

# Memorandum

To Dr. Francisco Durán, Superintendent, Arlington Public Schools

From Superintendent's Advisory Committee on Sustainability

Topic 2024 Annual Memorandum

Date June 21, 2024

## Executive Summary

The Superintendent's Advisory Committee on Sustainability (SACS) is pleased to share with you some of Arlington Public Schools's sustainability highlights from the last year, including: 1) environmental performance; 2) Solar across our portfolio; 3) the Sustainability Liaison Program; and 4) Master Gardeners' involvement within APS.

As you'll see in the brief summaries below, APS' environmental performance has improved since FY 19 – with significant reductions in energy use, greenhouse gas emissions, and water use from pre-pandemic levels. We encourage APS to continue seeking out and implementing ways to increase efficiencies and minimize waste to keep energy, emissions, and water use trending downwards. This includes the successful implementation of renewable energy projects on-site, such as those at Jefferson.

We are delighted to continue to see our fully funded Sustainability Liaison Program make a positive influence on nearly every school. The diverse portfolio of projects spearheaded by these liaisons and their students continues to be extremely impressive. We will continue work towards supporting our liaisons and expanding some of the more successful liaison projects into APS-wide programs whenever possible.

Virginia Cooperative Extension Master Gardener (EMGs) continue to volunteer within the Arlington Public School system. The longest relationship is with Carlin Springs Elementary, dating from 2007, where EMGs support an after-school garden club for the students in extended day care. EMGs engage in ongoing programs at five of our schools, while also supporting special events at another five schools. Learning activities are adjusted to the physical and learning readiness levels of the children at each school, which ranges from Pre-Kindergarten through Middle School. The group seeks to expand into more schools and has completed a survey of schools in FY23 to help assess gardening needs and capabilities in the coming year.

SACS conducted a recruitment campaign in FY22 and welcomed Isabelle Cozzarelli, Richard Derbyshire, and Paul Kaplowitz as new committee members in the upcoming academic year. These new members work with other environmental organizations such as the United States Geological Survey, the Master Gardeners of Northern Virginia, and the Potomac River Group of the Sierra Club.

Please see the summaries below for additional details about APS sustainability and SACS. We look forward to working with you in the upcoming year to provide continued sustainability support for APS, including the review of adding a potential Energy Career Cluster at the new Arlington Career Center.

## Environmental Performance

### Energy

In Appendix B, both the site and source energy use intensity (EUI) can be observed for each school for the years 2021 through 2023, as well as 2019. The year 2020 was omitted as covid directly impacted performance. The year 2021 was also impacted but left in the graph for reference.

Site EUI refers to the amount of energy used per square foot annually. It's calculated by dividing the energy consumed by the building in a year by the total gross floor area. Like miles per gallon for cars, EUI is an important indicator of a building's energy performance.

Similarly, Source EUI refers to the amount of energy needed to power the building per square foot annually. However, it's calculated by dividing the total energy generated to power the building in a year by the total gross floor area. This includes not only the energy directly consumed by the building, but also the power lost across transmission lines on the grid, known as 'grid loss'.

We are proud to report energy use in FY23 for nearly every school was lower than FY22, as well as FY19. FY20 and FY21 were impacted by covid and therefore performance during those two years is not comparable. This decreased energy use is attributable to our teams' efforts both in school operations and maintenance, as well as the continued implementation of energy-saving projects.

Across the APS portfolio, both site and source EUI **decreased by 17%** from FY19 levels to FY23 and **decreased by 5%** in the past year from FY22 levels to FY23.

Across our portfolio in 2023, the average Site EUI for our schools was 53.0 kbtu/ft<sup>2</sup>.

### GHG Emissions

The Greenhouse Gas (GHG) Emissions Intensity is similar to EUI, where APS measures the amount of GHG emissions per square foot to normalize data across schools of various sizes. Following the energy pattern, GHG emissions were, in general, lower in FY23 compared to both FY19 and FY23.

Across the APS portfolio, GHG emissions intensity **decreased by 18%** from FY19 levels to FY23 and **decreased by 3%** in the past year from FY22 levels to FY23.

