

## RESEARCH AGREEMENT

**This Research Agreement** (the "Agreement") is entered into as of the date of the last signature of this Agreement (the "effective date") by POLK COUNTY (the "Sponsor"), a political subdivision of the State of Florida, with an office mailing address of 10 Environmental Loop South, Winter Haven, FL 33880, and Florida Polytechnic University Board of Trustees (the "University"), a public body corporate of the State of Florida, with a principal location of business at 4700 Research Way, Lakeland, FL 33805. The Sponsor and the University may be individually referenced throughout the Agreement as "Party," and collectively as the "Parties." Sponsor and University agree to the following:

### BACKGROUND

The University's research capabilities reflect a substantial public investment as part of its research and higher education mission. The research contemplated by this Agreement is aimed to produce results of mutual interest to the University and Sponsor by advancing the instruction, research, and public service missions of the University, and by potentially creating or enhancing technologies which may assist the Sponsor.

### SECTION 1 - RESEARCH WORK

- 1.1 Research Efforts. Sponsor hereby retains the University to perform the research and support (collectively, such services are the "Project") described in Exhibit 1, Scope of Work, which is attached and made a part of the Agreement, according to the standards of a United States institution of higher education and to the professional standards, if any, applicable to the Project services. The University shall use diligent efforts when performing the Project services.
- 1.2 Period of Performance. The period of performance for the Project will begin on April 7, 2026, and end on September 30, 2029.
- 1.3 Principal Investigator. The "Principal Investigator" is MALAK ANSHASSI of the University's Department of Environmental Engineering, who is responsible for the performance of the Project on behalf of the University. If MALAK ANSHASSI ceases to serve as Principal Investigator for any reason, the University shall promptly notify the Sponsor, and the University and Sponsor shall use good faith efforts to identify a mutually acceptable replacement within sixty (60) days. However, if the University cannot timely find a mutually acceptable replacement, then the University or Sponsor may terminate the Agreement.
- 1.4 Sponsor Technical Representative. The "Sponsor Technical Representative" is BRIAN COGSWELL, who is the Sponsor's principal representative for consultation and communications with the University and the Principal Investigator regarding technical matters that are involved

with the Project. Sponsor may change its Sponsor Technical Representative upon delivering ten (10) days' prior written notice to the University.

- 1.5 Consultation. The Sponsor Technical Representative may consult informally with the Principal Investigator in person, by telephone, or by electronic means regarding the Project. The University shall provide the Sponsor Technical Representative with reasonable access to University facilities where the Project is being conducted, but the Principal Investigator determines the exact time and manner of access.

**SECTION 2 - RECORDS AND REPORTS**

- 2.1 Records. The Principal Investigator shall prepare and maintain records containing the Research Results, including laboratory notebooks, in accordance with customary University practice. For the duration of this Agreement, at the convenience of the Principal Investigator, the Principal Investigator shall provide the Sponsor Technical Representative with reasonable access to research records.
- 2.2 Reports. The Principal Investigator shall deliver written reports to the Sponsor Technical Representative that assess the accomplishments of the Project as follows.

<u>Report Type</u>	<u>Due Date</u>
State of Practice Reports	As described in the Scope
Annual Material Flow Report	April 30, 2026 and April 1 <sup>st</sup> each year thereafter.

**SECTION 3 - COSTS, BILLINGS AND OTHER SUPPORT**

- 3.1 Total Funding. In consideration of the University performing the Project services and associated work, the Sponsor shall pay the University an amount not to exceed the sum of one-hundred and thirty-six thousand eight hundred and fifty dollars (\$136,850.00). This agreement is Fixed Price.

Lump sum Payments: \$27,370, US Dollars upon execution and \$27,370 every 6 months thereafter.

