



FINAL REPORT
ALACHUA COUNTY ENHANCED SMALL QUANTITY GENERATOR GRANT
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION AGREEMENT NO. S0359
AMENDMENT No. 5
SCHOOL CHEMICAL CLEANUP INSPECTIONS

1.0 INTRODUCTION

Typical school laboratories use a wide variety of chemicals and chemical products. It is common for science teachers to save and accumulate quantities of chemicals, thinking that they will use them some day. As science teachers come and go within the school system, the accumulation of used and unused chemicals continues to grow. Additionally, practices such as ordering chemical substances in bulk and lack of centralized inventories contribute to the problem. These bulk stored chemicals have the potential to increase the risk of exposure to the students and teachers to hazardous chemicals, as well as the possibility of unforeseen reactions from improperly stored or improperly segregated chemicals. This project is a follow-up to the School Chemical Cleanup Campaign program conducted by Alachua County in 2006.

On January 11th, 2011 the Alachua County Environmental Protection Department (ACEPD) entered into an agreement with the Florida Department of Environmental Protection (FDEP) to perform hazardous waste generator compliance assistance visits (CAV) of businesses in Alachua County as part of the FDEP Enhanced Small Quantity Generator program (ESQG). This is the 5th year of the agreement; the primary focus for this contract period was assessing the current hazardous materials management practices at the Middle and High schools in the County. This report presents a summary of the work performed by ACEPD, selected statistics and conclusions based on the results of the project.

2.0 SCOPE OF WORK

1. The Grantee will coordinate with the City of Gainesville Fire Department, Alachua County Fire and Rescue Department - Hazardous Materials response units and Alachua County Sheriff's Office - Bomb Squad. Their role will be to handle hazardous materials that may pose a significant and immediate hazard to the school and community on an as needed basis.
2. The Grantee will perform school audits using the chemicals inventory checklists developed by the Florida Department of Environmental Protection (FDEP) and the Department of Education (DOE). Conduct a safety and chemical storage briefing with the science department personnel; provide technical assistance and recommend chemicals for disposal.

3. The Grantee will coordinate the inventory and the disposal of unwanted chemicals. The disposal of chemicals will be performed at the Alachua County Hazardous Waste Collection Center (ACHWCC).
4. The Grantee will ensure chemical inventories and materials disposed will be detailed and categorized according to Department of Transportation (DOT) hazard class.
6. The Grantee will generate a Final Report for FDEP.

3.0 RESULTS

Table 1 shows a summary of the chemical inventory for each school. Chemicals are grouped according to the Chemical Risk Classes outlined in the School Chemical Cleanout Campaign Workshop Manual.

