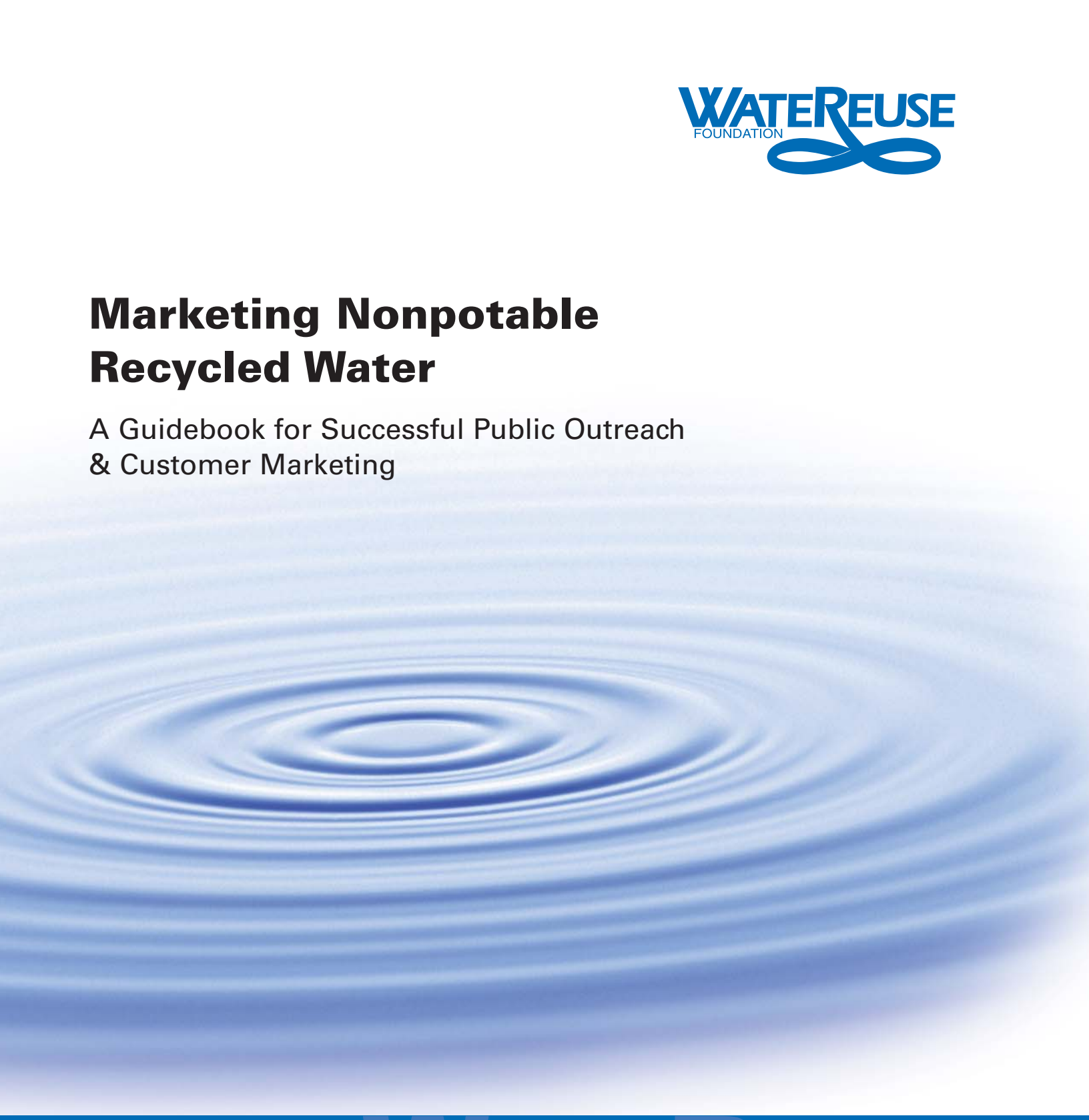
Marketing Nonpotable Recycled Water

A Guidebook for Successful Public Outreach & Customer Marketing



WateReuse Foundation

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About the WateReuse Foundation

The mission of the WateReuse Foundation is to conduct and promote applied research on the reclamation, recycling, reuse, and desalination of water. The Foundation's research advances the science of water reuse and supports communities across the United States and abroad in their efforts to create new sources of high quality water through reclamation, recycling, reuse, and desalination while protecting public health and the environment.

The Foundation sponsors research on all aspects of water reuse, including emerging chemical contaminants, microbiological agents, treatment technologies, salinity management and desalination, public perception and acceptance, economics, and marketing. The Foundation's research informs the public of the safety of reclaimed water and provides water professionals with the tools and knowledge to meet their commitment of increasing reliability and quality.

The Foundation's funding partners include the U.S. Bureau of Reclamation, the California State Water Resources Control Board, the Southwest Florida Water Management District, and the California Department of Water Resources. Funding is also provided by the Foundation's Subscribers, water and wastewater agencies, and other interested organizations. The Foundation also conducts research in cooperation with two water research coalitions – the Global Water Research Coalition and the Joint Water Reuse & Desalination Task Force.

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FOREWORD

The WateReuse Foundation, a nonprofit corporation, sponsors research that advances the science of water reclamation, recycling, reuse, and desalination. The Foundation funds projects that meet the water reuse and desalination research needs of water and wastewater agencies and the public. The goal of the Foundation's research is to ensure that water reuse and desalination projects provide high-quality water, protect public health, and improve the environment.

A Research Plan guides the Foundation's research program. Under the plan, a research agenda of high-priority topics is maintained. The agenda is developed in cooperation with the water reuse and desalination communities, including water professionals, academics, and Foundation Subscribers. The Foundation's research focuses on a broad range of water reuse research topics including the following:

- Defining and addressing emerging contaminants;
- Public perceptions of the benefits and risks of water reuse;
- Management practices related to indirect potable reuse;
- Groundwater recharge and aquifer storage and recovery;
- Evaluating methods for managing salinity and desalination; and
- Economics and marketing of water reuse.

The Research Plan outlines the role of the Foundation's Research Advisory Committee (RAC), Project Advisory Committees (PACs), and Foundation staff. The RAC sets priorities, recommends projects for funding, and provides advice and recommendations on the Foundation's research agenda and other related efforts. PACs are convened for each project and provide technical review and oversight. The Foundation's RAC and PACs consist of experts in their fields and provide the Foundation with an independent review, which ensures the credibility of the Foundation's research results. The Foundation's Project Managers facilitate the efforts of the RAC and PACs and provide overall management of projects.

The Foundation's primary funding partners are the U.S. Bureau of Reclamation, the California State Water Resources Control Board, the Southwest Florida Water Management District, the California Department of Water Resources, Foundation Subscribers, water and wastewater agencies, and other interested organizations. The Foundation leverages its financial and intellectual capital through these partnerships and funding relationships. The Foundation is also a member of two water research coalitions: the Global Water Research Coalition and the Joint Water Reuse & Desalination Task Force.

This publication is the result of a study sponsored by the Foundation and is intended to communicate the results of this research project. The goals of this project were:

- Develop marketing strategies for water agencies to use to increase the demand for nonpotable recycled water;

- Develop strategies to improve communication of the value of recycled water, the public's perception of recycled water, and the benefits associated with water reuse to recycled water customers; and
- Develop marketing strategies and tools to address issues such as public perception, trust in municipal agencies, nature of the market, cultural values, and the status of competing public and political issues.

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EXECUTIVE SUMMARY

The purpose of this Guidebook is to provide agencies with a comprehensive document to aid in planning and designing a public outreach and customer marketing campaign for a recycled water program. The case studies, market research, and templates of an outreach plan and communication materials will help agencies avoid pitfalls and design an outreach program that will help the public and other stakeholders understand the many benefits of reuse for their community.

Here's how we recommend that you benefit from this Guidebook: You might want to start with reading the background information—the case studies and the market research—to provide a useful context that you can relate to your own project. This information may generate some thoughts about your own community, such as its size and whether it is growing, your own needs for water supply, the demographics and politics, and any other considerations that help you develop the framework for your own public outreach and customer marketing program. You may want to share some of your thoughts or have discussions about this information with other staff, elected officials, or consultants.

Next, in Chapter 1, Common Strategies for Success, we've provided a general list of activities and tasks that we have found workable in all the case studies we've described. At this point, with a volume of information as background, you may be ready to start framing your own agency's public outreach and customer marketing program. We have woven some of the key research findings into the Common Strategies section, but you will find more specific customer marketing strategies in the Strategic Public Outreach and Customer Marketing Plan template.

In the Communication Tools section, there's a template for constructing a tailored Strategic Public Outreach and Customer Marketing Plan—the first step in designing your own outreach program. You and your staff can begin filling in information that reflects your own community's and agency's needs. Once the Plan is developed and you have a budget and timeline (there are ideas provided about how to do both), you can start developing communication tools.

The Communication Tools templates (provided on two CDs) include a brochure, newsletter, PowerPoint presentation, and fact sheet. These contain some generic messages and language, although you can change any of this information to suit your needs. You can include your own agency's logo and other information, and even switch out some of the graphics and photos if you desire. We recommend that you use a professional graphics person to help with the materials, because they require specific design software. The specifications for using these templates are included as well.

As much as you may try to anticipate every problem you might encounter in a given project, there will inevitably be surprises. You'll find in the case studies we have provided that everyone encountered obstacles along the way. They survived and succeeded, and so will you.

CHAPTER 1

COMMON STRATEGIES FOR SUCCESS

The information gathered for this Guidebook was collected from various sources—from five case studies of successful reuse projects, market research (a public opinion survey, a general public focus group, and a recycled water customer focus group), research gathered from other studies and reports, and the author's own expertise and experience in working with public agencies and various stakeholder groups. What the reader will find throughout all of this information is that there are some fundamental themes of success woven into every public outreach and customer marketing program—common strategic threads that skillfully stitch together project triumphs.

All the agencies that participated in the case studies and market research faced similar challenges: surging populations, lack of a reliable local water supply, quality issues, and discharge issues. Despite varying geographies, demographics, and political environments, each succeeded by following common strategies in public outreach and customer marketing that any agency can implement.

Each agency encountered pitfalls and problems and made mistakes, but each also persevered, planned ahead, and corrected courses of action once obstacles appeared. Their examples illustrate the underlying theme of this Guidebook: COMMUNICATION. It is the essential key to any successful project. Even the most technically efficient program cannot succeed without two-way communication with the public, customers, media, internal staff, regulators, other government agencies, and everyone else affected and involved.

Supplementing the lessons learned from each case study, the Guidebook features a market research section. Included are results from a public opinion survey, a general public focus group, and a recycled water customer focus group that provide insights into the thinking of those you will deal with the most—the general public and your customers. The data emphasize that there is a contrast between the assumptions we might hold and the reality of how the public and customers think about recycled water.

The survey and focus group results reveal the fears, concerns, and lack of knowledge that can sink a recycled water program if issues are not squarely addressed. Whether an agency is studying recycled water use because of a shortage of potable water supply, discharge issues, or growing populations, the survey data provide an important tool for anticipating and coping with challenges.

Besides the case studies, the Guidebook provides a Communication Tools section that includes a Strategic Plan template and templates for various materials, including a brochure, newsletter, fact sheet, and PowerPoint presentation. These templates can be used by your agency to begin to design and plan for a public outreach and customer marketing program. The templates allow the user to customize these tools to fit the needs and requirements of their agency.

The Strategic Plan template included in this Guidebook serves as a comprehensive blueprint of approaches, strategies, and tasks that an agency can follow to successfully implement the

outreach and marketing elements of your recycled water program. Each agency's plan can be individualized to mirror the concerns, demands, and constraints of each community.

In addition, the materials included in the Guidebook provide a universal language, visuals, guides, and messages that you can implement in your own recycled water program. These resources were developed from a comprehensive review of publications and materials of numerous public agencies with successful recycled water programs. The language is meant to be free of technical jargon and therefore easily understood by a layperson. It is recommended that the communication tools be revised with the assistance of an experienced graphic designer or a staff person familiar with the programs used to develop the tools.

The tools and strategies included in this Guidebook will help your agency gain the trust and support of the public, but be aware that even with the best outreach programs there may be controversies. Based on analysis of many of the recycled water programs that did become controversial, it is evident that most problems were caused by inadequate implementation of a public outreach program. Having a good solid foundation of information about the region, past controversies, demographics, and the media will help an agency proceed on a positive path. Even with a solid outreach program, opposition is likely to develop, and a successful outreach program needs to anticipate and plan for potential setbacks.

Very often the controversy is rooted in the public's perception of the source of the water and related public health issues; however, growth, economic, and political issues can also arise. In order to avoid potential controversy, these issues must be acknowledged and addressed truthfully throughout the outreach process and to each stakeholder group. Studies have shown that the more the public knows about recycled water, the higher the rate of support.

The strategies listed below are general guidelines—there are more specific strategies appropriate for various stakeholders listed in the Strategic Public Outreach and Customer Marketing Plan sections later in the Guidebook.

- Prepare an adequate budget for staff or consultants to implement public outreach and marketing and have them work alongside technical staff.
- Start with development of an outreach and marketing plan.
- Conduct market research if your budget allows—this will help with designing the public outreach plan and utilizing accurate messaging.
- Involve citizens, customers, and stakeholders in the initial planning process and listen and respond to their concerns.
- After identifying the potential customers, don't assume that they will be willing customers until meeting with them and discussing the project benefits.
- Always provide follow-up to questions and concerns—building trust with stakeholders is crucial.
- Incorporate recycled water education into your overall water and/or wastewater school education program.

- Bring in experts to conduct independent research or serve as a blue ribbon panel regarding health issues, water quality, and other concerns if it is necessary to convince stakeholders that reuse is a benefit.

- Seek assistance from elected officials who support reuse—ask for their leadership in educating and convincing the public.

- Meet early and often with the media—they will support the project if they understand the underlying reasons for reuse.

- Communicate early with regulators so there are no unexpected hurdles or obstacles along the way.

- Determine if other public agencies overlap boundaries of your agency and whether they can align with the project. Politics can be a major obstacle if jurisdictional issues are not handled thoughtfully.

- Cost of the recycled water is the major factor in pursuing customers—the price of the water is your premier marketing tool.

- Getting customers connected to the recycled water system should be free of red tape and bureaucracy.

- Develop a customer service program that requires as little as possible from the customer.

- Make sure that customers are informed of any recycled water price increases well in advance so they can budget accordingly.

- Ongoing customer service and communications are essential tools. Stress the importance of customers to everyone in the organization.

- The construction phase requires day-to-day communication with commuters, neighborhoods, schools, day care facilities, hospitals, and other sensitive areas.

- Assign staff to recycled water operations—there may be crossover responsibilities with water and wastewater operators, and there should be a full understanding of this new service.

- Educate all staff in the recycled water program—very often they are the “eyes and ears” in your community.

- Be honest if mistakes occur—have a crisis plan in place in advance so everyone knows what to do if there’s a spill, cross-connection, or other problem.

- Persevere! Every project has obstacles and setbacks. The successful projects described in this Guidebook kept the vision and eventually were able to provide recycled water to their communities.

CHAPTER 2

COMMUNICATION TOOLS

2.1 HOW TO USE THE STRATEGIC PUBLIC OUTREACH AND CUSTOMER MARKETING PLAN

The Strategic Public Outreach and Customer Marketing Plan serves as a comprehensive blueprint of approaches, strategies, and tasks that an agency can follow to implement successfully the outreach and marketing elements of your recycled water program. The Plan should include a budget, timeline, and goals so that there is clear direction and so that funds are available to support activities without interruption throughout the planning, design, permitting, and construction phases of the recycled water program. A timeline helps plan for and track the outreach activities as the technical work proceeds.

The Plan, once it is approved by either the governing body or management, should be distributed to the technical consultants, staff engineers, planners, and operations staff so they are aware of how outreach and marketing complement the planning, design, and other work that is ongoing. Outreach and marketing are essential in every recycled water program—it is in the realm of communications where most potential problems arise.

As you'll discover in the case studies provided in this Guidebook, most major project setbacks were consistently caused by lack of information, not talking to customers or not letting them know when changes occurred, miscommunications, or lack of preparation for unanticipated events. The most successful agencies devote staff, budgets, and skillful communication efforts to ensure that all stakeholders are adequately informed as a program begins and unfolds.

It is recommended that the Plan be written in layperson's language so that it can be easily understood by elected officials, the general public, customers, media, and all other stakeholders. The Plan does not have to be lengthy to be valuable; in fact, the more succinct it is the better, so that everyone who needs to read it can do so quickly.

The Strategic Plan that follows is a template. It requires you to fill in the information that is relevant to your agency or project. In this way, the Plan will be tailored to the recycled water program in your community.

2.2 SAMPLE OUTLINE OF A STRATEGIC OUTREACH PLAN

Introduction
Situation Analysis
Budget
Public Outreach and Marketing Goals
Challenges and Opportunities
Key Outreach Messages
Stakeholder Groups
Strategies for Stakeholder Groups
    General Public
    Elected Officials
    Government Agencies
    Media
    Internal Staff
    Recycled Water Customers
Recommended Communication Tools and Advertising
Timeline

2.3 STRATEGIC PLAN TEMPLATE

2.3.1 Introduction

Explain the purpose of the Strategic Plan and describe why it is being developed. You will want to explain to the reader why a plan is necessary and how it will help your agency succeed by keeping your project within both your budget and time frame. Keep in mind who will be reading the Plan: elected officials, technical staff and consultants, and participating agencies.

2.3.2 Situational Analysis

Describe your agency's and community's need for a recycled water project. This may include a growing population, drought conditions, limited potable supply, a discharge problem, or some other factor. The analysis should be a rationale for why your agency is pursuing water reuse as an augmentation to the potable water supply. The analysis could also answer the following questions:

- Were there other alternatives that were studied in addition to reuse? Why were these alternatives not pursued?

- What is the impact of limited water supplies on your community? (consider economic, environmental, and political impacts)

- How will recycled water be used to improve the situation? Clearly articulate the specific benefits and value to your community.

2.3.3 Budget

Whether your outreach program is developed in-house or with a consultant, your budget should show the costs of implementing strategies, completing tasks, and developing

communication tools and advertising. A budget helps you track your program, allocate future years' budgets (to ensure funding throughout the entire planning and implementation phases), and provide documentation if you are receiving grant funding.

While the Plan and the list of Communication Tools are comprehensive, many organizations must prioritize and use only some of the recommended communication tools due to budget concerns. The most basic necessities, if you have limited funds, would include the Strategic Plan, a brochure, fact sheets, a website, and a PowerPoint presentation. These tools are less expensive to produce and provide the public with in-depth information about a project at a lower cost. Of course, the effectiveness of the materials increases significantly with use of a diverse set of tools to reach a larger segment of the public. You may find other ways to produce materials, such as bill stuffers, other agency publications, or partnering with another participating agency. Considering the overall cost of a recycled water project, the public outreach and customer marketing element is frequently one of the lowest-cost items and yet has one of the most important functions.

2.3.4 Public Outreach and Marketing Goals

Some suggested goals for public outreach and marketing are:

- Provide adequate information to identified customers, stakeholders, and the community in order to secure support for the project.
- Gain consensus among the water customers and users and other stakeholders as to how the project will be implemented.
- Market to potential customers so that they are willing and enthusiastic about using recycled water. Identify customers that will advocate for recycled water or provide testimonials.
- Support the agency's efforts to design and construct recycled water facilities within the time frame and budget

2.3.5 Challenges and Opportunities

It's important to identify and articulate the potential problems and issues that you may face as you initiate your project and to develop a response or plan to respond. It will be easier to anticipate and plan how to address such issues instead of waiting for obstacles to emerge along the way. Developing a list of opportunities is equally important. By identifying these opportunities and positioning yourself to benefit fully from them, you will ultimately strengthen your project and win over detractors.

First, describe all obstacles and challenges to your project. These challenges may originate among the public, regulatory agencies, customers, elected officials, or special interest groups. Some examples from other projects include:

- Agencies with overlapping jurisdictions are not in agreement with the plans for your project (institutional issues).

- There are potential water quality issues that need to be addressed before customers using potable or well water will want to change.

- The public has historically opposed any construction in the region.

- Rates will have to be raised to pay for this project, and any increases will be opposed by most citizens.

- Vocal activist or environmental groups will oppose the project because it is perceived to be conducive to faster growth in the region.

- An elected official or candidate for office is using misleading information to damage the community's perception of recycled water.

- The regulatory agencies and/or other government agencies have never permitted a recycled water project, have water quality concerns, or may have land that will be affected by the recycled water.

- Past projects that were not successful can start you off on the wrong foot.

Second, list the opportunities that can help your project succeed. Some examples from other projects include:

- The local water supply is shrinking because of drought, regulatory controls, or overdrafting of groundwater supplies.

- New businesses (golf courses, resorts, industries, master planned communities, etc.) will need an additional water source for irrigation and industrial uses if allowed to develop.

- There are readily available sources of grants and low-interest loans to help offset the cost of the project.

- Recycled water will help reduce the discharge of effluent.

- Political, business, and community leaders are in agreement that reuse is a positive direction for the community.

- Successful pilot project.

- Support from a public opinion survey.

2.3.6 Key Outreach Messages

A proactive public outreach program should establish and maintain consistent messages to ensure that the public and other stakeholders become informed without confusion. Messages may be carried via informational materials, advertisements, press releases, presentations, on a website, and in meetings with all stakeholder groups. Below is a list of key messages to consider:

- Recycled water is a reliable and drought-proof supply of water.

- Recycled water is the best use of a crucial natural resource.
- Recycled water is the key element of a water management plan.
- Recycled water is safe and is regulated to protect the public's health.
- All water is recycled.
- Using recycled water is good for the environment.
- Recycled water is economical.

2.3.7 Stakeholder Groups

A stakeholder is any individual, group, or organization that has a real or perceived vested interest in the outcome of the project. Once the key stakeholders are identified, strategies and tasks can be developed to ensure that each stakeholder group has been contacted and educated about the project. Other stakeholders may emerge during the planning process. After reviewing the general categories below, there may be others in your community not listed. Also, the General Public category can be subdivided into additional categories, such as environmental organizations, school children, business organizations, etc.