- 3.2 Payments. The Sponsor shall pay the University in accordance with the following schedule after receipt of a correct, fully documented invoice with applicable cost substantiations included:

<u>Amount</u>	<u>Date</u>
\$27,370	Upon execution of the Agreement
\$27,370	October 15, 2026
\$27,370	April 15, 2027
\$27,370	October 15, 2027
\$27,370	April 15, 2028

If Sponsor fails to timely pay University, then it will pay University interest on the unpaid balance as provided in Section 218.74, Florida Statutes. Sponsor shall pay the University for collection fees and legal fees that it incurs to collect outstanding balances.

3.3 Billing Addresses.

University shall send invoices to: Polk County Solid Waste Division  
 Attn: Division Director, Brian Cogswell  
[BrianCogswell@PolkFL.gov](mailto:BrianCogswell@PolkFL.gov) and  
 Accounts Payable ([WR-AP@PolkFL.gov](mailto:WR-AP@PolkFL.gov))

Sponsor shall remit payments to: Florida Polytechnic University  
 Student Business Services  
 4700 Research Way  
 Lakeland, FL 33805-8531  
 Email: [Accountsreceivable@floridapoly.edu](mailto:Accountsreceivable@floridapoly.edu)  
 Phone: 863-874-8730

Sponsor shall include the University Project number, GR-26POLK-MA, on all billing correspondence.

**SECTION 4 - PUBLICATIONS; CONFIDENTIAL INFORMATION; PROPRIETARY MATERIALS**

4.1 Publications.

(a) Policy. Under University policy, University researchers must have the freedom to publish research results in journals, theses, or dissertations and present the results at symposia or professional meetings. However, at least thirty (30) days prior to any submission for publication or presentation, University researchers will provide Sponsor copies of the proposed publication or presentation to allow Sponsor to determine whether patentable

subject matter or Sponsor's Confidential Information (defined in Subsection 4.2(a)) would be disclosed, or whether information exempt from disclosure pursuant to the State of Florida Public Records Law (Chapter 119, Florida Statutes), would be disclosed.

- (b) Patentable Subject Matter. If Sponsor determines within thirty (30) days after receipt of the copies that the proposed presentation or publication contains patentable subject matter which needs protection, or information exempt from disclosure pursuant to the State of Florida Public Records Law, the researcher(s) shall refrain from making the presentation or publication for a maximum of three (3) months in order for the University to file patent application(s).
- (c) Confidential Information. If Sponsor determines within thirty (30) days after receipt of the copies that the proposed presentation or publication contains Sponsor's Confidential Information, the researcher(s) shall delete Sponsor's Confidential Information and any other information exempt from disclosure pursuant to the State of Florida Public Records Law.
- (d) Publication. If the Sponsor does not respond within the thirty (30) days, the researcher(s) may proceed with the presentation or publication.

#### 4.2 Confidential Information.

- (a) Definition. "Confidential Information" means any confidential or proprietary information furnished by one Party ("Disclosing Party") to the other ("Receiving Party") in connection with the Project that is specifically marked as confidential or followed up in writing to document its confidentiality as soon as possible but no more than fifteen (15) days after disclosure.
- (b) Obligations. For three (3) years after disclosure of Confidential Information, the Receiving Party may only disclose Confidential Information to its directors, officers, employees, consultants, and contractors who are obligated to maintain its confidentiality and who need to know Confidential Information for the performance of the Project. The University may refuse to accept any Confidential Information offered by the Sponsor.
- (c) Exceptions. The obligations of Subsection 4.2(b) do not apply to information that the Receiving Party can demonstrate (i) is publicly available; (ii) is independently known, developed, or discovered without use of Confidential Information; (iii) is made available by a third party without a known obligation of confidentiality to the disclosing Party; (iv) is required to be disclosed to comply with a law, regulation, or court or administrative order provided that the receiving Party uses reasonable efforts to provide prior written notice of the disclosure.

