

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2011	2012	2013	2014	2015
Capital Expenditures	<u>\$9,000.00</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
External Revenues	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Program Income (County)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
In-Kind Match County	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
NET FISCAL IMPACT	<u>\$9,000.00</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
# ADDITIONAL FTE POSITIONS (Cumulative)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

Budget Account No.: Fund 4001 Agency 720 Org. 1110 Object 5412

Is Item Included in Current Budget? Yes X No

Reporting Category

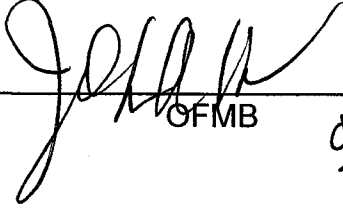

B. Recommended Sources of Funds/Summary of Fiscal Impact:

Water Utility Department User Fees

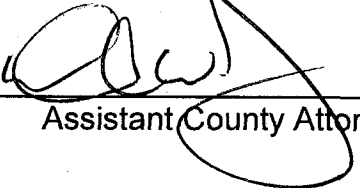
C. Department Fiscal Review: Summarized

III. REVIEW COMMENTS

A. OFMB Fiscal and/or Contract Development and Control Comments:

<p><u></u> 3/7/11 OFMB</p> <p><i>OK 3/7/11</i> <i>2/2/11</i></p>	<p><u></u> 3/10/11 Contract Development and Control</p>
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B. Legal Sufficiency:

 3/10/11
Assistant County Attorney

C. Other Department Review:

Department Director

received
PFA-4/7/10-NR

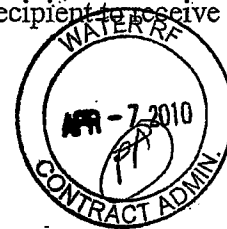
EPLS CHECKED	
4/7/10	NR
Date	Name

Project Funding Agreement 04228
"Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation"
between
Water Research Foundation ("Foundation"),
the Co-Funding organization(s) ("Co-funders") detailed on Exhibit C, and
Columbia University ("Sub-recipient")

This Joint Project Funding Agreement (hereafter "PFA") is between the Awwa Research Foundation, (hereafter "Foundation"), a Delaware non-profit corporation whose principal place of business is located at 6666 W. Quincy Ave., Denver, Colorado 80235, the organization(s) detailed on Exhibit C of this PFA (hereafter referenced as "Co-funders"), and Columbia University (hereafter "Sub-recipient"), whose principal place of business is located at 2880 Broadway, New York, New York 10025.

The Foundation and the Co-funders have selected said Sub-recipient to receive a research and development grant as more specifically detailed in this PFA.

The parties mutually agree as follows:



I. DEFINITIONS

For purposes of this PFA, the terms and definitions detailed below, and throughout this PFA shall control:

- A. "Co-funders" is the entity(ies) as more specifically described on Exhibit C. All entities referenced as Co-funders shall be defined to include all officers, directors, employees, volunteers, independent contractors, affiliates, agents, and related entities of each such Co-funder.
- B. "Cost Share" is goods or services provided by an organization dictated by the cost principles that are applicable by their cognitive agency.
- C. "Cure Period" is a complete or permanent solution or remedy that is completed in a cycle, a series of events, or a single action.
- D. "Derivative Work" is defined as a work of authorship that is based on any pre-existing written report, study, test result, or other work of authorship, and that modifies, transforms, or recasts that pre-existing work so as to alter it in any way.
- E. "Educational Purpose" is defined as any non-commercial and non-profit use of Intellectual Property as defined by Paragraph I.G., including, but not limited to, a Foundation or Co-funders owned publication or report utilized as a research tool and/or reference, to inform the drinking water community, water utility personnel, or the general public of the outcome of this Project.
- F. "Foundation" is a non-profit corporation organized to sponsor practical applied research on behalf of the drinking water industry through funding research and development regarding the subject of drinking water. It shall be defined to include all officers, directors, employees, volunteers, independent contractors (with the exception of the Sub-recipient, Subcontractors, and Co-funders),

affiliates, agents, and related entities of Foundation.

- G. "Intellectual Property" is defined as all inventions, innovations, creations, works, reports, figures, tables, processes, designs, methods, formulas, drawings, plans, technical data, specifications, logos, computer programs, computer chips and circuits, whether or not protectable through patent, copyright, trademark, or mask work and whether produced in any medium now known or hereafter produced or developed.
- H. "Principal Investigator" is defined as the Sub-recipient's employee, as specifically designated herein, with primary responsibility for ensuring that all terms and conditions of this PFA are met and to whom The Foundation shall give all Notices (*See XIV.P*), including, but not limited to, Notice of insufficiencies.
- I. "Program Income" is defined as gross income earned by the Sub-recipient that is directly generated by a supported activity or earned as a result of the award.
- J. "Project" is defined as the work to be completed by the Sub-recipient and any Subcontractors pursuant to this PFA and as described more specifically in the Project Proposal.
- K. "Project Advisory Committee" or "PAC" is defined as a group of independent volunteers who are not controlled by the Foundation or Co-funders and who are gathered by the Foundation and Co-funders to provide technical review, assistance, and/or expertise to the parties regarding the Project.
- L. "Project Managers" are defined as Foundation's employee(s) and the Co-funders' employee(s), as specifically designated herein, with joint responsibility for all contact with the Sub-recipient and as having authority to communicate all the Foundation and Co-funders' decisions concerning the Sub-recipient's Project.
- M. "Project Proposal" is defined as the initial request by the Sub-recipient for funding and shall include all relevant correspondence and/or other written communications subsequent to that request but prior to the execution of this PFA.
- N. "Sponsor" is a qualified sponsoring utility that shows financial and conceptual support to the research for a Project.
- O. "Sub-recipient" is defined as the named individual(s) and/or entity(ies) described in the introductory paragraph of this PFA or the party(ies) entering into this PFA with the and the Co-funders. The singular form of Sub-recipient shall include all individuals and entities detailed herein. The Sub-recipient shall include all officers, directors, employees, affiliates, and agents of the Sub-recipient.
- P. "Subcontractor" is defined as any individual or entity, with whom the Sub-recipient shall separately contract, to complete one or more specific tasks required by the Project.

II. SERVICES TO BE PROVIDED

- A. Sub-recipient: The Sub-recipient agrees to complete research and prepare written reports as detailed by Exhibit B based upon the Project Proposal attached as Exhibit A. The deliverable schedule for these reports is outlined in Exhibit B to this PFA.
- B. Foundation and Co-funders: Foundation and Co-funders will provide funds as available and as detailed by Exhibit C attached for activities detailed by the Project Proposal. Co-funders will provide all funds designated in full to the Foundation as detailed by Exhibit C; the Foundation shall make all disbursements to Sub-recipient.

III. KEY CONTACTS

A. Foundation Key Contacts:

- Kenan Ozekin, Senior Project Manager, Water Research Foundation, 6666 W. Quincy Ave., Denver, CO 80235, Phone: (303) 734-3464, and Email: kozekin@waterresearchfoundation.org
- Peggy Falor, Contract Administrator, Water Research Foundation, 6666 W. Quincy Ave., Denver, CO 80235, Phone: (303) 734-3424, and Email: pfalor@waterresearchfoundation.org .

B. Sponsor Key and Co-funders Key Contacts:

Sponsor Authorized Representative

- Bevin Beaudet, Palm Beach County Utilities Department, 8100 Forest Hill Blvd., West Palm Beach, FL 33413, Phone: (561) 493-6007, and Email: 493-6007, and Email: bbeaudet@pbcwater.com.

Accounting

- Rhonda Alexander, Palm Beach County Utilities Department, 8100 Forest Hill Blvd., West Palm Beach, FL 33413, Phone: (561) 493-6000, and Email: ralexander@pbcwater.com.

C. Sub-recipient Key Contacts:

Principal Investigator

- David Major, Columbia University, 2880 Broadway, New York, NY 10025, Phone: (212) 255-8329, and Email: dcm29@columbia.edu.

Accounting

- Christopher Shashkin, Columbia University, 2880 Broadway, New York, NY 10025, Phone: (212) 678-5543, and Email: cs10@columbia.edu.

Contract Administration

- Patricia Valencia, Columbia University, 2880 Broadway, New York, NY 10025, Phone: (212) 854-0371, and Email: pv122@columbia.edu.

Each party shall provide written Notice of changes in contact persons, addresses, telephone, fax, and email addresses. Changes or substitutions for the Principal Investigator or Co-Principal Investigator require prior written approval from Foundation as identified in Paragraph XIV.G.

1. The Foundation and Co-funders will make mutually agreed management decisions regarding this PFA and the Project. In the event a disagreement arises and the parties are unable to resolve it between themselves reasonably and in good faith and/or with the advice of the PAC, the Foundation shall have final decision-making authority (*See XIII.A*).

2. The PAC shall be composed of an independent group of volunteers that are technically expert individuals the number which will be determined by Foundation.

IV. PFA PERIOD

- A. Period: This PFA shall be effective for the period commencing on March 1, 2010 and ending on January 1, 2012. Neither the Foundation nor the Co-funders shall have any obligation for payment of services rendered by the Sub-recipient that are not performed within this specified period.
- B. Time of Performance: Sub-recipient shall complete all Project tasks, reports, and other obligations according to the performance schedule detailed in Exhibit B (which may be amended from time to time upon mutual agreement of the parties) in this PFA

V. FUNDING

- A. Source of Funds: All funds provided come from the Foundation and Co-funders solely.
- B. Condition for Receipt of PFA Funds: Funds provided to the Sub-recipient under this PFA may not be used by the Sub-recipient as a match or cost-sharing provision to secure U.S. Federal monies or money from any other sources without prior written approval by Foundation.
- C. Maximum Amount Available: The Foundation agrees to provide grant money to the Sub-recipient in an amount not to exceed nine thousand US dollars (\$9,000) for the completion of this PFA if not terminated early (*See XIV.E*). Further, the Co-funders agree(s) to provide money to Foundation, as more specifically detailed by Exhibit C, for further distribution to the Sub-recipient in a total amount not to exceed nine thousand US dollars (\$9,000) for the completion of this PFA if not terminated early (*See XIV.E*). The Foundation will have sole responsibility for payments to the Sub-recipient as more specifically detailed by Exhibit C. The Sub-recipient agrees to provide zero US dollars (\$0.00) cost share and zero US dollars (\$0.00) in in-kind contributions as detailed in Exhibit C. For a Project total budget of eighteen thousand US dollars (\$18,000).
- D. Co-funders should submit payment in full upon receipt of signed agreement and invoice if required. If Co-funders require(s) a purchase order please contact the Foundation Accounting at (303) 734-3555. Payment(s) to the Foundation should be made by check and sent to: Water Research Foundation, Accounting, 6666 W. Quincy Ave., Denver, CO 80235, (303) 734-3425. Co-funders accounting contacts for this Project are:

Organization	Contact	Contribution
Palm Beach County Utilities Department	Bevin Beaudet, 8100 Forest Hill Blvd., West Palm Beach, FL 33413, Phone: (561) 493-6000, and Email: bbeaudet@pbcwater.com	\$9,000 cash payable to the Foundation within 30 days upon receipt of final agreement or invoice from the Foundation.

VI. STATUTES AND REGULATIONS

- A. Sub-recipient is solely responsible for obtaining, reviewing and understanding all U.S. Federal, State, and local ordinances, rules, regulations, and statutes applicable to this PFA and Project, which ordinances, rules, regulations and statutes, as amended from time to time, are hereby included by this reference in this PFA.

