

Rehab the Lab Campaign



Fall 2002 through
Winter 2003

David Tipton and
Brad Zulewski

Project Team:

Presentation Outline

- The work plan, the turmoil and the fallout
- “The Sudden Realization” – we’re in way over our heads on this one . . .
- We are saved by knowledgeable experts
- We hire someone who knows about laboratory chemicals
- Non-regulatory, Top down approach
- We get lucky and find funding for disposal
- Unwanted, unneeded, and dangerous chemicals . . .
- Short & long term compliance
- The Pledge . . .
- Follow ups: What happens now?

Why School Labs?

- Science teacher turnover
- Teachers inherit unknown, unfamiliar chemicals -- leads to backlog
- Teacher's priority is the CLASSROOM not the STOCKROOM



JAN 8 2003

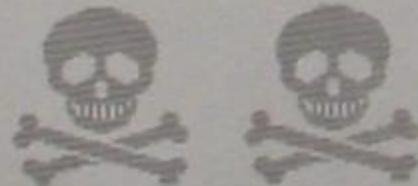
DANGER

HAZARDOUS
MATERIALS



SCIENCE OFFICE
AND PREP ROOM

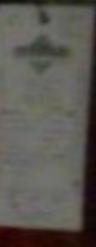
NO STUDENTS!



DANGER

**FLAMMABLE
LIQUIDS**

268







CORROSIVE

8



CORROSIVE

8



FLAMMABLE

3

KEEP FIRE AWAY



FLAMMABLE

3

SciMarCo
Division of Flinn Scientific, Inc.

SciMarCo
Division of Flinn Scientific, Inc.

SciMatCo

Division of Flinn Scientific, Inc.



RADIOACTIVE

7

Why Else?

- Waste disposal is paid for by Maintenance Department
- Maintenance budget is often first to cut -- can lead to long-term storage



JAN 8 2003



OCT 2 2002





CHEMICAL STORAGE



Campaign Objectives

1. Involve teachers, administrators, district safety officers
2. Provide on-site review and inventory
3. Identify unneeded, unwanted chemicals with each teacher
4. Help package, label and dispose



NOV 4 2002



3ML-HCL



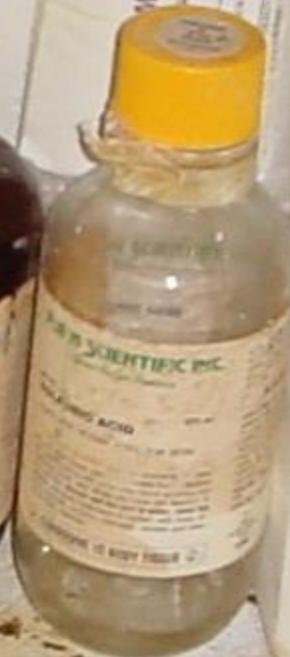




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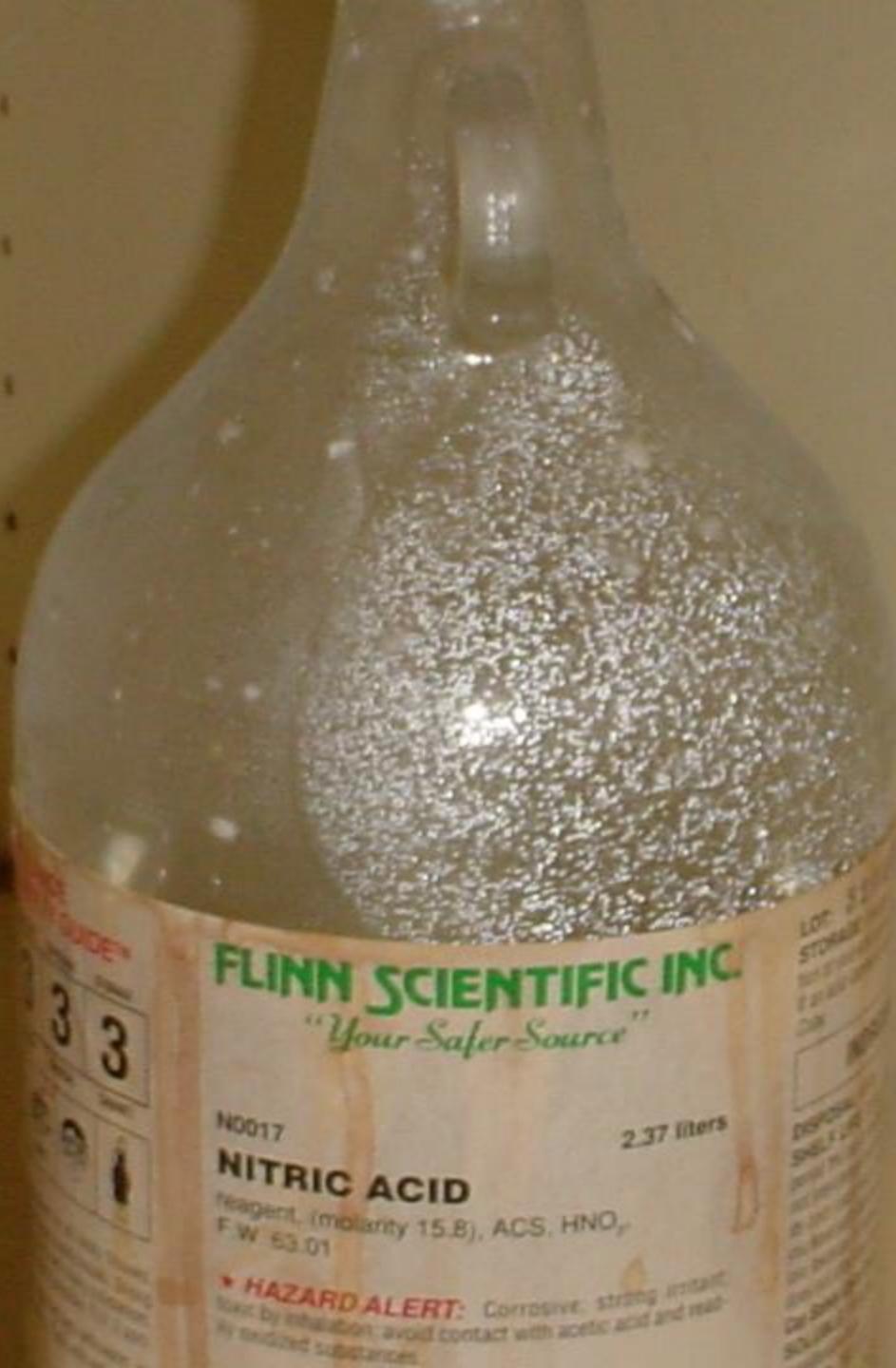
NOV 4 2002



