

- **Board of Directors**  
**Water Planning and Resources Committee**

December 12, 2000 Board Meeting

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**10-3**

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**Subject**

Report on seawater desalination activities

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**Description**

At its August 21, 2000 meeting, the Board directed staff to undertake several tasks for seawater desalination. This information letter specifically reports on the following tasks:

- Comprehensive review of activities carried out under the 1995 seawater desalination policy principles.
- Survey of member agency seawater desalination projects.
- Coordinated legislative activities with member agencies to generate support for state and federal funding of seawater desalination projects.

A summary of the attachments for each of these tasks is provided below.

**Activities From 1995 Policy Principles.** At its February 8, 2000 meeting, the Board reviewed an information letter ([Attachment 1](#)) that provided an abbreviated summary of Metropolitan’s involvement with seawater desalination, an overview of Metropolitan’s Ormond Beach property, and the July 18, 1995 board letter “Adoption of Policy Statement and Principles for Seawater Desalination.” [Attachment 2](#) updates the status of Metropolitan’s Parsons and Israel Desalination Engineering (Parsons/IDE) partnership. For the Ormond Beach property, Metropolitan staff continues to work with the Community Development Commission of Oxnard in evaluating different alternatives for that property.

**Survey Of Member Agency Seawater Desalination Projects.** At the September 22, 2000 member agency managers’ meeting, Metropolitan staff provided a list of project-specific information that would be solicited from those member agencies who were either undertaking seawater desalination projects or were aware of a seawater desalination project in their service area. The survey information is summarized in [Attachment 3](#).

Additionally, Metropolitan staff has prepared a comprehensive description of the Tampa, Florida seawater desalination project. This project description can aid member agencies in their decisions on seawater desalination by serving as a program or project “check-list” of items to be considered in the development of their projects.

**Legislative Activities.** Metropolitan staff has begun coordinating with member agency representatives to address the need for short-term actions and longer-term strategies for seawater desalination at both the state and federal level. These activities have included extensive coordination to assist in identifying funding sources in the current federal legislative session. Additionally, staff has begun identifying what strategies to undertake with the member agencies for the next state and federal legislative sessions, with the objective of building understanding and support for seawater desalination.

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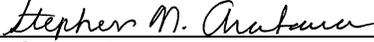
**Policy**

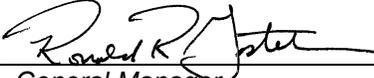
Prior Board direction provided by board letter dated July 18, 1995.

**Fiscal Impact**

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None.

 Stephen N. Arakawa Manager, Water Resource Management	11/17/2000 <i>Date</i>
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 General Manager	11/18/2000 <i>Date</i>
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**Attachment 1 – Previous Board Letter 10-6, February 8, 2000**

**Attachment 2 – Parsons – IDE Joint Venture Update**

**Attachment 3 – Survey of Member Agency Seawater Desalination Projects**

BLA#413



## Board Report on Seawater Desalination, November 14, 2000

- **Board of Directors**  
**Water Planning and Resources Committee**

February 8, 2000 Board Meeting

10-6

**Subject**

Integrating Metropolitan's Seawater Desalination Activities

**Description**

Metropolitan has explored the potential of seawater desalination as a water supply for Southern California over the past several decades. In 1995, the Board adopted a policy that established a lead role for Metropolitan in the development and demonstration of seawater desalination.

Since 1990, Metropolitan has conducted research in seawater desalination technology. This effort recently culminated in the completed design of a generic Vertical-Tube-Evaporation Multiple-Effect-Distillation (VTE-MED) plant by Parsons Overseas Company and Israel Desalination Engineering (Parsons/IDE). This effort was jointly funded by Metropolitan and the U.S./Israel Science and Technology Foundation. In 1998, Metropolitan also purchased property at Ormond Beach in Ventura County that could serve as a future desalination plant site. These efforts have been prompted by the impacts of periodic droughts, investigations into diversifying conventional water supply and public interest in tapping the Pacific Ocean as a limitless source of drinking water.

To date, high costs and environmental concerns have distinguished seawater desalination opportunities from traditional, more cost-competitive resource options. As part of the 1996 Integrated Resource Plan (IRP), Metropolitan evaluated the cost of seawater desalination and excluded it as a supply element at least through 2020. However, recent advances in reverse osmosis (RO) membrane technology are improving efficiencies to a point where seawater desalination may be more competitive within the foreseeable future.