Below are some general categories of potential stakeholders. Each may be broken down into smaller sublists:

- General Public (rate payers, neighbors, homeowner associations, etc.)
- Elected Officials (local, state, and federal)
- Media (reporters, editors from newspapers, radio, television, and Internet communications)
- Internal Staff (wastewater and water treatment operators, public works directors, parks and recreation, planning, and other departments)
- Business Community (Chamber of Commerce, Building Industry Association, local businesses, etc.)
- Government Agencies (overlapping jurisdictions, regulatory and permitting agencies)
- Recycled Water Customers (golf course superintendents, school districts, industries, homeowner associations, etc.)

2.3.8 Strategies for Stakeholder Groups

The strategies for reaching stakeholder groups should encompass the entire planning process through design, market assessments, environmental review, permitting and construction, start-up, operations, and customer development. In the long term, this approach will help prevent delays, help the project to stay within budget, and proactively address any controversial issues. Because their interests and potential concerns may differ, you may want

to develop a goal for each individual stakeholder group. You may want to update the strategies on an annual basis to reflect progress with planning, design, permitting, construction, etc. Some examples are discussed below.

2.3.8.1 General Public

Members of the public often have varied interests and opinions about a recycled water project. If the project will increase sewer or water fees, then rate payers' issues should be squarely addressed.

If the project includes siting and construction of a new water recycling facility in proximity to homes, community facilities, or schools, then the public's interest is likely to be more focused on this issue. Your community may have active watchdog or environmental organizations that may take an interest because of an environmental impact or growth issue.

Take all of these and other potential issues into consideration when developing strategies for the general public. Even a small group of people can undermine a project that has broad community support, causing controversy, delays, and unnecessary expenditures.

Here are some relevant strategies from the case studies, market research, and other successful outreach programs:

- Discuss with staff and consultants any potential problems you might foresee (rates, siting, construction, health and safety issues, etc.).

- If your budget allows, conduct a public opinion survey prior to launch of your outreach program.

- Create a common theme and messages that can be used throughout all communications. Some agencies have developed a new name and logo specifically for the recycled water project.

- Make sure that materials include a simple-to-understand project description as well as a description of how recycled water is produced. Health and safety are of utmost importance to the public, especially parents. Materials should also explain why this project is important.

- Don't assume that the public is aware of the water supply situation or where their water comes from. This fact needs to be communicated as the basis for why recycled water is needed.

- Develop a Citizens' Advisory Panel of individuals and give them a specific role (e.g., commenting on aesthetics of the plant, rates, and construction issues). Make sure that participants clearly understand the role they will play. Although you may invite certain representation on the panel, allow anyone who wants to participate to do so.

- Conduct presentations to community organizations. Identify interested groups and associations and request an opportunity to speak.

- Ask health departments or other experts to help the public understand how recycled water is monitored and inspected to help build confidence in its safety.

- Create a list of supporters and maintain a database for a speakers' bureau, mailings, invitations, and project updates.

- Enlist the business community. Ask them to help disseminate information.

- Procure a display booth and attend local events.

- Conduct an advertising and media campaign to raise awareness of the water issue and the benefits of recycled water.

- Offer tours of the wastewater treatment plant.

- Create communications materials (see templates in this Guidebook) and distribute by mail, newspaper insertions, at public locations, meetings, etc.

2.3.8.2 Elected Officials

Elected officials are crucial to your success because they control budgets, timelines, and other critical issues related to the project. Because most recycled water projects require several years to implement and elections may come up in the middle of the planning process, it is essential that elected officials be regularly updated and informed. In the absence of broad understanding, a newly elected city council majority might change the direction of a project or even end it. It is also important to keep state and federal officials updated and informed, especially if your agency is seeking funding.

Important strategies include:

- Provide ongoing updates designed to educate, receive input, and gain acceptance.

- Encourage elected officials to participate in the program by inviting them to speak or participate in groundbreaking events, turning-on of water to first customers, press conferences, etc.

- Because elected officials on local boards and agencies can change every election period, be prepared to meet with and update newly elected officials.

2.3.8.3 Government Agencies

Permitting and planning for a recycled water program will involve a variety of regulatory and permitting agencies, as well as overlapping jurisdictions.

- Meet one-on-one with any agencies that might prove to be a challenge, preferably before the project gets started.

- Maintain ongoing communications with regulatory agencies by briefing them on a consistent basis and sending real-time updates.

- Seek support from other local government agencies. Partner whenever possible.

- Pursue grant opportunities (federal and state).

2.3.8.4 Media

The media will develop stories based on their existing knowledge base. On small community newspapers, for example, a reporter may be assigned to cover many disparate beats and have little time to research a story in depth. Wastewater and water news often takes a "back page" to more enticing or controversial items. The most successful water recycling programs make an effort to meet with local reporters and editors, provide background information on water recycling projects, and convey a compelling story for why the project is needed. Taking a reporter to lunch or breakfast helps create a positive relationship while getting your message across. Providing the reporter or editor with regular updates of progress and periodic press releases is also key to getting an accurate story written. Be sure that you are candid even in the midst of a crisis situation, and in most instances the media will be fair and accurate.

Here are some general strategies taken from other successful outreach programs:

- Educate reporters and editorial boards about the projects. One-on-one lunch meetings, tours of the treatment plant, phone calls, and providing background materials can accomplish this.

- Submit regular press releases and/or media advisories when there are key milestones initiated or completed.

- Organize press conferences or other media-related events to celebrate major milestones of the project.

- Utilize print and radio advertising to promote public meetings, celebrations, important announcements, and general awareness of recycled water.

- Prepare an initial press kit with background information, local and national resources, contact lists, materials, and other relevant data.

2.3.8.5 Internal Staff

In many communities, the internal staff members live and work locally and have neighbors, friends, relatives, and other contacts who ask questions about the project. Your internal staff are the "eyes and ears" in your community and therefore should be provided with accurate and up-to-date information. It is not unusual, especially in a large agency, to find staff members who know little or nothing about recycled water and how it will be used. Ways to remedy this include:

- Develop a staff workshop to provide information and handouts. Conduct a role-playing exercise to practice answering potential questions from the public.

- Provide ongoing progress updates at staff meetings or by e-mail.

2.3.8.6 Recycled Water Customers

A recycled water program cannot succeed unless there is a willing, paying customer on the receiving end. It helps to view potential recycled water customers the same way that a business would look at selling a product and winning long-term clients. Think of the services and products that you use in your own life: what is it that creates a positive feeling about working with a vendor? It's generally founded on trust, good service, timely delivery of a

quality product, and clear two-way communication, especially when there is a problem. The case studies included in the Guidebook describe each agency's experiences working with customers and the lessons learned if they were to go back to the beginning again. Many of the strategies listed here are from those case studies.

Here are some strategies that are useful in building such positive relationships:

- Meet with potential customers one-on-one to determine their level of knowledge about recycled water and degree of interest. This needs to occur prior to designing or building pipelines to customers.

- Develop a relationship with each customer that is based on long-term satisfaction; develop an internal system for customer service that is tailored to the type of customers you will have. For example, have a system in place for responding immediately if there are problems.

- Help customers deal with landscape issues, such as drainage, burning on greens, and irrigation levels.

- Conduct presentations to the customer's constituencies (e.g., school district administrators, school boards, industrial workers, golf course employees, etc.). A golf course may have a board of directors, superintendent, maintenance workers, members, etc.

- Offer tours of other recycled water programs that are similar in scale and size to what you are planning.

- Pay special attention to school districts, including superintendents, school boards, facility and maintenance staff, parent-teacher organizations, principals, parents, and students. Schools can become incubators of controversy if parents are afraid their children will be harmed by playing on fields irrigated with recycled water.

- Businesses need to know in advance what their costs will be. As much as possible, provide an accurate recycled water price and on-site retrofitting pricing so that your customer can accurately budget. Try to avoid any surprises with rate increases; businesses, like public agencies, have to adhere to and plan for upcoming budgets.

- Maintain ongoing communications through newsletters, e-mail, and periodic meetings with customers.

- Promote and publicize your customers as "good guys" who are helping to conserve by using recycled water. They will most often appreciate the positive attention. Make sure that they want this attention and can review any materials or articles.

- Promote customers as project partners. The term "partnership" describes customers as willing and enthusiastic and conveys the message that communications go both ways. Listen to your partners' needs and concerns and address them.

- Discuss customers' needs with other departments that have responsibilities that might overlap, such as accounting or permitting. Ensure that everyone who interacts with

customers understands the service philosophy and has a system of internal communications that includes these different departments in case of problems.

- Since customers need to deal with neighbors or their own customers, it's important that the agency support them in case there are problems, such as overspray or leaks.

- Develop a small brochure or fact sheet that customers can distribute to neighbors, clients, and others.

There are also other discussions about handling customers in the case studies of Chapter 3 and the market research discussion in Chapter 4.

2.3.9 Recommended Communication Materials and Advertising

Communication tools are a necessary element of any outreach program. Although face-to-face communications and presentations are ideal, materials should also be available for stakeholders to take with them or for you to distribute at a variety of venues, including meetings, presentations, and public events or via direct mail.

To help you develop effective communications materials, we have created usable templates that include basic text and suggestions about the types of specific information you might want to add. Templates exist for the following materials: brochure, newsletter, fact sheet, and PowerPoint slide presentation.

These materials can include:

- Name and logo: Create a name for the project that is easy to remember. A logo will also help the targeted audiences easily identify your project and remember its benefits.

- Brochure: Explain project benefits, discuss the local water supply situation, address health and safety issues, and graphically demonstrate the process. (See template.)

- Fact sheets: Focus on such specific issues as health and safety, landscape irrigation guidelines, frequently asked questions, or environmental benefits and concerns. (See template.)

- Newsletters: Deliver current news, such as project milestones, schedule changes, maps, and other key outreach messages. (See template.)

- Radio ads: Provide brief "1-minute" updates and facts about the water supply, impact of droughts on the local economy, conservation tips, and explanations of how water is purified.

- Magazine and newspaper advertisements: Convey information that is more detailed than the radio ads in a series of brief articles that progress in complexity over time.

- Websites: Provide a convenient source of additional information for stakeholders, customers, and other interested parties. The website may contain a project overview, meeting and event information, education page for teachers, quizzes, interactive

descriptions of treatment processes, and important documents (environmental impact reports and press releases). Use the website address on all publications and advertising to promote its use.

- Feature articles and bill inserts: Provide periodic updates and information. Feature articles can be submitted to local organizations, school districts, government agencies, and community associations to include in their existing newsletters.

- PowerPoint presentations: Tailor a presentation for each specific stakeholder group. (See template.)

- Press kit: Distribute this important resource to members of the media at special events or send to individual reporters and editors. The kit is typically a folder containing press releases, fact sheets, photos, business cards, project timeline and statistics, a brochure, and the latest newsletter.

- Display booths: Illustrate your project with photos, graphics, a regional map, a colorful portrayal of the treatment process, and more. Use the display booth at community events.

2.3.10 Timeline

A timeline should be developed and updated annually for outreach to each individual stakeholder group. It should dovetail with the timeline for the overall project and include milestones for all relevant phases, such as planning, design, environmental review, permitting, and construction.

CHAPTER 3

CASE STUDIES

Four of the case studies highlighted in this Guidebook are examples of recycled water programs that are now considered successful models of good planning, in particular because of their efforts with public outreach and customer marketing. The case study of Victor Valley Wastewater Reclamation Authority, which is still in the planning phase, describes the outreach and marketing elements that have taken place and will be continuing, although the project is not yet built. Key to the success of the four other case studies was an element of public and customer outreach. In many cases, the successful agencies learned valuable lessons from earlier projects that failed due to controversy. Each of the case studies acknowledged mistakes and pitfalls along the way, but because of their perseverance, each ultimately succeeded.

Failed projects such as the City of San Diego's Water Repurification Project, the Dublin San Ramon Services District's Clean Water Revival Project, the City of Los Angeles East Valley Water Reclamation Project, and others around the United States all had health, growth, economic, and/or political issues arise that effectively put an end to the proposed projects. In these examples, each project's undoing can be traced back to insufficient outreach to and input from the public, as well as political issues. The information vacuum that resulted was filled with unrealistic fears and political opportunism that shifted public attention toward catchy slogans and misinformation.

In each of the following five cases examined, the agency began with a plan for how to reach the public. Some were more structured than others, but all the case study participants acknowledged the need for planning. Some of the agencies, but not all, either had public information staff or used public relations consultants. In all cases, the general public and recycled water customers were provided with ample opportunity to receive input and gather information about the proposed projects. The successful agencies share a common theme: they all made communicating with identified stakeholders a critical element of their recycled water programs. These themes are described under Common Strategies for Success.

3.1 LAS VEGAS VALLEY WATER DISTRICT

Winning Public Outreach: How Nonpotable Recycled Water Became a Sure Bet in Vegas

3.1.1 Project Background and Agency Information

Las Vegas, NV, is one of the fastest-growing cities in the United States. The population jumped from 64,400 in the 1960s to nearly 560,000 by 2004. By 2009, over 2 million people are expected to be living in the Las Vegas Valley.

More than ever, a key economic and quality of life question is whether—and where—the region can find the necessary water supplies to keep pace with this exponential growth.

With an average annual rainfall of just 4.2 in., Las Vegas has never had the luxury of ignoring water supply issues. For the first 70 years of the last century, groundwater was the only water source for the City, until a serious aquifer overdraft required officials to consider alternatives.

Nevada has also enjoyed rights to a portion of the Colorado River flow, and Lake Mead now supplies nearly 90% of the Valley's water. Lake Mead is also the recipient of treated wastewater from the main treatment plants of the cities of Las Vegas and Henderson, as well as the Clark County Water Reclamation District. Although other water reclamation facilities are located in Clark County, this case study focuses on the development of the Durango Hills Water Resource Center (DHWRC; initially named the Northwest Water Resource Center), one of the three satellite treatment facilities in the Valley.

It seems logical that recycled water development would occur naturally and easily in this locale. Historically, however, the opposite has been true. Based on the consumptive allocation of 300,000 acre-ft/year of Colorado River water for Nevada and the provisions of an agreement establishing "return flow credits," when 1 gal of treated wastewater is returned to Lake Mead, then another can be treated and pumped back into the Valley for potable uses. This policy effectively recycled almost all of the Valley wastewater but was also instrumental in delaying the investment in additional infrastructure to accommodate new water reuse opportunities.

A couple of unique situations helped bring water reuse to the Valley. One was the close proximity of golf courses to the City of Las Vegas and Clark County Water Reclamation treatment plants. The second was in the City of Henderson, which was required to use rapid infiltration basins for treated effluent because it did not have a discharge permit at that time. As a result, Henderson decided to use its recycled water to irrigate nearby golf courses.

The tremendous impact of rising population on the existing wastewater treatment system did not go unnoticed. Beginning with the creation of the Southern Nevada Water Authority in 1989, all seven local water purveyors began to address common water and wastewater issues for the Valley. Many new resort developments that included golf courses increased the demand for irrigation water, while new housing increased the flow to wastewater treatment plants.

In 1990, the City of Las Vegas commissioned a Wastewater Collection System Master Plan Study, which identified the possibility of a satellite treatment facility near the Sun City Summerlin area of the City. This community was rapidly growing with new homes, golf courses, parks, schools, and other facilities rising from the landscape. The City and the Las Vegas Valley Water District (LVVWD) agreed on a partnership to ensure delivery of the recycled water. The treatment facility is owned and operated by the City of Las Vegas, and the LVVWD operates the reservoir and the recycled water distribution system (RWDS).

After 7 years of planning, design, and construction and $63 million, the DHWRC and RWDS were completed in 2001. The DHWRC site includes a 10 million gallon per day (MGD) water reclamation plant, a 2 million gallon reservoir, and a 20 MGD main pumping station of the RWDS. Two booster pump stations are located along the RWDS pipelines. The plant treats flow from the City's collection system to irrigate 11 golf courses in the Summerlin area, with future plans for irrigating parks and schools. The LVVWD, which constructed the reservoir, pumping stations, and 17 miles of distribution pipelines, is responsible for the delivery and customer service of the recycled water. Solids handling is done at the City's main wastewater treatment plant to maintain "neighborhood-friendly" operations and in order to avoid any odors.

By constructing the satellite recycled water plant, the City was able to reduce the size of some cross-town interceptor sewers, thereby realizing significant savings. The development of numerous golf courses in the area of Summerlin provided a unique opportunity for a concentrated demand for irrigation water. Using recycled water to satisfy the golf courses' needs has conserved huge quantities of potable water for domestic use.

Peak demand in the summertime is forecast to be approximately 17 MGD. The Center will be able to meet 10 MGD of that amount, with the rest being met by four potable recharge and recovery wells constructed near the recycled water facility on City property. This effectively removes the entire summer peak demand on the potable water system.

Golf courses using recycled water from the LVVWD will also benefit from a reduced water rate. The golf courses' average cost annually when using potable water was calculated to be approximately $2.09 per thousand gallons at the beginning of plant operations. The recycled water was initially offered at $1.69 per thousand gallons, with the intention that the facilities would eventually be paid for entirely through the recycled water rate. The first increase in rate to $1.85 per thousand gallons took place in April of 2004. The recycled water from the plant meets the Nevada Administrative Code 245A.277 Exception Water standard, "adequate for full-body contact," which is similar to California Title 22 water quality.

3.1.2 Public Outreach Efforts

Public outreach and education for the DHWRC began as soon as the feasibility study was completed and it became likely that the project would move forward. Jointly, the City of Las Vegas and the LVVWD established a number of strategies for informing the public. The first step was development of a Community Relations and Public Involvement Program that identified the key target audiences, strategies for reaching those audiences, recommended materials, and suggestions on how to work with the media.

The Public Involvement Program objectives included:

- Engage the public in the problem-solving process and evaluate the project from their point of view.
- Solicit public opinions and questions regarding the project.
- Provide quick, candid, understandable answers to questions and become the public's most reliable source of information.
- Provide project facts in plain language.
- Identify the public's concerns and misunderstandings and include those in the evaluation process.
- Win the public's enthusiastic informed consent for the project.

All communications included these key messages:

- There is a genuine need to manage the water resources in our community effectively and economically to maintain our current quality of life.
- The City of Las Vegas and the LVVWD missions are to manage the water and wastewater generated in the community in an environmentally and economically acceptable manner.
- The proposed site is ideally suited for the project based on a review of all possible locations in terms of technical and economic considerations, as well as the benefits to the entire community.
- Our problem-solving approach is reasonable, sensible, and responsive and incorporates what we have heard from the public.

Staff conducted a series of community meetings and open houses in the neighborhoods, providing maps, project descriptions, and other educational materials in order to receive feedback and inform the public about the project. By utilizing an "open house" type of forum without a podium, the public mingled with City and LVVWD staff, reviewed materials, and was able to communicate one-on-one with staff. Staff also used audiovisual presentations, mailed numerous newsletters to over 45,000 residents and businesses, responded to public inquiries by telephone and letters, and coordinated field trips to other similar facilities. A brief video with project and construction information was produced and aired on community access television. One of the examples of another successful project that was used to reassure the public was Gainey Ranch in Arizona. This upscale community mirrored the type of community being developed in Summerlin, complete with housing around the golf course and a "neighborhood-friendly" water resource center.

Some of the concerns that emerged from these meetings, although minimal, were health and safety related. Residents wanted the recycled water to be used on golf courses but not parks or schools, because of fears of using the water near children. Initially, the City of Las Vegas planned to construct an active sports park around the satellite treatment facility, but residents wanted a golf course instead. Residents were concerned about noise and traffic at the

proposed sports park. It was decided that the water district and City would accommodate all of the residents' requests and concerns to minimize opposition and to move the project forward, especially since the agencies had sought public comment.

The homes in this area are in the middle to high range in cost, and there was considerable concern about property values. The community also includes a large population of seniors. The satellite treatment facility shares the immediate area with homes, a community center, and a golf course. The plant was constructed to be a "good neighbor facility" by being placed at grade and underground, so that no facilities over one story tall are visible. Because of the critical nature of odor control, all unit processes were covered, up to the final filters. Aesthetically, the facility fits in well with the nearby community center, with a similar style in roofing, design, and landscaping. It would be difficult to know the facility is a water reclamation plant without looking at the sign in front of the building. The architect who designed the facility was an understudy of Frank Lloyd Wright, a selection that signified the commitment of both agencies to construct a facility that is aesthetically pleasing to the community.

The biggest challenge for LVVWD staff was the construction of recycled water pipelines. Staff prepared a public outreach plan specifically for the 1-year construction period, which began in 1999. To bring recycled water to golf course customers, 17 miles of pipeline needed to be constructed, much of it along one of the busiest major surface streets in western Las Vegas, Rampart Boulevard. The plan addressed the needs and concerns of three stakeholder groups: the press, the public, and the politicians.

The public was not happy with blocked lanes and traffic delays, especially during rush hour. The extreme heat of Las Vegas adds to the usual unpleasantness of slow traffic. In order to inform apprehensive residents and commuters, the LVVWD produced and mailed periodic newsletters to more than 45,000 homes and businesses, publicizing construction schedules and emphasizing the value of the project. Road signage provided information about the project, including start and completion dates, along with a contact name and phone number. Presentations were given to homeowners associations, planning groups, and civic organizations.

Open houses were also held, and one-on-one meetings with residents were conducted when group meetings were not practical. Approximately 100 one-on-one meetings took place during the construction phase.

Communication with the media included advisories notifying reporters of street closures, land restrictions, and the progress of construction. The LVVWD staff was also available to provide information through briefings and interviews. Engineers and project managers were provided to discuss the more technical aspects of design and construction.

Elected officials were included in outreach efforts to ensure that each had accurate and current information about the construction. Briefings were held to update other public agencies. Because the southern Nevada projects are located on federal land, federal agencies needed to be consulted and kept up-to-date.

