# "High Hazard" Wastes:
## Explosives, Gas Cylinders, and Radioactive Wastes at HHW Facilities and Transfer Stations

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*Metro*

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# Explosives

**Explosion**: A sudden, violent release of mechanical, chemical, or nuclear energy from a confined region

# Explosives

- Many chemical compounds are considered explosive (covered in Dave's presentation)
- Explosive items, devices, products
  - May be received in HHW programs
  - Or come mixed with MSW in transfer stations

# “Low Hazard” Explosives


DANGER
1.4
EXPLOSIVES


IMPERIAL
SPECIAL LONG RANGE
5 11:46AM

# *Low Hazard Explosives*

- **Flares**
- **Fireworks – EXCEPT M80's in groups of 4 or more**
- **Ammunition**
- **Smokeless Powder, a.k.a. rifle powder**
- **Hobby rocket motors**

# “Low Hazard” Explosives

# *High hazard explosives (call bomb squad immediately)*

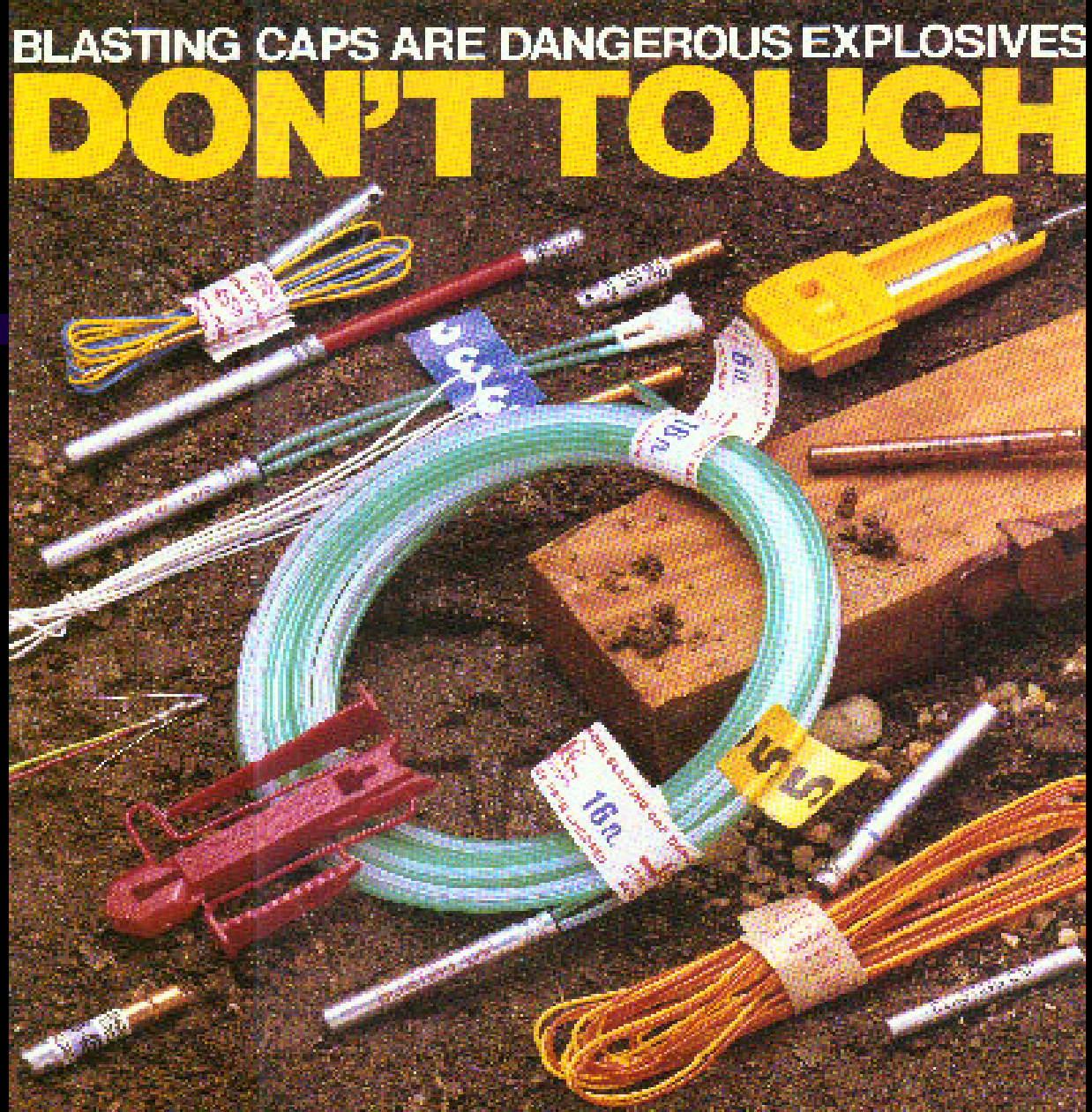
- Bombs (pipe bombs, other home-made devices)
- Dynamite
- Military Ordnance (grenades, shells, etc.)
- Flash Powder / Black Powder
- Blasting Caps
- Detonation Cord