VII. PAYMENT TERMS AND CONDITIONS

- A. Advance Payment: An advance of \$1,800 (10% of total cash) US dollars shall be paid to the Sub-recipient upon execution of this PFA provided Co-funders have timely provided their share of funds to the Foundation. No invoice shall be necessary for such advance. Sub-recipient shall be permitted to use the same for performance of the Project immediately upon the receipt of the same and may not utilize these funds for any other purposes.
- B. Budget: The PFA Budget, attached as Exhibit C, shall constitute the maximum amount available to the Sub-recipient for work performed under this PFA.
- C. Payment of an Invoice: Payments are based on submission and acceptance the Periodic Report to the Foundation and Co-funders each as defined in the Foundation "Proposal Guidelines" or "Guidelines for Tailored Collaborations" (depending on the type of proposal submitted) which Guidelines are hereby made part of this PFA by reference. No payment will be disbursed by the Foundation unless and until each Periodic Report (to be submitted every three months with invoices) is received and accepted by the Foundation and Co-funders (such acceptance not to be unreasonably withheld). An invoice detailing expenses incurred during the reporting period must be submitted to the Foundation every three (3) months in accordance with Exhibit B. The Sub-recipient invoice must also detail all cost-share and third party in-kind (if available) for each reporting period. Each invoice should be displayed according to the budget line items in Exhibit A. All invoices must be submitted using the form shown in Exhibit D and must be on the Sub-recipient's letterhead. Sub-recipient shall be paid as follows:
1. The initial ten percent (10%) advance payment, to be paid to Sub-recipient as detailed in Paragraph VII.A, is to be shown on all invoices as an advance into each reporting period including the final invoice.

2. Ten percent (10%) of the total funding will be held back from the Sub-recipient until (a) receipt of an acceptable draft report, as defined on the Foundation's website "Guidelines for Tailored Collaborations." Another ten percent (10%) will be held back from the Sub-recipient until (b) Sub-recipient responds to subsequent editor queries on the final report, as defined on the Foundation's website "Guidelines for Tailored Collaborations," and submission of a final invoice detailing final Project costs including cost share and in-kind contributions. All funding is contingent upon actual costs incurred.
3. The payment of an invoice by the Foundation shall not prejudice Foundation's right to object to or question any invoice or matter relating to invoices submitted in accordance with this PFA. Payment by the Foundation shall not be construed as acceptance of any part of the work or service provided.

D. Unallowable Costs: The Sub-recipient's invoice shall be subject to reduction for amounts included in any invoice or prior payment made which are determined by the Foundation not to constitute allowable costs on the basis of audits, reviews, or monitoring of this PFA in accordance with Foundation's standards and any applicable Federal Uniform Administrative Requirements applicable to this PFA.

E. Deductions & Withholdings:

1. Foundation may deduct amounts or withhold payments invoiced by the Sub-recipient if the Sub-recipient fails to comply with any Foundation standard and/or Federal Uniform Administrative Requirements applicable to this PFA based upon the Sub-recipient's cognitive agency.
2. Funds withheld due to unsatisfactory compliance with any Foundation standard and/or Federal Uniform Administrative Requirements (based on Sub-recipient's cognitive agency) may be restored upon satisfactory correction or completion of the condition that caused the withholding.

VIII. STANDARDS FOR FINANCIAL MANAGEMENT

A. Financial Management System:

1. The Sub-recipient will maintain an accounting system and a set of accounting records that, at a minimum, allow for the identification of individual Projects by source of revenue and expenditures related to this PFA.
2. All costs will be supported by source documentation and be made available to the Foundation upon request.
3. The Sub-recipient's accounting records will be the basis for generating financial reports that must reflect accurate and complete data. In addition, financial records must be properly closed out at the end of the PFA period and all reports submitted in a timely manner.

B. Cost Principles: Even though no U.S. Federal funds are being provided for this Project, for each type of Sub-recipient organization, there is a set of Federal cost principles for determining allowable costs with which principles the Sub-recipient agrees to comply and which principles are hereby included by this reference in this PFA unless such principles are modified by this PFA. Allowable

costs are determined in accordance with the cost principles applicable to the type of organization incurring the costs. The following is a non-exclusive example of a list of organization types and the applicable cost principles to be used:

- State, local or Indian tribal government, OMB Circular A-87.
- Non-profit Organization (NPO), 2 CFR 230.
- Institution of Higher Education, 2 CFR 220.
- Hospitals, 45 CFR 74.
- Commercial (For Profit) and selected Non-Profit Organizations.

C. Indirect Costs and Allocation of Costs:

1. If the Sub-recipient charges indirect (overhead) costs to the PFA, an "Indirect Cost Proposal" must be prepared in accordance with the applicable cost principles referenced in Paragraph VIII.B.
2. For payment of indirect costs by the Foundation the Sub-recipient must provide a written statement from an independent certified public accounting firm attesting that the proposal complies with the requirements of the applicable cost principle as required by VIII.B above and which statement provides the basis of the calculated rate.

IX. PROCUREMENT STANDARDS

A. Procurement Standards:

1. As with Cost Principles (VIII.B above), the parties adopt the U.S. Federal standards for procurement as are outlined in the U.S. Federal Uniform Administrative Requirements applicable to the organization type to which the Sub-recipient belongs; and Sub-recipient's compliance with those standards is required under this PFA (See VI) except as may be modified by this PFA.
2. These provisions define the standards for use in establishing procedures for procurement of supplies, equipment, and other services which cost is borne in whole or in part as a condition of this PFA.
3. These standards include but are not limited to the following:
 - a. Sub-recipient may use its own procurement policies provided that they adhere to the applicable standards;
 - b. Sub-recipient shall maintain a code of conduct which shall govern the performance of its officers, employees, and agents in contracting with or expending Foundation and Co-funders' funds; and
 - c. All procurement transactions shall be conducted in a manner so as to provide for maximum open and free competition.

B. Title to Equipment and Supplies:

1. Sub-recipient shall assume responsibility for the care and maintenance of all equipment or supplies acquired for use in the Project pursuant to current Sub-recipient policy and manufacturer's instruction.
2. Title to any equipment and supplies for this Project shall be vested to Sub-recipient.

X. AUDITS AND MONITORING

- A. Audit Procedures: The expenditure of funds under this PFA may be subject to quarterly or annual audits conducted by the Foundation on behalf of itself and Co-funders, in Foundation's sole discretion, or by its authorized representatives. The Sub-recipient shall provide to the Foundation and its authorized representatives all technical staff, assistance, and information needed to enable Foundation to perform its auditing function. This assistance includes, but is not limited to, information about the Sub-recipient's Project in-kind and money grants, expenditures, operation, accounting, and database systems.

B. Monitoring:

1. The Sub-recipient may receive on-site reviews from the Foundation or its authorized representatives, in addition to review(s) from Federal government personnel. Monitoring staff may review Project and/or financial activity relating to the terms of this PFA. Upon request, Foundation or its authorized representatives shall be given full and complete access to all pertinent information related to the performance of this PFA.
2. The Sub-recipient shall provide to the Foundation and its authorized representatives all technical staff, assistance, and information needed to enable the Foundation or Federal government personnel to perform their monitoring function. This assistance from the Sub-recipient includes, but is not limited to, information about the Sub-recipient's Project operation, accounting, and database systems.

C. Program and Financial Deficiencies:

1. Through audits, reviews, monitoring, or other means, the Foundation may find the Sub-recipient to have program or financial deficiencies in the performance of the PFA. Such deficiencies may include, but are not limited to, the areas of accounting, financial controls, budgeting, and/or Project compliance issues. If deficiencies are found, the Foundation may exercise its rights to terminate this PFA or may require the Sub-recipient to take corrective action and to submit a written corrective action plan to address identified deficiencies. All corrective action plans must be accepted by the Foundation or its authorized representatives. Any corrective action must be satisfactorily completed within the 30 (thirty) days "cure period" if such a cure period is provided (*See XIV.E.1*).
2. The Foundation in its sole discretion may require Sub-recipient to submit additional periodic written verification that measures have been taken to implement the corrective action. If the Sub-recipient fails to demonstrate its compliance with the approved corrective action plan within

the time constraints set by the Foundation in its sole discretion, the Foundation may exercise its rights to terminate this PFA. The Foundation may also exercise any of the other rights and remedies available to it at law or in equity.

XI. REPORTS AND RECORDS

A. Required Deliverables: Required Project deliverables are described in the Foundation "Proposal Guidelines" and are listed in Exhibit B.

1. Sub-recipient will provide Co-funders with a copy of all Periodic, Interim, Draft, and Final Reports arising from the Project. Further, the Foundation will decide who will publish the Final Project Report, who will oversee such publication, and in what language it will be published. the Foundation will decide the mode of publishing (print, electronic, or other). Co-funders will each receive ten (10) copies of the final printed report.
2. In the event the Foundation decides to electronically publish a Report, it will provide the Co-funders with a complete *PDF* file of the Report in the English language prior to general publication to subscribers or outside third parties. The parties agree that each may place a *PDF* version of the full Final Report on its own web site, if any, after the Foundation has provided such Report to its subscribers. No drafts shall be published by the Co-funders.

B. Record Retention:

1. Sub-recipient shall retain all financial records, supporting documents, statistical records, and all other records pertinent to this PFA for a period of three (3) years from the date of payment of final invoice.
2. If any litigation, claim, or audit is started before the expiration of the three (3) year period, the records shall be retained until all litigation, claims, or audit findings involving the records have been resolved and final action taken.

C. Access to Records:

1. The Foundation, the Co-funders, and their authorized representatives, have the right of timely and unrestricted access to any books, documents, papers, or other records of the Sub-recipient upon forty-eight (48) business hours Notice in order to perform audits, monitoring reviews, or other types of site visits during regular operating hours of Sub-recipient.
2. The rights of access to Sub-recipient's records also includes timely and reasonable access to the Sub-recipient's available past and present personnel for the purpose of interviewing and disclosing matters related to such documents.
3. The right of access to Sub-recipient's records is not limited to the required three (3) year period.
4. Sub-recipient waives any confidentiality, privacy privilege, or proprietary defenses regarding audits or monitoring or subject by the Foundation (or its representatives). the Foundation will keep any of Sub-recipient's proprietary technical and/or scientific information confidential if such material is appropriately marked as "Confidential," is not already in the public domain prior to

disclosure, is not required to be disclosed as a result of court order, legal process or government action or applicable law of regulation, or was already known to others not under a requirement to maintain its confidentiality.

XII. INTELLECTUAL PROPERTY AND PUBLICATION

- A. Proprietary Rights to Intellectual Property: The Foundation's and Co-funders' primary purpose in funding the Sub-recipient is to further scientific and technological knowledge in the area of research covered by this Project. As such, certain written works and copyrightable computer software programs created during the course of this PFA are to be owned by the Foundation and licensed to Co-funders while patented inventions or inventions in the process of being patented, created by the Sub-recipient, including software inventions, made under this PFA shall be owned by the Sub-recipient and other created intellectual property are to be owned by all the parties jointly as more specifically delineated below.
- B. Foundation Intellectual Property: The Parties intend that the Foundation shall own all U.S. and world-wide copyright in the Scope of Work, all Periodic Reports, all Draft Reports, the Final Report, and the Project Profile, all drafts of these works and reports, and all non-patented computer software developed as a deliverable for this Project as defined in the Foundation's "Proposal Guidelines," and in Exhibit A. Such property is hereby assigned to the Foundation (hereafter "Foundation Intellectual Property"). Except as provided herein, no Foundation Intellectual Property shall be utilized or distributed by the Sub-recipient or Co-funders or any Subcontractor in any manner without Foundation's prior written approval, except for Educational Purposes as defined in I.E. The Sub-recipient shall execute whatever additional documents are necessary in order to comply with this Paragraph (e.g., a U.S. Copyright Office application or other world-wide application for copyright protection, or short form license or assignment agreement(s) for recordation) (See Exhibit E Assignment of Copyright).
1. The Foundation hereby grants the Sub-recipient and Co-funders a royalty free, world-wide, nonterminable, nonexclusive license, without the requirement for any accounting, to utilize Foundation's Intellectual Property solely for Educational Purposes as defined in Paragraph I.E. above except as restricted by this PFA (See XI.A.2).
 2. While Sub-recipient and Co-funders may not utilize any Foundation Intellectual Property for other purposes without prior written permission from the Project Manager, reasonable requests to present or publish portions of the Foundation Intellectual Property will be seriously considered as the Foundation is highly interested in the distribution of the information developed through this PFA.
- C. Sub-recipient's Intellectual Property: All patented inventions and improvements (or in the process of being patented) shall be considered Sub-recipient's Intellectual Property, including, but not limited to, the right to file for patent registration. The Sub-recipient shall be responsible for any and all disclosures required to the U.S. Government. If the Sub-recipient intends to, or does, abandon its rights to any of Sub-recipient's Intellectual Property, Sub-recipient shall notify the Foundation of the same and assign to the Foundation those rights upon timely request. Sub-recipient shall not withhold any findings based on Sub-recipient Intellectual Property, patentable or otherwise, from works and reports, as defined in the Foundation's "Proposal Guidelines," and in Exhibit A. The Sub-recipient

shall have the burden of demonstrating the existence of confidential information and/or trade secrets should it designate information as such by legend. If the Sub-recipient is using an existing patent or pre-existing patented material owned by another party, the Sub-recipient must have mentioned the same in Sub-recipient's Project Proposal as attached as Exhibit A and must obtain written permission to use the patent on this Project. Copies of any permission or licenses granted shall be provided to the Foundation upon execution. All permission must be provided to the Foundation prior to completion of any Draft of the Final Report.