Staff's initial assessment of seawater desalination is that it appears best suited for local development by communities bordering the Pacific Ocean, consistent with the water recycling and groundwater desalination components of the current IRP. Metropolitan is in a unique position to both assess the regional merits of seawater desalination as it updates its IRP and aid local agency decisions regarding development of new projects. Metropolitan could extend its valuable water quality treatment and engineering expertise to support technical assessments initiated by member agencies. Additionally, Metropolitan could leverage its research efforts by partnering with member agencies and others in programs similar to the existing Desalination Research and Innovation Partnership (DRIP) program which currently focuses on brackish groundwater, Colorado River water and reclaimed water.

Recently, the Board has considered policy principles as part of its strategic planning process. It is timely that Metropolitan review its role in seawater desalination as it finalizes its strategic plan over the next several months.

To accomplish this, staff will provide over the next several months an assessment of Metropolitan's investments and opportunities in seawater desalination, provide strategic planning implications, and propose options for Board consideration and action regarding the following items:

- Revised policy principles for seawater desalination.
- Disposition of Metropolitan's Ormond Beach property.
- Future activities related to VTE-MED technology.

- Proposed approach for further research efforts in seawater desalination.

In advance of discussion of those items, the following background materials are attached:

- Abbreviated Summary of Metropolitan's Involvement in Seawater Desalination ([Attachment 1](#)).
- Overview of Metropolitan's Ormond Beach property ([Attachment 2](#)).
- July 18, 1995 Board letter, "Adoption of Policy Statement and Principles for Seawater Desalination." ([Attachment 3](#)).

## Policy

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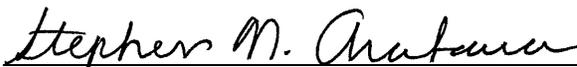
Prior Board direction provided by Board letter dated July 18, 1995.

## Fiscal Impact

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**Status Quo.** Under its currently adopted policy principles, Metropolitan could commit to capital-intensive research and demonstration of seawater desalination technology, the costs for which might be partially but not completely mitigated through public/private partnerships. Metropolitan could also commit to long-term retention of land it now owns for construction of a desalination plant at some undetermined future date. Metropolitan's proprietary rights, under the marketing agreement with the Parsons/IDE joint venture, might yield a revenue stream, depending upon future sales of the technology.

**Revised Approach.** A new approach for seawater desalination, in conjunction with the strategic plan, could define the relationship between Metropolitan, member agencies, and third parties for the research and development of this supply option, including financial participation by Metropolitan. Revising Metropolitan's policy principles to reflect this new approach would provide an integrated approach to previously undertaken activities such as the Parsons/IDE joint venture and the Ormond Beach property, as well as establish direction for future research and partnership efforts with member agencies and others. An integrated approach would ensure that Metropolitan's investments in seawater desalination are being made in a cost-effective manner.



Stephen N. Arakawa  
Acting Manager, Water Resource Management

1/21/00

Date



General Manager

1/24/2000

Date

[Attachment 1](#)

[Attachment 2](#)

[Attachment 3](#)

**Attachment 1****Abbreviated Summary of Metropolitan's Involvement with Seawater Desalination**

**1965-1968:** Metropolitan and a consortium of the federal government and Southern California electric utilities entered into agreements to determine the feasibility of developing an off-shore nuclear power/desalination facility known as the Bolsa Island Project. The electric utilities withdrew after cost projections increased. Metropolitan and the federal government continued the investigation.

**1974:** Metropolitan purchased 82 acres of land adjacent to Bolsa Chica State Beach in Orange County for an access corridor to the potential Bolsa Island project. The concept was subsequently abandoned and the Metropolitan's land was sold in 1997.

**1993-1995:** Metropolitan joined Central Basin MWD, West Basin MWD, Southern California Edison (SCE), the City of Long Beach and the Water Replenishment District of Southern California to investigate the feasibility of developing a seawater desalination facility at an existing SCE power plant in coastal Los Angeles County. A feasible alternative was not identified and the study was suspended.

**1990-1996:** Metropolitan conducted research and preliminary design to develop an innovative seawater desalination technology that can be applied to large-scale applications. Included in this work was the construction and operation of a 2,000 gallon per day test unit at the SCE's Huntington Beach Power Plant. This test demonstrated operational features of the new Vertical-Tube-Evaporation Multiple-Effect-Distillation (VTE-MED) distillation process.

