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# Water Market USA

Global  
Water Intelligence

# About this report

**Water Market USA** is the most ambitious market report yet published by Global Water Intelligence. It is more than just an indicator of where and how money will be spent in the US water sector over the next few years. It is also a collection of practical resources relevant to everyone with a business interest in the water industry.

At the centre of the report is a **project list**, compiled as a result of 3,500 hours of research contacting the top 1,000 water and wastewater utilities in the country, together with smaller utilities, which through the State Revolving Fund system had indicated that they were pursuing larger capital projects. We then analysed the **finances** of 300 major utilities in order to build up a picture of how the cashflows in the municipal water sector work. This enabled us to build up a **forecasting model** which we used to create an overall picture of **capital and operating expenditure between 2009 and 2016**, and then to drill down to examine the outlook for key **water technology sectors**.

In order to give the data a narrative context, we also interviewed key industry executives to get their views on emerging industry trends. These **interviews** were published initially as a business documentary included in the DVD accompanying this report, and subsequently as a print transcript with accompanying commentary in this report.

Besides the interviews and the research, we also created a series of datasets relevant to the US water industry, including a **companies listing** with thumbnail profiles, a **utilities directory** with performance indicators, a **mergers and acquisitions listing** and a database of all permitted **wastewater discharge facilities** in the US (covering both industrial and municipal wastewater producers). The idea is that the report and its accompanying datasets will enable readers not just to identify potential opportunities, but to make the connections to initiate action. The full contents of the data disk published with this report are:

Spreadsheets	Contents
Company profiles	Short profiles of businesses active in the water space.
Corporate finance	A listing of mergers and acquisitions in the water sector since 2000, plus a listing of water-related stocks.
Industrial water overview	A forecast of capital expenditure by industrial water users over the next decade.
Infrastructure forecast	A forecast of capital expenditure by water utilities.
Major utilities	A directory of major US water utilities.
Municipal operations	A forecast of operating expenditure by utilities.
Project list	A listing of current and future capital projects being contemplated by water utilities.
Technologies forecast	A forecast of expenditure on certain water and wastewater technologies and water treatment chemicals.
US Utilities' financials	A financial analysis of major US water utilities.
Wastewater discharge facilities	A complete listing of all municipal and industrial EPA-permitted wastewater discharge facilities in the US.
Water scarcity solutions	Detailed information about the outlook for desalination and water reuse.

PDF Documents	Contents
1. USA Market Report	This document, containing an introduction to the key features of the US market, a transcript of the DVD and forecast graphs and data.
2. USA Utilities and Projects	A directory of US utility companies, including contact details, financial information, infrastructure information and current/future projects being undertaken by the utilities.
3. USA Company Profiles and Directory	A PDF directory of utilities, financials and projects, listed by utility.
4. USA Desal and Reuse Tracker and Inventory	A comprehensive inventory of desalination and reuse projects, plus the most recent updates to the GWI desalination and reuse trackers.

We appreciate that the US water market is a moving target, and for that reason we aim to publish periodic updates of the data and content of this report. This should enable us to track the accuracy of our forecasts, and to take new information and policies into account.

The format and contents of the report represent a new direction for GWI's research publishing. I very much welcome feedback from readers so that we can improve.

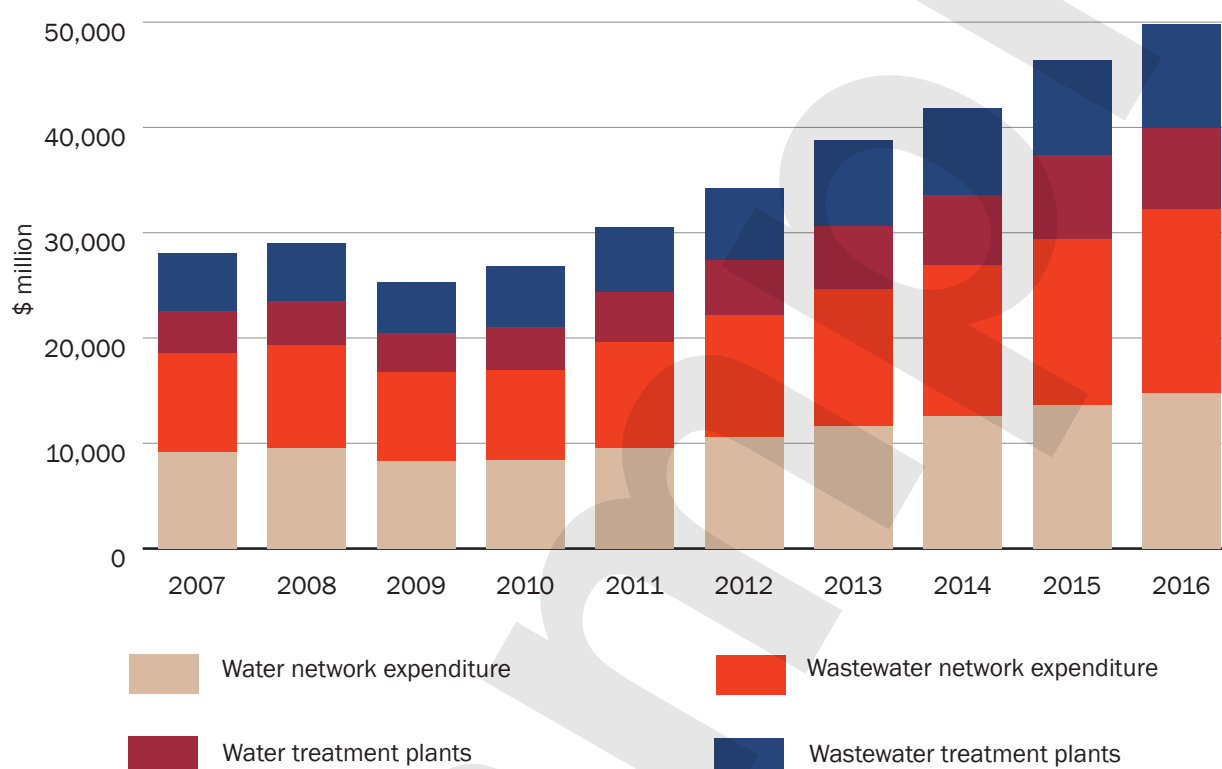
Christopher Gasson  
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 Oxford  
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# Water Market USA: Executive Summary

The US municipal water sector is facing greater challenges than at any time in its history. Decades of under-investment have left a legacy of decaying infrastructure, and an industry which is ill-equipped to meet environmental standards or prepare for growing water scarcity. The fundamental problem is that water is a capital-intensive industry, and the combination of low user fees and public ownership has meant that it is difficult to attract the necessary capital to the sector. The stimulus package is expected to provide only limited relief, as other sources of capital such as developer contributions and municipal bond issues are cut back.

Neglecting water investment is a common phenomenon internationally, but experience has shown that it cannot be avoided in the long term. We forecast the following pattern of capital investment in US water and wastewater infrastructure over the years to 2016.