Even with extensive outreach, the LVVWD had numerous challenges to deal with:

- Road construction was intense, and tempers flared among irate motorists.
- While some road construction took place at night to avoid noise and other impacts, that strategy had an ironic result: Some residents questioned whether any work was actually being done, since they couldn't see it happening during the day.
- Some media sensationalized the inconveniences with negative articles about the construction. One story headline read "Road to Nowhere."
- The contractor was not always sensitive to public concerns, and some of the work impacted residents more severely than necessary.

In addition to the extensive outreach conducted throughout the community, school outreach was also implemented. Several schools were impacted by the project. A PowerPoint presentation geared for children explained water reuse in simple terms, comparing it to recycling of other items such as paper, aluminum, and glass. Safety information about construction sites was explained, as well as why conservation is important.

The media was informed and updated throughout the entire project, and most articles have been very positive. As Las Vegas struggles through another drought period, recent coverage has focused on the benefits of recycled water during a water crisis.

3.1.3 Customer Marketing

To date, the 11 golf courses are the prime customers for the plant's recycled water. No parks or schools are yet benefiting from the new supply, due to initial public concerns about noise and traffic, although plans are underway to begin using recycled water at a local park. Many of the golf courses had to be retrofitted to receive recycled water, although some had been constructed with separate potable pipelines to serve the greens. Three of the golf course superintendents interviewed had many years of experience from other courses using recycled water and were confident they could respond to any problems that might occur. Since the planning phase, LVVWD staff has worked closely with golf course customers.

The response from the golf courses has been positive for several reasons:

- Many of the superintendents had worked with recycled water previously and were accustomed to relevant regulations and operations.
- The price of recycled water makes it cost-efficient for courses.
- Nutrients in the water partially saved the cost of fertilizers.

The District and the City have taken a proactive, customer service-friendly approach with golf course users. Monthly user–provider meetings allow customers to raise issues and concerns. Operations staff is available and responsive to individual customers as well. The LVVWD has also brought in experts to deal with drainage, irrigation, and landscape issues and conducted a study of plants that are tolerant of recycled water.

Given their past experiences with recycled water, it is not surprising that the three superintendents interviewed were unanimous in their support for the project. When asked what advice they could offer other golf course customers, they suggested:

- Good drainage is essential (whether the water is potable or recycled). Anything can grow with recycled water as long as there is proper drainage.

- The positives vastly outweigh the negatives (more reliable and plentiful water source, nutrient value, and cost savings).

- Some courses have changed grass to a Bermuda hybrid called Tifdwarf, which is especially tolerant of recycled water.

There are numerous resources available for working with recycled water, making it easy to use. Some of those resources include customer service staff, website information, and the monthly meetings, which are well attended.

- Safety training is held with golf course workers every 3 months; part of the training is a refresher about handling and working around recycled water. As a result, there have been no reported accidents or problems. A small, laminated card provided to workers outlines the basic health and safety issues of working with recycled water.

Neighbors of one golf course were at first skeptical of how the landscaping would look with recycled water. Now that they've seen the beauty of the result, they have lowered their walls to provide a sweeping view of the course. Property values, due in part to the improved landscaping and the beauty of the golf course landscape, have skyrocketed in the Summerlin area. There have been no complaints of spray, nor any health concerns from residents.

3.1.4 Lessons Learned

Despite comprehensive public outreach, problems and challenges did occur; however, the project ultimately achieved a highly positive outcome because the City and the LVVWD dealt straightforwardly with issues as they arose and staff and elected officials stayed committed to seeing the project through to completion.

Development and implementation of a community outreach plan was also key. It enabled the City and LVVWD to educate and inform the public in a consistent, thoughtful way. The plan was flexible enough to adjust communications methods and materials to match each phase of the project—engineering, environmental, design, and construction. In developing the plan, the City and LVVWD asked themselves: What impact do we want to have on our neighbors? What are the benefits we can bring to the community, and what are the potential temporary hardships?

Having materials available to the public that explain the value of recycled water to the community is essential. People are not as interested in the engineering details as they are in how recycled water benefits their lives.

Many committed staff members at the LVVWD kept faithfully to the vision of recycled water despite politics, resistance, and unexpected obstacles. The LVVWD is fortunate to have positive leaders who have stayed the course throughout the entire process, from design to

ongoing operations and customer service. Because projects can take many years to develop, having a long-term goal and then staying with it is essential.

Having committed elected officials at the City was also key. Since the beginning of the project, there have been three different elected City Councilors in the ward where the project is located. Each has supported the project and embraced a long-term vision for improving the water supply situation and preserving the region's quality of life. Support, education, and advocacy from other elected officials and management staff at both the City and LVVWD helped newly elected City Councilors understand the importance and benefits of recycled water. Living in a desert region that is growing at unprecedented rates provides a strong argument for an additional water supply.

Internal education at the LVVWD was critical for customer service. Personnel accustomed to regulations and operations associated with potable water needed training to manage recycled water processes and address potential issues. In retrospect, it would have been advisable for LVVWD operations staff to have been brought into the process during the design phase in order to provide each worker with a clear understanding of recycled water use. For example, handling a recycled water spill or leak requires a different set of procedures and reporting than a similar potable water situation.

Effective customer relations have also been essential, especially during the initial use of the water. Staff dedicated to customer marketing helped customers through retrofitting, training, and other important elements of implementation. It is still not a perfect situation, as one will see when reading results from the customer focus group in the Market Research section of this Guidebook. There are still some misunderstandings and concerns on the part of customers, even though LVVWD has made a concerted effort to communicate.

In the end, outreach—in all its varied forms—has been the indispensable key to bringing a needed new source of water to the Valley. It may not have been much of a gamble, in the Las Vegas sense, but the project's steady payout has been enormous, helping sustain the area's economic vitality while enriching the quality of life for residents.

3.1.5 Contacts

Las Vegas Valley Water District: Gary Grinnell, Sr. Civil Engineer (702) 258-3909, gary.Grinnell@lvvwd.com.

City of Las Vegas: Dave Mendenhall, Environmental Division Manager (702) 229-6200, dmendenhall@lasvegasnevada.gov.

3.2 CONSERVE II, ORLANDO, FL

Orange Groves to Greenbelts: Conserve II's Vibrant Public Outreach in Orlando

3.2.1 Project Background and Agency Information

Water Conserve II is the largest water reuse project of its kind in the world. Jointly owned by the County and City of Orlando, FL, it encompasses two water reclamation facilities which are connected to the Conserve II distribution center by 21 miles of pipeline.

From the distribution center, an additional 49-mile pipeline network carries reclaimed water to 75 agricultural, commercial, and residential customers, irrigating over 4000 acres of citrus, nurseries, tree farms, and golf courses. The newest customers are residents of the massive Horizon West master planned community, where reclaimed water is used for greenbelts and front and back lawn and landscape irrigation. The project also features an extensive system of rapid infiltration basins that use excess reclaimed water to recharge the Floridian aquifer, the state's primary drinking water source.

Orlando is home to Disney World, Sea World, Universal Studios, and a host of other tourist attractions. Thirty-five million people visit Orlando each year. As the region's vacation popularity has grown, its residential population has also surged. Yet, despite the new jobs and industry, Orlando remains a major center of citrus and other crop production. The region has experienced periodic droughts, much like other areas of the South and West.

In the late 1970s a citizens' group, citing degradation of water quality and habitat, filed suit against the City and County of Orlando to stop discharge of treated effluent into Shingle Creek. As a result of the suit and a subsequent state requirement, discharge into the creek was to end by 1988. During this same period, population increases necessitated expansion of the area's two wastewater treatment plants.

After evaluating numerous alternatives, the City and County decided upon advanced wastewater treatment to produce reclaimed water, primarily for agricultural customers. In addition, unused reclaimed water would be discharged into rapid infiltration basins to recharge the groundwater aquifer. The benefits of this twin plan include:

- Elimination of discharge to environmentally sensitive creeks;
- Proven, cost-effective technology providing reclaimed water to customers year-round;
- A dependable, long-term source of irrigation water;
- Easing of stress on the Floridian aquifer by eliminating the need to use well water for irrigation; and
- Establishment of a preserve in the rapid infiltration basins for endangered and threatened species of plants and animals.

3.2.2 Public Outreach Efforts

The public outreach effort was conducted by City and County technical staff and engineering consultants. Although there was no involvement of public information staff or consultants, those involved from the beginning were aware that education and outreach were critical to the success of Conserve II. Staff and consultants learned early in the planning that both residents and potential customers had real concerns and that the best way to alleviate their fears was by building trust and responding to those concerns.

Initially, residents of the Lake Avalon area had numerous concerns about Conserve II. Reclaimed water pipelines would be passing by their community, and there were fears of spills, odors, and health-related issues. As a result of their concerns, a state epidemiologist conducted a virus study which demonstrated to residents that the reclaimed water would be safe; because this independent research was conducted, residents were convinced and they dropped their opposition to the project. Conserve II staff and the engineering consultants utilized numerous citizen meetings throughout the design phase to further build trust and receive input from the residents. Media coverage, although minimal, changed from negative to positive. By continuing to meet with residents over time and responding to concerns with more information, staff and consultants eventually built a trusting relationship with them.

Elected officials of the both the County and City helped bring community-wide recognition, leadership, and awareness of Conserve II. With residential customers now on line (and more communities waiting to be built), it was important that the public had a sense of comfort and trust with using the water on public facilities such as golf courses as well as in their own backyards.

School tours are conducted at the two main treatment plants as part of the local school districts' environmental education curricula. Various brochures, newsletters, and other information were disseminated to residents and customers.

3.2.3 Customer Marketing

Initial skepticism among citrus growers, the initial customer market for the recycled water, drove the City and County to develop incentives for its use. Grower concerns included potential virus and disease problems, heavy metal contamination, flooding issues, odors, salts, and tree damage. Growers also worried that consumers might perceive that citrus grown with reclaimed water might be of poor quality or even unhealthy. There was also mistrust of the local government and a perception that "Big Brother" was trying to force something onto growers.

The City and County responded with a comprehensive plan and effort to allay concerns and overcome objections. To ease the growers' fear of crop degradation, the City and County commissioned an extensive study on the use of reclaimed water with various crops.

Research has been conducted since 1987 by the Mid-Florida Citrus Foundation, a nonprofit organization and the research arm of Water Conserve II, to test the reliability and quality of reclaimed water on citrus and other crops. The research work is performed by faculty from the University of Florida's Institute of Food and Agricultural Sciences. Some of the key findings to date are:

- The benefits of irrigating with reclaimed water have been consistently demonstrated since 1987.
- Citrus on sandy, well-drained soils responds well to irrigation with reclaimed water and can tolerate up to 100 in. per year.
- Tree condition and size, crop size, and soil are typically as good as, if not better than, in groves irrigated with well water.
- Fruit quality is similar to that of fruit irrigated with well water.
- Reclaimed water maintains pH within the recommended range; therefore, lime is no longer necessary.
- Boron and phosphorus are present in adequate amounts and have reduced the amount of fertilizer needed.

Because the research was conducted independently by University of Florida faculty, the findings have been well accepted by the growers. The process, supported by the City and County, built tremendous trust with growers and converted many reluctant users into enthusiastic supporters. Staff and consultants alike knew that building trust with the customers was essential to the success of the project: everyone had an investment in building positive relationships with the growers.

Reclaimed water is to be provided free of charge to the growers for a period of 20 years, a major incentive for the customer. Another benefit is freeze protection: adding reclaimed water to the trees during a freeze helps increase the temperature of the roots and protects against devastating losses of crops. Reclaimed water quantities have remained sufficient, so that growers don't have to be concerned with not having enough water during a freeze, hot spells, or droughts. Some of the citrus growers were invited to be interviewed for this study and three were available. Unanimously, they praised the Conserve II partners for their willingness and ability to understand the needs of their business. The water "sells itself" claimed one of the growers. Besides the economic, quantity, and quality issues, the nutrient value in the water makes its use widely accepted, and the freeze protection is so valuable that the citrus growers claim that many of them would have gone out of business without it. Another customer stated that the very cooperative staff at Conserve II has made this relationship work well over the years. Because of the longevity of staff at Conserve II and the County and City of Orlando, many of the same individuals have now known each other and worked together with the growers for the past 20 years.

In addition to the daily and ongoing contact with growers, quarterly meetings of a Growers Executive Committee and Conserve II staff have helped with ongoing communications.

Orlando, and especially the area surrounding Conserve II, is continuing to evolve. A main highway bisects former citrus groves, and new housing developments are being built in

formerly rural agricultural areas. Horizon West, a large master planned community, and its residents are the newest customers of reclaimed water. The water irrigates greenbelts, golf courses, and front and back yards. New homebuyers are given pamphlets that explain the health and safety precautions, and signage reminds residents of the purple pipe system. Initial community meetings were conducted by the County, and letters and bill stuffers have helped remind residents about reclaimed water use.

Five hundred homes were built with reclaimed water systems in the ground, and the community is anticipating the addition of an additional 700–800 homes. Residents enjoy a lower cost for reclaimed water. County staff states that although there was some initial resistance, the staff now receives numerous compliments about the customer service and quality of the water. Because property values have increased since the first residents moved in, there are no concerns that reclaimed water has degraded the community.

3.2.4 Lessons Learned

- Building trust and credibility with customers and citizens was essential to the success of this project.

- Responding to concerns with outside research and studies not only helped build trust but also brought an independent expertise to the project. Bringing in a third-party expert, Dr. Robert Koo, provided acceptance by the growers—it wasn't just the "wastewater guys" trying to sell their effluent.

- Communication with the customers is essential. Conserve II meets quarterly to discuss issues and concerns. A Grower Executive Committee was established at the beginning of the project.

- Having a consistent staff and consultants to work with customers helped build long-term relationships.

- Don't ever take the system for granted. Make certain that your utility keeps equipment "up to snuff" so that there are no quality or quantity issues.

- Make certain that the operators of the water reclamation facility think like drinking water operators as it relates to the product they are delivering.

- Make sure there's enough reclaimed water to go around during a drought. One of Conserve II's strong points is that they have supplemental wells tied into the system which can make up for shortfalls of water during droughts.

- Have a strong, reliable wet weather backup to the reclaimed water distribution system—one that won't get you into trouble with state and federal agencies during prolonged rain events.

- Incentives are necessary to bring willing customers to the table.

3.2.5 Contacts

Conserve II Staff: Woodard & Curran, P.O. Box 783125, Winter Garden, FL 34778-3125, (407) 656-2332.

Orange County: Gabor Delneky, Chief Engineer, 109 E. Church Street, Ste. 300, Orlando, FL 32801-3318, (407) 836-7266.

City of Orlando: Tom Lathrop, Wastewater Bureau Chief, 5100 L.B. McLeod Road, Orlando, FL 32811, (407) 246-2213.

3.3 SAN ANTONIO WATER SYSTEM

Remember The Alamo, and Other Strategic Public Outreach Lessons

3.3.1 Project Background and Agency Information

The City of San Antonio, TX, has seen a population increase of nearly 34% since 1999. As in many other regions of the country, a surging population, together with periodic droughts, has put a significant strain on the local water supply. The primary source of water is the Edwards Aquifer, which is shared by agricultural communities to the west and other municipal interests to the north. A severe drought in the 1950s raised awareness of the critical dependency on the aquifer for local water supply.

In 1996, during another extended drought, the San Antonio Water System (SAWS), acting through the City Council, instituted mandatory water rationing. The new policy was not well received by the public, however. There was also widespread skepticism about whether a shortage actually existed.

Yet, even as the public doubted the realities of shrinking supplies, groundwater pumping for commercial, industrial, and irrigation reduced the flow of water to natural springs in the region, including Salado Creek and the San Antonio River. As a result, the Sierra Club filed suit and the state began mandating water resource planning. The City suddenly needed to develop alternative water resources.

The initial planning for a comprehensive water supply strategy involved organization of a Citizens Committee on Water Policy. Early on, water recycling was identified as a key solution. Working with the Committee, the City defined its goal as increasing the availability of water from the aquifer by replacing drinking water with recycled water for nonpotable uses for commercial, industrial, and agricultural customers.

Other goals later developed included:

- Reducing the dependency on the aquifer as the sole source of water for San Antonio,
- Replacing 20% of the current SAWS demand from the aquifer by using recycled water,
- Acquiring additional pumping rights for trade for equal amounts of recycled water,
- Preserving San Antonio’s economic viability by providing industrial and commercial businesses with a reliable supply of water,
- Helping maintain ecosystems in the downtown San Antonio River, bays, and estuaries,
- Supplementing the water supply of City Public Service,
- Enhancing water quality in Mitchell Lake, and
- Creating supplemental water.

In 1996 SAWS identified potential customers, volumes, and recycled water pipeline alignments to support the distribution system. The potential demand for nonpotable water was estimated at 47,000 acre-ft. Estimates forecast a potential program supply of 130,000 acre-ft of recycled water use. Of that supply, 55,000 acre-ft of it to is be returned to downstream users, 40,000 acre-feet are contracted to electric power generation facilities, and the remaining 35,000 acre-ft were designated for supply through the recycled water distribution system, which also included releasing recycled water into the San Antonio River and Salado Creek.

The recycled water would be supplied from the four existing SAWS water recycling facilities. Because the facilities were already treating to an advanced process standard, including filtration, disinfection, and dechlorination, the sole project expense was the establishment of recycled water pipelines and other infrastructure, at a cost of $125 million. Today, nearly 75 miles of pipeline convey water from the recycling plants to customers, as well as to creeks and rivers for discharge.

The value of a drought-proof, reliable source of recycled water to the local economy has been tremendous. Compared to other water supply alternatives, recycled water is inexpensive. Recycled water flowing through the downtown River Walk is a major component of the local hospitality and tourist industry, which generated $7.2 billion in 2002. The historic Alamo, which receives millions of visitors every year, is also using recycled water. The San Antonio River and Salado Creek have experienced improved water quality. Clearly, the SAWS recycled water project has benefited the environment and economy of the City and outlying areas, while also conserving precious resources.

3.3.2 Public Outreach Efforts

In 1997 SAWS finalized a Community Outreach Plan that outlined the strategies and goals for increasing the public's awareness about recycled water and building community support. The Plan stated:

> *Building and nurturing a partnership with the community is an ongoing and constantly changing endeavor. It is important the agency is committed to building the public's trust by designing a public participation process that is fair, allows for two-way communication, solicits honest community feedback, and is willing to incorporate public input into the final program design.*

To meet the goal of educating the public and building support, SAWS relied on a range of targeted communications strategies. Examples include public information fairs that were heavily promoted through postcards, flyers, newspaper and radio advertising, Internet bulletins, and utility bill inserts. Public comment cards were distributed at the fairs to determine support and receive input on route alignments to minimize construction inconveniences. In an effort to promote the program as a component of a conservation measure, literature and promotional items, including free water-saving showerheads, were also provided to residents.

SAWS has a comprehensive school education outreach department where recycled water is taught as an integral element of its water conservation program. Called the SAWS H_2O University, the program targets elementary, middle, and high school students with a large portfolio that includes curricula, field trips, presentations, after school programs, and teacher tools.

3.3.3 Customer Marketing

As important as public acceptance was to the success of the project, the customer base was considered equally important. Without customers, the program would fail.

SAWS identified over 75 potential irrigation, commercial, industrial, and agricultural customers within its system. Total demand, and also total potential usage for recycled water, was estimated at 47,000 acre-ft per year during the design period of 1996–1997. Since the program supply was 35,000 acre-ft, SAWS had the comfort level to proceed with construction.

Recycled water customers fall into three categories (municipal, military, and private). Some of the customers included:

- The Botanical Gardens
- The Alamo
- Brooks City Base
- Lackland Air Force Base
- University of the Incarnate Word
- Fort Sam Houston
- Fort Sam Cemetery
- Numerous golf courses
- Numerous cooling towers
- Public parks
- SBC Arena
- Turf farms
- Construction

Letters of inquiry were sent to each of the potential customers. Those that expressed interest were contacted in person to discuss further details of the program. Numerous incentives were instituted to motivate customers to enter into agreements with SAWS. A conversion benefit credit was offered to help defray the costs of retrofitting a separate pipeline system at $900 per acre-foot, based on the number of acre-feet saved from Edwards Aquifer. Although recycled water is sold at the same basic rate as potable water (currently $300 per acre-foot), the customers do not pay additional potable rate fees. The fee structure is as follows: commercial potable water at $735.65 (with additional potable fees) and recycled water at $314.53.

In addition, recycled water is marketed as drought-proof, and customers are not limited on the amount of water for which they contract. Outdoor watering is restricted to use between the hours of 8:00 p.m. and 10:00 a.m. year-round. During critical periods when the water supply in the Edwards Aquifer is at low stages, the City of San Antonio imposes watering restrictions, allowing outdoor watering only on certain days. However, SAWS recycled water customers are not subject to these same watering restrictions, though they still have to adhere to the watering hours of 8 p.m. to 10 a.m.

The SAWS recycled water team coordinates and assists in all aspects of customer connections and service, and customer relations are a top priority. Internal training of both SAWS staff and customers is ongoing. A *Recycled Water Users' Handbook* outlines the rights and responsibilities of customers and details irrigation practices, health and safety

precautions, City ordinances governing recycled water, and reporting requirements. Cross-connection checks are conducted prior to use of recycled water and annually thereafter. In the case of any interruption in service, SAWS is able to back up its supply with potable water.

One objection from potential customers was concern that total dissolved solids (TDS) could affect some vegetation. As a result, SAWS incorporated TDS assurance levels in the Recycled Water Service Agreement provided to each customer.

Customers have become enthusiastic supporters of the use of recycled water because of the uninterruptible supply, good water quality, and the cost-effectiveness. An important example of good customer relations is provided by The Alamo. Mark Nauschutz, horticulturist with The Alamo, reports there are no problems with the quality of water used on the picturesque and diverse array of trees, flowers, turf, and plants at the site. Very positive relations and ongoing communications with SAWS have helped ensure that The Alamo is a satisfied and enthusiastic proponent of the recycled water program.

