to this Significant Aspect?

- ☛ Use of pesticides/herbicides on ground
- ☛ Leaks from cars onto parking services
- ☛ Containment of a 25,000 gallon fuel oil tank
- ☛ Salt storage and application to parking lot and walkways
- ☛ Integrity of Stormwater pond during rain



# **Our EMS Stormwater Discharge Objectives and Targets 2009-2010**

**Objective 1:** Determine integrity and functionality of ESC stormwater system

**Target 1.1** Visual inspection of condition of structural integrity and function

**Target 1.2** During rainfall event – within 30 minutes sample visually the runoff at point sources

**Target 1.3** Consider whether improvements are needed

## 2. Waste Generation – Nonhazardous Waste Disposal

What processes contribute to  
this Significant Aspect?



Ordering: laboratory packaging  
and containers for reagents and  
lab supplies



Eating lunch: food packaging



Facility Cleaning

# Our EMS Non-hazardous Waste Generation Objectives and Targets 2009-2010



**Objective 1:** Reduce the ESC solid waste stream by increasing recycling of plastics and aluminum

**Target 1.1** Permission to contribute ESC recyclables to Anne Arundel County.

**Target 1.2** Determine what recyclable materials are accepted by AACo.

**Target 1.3** Determine requirements for contributing to FGGM recycling

**Target 1.4** Expand recycling to include everything accepted at AACo.

# **Our EMS Non-hazardous Waste Generation Objectives and Targets 2009-2010**



**Objective 2:** Determine logistics of collection.

**Target 2.1** Determine procedure and schedule for transport of recyclables to Anne Arundel County.

# **Our EMS Non-hazardous Waste Generation Objectives and Targets 2009-2010**



**Objective 3:** Increase awareness and participation in the new recycling procedure

**Target 3.1** Distribute Tip Sheets to include changes to recycling

**Target 1.2** Promote awareness and instruction for the recycling changes.

# **Did we ignore the other Significant Aspects this year?**

**Absolutely not!**

Reducing our **Energy**, Fuel, Paper & **Water**

consumption are also continual goals.

# What can we do to reduce our Energy Consumption impact?

1. Turn off your computer monitor every night -- At \$.105 per kilowatt hour (kwh), turning off a 75-watt monitor outside 40 hours a week saves \$4.38 a month (42 kwh). This saves 750 lb. of CO<sub>2</sub> (greenhouse gas emissions) by burning 450 fewer pounds of coal each year!

Flat screen monitors consume about one third this much energy.

# Computer Energy Use Facts

- Desktop Computer 60-250 watts
- On screen saver (no difference) 60-250 watts
- Sleep / standby 1-6 watts
- Laptop 15-45 watts
- Monitor turned off at switch 0-10 watts

# Computer Energy Use Facts

- A business with 400 computers can use 260 kilowatts/hour.
- An average eight hour day equals 2080 kilowatts per day.
- Generally the average is 120 watts per computer or 48,000 watts for all computers per hour. A typical day is 384 kilowatts. This would equal **greater than \$840.00 per month** on average.

*The average cost per kilowatt hour was 11 cents in April 2008 across the United States. (A kilowatt hour is if a kilowatt is being used continuously for one hour.) This would equal **greater than \$4500 per month** for your company's computers alone at max usage. The odds of this being true (400 computers at max) is slim.*

# Computer Energy Use Facts

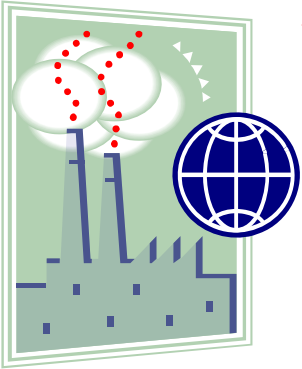
How to go **green**:

- Set all computers to hibernate and use standby.
- Personnel should turn off monitors when not in use.

# What else can we do to minimize Energy Consumption Impacts?

2. Evaluate whether equipment in you labs can be turned off when not in use
3. Turn off extra electrical appliance overnight – coffee makers, printers, copying machines, etc.



