# Marco Lakes ASR 2 and ASR 3 UIC Operating Permit Application and Engineering Report

for:

Florida Water Services Corp. P.O. Box 609520 Orlando, Florida 32860-9520

**April 2003** 

Water Resource Solutions, Inc

428 Pine Island Road, S.W. Cape Coral, Fl 33991.

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# Florida Water Services Corp.

P.O. Box 609520 Orlando, Florida 32860-9520

**April 2003** 

Water Resource Solutions, Inc. 428 Pine Island Road, S.W. Cape Coral, Florida 33991



April 3, 2003

bc: Bart Bradshaw Frank Kane Bob Leetch Jake Rohrich

Mr. Jack Myers, P.G. Florida Department of Environmental Protection Underground Injection Program 2295 Victoria Avenue, Suite 364 Ft. Myers, Florida 33901

Re: Marco Lakes Raw Water Facility

Applications to Operate Two ASR Wells (ASR2 and ASR3)

Dear Mr. Myers:

Florida Water Services is submitting Operating Permit Applications and the associated engineering report for Marco Lakes ASR wells ASR2 and ASR3. These wells are currently being operated under construction permit numbers 141218-001UIC and 141218-002UIC. The required application fee for two Class V wells of \$1500.00 (\$750 for each well) is also included.

A Water Quality Exemption for Color was previously requested in January of 2003. The request was submitted to Mr. Richard Deuerling. The Water Quality Exemption for Color was submitted at that time so that the color exemption and the operating permit can be issued simultaneously. The timing of these submissions was recommended by both yourself and Mr. Haberfeld so that these two wells can continue to operate under the construction permit until both the new Water Quality Exemption for Color and the new operating permits are issued.

As you are aware, issuance of the operating permit without the color exemption requires that the wells not be operated until the color exemption is issued. Since the current construction permits allow the wells to be operated into 2004, there is no need to issue the operating permit before the color exemption request is approved and issued.

If you should have questions, please do not hesitate to call me at (407) 598-4126.

Sincerely,

FLORIDA WATER SERVICES CORPORATION

Sandra y. Joiner, P.E. Senior Project Engineer

#### Enclosure

c: Craig Anderson, Florida Water Services
Mark Pearce, Water Resource Solutions
Joe Haberfeld, Florida Department of Environmental Protection
Nancy Marsh, United States Environmental Protection Agency, Region IV
Steven Anderson, South Florida Water Management District
Ron Reese, United States Geological Survey



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# PART I

# CLASS V UIC OPERATING PERMIT APPLICATIONS FOR ASR 2 AND ASR 3



#### Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Porm No:

Form Title: Application to Construct/

Operate/Abandon Class I, III,

or V Injection Well Systems

Bffective Date:

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# APPLICATION TO CONSTRUCT/OPERATE/ABANDON CLASS I, III, OR V INJECTION WELL SYSTEMS

#### Part I. Directions

- A. All applicable items must be completed in full in order to avoid delay in processing this application. Where attached sheets or other technical documentation are utilized in lieu of the blank space provided, indicate appropriate cross-reference in the space and provide copies to the Department in accordance with C. below. Where certain items do not appear applicable to the project, indicate N/A in the appropriate spaces.
- B. All information is to be typed or printed in ink.
- C. Four (4) copies of this application and four (4) copies of supporting information such as plans, reports, drawings and other documents shall be submitted to the appropriate District/Subdistrict office. An engineering report is also required to be submitted to support this application pursuant to the applicable sections of Rule 62-528, F.A.C. The attached list\* shall be used to determine completeness of supporting data submitted or previously received. A check for the application fee in accordance with Rule 62-4.050, F.A.C., made payable to the Department shall accompany the application.
- D. For projects involving construction, this application is to be accompanied by four (4) sets of engineering drawings, specifications and design data as prepared by a Professional Engineer registered in Florida, where required by Chapter 471, Florida Statutes.
- E. Attach 8 1/2" x 11" USGS site location map indicating township, range and section and latitude/longitude for the project.