- (d) Ownership and Return. The Disclosing Party (or a third party entrusting its information to the disclosing Party) owns its Confidential Information. Upon expiration or termination of this Agreement or at the request of the Disclosing Party, the Receiving Party shall return all originals, copies, and summaries of Confidential Information in its possession or control, except that the Receiving Party may retain one (1) copy of the Confidential Information for the purpose of monitoring its obligations under this Agreement and such additional copies of or any computer records or files containing such Confidential Information that have been created solely by the Receiving Party's automatic archiving and back-up procedures, to the extent created and retained in a manner consistent with the Receiving Party's standard archiving and back-up procedures, but not for any other use or purpose.
- (e) Florida Public Records Law. The parties acknowledge their respective obligations under Article I, Section 24, of the Florida Constitution, and under Chapter 119, Florida Statutes, to release public records to members of the public upon request and that the constitutional and statutory provisions control over the terms of this Agreement. In association with its performance pursuant to this Agreement, neither party will release or otherwise disclose the content of any documents or information that are specifically exempt from disclosure pursuant to all applicable laws, including any confidential and exempt information described in Section 1004.22(2), Florida Statutes.

## **SECTION 5 -- PROJECT INTELLECTUAL PROPERTY**

### **5.1 Definitions.**

- (a) "Intellectual Property" means discoveries, inventions, improvements, and prototypes, whether patentable or not, including software, copyrighted and copyrightable works other than publications and reports, trademarks, and service marks, which are conceived or made during performance of the Project.
- (b) "Background Intellectual Property" means any intellectual property owned or controlled by a Party prior to the Effective Date or conceived outside of the research conducted under this Agreement. Neither Party shall have any claims to or rights in Background Intellectual Property of the other Party.
- (c) "Research Results" means data and technical information that are obtained in performance of the Project. Research Results are expressly excluded from the definition of Intellectual Property.

- 5.2 Ownership. The University owns Intellectual Property that is conceived or made solely by employees of the University ("University Intellectual Property"). Sponsor owns all Intellectual

Property that is conceived or made solely by employees of Sponsor ("Sponsor Intellectual Property"). University and Sponsor jointly own Intellectual Property that is conceived or made jointly by employees of University and Sponsor ("Joint Intellectual Property").

5.3 Disclosure. University shall provide Sponsor with written disclosure of University Intellectual Property promptly after it is disclosed by a University employee to the University's Provost ("Tech Licensing"). Sponsor shall provide Tech Licensing with a written disclosure of any Sponsor Intellectual Property promptly after it is disclosed by a Sponsor employee to Sponsor. Each Party shall retain all Intellectual Property disclosures submitted by the other Party in confidence.

5.4 Patent Rights.

(a) University Responsibility. If Sponsor directs that a patent application for University Intellectual Property or Joint Intellectual Property be filed, University shall promptly prepare, file, and prosecute, at the expense of Sponsor (subject to Subsection 5.4(c)), patent rights for that Intellectual Property, using patent counsel reasonably acceptable to Sponsor. Sponsor and University shall cooperate to ensure that patent applications cover, to the best of Sponsor's knowledge, all items of commercial interest and importance. While the University is responsible for making decisions regarding the scope and content of the patent applications, the Sponsor may review and provide input. University shall keep Sponsor reasonably apprised as to developments with respect to the patent applications and shall promptly supply to Sponsor copies of all papers received and filed in connection with the prosecution. If the Sponsor decides to discontinue the financial support of the patent applications, the University may file or continue prosecution and maintain any protection in the United States and any foreign countries at the University's sole expense with no further obligation to the Sponsor.

(b) Cooperation. University and Sponsor shall cooperate in the preparation, filing, prosecution, and maintenance of all patent rights for University Intellectual Property and Joint Intellectual Property. Cooperation includes (i) promptly executing or requiring employees to execute papers and instruments as reasonable and appropriate; and (ii) promptly informing the other Party of matters that may affect the preparation, filing, prosecution, or maintenance of those patent rights.