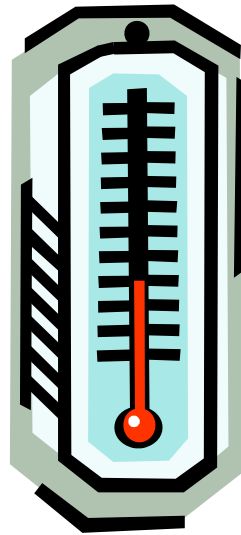


# What can we do to minimize Fuel Consumption (Oil) Impacts?

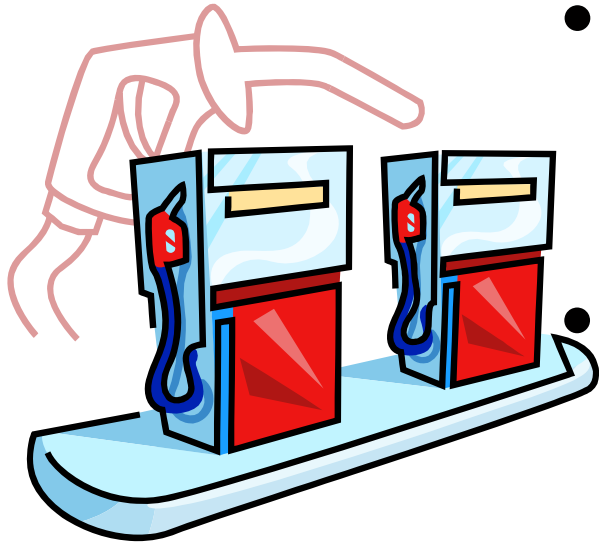
- Ensure your hood is closed when you are not using it and lab lights are off when you leave your lab.
- ✓ When your light is left on – the building thinks you are in the lab and increases the amount of air exchange – therefore increasing fuel consumption. Same is true when the hood is left open.

# Did You Know?

By turning down your central heating thermostat **1 degree**, fuel consumption is cut by as much as **10 percent**.

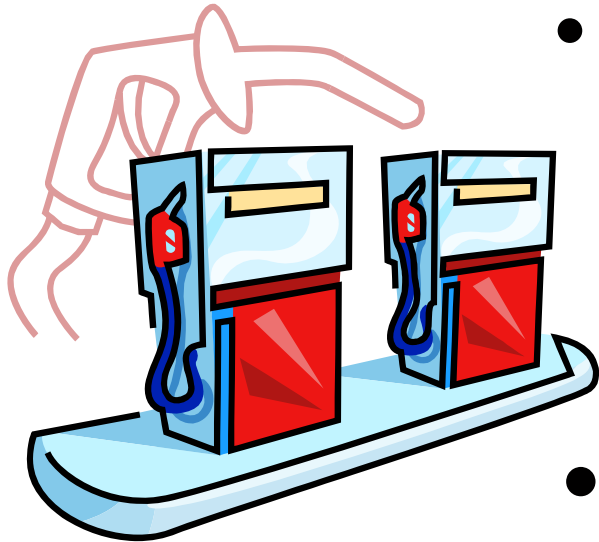


# What can we do to minimize Fuel Consumption (Mobile Sources) Impacts?



- Use the available hybrid or the smallest sized vehicle required when traveling
- Reduce miles traveled through shuttles, videoconferencing, and mass transit
- Commute to work with co-workers

# What can we do to minimize Fuel Consumption (Mobile Sources) Impacts?



- If you ride the Marc Train and bus, can get transit subsidies here at ESC
- <http://intranet.epa.gov/r3inttran/finance/transit.html>

# What can we do to reduce Paper Consumption Impacts?



- Refrain from printing unnecessarily
- Print and copy double sided
- Reuse paper for notes
- Recycle all discarded paper

# Paper Recycling Facts

- Approximately 2 billion trees worth of paper are thrown away every year in the U.S.
- Each ton of recycled paper can save 17 trees, 380 gallons of oil and three cubic yards of landfill space, 4000 kilowatts of energy and 7000 gallons of water
- The average American uses seven trees a year in paper, wood and other products made from trees. This amounts to about 2,000,000,000 trees per year
- The amount of wood and paper we throw away each year is enough to heat 50,000,000 homes for 20 years

# What can we do to reduce Water Consumption?

- Use Water-Saving Dual-Function Handle when flushing toilets
- Do not leave water running unnecessarily in labs, kitchen areas or bathrooms
- Report faucet drips/leaks immediately to ext 4357



# Additional things we can do to reduce ESC's Environmental footprint

- Reduce air emissions during sample analysis by recovering solvents instead of evaporation to the air
- Secondary containment for all samples and chemical/microbial standards to avoid spills and accidents
- Properly dispose of hazardous waste



# Recycle, Reduce, Reuse, and Refrain



# RECYCLING TIP SHEET

- Plastic – all but Styrofoam (#1, 2, 3, 4, 5 & 7)
- Glass (all colors, unbroken)
- Cans (Aluminum, Steel or Bimetal)

Recycling containers are available in all break rooms.

