

**MEMORANDUM OF UNDERSTANDING TO ENHANCE RESILIENCY AT  
COMMUNITY DRINKING WATER SYSTEMS IN PUERTO RICO BETWEEN  
POR LOS NUESTROS, WATER MISSION INTERNATIONAL,  
PUERTO RICO SCIENCE, TECHNOLOGY AND RESEARCH TRUST,  
PUERTO RICO COMMUNITY FOUNDATION, AMERICAN RED CROSS, OXFAM,  
POLYTECHNIC UNIVERSITY OF PUERTO RICO, AND THE  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

**I. Purpose and Parties**

The purpose of this Memorandum of Understanding (MOU) is to formally establish a mutually beneficial working relationship between Por Los Nuestros, Water Mission International, the Puerto Rico Science, Technology and Research Trust, the Puerto Rico Community Foundation, the American Red Cross, OXFAM, the Polytechnic University of Puerto Rico, and the United States Environmental Protection Agency, collectively known as the "PARTIES", to build capacity, develop, and implement equitable, reliable, and resilient solutions to community drinking water systems known as Non-PRASA and other unregulated drinking water systems located in geographically remote areas in Puerto Rico and carry out cooperative activities for the reliable provision of safe drinking water. The MOU will promote education, capacity building, sustainability and the design and implementation of projects to enhance these community water systems to address the challenges presented by extreme weather events.

POR LOS NUESTROS INC. (hereinafter referred to as the "PLN") is a domestic non-profit corporation, currently working on hurricane relief efforts and helping to raise funds and work in providing sustainable solutions in helping rebuild Puerto Rico. PLN's priority areas focus on issues related with safe drinking water, health and sanitation and long-term housing rebuilding. PLN is interested in working in addressing the challenges that Non-PRASA drinking water systems are facing in Puerto Rico, which have been exacerbated as a result of the impacts of Hurricanes Irma and Maria. PLN is focusing on providing energy independence solutions to these vulnerable systems with solar energy, in addition to providing capacity building and compliance assistance.

WATER MISSION INTERNATIONAL (hereinafter referred to as the "WMI") is a 501 (c)(3) non-profit Christian engineering organization that designs, builds and implements safe water, sanitation and hygiene solutions for people in developing countries and disaster areas. Since 2001, Water Mission has used innovative technology and engineering expertise to provide access to safe water for more than 3 million people in 52 countries. Water Mission has 250 staff members working around the world in permanent country programs located in Africa, Asia, North, South and Central America and the Caribbean. Since the impacts of Hurricanes Irma and María in September 2017, WMI has been working with the EPA and FEMA in efforts to ensure reliable safe drinking water at over 200 non-PRASA systems in rural communities in Puerto Rico. Accordingly, WM has successfully provided safe water in 46 communities and has successfully implemented solar-powered solutions and rebuilt systems in many communities making them more resilient and sustainable than prior to the impact of the hurricanes.

The PUERTO RICO SCIENCE, TECHNOLOGY AND RESEARCH TRUST (hereinafter referred to as the "S&T Trust"), established pursuant to Act No. 214-2004 is a private, non-profit entity charged with stimulating innovation, technology commercialization and the creation of high technology jobs in Puerto Rico. Act No.

214-2004 also authorizes the S&T Trust to define and implement the public policy for science, technology and research and development (R&D) for Puerto Rico.

The PUERTO RICO COMMUNITY FOUNDATION's (hereinafter referred to as the "PRCF") 2018 strategic focus is to strengthen viable access to social, economic and natural resources for community recovery and empowerment, including access to drinkable water. The water strategy is based on supporting communities that are not connected to the central water authority system and strengthening community aqueducts. The PRCF is already working with 20 community aqueducts – approximately 1,000 families – for its restoration, sustainable repairs and supplying renewable energy with solar systems. Technical assistance is being provided to community members to improve the aqueduct's administration, maintenance and compliance; community engagement during construction is encouraged. The PRCF is the only community foundation in Puerto Rico and it is a 501(c)(3) non-profit organization with the mission to develop the capacity of communities to achieve their social and economic transformation by stimulating community philanthropic investments and maximizing the yield of each contribution.