(c) Payment of Expenses. Within thirty (30) days after the University invoices the Sponsor, Sponsor shall reimburse the University for all reasonable patent-related expenses incurred by the University pursuant to Subsection 5.4(a). Sponsor may elect, upon sixty (60) days' advance written notice to University, to cease payment of the expenses associated with obtaining or maintaining that patent protection for one or more patent rights in one

or more countries. In that event, Sponsor loses all rights under this Agreement with respect to patent rights in those countries.

- 5.5 Option Rights. University grants Sponsor a first right to negotiate a worldwide, royalty-bearing, exclusive license to University Intellectual Property or to University's rights in Joint Intellectual Property (the "Option Right"). The Sponsor's right commences when the University notifies Sponsor pursuant to Section 5.3 and expires ninety (90) days later ("Option Period"). Sponsor may exercise the Option Right by written notice to Tech Licensing during the Option Period. If Sponsor does not exercise the Option Right during the Option Period, University may license its commercial rights under the relevant Intellectual Property to any third parties. If Sponsor exercises the Option Right, Tech Licensing and Sponsor shall negotiate in good faith a license agreement with commercially reasonable terms. If the Parties fail to execute a license to University Intellectual Property or to University's rights in Joint Intellectual Property within six (6) months after Sponsor's exercise of the Option Right, University has no further obligation to Sponsor for that Intellectual Property.
- 5.6 Licenses. In any license Tech Licensing grants to Sponsor for University Intellectual Property or for University's rights in Joint Intellectual Property, among other customary license terms, the Parties shall include terms to obligate Sponsor to (a) develop the Intellectual Property diligently for practical application and (b) pay all patent costs.
- 5.7 Use of Research Results. Each Party may use Research Results for any purpose. However, in the case of Sponsor, the use may not infringe any claim of a patent application or an issued patent included in University Intellectual Property rights for which Sponsor has failed to obtain a license as provided in Section 5.5.
- 5.8 Copyrightable Works. University or its employees own any copyrighted or copyrightable works (including reports and publications) that are created by University employees in the performance of the Project. University and the Principal Investigator grant Sponsor an irrevocable, royalty-free, nontransferable, non-exclusive right to copy and distribute, for internal purposes only, any research reports that are furnished to Sponsor under this Agreement.
- 5.9 Research Partially Funded by Third Parties. If any patentable invention in the Intellectual Property has been funded by the federal government, this Agreement and the grant of any rights in that invention are governed by federal law set forth in 35 U.S.C. §§ 201-211 and corresponding regulations, as amended, or any successor statutes and regulations. If any Intellectual Property has been funded by a non-profit organization, state or local agency, this Agreement and the grant of rights in that Intellectual Property are subject to the terms of the applicable agreement. If any term of this Agreement fails to conform to applicable law, regulations, or agreements, the relevant term is invalid, and the Parties shall modify the term.

## SECTION 6 - PUBLICITY

- 6.1 The Sponsor may not use the name of the University or of any member of the University's Project staff in any publicity, advertising, or news release without the prior written consent of University. The University may not use the name of the Sponsor or any employee of the Sponsor who is involved in the Project in any publicity, advertising, or news release without the prior written consent of Sponsor, which may be withheld in its discretion.
- 6.2 University is required by Section 1004.22 of the Florida Statutes to make available upon request the title and description of the Project, the name of the Principal Investigator, the name of the Sponsor, and the amount of funding.

## SECTION 7 - WARRANTY DISCLAIMER

- 7.1 UNIVERSITY MAKES NO EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES AS TO ANY MATTER RELATING TO THIS AGREEMENT, INCLUDING THE PERFORMANCE OR RESULTS OF THE PROJECT; THE AVAILABILITY OF LEGAL PROTECTION FOR RESEARCH RESULTS, INVENTIONS, OR ANY OTHER WORK PRODUCT OF THE PROJECT; OR THE VALIDITY OR ENFORCEABILITY OF ANY INTELLECTUAL PROPERTY PROTECTION THAT MAY BE OBTAINED PURSUANT TO THIS AGREEMENT. UNIVERSITY PROVIDES NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE FOR ANY RESEARCH RESULTS OR INTELLECTUAL PROPERTY RIGHTS.
- 7.2 Each Party shall be responsible for the negligent acts or omissions of itself and its own employees or agents while acting within the scope of their employment during the term of this Agreement. Neither Party shall be liable for the negligent acts or omissions of the other Party or the other Party's employees or agents. Each party's liability is limited as provided under Section 768.28, Florida Statutes, and does not extend to the other Party or to any third parties.