(PLEASE Rinse and clean containers.)

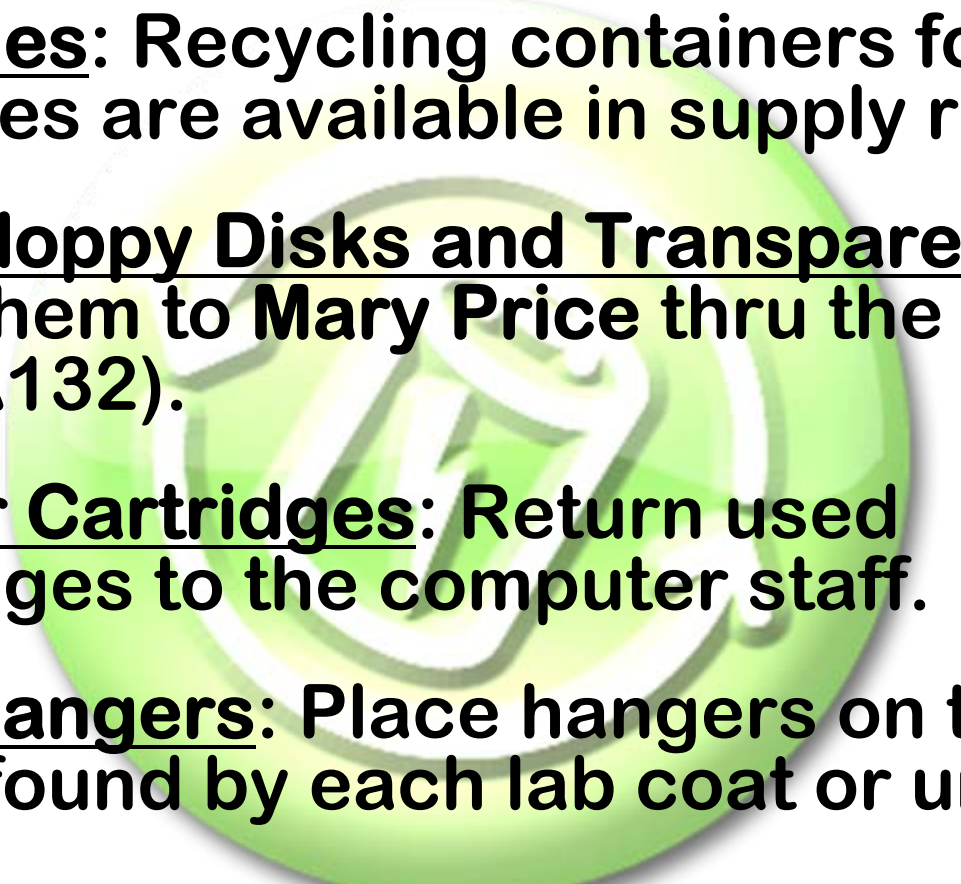


# RECYCLING TIP SHEET

- White Paper, Colored Paper, Magazines (glossy) and Newspaper: must be collected separately.
- Kimwipe & Nitrile Glove Boxes: Place in white paper recycling bins
- Cardboard: (corrugated/non-corrugated): Leave it outside your office or lab and mark “To be recycled”.



