COMMUNICATIONS STRATEGIES FOR ADVANCING PUBLIC ACCEPTANCE OF WATER REUSE PROJECTS

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SUMMARY

Water recycling, and more recently potable reuse, are potential solutions to water supply struggles around the world. Water reuse can provide a reliable, locally controlled source of water for communities anywhere—but one of the greatest obstacles toward implementation of reuse projects has been public acceptance. Knowing what works well in influencing public perceptions and acceptance is vital to successfully introducing these projects, whether for irrigating food crops, cooling server farms, or purifying recycled water further to augment drinking water supplies. Using proven communications tools and practices can be the deciding factor between success or failure of a project. Public outreach expert Mark Millan and his team have researched, tested, and put into practice a variety of communications strategies that have proven effective in moving challenging reuse projects forward. These strategies, methods and tools are particularly important when introducing potable reuse projects to the public.

Key words: acceptance, agriculture, communications, outreach, reuse

FORWARD By Bart Weiss, President, WateReuse Association USA

The implementation of water reuse to expand water supplies is critical for communities around the world whose water supplies are experiencing shortages. The challenge of introducing recycled water projects to communities with water supply shortages is a critical step toward implementing these projects. Public acceptance is a core concern, whether you are implementing reuse water for basic landscape irrigation, irrigating golf courses, or using recycled water to irrigate food crops. It is important that people feel confident that this water is safe. And as you can imagine, purifying recycled water even further to the level where it can be used as drinking water, presents an even greater communications challenge.

The studies mentioned below have already proven to be highly effective in executing and implementing reuse projects throughout the United States. WateReuse has conducted research on risk assessment for a variety of recycled water uses and developed messaging to make the results of this research easily understandable. Communications methods were tested in focus groups to determine the most effective approaches to assure the public understands the various treatment processes used to produce recycled water, and they trust that it can be used safely in a variety of scenarios.

We now know that potable water reuse utilizes a proven and reliable technology to purify recycled water so it can safely supplement a community's drinking water supplies. There are many projects in the US that are currently utilizing this technology and are in various stages of implementing the use of purified water.

Through research supported by the Water Research Foundation (USA) we have gathered a significant body of work, tested in surveys, and focus groups, that can be used by utilities large and small to gain public acceptance of potable reuse projects. For example, we have learned through surveys that the best messengers are not always political leaders—it may be more effective to have members of the public health and medical communities carry the message. The message that purified water is safe may be more palatable coming from someone who can personally substantiate and verify that purified water is safe to drink.

We are aware that in some parts of the world potable reuse may be a daunting idea to present to a community—even if there are drastic water shortages. In the United States over the last 40 years we have explored best practices for the use of recycled water and potable reuse, and they have been successfully implemented, in part, because these studies provide invaluable guidance in communicating with the public about the safety and benefits of purified water.

In this summary we will provide a brief overview of both these studies: one focused on risk exposures for the use of recycled water for irrigation, and the other introducing recycled water that has been purified further so that it can be used for drinking water.

I INTRODUCTION

The approaches outlined below are carefully crafted with a methodical strategy. They embrace previous theoretical research, tests, extensive literature review, in-depth interviews, focus groups, and public opinion surveys. Through multiple projects over the past 10 years, we have conducted in-depth interviews with water agencies in various states of the US, as well as with elected officials, health professionals, and special interest groups. The information from these interviews is used to identify key concerns and develop initial messaging.

We have tested messaging in various communities in the US where water agencies were considering the use of recycled (or reclaimed) water, and/or advanced purified water to augment drinking supplies. The findings from these information-gathering activities were used to develop a communications framework for detailed outreach plans. That framework can be utilized as a model for communities worldwide that seek to initiate basic recycled water projects for uses with tertiary treated water, or introducing indirect or direct potable reuse projects. Understanding what messaging works well and what messaging to avoid is vital in the communications and outreach process when introducing any reuse project to the public.[1] [2] [4] [5] [6] [7]

II RESEARCH CONDUCTED (1ST OF TWO STUDIES PRESENTED)

Risk Assessment Study of PPCPs in Recycled Water to Support Public Review (WRRF-09-07)

The first of the two research documents we will discuss is “Risk Assessment Study of PPCPs in Recycled Water to Support Public Review (WRRF-09-07).” This study focused on potential risk concerns that people have with the use of recycled water for irrigation, including on food crops. The study looks at the potential risk associated with people who work or recreate around tertiary treated recycled water for various uses, and equates it with exposure and potential to receive accumulated doses of various concerning constituents. For example, the study found that a child would have to play on a playfield irrigated with recycled water for 67,000 years to absorb one dose of an ibuprofen tablet (the constituent of concern exposure).