Table 1. Summary of Chemical Inventory for Each School by Chemical Risk Class

| School | Chemical Risk Class* | | | | | | | |
|-----------------------|----------------------|--------------|------------|--------------|------------|--------------|------------|--------------|
| | 1 | | 2 | | 3 | | 4 | |
| | Solid (Kg) | Solution (L) | Solid (Kg) | Solution (L) | Solid (Kg) | Solution (L) | Solid (Kg) | Solution (L) |
| Middle Schools | | | | | | | | |
| Bishop, Howard W | 30.4 | 24.1 | 0.2 | 9.0 | 0.0 | 0.0 | 0.5 | 0.1 |
| Ft. Clarke | 12.1 | 45.4 | 3.7 | 0.3 | 0.5 | 0.5 | 0.2 | 1.7 |
| High Springs | 3.7 | 10.2 | 0.3 | 0.8 | 0.0 | 0.0 | 0.0 | 1.2 |
| Kanapaha | 1.6 | 6.4 | 0.5 | 9.1 | 0.6 | 0.0 | 11.2 | 1.9 |
| Lincoln, Abraham | 0.0 | 4.9 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Mebane, A. L. | 0.5 | 10.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Oak View | 4.8 | 12.5 | 0.4 | 7.5 | 0.0 | 0.0 | 0.1 | 0.03 |
| Westwood | 6.4 | 17.1 | 1.1 | 1.7 | 0.3 | 0.0 | 0.0 | 0.3 |
| High Schools | | | | | | | | |
| Buchholz | 14.9 | 65.9 | 11.2 | 18.8 | 0.0 | 0.5 | 3.2 | 7.0 |
| Eastside | 33.5 | 55.8 | 17.2 | 17.3 | 0.3 | 2.6 | 2.7 | 9.4 |
| Gainesville | 46.0 | 2.9 | 18.4 | 0.0 | 1.0 | 0.0 | 1.8 | 0.0 |
| Hawthorne | 28.9 | 66.3 | 5.0 | 9.0 | 0.0 | 0.0 | 0.8 | 1.4 |
| Loften | 0.0 | 1.8 | 0.0 | 0.03 | 0.0 | 0.0 | 0.0 | 0.0 |
| Newberry | 47.0 | 110.5 | 8.5 | 15.5 | 0.4 | 0.0 | 2.6 | 7.4 |
| Santa Fe | 38.2 | 69.3 | 7.0 | 10.4 | 0.1 | 1.9 | 2.8 | 4.5 |
| Center Schools | | | | | | | | |
| A. Quinn Jones | 0.8 | 0.8 | 0.0 | 0.2 | 0.0 | 0.0 | 0.1 | 0.5 |
| Total | | | | | | | | |

* Chemical Risk Levels:

- 1: Other Chemicals of Concern – Stock smallest practical amount. Limit student use unless low concentration.
- 2: High Risk Chemicals – Use with extreme care. Purchase in smallest available amounts. If possible buy pre-diluted, limit storage to <250 g or 500 ml, use as demos.
- 3: Highest Risk Chemicals – Not Recommended for Use in Schools. Pose Very Serious Risks to Health and Environment.
- 4: Unknown risk chemical

Table 2 shows a summary of the chemicals identified for disposal by school. Table 3 shows the same data classified by Department of Transportation (DOT) Hazard Class.

Table 2 Disposal by School

| School | Solid | Solution |
|-----------------------|-----------|------------|
| | (Kg) | (L) |
| Middle Schools | | |
| Bishop, Howard W | 8 | 32 |
| Ft. Clarke | 6 | 25 |
| High Springs | 1 | 17 |
| Kanapaha | 2 | 15 |
| Lincoln, Abraham | 5 | 30 |
| Mebane, A. L. | 2 | 23 |
| Oak View | 1 | 23 |
| Westwood | 2 | 30 |
| High Schools | | |
| Buchholz | 12 | 68 |
| Eastside | 12 | 93 |
| Gainesville | 3 | 34 |
| Hawthorne | 5 | 100 |
| Loften | 0 | 0 |
| Newberry | 1 | 53 |
| Santa Fe | 29 | 49 |
| Center Schools | | |
| A. Quinn Jones | 6 | 42 |
| Total | 95 | 634 |

Table 3 Disposal by DOT Hazard Class

| DOT Hazard Class | | Solid | Solution |
|----------------------|-----|-----------|------------|
| | | (Kg) | (L) |
| Flammable Liquids | 3 | | 95 |
| Flammable Solids | 4.1 | 13 | |
| Water Reactive | 4.3 | 4 | |
| Oxidizing Substances | 5.1 | 19 | 144 |
| Toxic Substances | 6.1 | 16 | 62 |
| Corrosive Substances | 8 | 16 | 113 |
| Non-Regulated | NR | 30 | 219 |
| Total | | 97 | 633 |

4.0 CONCLUSIONS AND RECOMMENDATIONS

In general, most school chemical storage areas were in good overall condition and showed improvements from the baseline inspections conducted in 2006. Detailed notes on each school inspection are presented in Appendix A. The outstanding issues associated with the chemical storage areas were the result of excessive accumulation of chemicals and the limitations of the available storage area. The majority of the schools which were inspected showed a marked improvement.

