


Water Reuse From Aspiration to Implementation

July 18, 2018



A Few Notes Before We Start...

- Today's webcast will be 60 minutes.
- There is one Professional Development Hour (PDH) available.
- A PDF of today's presentation can be downloaded when you complete the survey at the conclusion of this webcast.
- Submit questions to the presenters by typing a message into the chat box located on the panel on the left side of your screen.

 Ask a Question

Chat with presenter

Send

Water Reuse: From Aspiration to Implementation

Water reuse as a viable and realistic solution for water availability and quality challenges

- By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world's population could be living under water stressed conditions (UN)
- By 2030, global demand for energy and water is expected to grow by 40% and 50%. (UN)
- Globally only four percent of wastewater is currently reused (WaterReuse)
- In the United States, approximately seven to eight percent of municipal wastewater is reused (Miller, 2006 and GWI, 2009)



The key to immediately reversing the global threat of water scarcity

SUEZ

we are **90,000+** employees
providing our customers (industries, local authorities
and consumers), partners and stakeholders, all over the
world, with **concrete solutions to address
key resource management challenges**

SUEZ

90,000+ employees

450,000 business and
industrial customers
worldwide

€120m combined annual
R&D investment

Our panel



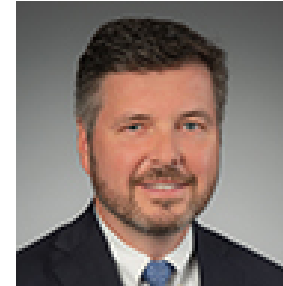
Jon Freedman
SVP Global Government Affairs
SUEZ – Water Technologies & Solutions



Fawn Bergen
Global Program Manager – Water Stewardship and Carbon Footprint
Intel Corporation



Irina Belozerova, PhD
UPW Engineer, UPW Conservation Team Lead
Intel Corporation



Alan Weland
VP/General Manager,
SUEZ – Water Long Island



Jim Gebhardt
Water Infrastructure and Resiliency Finance Center
U.S. Environmental Protection Agency



GLOBAL WATER STEWARDSHIP

Fawn Bergen, PE

Global Water Stewardship Program Manager

Irina Belozerova, PhD

Ultrapure Water (UPW) Engineer, UPW Conservation Team Lead

INTEL BY THE NUMBERS

1968

Year Robert Noyce and Gordon Moore founded Intel

\$62.8B

2017 Revenue

102,700

Number of employees as of January 2018

\$13B

R&D budget in 2017

200M

Approximate number of latest-gen transistors that fit on the head of a pin

900M

Cores shipped in the past 5 years powering the world's data centers and cloud infrastructure