**Figure i: Forecast of capital expenditure in US water and wastewater infrastructure 2007-2016**



Themes picked up in this report include:

**Infrastructure investment:** Utilities have been prepared to delay network rehabilitation work in the past because it lacks the urgency of meeting compliance deadlines related to treatment standard regulations. However, with three generations of pipe now reaching the end of their lives, investment is likely to become more crisis-driven. We forecast that from 2011 onwards, there will be a rapid acceleration of investment in pipe rehabilitation, with compound annual growth approaching 15% on the water side, and 17% on the sewer side.

**The impact of scarcity:** This is driven by growing demand in the face of a fixed renewable water supply. Although industrial and agricultural water demand is no longer growing, the problem for the US is two-fold. Firstly, domestic water demand is rising in those parts of the country which have the lowest natural water availability. Secondly, aquifers are being drained significantly faster than they are being replenished in many parts of the country: this is unsustainable. Water rights trading, desalination and water reuse are the obvious solutions, but are not universally popular. Objections will have to be overcome, as the West has few alternatives. We forecast that \$15.5 billion will be invested in desalination and water reuse between 2009 and 2016.

**Private sector participation:** There is strong political resistance to private sector involvement in the US water sector. 8.8% of the population is served by regulated private water utilities, and a further 6.5% is served by private operators contracted by municipal utility owners. The spread of the private sector in the US water sector has lost momentum since the 1990s, but there is some hope that tax incentives, the need for more complex technologies, and the aging of the municipal workforce will create additional opportunities for the private sector in future.

**Investment opportunities:** Water is emerging as a mainstream investment theme: investors are increasingly asking “what percentage should we have in water?” The quoted investment sector is divided between investor-owned utilities – which are seen to offer low risk returns, even in a bear market – and equipment/service suppliers which offer more variable performance. Opportunities for private

equity investment are emerging, as municipalities are forced to think more creatively about finance. The emergence of the water rights market is also attracting investment funds, but it is a risky market to operate in.

**Technology trends:** Some key water technology sectors will continue to see growth, despite the short-term downturn in capital expenditure. Membrane separation technology (especially reverse osmosis) and advanced oxidation (including UV disinfection) fall into this category. Growth in lower-tech equipment supply sectors such as pipes, pumps, and valves will be more closely associated with overall levels of capital expenditure.

**Fragmentation:** There are more than 50,000 water utilities in the US, and above that, two or three levels of regional, state and federal strategic or regulatory authority. This makes for an impossibly fragmented market, but there is one unifying force which leaves its signature at every level and in every corner of the industry: the **consulting engineers**. The top 20 firms are the key to the market: they define the procurement system, they take the lion's share of the capital expenditure, and they set the direction of the industry.

This report has been written and edited by Mario Alemi, Chris Bowling and Christopher Gasson. Design and production support was provided by Mark Porter, Heather Lang and numerous members of staff at Global Water Intelligence.

Published by Media Analytics Ltd.,  
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27 Park End Street,  
Oxford OX1 1HU,  
United Kingdom

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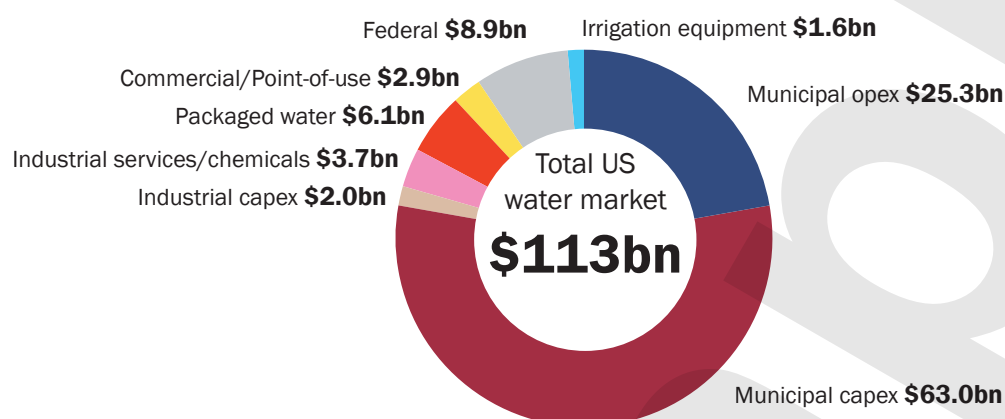


# 1. Introduction

## 1.1 Understanding the US water market

Water is used in almost everything that we do, so it is always important to define what we mean by a “water market”. This report focuses primarily on public water supply and wastewater collection and treatment. This encompasses the capital investment in infrastructure, as well as the operating cost of running it. It gives cursory coverage to the industrial water market, but it does not engage with the markets for packaged water, irrigation, point-of-use water systems, pool and spa products and services, or plumbing fittings. Figure 1.1 below gives our best estimate as to the size of this broader market and puts the public water supply market in context.

Figure 1.1: Size of the US water market



Source: GWI research.

Water is very much a local commodity: people tend to drink the water that falls on their heads, and the industry which has grown up to make this possible is locally focused. It means that there is very little in common between the water supply system in one country and the next. The US market in particular has evolved with a number of idiosyncrasies. These can be summarised as follows:

**Fragmentation:** There are more than 50,000 water utilities in the United States. Some serving major cities have millions of customers. Others may be no more than a borehole and a pipe connecting a handful of houses. 84% of them serve fewer than 3,300 people each. This fragmentation means that it is difficult for new companies and technologies to penetrate the market. Figure 1.2 below illustrates the diversity of US water systems.

Figure 1.2: Community water systems by size

Size of population covered by system	Very Small (<501)	Small (501-3,300)	Medium (3,301-10,000)	Large (10,001-100,000)	Very Large (>100,000)	Total
No. of systems	29,160	13,858	4,838	3,728	404	51,988
Population served	4,857,104	19,868,795	28,134,557	106,310,834	133,128,786	292,300,076
% of systems	56%	27%	9%	7%	1%	100%
% of population	2%	7%	10%	36%	46%	100%

Source: EPA

There are a smaller number of wastewater systems (perhaps 35,000), some of which are stand-alone entities and some of which are managed within the relevant municipal water department.

**Lack of sector policy:** The fragmentation of the water utilities sector means that water policy is highly decentralised. The most important federal institution is the **Environmental Protection Agency**, which is involved in setting quality and environmental standards for utilities and other water users. It also provides finance to support the **Clean Water State Revolving Funds** (for wastewater) and the **Drinking Water State Revolving Funds**. It does not take a proactive role in the organisation of the sector, and does not, for example, become involved in water resources issues.