Studies have shown that trace concentrations of pharmaceuticals and personal care products (PPCPs) can be found in treated wastewater effluent. The objective of the research project WRRF-09-07 was to

provide quantitative human health risk assessment (HHRA) results for PPCPs in recycled water and develop messaging strategies to present the results of the study to the public.

One of the biggest hurdles to public acceptance of water reuse projects is the perception of human health risks from the use of recycled water. One way to clear that hurdle is with a robust communications program that accurately and clearly portrays the relative human health risks of recycled water in terms that are easily understood by the public.

The ability for scientists to detect chemicals at very low levels has outpaced the ability to completely remove them from the environment. This has led to an increased public awareness via regional and national news reports of the presence of chemicals in our environment, including in our water and wastewater. Among the perceived health risks for recycled water projects is the presence of trace concentrations of PPCPs that can be detected in treated wastewater.

A primary goal of research project WRRF-09-07 was the development of a set of educational tools to communicate the relative human health risks that PPCPs pose during routine exposure to non-potable recycled water, and how those risks compare with everyday exposure to PPCPs.
The study focused on a set of 10 PPCPs that were carefully selected to be representative of the hundreds that have been detected in recycled water and are present in commonly used products such as prescription and over-the-counter drugs, household products, and food additives. [5]

A communications strategy was developed using the risk assessment results and a set of tools was created to illustrate the relative human health risks from exposure to recycled water compared with everyday exposure to PPCPs. The tools were designed for use by utilities and agencies with non-potable recycled water projects under way or in planning stages, to educate the public about the uses of recycled water and address public concerns about relative health risks.

The goal was to develop materials that clearly communicate the study findings, could be easily used by utility representatives, and that resonate with members of the public in a positive manner. The communications tools focus primarily on presenting the risk data in two ways: 1) comparing acceptable levels of the 10 chemicals included in the study with levels typically found in recycled water, and 2) comparing the number of years of exposure to those chemicals that it would take – under various non-potable, recycled water use scenarios – for an individual to be exposed to the same single daily dose of each PPCP that one would get from typical daily activities.

The list of PPCPs was chosen in an effort to obtain a group of compounds that is present in recycled water, represents the greatest potential risk, and will allow for comparable risk assessments to the public.

Table 1: The 10 PPCPs chosen for this study were:

PPCP	Common usage
17-beta estradiol	Synthetic hormone
Acetominophen	Analgesic
Bisphenol A	Various uses
Caffeine	Stimulant
N,*N*-Diethyl-*meta*-toluamide (DEET)	Insect repellant
Fluoxetine (Prozac)	Antidepressant
Ibuprofen	Non-steroidal anti-inflammatory
Perfluorooctanesulfonic acid (PFOS)	Fluorosurfactant
Sulfamethoxazole	Antibiotic
Triclosan	Antimicrobial

A. Exposure Assessment

According to the comprehensive statewide survey conducted by the California State Water Resources Control Board (SWRCB) in 2002, agricultural irrigation accounted for approximately 50 percent of recycled water use in California. Landscape irrigation accounted for approximately 20 percent of recycled water use. In July 2009, the SWRCB adopted general waste discharge requirements for landscape irrigation uses of recycled water (General Permit) to facilitate the regulatory process for such uses. The General Permit may result in increased landscape irrigation uses of recycled water in California.

Based on the current and anticipated volumes of recycled water for non-potable uses and the potential for human exposures, the following uses of recycled water were selected for further evaluation in the risk assessment:

- Parks, playgrounds, and school yards
- Golf courses
- Highway, and street landscaping
- Agricultural irrigation

Exposure scenarios were identified for each of these recycled water uses. The exposure scenarios represent human activities that occur and may result in exposure to recycled water. These exposure scenarios are representative of the recycled water uses selected for evaluation in the risk assessment and are intended to be protective of other groups exposed during the particular recycled water use.