The AMERICAN RED CROSS ("Red Cross") is a nonprofit, charitable organization that aims to prevent and alleviate suffering in the face of emergencies. Through its strong network of volunteers, donors, and partners, the Red Cross helps communities prepare for disasters and provides shelter, comfort and hope to people affected by disasters. As part of its efforts to help Puerto Rico recover from Hurricane Maria, the Red Cross is supporting efforts to make drinking water systems more stable and reliable.

OXFAM is a global organization working to end the injustice of poverty. OXFAM helps people build better futures for themselves, hold the powerful accountable, and save lives in disasters. Its mission is to tackle the root causes of poverty and create lasting solutions. OXFAM assists the poorest communities when disaster strikes, but is also working to ensure greater local resilience and the capacity of local responders and governments to deliver disaster response. OXFAM launched a response in Puerto Rico in October 2017 to support local organizations on the frontlines of the emergency, distribute emergency supplies, and support the voices of affected communities urging a fast, inclusive, and equitable federal emergency response. Over the past year, OXFAM has provided emergency assistance, solar powered lights and access to drinking water to the most vulnerable and marginalized communities in Puerto Rico, as well as supported partners working to help residents in access FEMA funds for housing and researching the specific impacts on and needs of women on the island.

The POLYTECHNIC UNIVERSITY OF PUERTO RICO (hereinafter referred to as the "PUPR") is a private institution of higher learning, duly licensed and chartered by the Government of Puerto Rico and the State of Florida to bestow undergraduate and graduate degrees in all academic fields. PUPR has accredited degree programs in engineering, among other fields, which are particularly relevant for the purposes of this MOU.

The UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (hereinafter referred to as the "EPA") is an agency of the United States federal government, established on December 2, 1970, which was created for the purpose of protecting human health and the environment by writing and enforcing regulations based on laws passed by the Congress of the United States of America. The EPA is also responsible for conducting environmental research, providing assistance to others combating environmental pollution and assisting the President's Council on Environmental Quality in creating new environmental protection policies.

## **II. Background**

As the frequency of intense storms increases, sea levels rise, land subsides and the planet becomes warmer, islands are becoming more vulnerable. Extreme weather events threaten the economic vitality and habitability of islands worldwide. Dealing with these challenges and adapting to the changes in our weather have become an imperative.

Recent weather variations and individual extreme events demonstrate both the impacts of weather-related stresses and the vulnerabilities of exposed systems. Such has been recently observed in the water sector in Puerto Rico in the aftermath of the impacts of Hurricanes Irma and María in September 2017.

In Puerto Rico, drinking and wastewater service is mainly provided by the Puerto Rico Aqueduct and Sewer Authority (PRASA). PRASA serves drinking water to approximately 97% of Puerto Rico's population and it provides wastewater service to approximately 60% of the population.

There are approximately 240 registered independent public water systems in Puerto Rico, that are neither owned or administered by PRASA. These systems are commonly known as Non-PRASA systems. The Non-PRASA systems are located in remote/rural areas that rely on surface water and/or groundwater for their water supply. These systems face unique challenges in providing affordable drinking water and wastewater services that meet federal and state regulations. Many of these systems lack financial resources and have difficulty obtaining financial assistance, have management limitations, lack long-term planning activities, have aging infrastructure, and lack the ability to attract certified operators. Reliable and affordable safe drinking water and wastewater treatment can help rural areas improve the quality of life of their residents. Investments in small system infrastructures support our long-term national goal of ensuring that rural communities have the basic infrastructure to become sustainable and to protect the rural economy and public health.

While these Non-PRASA systems are regulated by the Puerto Rico Department of Health (PRDOH) and EPA, there remains a small universe of "non-regulated" community water systems serving less than 15 connections that are not regulated by PRDOH/EPA. Unregulated systems face similar challenges related to inadequate infrastructure and water treatment capacity, as well as a lack of adequately trained staff and financial resources as Non-PRASA regulated systems but are at a further disadvantage without water quality testing, post-hurricane assistance and other resources that registered non-PRASA systems receive.

In general terms, many of these communities in isolated rural areas are served by water systems that do not comply with the federal and Commonwealth of Puerto Rico's drinking water regulations. They lack the technical, managerial and financial capacities necessary to assure a constant safe drinking water supply to their customers and the absence of qualified operators, in conjunction with a high possibility of chemical and bacteriological contamination, increases the risk of disease to vulnerable populations (children and elderly) living in these communities.

