

FES Quarterly Report – April 2021

Facilities & Environmental Services Department, Albemarle County



Top of the News

Climate Activity Kits for Fourth Grade Students

This past winter, the County had the opportunity to participate in a new initiative to provide climate activity kits for Albemarle County fourth graders. This initiative was spearheaded by the Community Climate Collaborative – with support from the Virginia Discovery Museum and Albemarle County Public Schools, and financial support from FES and the Batten Foundation.

The Community Climate Collaborative (C3) is a local not-for-profit organization with a mission to elevate climate action at the local level. Last December, C3 provided climate activity kits to 35 fourth graders at Agnor-Hurt Elementary School in response to a request from a teacher. The kits included fun activities for kids, such as an energy scavenger hunt, a reusable grocery bag to decorate, and a build-your-own solar powered nightlight.

The kits also included instructions for parents explaining the activities and directed them to local energy efficiency programs that could help them reduce their energy bills. About a third of parents responded to a survey – indicating that 80% had never heard of local energy efficiency programs. As a result of the kits, **40% of respondents requested an at-home LEAP energy assessment.**

Due to the popularity and success of this program, C3 then worked with the science curriculum coach for Public Schools to offer the program to the entire fourth grade class. On March 9, the partnership delivered 760 kits – in both English and Spanish – to science classes at 10 schools. This event was covered by the Daily Progress ([link to video](#)) and documented in a [three-minute video](#) by Public Schools.



(photo from Public Schools video)

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Capital Projects Report

Detailed capital projects scope and updates

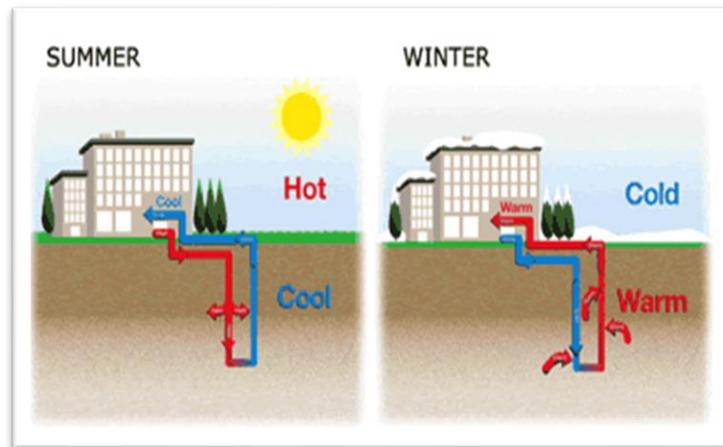
FES is pleased to have supported this initiative, which is directly related to Action B.4.6 in the Climate Action Plan adopted by the Board in October 2020: “Increase access to information and resources on building energy efficiency, renewable energy generation, and climate change for teachers and students in public schools.”

Construction and the Climate Action Plan

The Facilities Planning & Construction (FP&C) division of FES is working hard to continue to further incorporate the goals and objectives of the County’s Climate Action Plan into our planning, programming, design, and construction of projects we execute.

It is vitally important that staff educates team members and reinforces our organization’s commitment to help meet the global challenge of climate action. It is important that Climate Action becomes part of the culture and our thought process on an everyday basis. Staff at FP&C want to share examples of projects where we have incorporated Building Strategies & Actions consistent with the goals, objectives and expectations of the Board of Supervisors, the organization, and the community.

Crozet ES Addition and Renovations Geothermal System: This system utilizes vertical wells that use subsurface water to take advantage of the constant temperature found below the earth’s surface. While the initial costs are higher than traditional systems, this system at Crozet E.S. is projected to provide an estimated \$42,000 in operational savings per year. This results in a financial payback of approximately 7 years. Additionally, the projected lifespan for this closed loop system is 50 years, or about double the life of 25-year traditional systems. For Crozet, our conservative estimates project a total of over \$2 million in operational savings over a 25-year period. These savings are generated from lower electrical consumption rates due to the efficiencies gained from the constant temperature found below the earth’s surface.