- Child recreational exposure to PPCPs from dermal contact and incidental ingestion of recycled water while playing in parks and playgrounds irrigated with recycled water.
- Agricultural worker exposure to PPCPs from dermal contact and incidental ingestion of recycled water while working on fields irrigated with recycled water.
- Landscape worker exposure to PPCPs from dermal contact and incidental ingestion of recycled water while working in highway medians, street landscaping, or other areas irrigated with recycled water.
- Adult recreational exposure to PPCPs from dermal contact and incidental ingestion of recycled water while golfing on golf courses irrigated with recycled water.

Daily intakes for each PPCP were derived using concentrations detected in secondary and tertiary treated wastewater and assumptions regarding such variables as exposure duration, ingestion rates, skin absorption factors, and various other parameters that are used to describe human activities for the exposure scenarios. For some of the exposure factors, such as body weight and life span, the U.S. EPA provides default values intended to represent average exposures. These default exposure factors were used for many of the exposure parameters in this risk assessment. When default values were not available, conservative assumptions were used to derive exposure factors. The daily intake calculations used U.S. EPA intake equations.

B. Communications Tools and Materials

Using preliminary results, the effectiveness of the overall messages and public reaction to the specific communications materials were tested in two focus groups and then refined to include:

- A four-page general background piece explaining the risk assessment study and its preliminary findings, current uses of recycled water, and information about PPCPs and how the 10 chemicals were chosen for the study. The piece includes a full-page graphic illustrating the comparative risks between exposure to recycled water in the four scenarios (a golfer, agricultural worker, landscaper, and child at play) and normal use of three products containing PPCPs.