Non-PRASA and Unregulated community water systems are vulnerable to weather variability and change and have less capacity to recover from weather-related shocks.

At the same time, these communities do not have wastewater services from PRASA and have similar challenges to those of the Non-PRASA and Unregulated drinking water systems.

The circumstances and factors summarized above illustrate the need for a better understanding of how extreme weather effects affect these community drinking water systems and for the identification of processes, methods and tools that may help these systems and communities develop greater adaptive capacity to become more sustainable and resilient to the ongoing and projected changes in weather.

Through this MOU, the PARTIES will work together to strengthen the development and operation of Non-PRASA and Unregulated community water systems in Puerto Rico by way of providing capacity building to community organizations that own and operate these systems in order to ensure the systems provide safe drinking water to the community residents in compliance with federal and Commonwealth of Puerto Rico laws and regulations, and conducting infrastructure repairs and improvements to make these systems more sustainable and resilient to future extreme weather events. The PARTIES commit to support each other, however, the activities of the PARTIES under this MOU are not meant to replace the work being done by these organizations individually.

### **III. Understanding and Commitments**

The PARTIES are hereby establishing a working relationship and identifying areas of collaboration to implement strategies to make these community drinking water systems more sustainable in their operation and resilient to future extreme weather events.

The PARTIES intend to cooperate and coordinate efforts, with special emphasis on, but not limited to, the following priority areas:

#### **A. Academia and Sustainable Community Drinking Water Systems**

The PARTIES agree to develop and support specific academic projects and programs that investigate and apply design standards and technologies to achieve sustainability in the community drinking water systems. Sample projects could be the development of "Vertical Studios" in which a group of students and faculty from various disciplines:

1. Can make baseline assessments to learn the current state and needs of permanent work required to make these community drinking water systems more sustainable and resilient, including the design of projects intended to be sustainable in design, construction, and operation.
2. Could develop and apply specific technologies to achieve environmental performance goals, such as reduction in energy use, reduction in water use, and proper treatment and disinfection of water to produce safe drinking water in compliance with federal and Commonwealth of Puerto Rico's laws and regulations.

#### **B. Disaster Risk Reduction and Building Resilience**

Build resilience and advance adaptation strategies and disaster risk reduction approaches in community

drinking water systems. Some potential examples for consideration by the PARTIES include:

1. Supporting projects, such as installation of solar PV, among others, to add energy redundancy to make community drinking water systems more sustainable and resilient considering actual or projected effects of weather events, community socio-economic impacts, and storm risk management.
2. Promoting understanding in communities of sustainable innovative practices to enhance community drinking water systems' resiliency for extreme weather events.
3. Incorporating robust public engagement to provide support to the private non-profit organizations that own/operate the community drinking water systems by involving a diversity of stakeholder groups such as local communities, federal and Commonwealth agencies, non-governmental organizations, academia, among others, and using facilitators to assist collaboration among the stakeholders.

**C. Working with the Public/Private Sector in increasing resiliency through sustainable planning, energy/water efficiency and renewable energy and in delivering safe drinking water**

The PARTIES agree to:

1. Encourage application of technologies related to the efficient use of energy and water in order to sustainably operate drinking water systems and to improve deficient septic tanks. Projects could include installation of solar panels to energize drinking water systems, improvements to drinking water treatment and drinking water distribution infrastructure, improvements to septic tank infrastructure, the application of EPA's EnergyStar tools and WaterSense program, among others.
2. Encourage private non-profit organizations that own/operate these drinking water systems to get dully legally organized to potentially qualify as applicants for potential funding assistance through federal, Commonwealth, private and NGO programs.
3. The PARTIES will also collaborate in assessing the environmental (e.g., use of fuel, water use, septic tanks overflows/elimination of non-point source sewage discharges) and economic benefits (e.g., dollars saved, elimination of negative impacts to public health and the environment) of the activities being conducted under this MOU.
4. Building capacity in communities to properly operate and maintain the drinking water systems to provide safe drinking water in compliance with federal and Commonwealth of Puerto Rico's laws and regulations.