#### PART II. General Information

A.	Applicant Name Florida Water Services Corp. Title	
	Address <u>P.O. Box 609520</u>	
	City Orlando State Florida Zip 32860	
	Telephone Number <u>(407) 880-0058</u>	
В.	Project Status: New  Existing	
	Modification (specify)	
"Engi Opera	neering and Hydrogeologic Data Required for Support of Application to Construc te and Abandon Class I, III, or V Injection Wells"	:t,
C.	Well Type:   Exploratory Well  Test/Injection Well	

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[Filled in by DR
D. Type of Permit Application
Class I Test/Injection Well Construction and Testing Permit
Class I Well Operation Permit
Class I Well Operation Repermitting
Class I Well Plugging and Abandonment Permit
Class III Well Construction/Operation/Plugging and Abandonment Permit
Class I Exploratory Well Construction and testing Permit
Class V Well Construction Permit
■ Class V Well Operation Permit
Class V Well Plugging and Abandonment Permit
☐ Monitor Well Only
E. Facility Identification:
Name Marco Island Raw Water Source at Marco Lakes
Facility Location: Street <u>C.R. 951</u>
City N/A County Collier County
SIC Code(s)
F. Proposed facility located on Indian Lands: Yes No 🗷
G. Well Identification:
Well No. 2 of 3 Wells (total #)
Purpose (Proposed Use) Storage of Partially Treated Surface Water
Well Location: Latitude: 26 ° 4'0.9958" Longitude: 81 ° 41'33.3135" (attach separate sheet(s), if necessary, for multiple wells)
Subpart B. General Project Description:
H. General Project Description: Describe the nature, extent and schedule of the injection well project. Refer to existing and/or future pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance with the requirements of Chapter 403, F.S., and all rules of the Department. Attach additional sheet(s) if necessary or cross-reference the engineering report.

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#### PART III. Statement by Applicant and Engineer

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А.	ADD	$\perp$	u	.11

	certify under penalty of law that I have the information submitted in this documer inquiry of those individuals immediately I believe that the information is true, there are significant penalties for suppossibility of fine and imprisonment. applies to all subsequent reports subconstruction is involved, I agree to professional engineer registered in Florin accordance with Rule 62-528.455(1)(c),	e personally examinate and all attachment responsible for obteining accurate, and combinating false information of the desired, to provide in	ned and am familiar with the stand that, based on my staining the information, plete. I am aware that formation, including the this certification also to this permit. Where an engineer, or other
	OOON		Λ
	Cyl (hohm	· · · · · · · · · · · · · · · · · · ·	4-3-03
•	Signed		Date
	Craig J. Anderson, Vice President Environ	mental Services	(407) 598-4100
	Name and Title (Please Type)	<u> </u>	Telephone Number
	*Attach a Letter of Authorization.		
в.	Professional Engineer Registered in Flori	ida	
	This is to certify that the engine been designed/examined by me and found the principles applicable to the disposal application. There is reasonable assurated, when properly maintained and of compliance with all applicable statutes of instructions for proper maintenance and of instructions for proper maintenance and the statute of the stat	to be in conformity of pollutants char nce, in my professi perated, will dis of the State of Floundersigned will fur	with modern engineering acterized in the permit onal judgement, that the charge the effluent in rida and the rules of the rnish the applicant a set
		Lloyd E. Horvath, Name (Please Type	P.E. =)
	(Please Affix Seal)	Water Resource Sc Company Name (Ple	
	428 Pine Island Road, S.W., Cape Coral, E	Florida 33991	
	Mailing Address(Please Type)		
	Florida Registration No. 25260	Date 3-31-03 F	Phone No. (239) 574-1919

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#### ENGINEERING AND HYDROLOGIC DATA REQUIRED FOR SUPPORT OF APPLICATION TO CONSTRUCT, OPERATE, AND ABANDON CLASS I, III, OR V INJECTION WELL SYSTEMS

The following information shall be provided for each type of permit application.

#### A. CLASS I TEST/INJECTION WELL CONSTRUCTION AND TESTING PERMIT

- 1. A map showing the location of the proposed injection wells of well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.
- 2. A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone, confining zone, or proposed monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.
- 3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.
- 4. Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 5. Generalized maps and cross sections illustrating the regional geologic setting.
- 6. Proposed operating data.
  - (a) Average and maximum daily rate and volume of the fluid to be injected;
  - (b) Average and maximum injection pressure; and,
  - (c) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids.
- Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection zone.
- 8. Proposed stimulation program.
- 9. Proposed injection procedure.
- 10. Engineering drawings of the surface and subsurface construction details of the system.