Managers from two golf courses and country clubs, the San Antonio Country Club and Republic Golf Course, were also interviewed. Members of the San Antonio Country Club were initially reluctant to accept recycled water but were eventually convinced that the drought-proof supply would be beneficial. According to San Antonio Country Club General Manager Marvin Jones, there have been no complaints from members since recycled water has been used. He recognizes the importance of preserving the integrity of the aquifer and noted that using recycled water has now become a “way of life” for the region. He characterizes his partnership with SAWS as positive and advises other golf courses to learn more about the benefits of recycled water use. Jones has a high level of confidence in both SAWS and the benefits of recycled water. Training of workers is ongoing, and there have been no incidents or complaints about exposure to the water.

Republic Golf Course CFO Ed Miller has had similar experiences using recycled water. His course was the first to connect to SAWS, and so there were some installation obstacles to overcome in the beginning. In his experience, the initial specifications and guidelines were not completely clear. For example, he stated that it took longer than anticipated to order and have purple pipe delivered to the site. Because the course was built specifically to accommodate recycled water, the delay in implementing the system slowed the pace of overall construction. Most important to Republic is the economics of using recycled water; the incentives provided by SAWS have helped cut costs substantially.

At these courses, as among all customers, worker training, cross-connection inspections, and a customer manual are tools consistently used by SAWS to ensure the health and safety of workers and the public.

3.3.4 Lessons Learned

Planning phase:

- Public opinion can change with the weather.
- Involve your operations staff in the planning phase.

- Don’t underestimate the value of a stakeholder committee, with representatives from the community, government, and business.

- Hold staff accountable.

Construction phase:

- Coordinate with impacted neighborhoods.

- Use standard construction practices.

- SCADA should have been planned during construction.

- Don’t assign your project manager to “design” as well as manage your system.

Operations phase:

- Overcome the “us and them” attitude in organizations. Recycled water projects merge previously distinct areas of the organization, such as water and sewer.

- Don’t kid yourself: acknowledge that accidents such as cross-connections will happen in the best of recycled water systems.

- Follow the spirit of guidelines, not just the letter.

- Accept risks and work with your customers.

- River discharge is a good thing.

- Chlorine dosage may vary.

3.3.5 Contact

SAWS: Pablo Martinez, 1001 E. Market Street, San Antonio, TX 78298-2449, (210) 704-7407 (phone), (210) 704-7346 (fax), pmartinez@saws.org.

3.4 LAS VIRGENES MUNICIPAL WATER DISTRICT

Proactive Outreach Averts Information Cross-Connections in the Las Virgenes Municipal Water District

3.4.1 Project Background and Agency Information

The Las Virgenes Municipal Water District (LVMWD) is located in the Santa Monica Mountains, a semiarid region in western Los Angeles County, CA. Because the local terrain limits available water resources, the District was established in 1958 to import potable water to this growing area. Population growth also clarified the need for wastewater treatment service.

Early on, the District's publicly elected Board of Directors recognized the need to conserve existing resources and reduce the 100% dependence on imported water from northern California. Recycled water was recognized as key to a long-term solution. In 1972 the District began recycling secondary effluent from its Tapia Water Reclamation Facility for use on the campuses of a local college and middle school. By 1984 the District further improved its treatment capability by the addition of mono-media filtration, allowing compliance with State of California Title 22 regulations for use of recycled tertiary treated effluent.

Today, the District provides potable water to a population of approximately 65,000 customers within a 120-square-mile area. Recycled water is provided to approximately 220 customers within the service area. More than 20% of the water used by District customers is recycled water, and during mid-summer periods demand for the recycled water exceeds capacity, requiring a potable water supplement to the system.

LVMWD and the Triunfo Sanitation District, a special district providing wastewater services in areas of eastern Ventura County, CA, jointly own the Tapia Water Reclamation Facility, the backbone recycled water distribution system, and Rancho Las Virgenes biosolids composting plant. Together, the two agencies provide wastewater treatment and recycling for about 85,000 customers in western Los Angeles and eastern Ventura counties. The Tapia facility handles about 9 to 10 million gallons of wastewater daily. Together with each district's distribution systems, these facilities provide recycled water to parks, schools, landscape medians, cemeteries, freeway areas, and golf courses. Early efforts have been made to explore internal dual plumbing for flushing.

The Board of Directors is committed to recycled water and enacted an ordinance that requires its use whenever it is available. Preventing wastewater from being discharged into Malibu Creek has also been a priority for the Board. Malibu Creek flows into Santa Monica Bay, which has a long history of water quality problems emanating from a broad range of sources. Strong advocacy by environmental groups resulted in NPDES permit requirements which prohibit Tapia's discharge into the creek for 7 months each year, between April 15 and November 15.

For all of these reasons—the compelling environmental, supply, and conservation benefits—recycled water is an integral element in the District's overall water resource planning.

3.4.2 Public Outreach Efforts

Las Virgenes employs a Director of Resource Conservation and Public Outreach and staff who are responsible for all public education and outreach planning and implementation, school outreach, and media relations. Materials such as newsletters and brochures are distributed at events, with utility bills, and through the District's very active school education program. The District started its public outreach early in the planning process. As the recycled water program began, community meetings helped inform the public and allay concerns. Today, the District enjoys widespread support for its recycled water program.

The school education outreach program teaches children about resource conservation at an early age. All fifth graders take a tour of the composting facility and learn about their personal part in water and wastewater management. Schools receive books, curriculum materials, activity sheets, and other information that focuses on conservation, wastewater, recycled water, and biosolids recycling. Schools are engaged in an annual poster contest and are encouraged to bring classes to tour the local wastewater facilities. The district is an active participant in local watershed efforts, contributing staff time and monetary support to educational programs and scientific research within the Malibu Creek and Santa Monica Bay area.

Media reports have been mostly positive about the use of recycled water. The press has toured recycled water facilities, and specific efforts have been extended to educate the media about recycling and related issues. However, an accidental cross-connection in 1998 did provide an opportunity for a media frenzy.

In October of that year, the District received a call from a customer reporting green water coming from her home's internal faucets. Based on the customer's description and a review of the water system in the area, staff suspected a cross-connection between the potable water and recycled water supplies.

Investigations revealed an illegal connection between a home landscape irrigation system and the recycled water system serving the adjoining common landscape area. The two areas were separated by fencing, but an underground pipe was used to reach under the fence. After a new homeowner moved in, landscape changes resulted in the connecting valve being turned to open, thus mixing the two water systems.

All levels of staff worked together to develop a plan of action that included operating activities and public outreach. Efforts were focused not only on the physical and technical aspects of containing the potential for contamination, but also on proactively informing customers and addressing their health and safety concerns.

As portions of the distribution system were contained and testing and flushing got underway, efforts were initiated to alert and protect 1600 households, three schools, and a commercial–retail establishment which potentially could be affected. The district also:

- Contacted the California Department of Health Services.
- Contacted the school district and made individual calls to all schools to advise them of the bottled water order being imposed and necessary actions for them to take (i.e., to inform students and parents, tape off fountains, and place signs in restrooms). The school district promptly made bottled water available to all affected schools.

- Alerted the District's elected board, as well as local officials in the affected area (city, county, and state representatives).

- Alerted local grocery stores (for the expected run on bottled water supplies, the need to secure water fountains and other internal sources, and the need to close down external "filtered water" vending machines).

- Contacted and advised local restaurants.

- Developed notification flyers and distributed them by hand to every affected home. (California DHS approval of the flyer content was also necessary.)

- Mobilized additional staff and worked late hours to field incoming phone calls. Phones were kept open until calls waned, and a detailed message was left after that.

- Designated two staff members to answer questions from the media. (One handled TV, and the other handled radio and newspaper.) Maintained 24-h media contact throughout the incident, with a proactive approach, contacting reporters with each new development and test results.

- Briefed all District staff regularly with the latest information.

- When the final test results were in, developed a press release summarizing the entire incident. Called all reporters with the news and faxed the release. Walked through the affected area to inform customers their water was now safe for consumption.

- Following the close of the incident, placed an ad in the local weekly newspaper thanking customers and the community for remaining calm and supporting district efforts.

Thankfully, the impact of the connection was limited to a few households, with a very small proportion of recycled water having entered the potable lines. The lesson learned was that even with the most conscientious and proactive surveillance, information efforts, and preventative measures in place, incidents can occur. Proactively informing customers and the media and honestly addressing their questions helped to sustain confidence in the agency. The exceptional efforts of staff for prompt resolution of the incident and one-on-one contact were noticed and appreciated by customers.

For Las Virgenes, as for many other successful agencies, maintaining a proactive public outreach program has vastly increased public awareness and acceptance of recycled water and is also helping children grow up with the knowledge that resource conservation is important. For this younger generation, there is nothing unusual about recycled water. Rather, this safe and vital solution to water scarcity is a normal part of their everyday lives.

3.4.3 Customer Marketing

Las Virgenes has benefited from marketing experience and a customer service staff that interacts directly with recycled water customers, as well as potential customers. Staff members work closely with customers to ensure that installations are secure and regulations are followed, and they carefully watch over retrofits. Training for customers is ongoing, and

rigorous cross-connection inspections are proactive. Mechanisms for the proper control and use of recycled water include assignment of an on-site water supervisor by the service owner. This individual is responsible for properly controlling on-site recycled water use, maintaining a comprehensive knowledge of the on-site potable and recycled water piping systems, and acting as a liaison with District technicians during the initial and annual system check of the customer's facilities.

District staff also monitor installation of the recycled water irrigation system, as well as perform night surveillance of recycled water use and daily surveillance of the system in general. Anomalies are noted and corrected quickly, including areas for potential cross-connection (i.e., construction or landscape changes in areas where recycled water is in use) and locations where changes have been made that result in noncompliance (commonly, a moved fence line).

With more than 220 existing recycled water customers, the demand for recycled water now exceeds the District's capacity to serve during periods of high use. Adding to the popularity of the program are incentives the District has established for recycled water use. Customers are charged as much as 20% less than the potable water rate and pay no meter fee. In addition, the District offers no-interest loans that allow customers to retrofit irrigation systems. Customers reimburse the loans by paying the potable rate until the loan has been fully repaid.

Interviews with customers have generated favorable responses regarding the use of recycled water. The Los Angeles Pet Memorial Park finds that the biggest benefit is the cost savings. Water bills would be approximately 20% higher if this pet cemetery were using potable water. In addition, they've experienced a reduction in fertilizer costs because of the water's nutrient value. The only drawback is that visitors to the cemetery have no access to faucets with potable water for flowers left in vases at a pet's graveside.

The City of Calabasas in Ventura County makes broad use of recycled water and, in fact, is the District's largest recycled water customer. Recycled water is applied at parks, schools, and medians. As recycled water has been implemented, the District has been instrumental in allaying any resident concerns. In addition, the two agencies enjoy positive and cooperative relations in dealing with any issues that arise. Since Calabasas water usage is high in order to maintain public landscapes in an upscale demographic area, the cost savings is tremendous. The City spends nearly $1 million annually to irrigate with recycled water, but the bill would be much higher if potable water were being used instead. The City also uses the District's biosolids compost in parks and on landscaped areas, benefiting from another efficient way to reuse community resources.

A local golf course has been using recycled water for the past 24 years. During that time, the same superintendent has managed the site. He stated that the course had several concerns in the beginning, but after being given a tour of the treatment plant and working with District staff, those concerns have been mostly alleviated. They have experienced a cost savings from the nutrient value of the water, and golf course users have no problems with playing on the course. The only issue that has arisen involves irrigation of the greens: the course needs to flush with recycled water at least weekly to get the water to soak in, thereby preventing salt buildup. This situation occurs at golf courses where the drainage may not be ideal and/or the TDS in the recycled water is high. As a result of the flushing, the course is using high amounts of water. Overall, however, they are quite satisfied with the way the fairways and greens look. Using recycled water is now routine—just a way of life for all staff members.

3.4.4 Lessons Learned

- Public outreach is essential to the program and brings support from the community, from school age children to adults. Proactive early start-up is best to build awareness that recycled water is an important part of resource conservation. Don't wait for problems or questions.

- No matter how conscientious an agency is, accidents can occur. After the cross-connection issue, oversight in higher-risk areas was intensified and awareness-building with customers was strengthened.

- Be honest, open, and proactive with the media, especially during a crisis situation.

- All customers need education and ongoing communications to ensure public health and safety and customer satisfaction.

- It was critical that the Board of Directors had the vision many years ago and continues to provide strong support for program components.

- A well-staffed and trained customer support department has generated satisfied customers and alleviated problems.

3.4.5 Contact

LVMWD: Arlene Post, Director of Resource Conservation and Public Outreach, 4232 Las Virgenes Road, Calabasas, CA 91302, (818) 251-2100.

3.5 VICTOR VALLEY WASTEWATER RECLAMATION AUTHORITY

Promoting High-Technology Solutions in the High Desert

3.5.1 Project Background and Agency Information

The Victor Valley Wastewater Reclamation Authority (VVWRA) was formed in 1977 after the Mojave Water Agency obtained Clean Water Act grant funding to construct regional treatment and collection services for the growing area. The Mojave Water Agency executed service agreements with the county, two cities, and two county water districts. In addition, a joint powers authority was formed to assume control of the regional project. Today, VVWRA is a regional wastewater collection and treatment authority that serves the Southern California high desert area, including the cities of Apple Valley, Hesperia, Victorville, Spring Valley Lake, and Oro Grande, as well as the Southern California Logistics Airport (formerly George Air Force Base).

Victor Valley is located in the Mojave Desert, a high desert region just north of the San Bernardino Mountains. The high desert is of course extremely arid; elevation ranges from 2600 to more than 3500 ft above sea level. The annual average rainfall is only 5.5 in. per year. Large temperature fluctuations occur between day and night and between summer and winter. Winter low temperatures commonly dip below freezing, and lows of 0 °F have been recorded. Summer temperatures average 95 °F and commonly exceed 100 °F, and highs of 117 °F have been recorded. The area boasts 350 days of sunshine each year. Another characteristic of the high desert is the likelihood of strong winds, particularly from the west and south.

Victor Valley's drinking water is derived entirely from groundwater found in a system of aquifers underlying desert valleys, including the Mojave River Valley. The Mojave River primarily flows underground, although shallow surface water can be found at several locations along the river's path where the geology forces groundwater over rock shelves and faults. Groundwater supplies have been diminishing as customers have consumed far more water than is replenished by nature. Due to this overdraft, a complicated system of water rights was developed through an adjudication of the Water Basin after the City of Barstow filed a lawsuit in 1990 objecting to diminishing water supplies. Currently, the quantity of water rights allocated by the adjudication exceeds the natural supply, although this problem was intended to be corrected over time by using annual reductions in water rights. The annual reduction in water rights will continue until the supply of natural and imported water more closely matches consumption and the basin returns to a balanced condition.

Meanwhile, the Victor Valley area is experiencing explosive population growth and significant increases in commercial and industrial business, placing an even greater demand on the local water supply. The City of Victorville, which accounts for nearly 65% of the wastewater that flows into the regional wastewater treatment plant, is listed as one of California's top 10 fastest-growing cities.

Wastewater treatment flows have increased dramatically over the past year, and the treatment plant is currently treating 12.5 MGD of wastewater at their regional treatment plant. By the year 2020, the population growth will increase the flow of wastewater to at least 25 MGD. The treatment plant is currently being expanded to treat 14.5 MGD. Design is underway to treat 18 MGD, with further expansions to be studied.

VVWRA's first project was to convey recycled water from the regional treatment plant to the Westwinds Golf Course located at the former George Air Force Base, about 4 miles from VVWRA's facility. The 9-hole golf course will use about 400 acre-ft of recycled water per year for irrigation purposes. The golf course started receiving recycled water in early 2005 and will serve as a good example of recycled water use in the area.

Up until 1981, the golf course was irrigated with recycled water from the Air Force treatment system, which was abandoned when the base connected to VVWRA. In 1998 VVWRA submitted a petition to the State Water Resources Control Board for a change of point of discharge, which a number of parties protested, and a lengthy series of negotiations ensued. Later, the project was redefined to rely solely on growth flows, and an application for a permit was submitted to the Lahontan Regional Water Quality Control Board. This was also met with delays and protests, but the permit was eventually approved in 2003. Deliveries of recycled water have begun after the final improvements were made to the old Air Force Base plumbing that serves the Westwinds Golf Course.

In addition to the Westwinds Golf Course project, VVWRA prepared environmental review and planning documents for the construction of two subregional reclamation facilities to be located close to sources of high wastewater flows. These facilities would receive, treat, and distribute recycled water in close proximity to irrigation and industrial customers. Each subregional facility will vary in capacity from 1.5 to 4 MGD. The subregional treatment plants will be located a significant distance upstream from the regional treatment plant, much closer to potential customers than the regional facility. This project will extend the capacity of the existing sewer lines to accommodate the increases in population and flows.

The subregional plants will remove and treat water from the sewer system, but solids will be discharged back into the sewer system to be processed at the regional plant. Sending solids to the regional plant for processing will reduce construction and operation costs for the subregionals, and it will also help prevent odors and traffic at the subregional treatment plants.

The recycled water will primarily be used for landscape irrigation of parks, school grounds, golf courses, and freeway landscaping. Other possibilities for recycled water use include industrial process water, maintenance of recreational lakes, and groundwater recharge.

The California Department of Fish and Game (DFG) manages a historical riparian habitat area that now depends heavily on VVWRA's wastewater discharge for its survival. Due to overdraft of the groundwater, the Mojave River now flows primarily underground. DFG opposed the recycled water project due to its concern that water recycling would divert treated effluent from the riparian habitat, adversely affecting endangered species that live in the habitat unless imported water could be provided to maintain surface flows. Although the adjudication requires water producers to import water for the habitat if natural flows are insufficient to maintain the endangered species, DFG was not confident that the terms and conditions of the adjudication would be enforced in actual practice.

The City of Barstow, located downstream of VVWRA, also depends on VVWRA's effluent and limited natural flows to maintain its groundwater supplies. VVWRA's discharge now constitutes the majority of the water carried underground by the river, which replenishes Barstow's aquifers. The Mojave adjudication requires a minimum flow of 23,000 acre-ft per year from the Victor Valley area to the next basin to the north, which includes the City of Barstow. Although VVWRA is not a party to the adjudication, if the effluent discharge were

to decrease due to recycling, then water rights holders in the Victor Valley area would be forced to purchase water to maintain the flow in the river.

With VVWRA's decision to pursue subregional treatment facilities to meet growth, area leaders have concerns about water rights, the dwindling water supply, and the increasing cost to provide water to the community. Concerns also include who will distribute recycled water, what recycled water will cost, where and how recycled water will be used, and how customers will react to using recycled water. For example, a property owner in the vicinity of one of the proposed subregional sites owns a historic cattle ranch dating to the 1800s and has concerns about subregionals and water recycling that include maintaining aesthetics and avoiding odors, as well as preventing increased traffic and declines in property values.

In July of 2003 a memorandum of understanding (MOU) was signed between VVWRA and DFG regarding the amount of water that would continue to be discharged into the Mojave River. The MOU acknowledges that landscape irrigation of the Westwinds Golf Course is not expected to result in any long-term decrease in the recycled water discharged to the river and therefore will not adversely impact endangered species. However, with the MOU the DFG sought to secure a long-term supply of water for the habitat by limiting the recycling that can be done from the regional plant. In return, DFG agreed not to protest the development of subregionals and agreed that the development of subregionals would be allowed to reduce the discharge to the river for short periods of time.

Because the subregional facilities are intended to process new flows resulting from population growth, the average flow to the regional facility should not decrease over time. However, short-term decreases in the flow may occur as each new subregional begins operating and recycling water. The MOU with DFG alleviated some of Barstow's concerns about decreased flows to the river and city groundwater supplies.

After 5 years and many contentious hearings before the State Water Resources Control Board, the Lahontan Regional Water Quality Control Board finally approved the permit application for the Westwinds Golf Course to be irrigated with recycled water.

3.5.2 Public Outreach Efforts

VVWRA and a public outreach consultant are implementing a comprehensive public outreach program to inform and educate the public about recycled water. Although recycled water has been commonly used throughout California for over 70 years, it is a new concept to the Victor Valley area and the Mojave Desert. Even though George Air Force Base used recycled water until closing in 1981, few members of the public are aware of that fact.

A public outreach plan was created to identify all key stakeholders and develop strategies aimed at educating each stakeholder group. The goals of the recycled water public outreach program include:

- Provide adequate information to secure the community's support,
- Market recycled water in order to secure willing customers,
- Help VVWRA develop support among water users in the region, and

- Support VVWRA's efforts to construct four subregional facilities within the timeline and schedule necessary to meet expected growth.

The first task implemented was to organize a Subregional Advisory Committee comprised of elected officials, related government agencies, potential customers, key community leaders, and interested citizens.

Below is a summary of the tasks that are being used to communicate the program:

General Public

- Conduct presentations to community organizations
- Provide a booth at local events
- Create and post recycled water Web pages
- Implement a school education plan
    - Assemblies
    - Wastewater treatment plant field trips
    - Direct mailings to school officials and principals
    - Resources on the Internet
- Identify key staff to field questions
- Outreach to subregional facilities' surrounding neighborhoods

Customers

- Meet with potential customers one-on-one
- Conduct presentations
- Arrange for tours (customers tour similar regions implementing recycled water programs)
- Work closely with the school districts
- Provide education and training (guidebook and videos)

Media

- Educate reporters and editorial boards
- Develop a press kit

- Submit regular press releases
- Organize press conferences for major milestones

Elected Officials

- Provide ongoing updates
- Invite elected officials to participate in the program
- Organize a subregional advisory committee comprised of key stakeholders

VVWRA Staff

- Conduct a recycled water workshop
- Provide ongoing updates

3.5.2.1 Information Materials

Information materials have been designed to educate the various stakeholders through a variety of venues, including distribution at public locations, meetings, events, or presentations to recycled water customers and member agencies, as well as via direct mail. Materials for VVWRA include:

- Brochures (recycled water, VVWRA, Westwinds Golf Course, and economic development)
- Fact sheets (frequently asked questions)
- Newsletter
- PowerPoint presentations
- Press releases
- Event booth
- Web pages
- Recycled water customer manual

3.5.3 Customer Marketing

Because the subregional treatment plants are not yet under construction, a relatively limited amount of customer marketing has been conducted. For VVWRA's one customer, the Westwinds Golf Course, a great deal of coordination and communication was necessary.