## SECTION 8 - TERMINATION

- 8.1 Termination. Either Party may terminate this agreement without cause upon sixty (60) days' prior written notice to the other.
- 8.2 Termination for Breach. If either Party commits a material breach of this Agreement and fails to remedy that breach within sixty (60) days after receipt of written notice from the other Party, the Party giving notice may terminate this Agreement by written notice to the other Party, effective upon receipt.
- 8.3 Surviving Terms. Expiration or termination of this Agreement by either Party does not affect the rights and obligations of the Parties that accrued prior to the effective date of termination, except

that Sponsor's rights under Section 5 do not survive termination for non-payment of any amounts due under this agreement or any other material breach by Sponsor. Except in the case of material breach by Sponsor, expiration or termination of this Agreement does not affect the Parties' rights and obligations under Sections 3, 4, 6, 7, 8, and 10.

- 8.4 Payments on Termination. Upon early termination of this Agreement by either Party for any reason, the University will cease further obligation of funds for Project services and will take all reasonable steps to cancel or otherwise reduce outstanding obligations. Except for any amounts that are in dispute, Sponsor will pay the University for either (a) a percentage of those Project services completed as of the termination date, or (b) deliverable(s) completed to the date of termination, and (c) any non-cancellable obligations incurred on or before the date of termination pursuant to Section 3. University will refund any portion of SPONSOR advance payments not obligated pursuant to (a), (b), and (c).
  
- 8.5 Obligations on Termination. Upon any termination, the University will deliver to the Sponsor all data, reports, summaries, and any and all such other information and materials of whatever type or nature as may have been accumulated by the University in performing the Project work, whether completed or in process.

**SECTION 9 - NOTICES**

The Parties shall provide notices for this Agreement in writing by email, recognized national overnight courier, or registered or certified mail, postage prepaid, return receipt requested, to the following addresses:

<p>If to Sponsor</p> <p>Administrative: Polk County Solid Waste Division</p> <p>Attn: Director 10 Environmental Loop South Winter Haven, FL 33880 <a href="mailto:BrianCogswell@PolkFL.gov">BrianCogswell@PolkFL.gov</a></p>	<p>If to University:</p> <p>Administrative: Florida Polytechnic University Office of Research Services</p> <p>4700 Research Way Lakeland, FL 33805-8531 <a href="mailto:jaysmtih@floridapoly.edu">jaysmtih@floridapoly.edu</a> (863) 874-8585</p>
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**SECTION 10 – LEGAL RESPONSIBILITIES**

