

TAB 1



City of Palmetto Agenda Item

Meeting Date**2/28/11****Presenter:** Allen R. Tusing, Director**Department:** Public Works**Title:****Aquifer Storage and Recovery (ASR) Project**
COP Job # 04- 427**Background:**

The City of Palmetto is currently pursuing the use of Reclaimed Water Aquifer Storage Recovery (ASR) as a means to better manage the existing reuse system and maximize reclaimed water supplies. This project will also insure that sufficient reclaimed water is available for reuse customers, facilitate continued expansion of the City's reuse system and offset potable water usage typically used for irrigation.

The City applied for SWFWMD funding for the development of an ASR Well. Funding was approved by the Basin Board, for fifty percent (50%) of the project costs, to design, construct and test the ASR Well.

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| Budgeted Amount: | <input type="text"/> | Budget Page No(s): | <input type="text"/> | Available Amount: | <input type="text"/> | Expenditure Amount: | <input type="text" value="\$0.00"/> |
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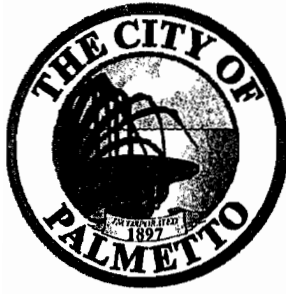
Additional Budgetary Information:

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|---------------------------|----------------------|------------------------------------|--|-----------------------------------|--|----------------|----------------------|
| Funding Source(s): | <input type="text"/> | Sufficient Funds Available: | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Budget Amendment Required: | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Source: | <input type="text"/> |
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|--------------------------------|---|---------------------------------------|---|-------------------------|--|----------------------|
| City Attorney Reviewed: | <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Advisory Board Recommendation: | <input type="checkbox"/> For <input type="checkbox"/> Against <input checked="" type="checkbox"/> N/A | Consistent With: | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | <input type="text"/> |
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Potential Motion/ Direction Requested:**Staff Contact:** Allen R. Tusing, Director**Attachments:**

- ASR Presentation
- SWFWMD Funding Letter



Department of Public Works
600 17th Street West
Palmetto, Florida 34221
Phone: (941) 723-4580 FAX: (941) 723-4539
Suncom: 599-4580

February 9, 2011

Scott McGookey, Project Manager
Southwest Florida Water Management District
2379 Broad Street
Brooksville, Florida 34604- 6899

**Subject: City of Palmetto Reclaimed Water ASR Project (L608)
Request to Resume Funding
COP Job # 04- 427**

Dear Mr. McGookey:

The City of Palmetto (City) would like to resume its reclaimed water aquifer storage recovery (ASR) program and hereby requests for resumption in cooperative funding from the Southwest Florida Water Management District. As part of our request, we have included background information on the ASR program, a plan for how to deal with the arsenic issue, and a schedule and costs for the program going forward.

Background

City and SWFWMD enter into Cooperatively Funded Agreement to initiate ASR program.

FDEP issued the City a Class V ASR Test Well Construction Permit (2007) for a reclaimed water ASR system at the City's water reclamation facility (WRF).

Storage zone monitor well was constructed as an exploratory well in 2008 to investigate the hydrogeologic framework and confirm the ASR targeted storage zone,

Arsenic issue in ASR systems caused SWFWMD to issue a moratorium on funding further ASR system construction until the arsenic problem was better addressed

Remaining components of the ASR system to be constructed include the ASR well and wellhead, supplemental monitor wells, UV system (if warranted), piping, pumps, electrical and instrumentation & controls.

Plan for Arsenic Issue

In general, groundwater quality monitoring shows that at most ASR well sites, arsenic does not migrate more than 200 feet from the ASR well. In addition, arsenic levels have decreased in nearly all ASR wells that have completed multiple cycle tests. These decreases include levels to less than 10 ppb (DWS) in many ASR wells. At the City WRF site, the nearest property boundary is located approximately 300 feet west of the proposed ASR well location.

Data from other ASR well sites indicates that achieving a Target Storage Volume (TSV) (large stored volume prior to conducting the 1st ASR test cycle) works to condition the aquifer prior to the initiation of actual smaller volume recharge and recovery cycle testing. When using the TSV approach, smaller storage and recovery volumes in the test cycles are completed within the TSV and results in lower arsenic levels in the recovered water and the monitoring wells and increased recovery efficiencies. The use of a TSV is the recommended primary approach to address the arsenic issue for the City.