- D. Jointly Owned Intellectual Property:** For the purpose of allowing Foundation, Co-funders, and the Sub-recipient to make full use of all Intellectual Property developed during the course of this Project that is not defined above as owned by either party solely; certain Intellectual Property shall be considered Jointly Owned Intellectual Property.
1. Jointly Owned Intellectual Property is defined as (a) all Intellectual Property developed during the term of, and pursuant to, this PFA which is not defined above as Foundation Intellectual Property, Sub-recipient's Intellectual Property, or as U.S. Government Intellectual Property, if applicable, (b) all scientific information and data reported such as innovations, creations, processes, designs, methods, formulas, plans, technical data, and specifications; and (c) the Project Proposal, excluding the statement of qualification and resumes.
 2. The Sub-recipient hereby assigns to the Foundation and Co-funders an undivided equal share to such Jointly Owned Intellectual Property, including the right to apply for copyright registration with the U.S. Copyright Office or similar official repositories throughout the world. The Foundation, Co-funders, and the Sub-recipient may each utilize such property, without royalty to the other, for any and all purposes throughout the world without any requirement of an accounting. Further, the Sub-recipient and Co-funders hereby grants to the Foundation's subscribers a nontransferable, nonterminable, and nonexclusive license, without royalty, and without any requirement for an accounting, to utilize Jointly Owned Intellectual Property throughout the world. The Sub-recipient shall execute whatever documents are required in order to comply with this Paragraph, including, but not limited to, assignments as necessary for any world-wide copyright protection (*See Exhibit E*).
- E. Pre-existing Intellectual Property:** In the event Sub-recipient owns Intellectual Property that was developed prior to this PFA and that pre-existing Intellectual Property is utilized for this Project, such Intellectual Property shall remain the property of Sub-recipient; however, the Foundation, its subscribers, and Co-funders are granted a nonterminable, world-wide, nonexclusive license, without royalty, and without the requirement of an accounting to Sub-recipient, to utilize such information for non-commercial (i.e., non-profit or educational) purposes. In the event Sub-recipient utilizes Intellectual Property owned by another in this Project (including any Foundation Intellectual Property), Sub-recipient shall obtain all appropriate permissions on Foundation's and Co-funders's behalf for the publication of such materials in any form or format, including, but not limited to, compilations without the requirement of any royalty or accounting. Agreements detailing such permissions shall be approved by, and completed documents shall be provided to the Foundation.
- F. Publication of Intellectual Property:** The Foundation encourages the Sub-recipient and Co-funders to publish Jointly Owned Intellectual Property based on this Project and to utilize the Foundation's Intellectual Property for Educational Purposes. Any publication of Foundation Intellectual Property

must comply with the requirements of this PFA. The Sub-recipient agrees to comply with the following steps prior to such distribution, presentation, or publication:

1. The Sub-recipient and Co-funders hereby agree to provide to the Foundation copies of any publication or presentation of Jointly Owned Intellectual Property or Foundation Intellectual Property approved for publication/presentation at least three (3) weeks prior to submission of such publication or presentation.
 2. Each party agrees and understands that it shall not dispose of or injure another's rights to Jointly Owned Intellectual Property or the Foundation's rights to Foundation Intellectual Property, including, but not limited to, any computer software by any presentation or publication of such property and shall take all steps necessary to preserve the owner's rights. This Paragraph shall not prevent the Sub-recipient, Co-funders, or the Foundation from transferring its own undivided but equal share of ownership of Jointly Owned Intellectual Property to a publication without any requirement of royalty or accounting to the others.
 3. In the event the Sub-recipient or Co-funders publishes Jointly Owned Intellectual Property and is required by the publisher to assign its copyright ownership to the work, the Sub-recipient and Co-funders agree to include the following or similar language on any copyright assignment: *The submitted manuscript [publication] [presentation] has been made possible through funding from the Water Research Foundation, and Palm Beach County Utilities Department. The information contained herein is based upon Intellectual Property that is jointly owned by Columbia University, Palm Beach County Utilities Department, and the Water Research Foundation. The Water Research Foundation, Columbia University, and Palm Beach County Utilities Department retain their rights to publish or produce the Jointly Owned Intellectual Property in part or in its entirety.*
 4. Sub-recipient agrees to acquire appropriate permission(s) to use any third-party copyrighted materials utilized in any manner in connection with the Project (See XII.E. above). The permission needs to cover both print and electronic versions of a report that will be published by Foundation and/or third party. Reference the Foundation's Format-Style Guide Chapter 4: Use of Copyrighted Material. The Sub-recipient should complete the copyright permission letter that is located on the Web at <http://www.waterresearchfoundation.org/research/projectAdmin/docs/SampleLetter.doc>. Sub-recipient agrees to provide full ownership and license information for any such materials; and the Foundation agrees to include appropriate acknowledgements for all original sources in published Foundation Intellectual Property.
- G. Student Thesis:** In the event a college or graduate student is employed by Sub-recipient to work on the Project contemplated by this PFA and that student completes a thesis, dissertation, or report relating to this Project, solely for Educational Purposes, the student shall own the copyright in that thesis or report, to the extent necessary for publication while not injuring the Foundation's or Co-funders' rights, and such rights shall be reserved to the student in any assignment document or form subsequently executed. In the event a portion of the Foundation Intellectual Property or Jointly Owned Intellectual Property is included in that thesis or report, the Foundation and Co-funders hereby grant the student a nonexclusive license to utilize that the Foundation Intellectual Property for the specific thesis or report for Educational Purposes.

- H. Copyright Notice: Any Jointly Owned Intellectual Property, or Derivative Works thereof, utilized by the Sub-recipient, Co-funders, or the Foundation shall include a United States' copyright notice of ownership as detailed below:

Copyright [year of publication], Water Research Foundation, Columbia University, and Palm Beach County Utilities Department
ALL RIGHTS RESERVED.

No part of this article may be copied, reproduced, or otherwise utilized without permission.

- Any Foundation Intellectual Property must contain the following copyright notice:

Copyright [year of publication], Water Research Foundation
6666 W. Quincy Avenue, Denver, CO 80235
ALL RIGHTS RESERVED.

No part of this article may be copied, reproduced, or otherwise utilized without permission.

- I. Sub-recipient's/Co-funders's Acknowledgement: Any public presentation or publication by the Sub-recipient or Co-funders, including a student writing a thesis, dissertation, or report, based on the parties' Jointly Owned Intellectual Property, Sub-recipient's Intellectual Property, or any portion of Foundation Intellectual Property, shall include the following, or a similar, statement acknowledging the Foundation and Co-funders, as appropriate, for providing financial and administrative support:
"Columbia University gratefully acknowledges that the Water Research Foundation and Palm Beach County Utilities Department are co-owners of certain technical information upon which this publication [manuscript] [presentation] is based. Columbia University thanks the Water Research Foundation and Palm Beach County Utilities Department for their financial, technical, and administrative assistance in funding the project through which this information was discovered."
- J. Disclaimer: Any publication and presentation by Sub-recipient or its students utilizing the Foundation Intellectual Property or the Jointly Owned Intellectual Property shall include the following disclaimer:
The comments and views detailed herein may not necessarily reflect the views of the Water Research Foundation, its officers, directors, affiliates or agents. Every Project Report shall contain (a) the Foundation logo and Co-funders logo, (b) an acknowledgment that the Foundation and Co-funders are co-sponsors of the publication, material, and its underlying research, and (c) a disclaimer which states: "This document was reviewed by a panel of independent experts selected by the Foundation. The Foundation, Columbia University, and Palm Beach County Utilities Department] assume no responsibility for the content of the research study reported in this publication or for the opinions or statements of fact expressed in the report. Mention of trade names or commercial products does not constitute the Foundation, Columbia University, and Palm Beach County Utilities Department's endorsements or recommendations for use. Similarly, omission of products or trade names indicates nothing concerning Foundation's, Columbia University, and Palm Beach County Utilities Department's position regarding product effectiveness or applicability. This report is presented solely for informational purposes."
- K. Return of Intellectual Property: The Sub-recipient shall provide to Foundation legible copies of all the Foundation's Intellectual Property and shall provide to Foundation and Co-funders legible copies of all Jointly Owned Intellectual Property and licensed pre-existing Intellectual Property within thirty (30) days of receiving a Notice of termination (including source and object code of any computer

software program) whether or not a cure period is provided. Further, at the same time, Sub-recipient shall provide copies and originals where the Sub-recipient has abandoned, or otherwise lost, its rights to patentable inventions or discoveries, as provided by 37 CFR 401 et.seq. Such information shall be provided in whatever medium is reasonably designated by the Foundation. No final payments will be made without proper provision of such Intellectual Property.

- L. Originality: The Sub-recipient shall verify and ensure that it, and its Subcontractors, are the sole creator(s) and originator(s) of all Foundation Intellectual Property, Sub-recipient's Intellectual Property, pre-existing Intellectual Property, and Jointly Owned Intellectual Property as defined herein; none of those rights have been bargained, sold, or conveyed in any other manner to any person or entity except as detailed and permitted by this PFA. Further, the Sub-recipient shall use its best efforts to ensure that no portion of this Project, including any portion completed by Subcontractors, infringes upon the Intellectual Property rights of any other person or entity or violates the common law or statutory right, title, or interest of any person or entity.
- M. Background Intellectual Property. This PFA shall not be construed as implying that either party hereto shall have the right or license (express or implied) to use background Intellectual Property of the other in connection with this Project except as otherwise provided hereunder or required by Federal government regulations. Background Intellectual Property includes property and the legal right therein of either party developed before or independent of this PFA or the Project including inventions, patent applications, patents, copyrights, trademarks, mask works, trade secrets, know-how and any information embodying proprietary data such as technical data and computer software.
- N. Other Research. The Foundation understands that Sub-recipient may be involved or become involved in similar or related research on behalf of itself and others. Subject to any confidentiality and Intellectual Property sections of this PFA, nothing contained in this PFA shall be construed to limit or impair the freedom of Sub-recipient or its researchers neither to conduct research for itself or third-parties nor to grant the Foundation any right to such other research or Intellectual Property, created as a result of the same.
- O. The terms of this Section XII shall survive the termination of this PFA.

XIII. DISPUTE RESOLUTION

- A. In the event Foundation and Co-funders are unable to resolve a dispute between themselves relating to the Sub-recipient, the Sub-recipient's actions or omissions, or the procedure, process, or research concerning the Project, Foundation shall be empowered to make the final determination after reasonably consulting with the PAC.
- B. In the event Sub-recipient and the Foundation or Sub-recipient and Co-funders have a dispute between themselves relating to this PFA, the Project, or a party's actions or omissions not related to the enumerated matters in Paragraph XIII.A, and if the parties involved are not able to resolve their dispute within sixty (60) days of Notice of the dispute being provided by a party to the others, the parties involved in the dispute agree to submit their dispute to mediation.
- C. In the event mediation is required, the parties shall jointly choose a single mediator located in Denver County, Colorado U.S.A. who is skilled in the subject matter of their dispute. In the event they are unable to jointly choose a mediator, the disputing parties shall each choose a mediator, which two

mediators shall jointly choose a third mediator – also located in Denver County - who will hear and decide the dispute.