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- 11. Contingency plans to cope with all shut-ins or well failures, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.
- 12. Plans (including maps) and proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.
- 13. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.
- 14. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, proposed blowout protection (if necessary), and a drilling, testing and coring program.
- 15. A certification that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.

#### B. CLASS I INJECTION WELL OPERATION PERMIT

- 1. A report shall be submitted with each application for a Class I Well operating permit, which shall include, but not be limited to, the following information:
  - (a) Results of the information obtained under the construction permit described in A. CLASS I TEST/INJECTION WELL CONSTRUCTION AND TESTING PERMIT, including:
    - (1) All available logging and testing program data and construction data on the well or well field;
    - (2) A satisfactory demonstration of mechanical integrity for all new wells pursuant to Rule 62-528.300(6), F.A.C;
    - (3) The actual operating data, including injection pressures versus pumping rates where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;
    - (4) The actual injection procedure;
    - (5) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone; and,
    - (6) The status of corrective action on defective wells in the area of review.
  - (b) Record drawings, based upon inspections by the engineer or persons under his direct supervision, with all deviations noted;
  - (c) Certification of completion submitted by the engineer of record;
  - (d) If requested by the Department, operation manual including emergency procedures;

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- (e) Proposed monitoring program and data to be submitted;
- (f) Proof that the existence of the well has been recorded on the surveyor's plan at the county courthouse; and,
- (g) Proposed plugging and abandonment plan pursuant to Rule 62-528.435(2), F.A.C.

#### C. CLASS I WELL OPERATION REPERMITTING

- 1. An updated map showing the location of the injection wells or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of pubic record and pertinent information known to the applicant is required to be included on this map.
- 2. A tabulation of data on all wells within the area of review which penetrate into the injection zone, confining zone, or monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.
- 3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the injection.
- Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 5. Generalized maps and cross sections illustrating the regional geologic setting.
- 6. Contingency plans to cope with all shut-ins or well failures, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.
- 7. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.
- 8. A certification that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.
- 9. A report shall be submitted with each application for repermitting of Class I Well operation which shall include the following information:
  - (a) All available logging and testing program data and construction data on the well or well field;

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- (b) A satisfactory demonstration of mechanical integrity for all wells pursuant to Rule 62-528.300(6), F.A.C.;
- (c) The actual operating data, including injection pressures versus pumping rates where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;
- (d) The actual injection procedure;
- (e) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone;
- (f) The status of corrective actin on defective wells in the area of review;
- (g) Record drawings, based upon inspections by the engineer or persons under his direct supervision, with all deviations noted;
- (h) Certification of completion submitted by the engineer of record;
- (i) An updated operation manual including emergency procedures;
- (j) Proposed revisions to the monitoring program or data to be submitted; and,
- (k) Proposed plugging and abandonment plan pursuant to Rule 62-528.435(2), F.A.C.

#### D. CLASS I WELL PLUGGING AND ABANDONMENT PERMIT

- 1. The reasons for abandonment.
- 2. A proposed plan for plugging and abandonment describing the preferred and alternate methods, and justification for use.
  - (a) The type and number of plugs to be used;
  - (b) The placement of each plug including the elevation of the top and bottom;
  - (c) The type and grade and quantity of cement or any other approved plugging material to be used; and,
  - (d) The method for placement of the plugs.
- 3. The procedure to be used to meet the requirements of Rule 62-528.435, F.A.C.

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### E. CLASS III WELLS CONSTRUCTION/OPERATION/PLUGGING AND ABANDONMENT PERMIT

#### Construction Phase

- 1. A map showing the location of the proposed injection wells or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water system, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.
- 2. A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone, confining zone, or proposed monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.
- 3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.
- Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 5. Generalized maps and cross sections illustrating the regional geologic setting.
- 6. Proposed operating data:
  - (a) Average and maximum daily rate and volume of the fluid to be injected;
  - (b) Average and maximum injection pressure; and,
  - (c) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids, including any additives.
- Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection zone.
- 8. Proposed stimulation program.
- 9. Proposed injection procedure.
- 10. Engineering drawings of the surface and subsurface construction details of the system.