During the construction of the recycled water pipeline to the Westwinds Golf Course, the golf course staff expressed concerns about working with recycled water. In response to this situation, an initial meeting was held to allow staff to voice concerns and ask questions about recycled water. It was determined that discussing these issues with staff before construction of the pipeline would have been more helpful.

A later meeting was held to coordinate efforts between VVWRA, the City of Victorville, and golf course staff. Eventually, a training workshop was held for all golf course staff to review health and safety issues as well as the methodology of irrigation with recycled water. A recycled water customer manual was developed and distributed to Westwinds staff. It includes health and safety guidelines, landscape uses, report forms, and other pertinent information.

The potential customers who have attended the Subregional Advisory Committee meetings are enthusiastic about receiving the water. A local glass plant, which uses 80 gal of water per minute all year, has expressed strong interest in using recycled water.

3.5.4 Lessons Learned

- Although the public opinion survey for this report revealed that the general public supports water reuse and there is a proactive and comprehensive public outreach program, government relations will play the most critical role in the completion of this project. Competing interests for the potable water and recycled water will influence the outcome and timing of the subregional facilities.

- VVWRA staff and public relations consultants have met with reporters one-on-one at the onset of the project and have continued to meet as new reporters are hired. Prior to meeting with the media and starting the public outreach campaign, reporters and editors would frequently confuse gray water with recycled water.

- It is important to educate the staff early in the project. A workshop was conducted as an opportunity for staff members to learn more about recycled water and to create a comfortable environment for them to answer questions. Since staff members live and work in the community, they are frequently asked questions, and it is critical that they support the project and have accurate information.

- Teachers and school district administration staff were invited to take a tour of the treatment plant, and they were encouraged to provide suggestions on educating school children and organizing field trips.

- VVWRA is educating the public about the local water supply as well as the benefits of recycled water. In the public opinion survey, it was evident that very few people knew where their water came from or that there was a shortage. Also, few residents had in-depth knowledge about recycled water, according to the focus group.

- VVWRA solicited support from statewide and national organizations, such as the WateReuse Association, before important regional board or permit meetings.

- VVWRA will refer to other cities that use recycled water as examples by asking someone from those other agencies to present or attend meetings, show posters outlining their plant or program, and arrange tours of their treatment plants.

- Siting of the subregional facilities may be an issue in the future. At public hearings, where the facilities would be located was a concern. Public outreach efforts will include mailings to neighborhoods surrounding the proposed sites, newsletters, public meetings, and presentations. Tours of similar facilities may also be provided if necessary.

3.5.5 Contact

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CHAPTER 4

MARKET RESEARCH

4.1 INTRODUCTION

The general public focus group and the public opinion survey were conducted in Victorville, CA. The customer focus group was conducted in Las Vegas, NV. Both of these areas were selected for the market research because they provide communities and circumstances that may reflect other regions investigating recycled water use. Both communities reside in the desert, have a growing demand for water and limited supplies, and are expanding at a rapid rate.

Some of the findings from the research, however, may not closely reflect the sentiments or opinions of every other community. For example, the participants in the Victorville studies were concerned with the issue of growth from the standpoint of developer fees and traffic rather than increases in population, perhaps because this region is able to provide relatively inexpensive housing and jobs for its residents and newcomers. In Las Vegas, the customers want more publicity for their efforts, but in other regions and depending on the type of customer, some may want to remain low-key and not receive any accolades about using recycled water.

Although this research offers some general findings common to both communities studied, an agency should research and examine issues specific to its own community before making assumptions about stakeholders' attitudes and needs.

4.2 GENERAL PUBLIC FOCUS GROUP FINDINGS

Fairbank, Maslin, Maullin & Associates (FMM&A) conducted a focus group with 12 residents of Victorville, CA, and the surrounding areas on June 8, 2004, to better understand their views on water usage and the possibility of using recycled water. It should be noted that focus groups do not measure directly the frequency by which opinions and attitudes may exist within a particular universe of people. Only a random sample survey can provide that type of statistically reliable data. However, focus groups dig deeply into mind-sets, customary actions, or beliefs and encourage responses to new ideas or concepts. They can also provide in-depth evaluations of issues.

The purpose of this report is to summarize the findings of the focus group. Overall, participants had little knowledge about the area's water supply and were generally supportive of recycled water, although there was skepticism that recycled water would be safe and affordable. The most persuasive selling point was that the area is rapidly growing and that the availability of water is coming to a crisis.

The group included 12 participants: eight women and four men in a variety of age, education, and income groups.

The key findings included:

- Participants had little knowledge about their water supply.
- Concern about rapid growth in the area was expressed.
- Developers should, according to most in the group, pay fees that would help shoulder the cost of expanding the area's infrastructure.
- There was little awareness of the VVWRA.
- About half of the participants had heard about recycled water.
- Initial responses to descriptions of recycled water brought out many concerns about health risks and human error; however, when provided with the description that follows, below, participants' approval increased.
- Participants were leery about reassurances of the safety of recycled water.
- Concerns were voiced that the cost of recycling plants would be passed on to tax payers, yet the average family would not benefit from the plants.
- The most persuasive message regarding using recycled water dealt with providing water for a growing population.

These and other findings are discussed in greater detail below.

Locally, there is concern about the area's growth and the resulting traffic and increases in the cost of living. Developers were singled out as needing to pick up more costs of growth, such as for roads and other infrastructure; this topic came up several times in the discussion. There was virtually no awareness about whether developers currently pay such fees.

Most participants were also unaware that the area's water comes from groundwater. Instead, the aqueduct that carries water to Los Angeles was cited as the source of water for the area.

> *Moderator: "Is there one main source of water here?"*
>
> *"The aqueduct."*
>
> *"They bring all the water from the Sierras down here."*

When made aware that the area's water does actually come primarily from groundwater and that groundwater supplies are being used up more quickly than they are being replenished, participants were not surprised, given their acute awareness of the area's growth. Suggestions on how to replenish the water consisted of building desalination plants, conserving water, and using water from the aqueduct.

> *Moderator: "Are you aware of the use of groundwater?"*
>
> *"That is a little surprising to me."*

"So you mean it's not mostly coming from the Owens River? That is where I thought it was coming from."

"I hear that some wells are kind of drying out and they have to drill from one to the other one because some of those wells are getting pretty low because there's not enough water."

"I see more people coming here but if we have good winters, I think it would be all right. But if we don't have good winters…"

Three of the 12 participants had heard of the VVWRA. Only about three people in the group also read the local newspaper regularly. About half of the participants had heard something about recycled water and were aware that recycled water is used in other locations.

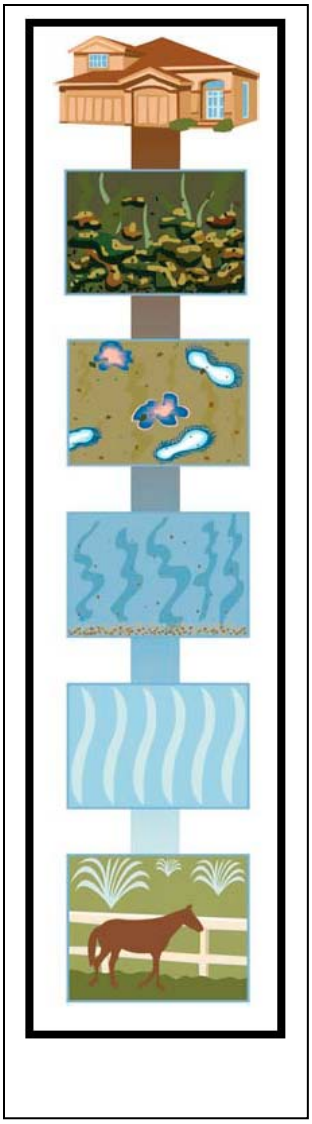
The following description was then given to the group:

Recycled water has been used in California and other states for over 75 years, and is currently used in more than 360 locations in California alone. Water is recycled through the following process: after water is used by residents and businesses, it flows to a local wastewater treatment plant. There it undergoes extensive cleaning through physical, chemical, and biological treatment, filtration, and disinfection. The process uses modern technology to replicate the natural method by which water is recycled, removing biological and chemical contaminants. This recycled water is then available for reuse in landscape irrigation, industrial cooling, or for other non-potable uses. Recycled water use is strictly monitored and regulated by the Environmental Protection Agency, the California Department of Health Services and other regulatory agencies.

Participants found the description to be understandable and clear. A few questions did arise, such as:

- How is the water collected?
- Will the amount of water collected be limited because many people in the area have septic tanks?
- Will the water for recycling only be collected from industrial or commercial sources?
- Will the water be cloudy or milky?

Participants were then shown a diagram about the process used to recycle water, which was based on a pamphlet provided by VVWRA.



1. Wastewater is collected from homes and businesses.

2. Wastewater goes through screening and grit removal.

3. An aeration basin with bacteria breaks down solids.

4. Solid matter settles out of wastewater.

5. Wastewater is filtered and treated with chemicals to turn it into recycled water.

6. Recycled water goes through purple pipes to landscaped areas.

Figure 4.1. Diagram of recycled water treatment.

When queried about specific uses of recycled water, responses were mixed. Concern about water safety was expressed and whether human error might be a factor as well as whether children should be around recycled water. One mother with young children was adamant about not letting her kids play on a playground that had been watered with recycled water because they might pick up harmful germs. Concerns were even expressed about using recycled water in public toilets because of the risk that the water could splash on someone and cause them to get sick. Four of the 12 participants consider recycled water safe at this point in the discussion.

> *"Sometimes I wonder if there is any bacteria that they get into the grass and kids play on it."*

"Animals too."

"My cat eats the grass."

"Picnics."

"The kids go to the park and they play in the grass and they touch everything. Sometimes I wonder if it's really that safe."

"Yeah, kids get dirty. They get it on their hands and their hands are on the ground and they put them in their mouth."

"My grandkid runs through the sprinklers."

"And kids drink out of hoses."

Next, the group was given additional information about safety standards that are applied to recycled water:

Recycled water is treated and cleaned to water quality standards far higher than its intended use; in fact, it is cleaned to a level that is safe for humans to swim in. Recycled water is always carried in separate pipes and signs are posted wherever it is used. As an added precaution, laws prohibit spraying recycled water on drinking water fountains, picnic tables, and benches. The use of recycled water is strictly monitored by the California Environmental Protection Agency, the California Department of Health Services, and other public health agencies. In over 75 years of use in California, there has never been a documented case of sickness from contact with recycled water.

Several participants expressed skepticism that the information may not be truthful or totally candid. No one said they were swayed by this safety information.

Focus group members were then provided the following information:

The Victor Valley Water Reclamation Authority is currently planning to develop and construct four new sub-regional water reclamation facilities. These facilities will provide additional sewage treatment capacity, and will allow the VVWRA to provide recycled water for landscaping irrigation at golf courses, parks, schools, and other locations. The facilities would be sited at the following locations:

- *Upper Narrows, near the Mojave Narrows Regional Park*
- *Along I-15 near the Green Tree Golf Course*
- *Apple Valley near Brewster Park*
- *In Hesperia, probably close to I-15*

Two of the facilities will be built by 2005—probably Apple Valley and either Green Tree or Upper Narrows—and the other two by 2010. All of the facilities will be state-of-the art plants, with odor control and architecture that allows them to blend into the areas where they are being built. A

dedicated system of pipelines will be constructed to transport the recycled water from these facilities, completely separate from drinking water pipes.

The project will cost between $75 and $125 million. The funding is expected to come from grants and low-interest loans from the state.

Benefits of the project include:

- Conserving drinking water supplies that are becoming increasingly scarce;
- Helping prevent water restrictions;
- Allowing for continued economic growth and addressing expected population growth;
- The community becoming less reliant on a single and limited source of water; and
- Helping limit rate increases.

Funding for recycling was questioned, because that information was too vague, according to participants. A central question was how a water recycling facility would impact taxes and residents' water bills. Also, it was mentioned that, if the only use for recycled water was watering golf courses, that the project was too expensive.

Additionally, no one spoke negatively about the proposed plant locations.

"Are they going to pass the cost onto residents even though they are not going to see any benefit from it? In private places like the golf course… is it going to cut our cost for our initial water if we are going to start reclaiming water for places like golf courses and schools and things? Are we going to see cost savings or are we going to see the cost of our water go up because they have to build these reclamation facilities and pump it out?"

Participants were next given a list of 10 messages about why people support the use of recycled water and were asked to rank the 3 most persuasive messages and the least persuasive message (Table 4.1).

Table 4.1. Most persuasive messages

Message[a]	Score[b]
Our area is facing a water supply crisis.	27
Our community is one of the fastest-growing areas in California.	14
Using recycled water will save us money.	8
Recycled water is good for the environment.	6
Using recycled water frees up more fresh water for drinking water supplies.	6
Recycled water is a drought-proof and reliable source of water.	6
Using recycled water will have great benefits for our local economy.	2
Recycling water is an important principle.	0

[a]See Appendix A for the full statements.
[b]Participants were given a handout with eight statements or messages and were asked to indicate the three that were most persuasive. For this analysis, the top choice was given a score of 3, the second choice was given a score of 2, and the third choice was given a score of 1. The summary scores were then calculated and are shown here.

After hearing these messages, participants were again asked if they were in favor of using recycled water in the area. Three participants were still not satisfied with the safety of the water. These people said they might be convinced only to support the proposal if they knew there would be inspections and could see the results and if solid proof could be provided that no illnesses would result from its use. All participants agreed that they would want to hear from residents—people without a stake in the project—from areas in which recycled water is used that recycled water is safe.

4.3 GENERAL PUBLIC OPINION SURVEY FINDINGS

This section presents key findings of a survey of 400 residents of the Victor Valley area conducted by FMM&A in August 2004. The goal of the research, conducted on behalf of the WateReuse Foundation and the VVWRA, was to assess (1) local residents' awareness of the area's water supply needs, (2) their current awareness and understanding of recycled water, (3) their support for both general and specific proposals to expand the use of recycled water in their area, and (4) their reactions to a variety of messages and methods of communication that might be used to educate the public about the use of recycled water.

The results of the survey showed that Victor Valley residents strongly support the use of recycled water in their area. Sizable majorities favor both use of recycled water as a general principle and also a specific proposal to build four new water treatment facilities in the Victor Valley area. Once given a basic description of the process by which recycled water is treated and monitored, most residents were confident that it is safe.

Among the key specific findings of the survey were the following:

- **Residents are relatively unconcerned about water supplies and water quality in the Victor Valley area.** Fewer than 1 resident in 20 cited issues related to water as those that they would most like to see local government address, and only 2 out of 5 viewed the adequacy of local water supplies as a "very serious" problem, a level of concern dwarfed by issues like traffic and the economy. In addition, a 46% plurality of local residents said that they are at least "somewhat confident" that existing groundwater supplies are adequate to meet future needs.

- **Most residents do not recognize groundwater as the primary source of Victor Valley's drinking water.** When offered a list of possible drinking water sources and asked to identify which one provided most of Victor Valley's drinking water, only about one-third of respondents (32%) were able to correctly identify groundwater as the source of most drinking water for Victor Valley.

- **Residents see water conservation as important and have faith in its ability to help increase water supplies.** Nearly 9 out of 10 residents believe that the area will not have adequate water supplies unless we "plan carefully now and invest in new conservation strategies." Nearly two-thirds believe that conservation will be an effective solution to the area's water needs, agreeing that "if people are careful to conserve water, we will have plenty of water to meet our area's future needs."

- **Residents are largely unfamiliar with the VVWRA.** Fewer than one-quarter of those polled described themselves as even "somewhat familiar" with the VVWRA, with just 5% "very familiar." After hearing a description of the Authority and its services, residents did not indicate many strong feelings about its performance, with nearly half declining to offer an opinion.

- **While many Victor Valley residents have a general familiarity with the concept of recycled water, relatively few have detailed knowledge about it.** A total of 48% of Victor Valley residents have seen, heard, or read something about recycled water, but only 16% said they had heard "a great deal" about it.

- **Victor Valley residents overwhelmingly support the use of recycled water in the area.** Given a brief explanation of recycled water and its uses, including the facts that it is used only for nondrinking purposes, is monitored and regulated by public agencies, and is being used in many other California communities, a sizable majority of local residents (82%) support the use of recycled water in the Victor Valley area. Just 12% oppose it.

- **Victor Valley residents also support a more specific proposal to build four new facilities to provide recycled water.** Given a description of plans to build four new water reclamation facilities in the area, including the proposed locations of the facilities, their costs and financing, and the uses of the recycled water they would provide, nearly three-quarters of local residents (73%) indicated that they support the proposal, with about one resident in five (19%) opposed.

- **Most Victor Valley residents perceive recycled water to be safe.** After hearing an explanation of how recycled water is created, survey respondents were asked to evaluate its safety on a scale ranging from 1 ("very safe") to 7 ("very unsafe"). The

overall average of responses was a 2.6, well on the "safe" side of the neutral midpoint (4). Two-thirds of respondents (66%) offered a rating of 1 to 3, indicating a belief that recycled water is "safe."

- **Victor Valley residents approve of a wide variety of uses for recycled water.** When presented with a list of 15 proposed uses for recycled water, residents indicated that they approved of each one. In fact, more than 7 out of 10 residents approved of all but two uses for recycled water: "providing additional water for lakes and reservoirs for recreation" (59% approval) and "providing water for public fountains" (52%).

- **Residents find a wide range of arguments in favor of recycled water to be persuasive reasons to support its use.** The survey tested eight arguments in favor of the proposal to build new water reclamation facilities in Victor Valley, and sizable majorities indicated that each made them "more inclined" to support the project. However, among that subgroup of local residents who initially offered only qualified support for the idea (the 27% who said they only "somewhat support" the proposal) and thus are prime targets for education and outreach, the following were the four most effective arguments:

    - *Our community is one of the fastest-growing areas in California.* We currently produce more than 10.5 MGD of wastewater, but in less than 20 years that number will more than double. The more water we use, the more important it will be to recycle water.
    - *Using recycled water frees up more fresh water for drinking water supplies.* Every gallon of recycled water that is used is a gallon of fresh drinking water that is saved.
    - *Our area is facing a water supply crisis.* Our population continues to grow rapidly, and with less than 5 in. of rain per year, we face very limited natural water supplies. As a result, our groundwater supplies are shrinking rapidly; by the year 2020, many wells in this area may be dry. Using more recycled water can help to reduce the demands on our groundwater supply and ensure that we will have the water we need in the future.
    - *Recycled water is good for the environment.* Using recycled water keeps fresh water from being diverted from places where fish, wildlife, and plants depend on it, while also reducing the amount of treated wastewater pumped out into local rivers and streams.

- **Economic arguments for recycled water appear to be the least persuasive.** Respondents were significantly less likely to see arguments stressing the economic benefits of recycled water (the fact that it is cheaper than groundwater or the potential that it offers for creating a stable water supply to attract businesses to the area) as persuasive than was the case for other arguments. (Note: While economic arguments were less persuasive for Victor Valley area residents, they may rate high, for example, in other communities with a tourist-driven economy or in communities with economies that are heavily dependent on outdoor activities, such as sports facilities, golf courses, ski resorts, etc.)

The balance of this section reviews these and other key findings of the research in greater detail.

4.3.1 Methodology

The initial step in the research process was to hold a focus group with residents of the Victor Valley area to discuss their understanding of recycled water and their reactions to various proposals to increase the use of recycled water in their area. The focus group was held on the evening of June 8, 2004, with a group of 12 men and women of various age, education, and income groups from throughout the Victor Valley area. Discussion in the focus group covered a wide range of issues related to recycled water and its potential use in the area.

The findings of the focus group were used to inform the design of the survey questionnaire. The survey was conducted by telephone between the nights of August 3 and August 10, 2004, with interviews conducted in either English or Spanish. Respondents included a random sample of 400 adult residents of the Victor Valley area, including the communities of Apple Valley, Hesperia, Oak Hills, Oro Grande, Spring Valley Lake, and Victorville. The margin of sampling error for the full sample was ±4.9%; margins of sampling error for subgroups within the sample would be higher.

4.3.2 Existing Concerns about Water Quality and Supply

An initial question in the survey asked respondents to indicate, in their own words, what they considered to be the most serious problem facing residents of their area that they would like to see local government do something about. The results were categorized and grouped and are shown in Figure 4.2, below. Overall, issues related to water quality and supply were rarely mentioned. The most frequently cited items were street and road maintenance (named by 22% of those polled) and crime (10%), traffic congestion (8%), and education (7%). Only 2% of those polled named water supplies as the most critical issue for local government to address, and an equivalent number cited water quality. There was very little demographic variation in these responses, though men age 50 years and over were somewhat more likely to mention a water-related issue (12%) than were residents in general (4%). In general, issues related to water do not appear to be a top concerns for Victor Valley residents.