# RECYCLING TIP SHEET

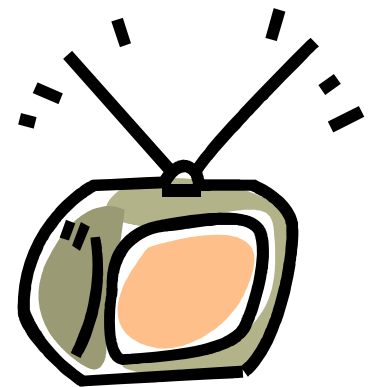
- **Batteries**: Recycling containers for batteries are available in supply rooms.
  - **CDs, Floppy Disks and Transparencies**: Send them to Mary Price thru the internal mail (A132).
  - **Printer Cartridges**: Return used cartridges to the computer staff.
  - **Coat Hangers**: Place hangers on the stand found by each lab coat or uniform rack.
- 

# RECYCLING TIP SHEET

- **Peanuts/Packing Supplies**: are re-used by OPP. Place in plastic bag or box and leave outside your lab or office. Call Mary Price for pickup.
- **Tyvek Envelopes**: Place by mail bins for pick up by Goodwill Contractors.
- **Pipet Tip holders**: Place in satellite waste areas for pickup

# Did You Know?

Energy saved from **1** recycled aluminum can will operate a TV set for **3 hours**, and is the equivalent to half a can of gasoline.





**Your Participation is  
Critical to the Success of  
Our EMS**

# What Are We Doing?

ESC is working toward continual environmental improvement – FY2009 statistics



- Recycled over 4000 lbs of cans, glass, plastic and aluminum.
- Recycled over 12,000 lbs of white and colored paper.
- Use 100% recycled-content process chlorine-free copy paper.

# Other cool things we are doing

## Honey bee hives



## Rain Garden



## Gordon's List



# How Are We Doing?



ESC is working toward continual environmental improvement – FY2009 statistics

- Energy consumption leveled off in FY09.
  - Electrical use reduce 1.7% ▼
  - Gas use increased 0.4% ▲
- Reduced 160 lamps in hallways
- Reduced annual water use
  - Domestic 34% ▼
  - Cooling towers 16% ▼
  - Boilers 6% ▼
- ESC began application and registration process for LEED Existing Building Operation and Maintenance certification

# How Does This Affect Me?



- Recycling soda cans and double-sided printing is the not the total answer.
- An effective EMS requires the participation of all employees.
- Everyone's job has the potential to impact the environment. We want you to think environmental protection in each task you undertake throughout your work day!

**WHAT DID YOU DO TO PRESERVE THE ENVIRONMENT TODAY?**

# Employee Responsibility

As a member of the ESC community, you are responsible for

- Performing your job in an environmentally safe and sound manner.
- Knowing how your job impacts the environment.
- Adhering to standard operating procedures (SOP).
- Knowing what the potential environmental impacts are for departing from these SOPs.
- Knowing the environmental legal (and other) requirements of your job.



# Purchasing Responsibility

Make smart purchasing decisions by following guidelines in EP06: Environmentally Preferable Purchasing Procedures

Purchase:

- Recycled content products
- Energy Star® products
- Water-efficient “WaterSense” products
- Biobased products
- EPEAT-registered electronic products
- Products with low or no toxic or hazardous constituents.
- Non-ozone depleting substances



# **Environmental Incident Reporting Responsibility**

- All staff are **required** to **report any environmental incidents or conditions that have an impact or may have a future impact on our ESC environmental footprint**. This includes any unsafe or potentially hazardous conditions that you are part of or you have observed. This could be slippery floors, leaky containers, water leaks, strange odors, or even inefficient procedures, etc.

# Environmental Incident Reporting Responsibility

- Bring the incident to the attention of your management and the SHEM Manager.
- An **Incident Form** will need to be submitted which describes the incident and how it was corrected.
- All reports will be tracked by the EMS Team who will periodically review the forms and determine if any trends are evident.

Use ***EPA's Green Desktop Supplies*** website to order “green” office supplies:

Found on the EPA@Work webpage:

<http://intranet.epa.gov/>

Select “Order Office Supplies” under Agency Services:

<http://intranet.epa.gov/agcyintr/tasks/supplies.htm>



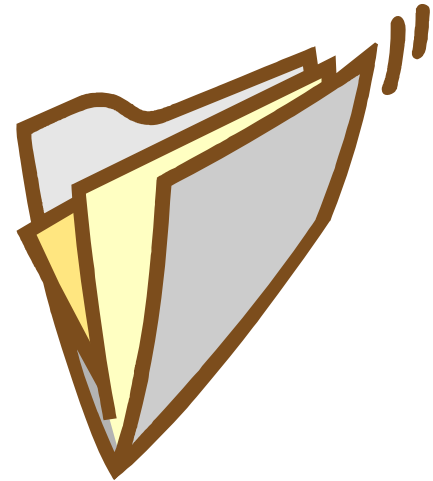
Encourage others to participate in the  
EMS program.  
Seek guidance from the EMS team.