\$1B

Amount invested in companies that are helping to advance artificial intelligence

30%

Estimated reduction in fatal accidents in Intel-powered ADAS-equipped vehicles

84%

Improvement in gap to full representation in Intel's U.S. workforce since 2015

3B

Kilowatt-hours of energy saved by energy conservation projects since 2012

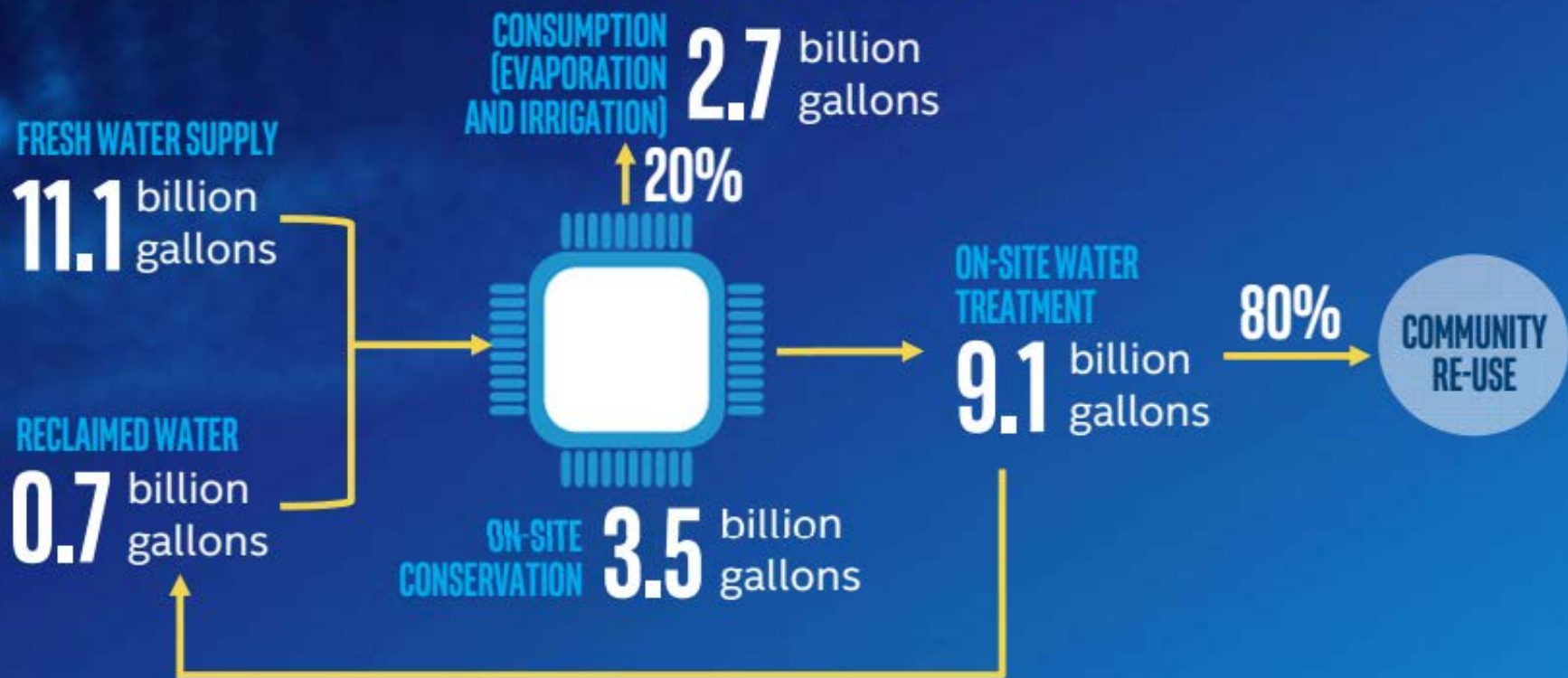


OUR GOLDEN ANNIVERSARY

Inspiring **50,000** Intel employees

to volunteer **1,000,000** hours in 2018

OUR WATER FOOTPRINT





INTEL'S WATER STRATEGY

CONSERVE the amount of water
used in our operations

COLLABORATE on water initiatives to
restore the water we withdraw

CREATE technology solutions to
reinvent the way the world uses water

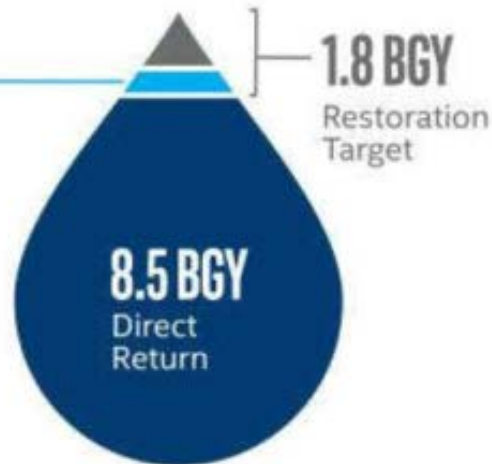
BY 2025 **RESTORE 100%**
GLOBAL WATER USE



OUR PROGRESS



Progress:
38%
of Restoration
Target



FOLLOW OUR PROGRESS AT:
WWW.INTEL.COM/WATER

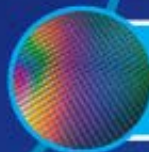
SEMICONDUCTOR PROCESS WATER AND WASTEWATER