A chemical compound involving bisulfide (or bisulfite) has also shown promise in ASR pilot testing at both Bradenton and Deland, Florida for DO removal and preventing the generation of subsurface arsenic. Bisulfide is typically used to dechlorinate water prior to surface water discharge. The City uses bisulfide at their WRF to dechlorinate their reclaimed water prior to discharge into the bay. The City proposes to configure its ASR well system design to incorporate the potential addition of bisulfide into the reclaimed water prior to injection at the wellhead. The use of bisulfide would be a secondary measure to address the arsenic issue and would likely only be used if the TSV approach did not achieve the desired results.

Other technologies:

Dissolved Oxygen (DO) removal systems utilizing membranes (manufactured by Membrana) are currently being tested at the Bradenton, Sanford and Seminole sites with potable groundwater ASR well systems. There have been a series of equipment problems at all three sites and only the Bradenton system has been able to reliably meet the target oxygen removal levels of several parts per billion. Arsenic, above the DWS, has not been found at the Bradenton site.

A recent completed pilot test at the Lake Tarpon site (Pinellas County) using lake water resulted in almost immediate plugging of the DO system membranes and inability to achieve DO removal below 1 part per million. The high organic carbon content (> 10 mg/l) of the lake water is believed to contribute to the membrane plugging. Palmetto's reclaimed water also has similarly high organic carbon levels.

Based on this data, a membrane type DO removal system is not likely to work for the Palmetto reclaimed water ASR system.

The City will also seek to obtain an Administrative Order (AO) from the FDEP prior to conducting any ASR cycle testing. The AO allows the permittee sufficient time to continue cycle testing in order to address the arsenic issue without the financial penalties associated with a consent order. The current Class V ASR construction test well permit expires in May 2012. Therefore, the City will pursue constructing the AST and monitor wells and secure the AO during the construction permit renewal in early 2012.

A proposed schedule and approximate budget needed to construct and test the City's ASR well system is attached to this letter. The City proposes to seek permission from SWFWMD to resume its ASR program as soon as possible so that design of the ASR system can be completed by October 2011 and construction completed by September 2012.

The City is excited about moving forward with their ASR program and appreciates the continued SWFWMD contribution. If you have any questions regarding the information contained in this letter, please do not hesitate to contact me.

Sincerely,



Allen R. Tusing, Director
Public Works Department

Enclosure: Schedule

Cc: Honorable Shirley G. Bryant, Mayor
Frank Woodard II, Deputy Director, Engineering & Project Mgmt.
Thomas Farkas, PBS&J
Mike Micheau, PBS&J