Objectives (continued)

5. Check safety equipment
6. Check chemical hygiene plan
7. Recommend pollution prevention
 - small scale chemistry
 - inventory control
 - centralized purchasing & distribution







NA2672 •

Mallinckrodt®

**AMMONIUM
HYDROXIDE**

AR® Analytical
Reagent



Maintains ACS Specifications
Certificate of Lot Analysis
Acidity (H+) ...
Carbon Dioxide (CO₂) ...
Chloride (Cl) ...
Heavy Metals (as Pb) ...
Iron (Fe) ...
Phosphorus (PO₄) ...

A certificate certifying that the above & all further analyses
of this lot were performed in accordance with the
specifications are included.
Ramsey Soddy
Quality Control Manager
The total 2% production
is controlled by quality control.

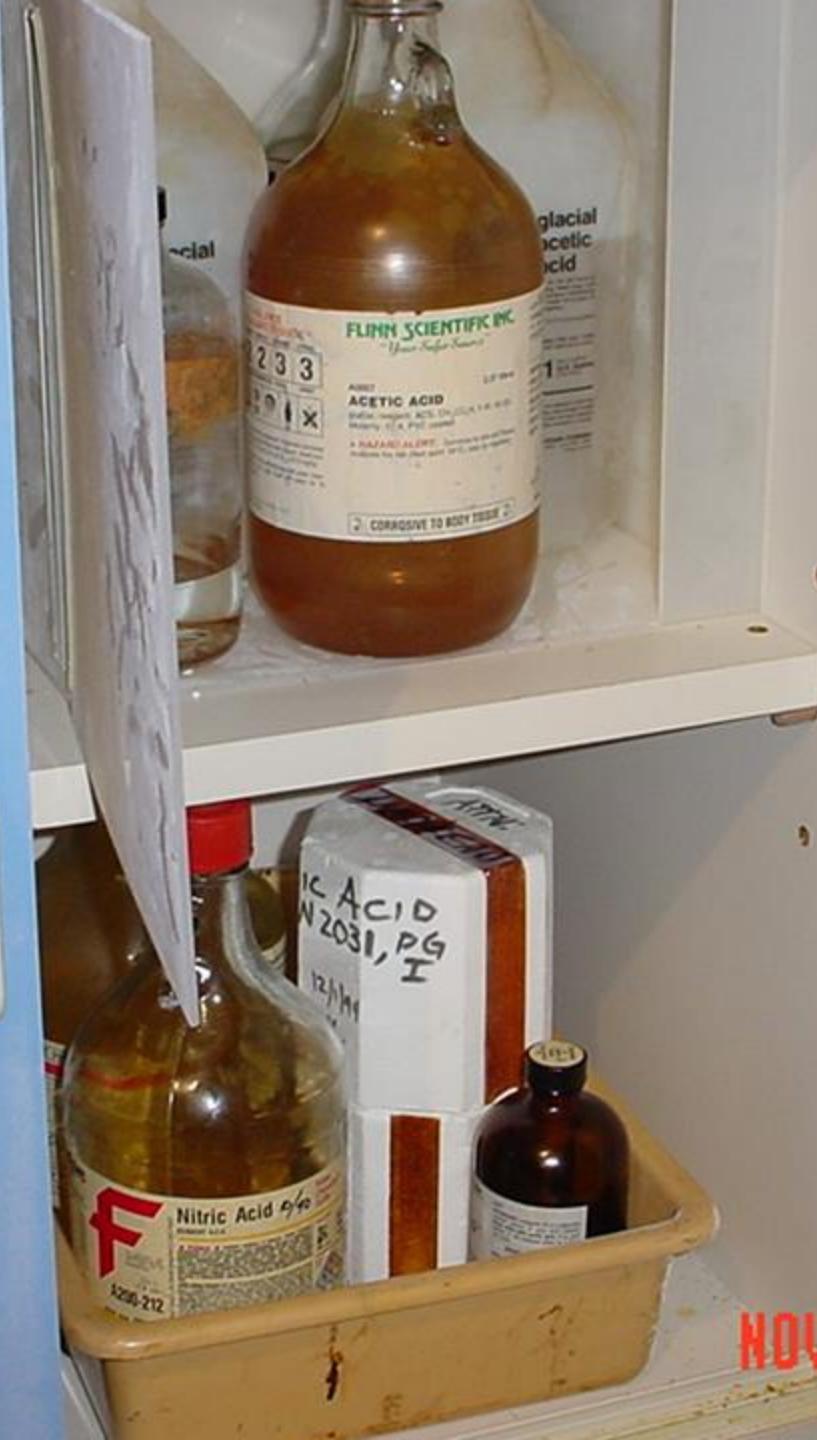


MFG. CO.

ACID



HAZARD-8017



NOV 4 2002

CAROLINA
Sodium Hydroxide, 0.3 M
Sodium Hydroxide
Dissolved Water
Keep Out of Reach of Children
Carolina Biological Supply Company
Burlington, North Carolina 27215

1.2
98.8

CASE
7732-18-5



Avoid breathing vapor. Use proper ventilation.
Avoid contact with eyes and skin. Don't drink.
Wash container in a closed dry place.

First Aid: If contact occurs, wash thoroughly with water.

CALL A PHYSICIAN

DO NOT REMOVE THIS LABEL

Keep Out of Reach of Children

Acid For Peeling off Labels

Carolina Biological Supply Company

Burlington, North Carolina 27215

NOV 4 2002



NOV 4 2002



HDU 4 2002

Hydroc
Acid



- 1) Acetone
2) Acetone Peroxide
3) Acetone Peroxide
4) Barium Chromate
5) Lead Oxide
6) Bromine
7) Mercury
8) Mercuric Chloride