Ultrapure water treatment



Cooling towers



Semiconductor tools



WIRELESS ANALYTICAL CART



POST-RINSE QUALITY MET

RINSE WATER USED

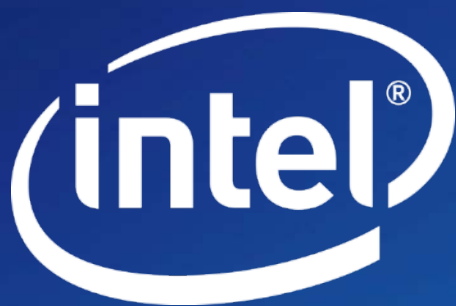
Return and check



Wireless alarm



~2 MILLION GALLONS SAVED ANNUALLY AT A SINGLE SITE



surrounded on all sides: long island's water conundrum

Preserving water on Long Island

- Long Island's drinking water comes from a single source: groundwater. The aquifer that provides the water is under intense pressure due to the area's high population
- Additionally, it is threatened by increased nitrogen levels, salt water intrusion, and pollution from fertilizers and other contaminants

South Shore of Long Island



Long Island's water supply must be preserved

how SUEZ is helping wastewater reuse

In February, SUEZ and Nassau County announced a plan to create a water reuse system at Cedar Creek

- This system will preserve approximately 300 million gallons of ground water per year
- It will cost \$1.1 million to implement, paid by SUEZ
- Expected to be operational early in 2019

SUEZ and Nassau County announced the project in February 2018



Water reuse system will save up to 300 million gallons of ground water annually

how does it work

making the most of wastewater

The system will process treated plant effluent a second time using strainers to remove solids and UV disinfection to kill certain bacteria and microbes

- This highly treated effluent will be used to cool generators and wash tanks and equipment. SUEZ will continue to purchase water for potable uses
- The water reuse system will result in an 80% reduction in the amount of water withdrawn from the aquifer
- Partnered with the Nassau County Health Department to ensure there will be no cross-contamination of drinking water supply as a result of the water reuse system

Treated plant effluent will be used for plant activities

Aerial view of Cedar Creek



savings extend beyond money

water reuse and the triple bottom line

The water reuse system will be financially, environmentally and socially beneficial:

- **Financial:** Will save \$350,000 a year
- **Environmental:** Will reduce stress on the aquifer
- **Social:** Will offer a measure of drought protection to Long Islanders as SUEZ will use substantially less groundwater to operate the plant

Reuse, reuse, reuse



Water reuse system saves water, money and the health and future of Long Islanders

potential future projects

other ways to reuse water

The water reuse system at Cedar Creek is just the beginning

- In the future, water reuse systems may be built at Bay Park and Glen Cove facilities
- SUEZ intends to explore the possibility of using highly treated plant effluent in other community locations:
 - Watering the county golf course adjacent to Bay Park
 - Watering Cedar Creek Park
 - Other agricultural, landscape, construction and municipal uses



Additional opportunities to reuse wastewater

Water Reuse: From Aspiration to Implementation

Federal Financing Programs/Initiatives

Jim Gebhardt, USEPA

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National Webinar

July 18, 2018



Topics

Federal Water Infrastructure Funding Programs

- Clean Water & Drinking Water State Revolving Funds
- Bureau of Reclamation Water Reclamation and Reuse Program
- Water Infrastructure Innovation Act (“WIFIA”) Federal Credit Program
- New federal Funding Initiatives:
 - New Proposals - Administration’s Infrastructure Plan
 - Developing A Role for Alternative Delivery Mechanisms (Public-Public/ Public-Private Partnerships)
 - Water Finance Clearinghouse
 - EPA Finance Learning Modules
 - National Drought Resilience Partnership (“NDRP”)
 - EPA Water Reuse Study Collaboration



EPA's Federal / State / Local Funding Partnership

Public Dollars Supplement Capital Markets

Federal water infrastructure funding support arose to address risks to nation's waters attributable to underinvestment

- First grants for wastewater treatment made to states in 1956
- Construction grants program 1972-1990 provided over \$50 billion to local governments for treatment projects
- Since 1987, EPA has delivered federal support via the Clean Water and Drinking Water State Revolving Loan Funds ("SRFs") created with Clean water Act and Safe Drinking Water Act Amendments
 - Congress has provided over \$60 billion in grants to capitalize SRFs
 - States have provided \$12.6 billion in required state match
 - FFY 2018 Budget: > \$2 billion split between CW and DWSRFs
 - >\$150 billion in below market rate financial assistance provided to date.
 - Supplemented by \$20 billion in debt issuance by state and local governments
- Water Infrastructure and Finance Innovation Act ("WIFIA") enacted in 2014 to provide federal support to broad segment of water project market with expanded list of eligibilities, including water supply projects and eligible entities including private parties.