- D. All parties will pay equally for the mediators' services.
- E. A mediator shall be chosen and mediation shall be scheduled no later than forty-five (45) days after the Notice of dispute is received. Mediation shall be completed no later than ninety (90) days after the Notice of dispute is received. During the period of dispute, no party shall take any action that which would injure the interests of another party or delay the Project.
- F. Mediation shall last no longer than four (4) business days unless agreed upon in writing by the parties. During the mediation period, documents submitted to the mediator and statements made during the mediation, including proposed settlement terms, are for settlement purposes only and shall remain confidential. However, evidence otherwise admissible or discoverable shall not be rendered inadmissible or undiscoverable because of its use in the mediation.
- G. If the parties are unable to reach a reasonable business decision on their own with the assistance of the mediator by the end of the mediation session, the mediator shall choose an Arbitrator located in Denver, Colorado U.S.A. to hear the parties' dispute. The Arbitrator's decision shall be binding on both parties. During this arbitration process,
 - 1. The Arbitrator shall have subpoena powers.
 - 2. The American Arbitration Association ("AAA") and Colorado Civil Procedure Rules, where not in conflict with the AAA Rules, which are in effect at the time the Notice of dispute is received shall apply.
 - 3. Any final binding determination issued by the Arbitrator shall be in writing within thirty (30) days of the final mediation session.
 - 4. Such written decision may be entered as an Order of the Court with proper jurisdiction.
- H. This Section XIII shall survive the termination of this PFA.

XIV. STANDARD TERMS AND CONDITIONS

- A. Standard terms, which by their nature and intent may continue beyond the termination of the PFA, shall survive the termination of this PFA.
- B. Accuracy of Testing/Quality Assurance: The Sub-recipient shall use its best efforts to ensure that all data and test results developed during the course of this PFA and included, or relied upon, in the Final Report are accurate to the best of its knowledge, information, and belief. In the event the Sub-recipient obtains any data, test results, information derived from such data or test results, or other information to be included in the Project from water utilities or any Subcontractor, the Sub-recipient will utilize reasonable and customary efforts to ensure the accuracy of the information obtained.
- C. **Co-funders Review**: The Sub-recipient shall (a) grant the Co-funders the right to review the Project's use and conclusions concerning that organization's data and/or test results, if any, and (b)

provide the Co-funders with the reasonable opportunity to correct, or if correction will take an unreasonably long time, to respond to any problems or difficulties uncovered by the data, information, or test results, all of which must occur prior to the publication or use of such information. This provision shall apply to each Co-funder in any manner with the Project, including, but not limited to, providing services, data, materials for testing, test results, and/or documentation. The Sub-recipient shall be responsible for providing letters for review and execution by each Co-funder confirming that they have been made aware of the nature of the cooperative relationship and have reviewed all applicable data, information, or results as described in this Paragraph. Letters of confirmation, signed by a representative for and each Co-funder, must be received by Foundation with submittal of the Final Report (Exhibit B). If the Sub-recipient has made reasonable efforts but is not able to obtain a Letter of Confirmation with the signature of a representative for the Co-funders, the Principal Investigator may submit a signed letter stating this fact and further stating that the Co-funders were provided reasonable opportunity to correct or respond to any problems or difficulties as stated above.

- D. Responsibilities: The responsibilities detailed by this PFA in order to protect the parties' Intellectual Property rights shall continue throughout this PFA and shall survive the termination of this PFA. Further, in addition to the responsibilities detailed elsewhere in this PFA, each of the parties shall have the responsibilities detailed below:
1. Responsibilities of Foundation. If the Sub-recipient experiences any problems relating to the completion of this Project or PFA from third parties, including, but not limited to, liabilities, obligations, damages, losses, costs, claims, lawsuits, causes of action, or demands, including any attorneys' fees and costs, the Foundation's sole obligation will be to provide evidence of this PFA and the grant provided. the Foundation will be responsible only for proven direct damages caused directly by its then current insured actions or omissions in breach of this PFA and not special, consequential, or other damages, or any attorneys' fees or costs, whether known or not. In no event shall any damages exceed the amounts actually provided to Sub-recipient by the Foundation, exclusive of Co-funders' monies, through this PFA.
 2. Responsibilities of Co-funders. If the Sub-recipient experiences any problems relating to the completion of this Project or PFA from third parties, including, but not limited to, liabilities, obligations, damages, losses, costs, claims, lawsuits, causes of action, or demands, including any attorneys' fees and costs, Co-funders' sole obligation will be to provide evidence of this PFA and the grant provided. Co-funders will be responsible only for proven direct damages caused directly by its then current insured actions or omissions in breach of this PFA and not special, consequential, or other damages, or any attorneys' fees or costs, whether known or not. In no event shall any damages exceed the amounts agreed to be provided to Sub-recipient by Co-funders, exclusive of Foundation monies, through this PFA.
 3. Responsibilities of the Sub-recipient. At all times, all obligations performed by the Sub-recipient or by any Subcontractors pursuant to this PFA shall be performed in a manner consistent with or exceeding the professional standards governing such services. Further, the Sub-recipient shall be responsible for, and shall hold harmless and indemnify the Foundation, Co-funders, and their officers, directors, affiliated organizations, employees, agents, volunteers, and publisher, if any, from any and all liability, obligation, damage, loss, cost, claim, lawsuit, cause of action, or demand whatsoever of any kind or nature, including, but not limited to, attorneys' fees and costs, arising from any actions taken by, or omissions of, the Sub-recipient, its officers, directors,

Subcontractors, employees independent contractors, agents, or other related entities or individuals arising from (i) any actions or omissions of the Sub-recipient or its Subcontractors, (ii) any use or misuse of Intellectual Property claimed to be owned by another, or (iii) any material breach of this PFA. Such indemnification shall be in proportion and to the extent liability, obligation, damage, loss, cost claim, lawsuit, cause of action, or demand are caused by or result from the reckless, intentional, or negligent acts or omissions of the Sub-recipient, its officers, directors, Subcontractors, employees independent contractors, agents, or other related entities or individuals.

4. Public Entities. In the event the Sub-recipient is a public entity or quasi-public entity that, by state statute, is not permitted to indemnify others, Paragraph XIV.D. 3 are modified to the extent detailed by this Paragraph. Instead, Sub-recipient agrees to be responsible, and will hold all public or quasi-public entity Subcontractors equally responsible, to the fullest extent available under the law, for any and all liability, obligation, damage, loss, cost, claim, lawsuit, cause of action, or demand whatsoever of any kind or nature, including but not limited to, attorney's fees and costs, arising from any actions taken by, or omissions of, the Sub-recipient its officers, directors, Subcontractors, employees, independent contractors, agents or other related entities arising from (i) any use or misuse of Intellectual Property claimed to be owned by another, or (ii) any material breach of this PFA by Sub-recipient. Such fiscal responsibility shall be in proportion and to the extent of liability, obligation damage, loss, or cost claim, lawsuit or action, or demand are caused by or result from the reckless, intentional, or negligent acts or omissions of the Sub-recipient, its officers, directors, Subcontractors, employees, independent contractors, agents, or other related entities or individuals. Further, Sub-recipient agrees to ensure that all individuals or entities or individuals involved in the completion of this PFA that/who may indemnify others are required to so indemnify the Foundation and the Co-funders through a written agreement acceptable to Foundation and the Co-funders.
 5. Insurance. The Sub-recipient shall maintain a financially sound program of self-insurance or commercially purchased liability insurance covering unfair competition claims and all reckless, intentional, knowing, and negligent actions or omissions of any and all of Sub-recipient's officers, directors, employees, agents, and independent contractors and/or Subcontractors in the amount of one million dollars (\$1,000,000.00). Proof of such insurance shall be presented to Foundation pursuant to the schedule detailed by Exhibit B and to the Co-funders upon request. The proof of insurance document shall clearly specify the Project by number and title on the insurance certificate.
 6. Worker's Compensation. The Sub-recipient and all Subcontractors shall maintain Worker's Compensation Insurance which complies with the applicable state laws. Proof of such insurance shall be presented to Foundation pursuant to the schedule detailed by Exhibit B and to the Co-funders upon request.
- E. Termination: This PFA, except for those provisions which, by their own terms, extend beyond the life of this PFA, shall terminate upon the Foundation providing Notice to the Sub-recipient, in writing, that all terms have been completed. The termination date shall be the date upon which all scheduled events have occurred, including the final accounting, and no further work remains to be completed pursuant to this PFA. The PFA, however, may be terminated earlier for the following reasons:

1. If the Foundation after consultation with the Co-funders and the PAC reasonably determines that the Sub-recipient, or any Subcontractor, is progressing unsatisfactorily, including, but not limited to, failing to comply with this PFA, the Foundation may so Notify the Sub-recipient in writing at any time of the problems/breach and may allow Sub-recipient a chance to cure the problems identified. If the Sub-recipient fails to eliminate problems detailed by the Foundation, or fails to cure a breach of this PFA when and if the Foundation provides a cure period, within thirty (30) days of the Foundation's Notice, this PFA shall terminate. The termination date shall be the date on which the thirtieth (30th) day falls.
2. Foundation may terminate this PFA without thirty (30) days Notice if the Foundation after consultation with the Co-funders and the PAC reasonably believes the Project is no longer technically feasible or if Sub-recipient failed to comply with the terms and conditions of this PFA. The termination date shall be the date on which the Notice is received. Such termination shall not be considered a breach of this PFA and shall not require a cure period.
3. Co-funders may terminate this PFA on ninety (90) days Notice if Sub-recipient or the Foundation materially breaches this PFA. In such event, an accounting of expended funds shall be submitted by the Sub-recipient promptly after receiving Notice and all unspent non-cancellable funds shall be submitted to the Foundation. The Foundation shall distribute all remaining non-cancellable and unspent funds among the Foundation and Co-funders in proportion to their original funding levels. In the event the Foundation and Co-funders disagree as to whether a Sub-recipient or Subcontractor's actions or omissions are unsatisfactory or a breach of this PFA, the Foundation shall make the final determination. Such determination shall not be considered a breach of this PFA.
4. Upon receipt of the written Notice of termination by Foundation without a right to cure, the Sub-recipient shall cease all work associated with the PFA. If the Foundation issues a Notice of termination with a right to cure, the Sub-recipient shall continue all work, first applying itself to curing the deficiencies noted.
5. The Sub-recipient may terminate this PFA upon thirty (30) days Notice to the Foundation if circumstances beyond its control completely preclude continuation of the research. Notification of termination of research by the Sub-recipient shall be in writing. Sufficient effort will be made by the Sub-recipient to consult with the Foundation's PAC to explore options for continuation of the Project that are acceptable to both parties. An accounting of expended funds shall be submitted by the Sub-recipient and all remaining unspent funds, at the time of Notice, will be returned to the Foundation. The Foundation will return to the Co-funders unspent funds on a pro rata basis in accordance to their contributions.
6. Any change in U.S. Federal statutes, rules or regulations or Sub-recipient's local statutes, rules or regulations which materially alter Sub-recipient's required activity, or any change in the availability of funds shall be viewed as binding and shall warrant good faith renegotiation of the provisions of the PFA that are affected. This change in circumstance includes suspension or termination of this PFA, or a reduction in granted funds. Such alterations or termination shall not be considered a breach of this PFA and shall not require a thirty (30) day advance Notice or cure period.