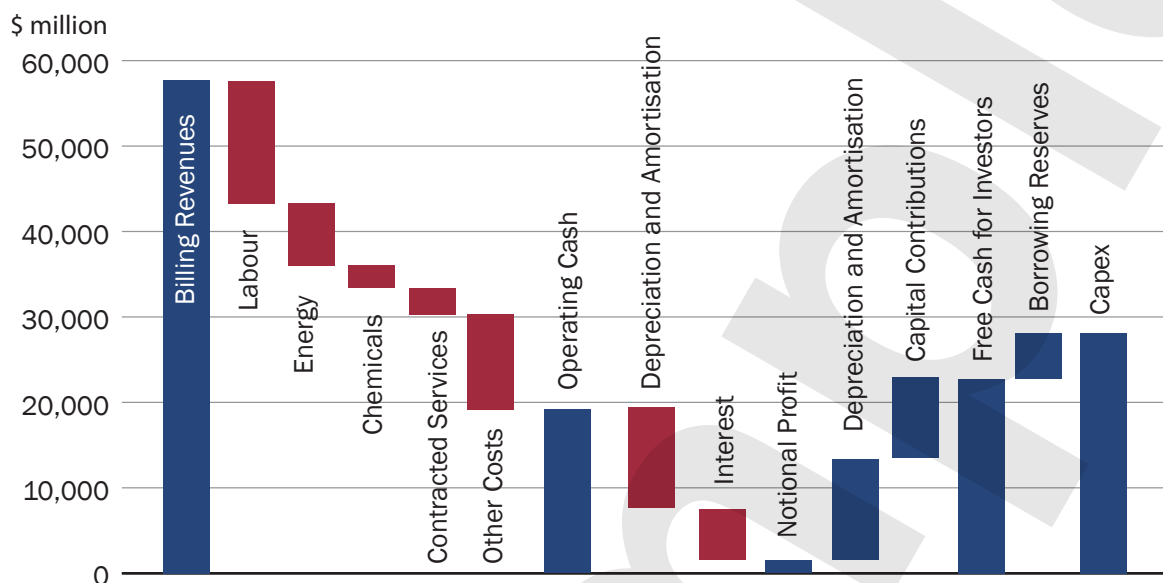
Other federal bodies involved in the water sector are the **Bureau of Reclamation** (which is responsible for water resources issues in the western United States), and the **Army Corps of Engineers** (which is involved in constructing and maintaining dams and levees). **State policymakers** have a bigger influence on water than federal policymakers, particularly where strategic water issues are important (such as in California, where the Department of Water Resources oversees the State Water Project). They are also involved in the economic regulation of investor-owned utilities, through the Public Utilities Commissions.

## 2. Forecasts

### 2.1 Municipal utility finances

In order to create a forecast of expenditure by US water utilities, we started by creating a financial model for the US municipal water sector based on analysing the financials of 400 major utilities. We then used this model to look at how the credit crunch might have affected expenditure in the water sector.

Figure 2.1: USA municipal expenditure model 2007

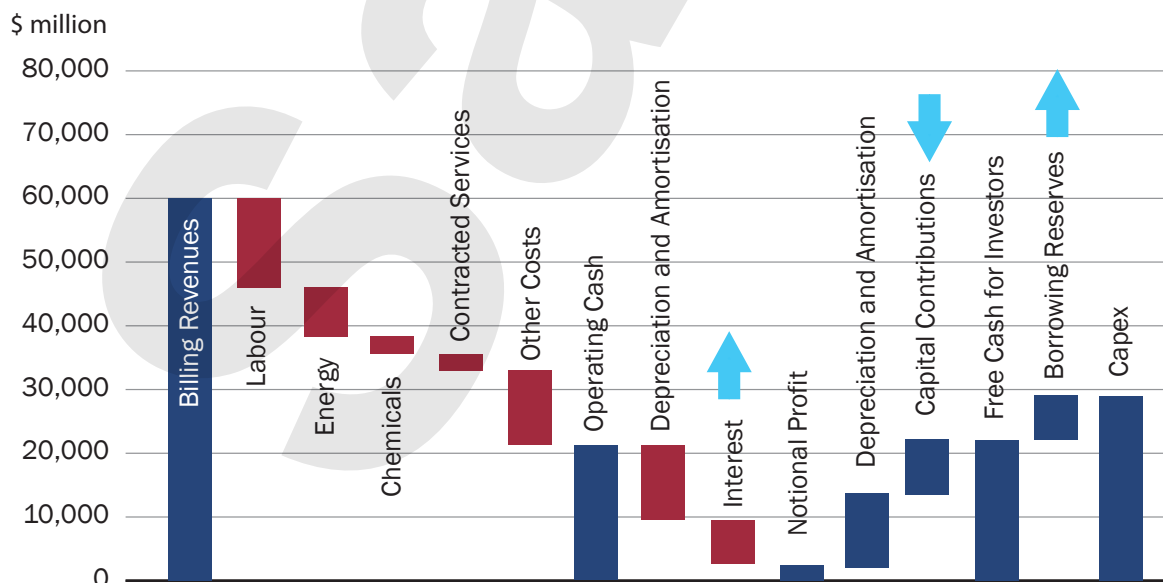


We estimate that 2007 water utility revenues were in the region of \$57 billion. Current expenditure on labour, energy, chemicals and contracted services totalled \$38 billion. This left total operating cashflow of \$19 billion. This is reduced to \$7.6 billion after taking depreciation into account. Interest charges of \$6 billion reduce the notional profit of the sector to around \$1.6 billion.

If we add back the depreciation, we get free cashflow of \$13 billion. On top of this comes capital contributions from private developers and government subsidies of \$9 billion, which leaves total internal cashflow available for capital expenditure of nearly \$23 billion. With net drawing from reserves and borrowing of \$5 billion, total capital expenditure would have been \$28 billion.

Now let's look at how the worsening credit conditions might have affected the market in 2008:

Figure 2.2: USA municipal expenditure model 2008



### 3. Meeting the challenge of water scarcity

This chapter looks at the opportunities for businesses and investors which may arise from meeting the challenge of water scarcity.

#### 3.1 The challenge of water scarcity

**Scarcity** is the most visible driver of demand for investment in the water sector. Governor Schwarzenegger's declaration of a drought in California in June of 2008; the water shortages in Atlanta, the draining of Lake Mead, the spread of dust-bowl conditions in the Mid West - all have added to the sense of crisis surrounding America's water resources.

Scarcity is a function of **supply** and **demand**. The problem we have is that demand for water is growing fastest where water is least available. Figure 3.1 shows the rate of population growth across the United States.