Crozet ES Addition and Renovations New Roof: The building structure was designed to accommodate the load of a future solar array. We are installing empty conduits through roof penetrations on the new addition to accommodate this anticipated future installation of solar panels.

COB – McIntire Windows: The new windows that will be installed this spring and summer will increase efficiency because of improved insulating properties and building envelope sealing. This will result in reduced energy operational costs, and the greenhouse gas emissions associated with the consumption of natural gas and electricity.

Station 12 Domestic Hot Water System Upgrade: The boilers at this facility were designed to both heat the buildings and to heat hot water for showers, laundry and other “domestic” uses. This design resulted in these large boilers running 24/7/365, even in the summers, to meet the minimal demands for domestic hot water. The FES team replaced added a dedicated and energy efficient domestic hot water boiler, and re-piped the system to take better advantage of the small array of solar thermal panels on the roof. This upgrade resulted in a reduction in natural gas consumption of 43% in the first month of operation compared to the same month of the previous year.

COB 5th Chilled Water Pump Replacement: We are changing the types of pumps to include differential pressure switches that reduce the energy consumed by monitoring the actual cooling demand and automatically adjusting output. What that means is a major reduction in electricity use associated with circulating cold water to the nine air handlers located throughout this large commercial building.

Broadus Wood E.S. HVAC Improvements: This project begins this summer and includes new energy efficient Variable Refrigerant Flow Units, Rooftop Heat Pumps and Dedicated Outdoor Air Systems. This equipment will reduce the amount of energy consumed to maintain comfort settings. The Outdoor Air Units will not only provide ventilation but also free cooling depending on outside air temperatures.

Scottsville Community Center HVAC Improvements: New Variable Refrigerant Flow units will be installed with much better Seer (**Seasonal Energy Efficiency Ratio**) ratings. Old fin tube radiators are being replaced with new energy efficient unit ventilators. The Scottsville Community Center has been one of the hungrier energy hogs (per square foot) in the County's portfolio, so we can't wait to see how much energy consumption is reduced after this project.

COB 5th St. HVAC Programming Changes: The team surveyed occupancy and use to reduce the occupied time of the HVAC system to save 1 hour of heating / cooling per day throughout the non-Police and Fire-Rescue areas. We also created a warm-up / cool-down mode to reduce Variable Air Volume units required reheat time. We also installed ionization units which enabled us to reduce the amount of outside air intake, which saves energy by not having to condition as much outside air. Big building, BIG operating cost and emissions reductions!

Northside Library: Installation of battery-operated shades at the children's and teen's southern facing areas is reducing the solar heating effect on the rooms, which saves energy and improves comfort.

Schools Roofing Projects 2021: Steps are being taken to retrofit some of the new roofs for future solar panel arrays. During design the team is directing the design professionals to increase the thickness of insulation, which will improve the insulation value of the roofs. The increased R-Values (In the context of building and construction, the R-value is a measure of how well a two-dimensional barrier, such as a layer of insulation, a window or a complete wall or ceiling, resists the conductive flow of heat) result in energy savings, year after year.

As we have in previous years, the roof ballast stone on school roofs will be reused by either the School System or Parks & Recreation. The removed EPDM rubber is also reused as tarps for stored materials and baseball mound covers.

These are just some of the projects that our team members are executing and as we move forward, we will be engaged in a consistent process of development and improvement to do our part to combat climate change.

Capital Projects Updates

Schools Capacity Project Updates

Red Hill Gym Addition: Work on the \$6.2M Red Hill Elementary School project is proceeding at a brisk pace. This project includes a new 6,300 square foot gymnasium, conversion of the existing gym into a new Media Center, site improvements, additional parking and select interior renovations. The gymnasium is close to what we refer to as "dried-in." That is a major milestone that indicates that the roof, windows, and doors have been installed. Work has also begun in the existing gym, which will be converted into a new Media Center. This project is scheduled to be complete in early August. The project team includes FP&C Project Manager Steve Hoffmann, General Contractor Virtexco, and Moseley Architects lead the design team.



