School Chemical Cleanout Campaign (SC3)

School Science Lab
Waste Reduction and Disposal Project

Tennessee Department Of
Environment and Conservation
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Tennessee Department of Environment and Conservation

- **Office of Environmental Assistance** – Tennessee Pollution Prevention Partnership
  - Green Schools Program
- **Division of Solid Waste Management**
  - Solid Waste Assistance Programs

TP3 Green School Activity Areas

- REDUCE, REUSE, RECYCLE
- ENERGY CONSERVATION
- <u>HAZARDOUS CHEMICALS</u>
- LAND & WATER CONSERVATION
- CLEAN AIR

TP3 Mission Statement

To be Tennessee's statewide network of households, schools, government agencies, organizations, businesses, and industries, working together to protect our shared environment through pollution prevention

TP3 Green Schools Program Objectives

- Promote operations that reduce waste and technologies that conserve natural resources – energy, water, air, & land
- Eliminate toxins and hazardous chemicals in schools
- Bring cost savings to school systems through conservation and pollution prevention
- Involve students in projects that accomplish these objectives, whenever possible
- Promote pollution prevention successes state-wide to increase public environmental education

TP3 Green Schools Program Levels

- **Prospect**
  - Shows interest in pollution prevention by signing up for the program
- **Pledge**
  - Makes simple pledges to improve the school environment
- **Partner**
  - Develops a five-project plan, completes one project, and submits a Success Story
- **Performer**
  - Completes all five projects, Success Stories, and includes local community in Green Activities

REWARDS

Pledge - the Pledge certificate

Partner - the Partner certificate

TP3 decals

public recognition

Performer - the Performer certificate

TP3 green flag

public recognition

SC3 – a Cooperative Project

- **Tennessee Department of Environment and Conservation**
- **Tennessee Department of Education**
- **U.S. Environmental Protection Agency**
- **Support from Tennessee Science Teachers Association**
- **Support from Tennessee Organization of School Superintendents**

An Historical Perspective

- March 2002
- Hawkins County
- One of the most expensive school lab chemical accidents in TN history
- The lab clean out and resulting fire and cleanup cost was ~$190,000.

Do not move chemicals to other locations for safety and regulatory reasons!

A Recent Incident

- Spring 2005
- Hamilton County
- Unknown employees accidentally dispose of lab chemicals in regular trash
- The lab clean out and resulting fire and cleanup cost was ~$80,000.

A Recent Incident

- March 2005
- Cheatham County
- A substitute teacher tried to clean up a sodium hydroxide spill with old jeans
- School was evacuated and teacher treated for burns

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NASHVILLE, TENNESSEE

A GANNETT NEWSPAPER

CHEATHAM COUNTY

Chemical spill in class burns teacher's hands

Students were evacuated and a teacher received medical treatment after a chemical spill at Cheatham County High School yesterday.

Cheatham County Emergency Management and the Ashland City Fire Department were called to the school after chemistry students noticed a strong smell in their classroom. "It looks like a student poured out a quart of sodium hydroxide earlier in the day," said Ashland City Fire Chief Clatick Walker.

"A substitute teacher tried to clean up the spill using a pair of old blue jeans and received a chemical burn to her hands."

Sodium hydroxide is a chemical base used in ways similar to caustic lye. When used with water, sodium hydroxide can become hot and burn the skin.

"It had a strong ammonia smell or kind of like bleach," said student Ila Lingenfelter. "It gave some of the kids headaches."

Walker said his department checked with hazardous-material experts who recommended ventilating the building and cleaning the spill.

The name of the teacher, who received medical treatment, was not immediately released.

CLARKSVILLE

Mayor still in hospital, but in 'good spirits'

Clarksville Mayor Don Trotter has an ulcer and is expected to remain hospitalized until early next week, a mayor's aide said yesterday.

"They want him to stay in there two or three days more so they can make sure the treatment is working," said Joe Pitts, the city's director of economic and administrative services.

The mayor was admitted to Gateway Medical Center on Thursday with complaints of stomach cramps, nausea and lightheadedness. Pitts said Trotter's treatment began during a plane ride back to Tennessee from Washington, where he had trav-

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ACROSS THE STATE

TENNESSEE

Smyrna Guard unit called up for active dut

Twenty-one National Guardsmen from a Smyrna unit are being called up to active duty for the war effort.