Figure 3.1: Rate of population growth by state

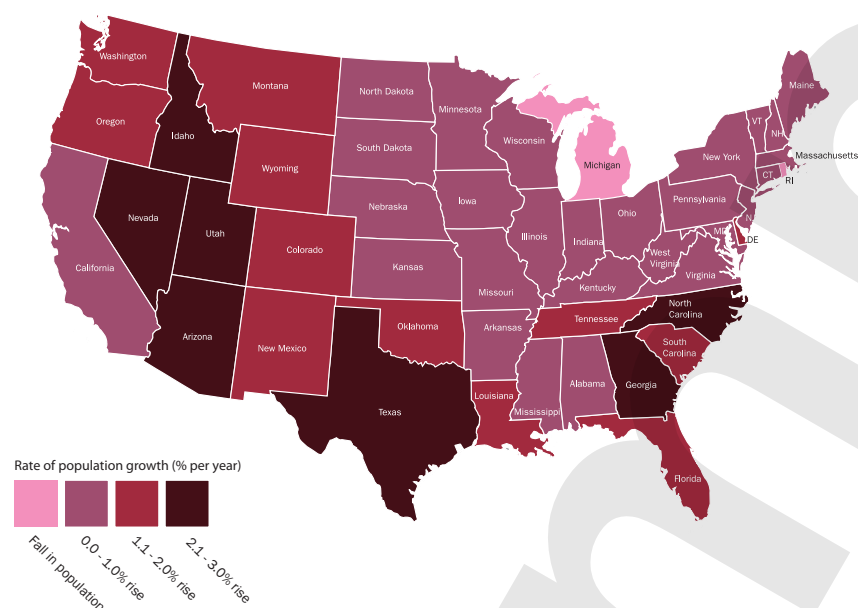
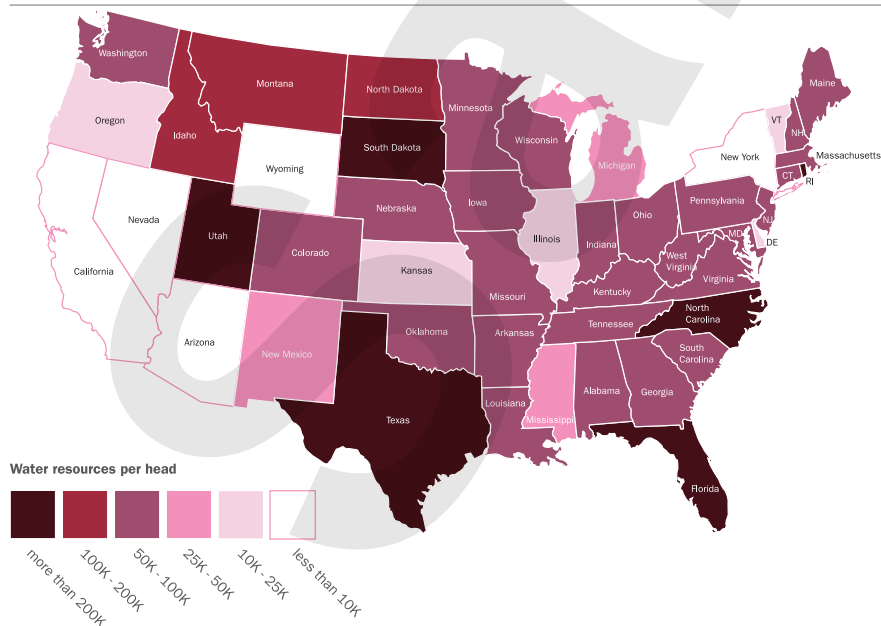


Figure 3.2 shows renewable fresh water availability by state.

Figure 3.2: Renewable fresh water availability by state



## 4. Investing in the US water market

### 4.1 Overview of investing in the US water market

As we examine investment opportunities in the sector, we focus on the appeals and challenges for individual investors, as well as for institutional investors, venture capitals and private equity. Also, we look at overall investment in the sector and private activity bonds, which tie into our infrastructure discussion.

While we have seen peaks of hype and over hype which unfortunately cloud the landscape, the fundamentals of the sector are attractive and provide **solid long term opportunities** and alluring **return potential**.

Until relatively recently, water as a standalone sector for investment was essentially unrecognised. There were only a few institutional pioneers such as John Dickerson with his Summit Global Fund and Pictet, one of the largest and most established water funds.

Over the past few years, we have seen a tremendous increase in investor interest on all levels. The number of water-specific funds has risen dramatically and prominent individuals such as T. Boone Pickens have jumped into the sector. Additionally, on the venture and private equity side, we see more and more people searching for the next hot deal. Also, there is an intrinsic appeal to investing in water, as pointed out by Gary Miller, a Senior Vice President of the engineering, construction and consulting firm CH2M. He attests to the very core, basic human component to investing in water, which makes it a stable long-term investment.

**Opinion: The strong need for water makes it a very stable long-term annuitised-type return.**

**GWI interviewed Gary Miller, Senior Vice President of Business Development & Planning at CH2M Hill OMI**

**Gary Miller:** I think that when you look at investment in the water industry, whether it's private equity or what have you, I think **people see the water industry as one of the essential ingredients of life**. We all need water no matter where you are in the world. There is always going to be that need and stability and demand for water for drinking purposes and also for industrial growth.

Economic growth and development needs solid water and infrastructure and also wastewater treatment services. So there is always going to be that strong need for water [and] wastewater, just like there is for electricity and power. And I think if you're an investor looking at the market, it's a very stable long-term annuitised-type return.

### 4.2 The Stock Market

In the equities market, the challenge in the US over the last several years has been to find value within an increasingly limited universe. GE, ITT, Danaher and other multi-conglomerates have swallowed up several of the treatment and equipment companies and the utilities universe remains extremely fragmented. **Size and liquidity are often hurdles** for institutional investors and while valuation multiples have contracted in recent months, finding viable options remains tricky.

Moreover, investors often seem to want some hot new technology. There is definitely a myth, particularly within the whirlwind of clean-tech, that the sector is full of options. In reality, the bulk of the sector is the more boring, staid equipment and infrastructure-related companies. Investing in water has become alluring, but ironically when you actually break down the investable options – pipes, pumps and valves, utilities, sewer rehabilitation and engineering companies – the selections are hardly glamorous. Investors also seem to want innovation and frequent breakthroughs, when overall the sector is, in many cases, tremendously **slow moving**.