ASR UPDATE

Presented To

City Of Palmetto
Commission Workshop

February 28, 2011

By

Allen R. Tusing
Director of Public Works

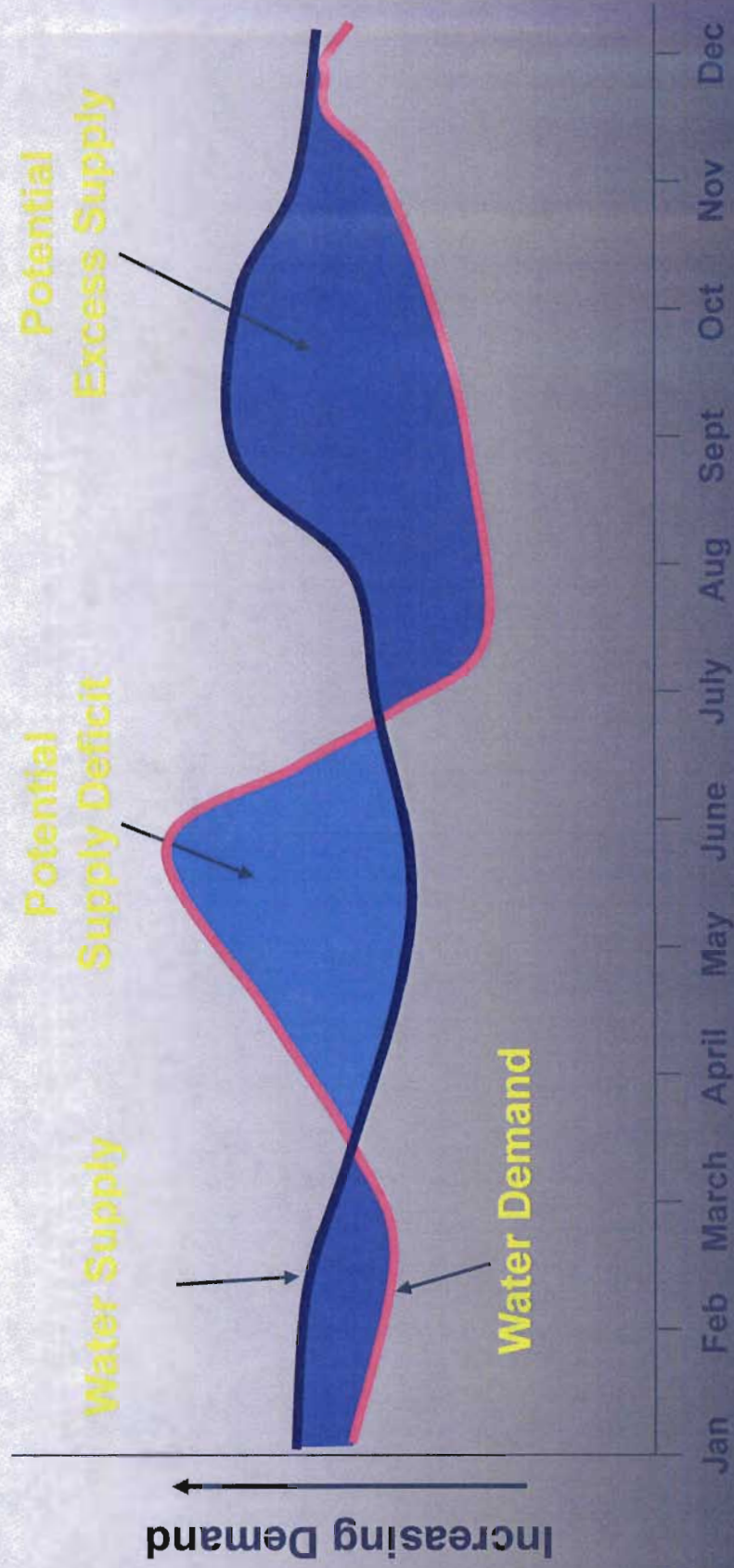
Presentation Overview

- ◆ What is Aquifer Storage Recovery (ASR)
- ◆ ASR Project Update
- ◆ Arsenic Issue
- ◆ Options to Move ASR Program Forward
- ◆ Recommendations

Aquifer Storage Recovery (ASR)

The storage of water in a suitable aquifer through a well during times when excess water is available, and recovery of that water from the same well during times when it is in demand.