Long history of federal support continues to deepen

Clean Water and Drinking Water State Revolving Funds (“SRFs”)

SRFs provide a sustainable source of funding for water infrastructure

SRFs have fundamentally changed the federal approach to providing financial assistance

- Changed from federal to state level based assistance – primarily below market rate loans
- Clean Water Act expanded project eligibilities include *water reuse projects for wastewater, stormwater or subsurface drainage*, nonpoint source and estuary projects
- *Federal law requires that point source projects be publicly owned but does not preclude P3 arrangements (state’s may authorize or impose limitations)*
 - *California amended CA 5956-5956.10 to allow SRF financing in association with P3s and private capital investment*
- DWSRF project eligibilities include potable water reuse projects that benefit the public and non-potable water reuse where such programs mitigate the need for additional potable water supply
- SRF Projects are selected based on state-based scoring systems; Scoring system and project list by score are publicly provided in Annual Intended Use Plans

See: <https://www.epa.gov/cwsrf> and <https://www.epa.gov/drinkingwatersrf>

Water Infrastructure Finance and Innovation Act (“WIFIA”)

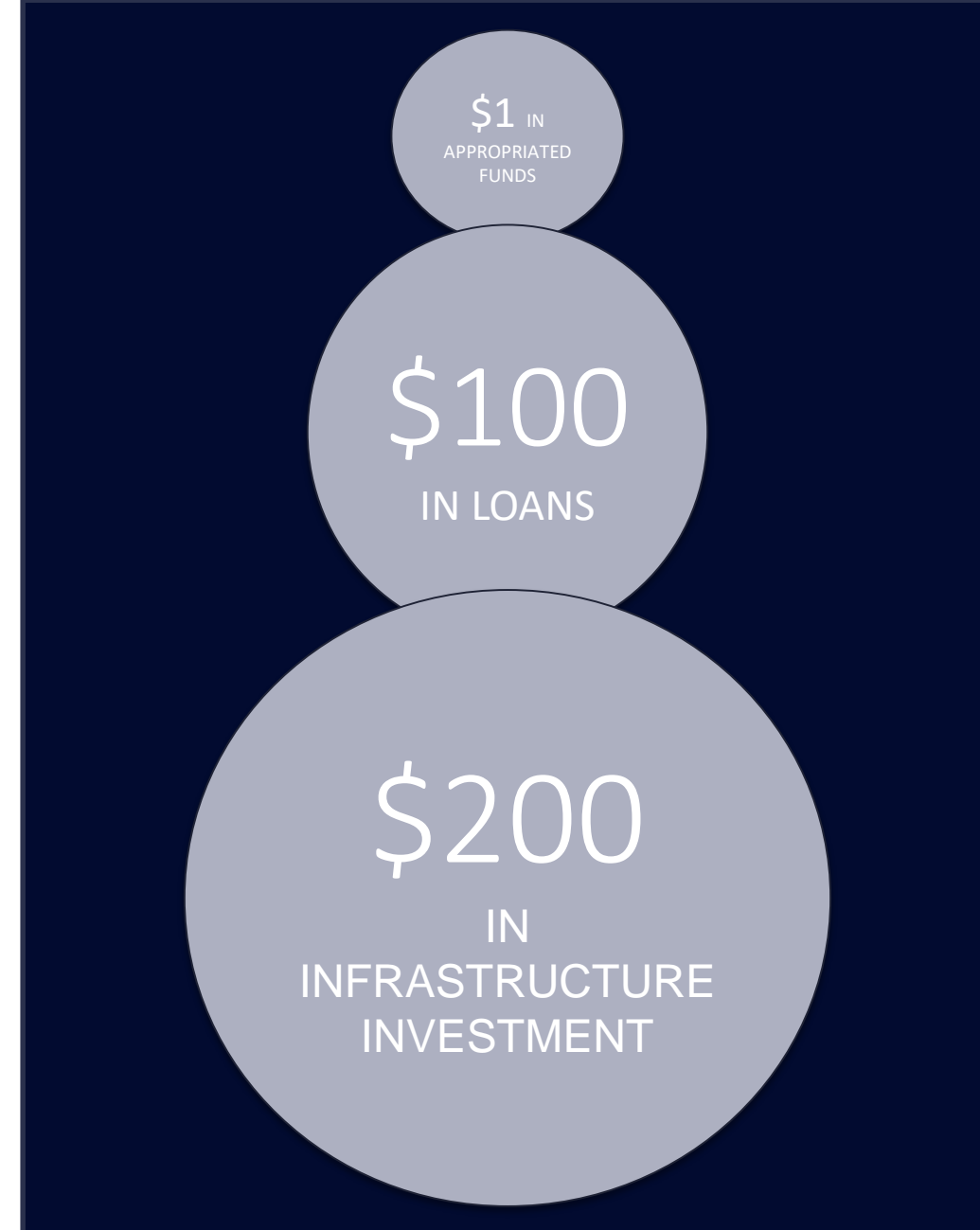
An innovative financing mechanism for water infrastructure that follows TIFIA model