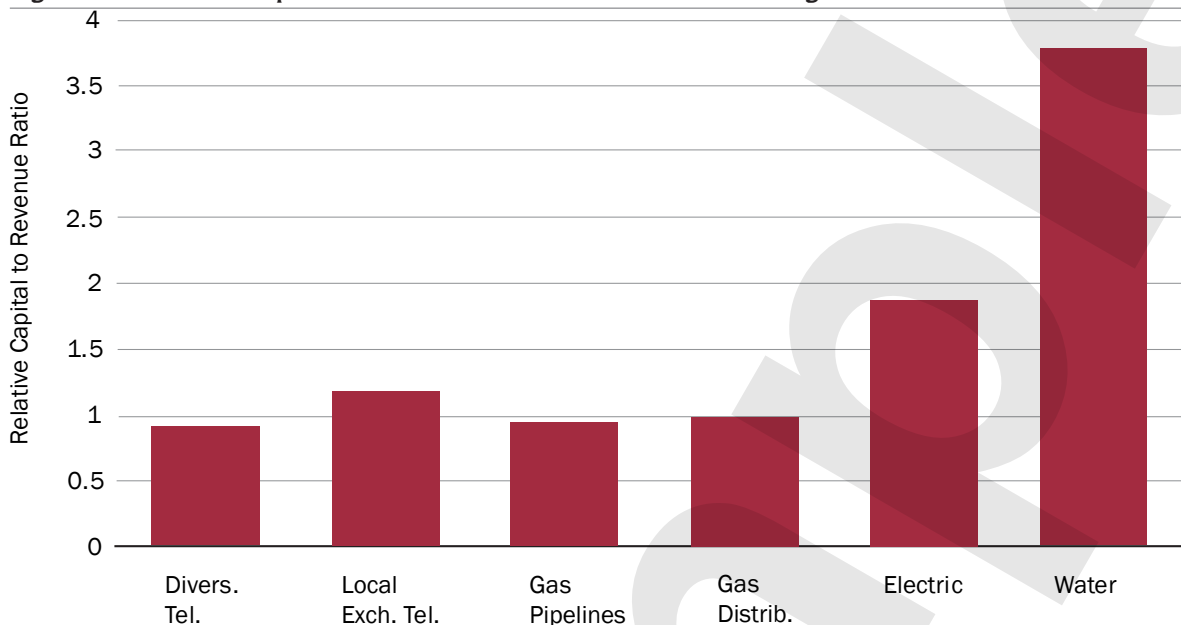
**Desalination** is a good example of what investors often view as an exciting, ground breaking area of investment. However, as Jud Hill of Summit Global Management points out, only a fifth of the embedded capital is in the “exciting” part of a plant, with the remainder in the distribution/collection system. He also points out that the water industry is very conservative, and new technologies generally require five to ten years to prove their reliability and become adopted by utilities.

## 5. The Outlook for America's Infrastructure

### 5.1 Overview

Water requires more capital investment per dollar of revenue than any other utility, as shown in Figure 5.1.

**Figure 5.1: Relative capital investment to revenue ratio for a range of utilities**



Pipelines are more expensive to lay than cables, but the end product is less highly valued than electricity or telephony. Furthermore, water infrastructure is **unseen infrastructure**. Pipes are buried beneath roads and sidewalks, but when a road or a sidewalk needs repairing, it is obvious to all. When a water pipe or a sewer needs repairing, it is out of sight and out of mind - at least until it becomes a sink hole.

In this section, we look at the gap between the need to invest in water infrastructure, and the amount of capital actually being spent. Michael Deane, Senior Policy Advisor for infrastructure finance at the Environmental Protection Agency (EPA) explains the trend:

#### **Commentary: The trend is towards lower grants and higher leverage through subsidised loans.**

**GWJ interviewed Michael Deane, Senior Policy Advisor, Infrastructure Finance, Office of Water EPA**

**Michael Deane:** Federal subsidies hit a high in 1980 after several decades of significantly ramping up from very low levels in the '50s to very high levels in the '80s.

Very consciously, a policy decision was made to move from **federal grants** to subsidised loans where the interest rate is subsidized by the federal government. [This was] a method [of] helping communities move from high subsidies with capital costs and wastewater projects to lower subsidies through loans that they have to repay... The trend is towards lower subsidy and higher leverage for the federal dollars by **federal matching funds** and recycling those dollars. So every federal dollar that goes out within the **State Revolving Fund loan program**, I believe so far it's been \$3 invested on that, so really a much higher leverage.

The **reduction in grant finance** for water utility investment coincided with an **increase in the operating cost** of water and wastewater utilities. Since the early 1990s, there have been growing concerns about the gap between the level of investment required to meet the need for clean drinking water and safe wastewater discharge.

The growing gap between investment needs and actual capital expenditure is highlighted by the D grades awarded to the nation's water and wastewater infrastructure by the American Society of Civil Engineers. The EPA estimated in 2000 that unless there was real revenue growth of 3 percent per year, there would be a capital shortfall of \$224 billion and an operating shortfall of \$160 billion in water and wastewater expenditure by 2019.

## 6. Contract Operations Market

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### 6.1 Overview

When the US **contract operations market**, often referred to as **public private partnerships** or PPPs, came of age during the 1990s, it appeared promising. But, after a short period of growth, contract operators struggled to fulfil contracts, and the stream of sizable new deals tailed off.

Perhaps, as GWI publisher Christopher Gasson writes, “the fundamental problem with the US water market is that nobody wants to think about it as a market”. That is reflected, for instance, in different fiscal and legal pressures on the public and the private sector. It’s a tough world, but the private operators seem to believe that hard work will lead to good results.

In this section, after a snapshot on the history of the contract operations in the US, we’ll discuss some of the main obstacles, and review experts’ ideas on how to overcome them.

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#### **Commentary: The early days of the market were limited by short contracts.**

**GWI interviewed Gary Miller, Senior Vice President of Business Development & Planning at CH2M Hill OMI**

**Gary Miller:** Typically in the US, this contracting out or outsourcing market is relatively young. It’s really only 35 years old now as compared to Europe where outsourcing has been done for 75 to 100 years. So you have an industry that’s really still in a developing stage somewhat. One of the limitations that we had early on was that most of the contracts that we would have with municipal governments were **limited to five years**.

There was a **rule change** several years ago called 9713, which actually allowed up to **twenty year contracts**. One of the early... challenges with that rule change was that many of the contracts that had been used actually did not change along with that rule change to allow for the 20-year contracts. [This meant] some of the terms and conditions in those contracts were really not applicable to the longer term contracts.

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Although these initial problems of contract length are now largely solved, there is still the matter of convincing municipalities that participation from the private sector is a good thing. As Patrick Cairo points out, it typically takes more than two years to make such an arrangement, which doesn’t fit well with the four year election cycle that the key municipality decision maker participate in. On the bright side, the experience has been that contracts are generally renewed once they are in place.

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#### **Opinion: The four year election cycle for decision makers is a major obstacle.**

**GWI interviewed Patrick Cairo, Executive Vice-President, Strategy and Marketing of United Water**

**Patrick Cairo:** The trend in new starts if you will, new contracts, is still very slow... We’re not satisfied. I think the entire industry of private companies is certainly hoping that it grows to a greater extent. It’s pretty widespread. [The market is] about \$1.5 billion and it encompasses over 2,500 contracts.

The good thing is that for the most part those contracts are **renewed** and stay within the private sector, but it is still a real challenge to convince municipalities to go from public operation to private operation... Whether they’re large or small it takes... over two years of discussions with them to convince everyone that that’s the right thing to do. The difficulty of course is that usually the decision makers here are on a four-year cycle of election. So... we have them convinced and then they start approaching an election so they put it on the drawing board and maybe they’re not reelected and things change.

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Don Correll, CEO of American Water stresses the importance of distinguishing between the “old” five year contract operations, which generally involved just operations and the “new” longer term PPPs, which also include investment in **infrastructure**.