Total GHG emissions, measured in metric tonnes, decreased 16%, with 3,670 metric tonnes less emissions in FY23 compared to FY19. **That is equivalent to planting over 60,000 trees.**

### Water

The Water Use Intensity (WUI) is similar to EUI, where APS measures the amount of water (in gallons) per square foot to normalize data across schools of various sizes. **WUI across the APS portfolio saw a 19% decrease from FY 19 to FY23**, thanks to water conservation efforts at the schools. In total, **APS saved over 10 million gallons of water in FY23 compared to FY19**. APS staff have noted a main contributor to the reduction in water use from FY19 was the repair of mechanical equipment, such as cooling towers. Leaks in mechanical equipment can result in large water loss, and APS staff have made efforts to amend and fix equipment over the years.

While APS saw a minor decrease of total water use from FY22 to FY23 (less than 1%), they did see a minor increase in WUI on average as some of our smaller schools used slightly more water (less than

2% more). This is a negligible fluctuation year-to-year, especially considering the good trend of lower water use since FY19.

## Solar & Energy Efficiency Improvements at APS

SACS is thrilled APS completed their 9th solar installation at Thomas Jefferson Middle School and eager to see APS's 10th solar array at Cardinal Elementary! APS generated over 3 million kilowatt-hours in FY23, and SACS is excited to see this number increase as more solar arrays are installed. SACS continues to recommend to the Superintendent that all roofs are investigated for solar array potential, especially during and after roof replacements.

In addition to solar arrays, SACS was happy to hear Barcroft elementary received a complete LED upgrade in conjunction with the ongoing HVAC renovation. Projects like these that upgrade school building infrastructure not only reduce energy consumption and costs but provide healthier learning environments for APS students. With the completion of the Facility Condition Assessment and Long Term Renovation Plan this school year, SACS recommends APS continues to install the most energy efficient equipment whenever possible.

## Sustainability Liaison Program

SACS is proud of the successes in APS Operations but does not forget sustainability embodies more than the built environment. The true heartbeat of sustainability at APS comes from the extraordinary Sustainability Liaisons. This program began in FY2016 with 10 pilot schools and is now in its second year of being fully funded at all APS schools. This school year there were 39 Sustainability Liaisons supporting 36 schools.

The Sustainability Liaison Program is the cornerstone of merging the sustainable practices in our built environment with the educational and habit building sustainability practices inside our schools. This year APS Sustainability Liaisons championed over 27 recycling/waste projects, 23 gardening activities, held outdoor learning activities with wildlife connections, and invasive plant species removals. Liaisons and their students also created sustainability educational newsletters, videos, and posters for their communities. Liaisons held walk to school days, stream and park clean up days, as well as grow, harvest, and donate over 5800 pounds of food! Many of our Liaisons have established environmental clubs within their schools and often partner with community groups such as Eco Action Arlington, the Master Gardeners of Northern Virginia, the Smithsonian Migratory Bird Center, and the Chesapeake Bay Foundation. The work these Liaisons do to embed sustainability practices into the culture of their school cannot be understated. Appendix C illustrates the breadth of sustainability activities APS Sustainability Liaisons have led both this year and last year. In addition you can visit our SACS webpage to see the full PowerPoint [Presentation](#) of this year's Liaison project highlights.

## Master Gardener Partnership with Liaisons

Virginia Cooperative Extension Master Gardener (EMGs) continue to volunteer in a modest number of schools in the Arlington Public School system. With limited financial support from the non-profit, Master Gardeners of Northern Virginia (MGNV), these relationships have been developed between

specific gardeners, known as Extension Master Gardener or EMG, and a teacher or dedicated contact within a school. The longest relationship is with Carlin Springs Elementary, dating from 2007, where EMGs support an after-school garden club for the students in extended day care. The general approach is a group of EMGs, usually one per four students, use a shared curriculum to conduct a classroom learning session indoors followed by outdoor hands-on experiences in the garden, weather permitting.