7. If termination occurs, under this Section XIV, the Sub-recipient shall be entitled to compensation for all satisfactory and authorized services completed as of the termination date, provided funds are available (i.e., a reduction in granted funds per Paragraph IV.6 above).
 8. Upon termination for any reason, the Sub-recipient and Co-funders shall have no right to recover from the Foundation any general, special, incidental, consequential, or any other damages of any description or amount, including, but not limited to attorneys' fees and costs. The terms of this Paragraph shall survive the termination of this PFA.
- F. Required Approvals: The individuals executing this PFA on behalf of their respective parties hereby represent and warrant that they have the right, power, legal capacity, and appropriate authority to enter into this PFA on behalf of the entity for which they sign below.
- G. Modifications: This PFA may not be modified or amended, nor may any term or provision be waived or discharged, including this particular Paragraph, except in writing, signed by all parties.
1. Examples of items requiring Foundation's prior written approval include, but are not limited to, the following:
 - Deviations from the Project plan.
 - Change in scope or objective of the Project.
 - Change in a key person specified in the application.
 - The absence for more than three months or a 25% reduction in time by the principal investigator.
 - Need for additional funding.
 - Inclusion of costs that require prior approvals as outlined in the appropriate cost principles.
 - Any changes in budget line item(s) as described in Exhibit A of greater than ten percent (10%) of the total.
 2. No changes are to be implemented by the Sub-recipient until a written Notice of approval is received from Foundation.
- H. Transferability or Assignment of PFA: This PFA shall not be assignable by the Sub-recipient without the prior written authorization of Foundation.
- I. Sub-Contracting: The Sub-recipient shall not enter into a subcontract for any of the work performed under this PFA without obtaining the prior written approval of Foundation.
1. Sub-recipient shall require any and all Subcontractors to comply with all applicable and material terms of this PFA prior to working on the Project in any manner.
 2. Payment for services of any and all Subcontractors shall be the Sub-recipient's sole obligation and responsibility. The Sub-recipient hereby indemnifies and holds the Foundation and Co-funders harmless for any liability concerning such payment. In the event Sub-recipient or any Subcontractors are public or quasi-public entities not empowered to indemnify others, Sub-recipient agrees to ensure that the Foundation and Co-funders are not responsible or liable for any

such payments or any Subcontractor actions or omissions through appropriate language included in any and all agreements between Sub-recipient and Subcontractors.

J. Completeness:

1. This PFA is complete and contains the entire understanding between the parties relating to this PFA.
2. This PFA supersedes all prior understandings, representations, negotiations, and PFAs between the parties whether written or oral.

K. Severability: The provisions of this PFA shall be deemed severable, and the invalidity, illegality or unenforceability of any provision of this PFA shall not affect the validity or enforceability of any other provisions. In the event any provision of this PFA is found to be invalid, illegal, or unenforceable, the parties shall endeavor to modify that clause in a manner which gives effect to the intent of the parties in entering into this PFA.

L. Foundation Right of Approval: The Foundation and Co-funders shall have the right, in their sole discretion, to refuse to permit any employee of the Sub-recipient, or employee of an approved agent, assignee, or subcontractor of the Sub-recipient, to be located at a Foundation or Co-funders work location, or to provide services to the Foundation, Co-funders or their clientele pursuant to this PFA. Such right of refusal shall not be considered a breach of this PFA.

M. Exhibits: All Exhibits attached to or made part of this PFA are incorporated and agreed upon by the parties. In the event a conflict occurs between the terms of an Exhibit and this PFA, the terms of this PFA shall control.

N. Federal Compliance: The Sub-recipient shall comply with all applicable Federal, State and local statutes, laws, rules, and regulations in the performance of this PFA, whether included specifically in this PFA or not.

O. Foundation and Co-funders Liability: The Foundation and Co-funders shall not have any liability except as specifically provided in this PFA. In no event shall any judgment against the Foundation exceed the amount of funds provided by the Foundation; nor any of the amounts of funds provided by Co-funders to Sub-recipient under this PFA (excluding in-kind grants).

P. Notices: Any notice, request, demand, or communication required under this PFA ("Notice") shall be in writing and shall be deemed sufficiently given upon delivery, if delivered by hand (signed receipt obtained), or three (3) days after posting if properly addressed and sent certified mail return receipt requested. These Notices shall become effective on the date of receipt or the date specified within the Notice, whichever comes later.

Q. Captions for Convenience: All captions used in this PFA are for convenience only and shall have no meaning in the interpretation or effect of this PFA.

R. Construction: This PFA, and any and all amendments to it, shall not be construed against the drafter.

- S. Force Majeure: None of the parties hereto will be liable for damages for any delay or default in performance during the term hereof if such delay or default is caused by conditions beyond its control, including, but not limited to, acts of God, Government restrictions, continuing domestic or international problems such as wars, threats of terrorism, or insurrections, strikes, fires, floods, work stoppages and embargoes; provided, however, that any party will have the right to terminate this PFA "without breach" upon thirty (30) days prior written Notice if another party's delay or default due to any of the above-mentioned causes continues for a period of two (2) months.
- T. Security Interest: No party will grant any security interest in, or allow any lien or encumbrance of any nature upon, any Intellectual property in which another party has an interest (i.e., the Foundation Intellectual Property or Jointly Owned Intellectual Property). Breach of this Paragraph may, at the Foundation's or Co-funders' option, require the repayment of all grant monies provided by the funding party to Sub-recipient under this PFA. The terms of this Paragraph will survive the termination of this PFA.
- U. Waiver: Waiver of any provision of this PFA must be in writing to be effective. Waiver by the Foundation or Co-funders of any breach of any provision of this PFA on any occasion shall not constitute or operate as a waiver of breach of such provision on any other occasion nor a waiver of any breach of other provisions, nor shall any failure to enforce any provision operate as a waiver of such provision hereof by the Foundation or Co-funders.
- V. Applicable Law/Venue: This PFA is written and shall be construed in accordance with and governed by the laws of Colorado unless U.S. Federal law applies. However, if legal action is taken against Sub-recipient and U.S. Federal or state laws which exist that govern Sub-recipient (as a quasi public or public entity) exclusively, this PFA shall be construed and interpreted in accordance with such laws. Any action against the Foundation must be brought in a Colorado State Court or U.S. Federal District Court located in Denver, Colorado in the event the mediation/arbitration provisions of this Agreement are modified. The terms of this Paragraph will survive the termination of this PFA.
- W. Signatures. This PFA may be executed on separate originals or copies and shall be valid as if all parties had executed the same document. Facsimile or electronic signatures shall be valid as written signatures. Foundation will maintain all signed documents for three (3) years after the termination of this PFA and will provide signature pages to all parties upon full execution.

XV. INDEPENDENT SUB-RECIPIENT

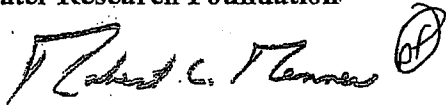
A. Relationship:

2. The relationship of all the parties to each other will be that of Independent Contractors and no principal-agent relationship or employer-employee relationship is contemplated or created by the parties to this PFA. Nothing in this PFA shall be construed as creating an agency, partnership, joint venture, or franchise relationship between any the parties. No party shall have any right or authority to assume or create any obligation, commitment or responsibility for or on behalf of the others except as the other may expressly authorize in writing. No party shall be eligible to participate in another's benefit program.

3. Sub-recipient shall be solely responsible for selecting, supervising, and compensating individuals employed pursuant to the terms of this PFA.
4. Sub-recipient shall be exclusively responsible for the payment to its employees and Subcontractors of all wages and salaries, taxes, withholding payments, penalties, fees, fringe benefits, compliance with the wage and hour law, and all other employment laws.

IN WITNESS WHEREOF, the parties have caused this PFA to be signed and dated as shown below.

Water Research Foundation



By: Robert C. Renner, P.E., D.E.E.
Title: Executive Director

Date: 2/25/10

Columbia University



By: Mario F. Reyes
Title: Director
Sponsored Projects Administration
Columbia University

Date: 4/6/10



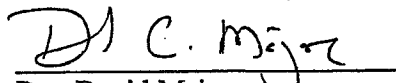
Water Research Foundation



By: Kenan Ozekin
Title: Sr. Project Manager

Date: 02/25/10

Columbia University



By: David Major
Title: Principal Investigator

Date: 7/6/10

Above signed has read and understands the terms, conditions, and deliverables of this PFA.

Above signed has read and understands the terms, conditions, and deliverables of this PFA.

Project 04228

Title: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation

CO-FUNDER/SPONSOR

ATTEST:
SHARON R. BOCK
CLERK AND COMPTROLLER


APPROVED AS TO FORM AND LEGAL
SUFFICIENCY

Assistant County Attorney

PALM BEACH COUNTY, FLORIDA, A
Political Subdivision of the State of Florida
BOARD OF COUNTY COMMISSIONERS

By: _____
Karen T. Marcus, Chair

APPROVED AS TO TERMS AND
CONDITIONS



Bevin A. Beaudet, P.E., Director
Water Utilities Department

Exhibit A
Project 04228

Title: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation

Project proposal, & all subsequent correspondence.

TAILORED COLLABORATION PROPOSAL COVER WORKSHEET

Proposal Title: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation

Sponsoring Utility (AwwaRF Subscriber submitting proposal): Palm Beach County Water Utilities Dept

Contact at Sponsoring Utility:

Name: Bevin Beaudet

Address: 8100 Forest Hill Blvd; West Palm Beach, FL 33413

EMMUTA

Phone: 561-493-6007
bbeaudet@pbcwater.com

Fax: 561-493-6008

e-mail:

Co-Funding and In-kind Summary: (attach additional sheet if needed)

Organization Name	Cash Co-fund Amount	In-Kind Contribution Amount (sponsoring utility)
1. PBC Water	9,000	
2.		
3.		
4.		
Total cash \$9,000		In-Kind

Project Personnel

Principal Investigator (i.e., researcher responsible for conducting research)

Name: Dr David Major

Organization: Columbia University

Address: 2880 Broadway, New York, NY 10025

Phone: 212- 255-8329

Fax: 212-678-5648

e-mail: dcm29@columbia.edu

Person responsible for finalizing Funding Agreement (i.e., research contract)

Name: Patricia Valencia

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AwwaRF Funds Requested: \$USD 9,000

Amount of Funds eligible for AwwaRF match: \$USD 9,000

Amount of Funds not eligible for AwwaRF match: \$USD 0

Total Cash Budget (AwwaRF Funds + All Co-Funding Cash): \$USD 18,000

Total In-kind Contributions: \$USD 9,000

Total Project Budget (Cash + In-kind): \$USD 27,000

Proposals with an incomplete Proposal Cover Worksheet will not be accepted.

**Water Utilities and Climate Change:
A Research Workshop on Effective System Adaptation**

Florida Center for Environmental Studies
Columbia University Center for Climate Systems Research

Sponsoring AWWARF Member:

Palm Beach County Utilities Department

Project Abstract

This proposal is for an integrative research workshop bringing together utility managers, engineers, and planners with climate scientists and urban infrastructure planners to begin mainstreaming climate science into the complex public decision process for water utility management, rehabilitation, and expansion in coastal areas. The workshop will provide effective guidelines for water utility adaptation planning within the context of urban coastal Florida, building on existing work by the research team and others in developing climate scenarios and adaptations for water utilities. At the same time the process will create an ongoing research agenda on specific adaptation issues. The workshop, with a utility-specific follow-up session, offers participating utilities an unusual opportunity to begin the exploration of their needs and opportunities for adapting to climate change, at a stage early enough to provide for both effective adaptation and cost minimization through appropriate capital programming. Workshop sessions at the main one-day meeting will include: Climate science fundamentals and future scenarios for Florida; inventory and assessment of existing and proposed future infrastructure for climate risks; the range and design of adaptations for system operations, infrastructure, and policy; evaluation of adaptations through benefit-cost analysis and environmental and other impact assessment; programming of capital improvements over the long term; and institutional needs and capacities for adaptation to climate change. The utility-specific follow-on session will incorporate workshop material into the analysis of specific problems and solutions. Workshop products will include: climate science education and awareness; a utility-specific follow-on workshop, with preliminary development of adaptation planning and assessment for participants; identification of major issues for new research and follow up; workshop report with guidelines for water utility adaptation in Florida coastal areas (and, by extension, to similar coastal areas in other states); and peer-reviewed articles in journals for widespread dissemination to utility personnel.

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EXHIBIT A

Project Description

Florida is one of the U.S. states most directly and severely affected by climate change. Approximately ten million of its people live in coastal or near coastal areas, where there is the potential for increased vulnerability to rising sea levels, storm surges, higher temperatures, salt-water intrusion, and more intense rainfall episodes.

Sea level rise will exacerbate storm surge during hurricanes, by making the surge higher and the wave action above it also higher. As a result, infrastructure flooding and loads applied to buildings by storm surge will be significantly higher, in many cases exceeding their designed capabilities. This very real potential for damage driven by sea level rise becomes even more worrisome when it is considered that new observational research data (1993 – 2006) shows that sea level has been rising faster than projected by models. These new data yield a linear trend of 3.3 ± 0.4 mm/year, which is 65% to 85% higher than the mean 2 mm/year rise of the 20th century (Beckley et al., 2007).