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- 11. Contingency plans to cope with all shut-ins or well failures or catastrophic collapse, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.
- 12. Plans (including maps) and proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.
- 13. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.
- 14. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, and a drilling, testing and coring program.
- 15. A certificate that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.
- 16. Expected changes in pressure, native fluid displacement, direction of movement of injection fluid.
- 17. A proposed monitoring plan, which includes a plan for detecting migration of fluids into underground sources of drinking water, a plan to detect water quality violation in the monitoring wells, and the proposed monitoring data to be submitted.

#### Operation Phase

- 1. The following information shall be provided to the Department prior to granting approval for the operation of the well or well field:
  - (a) All available logging and testing program data and construction data on the well or well field;
  - (b) A satisfactory demonstration of mechanical integrity for all new wells pursuant to Rule 62-528.300(6), F.A.C.;
  - (c) The actual operating data, including injection pressure versus pumping rate where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;
  - (d) The results of the formation testing program;
  - (e) The actual injection procedure; and,
  - (f) The status of corrective action on defective wells in the area of review.

#### Plugging and abandonment Phase

1. The justification for abandonment.

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- 2. A proposed plan for plugging and abandonment describing the preferred and alternate methods.
  - (a) The type and number of plugs to be used;
  - (b) The placement of each plug including the elevation of the top and bottom;
  - (c) The type and grade and quantity of cement or any other approved plugging material to be used; and,
  - (d) The method for placement of the plugs.
- 3. The procedure to be used to meet the requirements of Rule 62-528.435, F.A.C.

#### F. EXPLORATORY WELL CONSTRUCTION AND TESTING PERMIT

- Conceptual plan of the injection project. Include number of injection wells, proposed injection zone, nature and volume of injection fluid, and proposed monitoring program.
- 2. Preliminary Area of Review Study. Include the proposed radius of the area of review with justification for that radius. Provide a map showing the location of the proposed injection well or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.
- 3. Proposed other uses of the exploratory well.
- 4. Drilling and testing plan for the exploratory well. The drilling plan must specify the proposed drilling program, sampling, coring, and testing procedures.
- 5. Abandonment Plan.

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#### G. CLASS V WELL CONSTRUCTION PERMIT

(This form should be used for Class V Wells instead of Form 62-528.900(3), F.A.C., when there is a need for a Technical Advisory Committee and an engineering report.)

	. Type and number of proposed Class V Wells:
	Wells Receiving Domestic Waste
	Desalination Process Concentrate Wells (Reverse Osmosis, etc.)
	Aquifer Storage and Recovery Wells
	Aquifer Remediation Wells
	Salt-water Intrusion Barrier Wells
	Cooling Water Return Flow Wells Open-looped System
	Subsidence Control Wells
	Sand Backfill Wells
	Experimental Technology Wells
	Wells used to inject spent brine after halogen recovery
	Radioactive Waste Disposal Wells*
	Borehole Slurry Mining Wells
	Other non-hazardous Industrial or Commercial Disposal Wells
	(explain)
	Other (explain)
	*Provided the concentrations of the waste do not exceed drinking water standards contained in Chapter 62-550, F.A.C.
2.	Project Description:
	(a) Description and use of proposed injection system;
	(b) Nature and volume of injected fluid (the Department may require an analysis including bacteriological analysis) in accordance with Rule 62-528.635(2)(b),

(c) Proposed pretreatment.