**1993-1995:** Metropolitan evaluated the cost of seawater desalination and excluded it as a supply element of its Integrated Resources Plan extending through the year 2020.

**1995:** Metropolitan adopted a policy to promote and lead in the research, development and demonstration of improved seawater desalination technologies.

**1996-1998:** Metropolitan and the U.S./Israel Science and Technology Foundation co-funded the joint venture of Parsons Overseas Company and Israel Desalination Engineering (Parsons/IDE) to design a generic, non-site specific 12.6 MGD demonstration-scale seawater desalination plant based on the VTE-MED technology.

**1998:** Metropolitan acquired a 50 percent interest in 309 acres at Ormond Beach near Oxnard, with 20 of the acres targeted as a potential seawater desalination site. The Community Development Commission of Oxnard owns the remaining 50 percent interest.

**1999:** Parsons/IDE begin worldwide commercialization activities for the new VTE-MED distillation seawater desalination technology under a currently open agreement with Metropolitan.

**Attachment 2****Overview of Metropolitan's Ormond Beach Property**

The Ormond Beach property in Oxnard consists of approximately 309 acres and was purchased for \$10,200,000 in August 1998. Metropolitan owns an undivided 50 percent in this property with the Community Development Commission (CDC) of Oxnard as the 50 percent tenant-in-common. Metropolitan holds a note secured with a deed of trust for one-half the acquisition and due-diligence costs (\$5,212,081). The property currently generates \$87,000 annually via an agricultural land lease.

The Urban Land Institute recently completed its advisory study regarding strategies for optimizing land utilization in the Ormond Beach environs. Metropolitan and the CDC are analyzing this report for potential development of the property in conjunction with the larger Specific Plan area of 1,400 acres. The jurisdictional wetlands delineation maps/report are being finalized in order to determine the magnitude of useable acres.

Twenty (20) acres of the Metropolitan/CDC property has been designated for a desalination facility. The site is adjacent to the Ormond Beach Power Generating Station, which was recently sold by Southern California Edison to Houston Industries. An additional thirty (30) acres may be selected, at Metropolitan's sole option, during the next two years for further expansion purposes. Integration points for product water from a future desalination facility potentially include the City of Oxnard's proximate 45-inch main (20-mgd capacity) and the 39-inch Calleguas Oxnard-Santa Rosa Feeder (20-mgd capacity). At this point, Calleguas Municipal Water District, the most proximate member agency, has indicated no interest or need for this project.

Staff is continuing to evaluate numerous alternatives for desalination use of this land, including the following:

- pursue the establishment of a sea-water desalination plant
- sale of the property
- exchange/trade the property for another desalination site

In its feasibility analyses Metropolitan will also consider options for divestiture(s) of portions of the property, interim uses, and/or long-term revenue ground leases.

**Attachment 3**

APPROVED  
by the Board of Directors of  
The Metropolitan Water District  
of Southern California  
at its meeting held

41539

AUG 22 1995

Revised 8-6



**MWD**

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

*Karen E. DeWitt*  
EXECUTIVE SECRETARY

July 18, 1995

To: Board of Directors (Executive Committee--Action)  
 (Ad Hoc Committee on Energy and Desalination--Action)  
 (Committee on Legislation--Action)  
 (Engineering and Operations Committee--Action)

From: General Manager

Subject: Adoption of Policy Statement and Principles for Seawater Desalination

**RECOMMENDATION:**

It is recommended that the Board adopt a seawater desalination policy statement and principles as stated in this letter.

John R. Wodraska  
General Manager

Submitted by:

*Gary M. Snyder*  
for Gary M. Snyder  
Chief Engineer

Concur:

*for*  
*[Signature]*  
John R. Wodraska  
General Manager

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**SUMMARY:**

A Board policy is needed to guide the staff's work on seawater desalination. Metropolitan is Southern California's lead agency in regional water development and may become a significant consumer of desalinated seawater in the next century. In the past, Metropolitan has supported non-controversial legislation pertaining to funding of desalination research and development. In 1990, the Board of Directors authorized the Seawater Desalination Demonstration Project and funds the project as each phase is evaluated. In May 1995, the Board of Directors passed "A Resolution in Support of Desalination Technology" which was included as part of a research and development grant application to the United States Department of Commerce. Metropolitan wishes to continue to participate with national and international organizations to lead and promote the demonstration of seawater desalination technologies. These activities may be in conjunction with the private or public sectors. Newly proposed projects will be evaluated on a case-by-case basis and presented to the Board of Directors on a continuing basis.