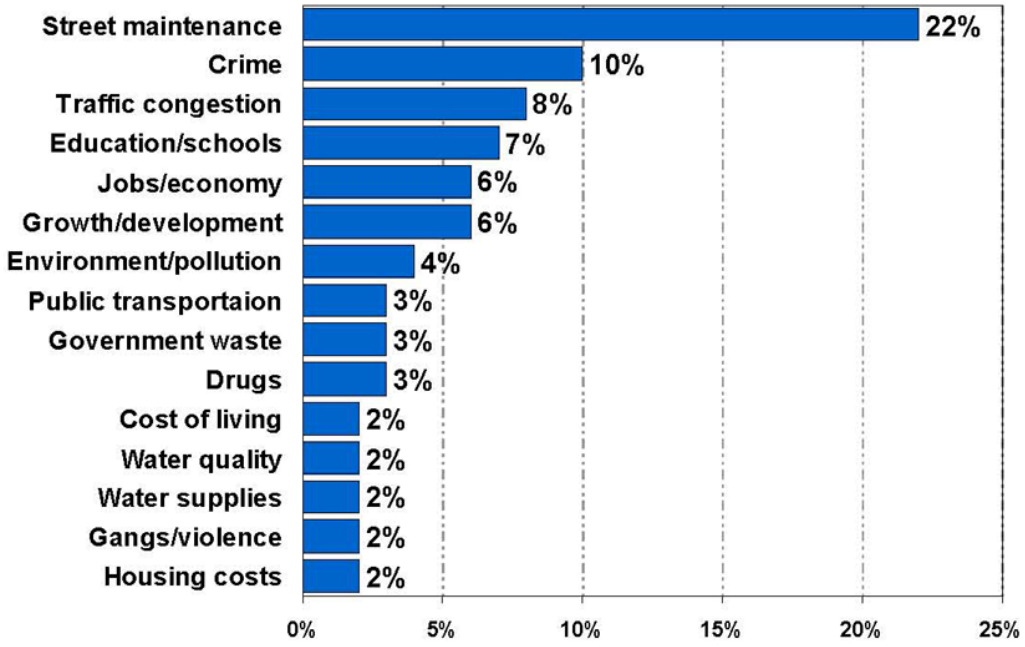


Figure 4.2. Most serious issues for local government to address (open-ended; top responses only).

Similar responses were evident when respondents were presented with a list of issues facing the Victor Valley area and were asked to rate each as either an "extremely," "very," "somewhat," or "not serious" problem. As shown in Table 4.2, local residents are most highly concerned about traffic congestion and the price of gasoline—issues that roughly three out of four residents rate as "extremely" or "very serious" problems. In contrast, just slightly more than half as many (41%) view "a lack of a reliable water supply for future needs" as a "very serious" problem. Even fewer are concerned about "pollution of rivers, creeks, and streams" (28%) or "the quality of drinking water" (26%).

Table 4.2. Evaluations of the seriousness of problems facing the Victor Valley area

	% Respondents who considered the issue to be:					
Issue	**Extremely or very serious (*total*)**	**Extremely serious**	**Very serious**	**Somewhat serious**	**Not serious**	**Don't know or not applicable**
Traffic congestion	**77**	42	35	12	11	0
The price of gasoline	**74**	42	32	15	10	1
Lack of good-paying jobs	**55**	24	31	21	16	8
Too much growth and development	**45**	21	24	18	34	3
Crime, drugs, and gangs	**43**	18	25	29	23	5
Lack of a reliable supply of water for future needs	**41**	20	21	21	28	11
Cost of housing	**40**	20	20	30	29	1
Quality of public schools	**35**	16	19	22	27	16
Amount you pay in local taxes	**32**	14	18	27	33	8
Pollution of rivers, creeks, and streams	**28**	14	14	23	40	10
Quality of drinking water	**26**	12	14	30	42	2

Some of the lack of concern about water supplies and water quality may stem from the fact that relatively few residents have a clear understanding of where their drinking water comes from. As illustrated in Figure 4.3, when presented with a list of five alternatives and asked where most of Victor Valley's drinking water comes from, only one resident in three (32%) was able to correctly name groundwater as the primary source. Equal proportions either named an incorrect source or simply admitted that they did not know where the area's drinking water came from. Those most likely to correctly cite groundwater as the source of the region's drinking water included those with a postgraduate education (59%), residents aged 50–64 (46%), and residents of Apple Valley (44%). There was also an enormous gender gap in understanding of water sources: men were twice as likely to be able to name groundwater as the main source of the region's drinking water (43%) as were women (21%).

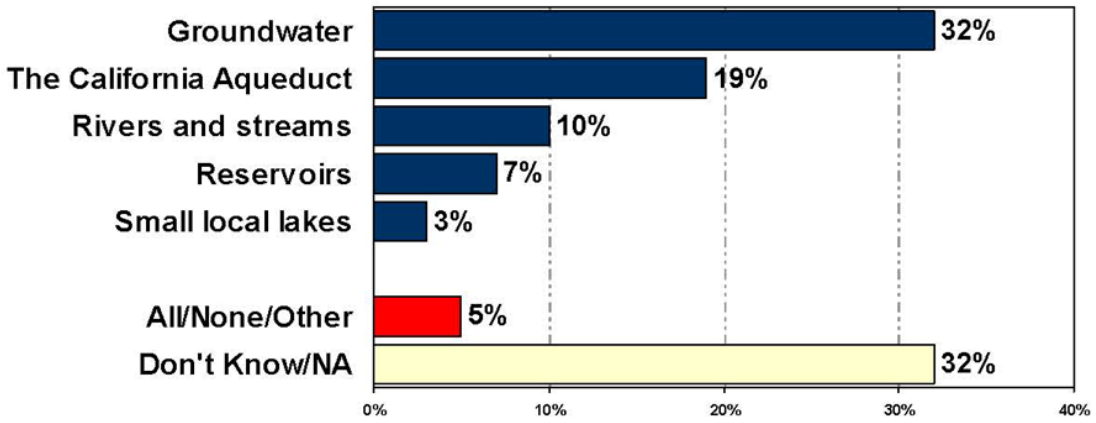


Figure 4.3. Residents' perception of the source of most Victor Valley drinking water. (Responses total 108% because respondents were asked to provide multiple answers.)

As a follow-up question, respondents were informed that groundwater provides the region's primary source of drinking water and were asked to indicate their confidence in the adequacy of the area's groundwater supplies, as follows:

> *"As you may know, all of the drinking water for people in your area comes from groundwater drawn up through wells. How confident are you that existing water supplies can continue to meet your area's needs over the next several years: very confident, somewhat confident, not too confident or not confident at all?"*

As shown in Figure 4.4, residents were about evenly divided on this question. Nearly half indicated that they were at least "somewhat confident" in the adequacy of groundwater supplies (46%), while a nearly equal number said that they were "not confident" (43%). Relatively few residents had strong feelings on either side of the issue, with just 16% indicating that they felt "very confident" and only 14% describing themselves as "not at all confident." Overall, these results suggest that Victor Valley residents lack a detailed awareness or understanding of the source of their drinking water or of the diminishing supplies of groundwater available to serve the region's needs.

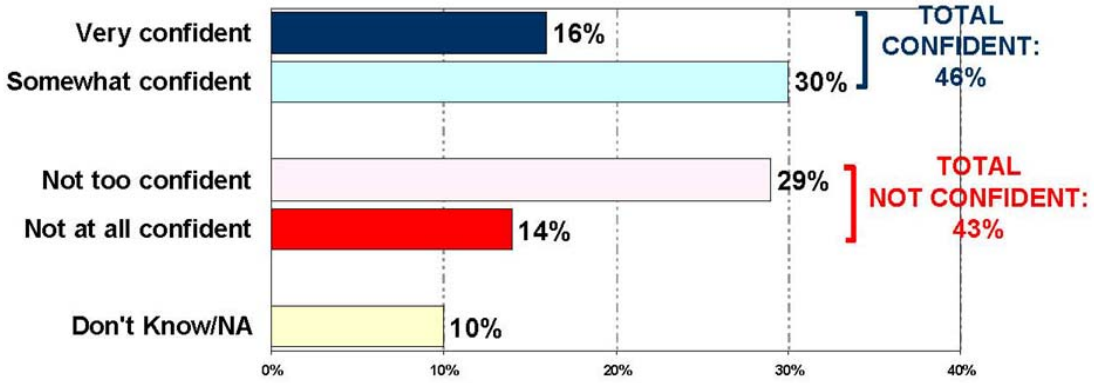


Figure 4.4. Residents' confidence in the adequacy of groundwater supplies

At the same time, it is clear that area residents understand the importance of water conservation in principle. Fully 87% agreed (with a 53% majority agreeing "strongly") that "we will not have enough water to meet our future needs unless we plan carefully now and invest in new conservation strategies." Nearly two-thirds (66%) agreed that "if people are careful to conserve water, we will have plenty of water to meet our area's future needs."

4.3.3 Attitudes towards the VVWRA

Relatively few local residents are familiar with the VVWRA. Less than one-quarter of residents (24%) described themselves as even "somewhat familiar" with the VVWRA, including just 5% who labeled themselves "very familiar" with the Authority. Familiarity with the VVWRA was slightly higher among men, upper-income residents (those with incomes of $80,000 or more), residents aged 50–64, and those with a postgraduate education.

Given this general lack of familiarity with the VVWRA, it is not surprising that even after a brief description of the Authority and its responsibilities, residents offered somewhat mixed evaluations of the Authority's performance in "providing wastewater collection and treatment services." As shown in Figure 4.5 below, more than one-quarter (28%) rated the VVWRA's performance as "excellent" or "good," while a slightly smaller proportion (24%) labeled it "only fair" or "poor." Nearly half of local residents, however, indicated that they did not know enough about VVWRA to offer an evaluation.

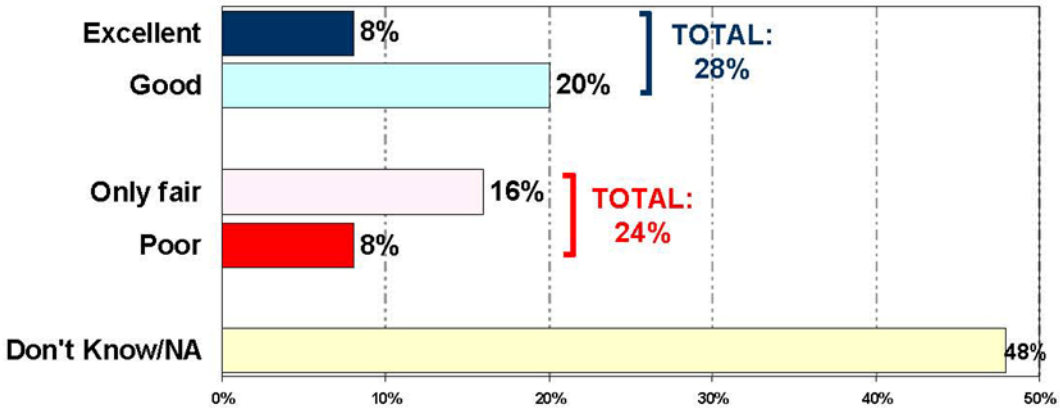


Figure 4.5. Evaluation of VVWRA's performance.

Those who described themselves as at least "somewhat familiar" with the VVWRA offered somewhat more positive evaluations of its performance. Among this subgroup, 40% gave the Authority favorable ratings (13% "excellent" and 27% "good"), while one-third gave more negative evaluations (23% "only fair" and 10% "poor"). There was little other significant demographic variation in residents' evaluations of the VVWRA, although residents aged 50 years and over were more likely to give the Authority positive marks than were those under age 50.

4.3.4 Attitudes towards Recycled Water and Proposals for Increasing Its Use

About half of local residents indicated at least some general familiarity with recycled water. As shown in Figure 4.6, 48% said that they had seen, heard, or read something about recycled water. The group that considered itself very informed about recycled water was relatively small, however; just 16% of residents said that they had heard "a great deal" about recycled water. Awareness of recycled water appears to increase with both age and educational attainment. Fully 55% of college-educated residents had heard something about recycled water, compared to 45% of non-college-educated residents, and 54% of residents age 50 years and over had heard something about recycled water, versus only 43% of residents under age 50. Men were more likely to have heard something about recycled water than were women (53% versus 43%), and Latinos (34%) tended to have less information about recycled water than other residents.

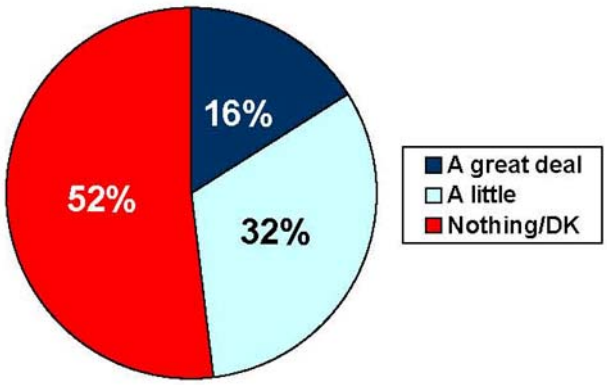


Figure 4.6. Awareness of recycled water. Respondents were asked, "Have you ever seen, heard, or read anything about recycled water?"

Ten percent of residents believe that recycled water is currently being used in the Victor Valley area, while 39% said that it is not, and fully half of the residents acknowledged that they simply do not know. There was little significant demographic variation in the responses to this question, although the most highly educated residents (those with a postgraduate education) were more likely than others to believe that recycled water is already in use in the area.

After the initial awareness questions, survey respondents were presented with the following description and explanation of recycled water:

> *Recycled water is wastewater that is treated to be suitable for use in landscape irrigation, industrial uses, and other non-drinking purposes. After water is used by residents and businesses, it flows to a local wastewater treatment plant. There it undergoes extensive cleaning through physical, chemical, and biological treatment; filtration; and disinfection.*
>
> *Recycled water use is strictly monitored and regulated by California's Environmental Protection Agency, the California Department of Health Services and other regulatory agencies. Recycled water has been used in California and other states for over 75 years, and is currently used in more than 360 locations in California alone.*
>
> *The Victor Valley Wastewater Reclamation Authority is planning to provide recycled water to the Victor Valley Area. The use of recycled water provides an additional source of water for the area, and helps conserve supplies of fresh drinking water.*

Given this description, respondents were then asked whether they supported the use of recycled water in their area. As shown in Figure 4.7, residents were overwhelmingly in favor of the idea, with 82% in support and just 12% opposed. As striking as the overall breadth of support for recycled water is its intensity: a sizable majority of Victor Valley residents (58%)

indicated that they support the use of recycled water "strongly." To a remarkable extent, this support for recycled water cut across demographic and geographic groups, with at least 70% of those polled in every major subset of the population saying they supported the use of recycled water.

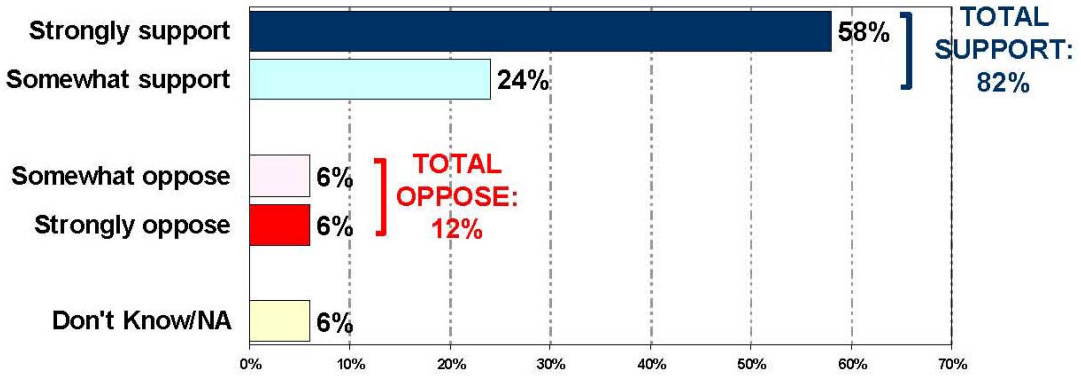


Figure 4.7. Support for the use of recycled water in the area.

As a follow-up question, respondents were provided with the following more-detailed description of a specific proposal to build new facilities to provide recycled water to the area:

> *The Victor Valley Water Reclamation Authority is planning to construct four new water reclamation facilities, which will provide additional sewage treatment capacity and provide recycled water for landscaping irrigation at golf courses, parks, schools, and other locations.*
>
> *The facilities would be sited at the following locations:*
>
> - *Upper Narrows, near the Mojave Narrows Regional Park;*
> - *Along I-15 near the Green Tree Golf Course;*
> - *Apple Valley near Brewster Park; and*
> - *In Hesperia, probably close to I-15.*
>
> *All of the facilities will provide state-of-the-art treatment, with odor control and architecture that allows them to blend into the areas where they are being built. A dedicated system of pipelines will be constructed to transport the recycled water from these facilities, completely separate from drinking water pipes.*
>
> *The project will cost between 75 and 125 million dollars. The funding is expected to come from a combination of sewer connection fees, grants, low-interest loans and certificates of participation.*

As illustrated in Figure 4.8, nearly three-quarters of area residents (73%) indicated that they would support this proposal, with only one resident in five (19%) opposed. Nearly half of those polled (46%) said that they supported the proposal "strongly." The only significant subsets of the population among which even one-quarter of those surveyed opposed the proposal were residents of communities outside the three major cities (41%) and those with household incomes over $80,000 (25%).

When asked to explain, in their own words, their reasons for supporting the proposal, two out of five supporters said that it would preserve clean water. An additional 26% simply indicated that the proposal was "needed," while 13% expressed general support for the principle of recycling. Interestingly, opposition to the specific proposal did not stem from generalized opposition to recycled water, but rather from the costs and structure of the proposal. Nearly one-quarter of opponents (22%) cited a belief that the proposal was not effective or would waste money as the reason for their opposition, while an additional 22% believed that it would increase taxes, and 19% believed that the proposed sites for the facilities were poorly located. Only 18% of the proposal's opponents said that their opposition was based on a belief that recycled water is unsafe.

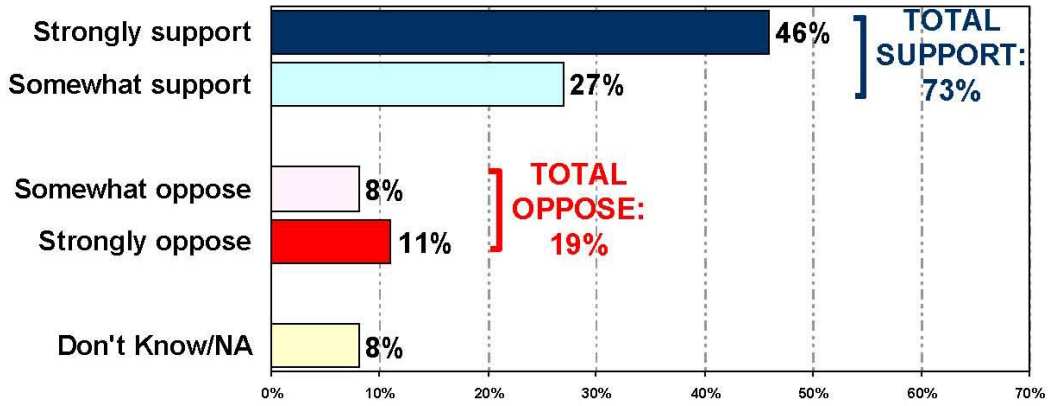


Figure 4.8. Support for specific proposal to increase recycled water production in Victor Valley.

4.3.5 Evaluations of the Safety of Recycled Water

Overall, Victor Valley residents are quite comfortable with the safety of recycled water. As illustrated in Figure 4.9, after hearing the initial explanation of recycled water, respondents were asked to indicate how safe they believe it is on a 7-point scale, with 1 representing "very safe" and 7 indicating "very unsafe." Overall, residents offered a mean score of 2.6, clearly on the "safe" side of the neutral midpoint of 4. More than one-third of those polled (35%) offered a rating of 1, indicating great confidence in the safety of recycled water. Those most likely to view recycled water as "unsafe" (a view held by only 14% of the populace at large) included Latino women (31%), women under 50 (26%), mothers (23%), all Latinos (22%), and non-college-educated women (20%).

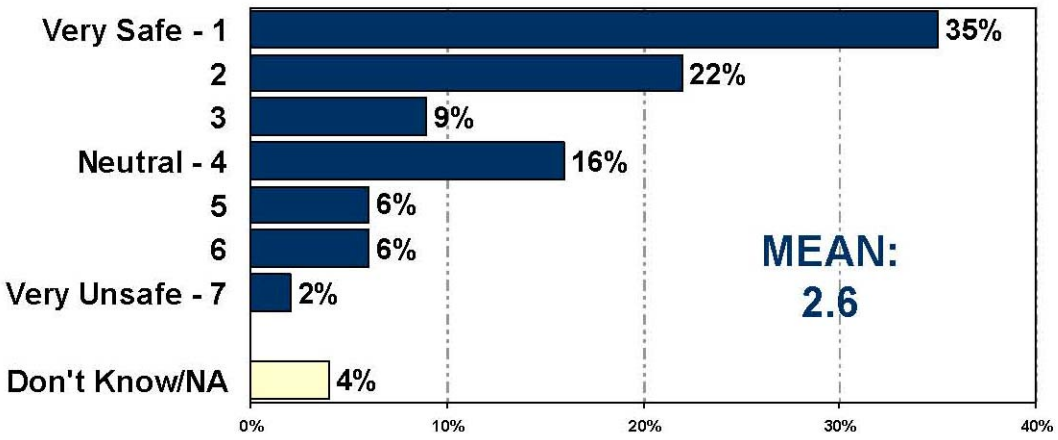


Figure 4.9. Initial evaluation of the safety of recycled water. (Scored on a 7-point scale, where 1 is "very safe" and 7 is "very unsafe.")

Those who offered some response other than a 1, 2, or 3 on the scale (in other words, those who did not initially view recycled water as "safe") were asked to explain, in their own words, why they perceived recycled water to be unsafe. About two in five could not offer a reason, probably reflecting some generalized discomfort with the idea. One in five said they were unsure if the water would be treated properly, and an equivalent number cited a concern that pesticides or toxics might be present in the water. Other concerns mentioned by these respondents were that the water is recycled from waste, that it is improperly regulated, that it is harmful to health, and that it is unsafe for crops.

This subset of respondents was then offered a follow-up explanation of the safety standards applied to recycled water, as shown below. After hearing this explanation, each was again asked to evaluate the safety of recycled water on a 7-point scale.