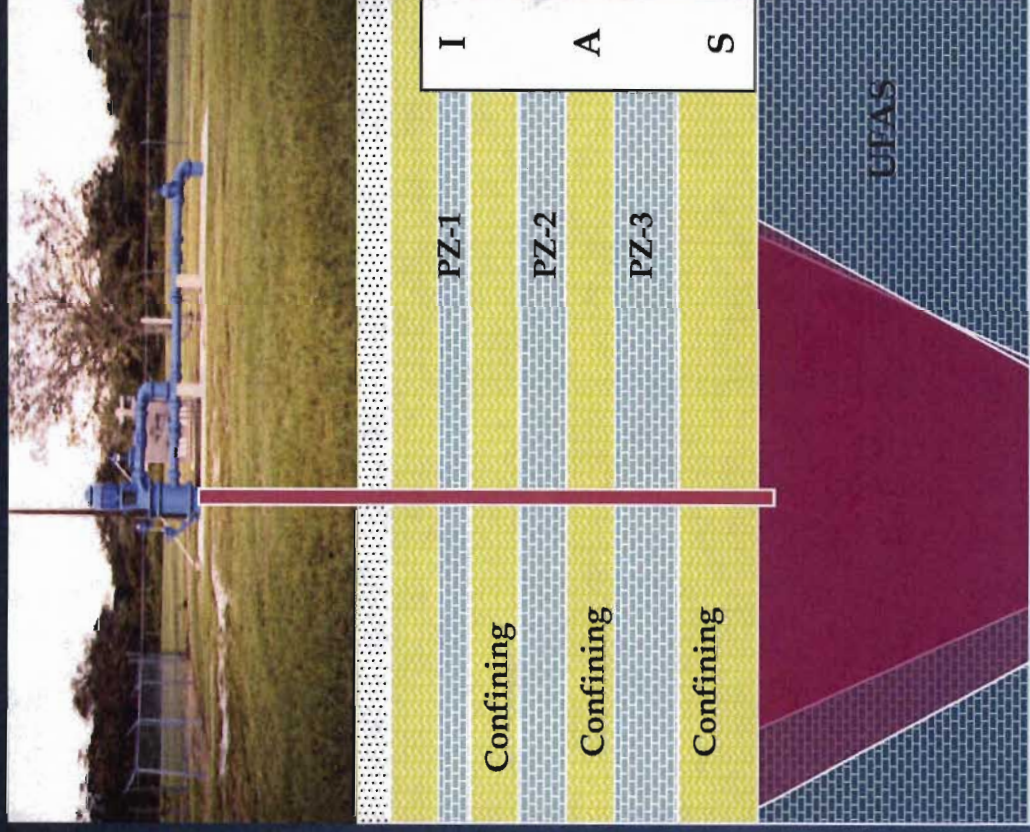
Resource Availability and Demand



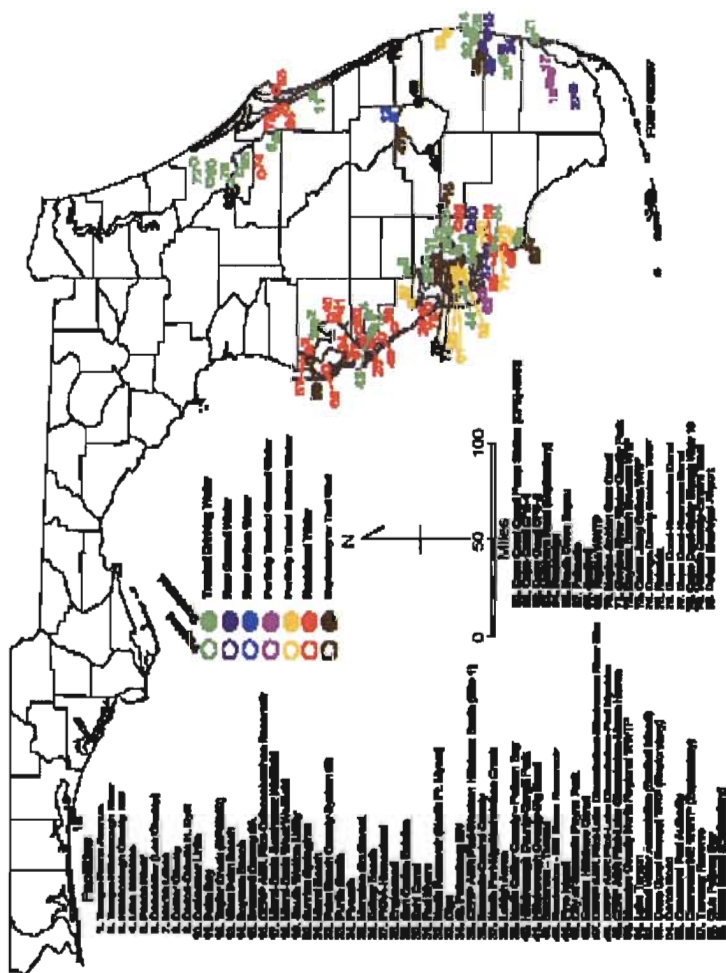
Why ASR?

- ◆ In Florida Water is Abundant Seasonally
- ◆ STORAGE is the Key to Resource Management and Maximizing Existing Supply Sources
- ◆ Capture Valuable Water Resource Discharged to the Bay
- ◆ Enhances Reliability of Reclaimed Water System
- ◆ SWFWMD Funding is available for ASR Programs