9) Arsenic
10) Antimony
11) Hydroxylamine Hydrochloride
12) Dibenzoyl Peroxide (Lucidol 98): Organic Peroxide, may explode if heated above 160°F.

Partnerships

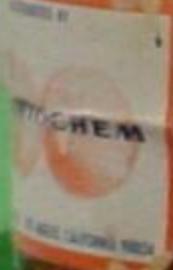
- EPA - Rehab the Lab Committee
- Ecology -- Technical Assistance
- ESD 113 -- Training
- Thurston County Health -- Lab assessments, one-on-one education
- School Districts

CACD FOR
CHIOTROGRAPHY

0-SIL-HA

as 70 mesh

100 gm.



CONTROL NUMBER

4207

DATE

9-28-66

CAUTION

Contains trace ether. Keep away
from flames. Keep bottle tightly
closed. Avoid exposure to mois-
ture.





OCT 2 2002



OCT 2 2002

OCT 2 2002

1-218

500 ml

Hydrogen Peroxide, 30% Stabilized, C.P.
Contains 0.0002% max. Na₂SnO₃H₂O as a Preservative
(Superoxol®)

P.W. 34.0

Superoxol® - Trademark of Merck & Co., Inc.

LOT

USE BEFORE

J.T. Baker Chemical Co., Phillipsburg, N.J. 08865



Bromine
solutions

PRO

IDEA

AME

ER



INHALATION HAZARD

STORAGE CODE WHITE

**DANGER! CORROSIVE
POISON! 96**
Causes severe burns. Causes
irreversible damage to eyes.
Fatal if swallowed.

Avoid contact with skin, eyes and
respiratory tract. Avoid breathing
vapors or mist. Avoid contact with
water. If swallowed, do not induce
vomiting. Call a physician or
Poison Control Center.

FIRST AID - SWALLOWED:
Do NOT induce vomiting.
Call a physician or
Poison Control Center.

EYES: Flush
thoroughly with water lifting upper and
lower eyelids separately. Continue
flushing for at least 15 minutes.

INHALATION AND SKIN: Remove to
fresh air.