- 10.1 Independent Contractor. University and Sponsor are independent contractors. Neither Party may act as agent for the other or enter into any contract, warranty, or representation on behalf of the other. Neither Party is bound by the acts or conduct of the other.
- 10.2 Liability. Each party is responsible for all personal injury and property damage attributable to the negligent acts or omissions of that party and the officers, employees, and agents thereof, acting in the scope of their employment or agency.
- 10.3 Governing Law. This Agreement is governed and construed in accordance with the laws of the State of Florida. The Parties shall bring any action in connection with this Agreement in courts of competent jurisdiction located in Polk County, Florida.
- 10.4 Assignment. Neither Party may assign this Agreement voluntarily, by operation of law, or through change of control without the prior written consent of the other, which the Party may not unreasonably withhold or delay. This Agreement is binding upon and inures to the benefit of the Parties and their permitted successors and assigns.
- 10.5 Agreement Modification; Waiver. The Parties may only modify this Agreement by a written instrument signed by both Parties. Any waiver of rights or failure to act in a specific instance relates only to that instance and is not an agreement to waive any rights or fail to act in any other instance. A Purchase Order may only be used for billing purposes. No other terms of this Agreement may be modified by terms included in a Purchase Order. The terms and conditions of such a Purchase Order do not apply, and such terms or conditions in a Purchase Order are null and void.
- 10.6 Force Majeure. Neither Party is responsible for delays resulting from causes reasonably beyond its control, including fire, explosion, flood, tropical storm, hurricane, war, strike, or riot, provided that the nonperforming Party uses commercially reasonable efforts to avoid or remove causes of nonperformance and continues performance under this Agreement with reasonable dispatch after the causes are removed.
- 10.7 Export Controls. The Parties shall comply with United States export control laws and regulations that apply to information and materials that are exchanged under this Agreement. Sponsor shall notify the University before providing the University with any export-controlled information or materials.
- 10.8 Dispute Resolution. The parties shall attempt to cooperatively resolve any and all disputes and/or claims that arise under this Agreement by first engaging the highest appropriate administrative officials of each Party, who shall negotiate in good faith to seek a cooperative resolution. For any dispute related to this Agreement that the Parties cannot resolve by mutual agreement, the

Parties shall seek agreement through formal mediation conducted either in Lakeland or in Bartow, Florida, failing which either Party may pursue any remedies legally available.

- 10.9 Compliance with Laws and Regulations. In conducting all Project work, University shall abide by all applicable statutes, ordinances, rules, and regulation pertaining to or regulating the provisions of such work, including those currently in effect and those hereafter adopted. Any violation of such statutes, ordinances, rules, or regulations shall constitute a material breach of this Agreement, and shall entitle the Sponsor to immediately terminate the Agreement upon delivery of written notice to University.
- 10.10 Attorneys' Fees and Costs. Each party shall be responsible for its own legal and attorneys' fees, costs, and expenses incurred with any dispute or litigation arising out of, or related to this Agreement including those incurred in mediation and for any appellate proceedings.
- 10.11 Limit of Liability. IN NO EVENT SHALL EITHER PARTY BE LIABLE TO THE OTHER FOR INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES OF ANY KIND OR NATURE, INCLUDING LOSS OF PROFIT, WHETHER FORESEEABLE OR NOT, ARISING OUT OF OR RESULTING FROM THE NONPERFORMANCE OR BREACH OF THIS CONTRACT WHETHER BASED IN CONTRACT, COMMON LAW, WARRANTY, TORT, STRICT LIABILITY, CONTRIBUTION, INDEMNITY, OR OTHERWISE.
- 10.12 Annual Appropriations. University acknowledges that during any fiscal year the Sponsor shall not expend money, incur any liability, or enter into any agreement which by its terms involves the expenditure of money in excess of the amounts budgeted as available for expenditure during such fiscal year. Accordingly, any agreement, verbal or written, the Sponsor may make in violation of this fiscal limitation is null and void, and no money may be paid on such agreement and the agreement will be terminated. The Sponsor may enter into agreements whose duration exceeds one year; however, any such agreement shall be executory only for the value of the services to be rendered which the Sponsor agrees to pay as allocated in its annual budget for each succeeding fiscal year. Accordingly, the Sponsor's performance and obligation to pay the University under this Agreement is contingent upon annual appropriations being made for that purpose.
- 10.13 Severability. If any provision of this Agreement is held invalid or unenforceable for any reason, the invalidity or unenforceability does not affect any other provision of this Agreement, and the Parties shall negotiate in good faith to modify the Agreement to preserve (to the extent possible) their original intent.
- 10.14 Entire Agreement. This Agreement constitutes the entire agreement between the Parties with respect to its subject matter and supersedes all prior agreements or understandings between the Parties relating to its subject matter.