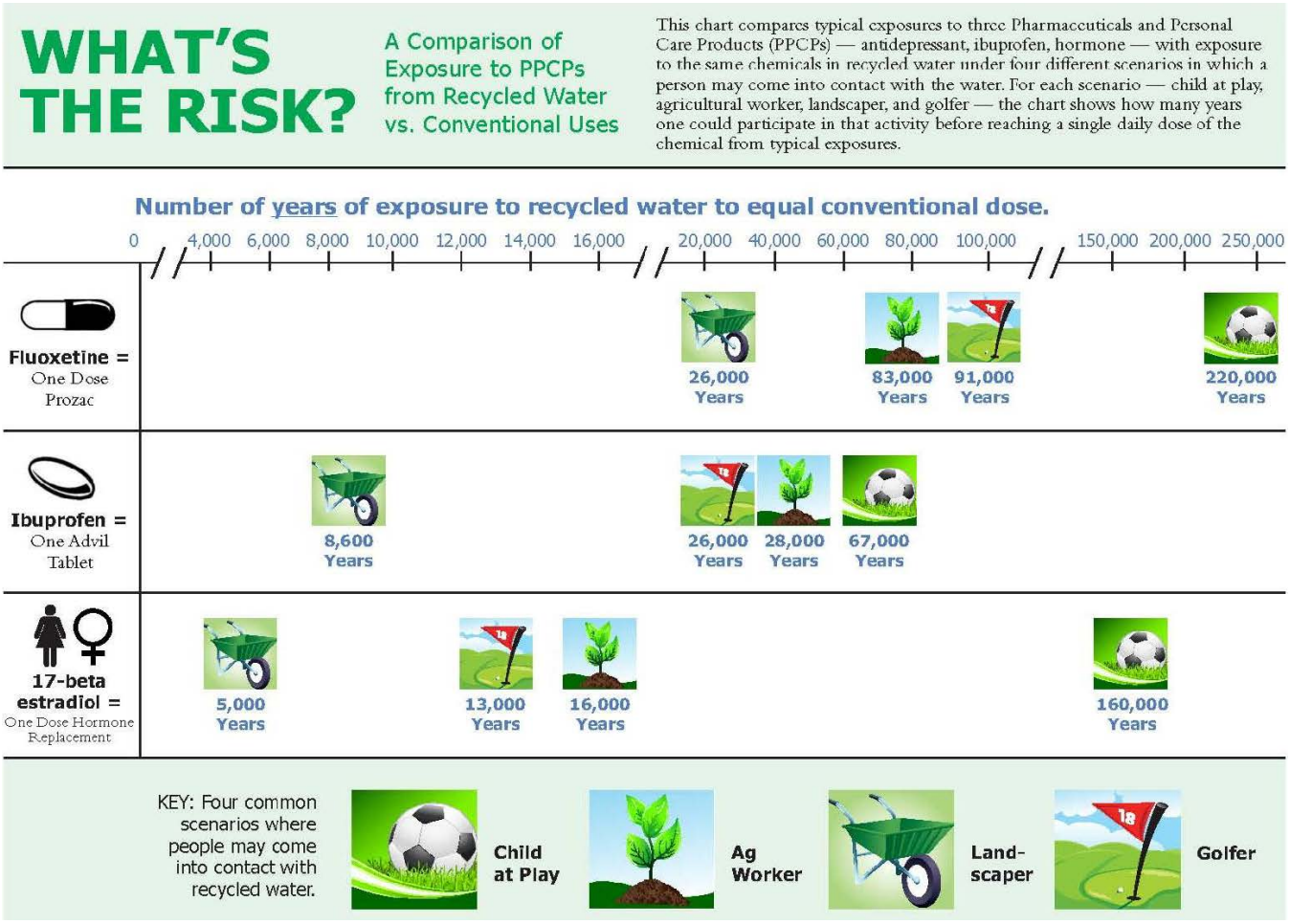

Figure 1: Example of infographic included in the WRRF-09-07 study.

- A fact sheet for each for the four scenarios. These fact sheets offer details about the specific exposure scenarios and also show acceptable versus actual levels of the 10 PPCPs and the number of years to reach equivalent exposures.

- A 12-minute video that summarizes the findings of this study, featuring interviews with scientists Laura Kennedy and Jean Debroux of Kennedy/Jenks and Mark Millan of Data Instincts. The video is intended as a self-contained educational tool in an accessible format that utilities can use to communicate to the public the relative risks of recycled water.

- A folder in which any or all of the materials listed above can be placed.

- Message points and a set of frequently asked questions on the topic of relative risk and recycled water. These will assist water utility managers and community affairs/public outreach personnel in addressing public concerns about the human health risks associated with the non-potable use of recycled water for landscape irrigation, and bring a scientifically based perspective to the discussion.

The above tools were selected for their versatility; agencies can use the folder to present the printed pieces (backgrounder and fact sheets) as a complete set. Alternatively, agencies can select the pieces that best fit their situation. The team developed a video instead of a PowerPoint presentation so agency

personnel would not be required to memorize presentation materials. Additionally, the video can be posted to various web and social media sites, allowing anyone researching recycled water to click, watch, and learn. The message points and frequently asked questions can be useful in addressing public queries or concerns. [5] [8] [9]

The communications tools listed above are available to agencies through the WateReuse Association and the Water Research Foundation. They will foster open communications and promote informed public discussions about the relative health risks associated with the non-potable use of recycled water for irrigation purposes.

III RESEARCH CONDUCTED (2ND OF TWO STUDIES PRESENTED)

Model Communication Plans for Increasing Awareness and Fostering Acceptance of Direct Potable Reuse (WRRF-1302)

Potable reuse involves the use of a proven and reliable technology to purify recycled water so it can safely supplement the drinking water supplies of communities. It is especially valuable to communities in water-scarce regions. Experience among water agencies and municipalities has shown, however, that public acceptance of potable reuse can be one of the primary challenges facing the use of this new source of water supply.

Public acceptance of drinking water that is purified from wastewater has been a difficult hurdle for utilities to clear. Overcoming the so-called “yuck factor” associated with potable reuse is at the forefront of public outreach research currently under way in the water reuse industry. The research paper “Model Public Communication Plan for Advancing DPR Acceptance” (WRRF-1302) is aimed at advancing public acceptance of potable reuse projects by building awareness and support for existing and planned potable reuse programs. The foundation of this effort includes fostering an understanding of the great need to continue to expand our water supply resources options.

Based on this research, a detailed communications plan for public outreach describes how to engage various key target audiences – and those audiences can play a make-or-break role in whether a potable reuse program or project is implemented. Within such a plan are key messages, messaging platform components, and public outreach tools and tactics. The plans are flexible documents that can be adapted to the specific needs and circumstances of individual communities.