Storage Areas: Most of the flammable storage and acid storage cabinets were good condition. However, most did not have documented inspections or properly vented flammable storage cabinets to the outside. Several acid cabinets require repair or disposal due to degradation of the units.

Each school should look at their storage area routinely with a minimum of annually and if applicable correct the deficiencies listed. Most of the chemical storage areas lacked appropriate warning signs.

Storage Chemical Containers: Every school had some sort of container labeling system in place, however the system was not consistent across the different schools and in some cases it was not completely followed within each storage area. Generally, containers were labeled by content and approximately 50% were also labeling the purchase date. Note that the date the chemical container was initially opened was not recorded and multiple containers of the same chemical were in use at the same time by different teachers. Inventory "First in, First out" (FIFO) should be followed to ensure proper chemical usage and minimize the waste of chemicals. A documented inventory inspection program would greatly benefit all the schools. Each school should look at their storage area and if applicable correct the deficiencies listed.

Fume Hoods: Most Fume Hoods were in good general shape. Several schools fume hoods were in poor

condition and all the schools should have documented testing and recertification to verify proper cubic feet / minute (CFM) airflow.

Other issues: Previously several schools had storage areas with large numbers of biological specimens stored in formalin, formaldehyde and other preservatives. These areas were not inspected in detail and they no longer contained large amounts of specimens and were presumed to be properly disposed although no paperwork for disposal was on hand to verify. Fire extinguishers were present as well as safety showers and eye wash stations; however some schools were unable to verify last inspection of the safety equipment. Recommend documented inspection of emergency showers / eye wash units on a routine basis.

APPENDIX A

Middle Schools

Bishop, Howard W.

1901 NE 9 Street, Gainesville, FL 32609

Date: May 21, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Rooms: 31-008, 31-003, 31-007, 18-011, 13-002D, 13-001D, 15-003

Specific Findings: Storage area in overall good condition centrally located for use. Shelves and containers in good condition with the exception of evidence of spills on shelves. Chemicals not segregated incompatibles stored near each other. Chemicals placed in sink with drain to sanitary sewer. They are not practicing "FIFO" or are using multiple containers of the same chemical with the same date. Not all containers had labels. Fume hood requires flow testing and recertification.

Safety Equipment (spill kits, emergency showers and eye wash stations) in place. MSDS available.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals were disposed of by Household Hazardous Waste Center.

Expected & Actual Follow up: None

Ft. Clarke

9301 NW 23 Avenue, Gainesville, FL 32606

Date: May 22, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Rooms: 01-042A

Specific Findings: Storage area in good condition centrally located for use. Chemicals segregated. Flammables and Acid Cabinets stacked and well maintained. Suggest placing Acid Cabinet at the floor level with the two flammables placed on top. Shelves and containers are in good condition. Two mercury thermometers removed from the school. Fume hood requires flow testing and recertification. Safety Equipment (spill kits, emergency showers and eye wash stations) in place.

MSDS were available.

Mercury / Mercury containing Devices found: 1 Relative Humidity Handheld Meter

Dangerous situations noted: None

Disposal Preparations: Waste chemicals were disposed of by Household Hazardous Waste Center.

Expected & Actual Follow up: None

High Springs Community School

1015 North Main Street, High Springs FL 32643

Date: March 22, 2012

Staff: Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 12-09

Specific Findings: Storage area in good shape. There was no Acid or Flammables Cabinet on site. Most containers had no acquired dates on them. All chemical stored in two metal cabinets; smallest amount of inventory in middle school also they also practiced micro chemistry. Warning sign for chemical storage room needed. Safety Equipment (spill kits, emergency showers and eye wash stations) in place. MSDS were available.

Mercury / Mercury containing Devices found: No

Dangerous situations noted: None

Disposal Preparations: Waste chemicals were disposed of by Household Hazardous Waste Center.

Expected & Actual Follow up: None

Mebane, A. L.