**D. Outreach and Education**

It is anticipated that the PARTIES will provide technical assistance and/or training regarding ways to make the community drinking water systems more sustainable and resilient to extreme weather events. This will be mainly accomplished by developing and coordinating technical outreach events with the PARTIES and the communities. The technical outreach and/or training may involve the development of educational strategies promoting asset management planning, water and energy efficiency practices, drinking water filtration and disinfection, best management practices, creating awareness about weather

risks, system vulnerabilities, and other sustainable utility management practices that are important to ensuring long-term technical, managerial and financial capacity.

### **E. Forms of Cooperation**

Forms of cooperation under this MOU may include a needs assessment by the PARTIES to be followed up by prioritization and discussion on how to address them, and may include the following:

1. Sharing information, data, research and experiences on the work that each party is conducting under this MOU and policies and programs that have effectively been implemented to make community water systems more sustainable and resilient and to produce safe drinking water for improving the livelihood of the community members.
2. Joint organization of symposia, seminars, workshops, exhibitions, and training either jointly or in an individual manner.
3. Any other form of cooperation that the PARTIES consider may contribute to the goals of this MOU.

### **IV. Terms and Conditions**

This MOU is not a contractual or a financial obligation instrument. Nothing in this MOU shall obligate the PARTIES to expend appropriations or to enter into any contract or other obligation or be cited as the basis for the promise or transfer of funds. Collaboration under this MOU shall be in accordance with applicable statutes and regulations.

This MOU does not restrict the PARTIES from participating in similar activities or arrangements with other entities, including local, State or Federal government agencies.

Any one of the PARTIES may unilaterally withdraw at any time from this MOU by transmitting a signed letter to that effect to the other PARTIES.

By mutual agreement, which may be either formal or informal, the PARTIES may modify the list of intended activities set forth in Section III. above, and/or determine the practical manner by which the goals, purposes and activities of this MOU will be accomplished. However, modification of other written parts of this MOU must be made in writing and signed by the PARTIES or their designees.

Nothing in this MOU shall be construed to authorize or permit any violation of any Federal, State or local law, including, but not limited to, any environmental law administered and/or enforced by EPA.

Each of the PARTIES agrees that it does not expect, nor will it ever seek to compel from any of the other PARTIES, in any judicial forum, the payment of money, services or other thing of value based upon the terms of this MOU. The foregoing provision does not in any way affect any legal rights accruing to the PARTIES by virtue of any other law, contract and/or assistance agreement.

The PARTIES understand and acknowledge that, as an institution of the Federal Government, EPA has a duty to refrain from providing any commercial entity an exclusive privilege without receiving payment therefore and, as a consequence, that EPA's relationship with the other PARTIES in no way affects, alters or otherwise constrains EPA's right to provide similar (or identical) services to, or establish similar (or identical) relationships with, any other entity.

The participation of each of the PARTIES in this MOU does not constitute an endorsement, express or implied, of: (a) any policy advocated by any of the other PARTIES or (b) any good or service offered or sold by the PARTIES.

The PARTIES agree that any copyrightable subject matter, including but not limited to journal articles, training, educational or informational material or software, created jointly by the PARTIES in the performance of the activities conducted under this MOU may be copyrighted by the PARTIES. The PARTIES hereby grant to each other and to the U.S. Government a royalty-free, nonexclusive, irrevocable right to reproduce, distribute, make derivative works, and publish the works that are written by the PARTIES under this MOU, or to authorize others to do the same on its behalf.

All records arising from the activities contemplated by this Memorandum of Understanding are agency records subject to the Freedom of Information Act, 5 U.S.C. § 552.

EPA enters into this MOU under the authority of Section 103 of the Clean Air Act, 42 U.S.C. § 7403, Section 104 of the Clean Water Act, 33 U.S.C. § 1254, and Section 8001 of the Solid Waste Disposal Act, 42 U.S.C. § 6981, Section 6604 of the Pollution Prevention Act, and Section 324A of the Energy Policy and Conservation Act, which provide EPA with authority to undertake cooperative efforts with private organizations to promote the coordination and acceleration of research, studies, training, and other efforts to prevent, reduce and eliminate pollution.