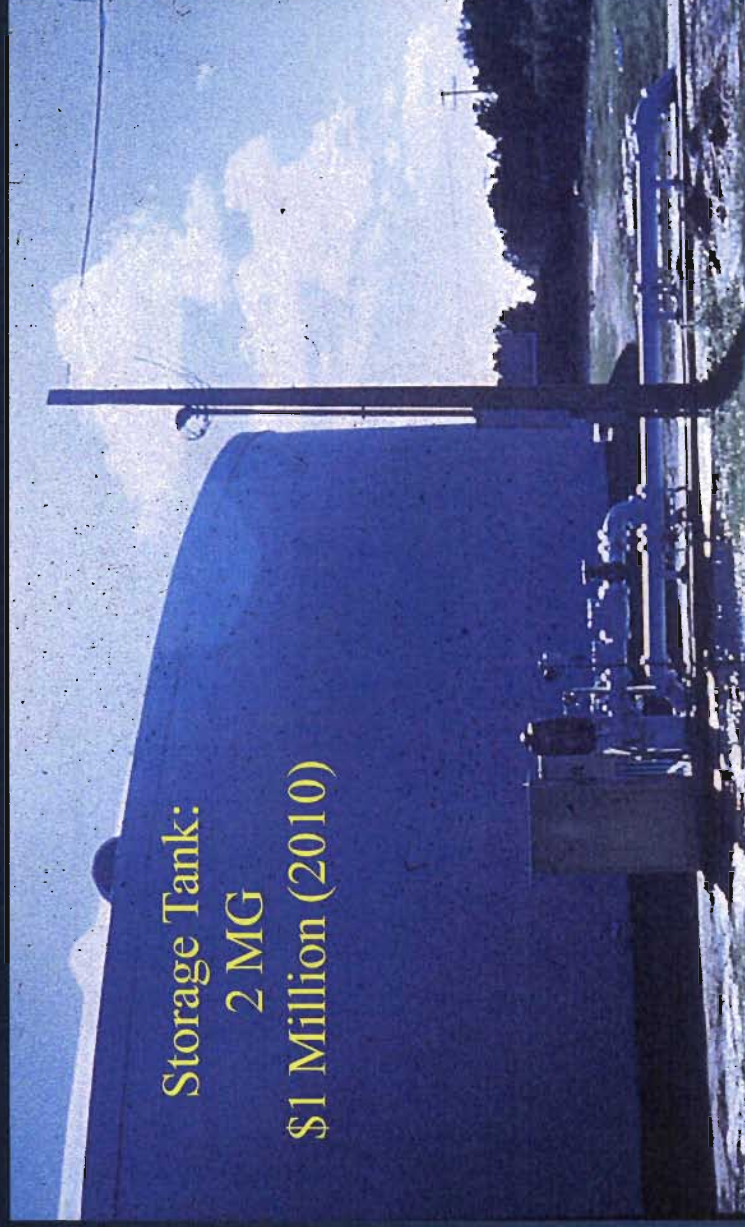
ASR is Used for Storage and Recovery



AQUIFER STORAGE AND RECOVERY FACILITIES IN FLORIDA



ASR Provides Cost Effective, Unlimited Storage Capacity



Storage Tank:
2 MG
\$1 Million (2010)