CORROSIVE

**Bromine Water
Saturated Solution**

UN 1744

Activity Series AP Kit

Contents:
Bromine: CAS No. 7726-95-6,
Water: CAS No. 7732-18-5

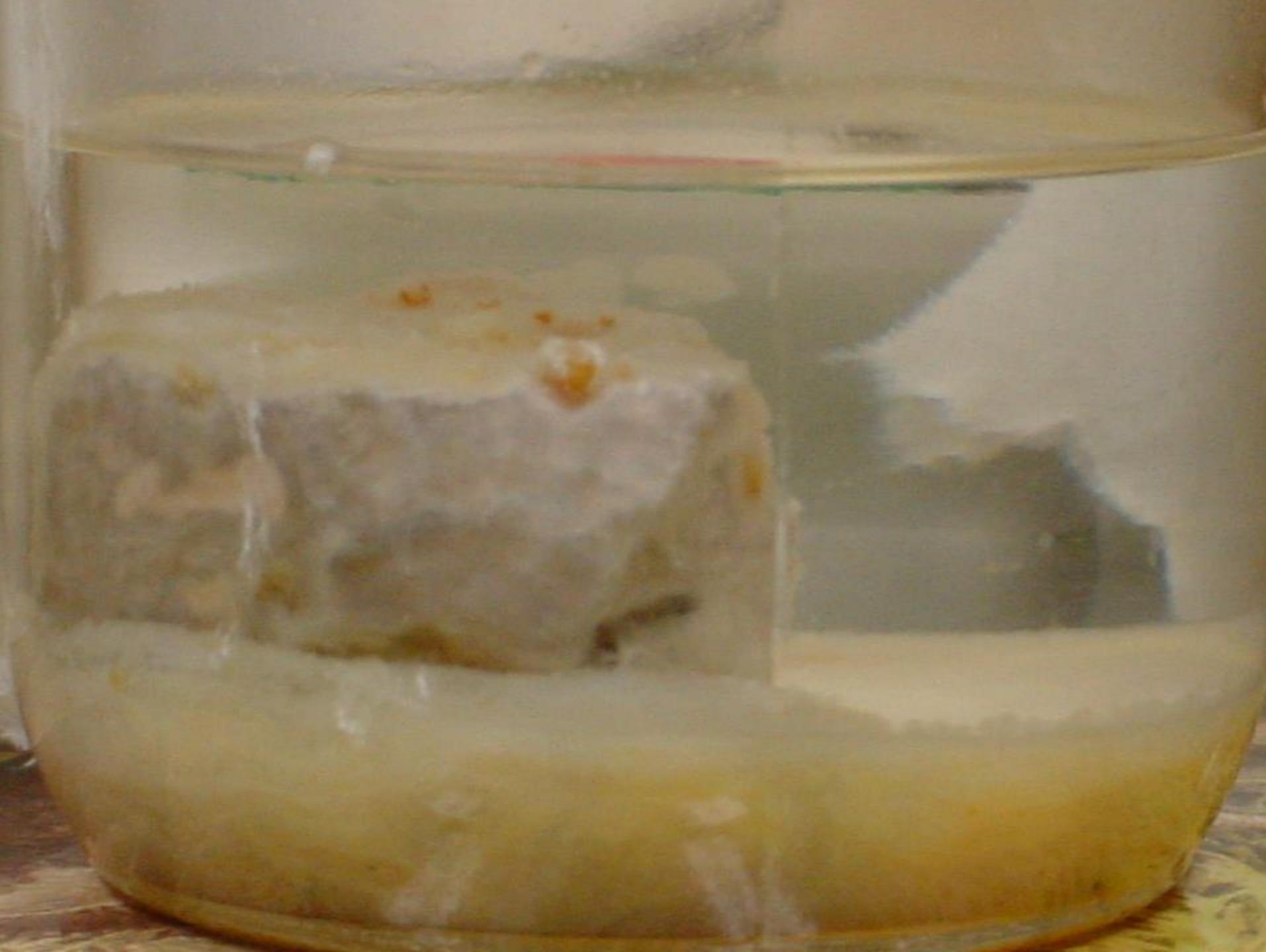
CATALOG # APC960-01 100 ml

WARD'S NATURAL SCIENCE
Established 1873 • San Luis Obispo, CA
Dana Laboratory • Ontario • Tu-Peak Air Under Seal
• U.S.A. • Canada • U.K. • France • Italy

Lot AD-1157

Acid	4
Alkaline	0
Flammability	2
Corrosion	2

OCT 2 2002



6616

1/4 LB.

Mallinckrodt[®]

PHOSPHORUS

N. F. VII STICKS

(YELLOW)

NOT INCLUDED IN CURRENT N.F.

At. Wt. 30.98

CAUTION: For manufacturing,
processing, or repacking.

CAUTION: Federal law prohibits
dispensing without prescription.

MALLINCKRODT CHEMICAL WORKS

ST. LOUIS • NEW YORK • MONTREAL

 POISON 

3 14:53

1 LB.
CHARCOAL, ANIMAL, GRAN.

CENTRAL SCIENTIFIC COMPANY
LABORATORY SUPPLIES
Apparatus  Chemicals
EX-BOSTON - CHICAGO - TORONTO - LOS ANGELES

Charcoal Willow

CHEMICALS & REAGENTS
CHICAGO
APPARATUS COMPANY
CHICAGO - ILLINOIS

NOV 6 2002



NOV 6 2002

FLINN SCIENTIFIC INC.

CX007

25 g

CALCIUM METAL

INSTRUCTION REAGENT

Ca

AW 40.08

"Your Safer Source"
510 W. WILSON ST. BATAVIA, ILL. 60510 U.S.A.

NOV 6 2002

Results

- Improved safety
- Disposal of unneeded wastes
- Teachers and district staff gain knowledge
- Pollution prevention
- Reduced potential for accidents

3756 *DISCS 100*

Mallinckrodt

BARIUM CHL

(GRANULAR)

$\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$

ANALYTICAL REAGENT

AR

Boron Oxide

Analyzed REAGENT

1962

Cadmium Nitrate, Cryst.