Sea level rise will exacerbate beach erosion, which will not only have adverse effects on tourism but will also lead to potential damage to water utility infrastructure and buildings by undermining foundation and protective structures (i.e., sea walls). The area subject to coastal flooding from storm surge will increase as sea level rises, bringing ever increasing numbers of infrastructure facilities and buildings not originally built to resist flooding into harm's way. To these impacts must be added the impacts of potentially more intense rainfall events that can exacerbate inland flooding and higher temperatures.

With substantial facilities located on the coasts, Florida water agencies and others nationwide have become aware of the need to adapt to climate change, but the next steps—detailed assessments of the range of potential adaptations, their integration into management and facilities design, and their programming as part of long-term capital budgets, have for the most part yet to be taken. This proposal, for an integrative research workshop bringing together utility managers, engineers, and planners with climate scientists and urban infrastructure planners, is designed to begin those steps. By mainstreaming climate science into the complex public decision process for water utility management, rehabilitation, and expansion in coastal areas, the workshop will provide effective guidelines for water utility adaptation planning. The workshop will build on the most up-to-date existing and in-process work in developing climate scenarios and adaptations for water utilities, within the context of urban coastal Florida. The challenge is the actual development of adaptations and their integration into the rehabilitation cycle and capital budgeting of water utilities. The workshop is seen as the beginning of a research process on infrastructure adaptation in Florida.

Workshop Plan and Contents

The workshop will combine three overarching objectives:

1. Facilitate the work of participating water utilities to begin an effective exploration of their needs and opportunities to plan for the impacts of climate change.

2. Identify, through water utility participation, the spectrum of adjustments that will be necessary to deal with climate change in Florida. This will provide a strong beginning of a research process to enable these needs to be met.
3. Initiate the development of a network of water utilities in Florida (and elsewhere) with common interests to develop a program of research, information exchange and interaction between them.

The participants will include utility managers, engineers, planners and academics and invited outside experts. Several relevant water utility personnel will be invited from areas outside of Florida with similar coastal problems, such as the Gulf Coast and Eastern seaboard. A special feature of the research workshop will be a set of follow-up activities with the partner utility, to further develop approaches to adaptation and to test elements of the report within the context of each utility's specific system, dependent on available resources.

Draft Workshop Agenda

9:00 – 10:00 Climate science fundamentals and the development of climate scenarios for Florida

This will cover the most recent IPCC results and their interpretation in a risk-based approach, including a discussion of the water utility infrastructure, management and policy elements that will require adaptation. A principal focus for Florida will be sea level rise and an increase in extreme events. However, precipitation and temperature changes are also important; for example the former may increase the potential for increases in damaging inland flooding. Best-practice methods of developing risk-based scenarios for Florida areas will be discussed, and examples of scenarios for sea level rise developed from recent IPCC GCM runs and gridded local sea level rise estimates will be presented; in addition, newly-developed high-end scenarios based on more rapid ice melt will also be discussed (Horton and Rosenzweig, 2010).

10:15 – 11:45 Inventory and assessment of existing and proposed future water utility infrastructure for climate risks

This session discusses the importance of preparing for adaptation planning by appropriate inventory and assessment of infrastructure. Such preliminary information is often not fully available, because infrastructure may be managed by several agencies, may be subject to planning for replacement over time periods shorter than those relevant to climate change, and is not consistently identified by parameters (height above mean sea level and storm surge records, distance from shore, expected lifetime, rehabilitation cycle) relevant to climate change. Strategies for preparing climate risk inventories will be presented (Major and O'Grady, 2010).

11:45 – 12:30 Evaluation of adaptations through benefit-cost analysis and environmental and other impact assessments

This session will demonstrate how benefit-cost analysis and environmental and other impact techniques can be applied in ways that will provide assessments that are directly useful for systems management under climate change. Such assessments can quantify the relative savings from enhanced preparedness by incorporating adaptations into newly-designed or newly-rehabilitated infrastructure rather than playing catch-up after sea level and storm surges have risen beyond the safety point for individual infrastructure elements. Methods for applying benefit-cost analysis and other techniques specific to climate change will be presented.

12:15 – 1:00 Lunch

1:00 – 2:30 The range and design of adaptations for system operations, infrastructure, and policy

This session will discuss available adaptations for infrastructure, operations, and policy and how they can be linked to climate scenarios through the use of model-based probability results, ranges, and thresholds. The intention of this discussion is to integrate the climate science and the range of adaptations so that water utilities can begin the complex process of evaluating adaptations. Pre-workshop preparation will identify the main issues which adaptation will face in Florida and strategies for their effective inclusion in water utility management.

2:30 – 3:00 Programming capital improvements over the long term

In most jurisdictions, long-term capital planning has not yet begun to include responses to climate change. This discussion will begin that process by indicating how climate change science, engineering design, decision time-scales and capital availability come together to improve the capital budgeting process.

3:00 – 4:30 Identifying the barriers and opportunities

A panel discussion involving utility representatives and outside experts to identify the institutional, financing, infrastructural, bureaucratic and other barriers to effective adaptation for climate change, and opportunities arising from barrier removal.

4:30 – 5:00 Wrap up and next steps, including preliminary scheduling of follow-on sessions.

EXHIBIT A

Products

- Utility awareness of the problem and ways of addressing it
- Climate change information for utilities
- Utility-specific follow-on workshop, with preliminary development of adaptation planning and assessment for participants
- Identification of major issues for new research and follow up.
- Workshop report with guidelines for water utility adaptation in Florida coastal areas (and, by extension, to similar coastal areas in other states)
- Peer-reviewed articles in journals for widespread dissemination to utility personnel.

Applications Potential

It is expected that the proposed workshop will begin a substantial process, for which there is a pressing need in Florida and similarly situated areas, of efficient, effective long-term planning for the adaptation of water utility infrastructure, operations and policy to climate change. The proposed workshop is part of a larger program of the two academic institutions to provide guidelines and protocols for management, infrastructure and policy adaptations to climate change for coastal cities for all sectors, including water resources. Because water utilities face similar problems throughout the Gulf Coast and the Eastern seaboard, the workshop products will have broad application. In addition, there will be benefits to other sectors and to the Florida climate change program as a whole. Within Florida, all types of coastal infrastructure will require adaptation, including transportation, buildings, power, health, and other sectors, and the leading role played by water utilities will be helpful in the larger, long-term, and costly efforts that will be required.

Summary of Related Research

The workshop will build on existing work in developing climate scenarios and adaptations for water utilities, within the context of urban coastal Florida. Previous work includes AWWARF's *Climate Change and Water Resources: A Primer for Water Utilities* (Miller and Yates, 2005), extensive work in New York City (Rosenzweig et al., 2007; New York City Department of Environmental Protection, 2008; New York City Panel on Climate Change, 2010), a climate plan from King County, Washington (2007), the 2007 Water Utility Climate Change Summit in San Francisco, ongoing AWWARF-supported research in Florida, rapid development of interest in and response to climate change in Florida (Florida Governor's Action Team, 2007), and developments in Europe, such as those discussed at the AWWARF/UKWIR Joint Workshop on Climate Change Research Needs, Edinburgh, 2007. As mentioned above, the next challenge is the actual development of adaptations and their integration into the rehabilitation cycle and capital budgeting of water utilities, which will be a principal focus of the research workshop.

Work in Florida

The pace of activity on climate change issues in Florida has picked up dramatically on both policy and project levels. An early EPA-sponsored study on the impacts of sea level rise on

the Treasure Coast (Treasure Coast 2005) and the pioneering work of Harvey Ruvin and colleagues in Miami-Dade county were initiatives begun in the early 2000's (Miami-Dade County Climate Change Task Force). An invited workshop of some 40 professionals state-wide convened by the Florida Center for Environmental Studies (FCES, 2006) focused attention on the issue and led to a state-wide conference in May 2007 attended by 350 people including the state Secretary for DEP and the Chief Financial Officer of the state (FCES 2007). Working groups produced a series of next steps and recommendations. Those relevant to water utilities and urban infrastructure more generally include the following:

- Climate change issues should be a part of planning at city, county and regional levels including the siting of infrastructure and power systems.
- Preparation is required for a generally hotter, drier climate, with periods of more intense rain and perhaps more severe storms, a recommendation directly relevant to water utilities..
- Florida is the most vulnerable state in relation to the impact of sea level change. There is a pressing need to develop specific risk assessments for Florida's coastline.
- The state and other governmental entities and universities should partner with utility companies to educate the public on energy efficiency and expand and increase incentives to homeowners (free/low cost loans for photovoltaic systems, net metering, solar panels), and water efficiency.
- Vulnerability assessments of utility and other assets are needed, as well as ways to quantify risks to these coastal assets – both natural and man made (Alvarez et al, 2005, 2006).

As a result of these recommendations, and energized by Governor Crist's state-wide effort to bring climate change into public focus, a working group was set up to examine mitigation efforts with regard to the built environment, including water and other utilities. This group organized a successful workshop in climate adaptation in Florida at the National Council for Science and the Environment (NCSE) conference in Washington, D.C., January 17, 2008 (report forthcoming) and is actively looking for funding for urban infrastructure assessment (Blockstein and Wiegman, 2010).

The workshop and follow-up activity are part of a broader pattern of research on Florida's urban response to the challenge of climate change in a vulnerable state (see also Murley and Bollman, 2007, Heimlich et al, 2009 and the work of the Climate Change Task Force in Miami and Broward Counties).FAU has in addition initiated a university wide initiative on adaptation to Climate Change headed up by Dr. Berry.

Work in New York

The workshop will follow generally the pattern of a successful Columbia University Center for Climate Systems Research (CCSR) research workshop in June, 2007 (at which there was AWWARF attendance), to develop an integrated modeling framework for incorporating climate change into watershed models of the New York City Department of Environmental Protection. This workshop used climate science and scenarios to develop applied methods for adaptation planning (Major et al., 2007).

For the climate scenarios for temperature and precipitation, for each GCM, the location of the New York City watershed relative to the GCM grid was determined. Downscaling procedures were applied to produce regional scenarios for temperature and precipitation from GCM outputs. These procedures produced 42 (3 x 14) outputs for each scenario period for temperature and precipitation. For each period and variable, the results are "model-based" relative frequencies presented as histograms, so that user groups can base decisions on statistics including the range of values, percent of values exceeding a key threshold, and uncertainty.

This probabilistic approach is also applied to sea level rise projections. Coastal and inland flooding scenarios have been developed using SLR and historical storm data; these will be further refined with estimates of increasing frequency and intensity of extreme events. These scenarios have been developed for the New York City Department of Environmental Protection (NYCDEP), the agency responsible for the water system of the region (Rosenzweig et al., 2007a).

Also in 2007, the team's scenarios have been used to analyze climate aspects of the infrastructure flooding potential for the Metropolitan Transportation Authority in its current review of future flooding, stimulated by the high-impact floods of August 8, 2007 that disrupted all of the city's subway lines (Rosenzweig et al., 2007b). This work includes the detailed assessment of flood potential at three different transportation infrastructure locations, including coastal flooding, inland flooding (from intense storms), and a combination of the two.

Further, for the period 2007-8, the team has been working with Mayor Bloomberg's administration to develop PlanNYC, contributing work on historical climate, future climate projections, and the importance of including adaptation to climate change in long-term planning. Members of the team have also met with New York City's Office of Emergency Management, the group responsible for hurricane preparedness, evacuation, and response.

Most recently, the Columbia team has been working with the Nature Conservancy on the evolution of climate change on Long Island with an emphasis on sea level rise and coastal storms. This work is highly relevant for coastal Florida, where sea level rise and storm surge associated with tropical cyclones may pose the gravest threat. It is being done with a set of 7

EXHIBIT A

GCM model outputs for which the data permit sea level calculations, together with high-end scenarios representing more rapid ice melt than is assumed in IPCC 2007a.