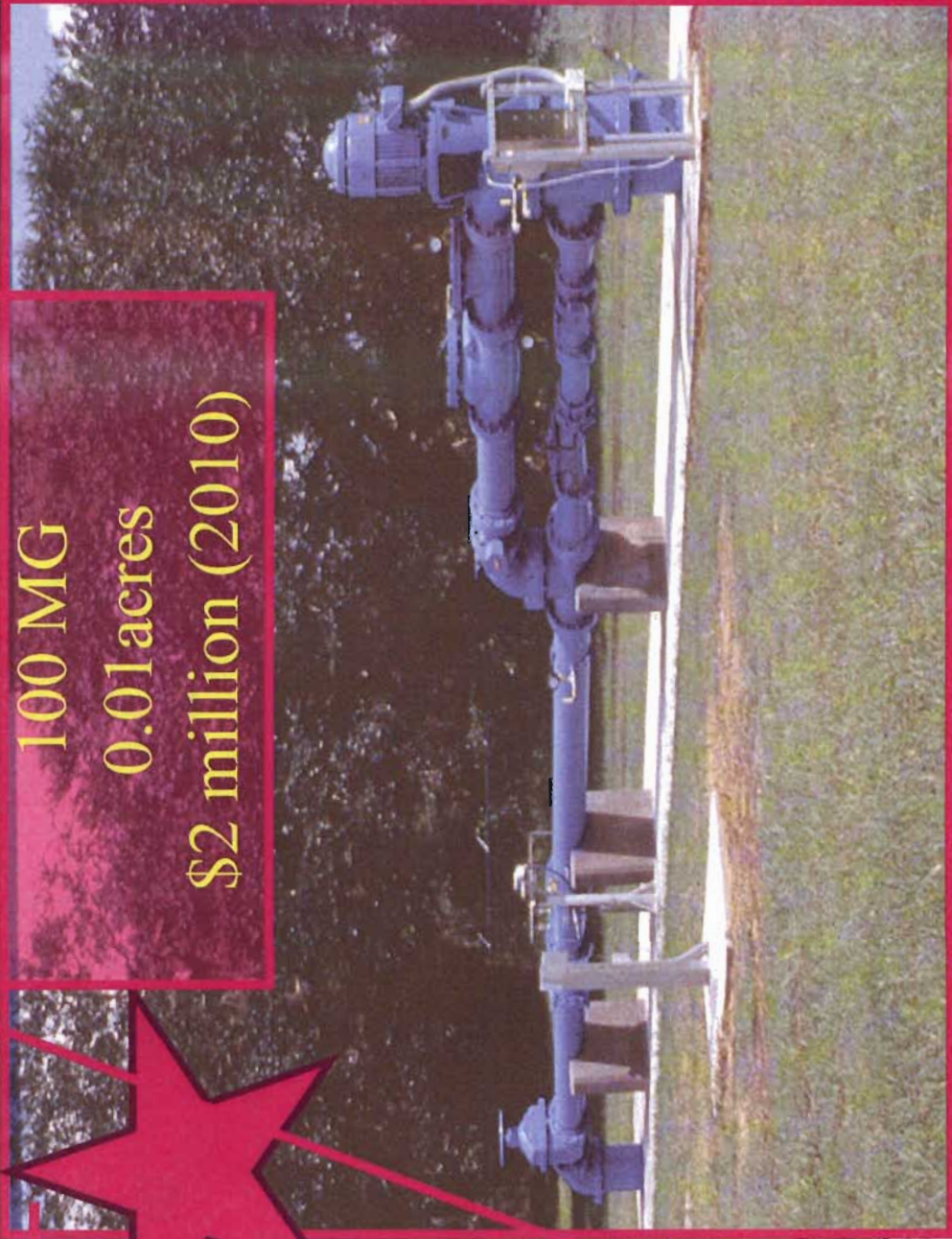
ASR WELL:
100 MG
\$2 Million (2010)

ASR Typically costs 10 % to 50 % of Conventional Surface Storage

Storage Pond

Storage Pond:
200 MG
110 acres
>\$\$\$ Millions

ASR Well:
100 MG
0.01 acres
\$2 million (2010)



ASR Project Update

- ASR Feasibility Study- WWTF Site Selected
- FDEP Class V ASR Test Well Permit Obtained
- Exploratory Well Confirmed Suitable Hydrogeology of WWTF Site
- Project Funding is on Hold by SWFWMD



Figure 3-20

Arsenic Issue

- ◆ Arsenic Initially Found above State Standards in most ASR Wells
- ◆ Arsenic is Derived from the Aquifer Rock Material
- ◆ Arsenic Levels Decrease with Continued Cycle Testing/Operation
- ◆ Monitoring Data Shows that Mobilized Arsenic Stays within 200 feet of ASR Well
- ◆ No Restrictions on Arsenic in Reclaimed Water
- ◆ FDEP is approving ASR wells for Cycle Testing with Administrative Orders (AO)

Options for ASR Program

- ◆ Approach SWFWMD with a Plan to Address Arsenic Issue
 - Approval of plan needed to secure continued funding commitments
 - Plan would need to identify a pre-treatment alternative and/or use of Target Storage Volume
- ◆ ASR will help City address issues with THMs (disinfection byproducts) that currently affect discharges from the WWTF

Bisulfite System at WWTF

- ◆ Use to remove oxygen in water
- ◆ Suppress arsenic generation in aquifer



RWASR Funding Schedule

Total Budget Need is \$2,125,000

Recommendations

- ◆ Submit plan to SWFWMD to Resume ASR Program with a Target Storage Volume Testing Approach
- ◆ Initiate Design and Construction of Remainder of ASR well system
- ◆ Renew FDEP Class V ASR Test Well Permit to Receive an AO for ASR testing
- ◆ Conduct ASR cycle Testing Under AO