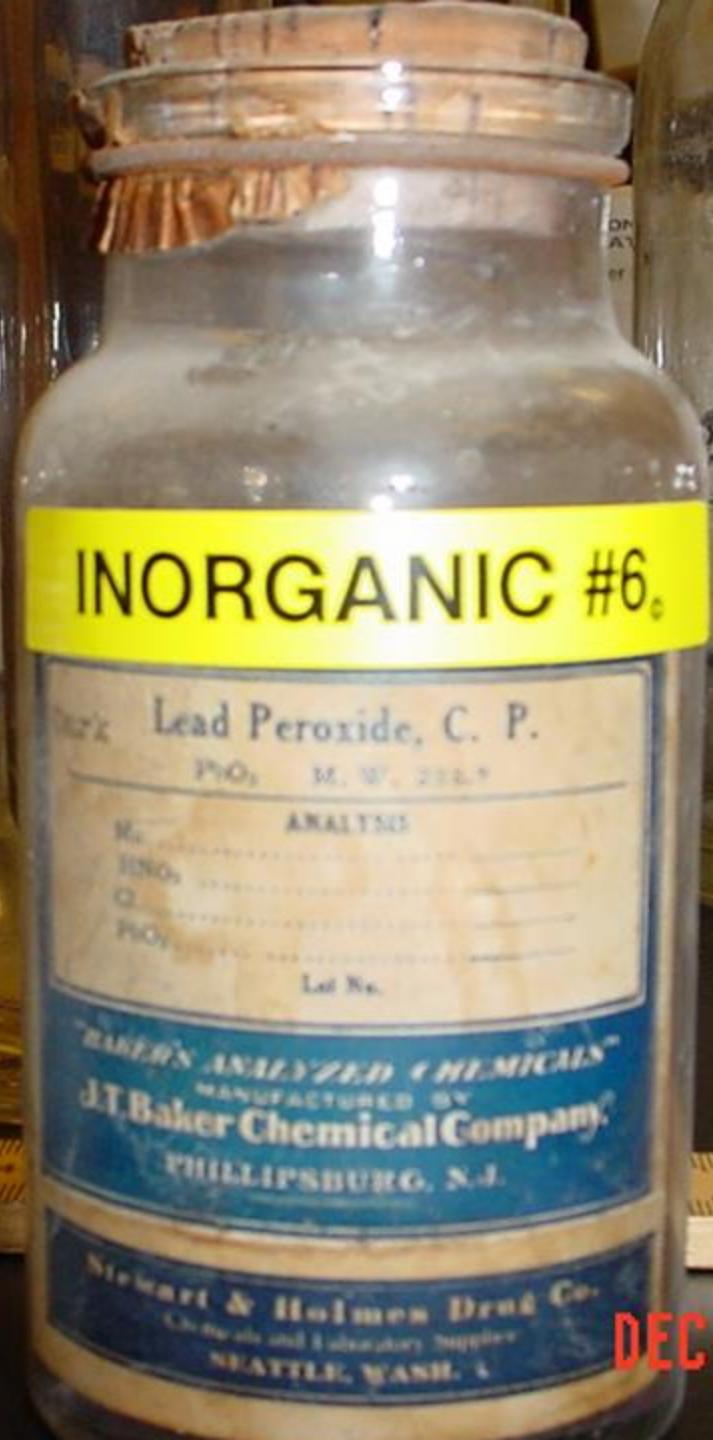
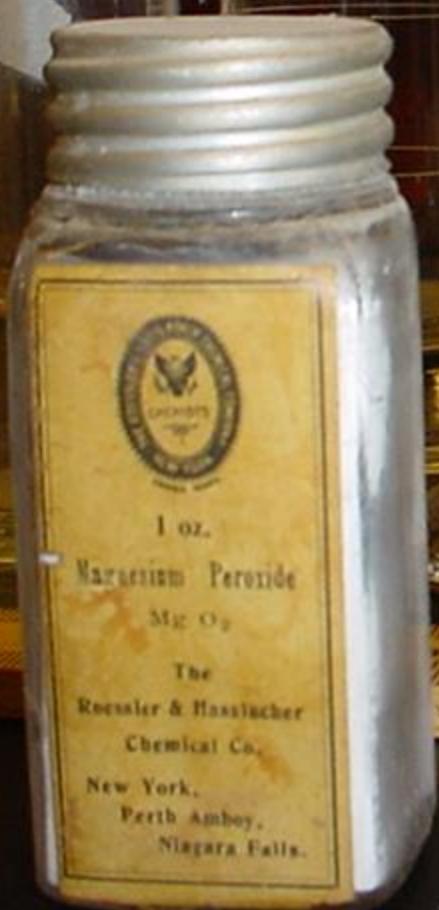
NOV 6 2002



NOV 6 2002



DEC 16 2002



DEC 16 2002

Bismuth Nitrate, C. P.
 $\text{Bi}(\text{NO}_3)_3 \cdot 10\text{H}_2\text{O}$ M. W. 450.17

