

Meeting Summary April 8, 2019

Council Members Present:

Carlo Colella, Vice President for Administration and Finance (Chair) Linda Clement, Vice President for Student Affairs David Cronrath, Associate Provost for Planning and Special Projects Maureen Kotlas, Executive Director, Department of Environmental Safety, Sustainability & Risk Scott Lupin, Assoc. Dir., Environmental Safety, Sustainability & Risk, and Director, Office of Sustainability MaryAnn Ibeziako, Director, Engineering and Energy, Facilities Management Eric Wachsman, Professor, Materials Science and Engineering and Director, Energy Research Center Bryan Quinn, Director of Technical Operation, Department of Electrical & Computer Engineering David Cooper, Assistant Director of Operations, Division of IT Joe Sullivan, Professor, Plant Science and Landscape Architecture Jana VanderGoot, Assistant Professor, Architecture Amelia Avis, Undergraduate Student, Government and Politics and Policy

Guests:

Bob Reuning, Director, Facilities Management Stephen Reid, Environmental Planner, Facilities Planning Jason Baer, Assistant Director, Environmental Affairs

Meeting start time: 10:00am

Meeting Highlights

Welcome and Review of March 8, 2019 Meeting Minutes

Carlo Colella welcomed the Council members and called the meeting to order. Meeting summary from March 8, 2019 was approved.

Annual Water Use and Watershed Report

Stephen Reid, Environmental Planner, Facilities Planning presented the annual Water Use and Watershed Report. Information can be found as Appendix A.

Sustainability Fund Proposals

Amelia Avis presented five University Sustainability Fund projects to the Council for approval. Information about the projects are available as Appendix B. The Council reviewed the following projects:

Ocean Friendly Campus: UMD Plastic Waste Reduction, Phase 2 The Council voted on a request of \$150,000: APPROVED

Algal Terp Scrubber

The Council voted on a request of \$61,750: APPROVED contingent upon approval from Facilities Council.

<u>A Smart, Connected, and Sustainable Campus Community</u> The Council voted on a request of \$42,710: APPROVED

<u>Pro Moss Treatment of ERC Cooling Tower, Cold Water and Hot Water Loops</u> The Council voted on a request of \$24,000: APPROVED

<u>Sustainability Fund Marketing and Sigange</u> The Council voted on a request of \$2,000: APPROVED

Open Forum Topics

- Scott Lupin asked the Council to share any ideas for future meeting topics or speakers.
- Amelia Avis shared that she is meeting with Robert Orr, Dean, School of Public Policy to see if they will send a representative to a future Council meeting to discuss America's Pledge.
- Andrew Muir shared that 2019 Sustainability Fund grants will be announced at the UMD Earth Day Festival on Monday, April 22 at The Stamp.

Adjourn 12:00pm

Appendix A



2019 Annual Water Update

Facilities Management & Dept. of Environmental Safety, Sustainability & Risk



Outline

- Sustainable Water Use and Watershed Initiatives
- MS4 Permit
- 12-SW (Industrial)
 Permit
- Vehicle Wash Update





Stormwater Permits

- Industrial Discharge Permit (08-DP)
- MS4 Permit
- Industrial Activities (12-SW)

Clean Water Act

National Pollutant Discharge Elimination System (NPDES) Program

Stormwater



2014 Sustainable Water Use and Watershed Report

- Report Made13 Recommendations
- Six of them became High Priority initiatives
 - Develop asset inventory
 - Restore Campus Creek
 - Develop a stormwater master plan
 - Conduct water capture/reuse feasibility study
 - Reorganize Roles/Responsibilities-Hire a Water Supply and Efficiency Engineer
 - Address Copper Discharges





UNIVERSITY SUSTAINABILITY COUNCIL SUSTAINABLE WATER USE AND WATERSHED REPORT

May 2014



💥 sustainableumd



Develop Utility Asset Inventory

- Baseline information for the GIS map of storm drain system has been developed.
- Working with GIS group to make this webavailable.
- Regular updates to this database is required as new projects come on line



Develop Utility Asset Inventory (cont.)

