Please submit this completed application and any relevant supporting documentation to Sustainability-Committee@Illinois.edu. The Working Group Chairs will be in contact with you regarding any questions about the application. If you have any questions about the application process, please contact the Student Sustainability Committee at sustainability-committee@illinois.edu.

General & Contact Information

Project Name: Reducing Water Waste in Talbot Laboratory
Total Amount Requested from SSC: $80,000

Project Topic Areas: ☒ Land & Water ☐ Education ☐ Energy
☐ Transportation ☐ Food & Waste

Applicant Name: Joshua L. Rovey
Campus Affiliation (Unit/Department or RSO/Organization): Aerospace Engineering
Email Address: rovey@illinois.edu

Check one:
☒ This project is solely my own ***OR***
☐ This project is proposed on behalf of (name of student org., campus dept., etc.):

Project Team Members

Name	Department	Email
Dassou Nagassou	Aerospace	nagassou@iilinois.edu
Nick Rasmont	Aerospace	Rasmont2@illinois.edu
Hussein Al-Rashdan	Aerospace	Halras3@illinois.edu
Toyofumi Yamauchi	Aerospace	Ty20@illinois.edu

Student-Led Projects (Mandatory):
Name of Faculty or Staff Project Advisor: Joshua L. Rovey
Advisor's Email Address: rovey@illinois.edu

Financial Contact *(Must be a full-time University of Illinois staff member)*
Contact Name: Andrea N. Vogel
Unit/Department: Engineering Shared Administrative Services
Email Address: andavis@illinois.edu

Project Information

Please review the proposal materials and online content carefully. It is highly recommended you visit a working group meeting sometime during the proposal submission process.

Please provide a brief background of the project, its goals, and the desired outcomes:

The EPLab in Talbot Laboratory Building was established in 1989. Major equipment in this laboratory consists of rough vacuum pumps and compressors for high vacuum pumps, all of which require cooling water. At the time of original installation, creation, and setup of this laboratory, equipment was connected to water from the Urbana city water connection and disposed in an open drain. New and upgraded equipment added to the laboratory continues to use this water connection and disposal method. A recent (2021) audit of water usage in Talbot Laboratory found that this space uses on average $1900/mo in Urbana city water, which equates to approximately 317,000 gallons/mo. This is almost half of the average monthly water use for the entire Talbot building (734 kgal/mo).

Where will the project be located? Are special permissions required for this project site?

If special permission is required for this location, please explain, and submit any relevant letters of support with the application.

- The primary location of this project is in the basement of Talbot Laboratory (room 6C).
- No special permission is required as the tie-in point is accessible from the same Laboratory.
- Talbot building manager expressed support to this project.

Other than the project team, who will have a stake in the project? Please list other individuals, groups, or departments affiliated directly or indirectly by the project. This includes any entity providing funding (immediate, future, ongoing, matching, in-kind, etc.) and any entities that benefit from this project.

Please attach letters of commitment or support at the end of the application.

- The department of Aerospace Engineering
- The department of Facilities and Services

How will this project involve and/or benefit students?

This includes both direct and indirect impact.

Student Impact

- Graduate and undergraduate students of the EPLab are involved in this project (14grad, 3undergrad)
- Students learn to be more mindful of their utility and resource usage
- Students will learn how a building chilled water loop works, and the issues and concerns and requirements of tapping into that loop
- Students will learn that there exist campus or institutional infrastructures that can be used to meet lab and equipment needs, and to explore all possible options before proceeding
- On the project management side, I expect students will learn about the challenges, delays, extended timeline, and exorbitant costs of working with the large institutional infrastructure of F&S, and they will learn how to plan and adjust accordingly, and be patient.

How will you bring awareness and publicize the project on campus? In addition to SSC, where will information about this project be reported?

- The department of Aerospace Engineering website
- The College of Engineering website
- Electronic bulletin boards in the department of aerospace and facilities & services

Financial Information

In addition to the below questions, please submit the supplemental budget spreadsheet available on the Student Sustainability Committee website. Submission of both documents by the submission deadline is required for consideration of your project.

Have you applied for funding from SSC before? If so, for what project?

NO

If this project is implemented, will you require any ongoing funding required? What is the strategy for supporting the project in order to cover replacement, operation, or renewal costs?

Please note that SSC provides funding on a case-by-case basis annually and should not be considered as an ongoing source of funding.

NO

Please include any other obtained sources of funding. Have you applied for funding elsewhere?