A. Research conducted

In WRRF-13-02 the project team initially conducted an extensive literature review of previous research related to potable reuse acceptance and attempted approaches to communications. Next, a series of one-on-one meetings were held with individuals involved with potable reuse projects in their communities—general managers and communications staff from various utilities—to gain an understanding of communications challenges and successes they experienced. Interviews were also conducted with elected officials and special interest groups in California to learn about their attitudes, perceptions, and support for or opposition to potable reuse projects. The findings from the literature review and interviews were used to develop a set of messages, which were tested in focus groups and telephone surveys in two communities (the City of San Diego and the service area of the Santa Clara Valley Water District). The research team surmised that these two regions reflected California’s overall demographic at the time (2014).

B. Literature Review

There are consistent lessons and recommendations throughout the potable reuse outreach literature. These generally suggest beginning outreach early, developing consistent terminology and messaging, establishing the utility as a source of trusted information, and focusing on water quality rather than its

history. It was often stated that knowledge and understanding of the water treatment process increased acceptance of water reuse. DPR efforts will have a better chance at gaining public acceptance by building upon previous efforts.

During each step of the studies and projects in which we've been involved, our team has used a guiding principle: "Listen, Learn, Adjust, and Engage." From the studies and our experiences over the last 10 years we have been able to formulate a universal Communications Plan framework. The end product is a how-to guide for potable reuse communications, that can serve a variety of communities and could be made applicable in any country.

C. In-Depth Interviews

C.1. Utilities and Agencies

When asked what they thought would be the most significant public acceptance challenge as more communities consider new water sources, such as potable reuse, utility and agency representatives identified the following:

- Addressing health and safety concerns
    - Water quality
    - PFAS/PPCPs/CECs
    - Perception of potential exposure to contagious diseases
- Costs to ratepayers
- "Yuck" factor/toilet-to-tap
- Engaging (breaking through disinterest and busy schedules) and educating the public
- Building trust
- Regulations/regulators
- Mixed messages from within the industry/inconsistent language
    - For example, clearly, simply, and consistently defining IPR and DPR

C.2. Legislators

While most leaders, or their representatives, were familiar with recycled water, only a few demonstrated that they had a solid understanding of potable reuse.

- Many respondents demonstrated a lack of awareness of the history of potable reuse and current and proposed projects in the state.
- Several legislators or their representatives stated that they could not go out on a limb without more knowledge and assurances relative to safety, costs, need, and benefits.
- A few were reluctant or unwilling to back a project unless public support is evident, which points to the need for public outreach and education.
- To combat issues of government distrust and suspicion, some stressed the importance of careful planning, education, and transparency every step of the way.

C.3. Health professionals

Most health professionals interviewed had significant concerns regarding what happens if there is off-spec water, and how to handle prior to sending, or not sending, into the distribution system. There were also questions regarding monitoring procedures and processes. Those interviewed believe their concerns may reflect those of health regulators and other water industry policymakers.

Fear of the unknown seems to be the keystone concern and will be the most difficult to overcome. In the words of one respondent, "We only measure a few hundred contaminants and fewer viruses, but we don't know what we don't know or aren't looking for."

Among the specific concerns that these respondents wanted to see addressed are:

- Reliable real-time monitoring
- Ability to detect and remove new constituents as they occur
- Assigning parameters for new and existing contaminants
- Response time/plan with regard to events to ensure contamination does not occur

C.4.Special Interests

- Many environmental special interest respondents are supportive because they know the need for supplemental supply is only going to intensify and they believe potable reuse is more environmentally responsible compared to other supplemental water supply options, particularly desalination.
- Respondents with greater familiarity with potable reuse tend to be more supportive of reuse projects and less fearful of the technology.
- Those with little or no knowledge are either casually supportive or strongly opposed to indirect and direct potable reuse projects.
    - Some in the latter group tend to be suspicious of the government and of the science and technology behind potable reuse.
- Among supporters, brine disposal remains an area of great concern; and one that could erode support if not adequately addressed. Other concerns include safety and cost.

D. Focus Groups and Surveys

Overall, focus group participants had highly positive impressions of recycled water. Most saw it as a prudent and worthwhile way to expand water supplies at a time when they perceive they are being taxed at a higher rate than ever before. Additionally, most were comfortable with the idea of *indirect* reuse of recycled water for drinking. However, most expressed initial discomfort with the idea of *direct* potable reuse (DPR) of recycled water. As much as they could believe it was technologically feasible to make wastewater safe for drinking, they simply lacked confidence that their community was ready – today – to make it a reality.