Home ♥ UMD Water Utilities - MES

New Map 🗸 📃 Stephen 🗸

Details 🕦 About 🔚 Content 🗮 Legend Contents

UMD Campus Boundary -AdministrativeAreaBoundaryLine

Outfall Point

Storm Drain Manhole

Inlet Point

Storm Drain Line

Outfall Drainage Area 1 💷 🧖 🧖 🛄 🚥 sdHydraulicConnection

sdPipeConnection

Stormwater Network Net Junctions

▲ UMD_Sanitary

SanitaryManholes

SanitarySewerline

Sanitary Network Net Junctions

Sanitary Sewer Cleanouts

▲ UMD Potable

BackflowPreventor

Mater Network Net Junctions Esri.com . ArcGIS Marketplace . Help . Terms of Use . Privacy . Contact Esri , Report Abuse , Contact Us



D Facilities Management | UMD Axis 2008 with edits from UMD real estate office. Data compared with Prince Ge



Restore Campus Creek

- All design work for permitting has been completed
- Construction expected to begin June 17, 2019
 - Construction funded by DNR grant (ca. \$1.2M)
- 50% of Campus Creek will be restored





Develop Stormwater Master Plan

- Integrated into MS4 compliance efforts
 - Currently working on Baseline Assessment and validating all stormwater management facilities
 - Documentation is required by MDE
 - Identify opportunities to upgrade existing facilities as part of MS4 permit
- This effort will be an integral part of developing the plan to meet the 20% restoration requirements which is due Oct 2020



Conduct Water Capture/Reuse Feasibility Study

- In 2016, Sustainable Water provided a feasibility study to capture and reuse wastewater on a commercial scale.
- Water conservation and reuse is a stated goal of the President's Energy Initiative Task Force.
- Additional studies will be conducted when the Water Supply and Efficiency Engineer is hired.



Reorganize Roles/Responsibilities

- Water Supply and Efficiency Engineer will be added to Dept. Planning & Construction
- Water and Stormwater Workgroup meet regularly to identify and address issues
- The Water Steering Committee meets as needed and provides resources



Copper Discharge Mitigation

- UMD holds discharge permit (#08-DP-2618) for condensate, cooling water, boiler blow-down
- Renewal submitted in October 2016; permit administratively extended; awaiting new permit
- Permit limits discharge of various pollutants
- Historically, UMD has regularly exceeded the permit limits for Copper (9 ug/L)
- DESSR and FM have been working to identify Copper sources and implement projects to reduce the discharges
- 2 non-compliance notifications sent to MDE in 2017 and 2018







Copper Discharge Mitigation (cont.)

- Outfall 005: Within Outfall 005, five buildings with cooling towers were identified as the primary source of Copper discharges to the outfall. Projects at four of those facilities are identified below
 - Main Administration Building (#077) The replacement of the existing cooling tower was completed in the first half of 2018.
 - Marie Mount Hall (#046) The level controls were upgraded in the second half of 2018.
 - McKeldin Library (#035) The level controls were upgraded in the second half of 2018.
 - H.J. Patterson Building (#073) A design is currently underway to redirect the cooling tower blow-down and condensate from the building to the sanitary sewer. The construction is planned for 2019.



Copper Discharge Mitigation (cont.)

- Campus-Wide Investigation: In order to expedite Copper mitigation efforts, the University implemented a program to conduct Copper field testing in conjunction with the Campus' Illicit Discharge Detection and Elimination (IDDE) Program.
- In addition to investigating / mitigating sources of Copper on campus, UMD is evaluating options to adjust our current permit limits for Copper to be site-specific:
 - 1. Adjust limits based on water quality (pH, hardness, etc)
 - 2. Conduct mixing zone study to evaluate impacts, if any, on receiving waters
 - 3. Conduct biological risk assessment to evaluate potential receptors (flora & fauna) and associated risk
 - 4. Conduct study to evaluate bioavailability of Copper, based on factors above
- Cost of studies could be less than one mitigation project (e.g., re-piping of identified discharge source)



UPDATE—New MS4 Permit

- UMD submitted the Notice of Intent for coverage under the new MS4 permit on Oct. 30, 2018
- The permit covers the main campus and IBBR
- As expected, the permit requires us to restore <u>20%</u> of existing untreated impervious areas



MS4 Permit—Restoration Requirements

- Currently conducting a Baseline Assessment to determine "treated" vs "untreated" areas
- Restoration credits can be obtained by building new SWM facilities or implementing alternative practices



Major MS4 Permit Requirements and Due Dates

Oct. 2018: Sign and submit Notice of Intent (NOI)

Oct. 2019: Submit Baseline Assessment

Oct. 2020: Submit 20% restoration plan to MDE

2025: Complete 20% restoration



12-SW Permit Update

- 12-SW Permit (stormwater from industrial activities) – stormwater pollution prevention plan implemented in July 2017
 - 7 Corrective Actions
 Implemented in 2017
 - First Annual Inspection
 completed November 2018





Vehicle Wash Update

- Discharge to storm drain is not permitted
- Building 011 had a vehicle wash
- Study completed;
 staff preparing
 recommendations