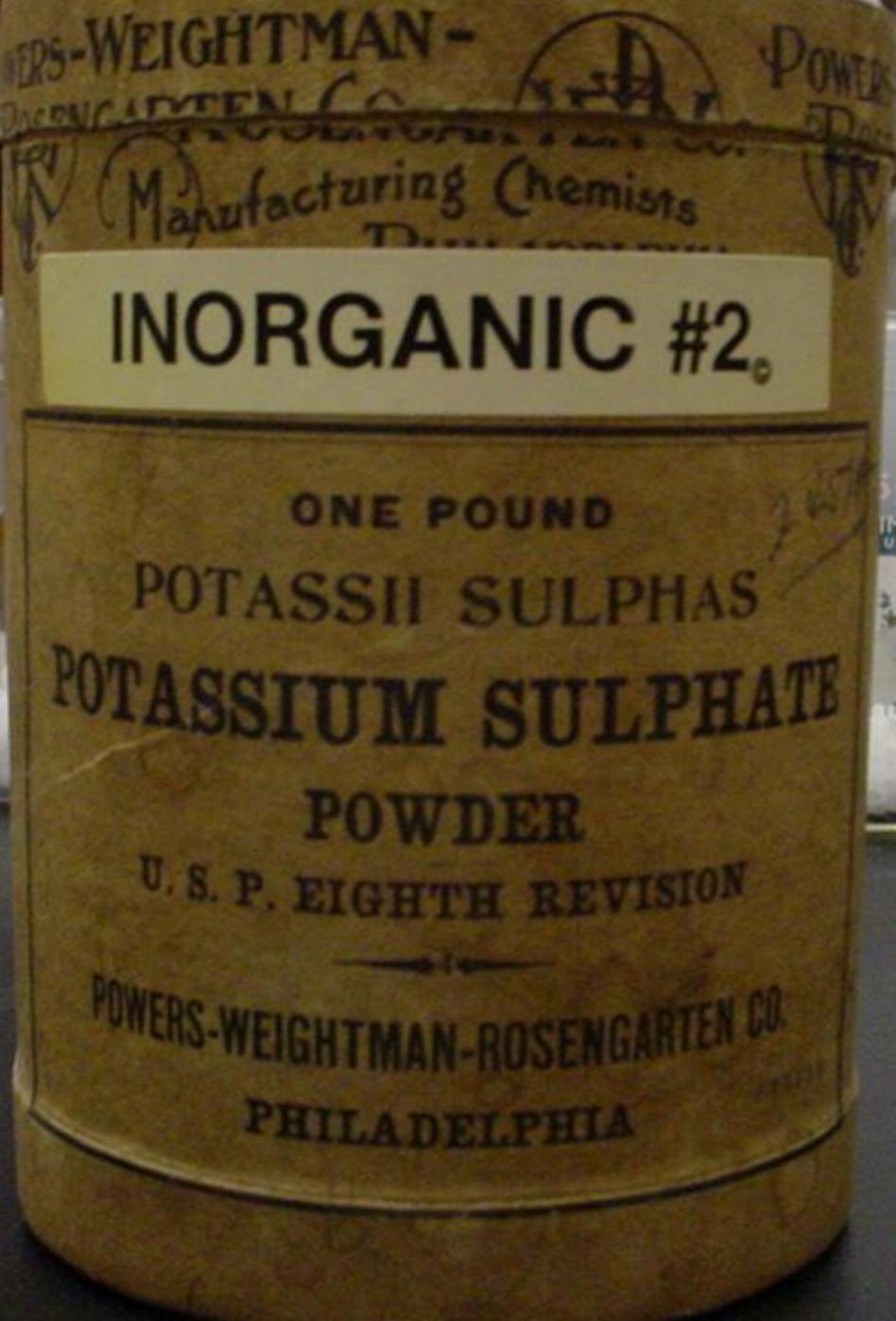
ANALYSIS

Pb.....
As.....
Q.....
SO₄.....

LOT NO.

BAKER'S ANALYZED
MANUFACTURER
J.T. Baker Chemical Co.
PHILLIPSBURG, N.J.

DEC 16 2002





DEC 16 2002

A GUIDE
SAFETY GUIDE™

3	2	3
2	1	X

Water. Calcium carbide reacts with water to produce acetylene gas which can cause explosions.
Contact with skin or eyes can cause burns.
Ingestion can cause burns.
Inhalation can cause respiratory distress. See a physician.

FLINN SCIENTIFIC INC.
"Your Safer Source"

C0011

CALCIUM CARBIDE

Lump, practical, CaC₂, F.W. 64.10

* **HAZARD ALERT:** Exposure to moisture evolves flammable acetylene gas which may ignite and burn skin. 500 grams of calcium carbide will react with approximately 150 liters of flammable liquid.

Incompatibility: Water, dilute acids, hydrogen sulfide, nitrate, copper compounds and heavy metals.



FLAMMABLE/COMBUSTIBLE

NOV 4 2002

3/6/10

TE, U.S.P.
No. 5172
Company
N.Y.

I2

Unwanted, unneeded, and dangerous chemicals . . .