> *Let me tell you a little bit more about the safety standards applied to recycled water. Recycled water is treated and cleaned to very high water quality standards; in fact, it is cleaned to a level that is safe for people to swim in. Recycled water is always carried in completely separate pipes from other water, and signs are posted wherever it is used. As an added precaution, laws prohibit spraying recycled water on drinking water fountains, picnic tables, and benches. In over 75 years of use in California, there has never been a documented case of sickness from contact with recycled water.*

This explanation was somewhat effective in reassuring residents with concerns about the safety of recycled water. As shown in Figure 4.10, 36% of this group viewed recycled water as "safe" (giving it a rating of 1, 2, or 3 on the 7-point scale) after hearing the explanation, while none had initially held that view. There was a significant gender gap in reactions to this explanation, with women far more likely to rate recycled water as "safe" after hearing the explanation (49%) than were men (13%). Latinos, lower-income residents, and those without a college education were also more likely than others to be persuaded by the explanation.

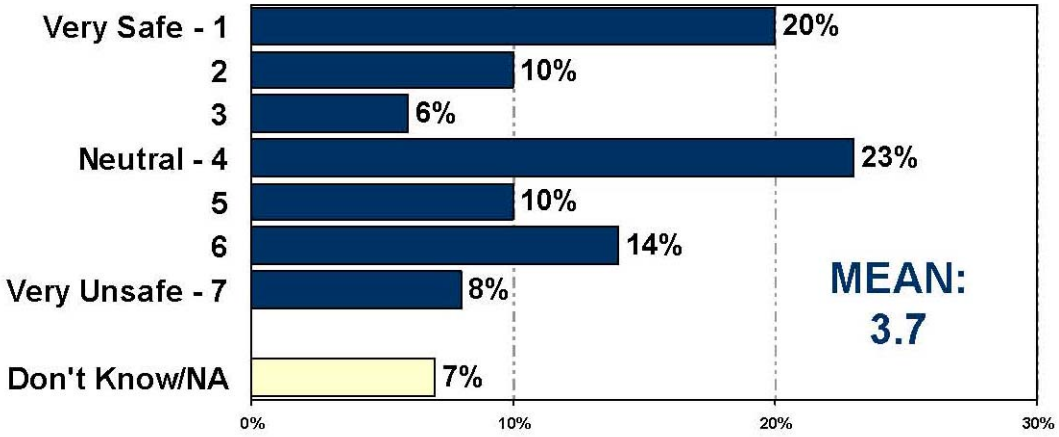


Figure 4.10. Follow-up evaluation of the safety of recycled water among those who did not initially rate it as "safe." (Scored on a 7-point scale, where 1 is "very safe" and 7 is "very unsafe.")

Survey respondents were also asked whether they approved or disapproved of a variety of specific uses of recycled water, as shown in Table 4.3. Majorities approved of every single proposed use, with only two uses finding approval from less than 7 out of 10 residents polled: "providing additional water for lakes and reservoirs for recreation" (59%) and "providing water for public fountains" (52%). More than 9 out of 10 residents surveyed approved of using recycled water for watering golf courses, mixing concrete, watering landscaping along medians and freeways, and flushing toilets in public buildings.

Table 4.3. Approval of various specific proposed uses of recycled water

Use	% Respondents who:					
	Strongly or somewhat approve (*total*)	**Strongly approve**	**Somewhat approve**	**Somewhat disapprove**	**Strongly disapprove**	**Don't know or not applicable**
Watering golf courses	**96**	72	24	2	0	2
Mixing concrete	**96**	69	27	1	1	3
Watering landscaping on medians	**96**	58	38	2	1	2
Watering landscaping along roads and freeways	**94**	73	21	2	1	4
Flushing toilets in public buildings	**91**	62	29	2	4	4
Providing cooling water and process water for factories	**90**	65	25	3	3	4
Controlling dust in industrial facilities	**90**	54	36	3	2	5
Watering for grass and landscaping in parks	**86**	61	25	6	3	5
Watering cemeteries	**86**	56	30	2	7	4
Watering landscaping on school grounds	**84**	52	32	7	7	2
Cleaning animal shelters	**80**	52	28	6	7	7
Providing water for industrial laundry operations	**73**	42	31	8	12	7
Irrigation for agriculture	**70**	46	24	9	12	9
Providing additional water for lakes and reservoirs for recreation	**59**	36	23	14	21	6
Providing water for public fountains	**52**	32	20	15	28	6

4.3.6 Communicating with Residents about Recycled Water

The survey presented respondents with a set of messages that might be used to promote the use of recycled water and asked them to indicate whether each made them "more inclined" to back the specific proposal to build four new water reclamation facilities in Victor Valley. Those who said that a message made them "more inclined" to support the proposal were then asked, in a follow-up question, whether it made them "much more inclined" or just "somewhat more inclined" to do so. Though these questions were asked in the specific context of the proposal to build new wastewater reclamation facilities in Victor Valley, it is likely that they would be equally effective in promoting the use of recycled water more generally.

As shown in Table 4.4, all eight of the messages were generally effective, with six of the eight leading at least half of respondents to say that they would be "much more inclined" to support the proposal. The distinctions between the top six messages (focusing on the rate of local growth and increasing demand for water, recycled water's potential to save fresh drinking water, the value of the general principle of recycling, the "water supply crisis" in the Victor Valley area, recycled water's ability to provide a "drought-proof" water supply, and the environmental benefits of recycled water) were fairly small, with about four out of five respondents saying that each made them "more inclined" to support the proposal.

The two arguments that were least effective were those stressing the economic benefits of recycled water, both in terms of costing less than pumping fresh groundwater and in terms of providing a dependable supply of water to help attract new businesses to the region. While majorities said that each of these arguments made them "more inclined" to support the proposal, the intensity was significantly reduced; the proportions of respondents that were "much more inclined" to support the proposal were notably smaller than those observed for the other messages.

Table 4.4. Impact of messages on inclination to support proposal to increase the use of recycled water

Message	% Respondents who were: Much more inclined	Somewhat more inclined	Less inclined or don't believe	No effect, don't know, or not applicable
Our community is one of the fastest-growing areas in California. We currently produce more than 10 and a half million gallons of wastewater per day, but in less than 20 years that number will more than double. The more water we use, the more important it will be to recycle water.	**55**	25	8	12
Using recycled water frees up more fresh water for drinking water supplies. Every gallon of recycled water that is used is a gallon of fresh drinking water that is saved.	**54**	27	5	14
Recycling is an important principle that we should follow whenever we can. Recycling water is basically the same concept as recycling aluminum cans or paper; it is simply a way of reusing scarce resources rather than throwing them away.	**53**	26	9	12
Our area is facing a water supply crisis. Our population continues to grow rapidly, and with less than 5 in. of rain per year, we face very limited natural water supplies. As a result, our groundwater supplies are shrinking rapidly; by the year 2020, many wells in this area may be dry. Using more recycled water can help to reduce the demands on our groundwater supply and ensure that we will have the water we need in the future.	**52**	26	10	13
Recycled water is a drought-proof and reliable source of water. Even when there are droughts and cutbacks in the availability of fresh water, recycled water customers can still count on a steady supply of water to irrigate and protect important landscaped areas.	**51**	26	8	15
Recycled water is good for the environment. Using recycled water keeps fresh water from being diverted from places where fish, wildlife, and plants depend on it, while also reducing the amount of treated wastewater pumped into local rivers and streams.	**50**	30	6	14
Using recycled water will save us money. It costs 10 times as much to use pumped fresh groundwater as it does to use recycled water. Using more recycled water will help private businesses to save money, and if government agencies use more recycled water it will save taxpayer dollars.	**42**	38	14	16
Using recycled water will have great benefits for our local economy. By helping to ensure a stable, reliable supply of water, we will be better able to attract new businesses to our community and keep existing employers here.	**36**	26	10	29

It is helpful to examine responses to this message question among a key subgroup of survey respondents: those who initially indicated that they only "somewhat" supported the proposal to build new wastewater reclamation facilities in Victor Valley. While 73% of residents initially supported the proposal, that number included 27% who indicated that they only "somewhat" supported it, reflecting some level of hesitation or qualification that might well be addressed by receiving additional information about the proposal. As such, this subgroup (which tended to include disproportionate numbers of Apple Valley residents, non-college-educated women, women under age 50, renters, and mothers) represents a good model of the segment of the population that might benefit from further public education about recycled water. Among those residents who initially only "somewhat" supported the proposal to build new wastewater reclamation facilities, the following four arguments led majorities to say that they would be "much more inclined" to back the proposal:

- **Our community is one of the fastest-growing areas in California**. We currently produce more than 10.5 MGD of wastewater, but in less than 20 years that number will more than double. The more water we use, the more important it will be to recycle water. (57% "much more inclined")

- **Using recycled water frees up more fresh water for drinking water supplies**. Every gallon of recycled water that is used is a gallon of fresh drinking water that is saved. (57% "much more inclined")

- **Our area is facing a water supply crisis.** Our population continues to grow rapidly, and with less than 5 in. of rain per year, we face very limited natural water supplies. As a result, our groundwater supplies are shrinking rapidly; by the year 2020, many wells in this area may be dry. Using more recycled water can help to reduce the demands on our groundwater supply, and ensure that we will have the water we need in the future. (51% "much more inclined")

- **Recycled water is good for the environment**. Using recycled water keeps fresh water from being diverted from places where fish, wildlife and plants depend on it, while also reducing the amount of treated wastewater pumped out into local rivers and streams. (50% "much more inclined")

Collectively, the messages were highly effective in building support for the proposal to build new wastewater reclamation facilities in Victor Valley. After hearing the series of messages in favor of the idea, respondents were reasked their support for the proposal. As illustrated in Table 4.5, the messages increased support for the proposal by a net 8 points, with a striking 16-point increase in "strong support" for the proposal.

Table 4.5. Change in support for proposed water reclamation plants, after messaging

Position	Initial support	After messages	*Change*
Strongly support	46%	62%	*+16%*
Somewhat support	27%	19%	*–8%*
TOTAL SUPPORT	**73%**	**81%**	***+8%***
Strongly oppose	11%	5%	*–6%*
Somewhat oppose	8%	7%	*–1%*
TOTAL OPPOSE	**19%**	**12%**	***–7%***
Don't know or not applicable	**8%**	**7%**	***–1%***

The survey also asked respondents to indicate the degree to which they would be likely to pay attention to various means of educating the public about recycled water. The responses are shown in Table 4.6. The mechanism that Victor Valley residents indicated would be most attention-getting was "a news article in your local newspaper," with more than four out of five saying they would pay attention to it, including more than half who said that they would "definitely" pay attention. Other effective means of communication (to which more than 7 out of 10 respondents would pay attention and more than one-third would "definitely" pay attention) included newsletters sent through the mail, newspaper advertisements, written brochures or pamphlets, billboards, and utility bill inserts.

Table 4.6. Likelihood of residents paying attention to various means of communication

Method	% Respondents that would:				
	Pay attention (*total*)	**Definitely pay attention**	**Probably pay attention**	**Not pay attention**	**Don't know or not applicable**
A news article in your local newspaper	**84**	52	32	14	2
A newsletter or publication mailed to your home	**75**	39	36	24	2
An advertisement in the newspaper	**73**	39	34	26	1
A written brochure or pamphlet	**73**	32	41	26	1
A billboard	**70**	38	32	29	1
An insert in your utility bill	**70**	37	33	29	2
A radio ad	**69**	33	36	29	2
Classroom programs in schools	**66**	38	28	27	7
A booth at a special event, such as a fair, festival, or home or car show	**66**	31	35	30	4
A colorful poster	**64**	27	37	33	3
An advertisement at the movie theater	**62**	31	31	31	7
An online information source you could access from a computer	**61**	32	29	34	5

4.3.7 Conclusion

Overall, the survey results show that Victor Valley residents are highly receptive to the use of recycled water in the region. While residents' initial awareness of the severity of the water supply problems facing the area was relatively low, they responded favorably to messages promoting recycled water as a logical part of the solution to those problems. In addition, once given a brief description of the process by which recycled water is treated and monitored, most residents were confident in its safety. Perhaps as a result, the overwhelming majority of local residents support a specific proposal to build four new facilities to provide recycled water to the Victor Valley area.

4.4 RECYCLED WATER CUSTOMER FOCUS GROUP FINDINGS

On November 22, 2004, FMM&A conducted a focus group at the LVVWD with representatives of eight recycled water customers, almost all of which are golf courses or country clubs, in the Las Vegas area. The goal of the focus group was to develop a better

understanding of customers' attitudes toward the benefits and drawbacks of recycled water and to identify how their satisfaction with their recycled water service might be enhanced.

This section summarizes some of the key findings of the session and presents illustrative quotations from the session's participants.

Overall, focus group participants had few significant complaints about recycled water. While issues with water quality required more attention and management than had been the case when they used potable water, most participants felt those issues were manageable and believed that in the long run the use of recycled water would offer them both a slight cost savings and a public relations benefit. Participants were uniform in their praise for their recycled water provider's customer service on operational issues and for the provider's public education materials and presentations. To the extent that participants had concerns about their recycled water service, those concerns focused on what they perceived to be a lack of regular and frank communications with their provider's senior managers. In particular, participants felt that they were not given adequate notice regarding upcoming rate increases.

It should be noted that as a technique in opinion research, focus groups do not measure directly the frequency by which opinions and attitudes may exist within a particular universe of people. Only a random-sample survey can provide that type of statistically reliable data. However, focus groups do dig deeply into mind-sets, customary actions, or beliefs and encourage responses to new ideas or concepts. As a result, the findings discussed in this report should be considered more a suggestive representation of recycled water customers' opinions than a definitive identification of majority sentiment on the issues.

Among the key findings of the focus group were the following:

- **Many participants felt they had little economic choice but to use recycled water.** Participants clearly recognized that using recycled water could offer them a number of benefits, notably, cheaper unit costs, a public relations advantage, and an opportunity to contribute to the broader public goal of conservation. At the same time, most participants made it clear that their company's primary motivation to use recycled water was in avoiding the higher costs for potable water that they would otherwise face. Most felt that they were offered little real choice by their water provider.

  "They laid it out on the table and basically there was this overhanging threat, 'If you don't work with us to make this happen, we're going to price you to the point where you are going to want to make this happen.' A lot of the things that were promised to us they fulfilled, and some of the things they promised to us they haven't… But at the beginning, from our perspective… it was sold to us under the circumstances two-fold. Number one, monetary savings. Number two, being responsible users of a scarce resource in the Valley."

  "[Money] was the incentive they used, because the water product clearly wasn't as good as using potable, from a golf perspective."

  "Back in 1994 they pretty much pitched it that this is going to happen. You're going to take it [recycled water] *or we'll price you out of it or we'll*

shut your water off. Legally they wouldn't shut our water off, but it was pretty much forced down our throat."

Some participants believed that their provider was pushing the use of recycled water to save themselves money: every gallon of recycled water used was one that their provider did not have to pay to treat and pump back to Lake Mead. Those participants who emphasized this point believed that their provider was not fully passing on the resulting savings to the customer.

- **Some participants said they had not realized the cost savings they were initially led to expect when they started using recycled water.** These participants believed they had been promised a lower rate than their provider eventually charged them.

  "When we walked into this, there was a rate promised. The northern plant, which opened first, and some of the golf course got three years advantage of it, we were promised a rate. For those that were on the second plant, we were given a verbal response that said, 'We know that plant isn't going to open at the same time, but we will honor the same thing when your time comes.' It wasn't honored."

- **Participants perceived a number of problems presented by recycled water that are not presented by potable water.** In particular, participants noted that the water was higher in salts, nitrates, and TDS. In most cases, participants indicated that they expected these problems and were prepared to address them. Few participants seemed to believe that problems with water quality were unmanageable.

  "The salts and the level of nitrates that come with that water push the grass so fast, and it just causes a lot of problems…. The greens grow way too fast, and that's not what you want."

A few participants said that they had problems with water pressure and with the desired amounts of water not being available at the times they were needed. These seemed to be minor concerns, however.

Those participants who were long-time recycled water customers noted that over time, the quality and odor of the water had improved dramatically.

- **Participants identified a number of benefits from using recycled water as well.** The primary benefit that most participants pointed to was public relations: using recycled water (which they publicized with notes on scorecards and signage on-site) gave them a powerful tool to use in combating a public perception that golf courses waste water.

  "But the public relations side of it, we are in a really highly traveled part of town, where I think… there [are] 200,000 cars a day that go [by] … people come to me and say, 'You're wasting all that water,' and we say, 'We use recycled.' We don't talk about the return flow credits…we're on reclaimed water, we're not a water waster. Then people usually back away right away. So that is the good side."

Some participants also said that the natural fertilizer in recycled water was beneficial.

"Especially when I first got on, there was a sizeable amount of natural fertilizer coming through… It actually is a positive for me in regards to my roughs and my fairways. However my greens, I did struggle with those a little bit this summer."

- **Most participants thought they would ultimately see few, if any, cost savings from the use of recycled water.** Most indicated that while they might save some money on recycled water rates, over the long term most of those savings would be offset by higher maintenance costs, damage to landscaping from salts in the water, or the need to invest in additional capital projects, such as fresh water loops on greens. Most still felt that in the long term, using recycled water would work out to be slightly cheaper than using potable water.

  "In [the provider's] mind they are seeing a big cost savings with this, and in reality, a lot of that to me is offset on the maintenance cost. We have to spend more on chemicals, we have to spend more on labor…and there is an offset there. So sometimes you don't realize it. The other big thing now is…the only way to offset the water that we're getting is to add a leaching fraction to it or to over-irrigate to move some of those salts through the soil. Right now we are in this drought situation where we're being told that you better under-irrigate, or you are going to face this huge penalties and fines. So it's almost a double whammy. Here is the water that you have to water more to be functional for your turf, and at the same time you better not water more, or you are going to be in some penalties."

  "Short term I think it's more expensive…. We didn't do the potable loop, but we put some greens in and we did some things that were very expensive up front. I think short term it is more expensive. I think long term it would be slightly cheaper than potable."

  "And it's added a degree of stress to the way everybody has to do things. During the summertime, you can't go on vacation and then come back and everything is going to be hunky-dory. You have to go outdoors with a certain amount of trepidation… you can't equate a dollar value to that, but you don't even have the financial situation to offset the added stress to your situation."

- **Participants were highly pleased with their provider's operation of their recycled water systems.** Participants had nothing but praise for the way that their recycled water systems operate and for the customer service they receive from their recycled water provider. While participants reported occasional problems, they indicated that their provider was always extremely responsive and fixed any glitches quickly.

  "Me personally, I am pretty satisfied with the actual service that we got. When you are going through the whole conversion aspect of everything is running electronically and they control everything. So getting all that stuff in line took some time, and you have your setbacks here and there. But outside of that, it is actually a good program, the way the water district runs it. It

actually eliminates me having to think about it on a daily basis, because they are controlling that aspect of making sure the lake is filled."

"Overall I've had a good experience with deliveries and things. I have had a couple of operational things where once they overflowed the lake into the pump station…and another time they shut the lake off and they didn't fill it …but a couple of quick calls and it's very responsive. They responded immediately. When something happens, they come out right away and they work on it. They are very responsive in those terms."

- **Participants also viewed the public education materials and services offered by their provider as extremely useful and effective.** Participants generally had high praise for the educational materials and presentations offered by their providers to address concerns about recycled water. Participants viewed their provider as proactive, well-prepared, and professional in providing such information.

  "I think the water district kind of went out of their way to make sure [people were comfortable with recycled water]… They came to my club before we started out and did a presentation and brought water samples and the whole nine yards and showed everybody, and did a pretty convincing job of educating everybody on what we were going to get. So there was a comfort level to begin with…."

  "I think they do a great job. They give us a Web site to track our water usage, which is great for myself. I love that."

  "I know they also offered to come out to some of the town hall meetings that we had before that transition came through…. They stood up there, they explained it. They explained it from using enough scientific facts that you could explain to the public about confusing the issue, and they allayed a lot of fears…it took me out of the position of having to stand up and try to explain what we were doing, which I shouldn't have…had to do anyhow. But they volunteered to do it, and they came in and some of the people got angry. They handled it very well."

- **Participants reported no significant problems with their employees or customers regarding the use of recycled water.** Some said that there was initial resistance from some employees who feared health problems that might result from using recycled water. But over time, most indicated that their employees became completely comfortable with it.

  "I don't know if [my employees] get it, but they're not asking questions. I don't think it's real high on their list of things that they're thinking about, to be honest with you."

  "You remind them…not to drink out of a hose or a lake, or there is no bathing in our ponds."

  Participants also indicated that their customers had few if any complaints about the use of recycled water on-site.

"We have a putting course, an all-natural grass putting course with a stream that runs through it. So you have families out there, and a little kid will hit their ball in the water, and we have signs that say to avoid contact. Parents sometimes are concerned, 'Does this mean my kid's hand is going to fall off?' We just tell them to wash the hands."

"There [are] an awful lot of golf courses, not just in this town, that are reclaimed water. There are purple sprinkler heads all over the place. I think from the resort side, to me anyway, it's something they are used to seeing…. They are used to seeing those signs, used to seeing those scorecards. I have never heard one thing from anybody."

Quite a few indicated that their customers are primarily concerned with the aesthetics of the course and were unlikely to have any concerns about recycled water unless, for example, it caused discoloration on ash trees or forced the use of Bermuda grass.

- **Participants did, however, indicate that they received frequent complaints about recycled water from their neighbors.** Participants said that neighbors of the golf course were concerned about oversprays and tended to blame recycled water for a wide range of problems that occurred on their property within range of the golf course sprinklers.

  "We have 1300 homes ranging from a half million to a hundred million. When we went to put [recycled water] in, my phone rang incessantly. We had to mail out brochures that the water district supplied us. We had mailers, we had town hall meetings. Even now if…it's overspraying into a yard, it doesn't take ten minutes before we're starting to get phone calls. People are irate and they are worried about their dogs getting sick and they are worried about everything under the sun. Everything that can go wrong with their house is because what we're using to water the golf course if there is an overspray."

- **Many participants felt strongly that that their provider did not adequately solicit their opinions or respond to their concerns on nonoperational issues.** This concern seemed to focus mainly on issues dealing with recycled water rights. Many participants felt that they were not given adequate notice to plan for the impact of rate increases. More fundamentally, many participants did not feel that their provider devoted much energy to seeking out their opinions or attempting to understand their concerns.