**ISSUE**

Metropolitan is Southern California's lead agency in regional water development and may become a significant consumer of desalination water in the next century.

**Should Metropolitan continue to lead and coordinate seawater desalination activities and programs including the pursuit of legislation to fund research and demonstration?**

**BACKGROUND**

For nearly forty years, Metropolitan and its Member Agencies have explored the viability of desalinating seawater. While more than adequate supplies of seawater are available and reliable, the costs to produce potable water using traditional desalting methods is far more costly than other existing sources.

There is significant world-wide interest for an economically feasible method to produce desalinated seawater. Desalination gained popularity in the 1990's as the public became keenly aware of drought and its environmental impact. In support of this work by both the public and private sectors, members of Congress have introduced legislation to provide research and development funding.

In keeping abreast with the technology in this arena, Metropolitan developed a conceptual design of an enhanced seawater distillation process. And in 1990, Metropolitan's Board of Directors authorized the exploration of a new, cost-competitive method of seawater desalination, The Seawater Desalination Demonstration Project. Funding is granted by the Board of Directors only after each phase of the project is evaluated and reviewed. A special Board Ad Hoc Committee on Energy and Desalination advises and monitors project activity.

The Seawater Desalination Demonstration Project is a three-phase program that includes preliminary engineering with a 2,000 gallon-per-day test unit, final design, and development and construction of a 5 million-gallon-per-day (mgd) demonstration plant. Total costs of this

multi-year program are estimated at \$35 million. Thus far, Metropolitan has committed \$5 million to finance the costs of the preliminary design of the 5-mgd plant and for the design and construction of the 2,000 gallon-per-day test plant. This will serve as a prototype for a future, full-size 75 mgd plant.

Last May, Metropolitan pursued opportunities to help defray \$4 million of the remaining design costs of the demonstration plant through the use of research and development grant funds from the United States-Israel Science and Technology Program administered by the Department of Commerce. Metropolitan joined with the Ralph M. Parsons Company and the Israel Desalination Engineering Company in preparing a grant proposal which was submitted May 19.

#### **METROPOLITAN POSITIONS**

In the past, Metropolitan has supported non-controversial legislation pertaining to funding of desalination research and development technology.

Metropolitan has also encouraged member agencies to develop alternative sources of water through its Local Projects and Groundwater Recovery Programs and through such programs as the Central Basin Municipal Water District's Long Beach Desalination Project.

In support of Metropolitan's Seawater Desalination Demonstration Project, the Board of Directors adopted a "Resolution in Support of Desalination Technology" at its regularly scheduled meeting May 9, 1995. The adopted resolution states:

**Whereas**, Metropolitan meets supplemental water demands of 16 million people living in a six-county region of Southern California, is one of the largest water suppliers in the world, and is the lead agency in the region's integrated water resource planning and management efforts that include seawater desalination as a potential local water supply, and

**Whereas**, Metropolitan may become a significant consumer of desalinated seawater in the next century, it has an incentive to invest in developing cost-competitive technologies, and

**Whereas**, Metropolitan has analyzed seawater desalination projects throughout the world and has found that the actual costs of currently operating seawater desalination plants and the cost estimates for new seawater desalination plants are not cost-competitive with Southern California's traditional sources of water supplies, and

**Whereas**, in 1990 Metropolitan authorized the initiation of the Seawater Desalination Demonstration Project and has since committed \$5 million to complete the preliminary design of a large capacity seawater desalination facility that incorporates a new technology and to design, build, and operate a 2,000 gallon-per-day test unit which is currently in operation, and

**Whereas**, the Preliminary Design Report was completed in 1993, a test unit is now installed and preliminary test results of the new technology are very promising in producing cost-competitive drinking water,

**NOW THEREFORE**, the Board of Directors of the Metropolitan Water District of Southern California does hereby resolve to:

PROVIDE FUNDS TO CONTINUE PURSUIT OF A NEW COST-COMPETITIVE SEAWATER DESALINATION TECHNOLOGY VERIFIED THROUGH THE DESIGN, CONSTRUCTION, AND OPERATION OF A 5-MILLION-GALLON-PER-DAY DESALINATION PLANT.