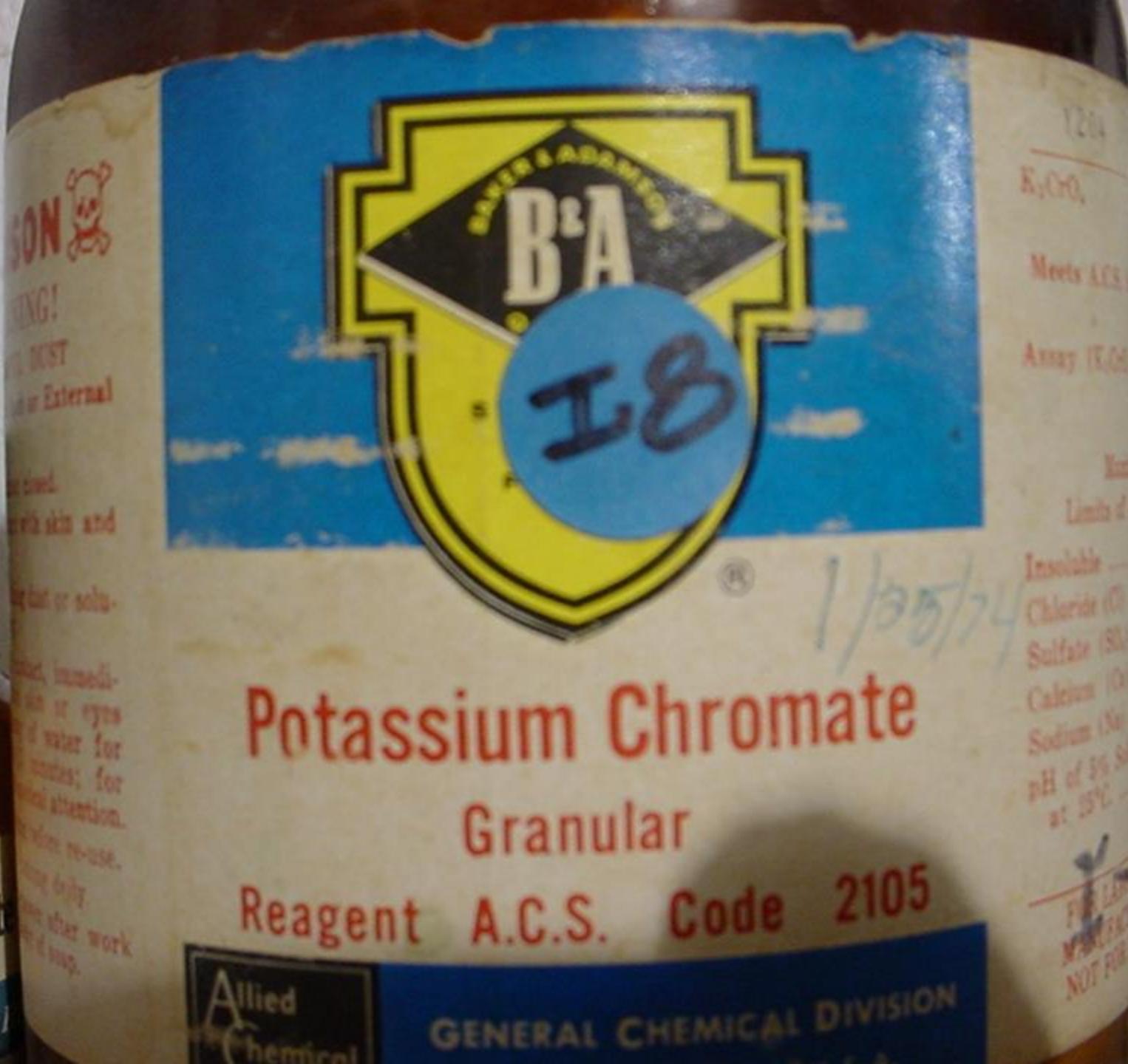
Primary Goal: dispose of excess, unused, unwanted and outdated chemicals

3,910 lbs removed from 26 schools:

<u>Materials Removed</u>	<u>Amount Removed</u>	<u>Disposal \$ per pound</u>
- Ignitable liquids	2,334 lbs	0.40
- Corrosive liquids & solids	562 lbs	2.45
- Oxidizing liquids & solids	223 lbs	9.60
- Water reactive materials	14 lbs	7.75
- Toxic liquids & solids	695 lbs	2.70
- Ignitable solids	9 lbs	7.75
- Organic peroxide	6 lbs	2.15
- Explosive materials	4 lbs	N/A
- Potential reactives	13 lbs	7.75
- Low-level radioactives	15 lbs	N/A
- Mercury	36 lbs	3.55 / 7.05

Way Bad Chemicals – degraded, potentially unstable &/or require special handling & disposal:

- 1) Crystallized Cyclohexene – peroxide former, potentially shock sensitive
- 2) 2,4-Dinitrophenol – potentially explosive (this stuff had dried out)
- 3) Degraded red phosphorous resulting in the formation of white phosphorous – potentially shock sensitive and pyrophoric
- 4) Degraded sodium metal – peroxide former, potentially shock sensitive