  "The only complaint that I have in regards to our relationship with the water district is there is such a lack of respect for how a private entity operates. When you are in this public service aspect, I think they don't understand that there is a lot of times when we just can't jump to change things instantly. We don't get the lead time that is needed…to adjust for these changes that come about. That is the only part from my end that is very frustrating, especially…the financial aspects of it. There is a lot of times when they will throw down or they will come up and say, 'We're going to raise rates.' Well, why didn't you tell us a year ago so we could budget and start planning for that, or make changes to adjust for that higher price?"

"The guys we deal with on a daily basis, the guy who is running the plants, the guy who is mid-level and down I think just bend over backwards and work with… My problem is with the upper level, the guys [who] are setting the rates. They think we are just the peasants that we're going to do what we are told. I would say there is a little bitterness there. We are going 18 months out ahead of time sometimes setting budgets and trying to plan for what our business is going to do in the future. These folks pop in and say, 'In 30 days we're going to show you a price increase of $250,000.' I would challenge them in their business to absorb a hit like that in that limited time frame. That is aggravating."

"There is a sense of arrogance, in my opinion, not on the operational people, but in terms of the accounting side or the guys who collect the money or make the policy on rates. There is to me a huge amount of arrogance, where they are going to tell you, and like it or lump it kind of attitude."

Participants expressed a desire for decisions to be made on the basis of sound science and an understanding for the workings of golf course business, rather than purely on what they perceived to be largely budgetary or political considerations.

"I think we would be more satisfied if they actually looked at scientific record when they were making decisions instead of making decisions based on what the bean counters tell them."

- **Many participants felt they lacked a regular avenue for communication with their provider.** These participants indicated that regular meetings or phone calls would give them more opportunity to express their concerns and might help give them more confidence that their needs were understood and being addressed.

- **Participants were highly concerned about dispelling the public perception that golf courses are irresponsible water users.** Participants were eager to dispel the perception, which many clearly found burdensome, that golf courses are large water wasters.

"Anyone that you talk to, regardless of the form, they say, 'Who [are] the biggest water wasters?' and they automatically assume it's golf courses, Clark County School District, hotels and casinos. Of course it's not, it's the standard homeowner who is the number one water user and waster. So going in with an effluent situation, we felt it was a plus with our PR and our civic responsibilities to get on board and say that we're doing everything that we can to help out and still create this industry that is much needed in the city."

"Public perception is that golf courses waste and use a lot more water than they should… From our standpoint…the initial thing…is to get the public's perception away from golf courses as water wasters and into not only very sound users of water, but the type of water that we are, in fact, using. It hopefully will change their perspective on it and understand that we're not really wasting water, but we're using water that no one else at this juncture will use other than some industries."

A number of participants expressed a desire to have their provider assist them in publicizing the work that golf courses are doing to use recycled water and reduce their use of fresh water.

"I would like to see a lot more PR work… to fight the public perception, that golf is a big waster… The golf courses this past year have saved hundreds of millions of gallons of water as part of this drought plan. I haven't seen any commercial…. But this is a billion dollar industry, and we're making strides to help them work some of these drought plans and this stuff. We should be included in the public push in…getting the word out there."

On the whole, the focus group participants agreed to have recycled water as a part of their day-to-day business. Whatever lingering concerns they had about its associated costs or its water quality, most participants seemed to expect that they would be using recycled water for the foreseeable future. Most were highly pleased with the service they had received from their recycled water provider, and most thought that the educational materials and outreach offered by their provider to employees and members of the public were extremely helpful. As they looked toward the future, participants' concerns focused on three desires: having more advance notice regarding rate increases in order to facilitate long-term planning; having more regular and in-depth contact with senior managers from their provider, which would give them more confidence that their concerns as customers were being heard; and having their provider do more to publicize efforts by golf courses (such as their use of recycled water) to conserve water in the Las Vegas area.

FURTHER READING

San Antonio Water System, *Recycled Water Users' Handbook,* August 2003.

City of San Antonio, *Chapter 34, San Antonio City Code, Recycled Water Service and Rates.*

San Antonio Water System Water Recycling Program, *Engineering Feasibility Report – Public Outreach and Information.*

San Antonio Water System, *Water Recycling Business Plan – Draft Document,* May 2004.

Water Conserve II, *Reclaimed Water Construction and Inspection Guidelines Summary,* August 1999.

Florida Grower Magazine, *Reclaiming Florida's Water,* September 2000.

Neil Laudati, Las Vegas Valley Water District, *Installing a Traffic Jam – Constructing Recycled Water Lines in Developed Communities,* American Water Works Association, Water Sources Conference Abstract, January 2002.

Kenneth Trompeter, P.E., Greeley and Hansen LLP, and Adrian J. Edwards, Chief Operator, City of Las Vegas, *Construction and Startup of a 10 MGD Wastewater Reclamation Plant,* American Water Works Association, Water Sources Conference Abstract, 2002.

John Mundy, Marsha Eubanks, Arlene Post, Las Virgenes Municipal Water District, *How a Potential Cross-Connection Became a Reality and What You Can Do To Prevent It, 1999.*

ABBREVIATIONS

DFG	Department of Fish and Game (California)
DHWRC	Durango Hills Water Resource Center
FMM&A	Fairbank, Maslin, Maullin & Associates
LVMWD	Las Virgenes Municipal Water District
LVVWD	Las Vegas Valley Water District
MGD	Million gallons per day
MOU	Memorandum of understanding
RWDS	Recycled water distribution system
SAWS	San Antonio Water System
TDS	Total dissolved solids
VVWRA	Victor Valley Wastewater Reclamation Authority

APPENDIX A

RESULTS OF RANKINGS BY FOCUS GROUP PARTICIPANTS

Handout #3

Select the three statements you think are the most persuasive arguments for using more recycled water, and rank them "1" (most persuasive), "2" (second-most persuasive), and "3" (third-most persuasive). Write "last" by the statement you find least persuasive. In all of the statements, circle any words or phrases you like or find very persuasive, and cross out any words or phrases you do not like or do not find persuasive.

Rank

A. Using recycled water will have great benefits for our local economy. By helping to ensure a stable, reliable supply of water, we will be better able to attract new businesses to our community and keep existing employers here.

Votes: 2 votes for third most persuasive/3 votes for least persuasive

B. Our area is facing a water supply crisis. Our population continues to grow rapidly, and with less than five inches of rain per year we face the constant possibility of droughts. As a result, our groundwater supplies are shrinking rapidly; by the year 2020, many wells in this area may be dry. Using more recycled water can help to reduce the demands on our groundwater supply, and ensure that we will have the water we need in the future.

Votes: 9 votes for most persuasive/1 vote for least persuasive

C. Recycling is an important principle that we should follow whenever we can. Recycling water is basically the same concept as recycling aluminum cans or paper; it is simply a way of re-using scarce resources rather than throwing them away.

Votes: 3 votes for least persuasive

D. Using recycled water will save us money. It costs ten times as much to use pumped fresh groundwater as it does to use recycled water. Using more recycled water will help private businesses to save money, and if government agencies use more recycled water it will save taxpayer dollars.

Votes: 3 votes for second most persuasive/2 votes for third most persuasive

E. Our community is one of the fastest-growing areas in California. We currently produce more than 9.5 million gallons of wastewater per day, but in less than 20 years that number will more than double to 19.5 million. The more water we use, the more important it will be to recycle

water. Votes: 1 vote for most persuasive/4 votes for second most persuasive/3 votes for third most persuasive

F. Recycled water is good for the environment. Using recycled water keeps fresh water from being diverted from places where fish, wildlife, and plants depend on it, while also reducing the amount of treated wastewater pumped into local rivers and streams. Votes: 1 vote for most persuasive/1 vote for second most persuasive/1 vote for third most persuasive

G. Using recycled water frees up more fresh water for drinking water supplies. Every gallon of recycled water that is used is a gallon of fresh drinking water that is saved.

Votes: 2 votes for second most persuasive/2 votes for third most persuasive/1 vote for least persuasive

H. Recycled water is a drought-proof and reliable source of water supplies. Even when there are droughts and cutbacks in the availability of fresh water, recycled water customers can still count on a steady supply of water to irrigate and protect important landscaped areas.

Votes: 2 votes for second most persuasive/2 votes for third most persuasive/2 votes for least persuasive

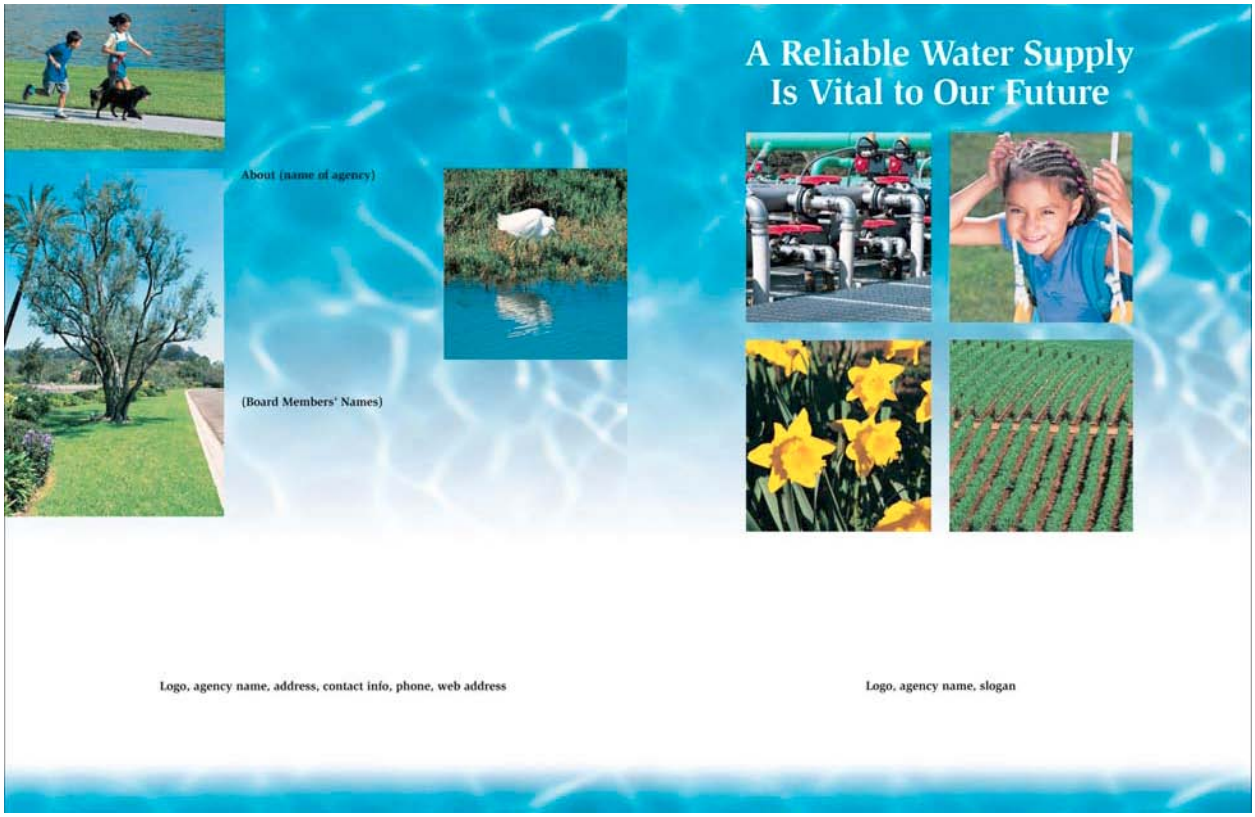
APPENDIX B

DESIGN SPECIFICATIONS FOR MATERIALS

Brochure

Description:	4 color, 2 sides, varnish is optional, 4 pages, full bleed
File name:	Brochure.indd (document) Brochure.indt (template) Format: MAC
Program:	MAC Adobe InDesign CS2
Linked files:	22 Adobe Photoshop cmyk MAC tiffs (22 PC tiffs and 22 jpegs also included)
Other files:	Process illustration in Adobe Illustrator document and eps files, Photoshop tiff, PC tiff and jpeg, Brochure in low resolution pdf file
Fonts:	Slimbach Medium, Slimbach Bold (MAC and PC fonts included)
Flat size:	11” × 17”
Folded size:	8.5” × 11”
Imprint areas:	Add your agency information as needed.

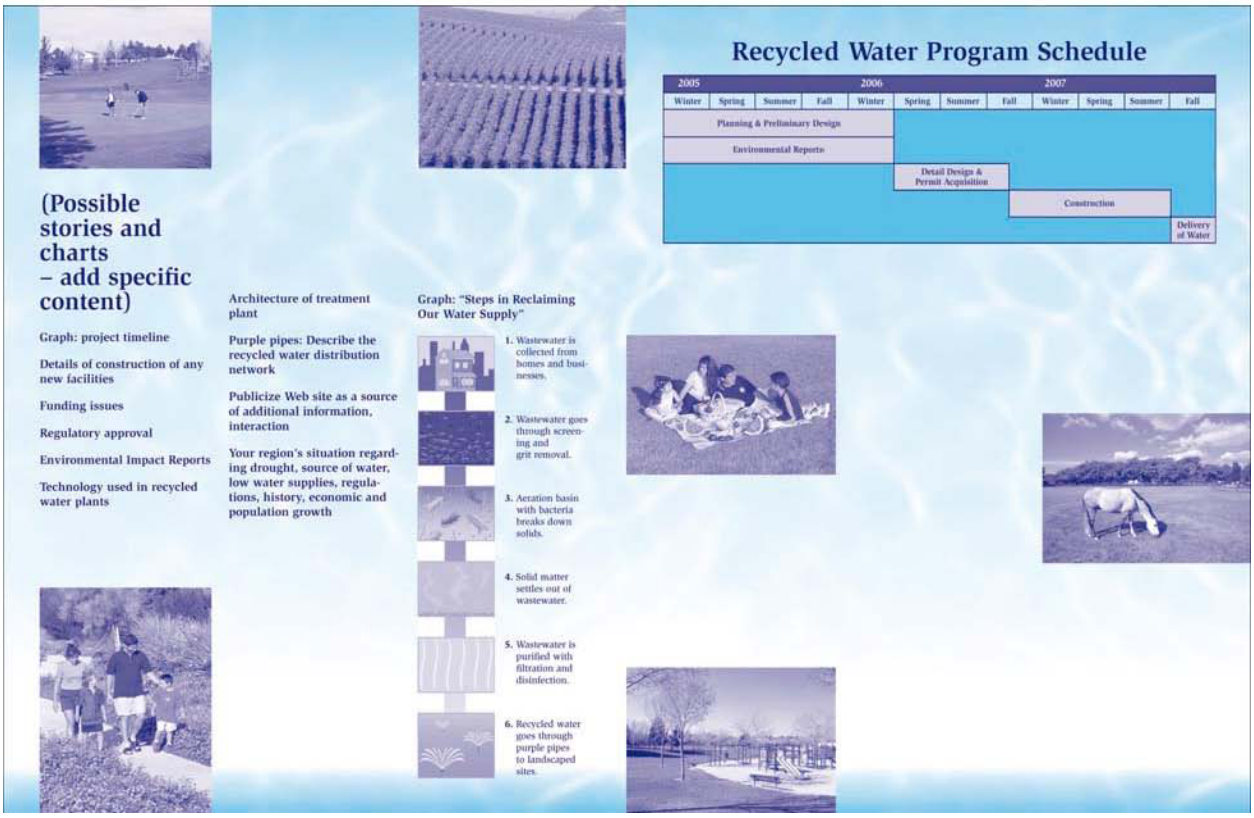
Brochure Sample:



Newsletter

Description:	2 colors, 2 sides, 4 pages, full bleed Pantone Colors: 2685 (purple) and 2995 (blue)
File Name:	Newsletter.indd (document) Newsletter.indt (template)
Format:	MAC
Program:	MAC Adobe InDesign CS2
Linked files:	12 Photoshop grayscale tiffs (12 PC tiffs and 12 jpegs also included)
Other files:	Newsletter in low resolution pdf file
Fonts:	Slimbach Medium, Slimbach Bold (MAC and PC fonts included)
Flat Size:	11” x 17”
Folded Size:	8.5” x 11”
Imprint Areas:	Add your agency information as needed.

Newsletter Sample:



Fact Sheet

Description:	2 colors, 1 page, prints 1 side, full bleed
Colors:	Pantone 2685 (purple) and Pantone 2995 (blue)
File name:	Fact Sheet.indd (document) Fact Sheet.indt (template)
Format:	MAC
Program:	MAC Adobe InDesign CS2
Linked files:	2 Photoshop grayscale tiffs (2 pc tiffs and 2 jpegs also included)
Other files:	Fact sheet in low resolution pdf file
Fonts:	Slimbach Medium, Slimbach Bold (MAC and PC fonts included)
Flat size:	8.5” × 11”
Folded size:	Can be left flat or folded in half to 5.5” × 8.5” or letter-folded to 3.66” × 8.5”
Imprint area:	Add your agency information as needed.

Fact Sheet Sample:

Frequently Asked Questions

What is recycled water?
Recycled water starts out as wastewater, which is then treated so it is suitable for landscape irrigation, industrial uses and other non-drinking purposes. Recycled water is processed through biological treatment and a filtration and disinfection system before being provided to landscape and industrial customers. A dedicated system of pipelines is constructed for recycled water which is completely separate from drinking water pipelines. These pipes are often colored purple to distinguish them from drinking water pipes.

Why are we developing a recycled water program?
Water supplies in our region are being stretched to the limit because of population increases, economic growth, environmental restrictions and periodic droughts.

Is recycled water safe?
Because recycled water originates from wastewater, its use is strictly regulated and monitored by regulatory agencies. These guidelines are precautionary measures intended to protect the public from any potential risk associated with recycled water. Recycled water receives a disinfection process that destroys any harmful bacteria before it is used for irrigation. Recycled water is treated to a level that is safe to swim in but is not recommended for drinking. In over 75 years of use, there has never been a documented case of anyone becoming ill from contact with recycled water.

What are the benefits of using recycled water?
Recycling is an important principle that we should try to incorporate into our daily lives. Recycling water is the same concept as recycling aluminum cans or paper, where scarce resources are reused instead of thrown away. Reusing water helps to reduce the drinking water taken from groundwater aquifers and other sources, maintaining these resources for the future. Every gallon of recycled water that is used is a gallon of fresh drinking water that is saved.

In addition, recycled water is locally produced, providing a sustainable source that will be here rain or shine. Recycled water will protect expensive landscaping from the devastating effects of droughts and water shortages. It's good for the environment, too. Using recycled water keeps fresh water from being diverted from places where fish, wildlife and plants depend on it, while also reducing the amount of treated wastewater pumped into local rivers and streams.

Where will recycled water be used?
Recycled water is ideal for irrigating golf courses, school grounds, parks, greenbelts, freeway medians and cemeteries. Recycled water is also commonly used for agriculture and industrial cooling processes. Other popular uses include:

- Controlling dust
- Mixing concrete
- Cooling Towers
- Flushing toilets in public buildings
- Water for industrial laundry operations
- Cleaning water for animal shelters
- Water for aesthetic fountains

Will my kids get sick from playing on the grass at the park? Can my kids run through sprinklers that use recycled water?
Recycled water is similar to drinking water and is cleaner and safer than the water found in most rivers, lakes and beaches. Recycled water is also used at recreational lakes where people boat, swim and fish. The treatment process will fully disinfect the water.

To further reduce concerns, parks and playgrounds usually irrigate at night, a time of day when students are gone or the park is not populated. If for some reason the sprinklers are on and kids play in the sprinklers, or even drink directly from a sprinkler, they will not get sick. Adverse health effects from recycled water could appear only if it were ingested in large quantities over an extended period of time. That is why recycled water is not intended for drinking.

Will children or golfers bring back bacteria on their shoes?
No. It is more likely that bacteria will come from the fertilizer used on the grass or soil itself. Recycled water is treated to the point where it becomes "pathogen free."

Does recycled water smell or look different from tap water?
No. Recycled water is the end product of a three-stage multi-barrier treatment process. Following tertiary treatment, the water is clear, colorless, odorless and virtually indistinguishable from tap water to the human senses. The recycled water does not contain any constituents that exceed federal and state drinking water standards for heavy metals, minerals, trace organic compounds, pesticides, microorganisms or radionuclides.

Additional Questions (requiring region-specific answers):

How much will the project cost?
What are the sources of funding?
How many facilities will be built?
What is the project schedule for the facilities?
How can I learn more?

Logo, agency name, slogan, address, contact info, phone, web address

PowerPoint

Description:	PowerPoint template containing 19 slides.
Other files:	13 photo jpegs, 1 illustration jpeg, and 2 water background jpegs
File name:	powerpoint.ppt
Format:	PC
Program:	Microsoft PowerPoint
Font:	Times New Roman
Imprint area:	Add your agency information as needed.

APPENDIX C

CONTENTS OF THE COMMUNICATION MATERIALS DISCS

CONTENTS OF DISC 1

Brochure

Description:	4 color, 2 sides, varnish is optional, 4 pages, full bleed
File name:	Brochure.indd (document) Brochure.indt (template) Format: MAC
Program:	MAC Adobe InDesign CS2
Linked files:	22 Adobe Photoshop cmyk MAC tiffs (22 PC tiffs and 22 jpegs also included)
Other files:	Process illustration in Adobe Illustrator document and eps files, Photoshop tiff, PC tiff and jpeg, Brochure in low resolution pdf file
Fonts:	Slimbach Medium, Slimbach Bold (MAC and PC fonts included)
Flat size:	11” × 17”
Folded size:	8.5” × 11”
Imprint areas:	Add your agency information as needed.

CONTENTS OF DISC 2

Newsletter

Description:	2 colors, 2 sides, 4 pages, full bleed Pantone Colors: 2685 (purple) and 2995 (blue)
File Name:	Newsletter.indd (document) Newsletter.indt (template)
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Font:	Times New Roman
Imprint area:	Add your agency information as needed.

Advancing the Science of Water Reuse and Desalination

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