THE Water Research FOUNDATION

FOCUS AREA RFP

This project is being funded through the Focus Area Program, which enables WRF to solve broadly relevant subscriber issues and challenges with a targeted, sustained research effort. The program is developed around research Focus Areas: a topic area that is of high interest and priority to WRF subscribers because of a challenge or opportunity that is present, emerging, or anticipated, and for which research will help subscribers manage and address the challenge or optimize the opportunity. A focus area includes a discrete challenge or opportunity statement, measurable objectives, and one or more projects that will lead to applied solutions and benefits for WRF subscribers within a specified, relevant time frame.

This project is funded under the Focus Area titled, ***Source Separated Organic Feedstock Pre-Treatment and Management Practices*** *and is intended to support the Focus Area objective(s):*

- ***Feedstock characterization and analysis methods***
- ***Pre-treatment technologies and management strategies***
- ***Impacts on Operation of WRRFs (biosolids and return flows)***
- ***Implementation, Guidance, and Tools***

Characterization and Contamination Testing of Source Separated Organic Feedstocks and Slurries for Co-Digestion at Resource Recovery Facilities (RFP #4915)

Project Objective

The objectives of this project are to identify, evaluate, and develop techniques for characterizing source separated organic (SSO) feedstocks and slurries for co-digestion at resource recovery facilities and testing them for contamination; to link characteristics to product quality; and support development of minimum feedstock quality standards for various product goals and standardization of sampling protocols for rapid monitoring of feedstocks.

Budget

Proposals may request WRF funds in the range of $300,000 - $340,000. WRF funds requested and total project value will be a criteria considered in the proposal selection process.

Background

Co-digestion with organic feedstocks are practiced at water resource recovery facilities (WRRF) to improve digester performance, increase methane production for energy generation, and potentially decrease operating costs through receipt of tipping fees and offset of energy costs. The highest increase in biogas production values have been recognized from (liquid/lower solids) high strength organic wastes, such as food processing wastes, and fats, oils, and greases. Thus, most operational practice and process optimization research has focused on (liquid/lower solids) high strength organic wastes streams. However, a shifting regulatory landscape is leading WRRFs to evaluate co-digestion with residential and commercial food waste from both pre-consumer and post-consumer waste (source separated organic (SSO)) feedstocks. For purposes of this project, SSO feedstock is defined as originating from commercial generators such as restaurants (excluding grease), commercial kitchens and cafeterias, grocery stores, food distribution centers, and residential generators separated from other wastes at the source. Existing research on SSO co-digestion focuses on anaerobic digestion operational strategies and processes, and there is minimal information on feedstock pre-treatment, characterization and management of

contaminants, overall pre-treatment implementation and monitoring, and assessment of pre-treatment feasibility.

As a first step, there is a need to evaluate techniques available for characterizing feedstock quality and testing for potential contamination. Such an evaluation will support the development of rapid screening techniques and sampling protocols that can be used for quality control in acceptance of feedstock deliveries, identification of pre-treatment needs, and feedstock monitoring. The waste industry may have procedures that can be adopted, or methods may need to be developed. Characterization and testing methods also need to be evaluated for slurry going into digesters after pre-treatment. Desired characteristics include physical (e.g., size distribution and grit), chemical, microbial (e.g., antibiotic resistant genes), and bioavailability to predict biogas potential. Characterization and testing of multiple slurry samples can then be used to link slurry characterization to the quality of various products (digestate, compost, biosolids, biogas, etc.) to support development of minimum feedstock quality standards for various product goals. It will also help define SSO contamination and characteristics that could impact land application or otherwise negatively impact products, digestion, or facility operations.

Research Approach

In order to achieve the objectives, researchers are expected to do the following, at minimum:

- Standardized terminology and metrics
- Identify techniques for characterizing SSO feedstocks, the organic fraction of municipal solid waste (OFMSW), waste, and slurries for co-digestion after pre-treatment
    - May be done through a literature review, surveys, and/or work with the waste industry, depending on availability of information for each type of material
    - Should include both conventional and innovative techniques
    - Desired characteristics and level of contamination, at a minimum, include:
        - Physical: TS, VS, FS, grit, size distribution
        - Chemical: TCOD, SCOD, VFA, TP, TKN, S, C:N:P ratios, siloxanes, etc.
        - Microbial: toxicity
        - Bioavailability (to predict biogas potential): specific methanogenic activity, anaerobic toxicity assay, water extractable phosphorus
        - Emerging parameters of interest: plastics, etc.
    - Should include parameters used in process models (e.g., ADM1, BioWin)
        - Organic substrates (e.g., hemicelluloses, cellulose, lignin) as determined from by relative solubility in ethanol and neutral detergent-soluble carbohydrates (NDSC) analysis
- Evaluate the suitability of SSO characterization methods for their potential to be used for quick screening of feedstock deliveries for quality control purposes and adapt or develop techniques if necessary
- Evaluate characterization and contamination testing methods for slurries and adapt or develop techniques if no suitable methods currently exist
- Apply recommended techniques to characterize multiple samples of SSO feedstocks and slurries
- Compare SSO and slurry characteristics to the quality of various end products
    - End products should include digestate, compost, biosolids, biogas, etc.
    - Compare and contrast slurry created from SSO versus from MSW

- Identify characteristics that could impact land application or otherwise negatively impact products, digestion, or facility operations and use this information to define SSO contamination and identify what needs to be removed via pre-treatment
- Develop minimum feedstock quality standards, with emphasis on contamination levels, for various product goals.