Appendix B

University Sustainability Fund

PROPOSED PROJECTS - APRIL 8, 2019

Summary

4 Projects (plus marketing costs):

- Ocean Friendly Campus: UMD Plastic Waste Reduction Phase II
- 2. Algal "Terp" Scrubber
- 3. A Smart, Connected, and Sustainable Campus Community

Average Request: \$69,570.00

Total Recommended Funding: \$280,280.00

- 4. ProMoss Treatment of ERC Cooling Towers, Cold Water and Hot Water Loops
- Added costs: Marketing and Sustainability Fund Signage (\$2,000)

1. "Ocean Friendly Campus: UMD Plastic Waste Reduction Phase II"

<u>Requested</u>: \$216,483.29 (previously \$145,129)

Submitted by: Dining Services

<u>Summary</u>: Dining Services requested a grant to cover the costs of **shifting from plastic bags, utensils, and straws in DS cafes to paper alternatives**. They also request the cost of **purchasing give-away reusable straws, bags and utensils**, as part of an effort to change campus culture surrounding single-use items.

Benefits: Plastic reduction, consumer behavior change

Supporters:

UM Center for Environmental Science,

Sustainable Ocean Alliance UMD Chapter,

SGA Student Sustainability Committee

Recommendation:

Partial Funding (\$150,000)

Modified proposal

- Initial proposal requested \$145,000 to replace all plastic items with paper alternatives
- Issues: retained harmful single-use habits, high energy cost of paper bag production, imposed costs on students
- •Solution: DS worked on new proposal over Winter 2019. New proposal included bag giveaway and trade program for each incoming residential student, and aimed to reduce consumption by 25% to 75% over two-year period.
- •Highlights: high-quality bag, trade program to reduce waste, educational materials



Budget (revised)

Grant Budget Request							
Item	Total Cost Difference Year 1	Total Cost Difference Year 2	Annual Cost	Total Grant Request	Notes		
Paper Straws	\$18,813.60	\$14,110.20		\$32,923.80	25% reduction in usage by year 2		
Paper Bags	\$32,790.25	\$10,847.24		\$43,637.49	75% reduction in usage by year 2		
Compostable Utensils	\$5,961.00	\$5,961.00		\$11,922.00	No reduction anticipated by year 2		
Reusable Bags			\$54,000.00	\$108,000.00	9,000 bags annually. Alternatives explored: Compostable reusable grocery bag from ACME Paper (\$1.75 each), Chico Bag Recycled bag (\$6.00 each), or Chico Bag Polyester bag (\$4.00). Budget based on Chico Bag from Recycled content: https://www.chicobag.com/t-what-is-repete		
Give-away: Reusable straws			\$5,000.00	\$10,000.00	Sample item: https://www.ecopromotionsonline. com/products/bpa-free-drinkware-straws- conservation-and-awareness-items-waste-free- lunch-earth-day-eco		
Give-away: Reusable utensils			\$5,000.00	\$10,000.00	Sample item: https://www.ecopromotionsonline. com/products/conservation-and-awareness-items- waste-free-lunch-earth-day-eco-kitchen-utensils- green-2		
Total				\$216,483.29			

2. "Algal "Terp" Scrubber"

Requested: \$61,570.00

<u>Submitted by</u>: American Ecological Engineering Society (Undergraduate Student)

<u>Summary</u>: The Algal "Terp" Scrubber is an algae-based water filtration device project designed by undergraduate students which aims to increase and enhance sustainable stormwater management practices on the UMD campus, provide an educational opportunity for the entire UMD community, and make UMD an innovator in green technology.

Benefits: Sustainability education, stormwater management, undergraduate innovation

<u>Support:</u> ENST Department (3 faculty), College of Agriculture and Natural Resources (Dean), Stormwater Management Inspector, Department of Landscape Architecture

Recommendation: Full Funding

Location

- •Located near Terrapin Trail Garage
- •Visible from garage
- •Little disruption to campus life
- •No conflict with Facilities Master Plan

 Next to Wooded Hillock; easy connection to sustainability principles





Design Renderings





The pump house and rhythmically dispensing surgers at the East end of the system.

Site topography and rendering consultation provided by Dr. Christopher Ellis, LARC

Algal Turf Scrubber, cont.