Scottsville Classroom and Gym Additions: Work on the \$11.2M Scottsville Elementary School project is right on schedule, with tremendous progress made on both the new gym and classroom additions. This project includes a new 6,155 square foot gymnasium, new 10,000 square foot classroom addition, conversion of the existing gym into a Music Room and flex space, site improvements, additional parking, select interior renovations and a new septic system. Exterior brick work was just completed on the new gym, and inside the gym new lights and HVAC equipment are being installed. Classroom addition restroom ceramic tile work will begin in early April. The project team includes FP&C Project Manager Walter Harris, General Contractor Jamerson Lewis, and Grimm + Parker Architects lead the design team. This project is scheduled to be complete in early August.



Crozet E.S. Additions and Renovations: Bids were received for the \$21M Crozet E.S. project on March 18th. A low bidder was identified and a Notice of Intent to Award has been posted on the County’s website. This project includes a 3-story 31,000 square foot classroom addition, a 2,200 square foot kitchen addition, extensive interior renovations, site improvements, new parking, and an energy efficient geothermal well system for heating, cooling and hot water. Construction mobilization for this multi-phase project will begin this spring and the project is scheduled to be complete in August of 2022. The project team consists of FP&C Project Manager Matt Wertman, and VMDO Architects lead the design team.



Four Seasons Stream Restoration Repair

Albemarle County completed the Four Seasons Stream Restoration project, one of the County's first of this type, in 2015. Subsequent severe weather, particularly the storms of 2018 and 2019, caused the channel to erode and degrade. Environmental Services Division (ESD) staff worked with Ecosystem Services, an engineering firm, and Harbor Dredge and Dock, a contractor, to design repairs and address the instability. Limited engineering analysis of the channel and its watershed suggested that channel erosion was primarily caused by greater energy in the channel and on streambanks during storm events than had been anticipated in the initial design. The repair approach was designed to decrease the amount of energy in the channel and increase the channel's ability to withstand future high energy storm events. These goals were respectively accomplished by increasing the width of the channel's floodplain, therefore allowing stormwater to slow down over larger areas, and installation of 'soil lifts' that help the channel's resilience against higher energy storm events. Several critical log and rock vane structures that serve to slow water within the channel were also replaced in order to prevent future scour around the side of the channel.

Project work included implementation of necessary repairs to mitigate previous erosion and to prevent future erosion along the approximately 360 linear foot restoration project. Engineering services included creating a repair plan and providing onsite construction management in partnership with ESD staff. The initial project budget was \$50,000, and total engineering and construction services ultimately cost a total of \$43,514.

ESD Staff have scheduled a group workday in April to augment the project repairs with installation of additional native plants.



Capital Studies Updates

What's on the horizon for Solid Waste?

Last fall the Board of Supervisors adopted the Climate Action Plan (CAP), which included the goals of reducing community-wide greenhouse gas emissions by 45% from 2008 levels by 2030 and to achieve zero net emissions by 2050. To help meet these goals, the CAP's Sustainable Materials Management chapter incorporated the objectives of increasing the percentage of recyclable materials put to positive use and diverted from landfills; and also increasing the percentage of organic materials diverted from landfills and composted. Below are some of the ways we are working to support the CAP's general goals and solid waste objectives.

Solid Waste Services Study: Gershman, Brickner & Bratton (GBB) was retained by the County to explore alternatives to meet the solid waste management vision outlined in the CAP and guide future solid waste management decisions. GBB's final report will be the result of a five-phase study that includes a service gap analysis and recommendations for closing those gaps. The report is meant to support the County as it moves its solid waste management programs forward and takes into consideration the current planning and programs; strategies and best practices aligned with the Climate Action Plan; case studies; and plan elements for Albemarle County strategy implementation. We are also excited that the City of Charlottesville engaged GBB at the same time, and we hope that this parallel work will result in a stronger regional approach to solid waste management programs and education.