# Bombs, Ordnance, Dynamite

# Blasting Caps

BLASTING CAPS ARE DANGEROUS EXPLOSIVES

# DON'T TOUCH



IF YOU FIND ANYTHING THAT LOOKS LIKE THIS

REPORT IT PROMPTLY TO

THE NEAREST POLICE OR FIRE DEPARTMENT

# Detonation Cord


DYNO
Dyno Nobel
SPECIAL 25-1
DYNO
Dyno Nobel
SPECIAL 18-T

Primadet
NONELECTRIC DELAY DETONATOR
NOISELESS LEAD-IN-LINE
200 FT/PI
60 M
0
PERIOD
PÉRIODE
LOT
DANGER
BLASTING CAP
DETONATEUR
EXPLOSIVE
KEEP
FROM CHILDREN
DANGER
DÉTONATEUR
EXPLOSIF
TENEZ
ÉLOIGNÉ
DES ENFANTS
Ensign-Bickford
Primadet


AGSTRITE 15
EXPLOSIVES BLASTING TYPE B
BLASTING AGENT


DYNO
Dyno Nobel
Gladstex 999
5H2/Y23/S/95
USA/M4590
3 1/2
UN 0332
1.5
D


D35
DYNO CAST
DYNO
Dyno Nobel
EXPLOSIF • DANGER • EXPLOSIF
EXPLOSIVO PELIGRO
D90
DS4
DYNO
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D25
DYNO CAST BOOSTER
DYNO
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D45
DYNO CAST BOOSTER
DYNO
Dyno Nobel


KINEPAK
KINETICS

# Compressed Gas Cylinders

Among the most hazardous wastes

- disposed of in MSW
- received in HHW/CESQG programs

# *Compressed Gas Cylinders*

Definition: Heavy-walled metal cylinders

- vapor pressure > 40 psia
- typical pressures ~ 2,400 psi
- some as high as 6,000 psi

(aerosol cans not included)

# *Compressed Gas Cylinders*

Various sizes:

- Small cartridges for BB guns, seltzer dispensers
- Large cylinders weighing hundreds of pounds

# *Compressed Gas Cylinders*

Can contain:

- substances in the gas phase under pressure
- liquified gases
- liquids under normal conditions along with a compressed propellant gas
- extremely hazardous materials not under pressure

# *Compressed Gas Cylinders*

Most common:

- propane!
- CFC refrigerants
- helium
- oxygen
- acetylene
- hydrogen
- ammonia
- ethylene oxide

# *Compressed Gas Cylinders*

Contents can be:

- extremely hazardous
  - toxic, corrosive, reactive
- moderately hazardous
  - more dangerous due to rapid dispersal
- inert
  - still dangerous due to high pressures

# *Compressed Gas Cylinders*

Releases:

- more likely with old, rusting, or damaged cylinders
- slow or sudden
  - can propel the cylinder swiftly over large distances
  - create flammable or toxic atmospheres
  - displace oxygen
  - generate extreme cold