Creates a federal credit program managed by EPA

Intended to help address significant water infrastructure funding needs and close a perceived gap in availability of SRF financing for “large” projects

- Appropriated funds capitalize loss reserves against which WIFIA loans are leveraged
 - Loss reserve can be leveraged up to 100x with OMB approval
 - Sponsor funding match yields 200x leverage factor against the federal appropriation
 - WIFIA relies on Treasury market access for loan capital

See: www.epa.gov/WIFIA



WIFIA

- Provides up to 49% of a project's eligible costs (with an exception: up to 25% of the appropriated budget authority may be used for up to 80% of a project's costs)

- *Will support privately owned projects and projects that involve public-private partnerships (subject to public sponsorship)*

- WIFIA Financing Terms:

- *One loan rate based on weighted average life*
- *Loan interest rate based on U.S. Treasury rates*
- *Loan terms of up to 35 years from substantial completion date*
- *no principal repayment obligation until five years after substantial completion*
- *Projects/obligor(s) must be creditworthy*

- Project cost threshold is at least \$20 million or \$5 million for projects serving small communities

- 15% set aside for small communities (up to 25,000 people) in each fiscal year (expires June 1)

- NEPA, Davis-Bacon, American Iron and Steel and all federal cross cutters apply

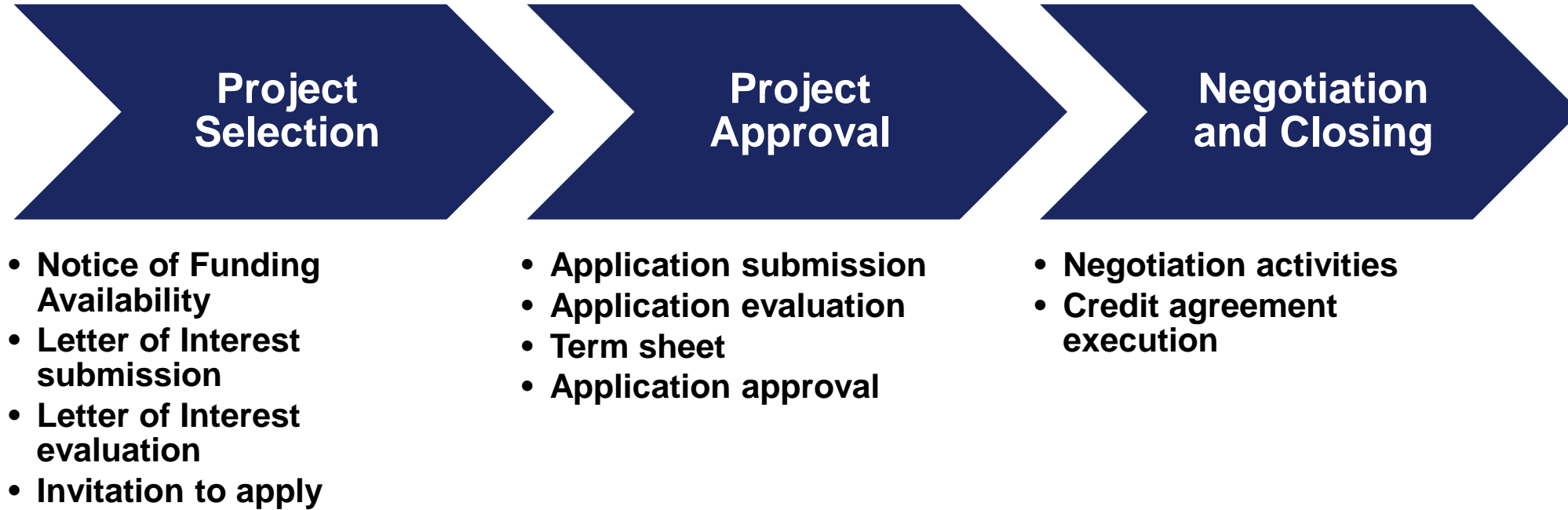
www.epa.gov/WIFIA

Eligibility

- Eligible recipients range from corporations and partnerships, to municipal entities, to the State Revolving Funds (SRFs)
- Eligible water infrastructure projects include all SRF eligible projects, brackish or seawater desalination projects, managed aquifer recharge projects, water reuse projects, etc.

WIFIA

Application Process is Three Steps



Each loan application review is tailored to reflect the complexity and risks of the proposed project

Projects are reviewed for , creditworthiness, engineering due diligence, legal issues and credit structure

www.epa.gov/WIFIA

WIFIA

Current Program Status

First Round: EPA expects to close on \$2.3 B in WIFIA Loans on behalf of \$5.3 billion in project costs based on 12 projects selected

Loans Closed

- \$134.5 million King County, Washington (May 2018)
- \$69.7 million, City of Omaha, Nebraska (June 2018)

FY 2018 Appropriation

- \$55 million in budget authority
- Will fund estimated \$5.5 billion in WIFIA assistance

FY 2018 Notice of Funding Availability (NOFA)

- Currently accepting Letters of Interest for Second Round