The shared curriculum is focused on gardening best management practices adjusted to age appropriateness of the children. The “curriculum” focuses on three concepts: building healthy soil; importance of native species; and growing your own food. We draw materials from a variety of resources including MGNV, Junior Master Gardener (JMG) handbooks, Kids Gardening and Homegrown National Parks. Quite a few of our EMGs have engaged in youth garden education training, such as online training with the JMG organization. Individual topics include a breakdown of the three concepts such as: composting, leave the leaves, the water cycle, native plants, invasive plants, pollinators, plant morphology, edible plant parts, plant parts, insects, trees, and vegetable gardening A-Z, with small group and large group discussions of each topic, as well their interrelationships. EMGs adjust the learning activities to the physical and learning readiness levels of the children, which ranges from Pre-Kindergarten through Middle School. However, currently, most of our groups are with elementary grade levels 3-5.

At present we have on-going programs at the following schools: Carlin Springs, Barcroft, Fleet (2 different groups), Innovation, and Discovery. These programs vary in frequency with some monthly, twice monthly, and others weekly for a limited number of weeks in the spring. Some programs are the entire school year. There are other schools where we participate in special events or a single event such as Hoffman-Boston, Abingdon, Cardinal, Jamestown Elementaries and Williamsburg Middle School. Our goal is to assist where requested with adequate site support, providing appropriate garden education for children. We encourage participation by parents and staff to support the physical effort and financial investment required to create functioning and positive gardening experience. Additionally, we are aware of schools who have expressed interest in receiving support from MGNV for their projects and continue efforts to manage those requests.

From our volunteer participation in the APS system, we have become aware of the difficulties and challenges that teachers and coordinators face when trying to establish a gardening program. With the release of the comprehensive Long-Range Plan to Renovate Existing Facilities, we have realized that the condition of gardens has been omitted from the consultant’s scope. With our experience in selected schools, we believe that we can make an important contribution through gathering information about garden and outdoor education resources in each school. The EMG Youth Education Program developed a series of questions used for a survey completed in early May with 80% responding. Our goal with the survey is to establish a baseline of gardening projects and activities, identify physical infrastructure elements that need attention, and reveal areas of opportunity to improve current programs. As a result, YEP anticipates adding more school programs to our current purview, a scenario which we welcome. We also welcome increased participation from APS staff, parents of students and operating with a greater range of resources.

## Appendix A: SACS 2023-2024 Membership

SACS meets on the third Tuesday of each month, except for July and August. All meetings are open to the public. Members are appointed to two-year terms and participate on a volunteer basis.

### Appointed Members

Meredith Allen	M. Ed, Senior Instructional Technology Coordinator, Tuckahoe Elementary School
Isabelle Cozzarelli	Research Hydrologist, U.S. Geological Survey
Richard Derbyshire	Retired, Technology Specialist and Architectural Consultant. Extension Master Gardener.
Elenor Hodges	M.Ed., Executive Director, <a href="#">EcoAction Arlington</a>
Paul Kaplowitz	Retired pediatric specialist, member of the Executive Committees of the local Sierra Club group and Tree Stewards of Arlington and Alexandria
Gregory Lloyd	CCM, LEED AP BD+C, TRUE Advisor, Construction Manager, Wesley Housing
Leah Nichols	Executive Director, Institute for a Sustainable Earth, GMU
Cynthia Palmer	JD, MPH, Senior Analyst for Petrochemicals, Moms Clean Air Force, EDF
Eric Tilden	PE, Director of ESG, Playa Hotels and Resorts
Laura Watchman	LEED AP Neighborhood Development, Principal, Watchman Consulting