Over the course of the session, however, and after exposure to detailed messaging, most participants became more much comfortable with the idea of DPR – particularly after hearing the details of the multi-stage treatment process applied to wastewater to make it safe to drink. Findings from the focus groups include:

- Indirect reuse of recycled water had significant initial appeal, while direct reuse of recycled water was initially divisive.
- “Purified Water” and “Certified Water” were clear standouts as terms to describe the product of DPR treatment, but participants also gravitated toward “Advanced Purified Water” as a preferred term.
- Visuals were extremely helpful in building understanding and support for DPR.
- The strongest messages in favor of DPR focused on the safety of the purification process and the importance of developing high quality water supplies to meet the challenges of growth and drought.
- Participants were comfortable with the amount of energy use involved in DPR.
- Messaging increased overall acceptance of DPR. At the conclusion of the sessions, most participants were open to DPR – but with many lingering reservations.

Communications recommendations from the Telephone Surveys:

- **DO** leverage public concern about ongoing water shortages to consolidate support for DPR – without relying on a current drought.
- **DO** emphasize the role of local water agencies, as opposed to other levels of government, in overseeing the process.

- In particular, **DO** emphasize the role of scientists and public health professionals in designing and monitoring the process.
- **DO** place a special emphasis on communications with women, communities of color, non-English speakers, seniors, and less educated and less affluent communities.
- **DO** continue to use "purified water" and "advanced purified water" as a term for the product of potable reuse.
- **DO NOT** simply and solely assert that technology has already made it possible to make any water safe to drink.
- **DO** emphasize the stages of your proposed treatment process.
- But **DO NOT** rely solely on such terms as "microfiltration, reverse osmosis, and ultraviolet light"– provide some brief explanation and context.
- **DO** highlight the frequency and sophistication of monitoring and testing processes.
- **DO** note that public health and environmental protection agencies have reviewed and approved the DPR process.
- **DO** use images to reinforce the effectiveness and complexity of the treatment process.
- **DO** highlight the successful implementation of potable reuse in other communities.
- **DO** draw comparisons to the health and safety of bottled water.
- **DO** appeal to the broader principles of environmental protection and recycling as rationales for expanding the use of recycled water.
- **DO NOT** state arguments that potable reuse may end up reducing rates.
- **DO NOT** rely on elected officials, taxpayer advocates, or business owners as messengers – they do not speak to the health issues at the core of public concerns. [3]

E. Key Messages include:

- Potable reuse provides a safe, reliable, and sustainable drinking water supply.
- Using advanced purified water is good for the environment.
- Potable reuse provides a locally controlled, drought-proof water supply. [3]

E.1. Key Message Supporting Information include:

- The purification process produces water that is purer than most bottled water.
- Purified water:
    - Will comply with or exceed strict state and federal drinking water standards.
    - Will be tested, in real-time, with online sensors and be strictly monitored by the department of health.
    - Is currently used to supplement drinking water in many communities in the US and around the world.
    - There have been no problems from this use of purified water.
- Environmental benefit:
    - The more recycled water we use for whatever purpose we use it, the less fresh water we have to take out of rivers, streams, and our scarce groundwater supplies. This is good for rivers and streams and the fish, plants, and wildlife that rely upon them.
    - We all recycle glass, plastic, paper and even yard waste, which is the right thing to do. For the same reasons, we should recycle and reuse as much of our limited water supplies as we possibly can—water is too valuable to be used just once.
- A locally controlled, drought-proof water supply:
    - Purified water is independent of climate or weather.
    - Purified water enhances water supply reliability and helps protect us from droughts by diversifying supply sources – keeping us from relying too much on any one source of water that may run low in a drought.

- Purified water provides a community with a constant source of water.

E.2. Additional suggested Message Points from the WateReuse Association's Public Education & Outreach Committee (2015):

- Water reuse – including potable reuse – happens naturally all over the planet.
- Water reuse happens daily on rivers and other water bodies.
- Planned Potable Reuse is publicly acknowledged as an intentional project to recycle water for drinking water.