# Water Market USA

## Utility Companies Directory and Projects Directory



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**Population served (water):** 325,000  
**Water pipe network:** 1320 km  
**Utility type:** Water/Wastewater Utility  
**Ownership type:** Public  
**Owner:** Alameda County

**Water sales revenue 2008 (2007):** \$31,291,000 (\$23,625,000)  
**Total revenue 2008 (2007):** \$50,462,000 (\$49,013,000)  
**Total operating costs 2008 (2007):** \$37,733,000 (\$31,751,000)  
**Total assets 2008 (2007):** \$301,229,000 (\$286,784,000)  
**Total liabilities 2008 (2007):** \$20,616,000 (\$25,273,000)  
**Year on year revenue growth:** 3%  
**Year on year operating cost growth:** 19%  
**Operating profit margin:** 25%  
**Average revenue per capita served:** \$155.27  
**Average operating cost per capita served:** \$116.10  
**Average revenue per water connection:** \$391.14  
**Average operating cost per water connection:** \$471.66  
**Operating surplus per water connection:** —\$80.53

## Projects

**Phase II, Brackish Groundwater Desalination Facility**  
**Type:** Desalination Plant  
**Cost:** \$10,141,000  
**Finance:** Part funded by California DWR Desalination Grant (\$2.8m)

## American States Water Company (AWR)

California  
 630 East Foothill Boulevard San Dimas, CA 91773  
 Lloyd E. Ross, Chairman  
**t:** 909—394—3600 **f:** 909—394—1382  
**e:** customerservice@aswater.com  
**w:** <http://www.aswater.com/>

**Population served (water):** 267,000  
**Stormwater drainage:** No  
**Utility type:** Water Utility  
**Ownership type:** Investor owned

## Anaheim Public Utilities

Anaheim California  
 201 South Anaheim Blvd. Anaheim, CA 92805  
 Marcie L. Edwards, General Manager  
**t:** 714—765—3300, 714—765—5137  
**w:** <http://www.anaheim.net/section.asp?id=54>

**Population served (water):** 334,000  
**Water pipe network:** 1207 km  
**Stormwater drainage:** No  
**Utility type:** Water/Energy Utility  
**Ownership type:** Municipal  
**Owner:** Municipality

## Projects

**Nohl Canyon Water Storage Tank**  
**Type:** Multiple  
 A new 10MG Storage Tank to help meet current and future water supply needs  
**Cost:** \$16,000,000  
**Finance:** Bonds  
**Status:** Design  
**Start:** 7—2008  
**Sources:** <http://www.anaheim.net/article.asp?id=1394>

## Antelope Valley—East Kern Water Agency (AVEK)

Antelope Valley—East Kern California  
 Antelope Valley—East Kern Water Agency Boardroom, 6500 W. Avenue N, Palmdale, CA 93551  
 Carl B. Hunter, Jr, Director  
**t:** 661—943—3201  
**w:** <http://www.avek.org/>

**Population served (water):** 500,000  
**Water pipe network:** 870 km  
**Stormwater drainage:** No  
**Utility type:** Bulk Water Supplier  
**Ownership type:** Created by the state of California

## Projects

**Groundwater Recharge Project**  
**Type:** Water — Other  
 Groundwater recharge and storage project. The Proposed project also provides for recovered raw water to be delivered to a storage, treatment and pumping facility.  
**Companies:** Hanson Environmental/Boyle Engineering  
**Status:** Initial Planning  
**Sources:** <http://www.avek.org/Initial%20Study.pdf>

## Apple Valley Ranchos Water Company

Apple Valley California  
 21760 Ottawa Road Apple Valley, CA 92308 P.O. Box 7005 Apple Valley, CA 92307  
 Nyri A. Wheeler—Lewis, Assistant Secretary

# Water Market USA

## Company Profiles and Directory

# Company Profiles and Directory

Company name	Operations and maintenance	Consultant engineer	Design / build / construction	Water Chemicals	Membranes / membrane systems	Membrane manufacturer	Water / wastewater treatment equipment	Network equipment	Other Accessories	Page
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Accusonic Technologies									•	1
ADI International Inc										1
ADS Environmental Services										1
Advance Products & Systems										1
Advanced Valve Technologies LLC										2
AECOM Technology Corporation										2
Aeration Industries International Inc										2
AEROMIX Systems Inc										2
Aerzen USA										2
Airmaster Aerator LLC										2
AirSep Corp										3
Airvac Inc										3
Alfa Laval Inc										3
AllMax Software Inc										3
A-LOK Products Inc										3
American Cast Iron Pipe Co										3
American Engineering Services										3
American Highway Products Ltd.										4
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Analytical Technology Inc										5
Andritz AG										5
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Ashbrook Simon-Hartley										7
Ashcroft Inc.										7
Ashland Inc.										8

Company name	Operations and maintenance	Consultant engineer	Design / build / construction	Water Chemicals	Membranes / membrane systems	Membrane manufacturer	Water / wastewater treatment equipment	Network equipment	Other Accessories	Page
Assured Flow Sales Inc										8
Atara Equipment/Sodimate										8
Atlantic Screen										8
Automata, Inc.										8
Automation Products Group Inc.										8
Badger Meter										9
BakerCorp										9
Baldor Electric Co										9
Basin Water Inc.										9
BDP Industries										9
Belt Collins										9
Bermad Inc										10
Bio-Microbics, Inc.										10
BIOREM Environmental Inc										10
BioShaft Water Technology Inc										10
Biothane Corp										10
BioVir Laboratories, Inc										10
Biwater AEWT										10
BJM Pumps LLC										11
Black & Veatch										11
Blue Angel Pumps										11
Blue Ribbon Sales/Service										11
Blue-White Industries										11
Brentwood Industries										12
Bright Technologies										12
Brown and Caldwell										12
Brown Bear Corporation										12
BW Technologies by Honeywell										12
C.I.M. Industries Inc										12
Caldwell Tanks										12
Calgon Carbon Corp.										13
California Water Services										13
Carollo Engineers										13
Carylon Corp										13
CAT Pumps										13
CB&I										14
CDM										14
CEI-Carbon Enterprises Inc.										14
CH2M Hill										14
CHEMetrics Inc										14
Chemilizer Products Inc										15
Chemineer										15
Chemline Inc										15
Chem-Tainer Industries										15
Chemtrol										15
Chemtura Corp										15

Company name	Operations and maintenance	Consultant engineer	Design / build / construction	Water Chemicals	Membranes / membrane systems	Membrane manufacturer	Water / wastewater treatment equipment	Network equipment	Other Accessories	Page
Christ Water Technology Americas, LLC										15
Cla-Val Co										16
Clearwater Enviro Technologies Inc										16
Clow Valve										16
Cobra Tanks Inc										16
Cole-Parmer										16
Conbraco Industries Inc										16
Connecticut Water Services										17
Consolidated Cos										17
Continental Hydrodyne Systems										17
Control Microsystems										17
Corrosion Control Products Co										17
Corrpro										18
Crane Pumps & Systems										18
Crispin-Multiplex Manufacturing Co										18
Cromaglass Corp										18
Cues Inc										18
Cultec Inc										18
Dakota Instrument										19
Danaher										19
Danfoss Flomatic Corporation										19
DDI Heat Exchangers Inc										19
DEL Ozone										19
Devcon										20
Dewberry										20
DeZURIK Water Controls										20
DHI Water & Environment										20
Dionex										20
Discflo Corporation										20
Doosan Hydro Technology, Inc.										21
Dosatron										21
Doug Meadows Co. LLC										21
Dow Chemical Company										21
Draeger Safety Inc										21
Dresser Roots										21
Duall Division										22
Duke's Root Control, Inc										22
Duperon Corp										22
Dwyer Instruments Inc										22
DYK Incorporated										22
Dynasonics										22
E.H. Wachs										22
Eagle Microsystems Inc										23
Eaton										23
EBAA Iron Sales Inc										23
ECC, LLC										23