- 10.15 Counterparts and Execution. The Parties may execute this Agreement in one or more counterparts, each of which is an original, and all of which together are the same instrument. This Agreement may be stored by electronic means and either an original or an electronically stored copy of this Agreement can be used for all purposes, including in any proceeding to enforce the rights and/or obligations of the parties to this Agreement.
- 10.16 Headings. Headings are for convenience and do not affect the meaning of any provision of this Agreement.

[Signatures to follow on next page]

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized representatives.

Polk County, a political subdivision of the State of Florida

By: \_\_\_\_\_

Martha Santiago, Ed. D, Chair  
Board of County Commissioners

Date: \_\_\_\_\_

ATTEST:

STACY M. BUTTERFIELD  
Clerk to the Board

Reviewed as to form and legal sufficiency:

By: \_\_\_\_\_

Deputy Clerk

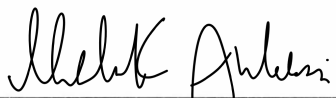
\_\_\_\_\_  
County Attorney's Office

Florida Polytechnic University Board of Trustees

  
\_\_\_\_\_  
Jay Smith, Director of Grants Administration

3/17/26  
Date

I have read and approve this Agreement, and understand my rights, title, and/or interests in any intellectual property pursuant to University Policy FUP-1.0061P.

 3/17/26  
\_\_\_\_\_  
Malak Anshassi, Ph.D.  
Principal Investigator

## Exhibit 1

### *Scope of Work*

#### **Advancing Sustainable Waste Management: Innovation, Market Strategy, and Operational Mapping for Polk County**

**Prepared for:**

Polk County Solid Waste Division

**Prepared by:**

Dr. Malak Anshassi, Assistant Professor  
Department of Environmental Engineering  
Florida Polytechnic University (FPU)

**Scope:**

Polk County seeks to strengthen long-term strategic planning and improve operational transparency in its solid waste and recycling systems. This project integrates applied research with annual operational support to develop state-of-practice reports, evaluate renewable energy integration on landfill infrastructure, assess curbside recycling market alignment, enhance mapping of recycling flows, and support annual reporting requirements to the Florida Department of Environmental Protection (FDEP).

This three-year research contract will support the Polk County Solid Waste Division through two integrated components:

1. **Innovation & State-of-Practice Research Program:** Development of three comprehensive state-of-practice reports focused on emerging and applicable waste management innovations.
2. **Operational Mapping & Recycling Reporting Support:** Annual technical support to map recycling and solid waste flows in Polk County and assist with required reporting for the FDEP Solid Waste Annual Waste Management Report.

The project is designed to bridge long-term strategic innovation with near-term operational decision-making.

**Project Objectives:**

- Provide decision-making ready state-of-practice research tailored to Polk County conditions.
- Identify feasible, scalable innovations in waste management.
- Enhance data transparency through mapping of recycling contractors, material flows, and infrastructure.
- Support FDEP-required annual solid waste reporting with improved accuracy and analytical depth.
- Strengthen Polk County's ability to implement targeted recycling and local circular economy strategies.

## **Overview of Tasks:**

### **PART I – INNOVATION AND STATE-OF-PRACTICE RESEARCH PROGRAM**

FPU (Dr. Anshassi) shall prepare three (3) State-of-Practice Reports over the three-year term. Each report may include literature review, benchmarking, regulatory review, technical feasibility assessment, economic analysis, Polk County applicability, and implementation roadmap.

#### **Task 1 – Solar Applications on Landfill Final Cover (Year 1)**

Evaluate feasibility of solar deployment on landfill final cover systems, including Phase 3 facing the Parkway. Assess structural considerations, ballasted versus anchored systems, thin-film solar technologies, regulatory compliance, and potential to power constructed wetlands, administrative facilities, or on-site operations. Provide conceptual design and cost-benefit analysis.

##### **Key Questions:**

- What is the current state of practice for landfill solar installations?
- Are film-based or lightweight solar panels viable for Polk County conditions?
- What revenue or cost-offset potential exists?
- What are regulatory and closure compliance implications?

