

LGFCU Excellence in Innovation Award Project Evaluation

Project ID	GG-13
Title of Program	Community Battery Recycling
Program Category	General Government
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Implementation Date	1/23/2015
FLSA Designation	Exempt
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Description of Productivity Improvement

In May of 2013, New Hanover County established a permanent Household Hazardous Waste collection facility. Due to the success of this program, in January of 2015, the Department of Environmental Management partnered with New Hanover County public libraries, University of North Carolina â€“ Wilmington (UNCW), Cape Fear Community College (CFCC), and the Fort Fisher Aquarium to provide satellite collection points for battery recycling.

Since inception, these satellite collection points have diverted over 14,900 pounds of batteries away from landfill disposal. While this program provided a convenient way for residents throughout the county to recycle single-use batteries, an unexpected benefit was the dramatic reduction in zinc detected in the county landfill's wastewater ("leachateâ€“). To date, total zinc declined from 301 mg per liter of water to 140 mg per liter of water â€“ a nearly 54% reduction. Heavy metals such as zinc are notoriously difficult to treat and remove from wastewater effluent, which is treated and then discharged into the Northeast Cape Fear River.

This program has proven effective in bringing the community together in a simple way to reduce landfill disposal, provide recycled raw materials back to industries, and improve water quality.

Description of why this project was initiated

New Hanover County's Household Hazardous Waste program originally collected toxic, corrosive, flammable, and reactive chemicals from county residents on an annual basis. These yearly collection events were expensive and inconvenient for residents. Many of these chemicals were disposed of with household garbage, despite many of these items being banned from disposal in landfills state-wide. Implementation of a permanent, six-day-a-week collection facility diverted several hundred tons of Household Hazardous Waste away from landfill disposal and has proven very popular with residents. The addition of satellite collection points for single-use batteries arose from a growing interest from environmentally-conscious residents who sought simple ways to preserve the county's fragile coastal environment and reduce reliance on landfills.

Quantifiable results (sustainability, cost savings, cost avoidance and/or a higher level of service).

Indication of what resources were used and what was done with any accrued time savings

1. As a result of this program expansion, over 12,550 lbs. of batteries were collected from the community during fiscal year 15-16, as compared to 2,440 lbs. collected during fiscal year 14-15. This represents a 514% increase in just the past fiscal year as a result of additional collection sites added within the community.

2. Diversion of batteries from landfill disposal has produced a significant reduction of nearly 54% in the level of zinc found in the leachate, or wastewater, at the landfill. Heavy metals such as zinc are monitored by the state as part of the landfill's solid waste permit requirements. Exceeding the permit levels would result in permit violations with resultant fines and environmental issues caused by the discharge of the material into groundwater. The reduction in zinc levels achieved as a result of this expanded battery recycling program has allowed the landfill to avoid fines for permit violations, with potential savings of \$5,000-\$7,000 per year. Further, the reduction in heavy metals will extend the life of the filters used in the reverse osmosis (RO) leachate treatment process, producing a direct cost savings estimated at \$ 850 /RO filter replacement for 30 filters, or potentially \$25,500 in cost savings over the life of the treatment system and its components.

Resources Used / Program Costs

FIXED COSTS - \$200 per receptacle with shipping (Receptacle Cost: \$200 X 13 locations =\$2,600)

VARIABLE COSTS - Labor (sorting, packaging, bagging, labeling):

- 1 Program Assistant @ \$14.32/Hr.
- 120 pounds processed by Program Assistant/Hr.
- \$0.12/pound processing cost
- \$0.26/pound Recycling/Transportation Cost

Other descriptive information

The program began with the New Hanover County's Public Library's four locations, which are strategically sited to serve all county residents. Collection bins are sited in or near high-traffic areas, such as entranceways or near checkout lines. The foot traffic through these libraries, coupled with a simple press release, generated tremendous usage by library patrons. Word quickly spread to both campuses of Cape Fear Community College, which grew from two to six collection points in less than six months. The program then expanded into UNCW (2 collection points) and the Fort Fisher Aquarium (1 collection point).

The county's Environmental Management Department furnished the collection bins and anti-static liners, and incurs the processing cost for sorting, packaging, shipping, and recycling of the batteries. Batteries collected include alkaline, lithium, sealed lead-acid, and rechargeable Li-Ion, NiMH, and Ni-Cad batteries. Batteries collected through the library locations are delivered via courier, while volunteers from the other locations deliver the batteries to the main facility on an as-needed basis.

Upon arrival at the main collection facility, county staff members sort the batteries by type, and individually bag any battery over 9 volts or any battery of lithium chemistry to reduce the risk of battery fires. The sorted batteries are then placed in steel open-head drums, sealed, labeled, manifested, and shipped to recyclers (Battery Solutions). A certificate of recycling (including weight of batteries by type) is mailed back to the facility for documentation and provides data to generate annual reports.

Implementation of a community battery recycling program would be easily replicated in other counties with a household hazardous waste program or other hazardous material collection program in place to appropriately dispose of the batteries. The initial startup cost requires the purchase of reusable receptacles for collection of the batteries and payment of the recycling and disposal costs to a contractor. Each community would determine the best locations for placement of the receptacles to create ease of disposal for the residents, such as public buildings, shopping malls or schools. Employees and/or volunteers would need to be identified to empty the receptacles and delivery the batteries to the recycling site.