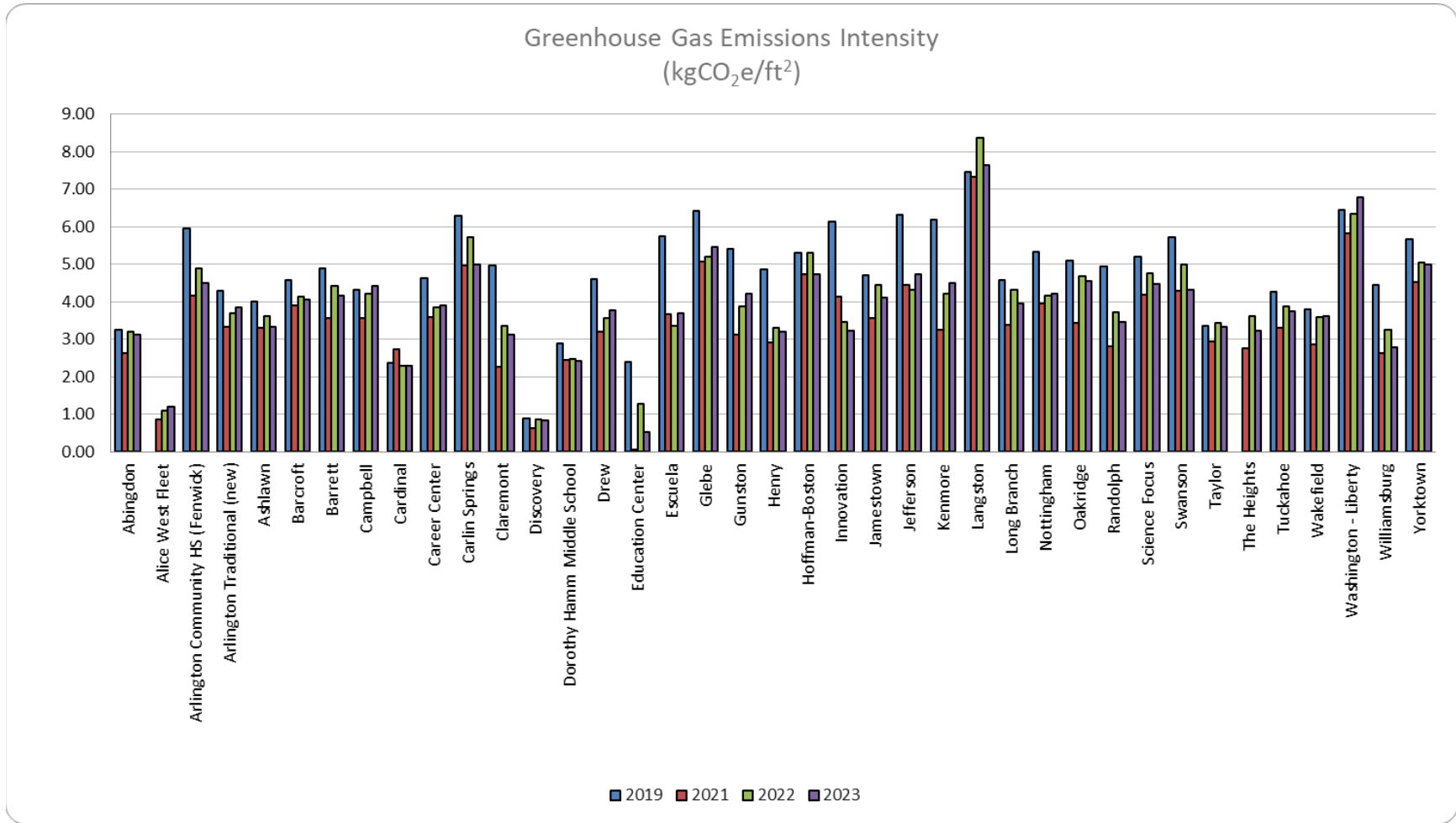
### Staff

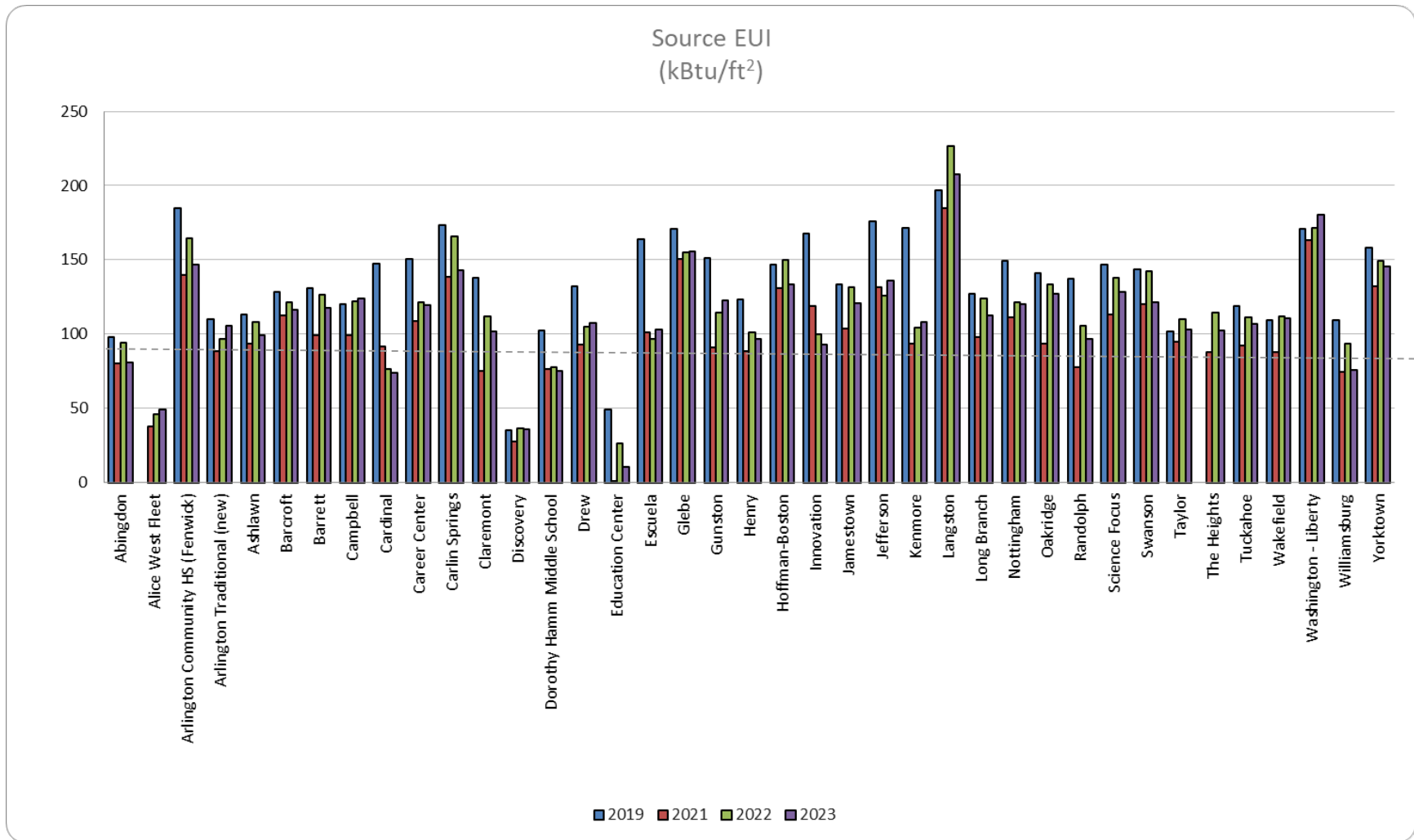
Cathy Lin	CEM, APS Director, Facilities and Operations
Dat Le	Ph.D., APS Science Supervisor
Tanner Prime	E.M.I.T., APS Energy/Stormwater Program Manager

### Liaisons to Other Committees

Gregory Lloyd	Advisory Council on School Facilities and Capital Programs
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## Appendix B: Energy, GHG Emissions, and Water Graphs