Nashville

Clarksville

Knoxville

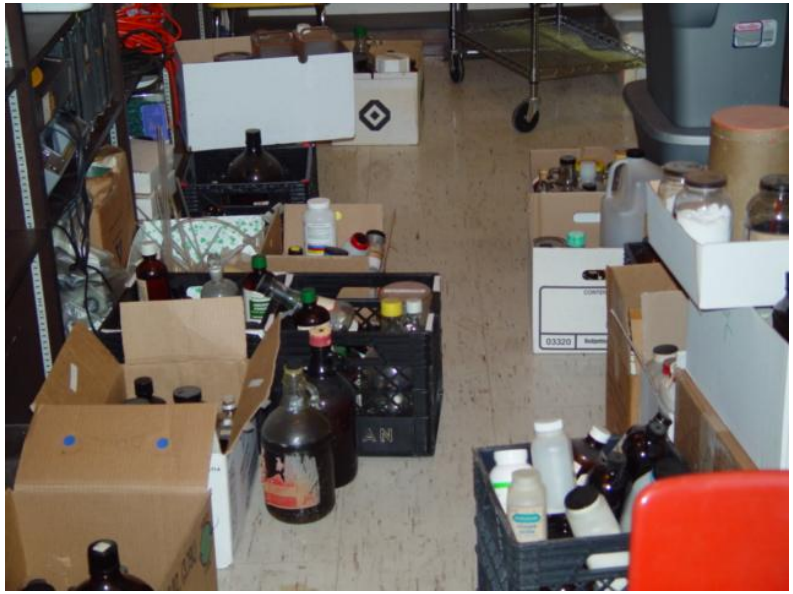
Jackson

Today's Reality

- Schools face rising waste management costs
- Schools have regulatory responsibilities
- Schools have a legal liability
- Lab chemicals in the wrong hands could be used for terrorism and manufacture of drugs

SC3 Project Goals

- Properly dispose of outdated, unknown, & unusable chemicals from TN public and private schools
- Reduce or eliminate potential environmental and safety risks
- Encourage environmentally sound use of chemicals as a teaching tool through alternatives (Green and Microscale Chemistry)



Disposal Cost

- Disposal cost is based on volume and location – coordinating with county HHW collections to save on costs
- EPA/TDEC grant funding will provide 50% to 90% cost share
- School system funds 10% to 50% (sliding scale based on County Economic Index)
- Cost estimate can be provided to school after inventory is completed and sent to us

SC3 Project Overview

- Complements the Department of Education's Total Science Safety System (TSSS) CD
- Inventories lab chemicals
- Disposes of waste lab chemicals
- Provides follow-up training for teachers to prevent similar situation in 10-20 years

SC3 Progress Report

- Through end of 2006, 89 schools were cleaned out in conjunction with local HHW events
- 15 more schools assisted with non-hazardous chemicals
- 2007: 10 more schools have been cleaned out
- We are still identifying public and private schools that need assistance

Chemicals Identified

Acute toxins such as cyanides and arsenates

Chemicals Identified

Flammables and Combustibles

Chemicals Identified

Toxic heavy metals such as mercury – total of 602 lbs removed through 2006

Chemicals Identified

Known or suspected carcinogens such as formaldehyde

Chemicals Identified

Potential explosives… shock/friction sensitive

Chemicals Identified

Reactive Metals

Chemicals Identified

Pharmaceuticals such as adrenalin

Chemicals Identified

50+ year-old chemicals

Chemicals Identified

Broken, leaking, degrading containers; improper storage of acids and bases

SC3 Summary

From 2003-2006, nearly 30,000 pounds of lab waste have been disposed from 89 schools

Recommendations for School Systems

- No food or drinks in labs
- Labs are kept locked
- First aid and chemical spill kits in labs (Hg)
- Vented, locked storage rooms
- Chemicals stored by chemical families
- Updated chemical inventory every year
- Emergency showers within 50 ft.
- Emergency eye wash within 25 ft.
- Exhaust hoods operable, calibrated, and vented to the outside

Recommendations for School Systems

- Material Safety Data Sheets (MSDS) for every chemical in schools
  - Printed and available where chemicals are located and used
  - First aid (Section 4)
  - Accidental Release (section 6)
  - Handling and storage (section 7)
  - Personal Protective Equipment (section 8)

SC3 Application Requirements

- Assign a primary contact person (Science teacher or School Administrator)
- Become a TP3 Green School member
- Complete an inventory of all excess lab chemicals (Total Science Safety System)
- Implement a chemical management plan

Follow-up Trainings for Schools

- Chemical ordering – smaller amounts, coordinated with curriculum (MSDSs)
- Safe and proper storage of all chemicals
- Lab Safety during experimentation
  - Fume hood calibration
  - Spill kits, personal protective equipment
- Green chemistry – uses less hazardous chemicals to teach same principles
  - Union University collaboration
- Microchemistry – uses small amounts of chemicals, producing less waste

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