# Propane

- small - camp stoves, etc.
- larger – barbecues, RV's

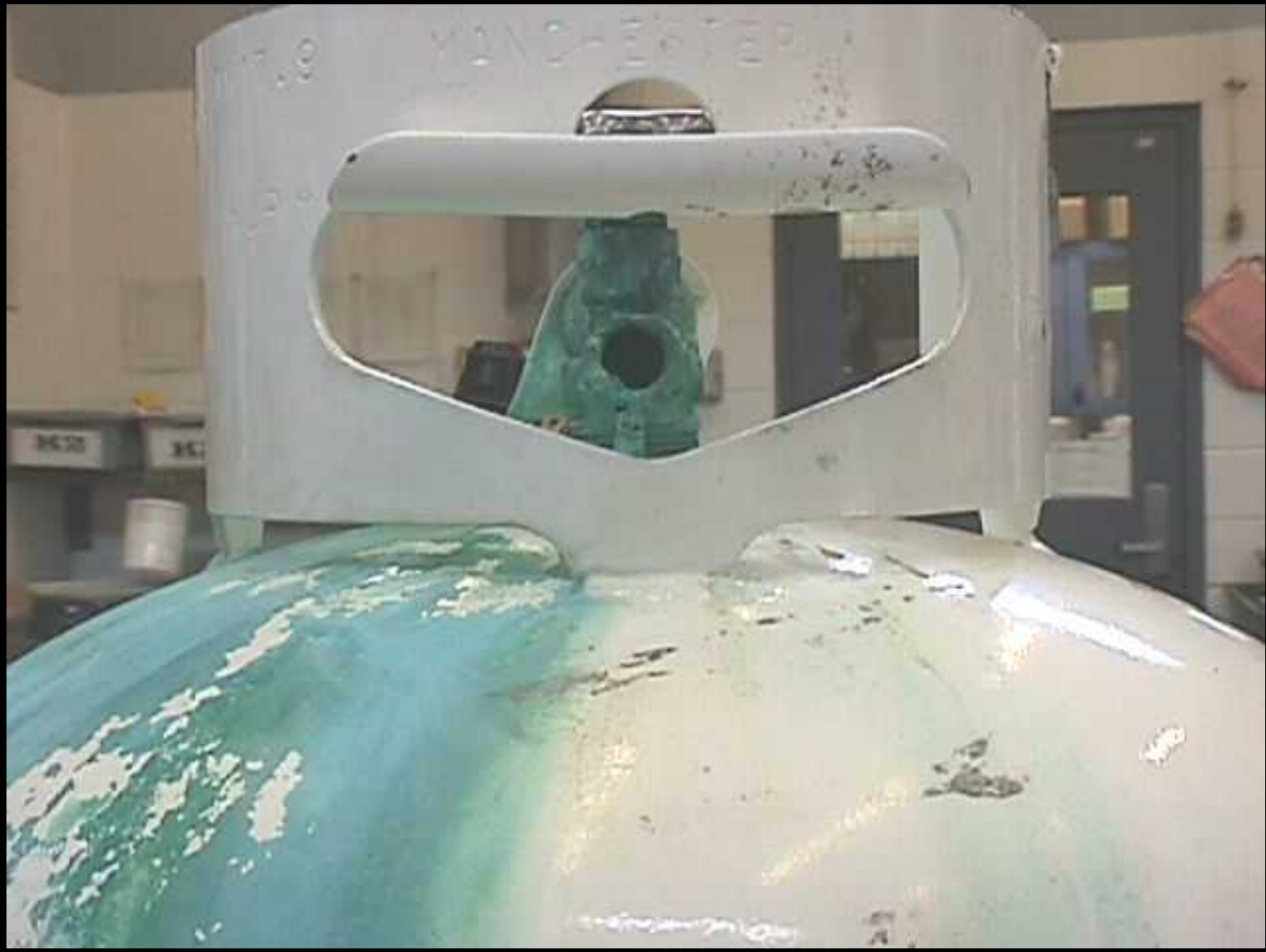
# *Compressed Gas Cylinders*

**Propane**

- **"OPD" – overfill prevention device**
  - **required for 4-40 lb propane cylinders**
- **older type phased out, may end up in the trash**
  - **began 1998, completed April 2002**
- **run over / compressed by MSW equipment→ serious explosions and fires**

