

GREEN RFP SUBMISSION FORM

Part I- General Information:

Name of Student Organization	Hillcrest Hall Council
Contact/Responsible Person	Susan Sale
Contact Office Held/Title	Hillcrest Hall Sustainability Officer
Contact Email Address	ssale@vt.edu
Contact Telephone Number	757-870-6983

Part II- Project Cost Information

Estimated Cost of this Proposal See III.C. below

Estimated Savings - See III.D. below

Net Cost of this Proposal =

Part III- Supporting Information

- A. Please describe your climate action, sustainability, and/or energy initiative and attach supporting documentation.

Water is essential to life on earth. It sustains and renews natural systems, and humans rely on water, especially fresh water, for agriculture and industrial processes. On earth, usable fresh water makes up less than one percent of all water (EPA), so it is very important that we conserve this valuable resource, especially as the human population continues to grow and need water resources. According to the Water Research Foundation, toilets are the largest indoor use of water in single family homes at 24% (DeOreo et al.) A simple way to reduce this statistic is by installing a toilet that uses less water to flush. The national standard is 1.6 gal/flush, but toilets have been developed that can use much less than this amount. Toilets given the WaterSense rating by the EPA use at least 20% less water than the standard without compromising performance (EPA).

In Hillcrest Hall, some toilets have been replaced with toilets that only use 1.0 gal/flush, but others remain that use 1.6 gal/flush. We propose that all of the toilets in Hillcrest Hall that use more than 1.28 gal/flush be replaced with WaterSense flushometer-valve toilets, preferably ones that use 1.0 gal/flush. Hillcrest is a suite-style residence hall home to the Honors Living Learning Community as well as offices for the Honors College, Veteran Services, and Undergraduate Academic Integrity. As of Fall 2021, there are 93 residents living in 53 rooms and served by 30 toilets. Of those, it is estimated that 10 are the older toilets that use 1.6 gal/flush, but a more accurate inspection is needed to confirm this. Assuming 10 toilets are 1.6 gal/flush and 20 are 1.0 gal/flush, 1.6 toilets make up only 33% of Hillcrest's toilets, yet account for 80% of water use by toilets. Hillcrest's downstairs has a public restroom including 4 toilets and 1 urinal, and some of the offices have toilets in them as well. However, it is unclear if these toilets

could be replaced with a lower flow option because the performance information of these toilets is unknown.

Based on data from VT Facilities, Hillcrest's average water use is 3344.50 gal/day, adjusted for the days per year that the building is occupied (Appendix A). On average, one person flushes the toilet five times a day (DeOreo et al.). If use at Hillcrest follows this pattern, switching to all 1.0 gal/flush toilets would save approximately 245.52 gallons of water a day. Over a year, Hillcrest would be saving around 52,000 gallons of water, or 7.3% of Hillcrest's average yearly usage.

- B. How does this initiative help to achieve the goals of the Virginia Tech 2020 Climate Action Commitment Resolution and Sustainability Plan?

According to the Campus Energy, Water, and Waste Reduction Policy, it is key that the university "ensure energy/water efficiency and conservation is a central consideration for business operations" to meet the Climate Action Commitment. This proposal would certainly provide significant improvements in water efficiency and conservation at Hillcrest Hall. Indeed, the policy suggests meeting or exceeding EPA WaterSense standards for fixtures and other equipment, which is currently not happening.

Attachment # 2

- C. What is the cost of your proposal? Please describe in adequate detail the basis for your cost estimate.

If 10 Toto CT705ULN#01 commercial toilets, which are the same as the existing 1.0 gal/flush toilets in Hillcrest, were purchased to replace the 1.6 gal/flush toilets, an estimate of the cost is \$2,870.00 for the bowls, \$540.00 for the seats, and \$8,020.00 for the flushometer valve and breaker set, totaling \$11,430.00. This cost could change, however, depending on the retailer chosen, shipping costs, and if a different model of toilet is deemed more suitable.