# Where To Go For Information

All ESC EMS documentation is on the “J:/ Drive” including:

- tip sheets
- suggestion forms
- meeting minutes
- regulatory documents
- newsletter articles  
and much more



And, even if your are not at work? Check out the ESC EMS website: [www.epa.gov/region3/esc/ems/](http://www.epa.gov/region3/esc/ems/)

# Suggest Ideas



Have an idea of how to reduce environmental impacts, recycle, conserve energy? Submit your ideas to the EMS team members!

You could win a parking spot of your choice for one month!!

Suggestion Form [www.epa.gov/region3/esc/ems/](http://www.epa.gov/region3/esc/ems/)

# Participate



Yes, you recycle but...

want to be more involved?

Attend ESC EMS events

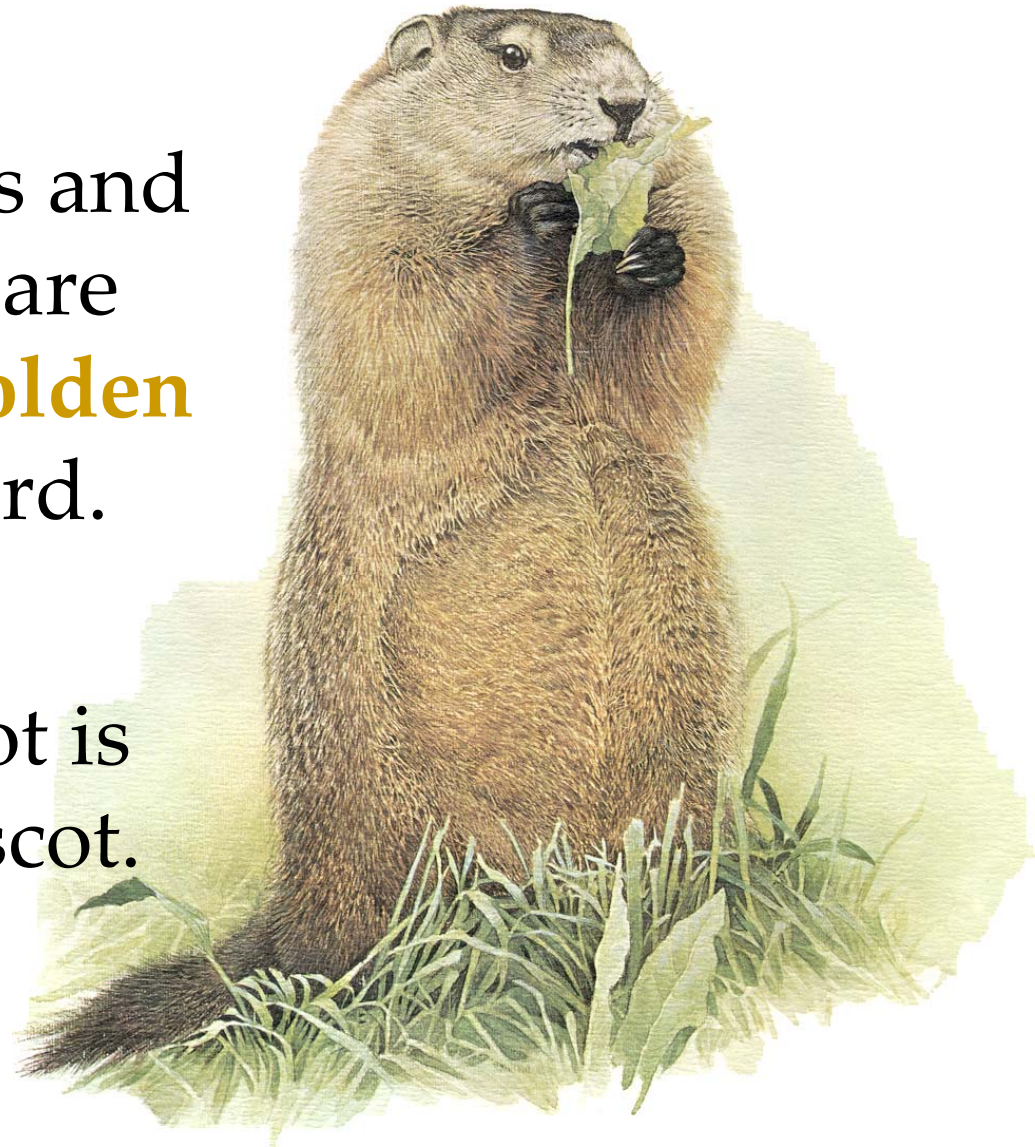
- Earth Day, recycling days, Golden Groundhog day, and more