The amount of fresh water on the planet does not change, so through nature all water has been used and reused since the beginning of time. [2] [3]

IV KEY FINDINGS

The key findings of the combination of the literature review, one-on-one meetings, and public opinion polling/research indicate that public acceptance of potable reuse can be achieved by implementing a coordinated, consistent, and transparent communications plan. The findings on achieving public acceptance of water reuse – whether the use of tertiary treated water for irrigation/industrial purposes or purifying wastewater for augmenting drinking water supplies – underscore these crucial elements, among others, to consider:

- Develop trust (build relationships, offer facility tours)
- Be consistent with outreach (start early, continue throughout project, maintain after project)
- Provide information about potable reuse and where it is already in use, to increase familiarity
- Be consistent with messaging and terminology
- Instill confidence in the quality of water (talk about the treatment process/technology)
- Be transparent (discuss costs, water quality, safety, environment)
- Be prepared (respond to tough questions and misinformation)

V. CONCLUSIONS

Through studies like "Model Public Communication Plan for Advancing DPR Acceptance" (WRRF-13-02) and "Risk Assessment Study of PPCPs in Recycled Water to Support Public Review" (WRRF-09-07), we have learned and demonstrated strategic methods to introduce and communicate the concept of water reuse—concepts that are vital in meeting the future water supply needs of communities throughout the world. These efforts establish the strategic groundwork toward fostering public acceptance of both basic water reuse and advanced purified potable water, whether IPR or DPR. Output from these studies has allowed us to create guidance documents that can be used in a variety of communities. For use of tertiary recycled water, we recommend the use of outreach tools created in WRRF–09-07. For potable reuse we encourage people to use "Helping People Understand Potable Reuse - One Glass at a Time. A Flexible Communication Plan for use by Public Information Professionals (2015)" (derived from WRRF-13-02).

These studies and their resulting outreach guidance materials provide the water reuse industry with key tools and a roadmap for robust public outreach efforts. Such efforts are essential to effectively communicate with decision makers, regulators, stakeholders, and the public about the value of both tertiary and advanced purification treatments, and the safeguards the water industry utilizes for safe and reliable water reuse.

Inclosing, since the completion of these two studies WRRF-09-07 and WRRF-13-02,
Mark Millan and his team at Data Instincts have consulted on numerous potable reuse projects in the US, including:

- Pure Water Monterey - One Water Monterey
- Pure Water SF – San Francisco Public Utility Commission
- Pure Water Soquel – Soquel Creek Water District
- OneWater Nevada – Truckee Meadows Water Authority, Reno, Sparks, Washoe County
- Pure Water Silicon Valley - Santa Clara Valley Water District

VI. REFERENCES

1. WHO Guidelines for Potable Reuse, World Health Organization, Chapter 7, The Art of Public Engagement, pp. 54-60 2016.

2. Model Communication Plans for Increasing Awareness and Fostering Acceptance of Direct Potable Reuse (WRRF-13-02, also referred to as WRF-4540) Millan, Tennyson & Snyder 2015.

3. Case Studies and Lessons Learnt – Data Instincts in coordination with Australian Water Recycling Centre of Excellence (AWRCoE) 2015.

4. Getting Past the “Yuck Factor”, Public Opinion Research Provides Guidance for Successful Potable Reuse Outreach, AWWA JOURNAL (Research article derived from WRRF 13-02, also referred to as WRF-4540 DPR) Tennyson, Millan & Metz July 2015

5. Risk Assessment Study of PPCPs in Recycled Water to Support Public Review (WRRF-09-07 also referred to as WRF- 1665) Kennedy, Debroux & Millan 2012.

6. The Psychology of Water Reclamation and Reuse (WRRF-04-08) Haddad, Rozin & Nemeroff 2009.

7. Helping People understand Potable Reuse – One Glass at A Time, (Derived from WRRF-13-02, also referred to as WRF-4540) Millan, Tennyson & Snyder 2015.

8. Monitoring Strategies for Chemicals of Emerging Concern (CECs) in Recycled Water. California State Water Resources Control Board (CSWRCB). Science Advisory Panel on Chemicals of Emerging Concern, Final Draft. 25 June 2010.

9. Identifying Hormonally Active Compounds, Pharmaceuticals, and Personal Care Product Ingredients of Health Concern from Potential Presence in Water Intended for Indirect Potable Reuse. Alexandria, VA, WateReuse Foundation. Snyder, et al. WRRF-05-005, 2010.