- Must be submitted by July 31, 2018
- EPA intends to select projects to invite to apply for credit assistance within 90 days following July 31st

First Round selection includes three water reclamation/reuse projects

www.epa.gov/WIFIA

It is free to submit an LOI for WIFIA credit assistance.

If a project is invited, EPA expects that there is a reasonable likelihood of reaching financial close.

Department of Interior

Bureau of Reclamation WaterSMART Program

Reclamation Projects and Adjustment Act, Title XVI (P.L. 102-575) provides grants for:

- Up to 50% of feasibility study costs
- Project sponsor must provide up to 75% of all project costs from non-federal sources
- Beneficiaries include municipal, industrial and agricultural water users that reside in the 17 Western State and Hawaii
- Bureau of Reclamation awarded \$23.6 million in FFY 2017 to seven states. \$21 million for projects included:
 - City of Pasadena Water and Power Department (California), Pasadena Non-Potable Water Project, Phase I, \$2,000,000
 - City of San Diego (California), San Diego Area Water Reclamation Program, \$4,200,000
 - Hi-Desert Water District (California), Hi-Desert District Wastewater Reclamation Project, \$4,000,000
 - Inland Empire Utilities Agency (California), Lower Chino Dairy Area Desalination and Reclamation Project, \$5,199,536
 - Padre Dam Municipal Water District (California), San Diego Area Water Reclamation Program, \$3,900,000
 - Santa Clara Valley Water District (California), South Santa Clara County Recycled Water Project, \$1,680,593
- FFY 2018 funding announcement is subject to finalization of proposed criteria issued on March 12 (public comments under review)

www.usbr.gov/watersmart/title.

Administration Infrastructure Plan

Proposal calls for \$200 billion in Federal dollars to be made available over 10 years

Administration estimates the federal commitment will support \$1.5 trillion in infrastructure investment as follows:

Federal Infrastructure Program	Federal Investment Share	Total Investment
Infrastructure Incentives	\$100 Billion	\$500-800 Billion
Rural Incentives	\$50 B	\$50 B +
Transformative Projects	\$20 B	\$40-80 B
Financing Programs	\$14 B (includes SRFs, WIFIA)	\$420-504 B
Private Activity Bonds Expansion	\$6 B (tax expenditure)	\$70 B
Federal Capital Fund	\$10 B	\$10 B
Total	\$200 B	\$1.09 - \$1.51 Trillion

www.whitehouse.gov/wp-content/uploads/2018/02/INFRASTRUCTURE-211.pdf



Legislative Outline for Rebuilding Infrastructure in America

THE WHITE HOUSE

Water Finance Center (“WFC”)