NOV
4
2002

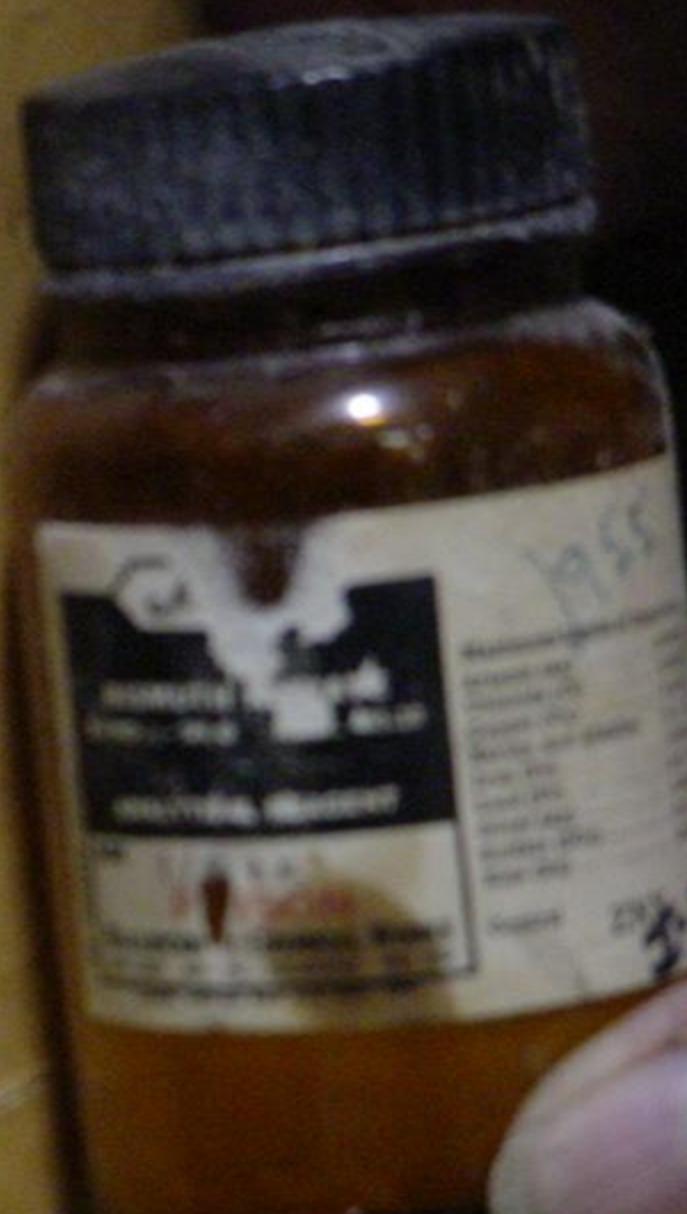
NOV 4 2002





2 lbs.
CHARCOAL, WOOD
POWDER 1955

THE C. M. FASSETT CO.
LABORATORY SUPPLIES
AND CHEMICALS
W. S. TRENT AVE., EVERETT 1, MASS.



NOV 4 2002





JUSTRITE MFG. CO.

FLAMMAB
KEEP FIRE AWAY

DO NOT OPEN
for any reason!
Shock sensitive
potential explosive!

TX1093
F5916

1043

250g

EASTMAN

Cyclohexene
(Stabilized with
Sodium Hydroxide)

73340

For Chemical Purposes, Not For Drug Use



STANIS ED
DIVISION
FISHER SCIENTIFIC
CHICAGO, ILLINOIS



**For Safe
Classrooms We
Pledge to:**

PLEDGE	GOAL
<input type="checkbox"/> Commit to ongoing proper disposal of hazardous waste.	School meets legal requirements to properly dispose of hazardous waste.
<input type="checkbox"/> Maintain serviceable, separate acid, base and flammable cabinets.	Safe storage of chemicals and reduced earthquake risks.
<input type="checkbox"/> Maintain documentation of hazardous waste activities (neutralization logs, waste disposal manifests).	Improve knowledge of the wastes that are being generated and where they're going.
<input type="checkbox"/> Maintain functional eye washes in areas of chemical use.	Increase safety. Reduce liability.
<input type="checkbox"/> Maintain functional and tested fume hoods.	Increase safety. Reduce liability.
<input type="checkbox"/> Purchase no high risk chemicals (see list).	Reduce earthquake and accident risks and reduce liability.
<input type="checkbox"/> Link purchase to use. Purchase containers so contents will be used up within 5 years.	Reduce waste and save money.
<input type="checkbox"/> Build the concepts of least-necessary amount and least-hazardous chemical option into the chemical purchasing contract.	Reduce waste and save money.
<input type="checkbox"/> Accept no donated chemicals unless you can demonstrate they will be used up within 1 year.	Reduce waste and save money.
<input type="checkbox"/> Adopt at least one microscale lab.	Reduce waste and save money.
<input type="checkbox"/> Complete earthquake preparedness: Lips on shelves, shelves anchored, secondary containment.	Reduce earthquake and accident risks.
<input type="checkbox"/> Put spill supplies and procedures in place for major hazard classes of chemicals.	Reduce risk of injury and accidental contact with spilled chemicals.
<input type="checkbox"/> Label all containers with chemical names and major hazard classes of chemicals.	Increase safety and reduce disposal costs.

Name of school: _____

Principal signature: _____ Date: _____

Science teacher signature: _____ Date: _____

District representative signature: _____ Date: _____



1 Can
10 P.M.
3.00 lbs
of meat
Can

100% TRIMMED
Ground
Pork
Beef
Lamb
or Turkey
Ground
Meat



1) Barium Chromate
2) Lead Oxide
3) Bromine
4) Mercury
5) Arsenic

6) Antimony

7) Hydroxylamine Hydrochloride

8) Dibenzoyl Peroxide (Lucidol 98): Organic Peroxide, may explode if heated above 160°F.



Project Costs

The Rehab the Lab project spanned 20 months and cost approximately \$55,000.

Labor costs -- about \$42,000

Disposal costs -- about \$13,000

Planning began in the spring of 2002 (230 hours)

Field work took place between the Fall of 2002 and Spring of 2003 (550 hours)

Data analysis and evaluation was done in the Fall of 2003

Report writing and review was carried out in the Winter and Spring of 2004 (400 hours)

Presentation Outline

- The work plan, the turmoil and the fallout
- “The Sudden Realization” – we’re in way over our heads on this one . . .
- We are saved by knowledgeable experts
- We hire someone who knows about laboratory chemicals
- Non-regulatory, Top down approach
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