In addition, both the GCM outputs and the most current observational data are being analyzed to develop insights into the potential for low probability but high impact events, within the IPCC framework for considering probabilities. These include, but are not limited to: accelerated sea ice loss in the Arctic Ocean shown by recent observations; the trend is suggested by modeling studies (Holland et al. 2006, for example); and increased melting of the Greenland and West Antarctic Ice Sheets suggested by recent studies (Rignot and Kanagaratnam, 2006; Shepherd and Wingham, 2007; Velicogna and Wahr, 2006)

Quality Assurance/Quality Control

The information on climate science that will be used in the workshop is quality controlled through the extensive peer reviewed processes of the IPCC, and the scenarios development methods have been peer-reviewed in journal publications. The material in the workshop will all be based on peer-reviewed (including some in-process) work.

Schedule

Planning will commence immediately upon initial funding, with the workshop to be held June/July 2010, and the follow-on utility-specific meetings and report drafting later in 2010. It is expected that the project will be completed by December 1, 2010.

Management Plan and Statement of Qualifications

The Florida Center for Environmental Studies (FCES), a state-wide Florida university research center, has undertaken to spearhead climate change research, awareness and adaptation in Florida. Among other key initiatives, it was the sponsor of the Climate Change conference in Tampa in May, 2007, that broke new ground for climate change in the state. The Columbia University Center for Climate Systems Research (CCSR), located at NASA's Goddard Institute for Space Studies on the Columbia University campus, is a leader in the integration of climate science and coastal infrastructure.

Key personnel for the Florida Center for Environmental Studies:

Leonard Berry, Ph.D., Professor and Director of the Florida Center for Environmental Studies will oversee the project in Florida.

Jo Ann Jolley, MPA, Associate Director of the Florida Center for Environmental Studies, will be responsible for project administration and coordination. She will assist the PI's in developing the workshop agenda, coordinating speakers and working with local utilities to identify staff attendees. Ms. Jolley will also provide workshop materials and provide climate

information for workshop utilities as a basis for ongoing activities. 2 weeks effort. (3% of annual time)

Ricardo Alvarez, Research Fellow, FCES, will provide workshop material and presentations on building code and storm surge issues in Florida. 1 week effort (2% of annual time)

Graduate Student (TBD) will be responsible for assisting in the preparation of materials for the workshop, providing logistical support and supporting post-workshop report development. 3 weeks effort (6% of annual time)

Key personnel for Columbia University:

David C. Major, Ph.D., Senior Research Scientist, will be the project co-Principal Investigator. He will help to shape the detailed planning for the workshop and follow-on meetings, and will help to draft the project report. A CV is attached as a Statement of Qualifications. Dr. Major will devote 2 weeks to the project.(2% of annual time).

Radley Horton, Ph.D., Associate Senior Research Scientist, will present climate science, scenario development methods, and perspectives on the future development of GCMs and climate science. Dr. Horton will devote 1.5 weeks to the project (2% of annual time).

Vivien Gornitz, Ph.D., Senior Research Scientist, will develop sample sea level rise scenarios for areas in Florida and present these at the workshop. Dr. Gornitz will devote 1 week to the project (2% of annual time).

Cynthia Rosenzweig, Ph.D., the director of the CCSR, will have general oversight of the development of the project and its integration into ongoing work. Dr. Rosenzweig's contributed time will include oversight throughout the project.

**Water Research Foundation
Research Project Budget**

(Instructions for Budget Preparation are located at: <http://www.waterresearchfoundation.org/research/projectAdmin/docs/universalBudgetInstructions>)

Applicant Name: Columbia University * Required fields are highlighted in yellow.
 Project Name: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation
 Preparation/Revision Date: 8 January 2010
 RFP # (if applicable):

Note: The information above will carry over to subsequent pages/worksheets. All totals below will be automatically populated from the following pages/worksheets.

		Total	Foundation Share	Cost-Share
A	Key Personnel	4 315,03	-	-
B	Other Personnel	-	-	-
<i>Total Direct Labor and Fringe Benefits</i>		4 315,03	-	-
C	Equipment Rental Special Equipment	-	-	-
D	Materials and Supplies	-	-	-
E	Travel	1 998,00	-	-
F	Subcontracts	7 973,00	-	-
G	Other Direct Costs	-	-	-
<i>Total Direct Costs</i>		14 286,03	-	-
H	Indirect Costs	3 714,36	-	-
I	Fee	-	-	-
J	Surveys	-	-	-
<i>Total Direct and Indirect Costs</i>		18 000,39	-	-
K	Third-Party Contributions	-	n/a	n/a
Total Project Budget		18 000,39		

Budget Summary

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**Budget Narrative
Columbia University**

Salaries and Wages: The salaries for the CU research personnel reflect typical rates within the university. This project will be completed within one calendar year and thus no cost of living or merit raises have been included in the budget.

David Major, researcher and coordinator, (\$1,350) will devote 2% of his time to this project and will be the project co-Principal Investigator. He will help to shape the detailed planning for the workshop and follow-on meetings, and will help to draft the project report.

Cynthia Rosenzweig, senior research scientist, will have general oversight of the development of the project and its integration into ongoing work. Dr. Rosenzweig's contributed time will include oversight throughout the project.

Radley Horton, Associate Senior Research Scientist (\$1,080) will devote 2% of his time to this project and will present climate science, scenario development methods, and perspectives on the future development of GCMs and climate science.

Vivien Gornitz (\$928) as Special Scientist will devote 2% of her time to this project and will develop sample sea level rise scenarios for areas in Florida and present these at the workshop.

Fringe Benefits: The fringe benefit rates are established by Columbia University. Currently these rates are 28.5% for all employees.

Travel: \$1,998 is budgeted for travel, which will include multiple visits to the participating utilities.

Indirect Costs: The current off-campus indirect cost rate is 26%. This rate has been negotiated with the U.S. Department of Health and Human Services Division of Cost Allocation.

**Budget Narrative
Florida Center for Environmental Studies**

Subcontractor Budget Justification

Salaries and Wages: The salary rates of the professional research staff are established by the university and funded by annual allocation. As this project will be completed within one calendar year, no cost of living or merit raises have been included in the budget.

Jo Ann Jolley, , (\$1,874.51) will devote 3% of her time to this project and will be responsible for project administration and coordination. She will assist the PI in developing the workshop agenda, coordinating speakers and working with local utilities to identify staff

attendees. Ms. Jolley will also provide workshop documentation and develop the post-workshop information for ongoing activities.

Graduate Student (TBD), (\$1,680) will devote 6% of his/her time to this project and will be responsible for preparing materials for the workshop, providing logistical support and assisting with post-workshop report development.

Fringe Benefits: The fringe benefit rates are established by the University. Currently these rates are 35.6% for professional staff and 0% for graduate students. Fringe benefit dollar amounts for this project are: Jolley (\$667.32) and Graduate Student (\$0).

Materials and Supplies: The total amount for CES materials and supplies is \$150. The majority of these costs will be for printing and copying workshop materials.

Travel: \$146 is budgeted for travel, which will include multiple visits to participating utilities as well as travel to and from the workshop.

Subcontracts: \$1,000 is budgeted for Ricardo Alvarez for consulting services to provide workshop material and a presentation on building code and storm surge issues in Florida.

Indirect Costs: The current campus indirect cost rate is 44.5% of modified total direct costs. This rate has been negotiated with the U.S. Department of Health and Human Services Division of Cost Allocation. The total cost of this proposal is subject to 44.5% indirect costs.

CES Budget as part of Budget Narrative

Salaries	
Jolley 3% time	\$1,875
Graduate Student (TBD) 6% time	\$1,680
Benefits	
Jolley @ 35.6%	\$667
Graduate Student @ 0%	0
Supplies	
Travel	\$150
	\$146
Subcontractor, Alvarez	
	\$1,000
Total Direct Cost	\$5,518
Indirect @ 44.5%	\$2,455
Total	\$7,973

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February 12, 2008

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RE: Letter of Support - Water Utilities and Climate Change
A Research Workshop on Effective System Adaptation
A proposal for an AWWA Research Foundation Tailored Collaboration

**Palm Beach County
Board of County
Commissioners**

Addie L. Greene, Chairperson

Jeff Koons, Vice Chair

Karen T. Marcus

Robert J. Kanjian

Mary McCarty

Burt Aaronson

Jess R. Santamaria

County Administrator

Robert Weisman

Dear Dr. Berry,

The Palm Beach County Water Utilities Department has been working with the Florida Center for Environmental Studies and Columbia University Center for Climate Systems Research in the development of a research workshop which will begin the process of detailed assessment of the range of potential adaptations needed to deal with the impacts of climate change and their integration into management and facilities design as well as their influence on long-term capital investment.

We recognize the pressing need for this process and are committed to being a sponsor of the workshop and its follow-up activities. Palm Beach County Utilities Department is willing to provide \$9,000 cash contribution for workshop expenses.

It is a pleasure to be a leader in this process in Florida and we appreciate AWWARF's potential support.

Sincerely,

A handwritten signature in cursive script that reads "Bevin Beaudet".

Bevin Beaudet, P.E. Director

*"An Equal Opportunity
Affirmative Action Employer"*

TC CO-FUNDING SUPPORT FORM

EXHIBIT A

Note: Each co-funding organization (including the sponsoring utility) must complete a separate Co-Funding Support Form and include it in the proposal.

Co-Funding Organization: PALM BEACH COUNTY WATER UTILITIES DEPT.

Type of Organization: water utility consulting firm manufacturer other (describe)

Is your organization eligible to participate in one of AwwaRF's subscription programs? Yes No

Is your organization requesting that AwwaRF match its funds? Yes No

Is your organization eligible for AwwaRF matching funds? Yes No

Cash co-funding amount being provided by your organization (in USD) \$ 9,000.00

Person responsible for contract matters for your organization:
Name: Bevin Beaudet, P.E.

Address at which FedEx packages can be received: 8100 Forest Hill Blvd, West Palm Beach, FL 33413

Phone/Fax/e-mail: 561-493-6007 561-493-6008 bbeaudet@pbwater.com

Person responsible for accounting matters for your organization:

Name: Rhonda Alexander

Address at which FedEx packages can be received: 8100 Forest Hill Blvd., West Palm Beach, FL 33413

Phone/Fax/e-mail: 561-493-6000 561-493-6008 ralalexander@pbwater.com

What approvals will be required in order for your funds to be released to AwwaRF? (e.g., City Council, Board of Commissioners)

BOARD OF COUNTY COMMISSIONERS

Have these approvals been obtained? Yes No

Can approvals be obtained and co-funding agreements be signed within 120 days of award? Yes No

(Note: 120 days after award notification AwwaRF may cancel the award—see TC proposal guidelines for details.)

Are there any conditions of the AwwaRF Co-Funding Agreement that would prevent you from signing it as it is currently worded? Yes No

If yes, please explain: (attach additional pages if required)

The person signing below acknowledges they are authorized to commit their organization to the proposed work.

Signature [Handwritten Signature] Print Name Bevin Beaudet
Title Director Organization PBC Water Utilities
Date 4-14-08 Phone 561-493-6007
Mailing Address 8100 Forest Hill Blvd., West Palm Beach, FL 33413

TC CO-FUNDING SUPPORT FORM

Note: Each co-funding organization (including the sponsoring utility) must complete a separate Co-Funding Support Form and include it in the proposal.

Co-Funding Organization: Miami-Dade Water & Sewer Dept.

Type of Organization: water utility consulting firm manufacturer other (describe)

Is your organization eligible to participate in one of AwwaRF's subscription programs? Yes No

Is your organization requesting that AwwaRF match its funds? Yes No

Is your organization eligible for AwwaRF matching funds? Yes No

Cash co-funding amount being provided by your organization (in USD) \$ 9000⁰⁰

Person responsible for contract matters for your organization:

Name: DOUGLAS YODER

Address at which FedEx packages can be received: SEE Below

Phone/Fax/e-mail: 786 552 8919 / 786 552 8937 / yoderd@miamidade.gov

Person responsible for accounting matters for your organization:

Name: DOUGLAS YODER

Address at which FedEx packages can be received: SEE Below

Phone/Fax/e-mail: SEE Above

What approvals will be required in order for your funds to be released to AwwaRF? (e.g., City Council, Board of Commissioners)

Board of County Commissioners

Have these approvals been obtained? Yes No

Can approvals be obtained and co-funding agreements be signed within 120 days of award? Yes No

(Note: 120 days after award notification AwwaRF may cancel the award--see TC proposal guidelines for details.)