Recent Collaboration on Alternative Water Project Delivery Models

- **Study, University of North Carolina**

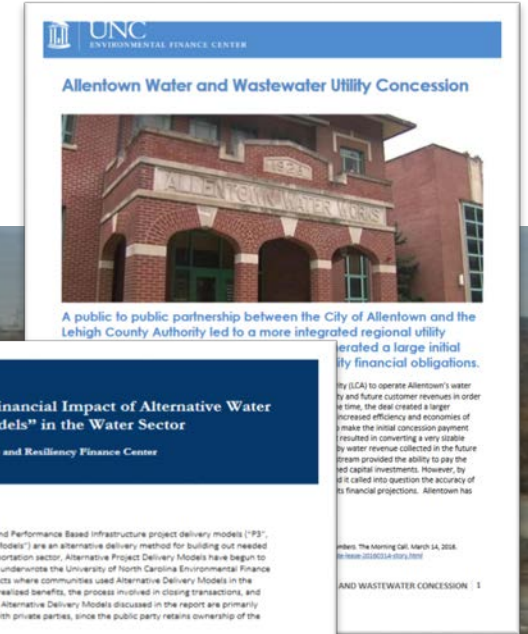
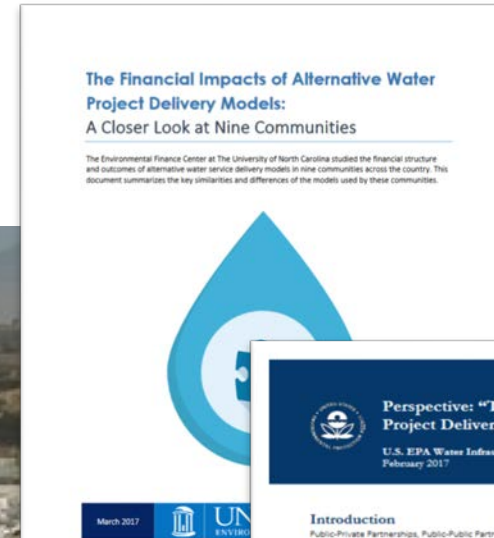
- <https://efc.sog.unc.edu/project/alternative-water-project-delivery-models>

- **Examined 9 Transactions:**

- Proposed vs. realized benefits
- Processes involved in closing transactions
- Performance of the agreements over the useful life of the assets

- **EPA Perspective**

- <https://www.epa.gov/waterfinancecenter/perspective-financial-impact-alternative-water-project-delivery-models-water>