Proposal Preparation Instructions

Proposals submitted in response to this RFP must be prepared in accordance with the Water Research Foundation document "Guidelines for Focus Area Program Proposals." The most current version of these guidelines is available at http://www.waterrf.org/funding/Pages/proposal-guidelines.aspx . The guidelines contain instructions for the technical aspects, financial statements and administrative requirements that the applicant must follow when preparing a proposal.

Eligibility to Submit Proposals

This RFP solicits proposals from all technically qualified U.S. based or non-U.S. based applicants, including educational institutions, research organizations, federal or state agencies, local municipalities, and consultants or other for-profit entities*. (If there is any funding from non-WRF sources, check with WRF Grants Management regarding possible eligibility restrictions)*

WRF's Board of Trustees has established a Timeliness Policy that addresses researcher adherence to project schedule. The policy can be reviewed at http://www.waterrf.org/funding/Pages/policies.aspx. Researchers who are late on any ongoing WRF-sponsored studies without an approved no-cost extension are not eligible to be a named participant in any proposal. If you have any questions about your eligibility for WRF projects, please contact the WRF Research Manager listed at the bottom of the RFP.

Administrative, Cost and Audit Standards

WRF's Focus Area Program standards for administrative, cost and audit compliance are based upon and comply with Office of Management and Budget (OMB) Uniform Grants Guidance (UGG), 2 CFR Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, and 48 CFR 31.2 Contracts with Commercial Organizations. These standards are referenced in the WRF's "Guidelines for Focus Area Program Proposals" and include specific guidelines outlining the requirements for Indirect Cost Negotiation Agreements, Financial Statements and the Statement of Direct Labor, Fringe Benefits and General Overhead. Inclusion of indirect costs must be substantiated by a negotiated agreement or appropriate Statement of Direct Labor, Fringe Benefits and General Overhead. Well in advance of preparing the proposal, your financial staff should review the detailed instructions included in WRF's annually released "Guidelines for Focus Area Program Proposals."

Budget and Funding Information

The funding available from WRF for this project is in the range of $300,000 - $340,000. A minimum 25 percent of the total project value must be contributed by the applicant (i.e. the applicant's minimum contribution must equal one-third of WRF funds requested). Acceptable forms of applicant contribution include cost-share, applicant in-kind or third-party in-kind that comply with 2 CFR Part 200.306 Cost sharing or matching. The applicant may elect to contribute more than 25 percent to the project but the

maximum WRF funding available remains fixed at $340,000. **Proposals that do not meet the minimum 25 percent of the total project value will not be accepted.**

Period of Performance

The proposed project schedule should be realistic, allowing ample time for the preparation of final reports and for review of project results. It is WRF's policy to negotiate a reasonable schedule for each research project. Once this schedule is established, WRF and its sub-recipients have a contractual obligation to adhere to the agreed-upon schedule. Under WRF's No-Cost Extension Policy, a project schedule cannot be extended more than nine months beyond the original contracted schedule, regardless of the number of extensions granted. The policy can be reviewed at http://www.waterrf.org/funding/Pages/policies.aspx.

Utility and Organization Participation

WRF is especially interested in receiving proposals which include both participation and contribution of resources from water utilities and organizations in the research effort. Information on utilities and/or organizations that have indicated an interest in participating in this research project are listed on the last page of this RFP. While WRF makes utility and organization participation volunteers known to applicants, it is the applicant's responsibility to negotiate utility and organization participation in their particular proposal, and the utilities and/or organizations are under no obligation to participate.

Application Procedure and Deadline

Proposals are now being accepted exclusively online in PDF only format and must be fully submitted before August 22, 2018, 5pm Mountain Time. All the forms and components of the proposal are available online in the "Proposal Component Packet" zip file. A login is required to download this packet and use the proposal website. This information is available at https://proposals.waterrf.org/Pages/RFPs.aspx

The online proposal system allows submission of your documents until the date and time stated in the RFP. To avoid the risk of the system closing before you press the submit button, do not wait until the last minute to complete your submission.

Questions to clarify the intent of this Request for Proposals and WRF's administrative, cost and financial requirements may be addressed to the Research Manager, Stephanie Fevig, at 303.347.6103 or by e-mail at sfevig@waterrf.org.

4915 UTILITY AND ORGANIZATION PARTICIPANTS

The following utilities have indicated an interest in possible participation in this research. This information is updated within 24 business hours when a utility submits a volunteer form and this RFP will be re-posted with the new information. **(Depending upon your settings, you may need to click refresh on your browser to load the latest file.)**

Jennifer Loudon
Lab Manager
Raritan Township MUA
365 Old York Road
Flemington, NJ 08822
USA
908.782.7453 ext. 19
jloudon@rtmua.com

Donna Serrati
Manager, Engineering
Region of Waterloo
20 Weber St
Kitchener, Ontario N2H 1C3
Canada
519.575.4774
dserrati@regionofwaterloo.ca

Nikos Melitas
Divison Engineer
Los Angeles County Sanitation Districts
1955 Workman Mill Rd
Whittier, CA 90601
USA
562.908.4288 ext. 2816
nmelitas@lacsd.org

Kate Dunlap
Source Water Quality Program Coordinator
City of Boulder
5605 N. 63rd St.
Boulder, CO 80301
USA
303.413.7402
dunlapk@bouldercolorado.gov

Ryan Williams
Water Quality Manager
Weber Basin Water Conservancy District
2837 East Highway 193
Layton, Utah 84040
USA
801.614.5314
rwilliams@weberbasin.com