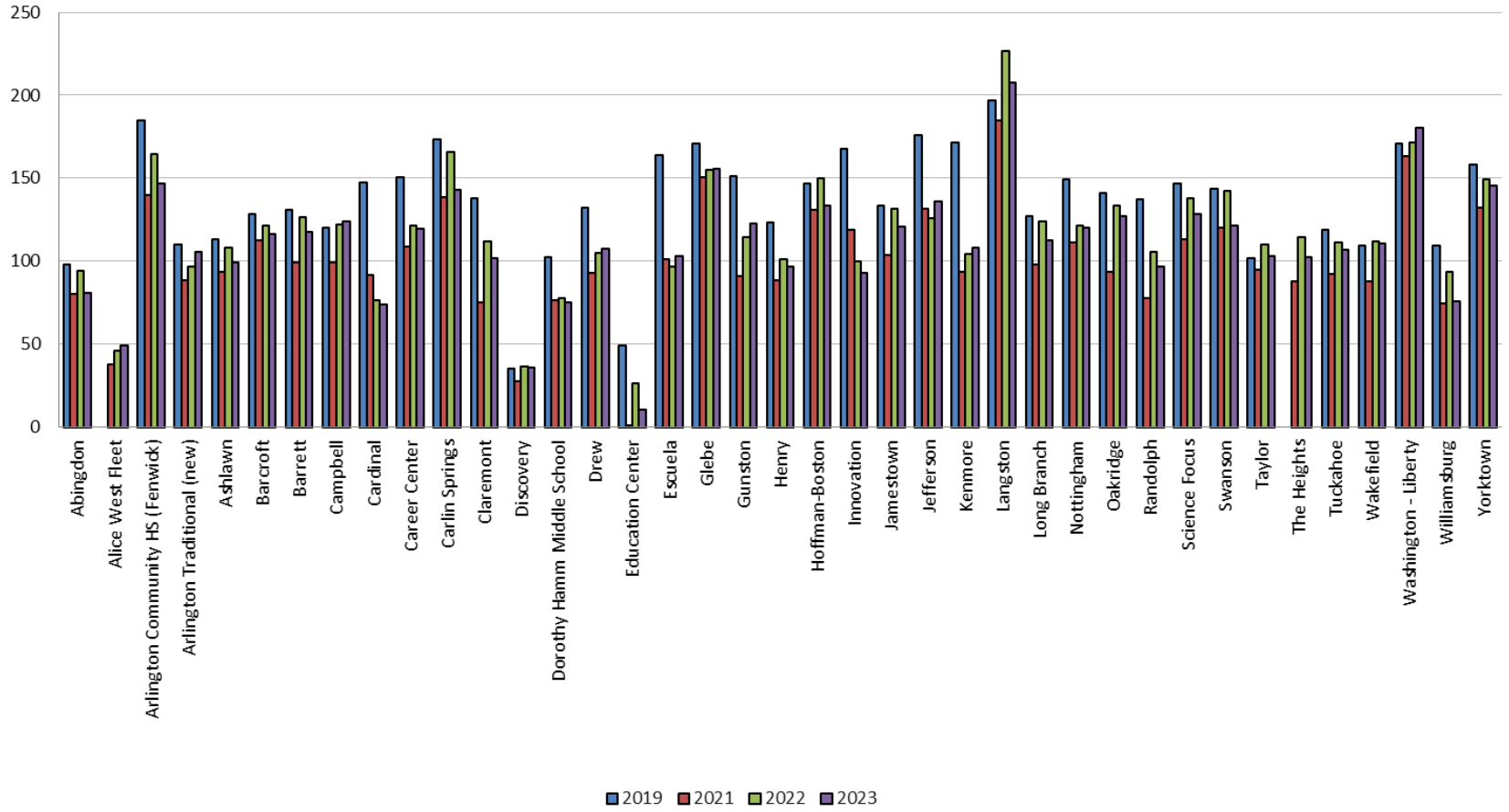




**Note:** The gray dashed line represents a Site EUI of 48.5. This is the national median for K-12 schools across the U.S., per ENERGY STAR. Schools below this line are seen as more energy efficient than the national median school.