- Collaboration between multiple student groups (Engineers without Borders, AEES, ETE Scholars)
- Practical water filtration benefits on campus next to Terrapin Trail Garage
- Educational benefits in ecosystem services
- Innovation: project placed in top 10 nationally for EPA competition; first ATS installed on a university campus
- Awaiting decision from Architectural Land Review Board and Facilities Council after approval by Student Facilities Fund Review Board

(Potential) Funding Sources	Total Granted
Student Sustainability Fund Mini Grant 2017	\$500
Do Good Mini Grant 2018	\$500
Student Facilities Fund 2018	\$105,086 (tentatively voted)
Student Sustainability Fund 2019	\$61,570
Total (including deconstruction after 10 years)	\$167,656



Budget

Item #	Item Title	Description	Size	Price	Quantity	Total Cost
	Raceways:					
1	Black Raceway Paint	Jet Black Exterior Paint	5 Gal (2000 sq ft)	\$166.00	1	\$166.00
2	Screws for raceway panels	External Hex Head Lag Screw	5/16" x 1 1/2"	\$0.23	2000	\$460.00
3	Pond Liner	10'x100' 45mil EPDM	10'x100'	\$640.00	3	\$1,920.00
4	Screen	PLA Screen with 3mm gaps.	square yard	\$2.00	150	\$300.00
5, 6	Lumber	See cutting sheet	See cutting sheet	-	-	\$2,198.10
7	Steel Angle "Gusset plates"	Permanent attachment of angle beams	1.5" x 2" x 1-3/8"	\$0.40	112	\$44.80
8	Steel structure bolts	For steel angle fixation	5/16" x 1.5" long	\$0.25	448	\$112.00
9	Steel structure nuts	For steel angle fixation	5/16"	\$0.20	448	\$89.60
10a	Steel Angle (long)	Permanent structural material for raceways	2"x72"x1/8"	\$24.97	56	\$1,398.32
10b	Steel Angle (short)	Permanent structural material for raceways	2"x48"x1/8"	\$16.57	42	\$695.94
	Pump System:					
11	Water Pump	Convertible Well Jet Pump (cast Iron body; 31GPM, Max Head 90', 230V 8.5A)	18.19" * 10.24" * 10.04"	\$529.00	6	\$3,174.00
12	Circuit breakers for pumps	Layer of protection against power surges. Reusable.	-	\$54.87	1	\$54.87
13	Intake Basket	Attachment for the pond-side of the intake hose (keeps debris out of the pump system)	6" diameter; 1/8" holes; 2" intake	\$22.00	6	\$132.00
14	Retum pipe	Transports water from and returns to stromwater pond	4" diameter (carries 30-60gpm)	\$18.34	32	\$586.88
15	PVC 90 degree connectors	Breaks angles in water transport pipes	4" diameter	\$1.98	9	\$17.82
16	PVC coupling	Connects two straight lengthes of 4" PVC	4" internal diameter	\$2.09	13	\$27.17
17	Bell Siphon Boxes	Aparatus at the head of each ATS raceway which turns constant flow into rhythmic flow.	Made in-house and in-kind to fit system	\$300.00	3	\$900.00

	Cladding Options:				
18	Nailon Brick Siding Panels	Faux Brick Panels	44.5"x18.8"	\$30.43 207	\$6,229.00
				Materials	\$18,506.50
				5% Contingency	\$925.33
	Flow Way Total			Flow-way Total	\$19,431.83
	Contractor:				
20	"Install 84 4" sign posts"				\$16,750.00
22	Wooden Pump House	Contains and protects water pumps. Built with considerations to sound insulation and thermal constraints			\$6,000.00
24	"County permitting process"	"Does not include drawings"			\$1,000.00
				Deck/Installation	\$23,750.00
				5% Contingency	\$1,187.50
	Contracting Total			Contracting Total	\$24,937.50
	System Removal After Five Years				
25a	"Demolition/hauling of materials"	After 5 years			\$6,000.00
26a	"Regrade to original slope"	After 5 years			\$4,000.00
27a	"Removal of gravel"	After 5 years			\$4,000.00
	Cost of Removal After Five Years				\$14,000.00
	System Removal After Ten Years				
25b	"Demolition/hauling of materials"	After 10 years			\$8,000
26b	"Regrade to original slope"	After 10 years			\$4,600
27b	"Removal of gravel"	After 10 years			\$4,600
	Cost of Removal After Ten Years				\$17,200.00
		This ammount reflects the cost of the scientific/aglae producing component of the Algal "Terp" Scrubber installation as well as the deconstruction after 5 years .			
	ATS Essentials Total:	Other items, mainly the walkway, are being covered by other funding sources.			\$58,369.33

3. "A Smart, Connected, and Sustainable Campus Community"

<u>Requested</u>: \$50,000.00

Submitted by: Dr. Marccus Hendricks (Faculty)

<u>Summary</u>: This project would use an Internet of Things (IoT) framework along with low-cost sensors to monitor and improve stormwater management on the UMD campus. This project would provide real-time data that can inform both short term responses and longer-term adaptations to stormwater surface runoff.