Company name	Operations and maintenance	Consultant engineer	Design / build / construction	Water Chemicals	Membranes / membrane systems	Membrane manufacturer	Water / wastewater treatment equipment	Network equipment	Other Accessories	Page
Ecology & Environment Inc										23
Eco-Tec Inc										23
EDI (Environmental Dynamics Inc)										24
EESTech										24
EIMCO Water Technologies										24
Electrolytic Technologies Corp										24
Electronic Systems Design Inc										24
Elster AMCO Water										24
EMA Inc										25
EMCO Flow Systems										25
EMEC Americas, Inc.										25
Emerson Process Management Liquid Analytical										25
Endress + Hauser										25
Energy Recovery Inc.										25
ENPRESS LLC										26
Entech Design Inc										26
Enviroline Group										26
Environetics Inc										26
Environment One Corp										26
Environmental Leverage Inc										26
Enviroquip Inc										26
Erdco Engineering Corp										27
ESRI										27
EXTECH Instruments										27
Fairbanks Morse Pumps										27
Farwest Corrosion Control Co										27
Fibergrate Composite Structures Inc										27
FIBOX Enclosures										27
Filtronics Inc										28
Flo Trend Systems										28
Flomotion										28
Flowserve Corp.										28
Fluid Dynamics International										28
Fluid Imaging Technologies										28
Fluid Metering Inc										29
Fluidyne Corp										29
Fluor Corporation										29
Force Flow Equipment										29
Forestry Suppliers										29
Fournier Industries, Inc.										29
Franklin Miller Inc										30
French Creek Software										30
Gamajet Cleaning Systems Inc										30
Gardner Denver Engineered Products										30
General Electric Co.										30

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Geomembrane Technologies Inc										30
GF Piping Systems										31
GfG Instrumentation Inc										31
Global Water Resources										31
Godwin Pumps of America Inc										31
Golder Associates										32
Gorman-Rupp Company										32
GPM Pumps Inc										32
Graver Technologies Inc (HydroGlobe)										32
Great Plains Industries Inc										32
Greyline Instruments										32
Grundfos Pump Corp										33
H2O Innovation (2000) Inc.										33
Hach Company										33
Halliday Products Inc										33
Halogen Valve Systems Inc										33
Hancor Inc										34
Hanna Instruments USA										34
Harmsco Filtration Products										34
Harn R/O Systems										34
Harrington Inc										34
Harwil Corporation										34
Hawk Measurement Systems										35
Hazen and Sawyer										35
HDR										35
Headworks Inc										35
Healy-Ruff Co LLC										35
Hedland Flow Meter										36
Henry Pratt Co										36
HF Scientific Inc										36
Highland Tank and Manufacturing										36
Hi-Tech Environmental Inc										36
HM Digital Inc										36
Hobas Pipe USA										36
Hoffer Flow Controls Inc										37
Holland Pump/Lobestar										37
Honeywell										37
Huber Technology Inc										37
Hurco Technologies Inc										37
Hydranautics										37
Hydro Instruments										38
Hydro International										38
Hydro-Dyne Engineering Inc										38
Hydroflo										38
Hydromantis										38
Hydropro										38

Company name	Operations and maintenance	Consultant engineer	Design / build / construction	Water Chemicals	Membranes / membrane systems	Membrane manufacturer	Water / wastewater treatment equipment	Network equipment	Other Accessories	Page
IDEXX Water Inc										39
Industrial Test Systems, Inc.										39
Infiltrator Systems Inc										39
In-Pipe Technology Co LLC										39
Insite Instrumentation Group										39
Insituform										39
Integra Chemical Co Inc										40
IPEX										40
Isolux Technologies										40
Itron										40
ITT Corporation										40
J.C. Whitlam Manufacturing Co.										40
Jacobs Engineering Inc.										41
John Crane Mechanical Seals										41
JOWA Consilium US Inc										41
JWC Environmental										41
Kaeser Compressors Inc										41
Keller America Inc										42
Kemira Water Solutions Inc										42
Keystone Filter Division, Met-Pro Corp.										42
Kinetico Inc										42
Kobold Instruments										42
Koch Membrane Systems, Inc.										42
Komline-Sanderson										43
Korea Environmental Preservation Association										43
KPSI Transducers Pressure Systems Inc										43
KROHNE, INC.										43
KSB, Inc.										43
Kupferle Foundry Co										43
Lakeside Equipment Corp										44
LaMotte Company										44
Lantec Products, Inc.										44
Layne Christensen										44
Layne/Verti-Line										44
Lemna Technologies Inc										44
Liquatec										45
LMI Milton Roy										45
Louis Berger Group										45
LUDECA, INC.										45
Lutz – JESCO America Corporation										45
MACE USA										45
Malcolm Pirnie										46
Markland Specialty Engineering Ltd										46
Maser Consulting										46
Mass Transfer Systems										46

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Matrix Utilities										46
Maverick Manufacturing										47
McCrometer										47
McElroy Manufacturing Inc										47
MCL Technology Corp										47
MECO										47
Membrana										47
Merrick & Co										48
Met-Pro Corp										48
Metropolitan Industries, Inc.										48
Mettler-Toledo Thornton										48
Michael Baker Corp										48
Middlesex Water										49
Miller-Leaman Inc										49
Milliken Valve Co										49
Millipore										49
Milton Roy										49
MIOX Corporation										49
MISSION Communications										50
Moyno, Inc.										50
MSA Professional Services										50
Mueller Water Products										50
MultiTrove Inc-USA										50
Municipal Solutions										50
MWH Global										51
MWI Corp										51
Myers										51
Myron L Company										51
Nalco										51
Natgun Corp										52
National Liner										52
National Oilwell Varco										52
National Pump Co LLC										52
NEFCO Inc										52
Neptune Chemical Pump Co Inc										52
Neptune Technology Group										52
Netzsch Inc										53
Niagara Conservation										53
Noren Products Inc										53
Norit Americas Inc.										53
Norma Products										53
Northern Lake Service Inc										53
OCV Control Valves										54
OI Analytical										54
Omega Engineering Inc										54
OMI Industries										54