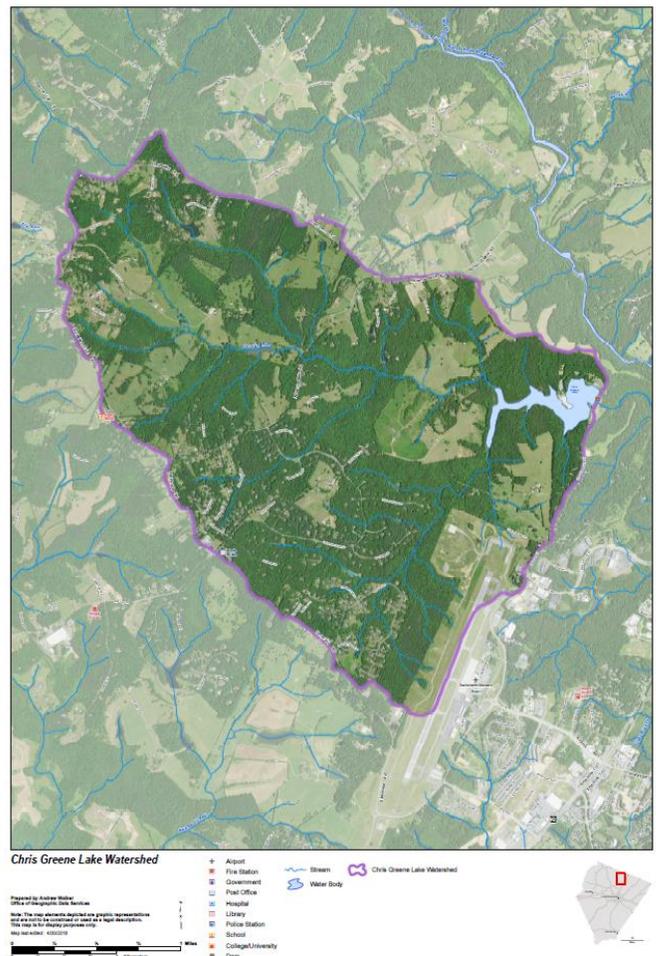
Southern Convenience Center: For many years, the Board of Supervisors has recognized the need for expanded solid waste management services in rural areas of Albemarle County. As detailed in the final 2015 report of the Long-Range Solid Waste Solutions Advisory Committee, Albemarle has lagged significantly behind its neighbors in the provision of collection sites for residential trash and recyclables (solid waste convenience centers). In partnership with the Rivanna Solid Waste Authority (RSWA), we have in recent years funded major capital projects to meet this challenge, constructing a solid waste transfer station and a solid waste convenience center at the Ivy Materials Utilization Center (Ivy MUC) in the western part of the county.

It is envisioned that additional convenience centers will be placed in strategic locations throughout the county to ensure equitable service provision; this strategy is consistent with the CAP. The first of these additional convenience centers has been approved and funded, with a site selected in the southern part of the county. It is assumed that it would provide a level of service similar to what is currently provided at the Ivy Convenience Center (western part of the county) and the McIntire Recycling Center (center of the county).

Thomas Jefferson Planning District’s Solid Waste Management 5-Year Plan, Revision: As a member of the regional group Thomas Jefferson Solid Waste Planning Unit (TJSWPU), the County is taking part in the revision of the Thomas Jefferson Planning District’s Solid Waste Management Plan. This plan includes a description of existing and projected solid waste needs and facilities, as well as a plan for management of the solid waste generated by residential, industrial and commercial activities of the TJSWPU. The revision will include updates to the County’s collection and transportation practices; storage, treatment and disposal; waste reduction and reuse programs; and future planned activities.