Are there any conditions of the AwwaRF Co-Funding Agreement that would prevent you from signing it as it is currently worded? Yes No

If yes, please explain: (attach additional pages if required)

The person signing below acknowledges they are authorized to commit their organization to the proposed work.

Signature: *Douglas Yoder* Print Name: DOUGLAS YODER

Title: Deputy Director Organization: Miami-Dade Water & Sewer

Date: 3-12-08 Phone: 3071 846 786 552 8979

Mailing Address: 3071 SW 38 Ave, Suite 519, Miami FL 33146

**Technical Review Committee - Review Comments
AwwaRF Tailored Collaboration Proposal TC-08-07
Water Utilities and Climate Change: A Research Workshop on Effective System
Adaptation**

**Responses to Review Comments
December 15, 2008**

EXHIBIT A

Reviewer No. 1

1a) I question how much can be accomplished in the one day workshop. The agenda seems rather ambitious, unless the intent is to do an overview and cover broad general issues instead of trying to develop specific guidelines for FL. 1b) The follow-on sessions should be fleshed out a bit more. That seems like the logical venue to develop guidelines rather than trying to get it done via the workshop.

Responses:

1a) The agenda is ambitious, but the key to success is the breadth of knowledge and experience of the project team. The FCES group has excellent relationships with, and knowledge of, Florida agencies and utilities, and the Columbia group is a world leader in urban adaptation to climate change. So much has been done in other venues that a concise, effective set of planning guidelines can be presented in the workshop.

1b) The follow-on sessions are indeed key to success. The exact nature of the sessions will depend on the needs of each utility and the personnel available; however it is expected that they will run for at least one day per utility. In these sessions, it is expected that methods developed to date will be adapted to the specific conditions of each utility. By the time of the follow-up sessions, to take one example of methods that will be used, the detailed climate risk information and adaptation planning guidelines on which several team members are working for New York City will become publicly available. Adaptation materials from many other venues will also be considered; these are being gathered and assessed by team members now, both by those involved in the International Panel on Climate Change for Cities (IPC3), and for the forthcoming World Bank guide for Mayors, which will include a chapter on climate change and water and wastewater planning authored by one of the project team.

Reviewer No. 2

2a) Proposal could use more specificity regarding how the workshop products will benefit the utility specific follow-on sessions. 2b) The workshop sounds more like an information sharing type of meeting with outcomes limited to ideas and suggestions for how Florida utilities can incorporate climate change into their planning. 2c) It might be more productive to precede the workshop with a simple survey to find out what Florida

utilities information needs are in the area of climate change and then structure the workshop to deliver on those specific needs.

2d) My sense is that the workshop objectives are not achievable with the level of effort proposed. I think they can accomplish the objective of raising the awareness of the issues, but I think they are biting off more than they can chew if they intend to provide effective guidelines for planning.

2e) I think there is value in performing the work, especially if the approach can be developed as a model for other regions that are just starting to incorporate climate change into their planning.

Responses:

2a) See 1b), above. The team has substantial experience in working with utilities, as is illustrated by its contributions to the most recent New York Department of Environmental Protection Climate Change Program's *Assessment and Action Plan*, May, 2008. Members of the team worked for more than 3 years with NYCDEP to develop this program, its reports, and its recommendations.

2b) See also 1a), above. The amount of detailed planning information that has become available even since the original submission of this proposal is quite substantial, and this information will be used to provide a concise and effective approach to planning guidelines.

2c) A survey can be a good idea in general; however, in this case the objectives of the survey have already been accomplished through the extensive contacts with, and work for, Florida agencies and utilities by the FCES.

2d) See also 2b). The material available and the wide-ranging experience of the project team will make the workshop effective.

2e) This comment exactly represents one of the aims of the project.

Reviewer No. 3

3a) Has the list of workshop participants been finalized? If yes, who are they? What other utilities will participate? 3b) The level of effort between a workshop and follow-up activities with participating utilities indicates longer than 6 months to complete the final report. The project schedule seems tight.

3c) Unless the workshop includes more than just the two co-funding utilities not sure of the broader applicability.

Responses:

3a) The complete list of invitees will be developed, based on the extensive contacts of FCES and the participating utilities, immediately on the availability of AWWARF funding.

3b) The schedule is tight but doable given the experience of the project team in workshop preparation and presentation and report writing.

3c) The workshop has two co-funding utilities now; there would be at most one more, as it is desired to keep the initial workshop at a manageable size to achieve objectives. The two current sponsors have between them a wide range of challenges and problems relevant both to Florida and to other jurisdictions. After success has been demonstrated with the first workshop, it is planned to offer other workshops in Florida and elsewhere.

EXHIBIT A

**Exhibit B
Project 04228**

Title: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation

<u>TASK</u>	<u>DUE DATE</u>
Begin Project	March 1, 2010
Scope of Work	April 1, 2010
Participant presents Proof of Insurance(s) or Certificate of Self Insurance	April 1, 2010
Participant presents Proof of Worker's Compensation Insurance	April 1, 2010
Periodic 1 Report 1 & Invoice (5 copies)	June 1, 2010
Periodic 2 Report (incl. Technical Summary & Web Update) & Invoice (5 copies)	September 1, 2010
Draft Report (5 copies) & Invoice	December 1, 2010
Final Report & Final Compensation (2 copies)	March 1, 2011
Letters of Confirmation for participating utilities	March 1, 2011
Complete & Submit Exhibit E – Assignment of Copyright	March 1, 2011
Project End & Foundation Publication Date	January 1, 2012

Note: Final payment will be disbursed subsequent to response to editor queries on the final report, as defined in the Foundation "Tailored Collaboration Guidelines," and submission of a final invoice detailing final Project costs including cost share and in-kind contributions. Please submit # of copies shown for each report. For each report an invoice must be submitted for payment using Exhibit D – printed on your company letterhead.

BUDGET SUMMARY

Exhibit C
04228



Contractor: *Columbia University*

ORGANIZATION	Award Amount	Cost Share	In-Kind Amount
Sponsor			
Palm Beach County Utilities Department	\$9,000	\$0.00	\$0.00
Participants			
Miami-Dade Water & Sewer Department	\$0.00	\$0.00	\$0.00
Florida Atlantic University	\$0.00	\$0.00	\$0.00
Sub-recipient			
Columbia University	\$0.00	\$0.00	\$0.00
Water Research Foundation	\$9,000	\$0.00	\$0.00
TOTALS	\$18,000	\$0.00	\$0.00
Total Project Budget \$18,000			

Award Amount: \$18,000

Amount due upon acceptance of draft report: \$1,800

Amount due upon acceptance of final report and final invoice: \$1,800

Project Advance: \$1,800

Exhibit D
Project 04228

Title: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation

Exhibit D – Invoice Form

For access to the Water Research Foundation website please see:

<http://www.waterresearchfoundation.org>

To download Exhibit D – Invoice Form please see:

<http://www.waterresearchfoundation.org/research/projectAdmin/contractsAndForms.aspx>

The invoice form was created under MS Excel and is a protected worksheet. Please fill in the yellow highlighted areas.

Exhibit E
Project 04228

Title: Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation
Assignment of Copyright

Whereas _____, whose address is _____ ["Assignor"] has created and authored an original expression of an idea and/or design described as follows:

_____ (hereafter the "Work"); and

The Assignor claims and warrants exclusive ownership, with no transfers having occurred prior to this Assignment, of all right, title and interest in and to the Work, including the copyright.

Whereas Water Research Foundation, whose principal place of business is located at 6666 W. Quincy Avenue, Denver, Colorado 80235 U.S.A. ["Assignee"], is desirous of obtaining all rights, title and interest in and to the Work, including the copyright.

NOW, THEREFORE, for good and valuable consideration, receipt of which is hereby acknowledged, said Assignor does hereby assign unto the said Assignee all world-wide right, title and interest in and to the said Work, including the right to apply for copyright for that Work as sole Owner.

Signature of Assignor Date

State of _____ }

} ss.

County of _____ }

On this _____ day of _____, 204228_ before me appeared _____, the person who signed this instrument, who acknowledged that he/she Signed it as a free act on his/her own behalf (or on behalf of the identified corporation or other Juristic entity with authority to do so).

Notary Public Comm'n. Exp.



**WATER
RESEARCH
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David E. Rager, Chair
Roy L. Wolfe, Vice-Chair
Denise Kruger, Treasurer
Robert C. Renner, Executive Director

RECEIVED
2010 MAR 17 P 4:38
COLUMBIA UNIVERSITY

February 25, 2010

To: Bevin Beaudet / Palm Beach County Utilities Department
David Major / Columbia University

Dear Sirs:

Attached are two final signed copies of the Water Research Foundation's TC Joint Multi Funded Agreement (JMFA) entitled "Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation," the Foundation's project number 004228.

Please note - each party signs the same agreement and there are multiple signature pages. Please have the duly authorized individual in your organization and the Principal Investigator do the following:

- 1) Sign both sets of documents.
- 2) Retain one of the fully signed copies for your records, do not return both sets.
- 3) Return the other copy to: Peggy Falor
Contract Administrator
Water Research Foundation
6666 W. Quincy Ave.
Denver, CO 80235
Phone: (303) 734-3424

Please return one copy of the signed originals back to the Foundation no later than three (3) weeks from receipt. The Foundation will email a PDF of this fully executed agreement to you for your files.

Thank you for your assistance.


Peggy Falor

04228:PF

6666 West Quincy Avenue
Denver, CO 80235-3098 USA
P 303.347.6100
F 303.730.0851
www.WaterResearchFoundation.org
info@WaterResearchFoundation.org

EPLS

Excluded Parties List System



Search - Current Exclusions

- > Advanced Search
- > Multiple Names
- > Exact Name and SSN/TIN
- > MyEPLS
- > Recent Updates
- > Browse All Records

View Cause and Treatment Code Descriptions

- > Reciprocal Codes
- > Procurement Codes
- > Nonprocurement Codes

Agency & Acronym Information

- > Agency Contacts
- > Agency Descriptions
- > State/Country Code Descriptions

OFFICIAL GOVERNMENT USE ONLY

- > Debar Maintenance
- > Administration
- > Upload Login

EPLS Search Results

Search Results for Parties Excluded by

Exact Name : COLUMBIA AND UNIVERSITY or MARIO AND R AND REYES or DAVID AND MAJOR or PALM AND BEACH AND COUNTY AND UTILITIES AND DEPARTMENT or BEVIN AND BEAUDET

As of 08-Apr-2010 11:35 AM EDT

Save to MyEPLS

Your search returned no results.

It is further recommended that you perform a Partial Name search on any word of the name to further confirm the eligibility status of the party. An additional Partial Name search might be necessary because an Exact Name match will not be found if the spelling or format of the name you are searching for is different than the name of the exclusion in EPLS.

[Back](#) [New Search](#) [Printer-Friendly](#)

Resources

- > Search Help
- > Public User's Manual
- > FAQ
- > Acronyms
- > Privacy Act Provisions
- > News

Reports

- > Advanced Reports
- > Recent Updates
- > Dashboard

Archive Search - Past Exclusions

- > Advanced Archive Search
- > Multiple Names
- > Recent Updates
- > Browse All Records

Contact Information

- > For Help: Federal Service Desk



Invoice Number 000749
 Invoice Date April 13, 2010
 PO Number
 Contract
 Project 04228
 Page 1 of 1

Palm Beach County
 8100 Forest Hill Blvd.
 West Palm Beach, FL 33413
 United States

Scheduled Billing	Co-funding for project 4228	\$	9,000.00	
	Invoice Total	\$	9,000.00	(US Dollars)

To invoice you for your commitment to co-fund Water Research Foundation's project 4228 entitled "Water Utilities and Climate Change: A Research Workshop on Effective System Adaptation."

IMPORTANT: Make check payable to Water Research Foundation.

Please return check to:
 Water Research Foundation
 6666 W. Quincy Avenue
 Denver, CO 80235
 (303) 734-3555

Attachment # 2