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Onyx Valve Co										54
OPS Systems Inc.										54
Orbeco Hellige										55
Orica Watercare Inc										55
Orival Water Filters										55
Ozonla North America										55
Pacific Ozone Technology										55
Palintest										55
Pall Corporation										56
Parker Hannifin Corp										56
Parkson Corporation										56
Parsons Brinckerhoff										56
PAX Water Technologies, Inc.										56
PBS&J										57
Peabody Engineered Tank Systems										57
Peerless Pump										57
Penn Valley Pump Co										57
Pennichuck Corp										57
Pentair										58
Pepcon Systems										58
PeriFlo Pumps										58
PerkinElmer										58
Philadelphia Mixing Solutions Ltd										59
Phoenix Process Equipment Co.										59
PICO Holdings										59
Pioneer Water Tanks										59
Plast-O-Matic Valves Inc										59
Preload Inc										59
Primary Fluid Systems Inc										59
Princo Instruments Inc										60
Prism Visual Software Inc.										60
Pristine Water Solutions										60
Proco Products Inc										60
ProMinent Fluid Controls Inc										60
Prominent Systems, Inc										60
Pulsafeede										61
Pulsar, Inc. (Pulsar Process Measurement Ltd )										61
Pump Engineering. Inc.										61
Purafil, Inc										61
Pure Aqua Inc.										61
PureGen Technology (China) Inc.										61
Quantum Compliance Systems Inc.										62
Ques Industries Inc										62
RACO Manufacturing & Engineering Co.										62
Rain for Rent										62

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Rapid View LLC										62
RDP Technologies Inc										62
Real Tech Inc										62
RED Flint Sand and Gravel										63
Red Valve Co Inc										63
Renaissance Instruments Inc										63
Revere Control Systems										63
Richards Industries										63
Robo-Control										63
Rockwell Automation										63
Rodney Hunt Co										64
Romtec Utilities Inc										64
Rotork Controls Inc										64
SAF-T-FLO Chemical Injection										64
Sauereisen Inc										64
Scaleton Industries Ltd										64
Schlumberger Water Services										64
Schneider Electric										65
Seametrics										65
SEC Group Inc										65
See Water										65
seepex Inc										65
Selwood Limited										65
Serfilco										65
Serpentix Conveyor Corp										65
Sethco Division										66
Severn Trent Services										66
Shanley Pump/Liberty Process										66
Shelco Filters										66
Siemens AG										66
Sigma Corp										67
Singer Valve Inc										67
Sioux Corporation										67
SJE-Rhombus										67
SJW Corp.										67
Solar Bee (Pump Systems)										67
Solinst Canada Ltd.										68
Solvay Solutions, Inc.										68
Sonic Solutions LLC										68
Southwest Water										68
Spears Manufacturing Co Inc										68
Spencer Turbine										69
Sprayroq Inc										69
SPX Valves & Controls										69
SRS Crisafulli, Inc.										69
Stahlin Enclosures										69



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STANLEY CONSULTANTS INC.										69
Muscatine, Iowa E										
Stantec Consulting										69
Stenner Pump										70
Stevens Water Monitoring Systems Inc										70
STI Controls LP										70
Strategic Diagnostics Inc										70
Strongwell										70
STV GROUP INC., New York, N.Y.† EA										70
SubSurface Leak Detection Inc										70
Suez Environnement										71
Sulzer Pumps Ltd										71
Suntree Technologies Inc										71
Superior Tank Co., Inc.										71
Swan Analytical Instruments										72
Synagro										72
Tank Connection										72
Taylor Technologies Inc										72
Teledyne Isco										72
Telog Instruments, Inc.										72
Temcor										72
Terracon Consultants										73
Tetra Tech Inc.										73
Thermo Fisher Scientific										73
Thompson Pump and Manufacturing Co										73
Tideflex Technologies										73
TIGHE & BOND INC., Westfield, Mass. E										74
Tnemec Co Inc										74
Tomlinson Industries										74
Tonka Equipment Co										74
Topp Industries, Inc.										74
Toray Membrane USA, Inc.(TMUS)										74
Trihedral Engineering Ltd										74
Trojan Technologies										75
Troy Valve										75
Trumbull Industries										75
Turck Inc										75
Turner Designs Inc										75
Tuthill Pump Group										75
Tyco										75
Ultraflote Corp										76
Universal Flow Monitors										76
URS Corp.										76
US Peroxide										76
Vactor Manufacturing										76
Val-Matic Valve & Manufacturing Corp.										76

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Valve and Filter Corp/VAF										77
Vanton Pump and Equipment Corp										77
Varec Biogas										77
Vaughan Co Inc										77
Veolia Water										77
Veris Inc										78
Videx Inc										78
Viking Chains Inc/VC Chains Corp										78
Vulcan Industries Inc										78
Vynckier Enclosure Systems Inc										78
Wachs										78
Wade Trim, Detroit, Mich.										78
Walchem Corporation										79
Walker Process Equipment										79
Wallingford Software Ltd										79
Waterloo Biofilter Systems Inc.										79
Watson-Marlow Bredel Pumps Inc										79
Watts Water Technologies, Inc.										79
WestTech Engineering Inc.										79
Westfall Manufacturing Company										80
Weston Solutions Inc										80
WIKA Instrument Corp										80
WILO EMU USA LLC										80
Wonderware										80
WTW										80
Xerxes Corp										80
XP Software										81
York Water										81
YSI Inc										81
Zoeller Co										81
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# Water Market USA

## Desalination and Reuse Inventory and Tracker

## Desalination and Reuse Inventory and Tracker

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Desalination plant inventory	13
Reuse facility inventory	83

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# Current and future desalination projects

Project	Plant	Contact	Client	Expected cost	Project Structure	Status (GWI Desal Tracker, May 2009)
Bay Area Regional Desalination Project (BARDP), CA			Bay Area Regional Desalination Project Partners, East Bay Municipal Utility District (EBMUD), San Francisco Public Utilities Commission (SFPUC), the Santa Clara Valley Water District (SCVWD) and Contra Costa Water District (CCWD)			
Brownsville, TX						On 30 December 2008, NRS published the Texas Seawater Desalination Demonstration Project pilot study for the Texas State Water Development Board (TWDB). Seawater desalination is technically feasible, but more expensive than previously thought. The Brownsville Public Utilities Board therefore proposed to construct a second, bigger 2.5 MGD (9,500m <sup>3</sup> /d) pilot plant for a total estimated cost of \$67 million. The financing package will include a \$20 million loan from the TWDB, a \$28.2 million grant from the state, and \$19.3 million from the TWDB State Participation Fund.
Calleguas Creek, CA					The Department of Water Resources will underwrite half the cost for the City of Camarillo	
Cambria, CA				\$13.7 million		A 3,300m <sup>3</sup> /d SWRO plant is planned using subsurface wells, at either San Simeon Creek, or Santa Rosa to the south. A geotechnical study is planned at Santa Rosa to assess the site's suitability, but an environmental assessment for this preliminary site work must be completed first by the US Army Corps of Engineers. The study will probably be started in September 2009 and will take around six months to complete. The schedule of the tender process and construction will depend on financing and the outcome of the environmental and technical studies.