**RECOMMENDED POLICY AND PRINCIPLES**

It is recommended that the Board adopt the following policy and principles:

Policy

Metropolitan, in cooperation with national and international organizations, shall promote and lead in the development and demonstration of improved seawater desalination technologies. These activities and/or programs may be in conjunction with its member agencies and/or private and public sectors in order to provide additional, reliable potable water supplies to meet the projected demands of Southern California's growing population in the 21st century.

Principles

- 1) Metropolitan shall continue to play a leadership role in the research and demonstration of seawater desalination technology.
- 2) Metropolitan shall continue its effort to obtain research and development funding for projects from all external sources.
- 3) Metropolitan shall protect its intellectual property rights and install and maintain internal procedures to help ensure protection.
- 4) Metropolitan shall develop a broad coalition of public and private entities to share non-protected information, discuss opportunities and the transfer of technology, and to encourage the passage of legislation consistent with this policy.
- 5) Metropolitan staff shall evaluate each seawater desalination project proposal on its own merits, and submit an analysis with recommendations to the Ad Hoc Committee on Energy and Desalination.

With the adoption of this policy and principles, Metropolitan will continue to coordinate all related activities within its various divisions, departments and member agencies and ensure appropriate outreach to external participants.

## Parsons – IDE Joint Venture Update

### Background

From 1990 to 1996 Metropolitan conducted research and preliminary design activities to develop an innovative seawater desalination technology that can be applied to large-scale applications. The result of these investigations and research led Metropolitan to pursue thermal type seawater desalination. As part of these activities Metropolitan also constructed and operated a 2,000 gallon per day pilot scale test unit located at Southern California Edison's Huntington Beach Power Station. This pilot scale test unit was used to verify operational features of the new Vertical Tube Evaporation Multiple Effect Distillation (VTE-MED) desalination distillation process.

In 1996, to further develop VTE-MED desalination technology, Metropolitan and the United States - Israel Science and Technology Foundation co-funded the design by a joint venture of Parsons Overseas Company (Parsons) and Israel Desalination Engineering (IDE) (Joint Venture) in the amount of \$4 million each a generic, non-site specific, 12.6 MGD demonstration-scale seawater desalination plant based on the VTE-MED technology that Metropolitan had developed. A key feature of the design was the use of innovative materials to reduce the costs of seawater desalination.

In funding the demonstration plant design effort, Metropolitan shared with the Joint Venture, the technologies and research data that it had developed to support the development of a viable VTE-MED facility and gave the Joint Venture the exclusive right to market the technology. In return, the Joint Venture agreed to provide Metropolitan with a 20 percent share of profits derived from the sale of the designs or any plant construction to other entities.

In 1996 the Parsons – IDE Joint Venture contracted with Metropolitan to provide sub-consultant engineering design services valued at \$1.7 million dollars as part of the development of the 12.6 MGD demonstration design.

Under appropriation No. 15167, a total of \$11,950,000 has been appropriated for the efforts described above. The amount spent to date is approximately \$11,195,000.

### Agreements

The project involved the four agreements listed below:

- a. **Agreement with Southern California Edison:** This agreement allowed Metropolitan to construct and operate a research test unit at Southern California Edison's Huntington Beach thermal power station. The research pilot plant has been dismantled at Southern California Edison's request in order for them to complete the sale of the power station to another entity. The Agreement is closed.
- b. **Design and Marketing Services Agreement with the Parsons – IDE Joint Venture:** The contract between Metropolitan and the Parsons – IDE Joint Venture is currently open. Under this agreement, Metropolitan agreed to provide 50 percent of the funds (\$4 million) required to design a generic 12.6 MGD VTE-MED desalination plant. The design is complete. Upon construction of a demonstration unit, the Agreement shall remain in force for a period of 15 years. No such demonstration plant has been built. Under the terms of the Agreement,

Metropolitan will receive a 20 percent share of the profits from the sale of a VTE-MED desalination design unit.

- c. **Agreement between Parsons – IDE Joint Venture and Metropolitan to provide design services:** This agreement sub-contracted to Metropolitan the design of all supporting facilities, connections between the site and the power plant and control systems for operations of the plant. Metropolitan successfully completed the tasks in this agreement and received \$1.7 million dollars for services rendered. The contract is closed.
- d. **Agreement with Parsons Corporation for Site Selection:** This contract for \$150,000 tasked Parsons Corporation to prepare a report which investigated several potential VTE-MED sites in the southern California region and estimate the costs for a reduced height VTE-MED desalination plant. Currently, the agreement is open and Parsons has prepared a draft report of 13 potential desalination plant sites.