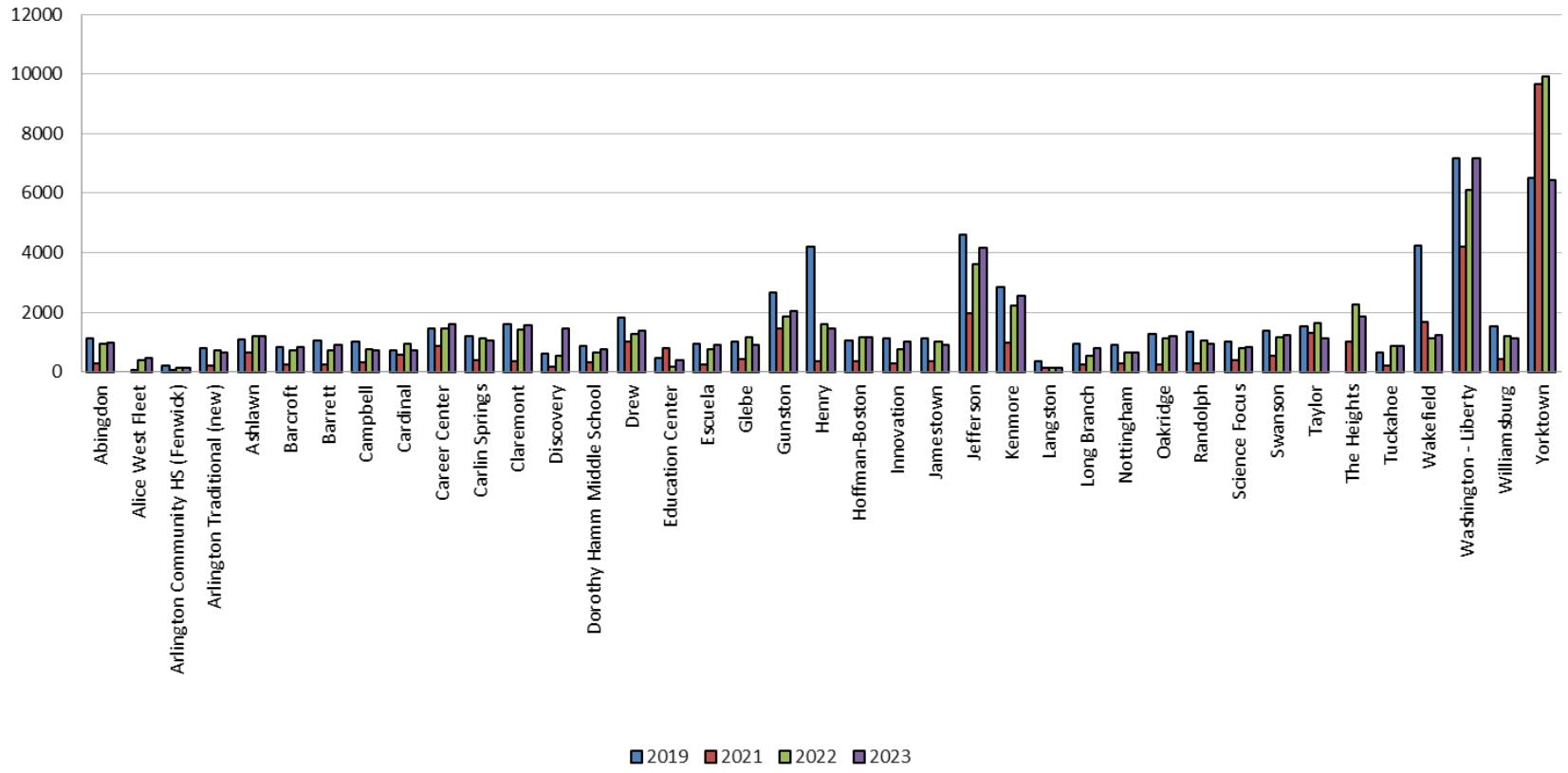
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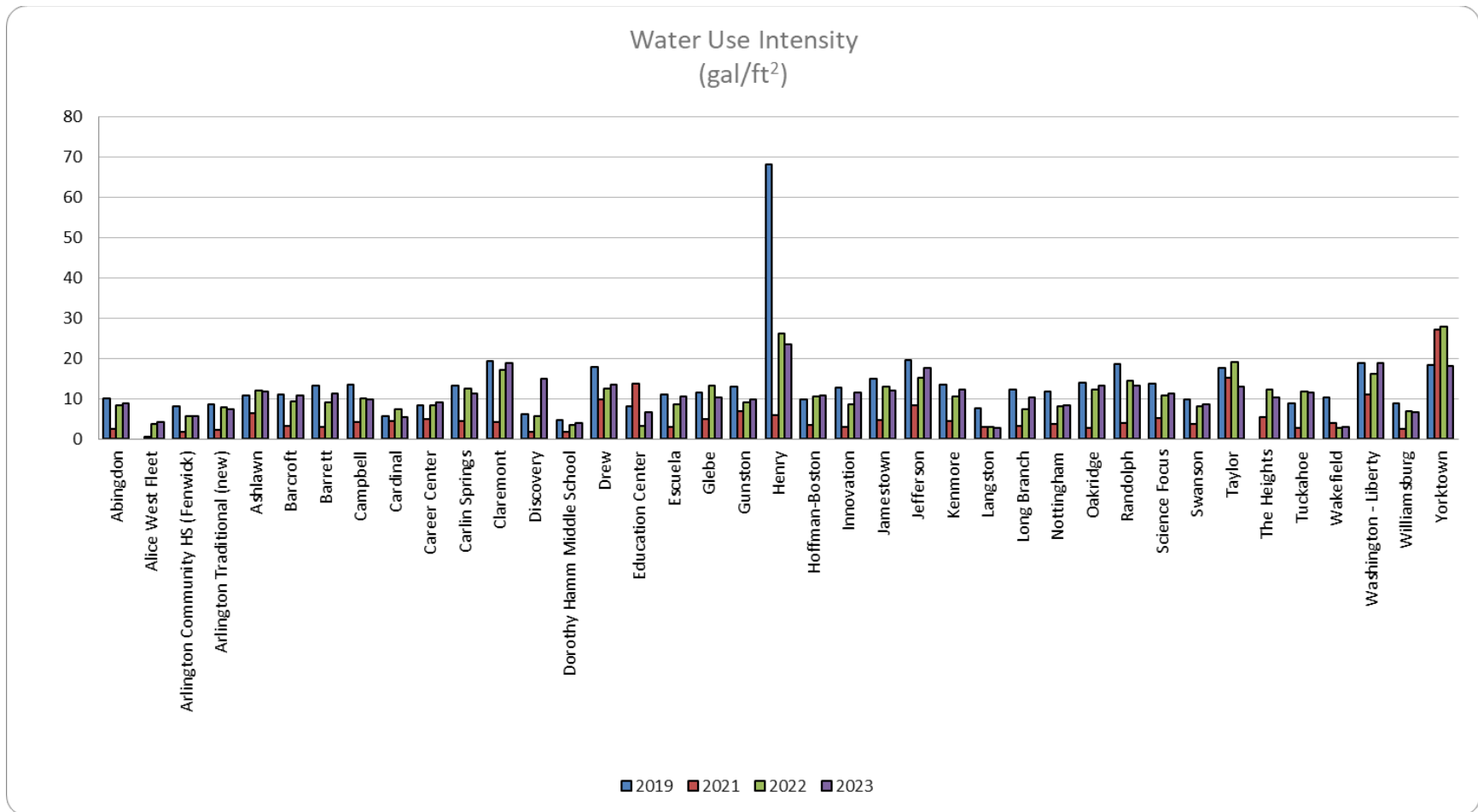
Source EUI  
(kBtu/ft2)





### Water Use (kgal)





**Note:** MPSA (Henry) and the high water usage is accurate - The building cooling system had issues resulting in higher water usage than typical, which were resolved in 2019.

Appendix C: [2023-2024 Sustainability Liaison Project Presentation](#)