# *Drug Lab Cylinders*

- Propane cylinders with corrosion
- Unusual modified cylinders



# *Compressed Gas Cylinders*

Recommended:

- Never dispose of any cylinder as MSW - even when “empty”
- Part of a waste screening program

# *Compressed Gas Cylinders*

**Handling / Storage:**

- **OSHA: chained or otherwise stored to prevent falling over**
- **Recommended: protected from precipitation, access restricted, warning signs**
- **Safety glasses or goggles, gloves and other PPE**

# *Compressed Gas Cylinders*

Disposal is Expensive!

– **up to several thousand dollars <u>each</u>**

Alternatives:

1) Return to manufacturer/distributor

- look for labels, engraved abbreviation
- check with local companies
- DOT, CGA info

# *Compressed Gas Cylinders*

Disposal Alternatives cont.

2) Onsite removal, recycling

- Propane, CFC’s

# *Compressed Gas Cylinders*

Disposal Alternatives cont.

3) Venting

- Inert gases: nitrogen, carbon dioxide, compressed air, helium, argon, neon, xenon, or krypton
  - **After venting, cylinder → scrap metal**
  - **usually requires cylinder cut in half or valve removed**

# *Compressed Gas Cylinders*

Disposal Alternatives cont.

Safety procedures critical

- **ice plugs may form in valve, or valve may become inoperational**
- **cylinder may seem empty**

# *Compressed Gas Cylinders*

What if contents are not known?

- Ask the manufacturer/distributor
  - Give them dimensions, color, valve style, labels, ICC/DOT number
- Clues:
  - UN/NA number (see DOT "Emergency Response Guidebook")
  - Warning labels (see CGA guide)
  - Valve and cylinder style (see CGA, DOT)


4B300
15T

# *Identifying unlabeled cylinders (cont.)*

When in doubt, have a sample taken and an instrumental analysis done

$$$$!


AEROSECT
E WONDER INSECTICIDE
Toxic
Humans, Animals, and Pet
ENGINEERING COMP
INSECTICIDE IN THE REFILLAB

# Radioactive Materials

- May be brought in by HHW customers
- May come into transfer stations mixed with MSW

# *Radioactive Materials in MSW*

- Naturally occurring
- Medical
- Other manmade

# *Naturally-Occurring Radioactive Materials (NORM)*

- mineral formations w/ uranium, thorium & decay products
- zircon sand used by some foundries in casting process
- brick and masonry products- demolition debris
- generally legal to dispose of in municipal landfills

# *Medical Sources*

- “Radiopharmaceuticals” - very important diagnostic tools
- handled under licenses issued by regulatory agencies
- decay in storage requirements
- slip ups happen

# *Medical Sources cont.*

- outpatients - undergarments etc.
- radiation sources in some medical devices
  - small, but potentially high level

# Radium dial watches, clocks, compasses

# *Fiesta ware*

# Lantern mantles

# Tritium exit signs

# Radium “curative” devices

# Cloisonne jewelry

# *Other Manmade Sources cont.*

- smoke detectors
- dental porcelain
- eyeglasses
- uranium samples
- etc.

# *Recommended:*

- Monitor incoming MSW loads, even if not required
- Have a portable monitor available at HHW sites
- Make friends with your state radiation office

# *Accepting "High Hazard" Wastes Requires:*

- Training
- Procedures
- Equipment
- Disposal outlets
- Top-notch safety program

# *Why Bother?*

- What else will the public do with these wastes?
- If you operate a transfer station or landfill, you'll find them in your load check program

# Metro

People Places Open Spaces