### **Conclusion**

Metropolitan's past effort focused on reducing the cost of seawater desalination. To reach that goal, Metropolitan's efforts focused on encouraging desalination research, developing technical innovations and forming partnerships with governmental and private sector entities to reduce costs.

To date, Metropolitan's development efforts have focused on VTE-MED thermal desalination technology. This focus led Metropolitan to develop specific technical innovations intended to reduce the cost of VTE-MED desalination plants. The result of this effort has been the creation of a non-site specific, VTE-MED desalination plant design. Metropolitan has also worked to protect the intellectual property rights it developed through this effort. Metropolitan signed the design and marketing services agreement with the Parsons IDE – Joint Venture to obtain a share in the profits should a sale of the VTE-MED technology occur. At this point, no further action is required by Metropolitan to receive profits from sales of this technology.

While Metropolitan has pursued VTE-MED technology, it has always been open to reviewing and assessing other competing desalination technologies. Today, it appears that there are large advances being made in many different areas of seawater desalination. As such, Metropolitan's and the Southern California Region's (Region) best interests may be served by competitively soliciting the most cost-effective technology from the private sector.

## **Survey of Member Agency Seawater Desalination Projects December 2000**

### **Introduction**

The information provided below provides a brief survey of member agencies that are considering seawater desalination projects in their service area. The survey information is the result of direct meetings and phone conversations between Metropolitan and member agency staff.

In general, the projects listed below are in various stages of preliminary studies, either environmental, feasibility or conceptual. Calleguas is listed in the survey as a result of Metropolitan's ownership of the Ormond Beach property.

Additionally, Metropolitan staff have conducted phone interviews with South West Florida Water Management District (SWFMWD) and reviewed information from Tampa Bay Water to obtain similar survey information for the Tampa, Florida seawater desalination project. The information is subject to confirmation by Tampa Bay Water.

### **Survey Results**

#### **1. Agency Name:** City of Long Beach

**Project Proponents:** City of Long Beach

**Project Description:**

- Yield – potentially between 25 – 40 million gallons per day
- Both local distribution and regional distribution by Metropolitan
- Treated water supply
- One potential site being considered with another as alternative site

**Estimated Project Cost:**

Unit cost estimates range between approximately \$800 - \$850 per acre-foot, depending upon capacity. Unit cost does not include any additional pipeline distribution costs.

**Estimated Operations, Maintenance, Power, and Replacement Costs:**

Project concept is a water purchase contract such that operations, maintenance, power, and replacement costs are captured in the unit charge for water purchased.

**Infrastructure requirements:**

Project concept seeks to utilize existing infrastructure to the greatest extent possible, although some regional infrastructure will be required. Local infrastructure will also be necessary.

**Project Schedule / Status:**

Possible project time horizon of approximately three years. Environmental documentation and site analyses are underway.

2. **Agency Name:** San Diego County Water Authority

**Project Proponents:** City of Carlsbad (two sites) and San Diego County Water Authority (Authority)(one site)

**Project Description:**

- Yield – range of plant sizes being considered with a minimum size of 25 million gallons per day for the City of Carlsbad
- Local distribution and regional distribution within Authority service area
- Treated water supply
- Two sites under consideration for City of Carlsbad, Authority has also considered one additional site.

**Estimated Project Cost:**

No estimate available at this time.

**Estimated Operations, Maintenance, Power, and Replacement Costs:**

No estimate available at this time.

**Infrastructure requirements:**

Potentially additional infrastructure may be required.

**Project Schedule / Status:**

For the Carlsbad sites, a feasibility study has already begun which will take approximately 12 months to complete.

3. **Agency Name:** Municipal Water District of Orange County

**Project Proponents:** Municipal Water District of Orange County

**Project Description:**

- Yield – approximately 40 million gallons per day
- Local distribution – three potential options for local distribution
- Treated water supply
- Two potential site locations

**Estimated Project Cost:**

Between \$750 and \$800 per acre-foot total cost conceptually estimated at the Huntington Beach site (using existing intake and outfall facilities). Unit cost does not include any additional pipeline distribution costs.

