

## **School Education and Outreach**

### **Applicability**

A school education and outreach program should provide age-appropriate water efficiency and conservation lessons with background information. In addition, the lessons should be correlated to the North Carolina Essential Standards. These programs can be offered as professional development workshops to teachers or as programs conducted directly with students.

This BMP is intended for a water system (“utility”) that serves schools and or students as part of its customer base. Before deciding whether this BMP is necessary, review existing curricula to see if the local school district is already offering water efficiency and water conservation related curriculum.

### **Description**

School education programs, while not related to an equipment change may result in short and long-term water savings. Ideally, a school education program should reflect issues that are age appropriate, hands-on, and local in scope. Any suggestions for behavior changes should be things that a child in that targeted age range can accomplish on his or her own in order to create a lasting behavior change and positive environmental self-efficacy in the child.

A quality water efficiency and water conservation program for schools provides teachers with materials that contribute to interdisciplinary learning while educating the students about water efficiency, water conservation and local water resources. There are many state and national programs that include water efficiency, water conservation and water audits as part of a comprehensive water education curriculum, including Project WET (Water Education for Teachers) and the Environmental Protection Agency. Local issues can be incorporated into these lessons to help create a more locally appropriate curriculum.

Another option beyond offering a supplemental curriculum is to offer an education entertainment show for grades 1 through 5. These shows can be popular with teachers and often do not have the same requirements for material to meet the N.C. Essential Standards. In addition, the percentage of students that can be reached is often higher than for adoption of a curriculum.

To evaluate the effectiveness of the education materials, presentation or show, the utility should use an evaluation tool such as a pre- and post-test, or a survey.

### **Implementation**

Implementation should consist of at least the following:

- Evaluate local, regional, state and national resources available to determine applicability to the utility's local water conditions. Consider creating an advisory committee of local educators to assist in choosing or creating the curriculum.
- Provide environmental education professional development for utility staff that will be working with school education and outreach. For example, workshops offered through the N.C. Office of Environmental Education and Public Affairs, such as the Basics of Environmental Education and Methods of Environmental Education, provide an overview of how to effectively work with various age groups. Additionally, Project WET workshops offered through the N.C. Division of Water Resources give the participants activities to use with different audiences.
- Implement a school education program to promote water efficiency, water conservation and water conservation related benefits. Programs include working with school districts and private schools in the water supplier's service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed and water service area. When possible, educational materials should meet the N.C. Essential Standards.

A water oriented curriculum that is focused on conservation and resource issues should be made available for all grades and should include the following:

- Teacher professional development specifically targeted to certain grades is an effective approach to implementing a lasting water education presence in the schools. If possible, you should work directly with the school system to set up free, professional development training on a teacher workday. Correlate the agenda to the N.C. Essential Standards that the targeted educators teach. When possible, provide curricula and materials for them to take back to their classroom that they can implement easily. In addition, periodic follow-up with the teachers to ask how the utility can help them incorporate water education into their classrooms will result in greater implementation now and in the future.
- Grade appropriate programs and/or materials should be implemented for grades 1 through 5 initially. Alternatively, a presentation or educational show can be offered for some or all of these grade levels. Some utilities also sponsor day-long water festivals that incorporate water efficiency, water conservation and other water resource issues for 5<sup>th</sup> grade students in a school.
- For grades 6 through 8 and high school students, the utility may do one of the following: distribute grade appropriate materials for science, math, or other appropriate classes; present assembly type programs; sponsor science expositions with emphasis on water resources; or implement education programs with community groups such as Girl and Boy Scouts and 4-H clubs.

The utility can meet this BMP by focusing only on teacher training or direct student interaction.

In conjunction with the Showerhead, Aerator, and Toilet Flapper BMP, consider providing a water audit unit as part of the curriculum where the students take flow

measurements of showerheads and faucet aerators at their homes. If the showerheads and faucets are higher than current standards, the students can have their parents sign a request for replacement form to receive an efficient showerhead and faucet aerators to install with the assistance of their parents. This unit can be successfully implemented in grade 5.

## **Schedule**

Depending on the program option(s) selected, the following schedule should be followed:

- In the first year, find the appropriate teacher professional development curricula and materials that meet the needs of both the teachers' and the utility. You may also want to meet with your local Soil and Water Conservation Education coordinator or the Project WET State Coordinator to help facilitate the workshop. Meet with school administration and ask for help in coordinating the training on a teacher work day. Trainings should be grouped by ages taught, for example, elementary, middle and high school. In the second year, begin facilitating the workshops.
- The utility should adopt or develop the program in the first year and start implementation in the second year for grades 1 to 3.
- The utility should adopt or develop the program in the second year and start implementation of the program in the third year for grades 4 to 5.
- The utility should adopt or develop the program in the third year and start implementation in the fourth year for grades 6 to 8.
- The utility should adopt or develop the program in the fourth year and start implementation in the fifth year for grades 9 to 12.

It is important that follow-up contact with teachers and schools that participated in the past be initiated annually. It will serve as an impetus to ask questions or arrange speakers or programs for their students for the following year.