Join EMS team meetings

# The Golden Groundhog

Outstanding efforts and innovative ideas are awarded with a **Golden Groundhog** award.

This furry marmot is the ESC EMS mascot.



# For More Information See the EMS Team Members

## EAID

Robin Costas

Jennie Gunderson

Joe Reyna

Stevie Wilding

Franklin Bueno

## OPP

Lynda Podhorniak

Rebecca Pines

## OPM

Susan Shinn

Skip Weisberg

Mary Price

**Quiz**

**It is your responsibility to:**

**A. Follow the SOPs of your job**

**B. Know how your job impacts the environment**

**C. Do your job in an environmentally safe manner**

**D. All of the above**

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# **ESC's Environmental Policy only applies to employees that handle chemicals**

- True**
- False**

# **ESC's Environmental Policy only applies to employees that handle chemicals**

True

False

**The policy applies to ALL ESC personnel.**

# What are the three major elements for an Environmental Management System?

- Environmental Policy, Environmental Aspects, Environmental Targets
- Environmental Policy, Environmental Activities, Environmental Impacts
- Environmental Aspects, Environmental Impacts, Environmental Activities

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# What can we do to reduce Fuel Consumption (Oil)?

- A. Keep the hood closed when not in use
- B. Shut the lights off in our lab when we leave
- C. Turn our computer off (including monitor) every evening.
- D. Both A and B

# What can we do to reduce Fuel Consumption (Oil)?

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# **What can we do to reduce Energy Consumption (Electricity)?**

- A. Shut off all appliances when not in use**
- B. Keep the hood closed when not in use**
- C. Turn our computer off (including power to monitor) every evening.**
- D. Both A and C**

# What can we do to reduce Energy Consumption (Electricity)?

- A. Shut off all appliances when not in use
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# **What 2 Significant Aspects did the ESC focus on this past year?**

- Energy Consumption & Paper Consumption**
- Stormwater & Waste Generation**
- Energy Consumption & Fuel Consumption (Oil)**
- Fuel Consumption & Waste Generation**
- Water Consumption & Stormwater**

# What 2 Significant Aspects has the ESC focused on this year?

- Energy Consumption & Paper Consumption
- Stormwater & Waste Generation**
- Energy Consumption & Fuel Consumption (Oil)
- Fuel Consumption & Waste Generation
- Water Consumption & Stormwater

**It's ok to toss bottles and cans in the trash because recycling is a waste of time**

- True
- False

**It's ok to toss bottles and cans in the trash because recycling is a waste of time**

True

False

**Please use the different recycling bins provided for each type of material—paper, aluminum, glass, and plastic. There just isn't one good excuse to throw away recyclables.**

# **What should you do to reduce energy consumption?**

- A. Increase the temperature of the thermostat in the winter**
- B. Show up late to work**
- C. Turn your computer off each night**
- D. Leave the lights on when you leave the office**

# What should you do to reduce energy consumption?

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# **Where is ESC's EMS information located?**

- A. J:/ Drive, Library and on the ESC website**
- B. E:/ Drive**
- C. It's not made available to all staff**
- D. Only in hard copy at the EMS team lead's desk**

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**The EMS team wants suggestions for**

**A. Creative recycling ideas**

**B. EMS team building activities**

**C. Energy and waste reduction  
initiatives**

**D. All of the above**

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**A. Creative recycling ideas**

**B. EMS team building activities**

**C. Energy and waste reduction initiatives**

**D. All of the above**

Thank you. You have now completed the Environmental Science Center's Environmental Management System Refresher Training Course.

Please click on the following link to submit your name to the ESC as having completed the course and also to print your Certificate of Completion.

[FINAL STEP](#)