<u>Benefits</u>: Undergraduate student involvement, regulatory efficiency, campus environmental performance improvements

Support: UMD iSchool, UMD Arboretum, Office of Environmental Affairs, Allen Davis (Civil Engineering)

Recommendation:

Full funding (\$42,710)

Revised proposal

 Initial problems: low undergraduate involvement, unclear placement of sensors, lack of collaboration with Facilities staff

•Revised over Winter 2019 to include undergrad student assistants, clarify sensor placement options, provide more detail on practical use

•Supported by Facilities Management staff; may provide proof-of-concept for flow and contaminant monitoring for stormwater compliance

Requested that sensors measure flow



Budget

	Summary Proposal Buc	lget				
	Project Title:	UMD Sustainaibili	ty Fund Prope	osal 2019		
	Project Period:	09/01/19-08/30/202	0			
					Year	1/Total
		Name	An Sal	% Effo	rt	
1.	Senior Personnel:					
	PI	Marccus Hendricks			\$	Ξ.
	CO PI	Gerrit Knaap			\$	1
	CO PI	Jennifer Cotting				
	Total Senior Personnel:				\$	-
2.	Other Personnel:					
			\$ /hour	# of Hrs	5	
	Hourly Student = \$/hrs	2 undergraduate	\$15.00	960	\$	14,400
		students	•			
	Total Other Personnel:				\$	14,400
	Total Salaries & Fringe B	enefits:			\$	14,400
	Other Direct Costs:		Cost per	of Sense	ors	
3	Research Equipment: IO	T sensors	\$5,975,25	4	s	23,901
	Libelium-Devicelvnk Smar	t Water Solution Kit				
	https://www.the-iot-market	nlace.com/libelium-devi	celvnk-smart-	water-solu	ition-k	tit#hardwa
	re-components		coryint bindre			
4.	Technical Support				\$	4,409
	Company technical consult class and student workers	ancy support for IOT ser	nsors/education	nal consu	lting fo	or UG
	class and statent workers					
	Total Other Direct Costs:				\$	28,310
	TOTAL PROJECT COST	TS:			\$	42,710

4. "ProMoss Treatment of ERC Cooling Towers, Cold Water and Hot Water Loops"

Requested: \$49,544.88

Submitted by: UMD RecWell (Staff)

<u>Summary</u>: This project would install sphagnum moss in the Eppley Recreation Center cooling towers, combined with an additional implementation into the buildings cold and hot water loops. The proposers anticipate removal of dispersants, removal of anti-corrosion additives, an increase in blowdown settings to save water, less cleaning/service of scale in cooling tower, and reduced levels of scale and corrosion in chillers and throughout the pipes within cold and hot water loops.

<u>Benefits</u>: Environmental performance improvement, cost savings

Recommendation:

Partial funding (\$24,000)

Details

- System would allow some of ERC's water to be filtered by sphagnum moss, which would remove some contaminants ar save water usage
- proposal resulted from UMD Energy Audit
- Sustainability tours include moss treatment in Eppley Pool; would be innovative solution to high water use
- RecWell would share costs of labor
- Partial funding: will request that UMD Facilities and RecWell contribute majority of funding





Budget

Cooling Towers and Condenser Loop

Cold Water Loop

Hot Water Loop

\$ 1,760.00\$ 9,757.44\$ 840.00

<u>\$ 3,868.00</u> \$16,225.44

\$ 1,370.00\$ 4,878.72\$ 1,060.00

<u>\$ 3,868.00</u>

\$11,176.72

1 Contact Chamber for Moss (stainless steel):	\$ 5,000.00
72 bags ProMoss™3 (1 year supply):	\$ 4,878.72
Associated Installation Materials:	\$ 1,260.00
(pad, flowmeter & filter, valves, piping, insulation)	
Installation Labor:	<u>\$ 2,828.00</u>
	\$13,966.72

Technical Support

CWS Project Engineering & Lab Support	\$ 3,300.00
(includes 2 on-site visits)	
UMD Student HVAC Assistant	<u>\$ 4,876.00</u>
(assist with ProMoss™ management, testing, pictures, documentation: 46 weeks@10 hrs/week@\$10.60/hr)	\$ 8,176.00

GRAND TOTAL: \$

\$49,544.88

5. Marketing and communications costs