## **Scope**

The utility has three choices within the scope of this BMP. Select item 1, or items 2 and 3, or item 4 below. The utility should strive to reach 25 percent of teachers with professional development training by the third year of implementation.

- 1) The utility should strive to reach 10 percent of students in grades 1 to 5 with a presentation or lesson each year by the third year following the schedule above.
- 2) The utility should strive to reach at least 10 percent of students in grades 6 to 12 with a presentation or lesson each year by the third year of implementation following the schedule above.
- 3) Alternatively, this BMP will be met if the utility only focuses on grades 1 to 5 or 6 to 12. The program would be developed in the first year and implemented in the second year for either alternative. The utility should strive to reach either 15

percent of students within grades 1 to 5 each year by the third year of implementation, or 15 percent of students in grades 6 to 12 by the third year of implementation.

- 4) The utility can count students reached through clubs and other educational events as participants and students impacted by utility sponsored programs outside the utility service area.

For smaller utilities, or those in which service area boundaries overlap school district boundaries with another water utility, jointly operated or funded programs should be considered.

## **Documentation**

To track the progress of this BMP, the utility should gather and have available:

- The number of school presentations made during the reporting period.
- The number and type of curriculum materials developed and/or provided by the water supplier, including confirmation that curriculum materials meet N.C. Essential Standards and are grade-level appropriate.
- The number and percent of students reached by presentations and curriculum.
- The number of students reached outside the utility service area.
- The number of in-service presentations or teachers workshops conducted during the reporting period.
- The number of students reached by teachers trained at the above workshops.
- The results of evaluation tools used, such as workshop feedback forms, pre- and post-tests, student surveys and/or teacher surveys.
- Copies of program marketing and educational materials.
- Annual budget for school education programs related to conservation.

## **Determination of Water Savings**

Water savings for school education programs are difficult to quantify and therefore estimated savings are not included in this BMP. If the retrofit kit is distributed, water savings can be calculated as described in the Retrofitting Residential Fixtures – Showerheads, Aerators, and Toilet Flapper Programs BMP. A 1991 study conducted for The Harris Galveston Coastal Subsidence District found an average savings of 18 percent or 1,400 gallons per month in homes where the students and parents had installed efficient showerheads and aerators on bathroom and kitchen sinks.

## **Cost-effectiveness**

A true cost-effectiveness analysis cannot be determined without a measure of water savings. By implementing this BMP, the utility will enhance its public image, increase

customer goodwill, and increase the viability of its overall water efficiency and water conservation efforts.

School education costs vary widely due to the varying types of programs. Curriculum units can be developed and implemented for between \$1 and \$3 per student. Teacher education workshops can be facilitated for between \$20 and \$30 per teacher. Educational entertainment programs can be developed or contracted out for between \$2 and \$5 per student. There are prepackaged contractor programs with extensive features that cost up to \$35 per student. Most programs will require utility staff oversight and outreach efforts to schools and students.

If the showerhead and aerator kits are distributed as part of this BMP, the costs for the kits will be similar to those described in the Retrofitting Residential Fixtures – Showerheads, Aerators, and Toilet Flapper Programs BMP.

### References:

- Texas Water Development Board Report 362, Water Conservation Best Management Practices Guide, November 2004.
- Beyond Ecophobia, David Sobel, Volume 1 Orion Society Nature Literacy Series.
- Project WET (Water Education for Teachers): <http://www.projectwet.org>.
- NC Project WET: [http://www.ncwater.org/Education\\_and\\_Technical\\_Assistance/Project\\_WET/](http://www.ncwater.org/Education_and_Technical_Assistance/Project_WET/).
- U.S. Environmental Protection Agency Waterkids: <http://water.epa.gov/learn/kids/waterkids/watered2.cfm>.
- North Carolina Essential Standards: <http://www.dpi.state.nc.us/acre/standards/new-standards/>.

## **Case Study for a School Education and Outreach Program**

### Greensboro, North Carolina

The Greensboro Water Resources Department has many tiers to its school education and outreach program. The city directly provides youth education in the form of classroom presentations, special events and programs. Presentations are provided for school age children on a variety of topics such as general water supply awareness, conservation and water quality. In addition, each year, more than 300 5th grade students participate in the water festival. Students learn about the importance of water while visiting eight different hands-on water activity sites.

The Greensboro Water Resources Department also maximizes its education and outreach efforts by partnering with local agencies. The Greensboro Kathleen Clay Edwards Family Library branch offers a host of environmental programs and workshops for Greensboro residents. Educators can take advantage of Project WET (Water Education for Teachers), Wonders of Wetlands (WOW), and Planning of Wetlands (POW) training workshops. The Water Resources Department pays for the cost of the curriculum guides, so workshops are provided for free to teachers in the Guilford County School System at least once per year. Participants increase their knowledge of watersheds, wetland design, water quality and water conservation. They then take these activities back into their classrooms, thereby reaching the students as well.

In addition, a collaborative effort with North Carolina Cooperative Extension allows students in Grades 1-4 to participate in their annual poster contest. The contest is held in two categories: water conservation and water quality. Winners receive a prize and recognition at a local city council or county commissioners' meeting.