Please attach any relevant letters of support as needed in a separate document.

NO

Environmental, Economic, and Awareness Impacts

How will the project improve environmental sustainability at the Urbana-Champaign campus? If applicable, how does this project fit within any of the Illinois Climate Action Plan (iCAP) goals?

- Aligns with iCAP metric 4.1 – Reduce Fresh Water Consumption
- Increases environmental stewardship at UIUC by saving 317 kgal/mo of potable Urbana city water

How will you monitor and evaluate the project's progress and environmental outcomes? What short-term and long-term environmental impacts do you expect?

Some examples include carbon emissions, water conservation, green behavior, and reduced landfill waste.

A successful completion of this project will reduce potable Urbana city water consumption by 317,000 gallons *per month* and save the University $23,000 *per year*. In other words, the project cost ($80K) is recouped in about 3.5 years.

	Q0 we are doing this now	Q1	Q2	Q3	Q4
Work with F&S to Develop Plans for Connecting to Chilled Water					
Work with F&S to Finalize Plans for Connecting to Chilled Water Loop					
Milestone: Give Permission Approval to F&S to Make Connection					
F&S Completes the Work					
Milestone: EPLAB in Talbot is Using Chilled Water Loop					

What are your specific outreach goals? How will this project inspire change at UIUC?

- A successful implementation of this project will pave the way for other laboratory facilities at UIUC, which are currently utilizing fresh water as cooling medium, to stop wasting fresh water.

If applicable, how does this project impact environmental injustice or social injustice?

- 3,800 kgal per year of saved fresh water that could have been unjustly wasted.
- Cost avoidance associated with the production of such amount of fresh water, in terms of energy and maintenance

BUDGET NOTE:

Student Sustainability Committee,

I want to be very clear and upfront. The total cost of this project is *estimated* at $80,000. There is no formal Facilities & Services quote attached to this proposal. The $80K estimate is my (the PI) estimate of the cost based on my previous experience working with F&S. We contacted F&S immediately upon learning that our Step 1 proposal was invited for a Step 2 proposal. However, F&S declined to provide a quote, or even look at the lab water supply connections, because we could not supply an account number for them to bill for their time visiting the lab and doing any design and engineering that would be required for a formal quote. I emailed Albert Rios, Land, Water, & Air Chair, about this very issue on April 14, but received no response. To provide a formal F&S quote with this proposal, we already need funding in hand. To get funding, we must already have funding.

If this Step 2 is selected, our first action will be to use the budget to get a formal quote from F&S, a cost estimated at $1500. Then, if the formal quote is within our total $80K budget, proceed with the project. If the formal quote is larger than our total $80K budget, we would contact student sustainability committee and follow their guidance, perhaps increasing the budget or waiting and proposing again next year using the formal quote from F&S.

Joshua L. Rovey

ILLINOIS
Grainger College of Engineering

The Grainger College of Engineering
Offices of Facilities and Safety
303 Engineering Hall,
1308 W. Green Street, MC-266
Urbana, Illinois 61801

To: Student Sustainability Committee
From: Qu H. Kim, Director of Facilities
Subject: Support letter for Reducing Water Waste in Talbot Laboratory

Dear Committee Members:

The Grainger College of Engineering, the Offices of Facilities and Safety are writing a letter to strongly support the Reducing Water Waste project application in Talbot Laboratory.

As an architect, LEED Certified Professional, and a member of the iCAP Working Group, I have and am involved in sustainable projects and initiatives, including the first university Geothermal field in Bardeen Quad, to meet and support the iCAP and student goals for the university. This project is another example of Grainger Engineering's commitment to meet and stand by with the university and students for the effort.

This project is led by Aerospace Engineering Professor Rovey, who is very conscious of the waste of essential resources that can be easily supplanted by already existing cooling infrastructure and resource in the building. With assistance from the aerospace undergraduate and graduate students, this project will save 317,000 gallons/month, which can reallocate for consumable, potable water in the Talbot lab and is projected to save $23,000 per year for the university.

Grainger College always appreciates the continual support from the Student Sustainability Committee for our sustainability initiatives, and these types of "low-risk, high-yield" would allow us to be closer to the sustainable goals for which we all strive. Again, thank you so much for your time and consideration, and we look forward to receiving a positive outcome.

Sincerely,

Qu H. Kim Date: 4/22/2022
Grainger Engineering Director of Facilities