**Estimated Operations, Maintenance, Power, and Replacement Costs:**

Project concept is a water purchase contract such that operations, maintenance, power, and replacement costs are captured in the unit charge for water purchased.

**Infrastructure requirements:**

Not available at this time.

**Project Schedule / Status:**

MWDOC Board is considering moving forward with the project or pursuing preservation of the site for future consideration by January 2001.

4. **Agency Name:** West Basin Municipal Water District

**Project Proponents:** West Basin Municipal Water District

**Project Description:**

- Yield – potentially between 5 to 10 million gallons per day
- Local distribution and/or regional distribution: Undetermined at this time
- Treated, non-interruptible water supply
- Two potential sites being considered

**Estimated Project Cost:**

Between \$30 million and \$50 million (exclusive of any additional pipeline distribution costs).

**Estimated Operations, Maintenance, Power, and Replacement Costs:**

\$2 million to \$5 million per year

**Infrastructure requirements:**

Connecting piping.

**Project Schedule / Status:**

Schedule undetermined at this time.

5. **Agency Name:** Calleguas MWD

**Project Proponents:** None. Calleguas MWD has previously expressed no interest or need for the Ormond Beach project.

**Project Description:**

- Metropolitan's Ormond Beach property would be a potential site.

**Estimated Project Cost:**

N/A

**Estimated Operations, Maintenance, Power, and Replacement Costs:**

N/A

**Infrastructure requirements:**

N/A

**Project Schedule / Status:**

N/A

**Tampa Bay Water Project Status**

In the Tampa Bay region, increase in groundwater withdrawals have resulted in unacceptable environmental impacts. Because of these impacts and the need for additional fresh water,

seawater desalination was identified as one of the sustainable drought-proof sources of water that is in abundant supply and can be developed without adversely impacting the environment. This project, along with several others will produce water to meet growing demands and enable regional wellfields to reduce their withdrawals from 158 mgd to 90 mgd by 2007.

**Project Proponents:** Tampa Bay Water  
South West Florida Water Management District (SWFWMD)

**Project Description:**

- A Reverse Osmosis seawater desalination plant producing potable water, co-located at the existing Big Bend power generation facility, located in Apollo Beach, Florida.
- The initial plant will produce 25 mgd of potable water. This facility design and associated infrastructure are sized for a potential future expansion of 10 mgd, to raise the total production potential to 35 mgd of potable water.

**Estimated Project Cost:**

The cost of water is based on a fixed cost for delivered water priced at approximately \$600/acre-foot net. This cost is based on several project features, which include:

- Low salinity levels - 26,000 ppm;
- Interruptible electrical power costs of \$0.04 Kwh;
- The seawater is heated as part of the thermal power station cooling process;
- Use of tax-exempt private activity bonds;
- Amortization of financing over the 30-year contract period; and
- Use of the power plant's existing cooling water intake and discharge pipeline.

A cost reduction of approximately 60 cents per 1000 gallons will be realized due to funding from the Southwest Florida Water Management District (90 percent of the eligible capital cost, up to \$85 million). This will reduce the contracted 30 year average cost of water from \$2.08 per 1000 gallons to \$1.48 per 1000 gallons.

**Estimated Operations, Maintenance, Power, and Replacement Costs:**

The 25-mgd facility was contracted for \$94.5 million. However, the contract does allow for price escalation due to factors that are beyond the control of the developer, such as the purchase price of electricity, and fuel.

**Infrastructure requirements:**

A new pipeline must be built to transport product water from the plant to a delivery point. The pipeline is 42 inches in diameter, 14 mile long and is sized for 35 MGD. The pipeline is included in the \$600/acre-foot net price.

**Project Schedule / Status:**

- The project's current schedule calls for water production to begin no later than December 31, 2002.
- The project is one of several projects that are being implemented to address water demand increases and groundwater overpumping problems. Other projects include a reservoir, conservation programs, and wastewater reclamation programs.

- An Owner's-Engineer was hired to develop a request for proposals document and to assist in evaluating the proposals received. SWFWMD paid for a portion of the RFP documents and parts of the selection process.
- The contract selection required the use of existing technologies, although VTE-MED technology was proposed in one of the proposals for future phases.
- The construction contract awarded to the winning firm is a performance-based contract.
- Private Activity Bonds will be used for project financing.