#### **Task 2 – State of Innovative Waste Management Practices (Year 2)**

Evaluate emerging and innovative waste management approaches across municipal solid waste, organics, construction and demolition materials, and special waste streams. Identify pilot-ready and scalable innovations and develop an Innovation Roadmap for Polk County.

##### **Key Questions:**

- What innovative approaches are currently being implemented nationally?
- Which waste streams present the highest opportunity for improved management in Polk County?
- What scalable pilot projects could be deployed locally?

#### **Task 3 – State of Practice in Curbside Recycling Markets (Year 3)**

Analyze recycling materials historically collected in Polk County, identify materials lacking stable markets, assess opportunities for local manufacturers to use recycled feedstock, and evaluate targeted recycling strategies aligned with market demand. Provide policy and economic development recommendations.

##### **Key Questions:**

- Where are we currently in terms of recycling markets?
- Which materials lack viable markets?
- What if manufacturers in Polk County used recycled materials as feedstock?
- Can the County implement targeted recycling programs aligned with market demand?
- What policy or procurement strategies could stimulate local end-use markets?

**PART II – OPERATIONAL SUPPORT AND ANNUAL RECYCLING MAPPING**

FPU (Dr. Anshassi) shall provide annual operational mapping and reporting support aligned with FDEP reporting requirements.

**Task 4 – Annual Recycling and Contractor Mapping**

Annually identify and map recycling contractors, disposal facilities, material recovery facilities, end-use destinations, and recycling generators where data is available.

**Task 5 – Annual Material Flow Quantification**

Quantify recycling amounts by residential, commercial, construction and demolition, organics, and special waste streams. Categorize by material type, conduct year-over-year trend analysis, and identify system gaps.

**Task 6 – FDEP Reporting Support**

Provide technical and analytical support to assist Polk County in meeting annual reporting requirements to FDEP, including data validation, analytical summaries, charts, tables, and documentation.

**Meetings and Coordination**

FPU (Dr. Anshassi) shall conduct quarterly coordination meetings, provide progress updates, and present findings annually to County staff and stakeholders.

**Deliverables, Timeline, and Budget:**

The project deliverables are as stated in the table below.

**Schedule of Deliverables:**

<b>Deliverable</b>	<b>Year 1 (2026-2027)</b>	<b>Year 2 (2027-2028)</b>	<b>Year 3 (2028-2029)</b>
Landfill Solar Feasibility Report (Task 1)			
Innovative Waste Management Report (Task 2)			
Curbside Recycling Market Report (Task 3)			
Annual Material Flow Report (Task 4 and 5)			
FDEP Reporting Support (Task 6)			

Each Part I State-of-Practice Report shall be due no later than December 31<sup>st</sup> of the year the respective report is due. Each Part II Annual Deliverable shall be due no later than April 30, 2026 and April 1<sup>st</sup> of each year thereafter in the Period of Performance.

An overview of the major budget categories and their estimated costs are provided below.

Budget:

<b>Budget Category</b>	<b>Year 1 (2026- 2027)</b>	<b>Year 2 (2027-2028)</b>	<b>Year 3 (2028- 2029)</b>	<b>Total (2026-2029)</b>
<i>Personnel</i>				
Principal Investigator (PI)	\$21,111	\$21,744	\$22,397	\$65,252
Undergraduate Students	\$7,800	\$10,712	\$11,033	\$29,545
<i>Faculty (PI) Fringe</i>	\$3,948	\$4,066	\$4,188	\$12,202
<i>Travel Domestic (conferences, landfill-MRF visits, symposiums)</i>	\$2,000	\$2,000	\$2,000	\$6,000
<i>Materials and Supplies (software, database access)</i>	\$2,000	\$2,000	\$2,000	\$6,000
<i>Indirect Costs (15%)</i>	\$5,529	\$6,079	\$6,243	\$17,851
<b>Total</b>	<b>\$42,388</b>	<b>\$46,601</b>	<b>\$47,861</b>	<b>\$136,850</b>