This MOU does not create any right or benefit, substantive or procedural, enforceable by law or equity against any of the PARTIES, their officers or employees, or any other person. This MOU does not direct or apply to any person outside of the PARTIES.

## **V. Reporting**

To the extent practicable, within available resources, the PARTIES will produce a joint annual report of their activities under this MOU during the preceding year.

## **VI. Effective Date and Administration**

This MOU shall take effect on the first day by which it has been signed by all the PARTIES. It may be modified or amended by written agreement between the PARTIES. This MOU will terminate at the end of four (4) years from the date of signature, unless such termination date is revised or extended by written agreement of the PARTIES. The PARTIES will review annually the provisions of this MOU and its implementation.

**VII. Communications**

All communications related to this MOU will be directed through the following points of contact:

<p><u>For the EPA:</u></p> <p>Cristina I. Maldonado                  Physical Scientist                  Public Water Supply System Team - Municipal                  Water Program Branch                  Caribbean Environmental Protection Division -                  U.S. EPA, Region 2                  Telephone No.: (787) 977-5835                  Email: maldonado.cristina@epa.gov</p>	<p><u>For Por Los Nuestros:</u></p> <p>Alexander Rodríguez Hernández                  Project Manager                  Telephone No.: (787) 508-9841                  Email: alex@porlosnuestros.com</p>
<p><u>For Water Mission International:</u></p> <p>Mark Baker                  Director – Disaster Response                  Telephone No.: (843) 514-0593                  Email: mbaker@watermission.org</p>	<p><u>For the S&amp;T Trust:</u></p> <p>Leslie Maas                  Brain Trust Program Manager                  P.O. Box 363475                  San Juan, Puerto Rico 00936-3475                  Telephone No.: (787) 523-1592                  Email: lmaas@prsciencetrust.org</p>
<p><u>For the American Red Cross</u></p> <p>Ana Montero                  Recovery Executive – Puerto Rico                  American Red Cross                  Telephone No.: (609) 955-1004                  Email: ana.montero@redcross.org</p>	<p><u>For OXFAM</u></p> <p>Brenda Guzmán                  Senior Program Advisor                  Telephone No.: (787) 391-9152                  Email: brenda.guzman@oxfam.org</p>
<p><u>For the Polytechnic University of PR:</u></p> <p>Héctor J. Cruzado, PhD, PE                  Professor and Department Head                  Department of Civil and Environmental                  Engineering and Land Surveying                  Polytechnic University of Puerto Rico                  377 Ponce de León Ave.                  San Juan, PR 00918                  Telephone No.: (787) 622-8000 ext. 436                  Email: HCruzado@pupr.edu</p>	<p><u>For Puerto Rico Community Foundation:</u></p> <p>Mary Ann Gabino                  Senior Vice President                  Telephone No.: (787) 698-1101                  Email: mgabino@fcpr.org</p>

Agreed to and signed in Aguas Buenas, Puerto Rico, this 18<sup>th</sup> day of September, 2018.

**For Por Los Nuestros:**

\_\_\_\_\_  
Manuel Cidre Miranda  
President

\_\_\_\_\_  
Date

**For Water Mission International:**

\_\_\_\_\_  
Mark Baker  
Director – Disaster Response

\_\_\_\_\_  
Date

**For the Puerto Rico Science, Technology and Research Trust:**

\_\_\_\_\_  
Luz A. Crespo  
Chief Executive Officer

\_\_\_\_\_  
Date

**For Puerto Rico Community Foundation:**

\_\_\_\_\_  
Dr. Nelson I. Colón Tarrats  
President & CEO

\_\_\_\_\_  
Date

**For the American Red Cross:**

\_\_\_\_\_  
Ana Montero  
Recovery Executive – Puerto Rico

\_\_\_\_\_  
Date

**For OXFAM:**

\_\_\_\_\_  
María O. Concepción Díaz  
Program Manager

\_\_\_\_\_  
Date

**For the Polytechnic University of Puerto Rico:**

\_\_\_\_\_  
Dr. Carlos González  
Dean - School of Engineering

\_\_\_\_\_  
Date

**For the U.S. Environmental Protection Agency, Region 2:**

\_\_\_\_\_  
Pete López  
Regional Administrator, Region 2  
U.S. Environmental Protection Agency

\_\_\_\_\_  
Date