16401 NW 140 Street, Alachua, FL 32615

Date: April 15, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 09-0400, 9-005

Specific Findings: Storage area much improved with a new flammables cabinet. Storage shelves in good condition. Flammable cabinet should be vented to outside. Chemical storage area did have a spill kit. MSDS were available. Safety Equipment in classrooms.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals were disposed of by Household Hazardous Waste Center.

Expected & Actual Follow up: None

Oak View

1203 SW 250 Street, Newberry, FL 32669

Date: April 15, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 04-015, 03-015

Specific Findings: Storage area in good condition. Shelves and chemical containers in good condition. Storage area not vented to the outside with a separate ventilation system. Need a warning sign for chemical storage area. Fume hood requires flow testing and recertification. Need to date and label containers for contents when changed practice "FIFO". Safety Equipment (spill kits, emergency showers and eye wash stations) in place. MSDS on site.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Westwood

3215 NW 15 Avenue, Gainesville, FL 32605

Date: May 17, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 10-002, 12-007, 12-005

Specific Findings: In general Storage area in very good condition and separate; back door was found unlocked and a high hazard chemical was out of container and possibly in use in other area of school. Good shelves and storage containers. Acid and Flammables cabinets in place and in use. Storage area

should have a separate ventilation system. Need a warning sign for chemical storage area. Fume hood requires flow testing and recertification. This particular building will be relocated while structural foundation is stabilized. Safety Equipment (spill kits, emergency showers and eye wash stations) in place. MSDS on site.

Mercury / Mercury containing Devices found: No

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste

Collection Center

Expected & Actual Follow up: None

Lincoln, Abraham

1001 SE 12 Street, Gainesville, FL 32641

Date: May18, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 01-068A, 01-070A

Specific Findings: Chemical Storage area much improvement with the chemical inventory reduced overall. Corrosive cabinet rusted out most containers had acquired dates on them. All chemicals stored centrally. There was a large clean out of chemicals which may have contained specimens with formalin as well as chemical but no waste disposal receipt provided teachers and staff unsure of how chemicals were disposed; may have entered the solid waste stream. Safety Equipment in place. MSDS not on site.

Mercury / Mercury containing Devices found: No

Dangerous situations noted: None

Disposal Preparations: Waste chemicals were disposed of by Household Hazardous Waste Center.

Expected & Actual Follow up: None

Kanapaha

5005 SW 75 Street, Gainesville, FL 32608

Date: March 21, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC),

Room: 04-042

Specific Findings: Storage area in overall good condition. MSDS were available. Shelves and storage containers in good condition. Chemicals labeled and dated. Need to provide warning signs for all chemical storage areas. Safety Equipment in place. MSDS on site.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

High Schools

Eastside

1201 SE 45 Terrace, Gainesville, FL 32641

Date: March 7, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD) Johnny Sanders (SCAC)

Room: 04-040, 04-042, 04-035A

Specific Findings: Storage area in good condition with a large inventory of chemicals. Storage shelves and most containers in good condition. Some containers labeled and dated. Fairly large quantity of solutions made up with no dates or labels on containers. Warning sign should be posted in storage area. Need to correct piping from the flammable cabinet. Exhaust system inadequately. Need to clean room ventilation intake. School had a large amount of the same chemical containers opened; not practicing "FIFO". Teachers unsure of integrity of open container and will open a new container of an existing open chemical product. Not monitoring High Hazard chemicals "sodium" and "Lithium" metals oil as levels were low in containers. Chemical waste stored under hood in open containers, some chemicals stored in inappropriate containers for the chemical. Chemicals allowed evaporating under hood; containers discharged to shelf and formed crystals on container and shelf. Teacher insisted on keeping mercury containing large device (Barometer) for demonstration purposes. Safety Equipment

in place. MSDS available.

Mercury / Mercury containing Devices found: 15 thermometers plus 1 ml in container

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Gainesville High School

1900 NW 13 Street, Gainesville, FL 32609

Date: March 20, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC),

Room: 25-030, 27-060, 27-019, & 27-065A

Specific Findings: Storage area in good condition neat well organized. Inventory maintained and posted on wall in storage area. Storage shelves and containers in very good condition. No warning signs.