Water Finance Center

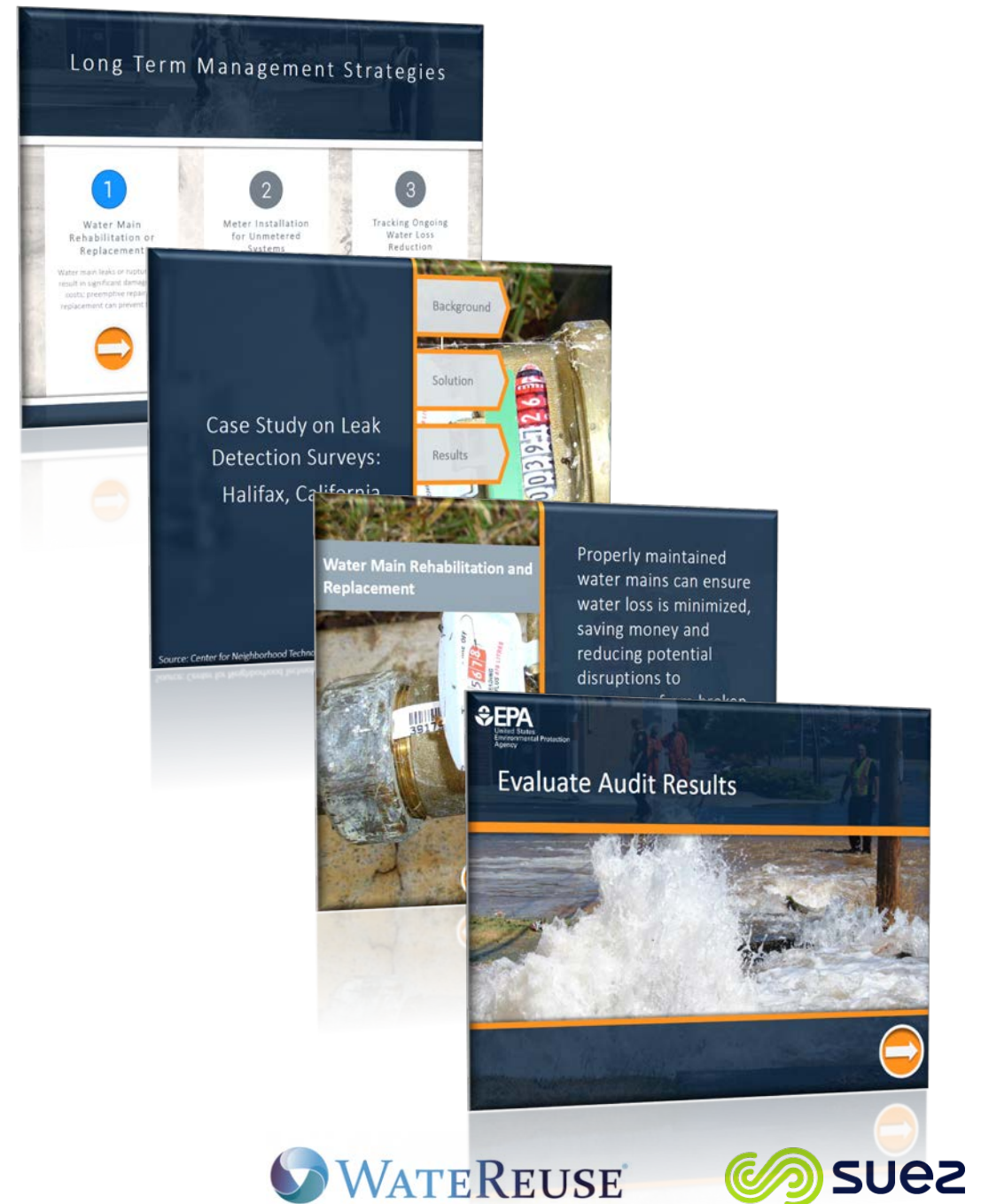
Water Finance Clearinghouse to host Finance Learning Modules

The Water Finance Center is working in partnership with branches across EPA's Office of Water to develop step-by-step interactive guides on specific water finance topics that will be housed in EPA's Water Finance Clearinghouse:

- SRF 101
- WIFIA 101
- Public-Private Partnerships ("Alternative Delivery")
- Water Loss financing methods
- Disaster recovery and resiliency financing
- Stormwater financing
- Financing municipal watershed partnerships with agriculture
- Financing decentralized wastewater systems

External expert stakeholders are being engaged to provide feedback and additional content before public release in Fall 2018

www.epa.gov/wfc



National Drought Resilience Partnership

A federal agency collaboration to Improve federal responsiveness and coordination with state, regional, tribal and local partners

Co-Chairs: USDA and USEPA

The NDRP is comprised of: U.S. Departments of Agriculture (USDA), Commerce thru the National Oceanic and Atmospheric Administration, Department of the Interior, Defense thru the Army Corp of Engineers, Homeland Security (Federal Emergency Management Agency), Environmental Protection Agency, and the U.S. Department of Energy. NDRP operates with six expressed goals:

- Data Collection and Integration
- Communicating Drought Risk to Critical Infrastructure
- Drought Planning and Capacity Building
- Coordination of federal Drought Activity
- **Market-Based Approaches for Infrastructure Investment**
- **Innovative Water Use, Efficiency and Technology**

www.drought.gov/drought/resources/national-drought-resilience-partnership



Related and Noteworthy:

EPA-cosponsored Workshop Report, "Mainstreaming Potable Water Reuse in the United States: Strategies for Leveling the Playing Field" that focuses on how to overcome institutional barriers to wider implementation of potable reuse in the US. https://www.epa.gov/sites/production/files/2018-04/documents/mainstreaming_potable_water_reuse_april_2018_final_for_web.pdf



Questions?



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U.S. Environmental Protection Agency

WateReuse Association

33rd Annual WateReuse Symposium September 9-12, 2018 Austin, Texas

The nation's premier conference on water reuse and the only conference dedicated solely to advancing the policy, technology, innovation and public acceptance of recycled water.

www.watereuse.org