Bowl: <https://www.kbauthority.com/toto-ct705uln-01-commercial-ada-compliant-floor-mounted-ultra-high-efficiency-toilet-with-elongated-bowl-in-cotton-1.0-gpf.html>

Seat: <https://www.kbauthority.com/toto-commercial-toilet-seat-sc534.html>

Flushometer Valve and Breaker Set: <https://www.kbauthority.com/toto-tet1ua32-cp-ecopower-touchless-1.0-gpf-toilet-flushometer-valve-and-12-inch-vacuum-breaker-set-in-polished-chrome.html>

- D. Will your proposal produce cost savings for the university? If so, how much? Please describe in adequate detail the basis for your savings estimate.

According to water data recorded by VT Facilities, the average yearly cost of water in Hillcrest Hall, from 2011 to the present, is \$2854.14. With the proposed 7.3% reduction in water use, water would cost approximately \$209.52 less (Appendix A). If these toilets last 15 years, \$3142.80 would be saved.

- E. Is this funding request for a one-time need or an ongoing need (please mark one)?

One-Time x

Ongoing _____

F. Is funding available for this request from another source? If yes, describe the funding (source, amount, etc.).
No.

**GREEN RFP SUBMISSION FORM
(Continued)**

Part IV- Requestors/Reviewers	
Prepared By (Name of Contact for Student Organization) Susan Sale	Date December 1, 2021
Todd Pignataro	12/8/21
Reviewed By (Name of Appropriate University Official)	Date
Nathan King	12/3/21
Reviewed By (Name of Office of Climate Action, Sustainability, and Energy Representative)	Date

**GREEN RFP SUBMISSION
CONTACT LIST**

In the preparation of your Green RFP form, student organizations are encouraged to seek input and guidance from the following list of university employees. These individuals are familiar with the form and the process. They can address the feasibility of your proposal, provide a technical review, and evaluate the cost & potential savings.

<u>Area of Expertise</u>	<u>Name</u>	<u>Title</u>	<u>Email Address</u>
Engineering & Operations, Energy Management	Steve Durfee	Campus Energy Manager	sdurfee@vt.edu
Facilities: Housing & Residence Life	Todd Pignataro	Associate Director of Facilities	ptodd@vt.edu
Facilities: Buildings & Grounds (Small Renovations)	Jim McDaniel	Project Coordinator	jmcdani@vt.edu
Exterior Lighting	Matt Hagy	Associate Director of Utilities	mhagy1@vt.edu
Student Engagement & Campus Life	Spencer Stidd	Associate Director for Event Services	sstidd@vt.edu
Dining Services & Housing (Student Affairs)	Blake Bensman	Sustainability Manager	bensman@vt.edu
Alternative Transportation (Bus, Bike, & Walk/EVs)	Nick Quint	Transportation Network Manager	nquint@vt.edu
Landscape Architecture	Jack Rosenberger	Campus Landscape Architect	jrosenb@vt.edu
Hahn Horticulture Garden	Scott Douglas	Director/Instructor	dsd1@vt.edu
Recycling & Waste Management	Teresa Sweeney	Program Consultant	msrecycle247@vt.edu
Other Sustainability Topics	Nathan King	Campus Sustainability Manager	naking@vt.edu

References

DeOreo, W. B., Mayer, P., Dziegielewski, B., & Kiefer, J. (2016, April). Residential End Uses of Water, Version 2. Water Research Foundation.

Environmental Protection Agency. (n.d.). Commercial Toilets. EPA. Retrieved December 1, 2021, from <https://www.epa.gov/watersense/commercial-toilets>.

Environmental Protection Agency. (n.d.). How We Use Water. EPA. Retrieved December 1, 2021, from <https://www.epa.gov/watersense/how-we-use-water>.

Teglas, J. C. (2016, August 31). Campus Energy, Water, and Waste Reduction Policy. Virginia Polytechnic Institute and State University.