Chris Greene Lake & Mint Springs Lake Algae Prevention

After a year of water quality testing, plant and fish surveys, watershed assessments, and modeling, the results are in: To prevent additional harmful algae blooms in Chris Greene and Mint Springs lakes, a key ingredient needed is more *oxygen*. The consulting team (led by SOLitude Lake Management) explains in its recent draft report that the “natural aging of both lakes has reached a tipping point.” The upper lake at Mint Springs was built in the late 1940s and Chris Greene Lake was built in the early 1970s. Since then, organic matter has naturally washed in from the watershed over the years and accumulated on the bottom of each lake. Now, when levels of oxygen in the water drop during the heat of the summer, that large accumulation of lake muck releases a significant amount of phosphorus (i.e., plant food) into the water – ripe conditions for algae blooms. In fact, the study tells us that at least half of the phosphorus available for algae growth in these lakes is coming from within the lake itself rather than from recent rain runoff. According to the consulting team, increasing oxygen levels in the deepest parts of the lakes would not only reduce the amount of nutrients available for growth of harmful algae, but would also improve the fishery in those lakes. Among the options for management strategies, the consultants suggest installing a “side-stream supersaturation” system that pumps water from the lowest level of the lakes into a pressurized chamber that oxygenates the water to beyond normal levels before releasing it back

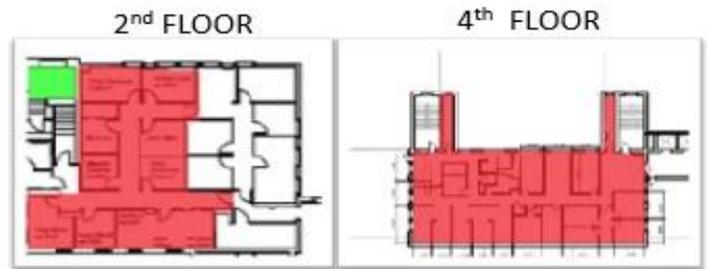


into the lowest level of the lakes. However, the report offers a wide variety of other possible management solutions for the County to consider, including dredging, algaecides, biomanipulation, watershed management, and others. The next step for FES/ESD will be to work with Parks & Recreation staff to more thoroughly consider the recommendations in the report and decide which ones to pursue further.

Department Updates

FES Divisions Office Relocations

As permanent teleworking is becoming the “norm” for many, it is also presenting unforeseen advantages for those whose job responsibilities require them to be on site. The Environmental Services Division of FES occupied approximately 1,153 square feet on the 2nd floor of COB-McIntire, though its eight employees, for the most part, were teleworking daily. In contrast, the twelve employees of the Public Works Division’s maintenance sections occupied 1,107 square feet in the basement. Limited space and open floor plan presented challenges in keeping the maintenance workers “socially distanced” when in the office. The majority of FES’ 4th floor suite was occupied by the Department’s Facilities Project and Construction Division, with many of their project managers also teleworking. Taking advantage of the free space teleworking created, FES moved the Environmental Services Division to the 4th floor, creating shared workstations for “as needed” use. This allowed the Chief of Public Works, Division Office Associate, and the Facilities Maintenance Section to move to the vacated space on the second floor, while providing more room in the basement for the Custodial Maintenance and Grounds Maintenance sections to maintain social distancing.



In cooperation with the County Executive’s Office and FES, similar adaptive changes are under consideration by a number of Albemarle County departments. The goals of our planning efforts include:

- Improved customer service points
- Reallocation of previously cramped spaces to more comfortably house employees who cannot telework when our “building posture” returns to normal
- The creation of flex spaces for use by employees who are expected to remain “part time teleworkers”
- Improved operational adjacencies for departments, such as Finance & Budget, whose structures have undergone change in the past year
- Return to COB McIntire the Finance and Economic Development operations that had been moved off-site into leased offices in 2019
- Accommodation of the recently approved Broadband Office