Fume hoods not certified or tested. Safety Equipment in place. MSDS available. Completed most of the recommendations provided in the 2006 inspection.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Hawthorne

21403 SE 69 Avenue, Hawthorne, FL 32640

Date: April 12, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 01-063A

Specific Findings: Since the last inspection the high school and middle school have been combined and the inventory reflects both science departments. This school receives overstock from the other

schools in the district. Storage area in good condition no outside ventilation. Storage shelves and containers in good condition. Leaks to shelves and tops of safety cabinets. No warning signs posted and very few containers were dated. Fume hoods not certified/tested. Chemicals left open under the Fume Hood. Mercury was removed from the school contained in the mercury spill kit. Safety Equipment in place. MSDS available.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Loften

3000 E. University Avenue, Gainesville, FL 32641

Date: March 18, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 23-05

Specific Findings: Storage area in good condition. Chemicals were moved from a previous location many still in containers not properly stored or placed on shelves although there is a small inventory of chemicals on hand. No warning signs posted. Storage shelves and chemicals containers generally in good condition. Need to date chemical containers and practice "FIFO". Safety Equipment in place. MSDS available.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Santa Fe

16213 NW US Hwy 441, Alachua, FL 32615

Date: April 10, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD) Johnny Sanders (SBAC)

Room: 22-0028

Specific Findings: This School had a new science wing built since the last inspection and there is all new equipment and storage areas. Storage shelves and containers in great condition, with the exception of one container leaking onto a shelf. Need to properly label and date solution containers. All chemicals should be dated. Fume hoods need testing and recertification will be required at some point. Storage and inventory showed much improvement upon return inspection. Chemical stockroom safety exit in the wing was screwed shut and unable to access. Safety Equipment in place. MSDS available.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Buchholz

5510 NW 27th Avenue, Gainesville Florida 32606

Date: March 14, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 22-0028

Specific Findings: MSDS and warning signs available. Storage shelves and containers in good condition, Shelves had been replaced and reinforced where necessary. Need to properly label and date solution containers. All chemicals have received and open dates. Fume hoods not tested or recertified. Large quantity of acids in stockroom. Safety Equipment in place. MSDS available.

Mercury / Mercury containing Devices found: 3 thermometers

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Newberry

400 SW 258th Street, Newberry, FL 32669

Date: May 14, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC),

Room: 01-002,

Specific Findings: Storage area in fair condition very crowded with chemicals stored on the tops of carts and cabinets with evidence of spills to tops. Chemicals stored in containers not designed for chemical storage. Many opened containers, "FIFO" not being practiced; multiple containers of the same chemical opened few with open dates noted. There was no ventilation in stockroom and acid or flammables cabinets were not vented to the outside. No warning signs posted. Fume hoods not certified or tested. Waste containers stored under hood with no labels or lids. Two mercury thermometers found and removed. Safety Equipment in place. MSDS available.

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste Collection Center

Expected & Actual Follow up: None

Center Schools

A. Quinn Jones

1108 NW 7 Avenue, Gainesville, FL 32601

Date: March 21, 2012

Staff: Chris Gilbert (ACEPD), Julie Pocklington (ACEPD), Johnny Sanders (SBAC)

Room: 23-05

Specific Findings: Storage area in poor condition. Chemicals were discharged to shelves in a metal cabinet. There is a very small inventory of chemicals on hand. No warning signs posted. Containers not labeled or dated. Need to date chemical containers and practice "FIFO". Clean up spills practice

safe chemical handling best management practices for a laboratory. Safety Equipment in place: Yes
safety showers and eye wash no spill kit on hand.

MSDS: None

Mercury / Mercury containing Devices found: None

Dangerous situations noted: None

Disposal Preparations: Waste chemicals taken to the Alachua County Hazardous Waste

Collection Center

Expected & Actual Follow up: None