F.A.C.; and,

3. Water well contractor's name, title, state license number, address, phone number and signature.

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<ol> <li>Well Design and Construction Details. (For multi-casing configurations or unusual construction provisions, an elevation drawing of the proposed well should be attached.)</li> </ol>
(a) Proposed total depth;
(b) Proposed depth and type of casing(s);
(c) Diameter of well;
(d) Cement type, depth, thickness; and,
(e) Injection pumps (if applicable): gpm @ psi
Controls:
<ul> <li>5. Water Supply Wells - When required by Rule 62-528.635(1), F.A.C., attach a map section showing the locations of all water supply wells within a one-half (1/2) mile radius of the proposed well. The well depths and casing depths should be included. When required by Rule 62-528.635(2), F.A.C., results of bacteriological examinations of water from all water supply wells within one-half (1/2) mile and drilled to approximate depth of proposed well should be attached.</li> <li>6. Area of review (When required by Rule 62-528.300(4), F.A.C.)</li> <li>Include the proposed radius of the area of review with justification for that radius. Provide a map showing the location of the proposed injection well or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.</li> </ul>
H. CLASS V WELL OPERATION PERMIT
(Final report of the construction that includes the following information may be submitted with the application to operate.)
1. Permit Number of Class V Construction Permit: 14128-001UIC
2. Owner's Name: Florida Water Services Corporation
3. Type of Wells: Class V Aquifer Storage and Recovery

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							i	(Pilled in by DRP)
4 .	Cor	nstruction	and Testing S	ummary:	See A	ttached Report	for Details.	
	(a)	Actual D	imensions:					
	Dia	ameter	/ i = ala = 1	Well	Depth		Casing Depth	
			(inches)			(feet)		(feet)
				•		*		
				•				
		-		•				
	(b)	Result of	Initial Test:	ina				
5.					ched Re	eport for Detai	ila	
	(a)		Rate (GPM);			sport for Dela	.1.0	
	(b)		on of injected	l wagte.	and			
	(c)		pressure and					
6.						attached Report		
	(a)		of monitoring		bee A	ccached keport	ior Details.	
	(b)	Depth(s)		veris;				
	(c)	_						
		Paramete						
	(d)		y of sampling;					
	(e)	Instrument	ation (if app	licable)	Flow			
				Pre	essure		···	
								_

### I. CLASS V WELLS PLUGGING AND ABANDONMENT PERMIT

- 1. Permit number of Class V construction or operating permit.
- 2. Type of well.
- 3. Proposed plugging procedures, plans and specifications.
- 4. Reasons for abandonment.

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#### J. MONITOR WELL PERMIT

This section should be used only when application is made for a monitor well only. If a monitor well is to be constructed under a Class I, III, or V injection well construction permit, it is necessary to fill in this section.

- A site map showing the location of the proposed monitor wells for which a permit is sought. The map must be to scale and show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, water wells and other pertinent surface features including structures and roads.
- 2. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.
- 3. Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 4. Generalized maps and cross sections illustrating the regional geologic setting.
- 5. Proposed formation testing program to obtain an anlysis of the chemical, physical and radiological characteristics of and other information on the monitor zone(s).
- 6. Proposed monitoring procedure.
- 7. Engineering drawings of the surface and subsurface construction details of the monitoring system.
- 8. Proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.
- 9. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, proposed blowout protection (if necessary), and a drilling, testing and coring program

10.	Monitor Well Information:
	On-site Multizone Single-zone
	Regional Other (specify)
	Proposed Monitoring Interval(s)
	Distance and Direction From Associated Injection Well
_	



#### Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DBP Form No:		62-528.900(1)
Form Title:	Application	to Construct/
<u>Oper</u>	ate/Abandon	Class I, III.
<u> </u>	V Injection	Well Systems
Effective Date		
DBP Applicatio	n No.:	
ľ	(Pil)	ed in by DEP)

# APPLICATION TO CONSTRUCT/OPERATE/ABANDON CLASS I, III, OR V INJECTION WELL SYSTEMS

#### Part I. Directions

- A. All applicable items must be completed in full in order to avoid delay in processing this application. Where attached sheets or other technical documentation are utilized in lieu of the blank space provided, indicate appropriate cross-reference in the space and provide copies to the Department in accordance with C. below. Where certain items do not appear applicable to the project, indicate N/A in the appropriate spaces.
- B. All information is to be typed or printed in ink.
- C. Four (4) copies of this application and four (4) copies of supporting information such as plans, reports, drawings and other documents shall be submitted to the appropriate District/Subdistrict office. An engineering report is also required to be submitted to support this application pursuant to the applicable sections of Rule 62-528, F.A.C. The attached list\* shall be used to determine completeness of supporting data submitted or previously received. A check for the application fee in accordance with Rule 62-4.050, F.A.C., made payable to the Department shall accompany the application.
- D. For projects involving construction, this application is to be accompanied by four (4) sets of engineering drawings, specifications and design data as prepared by a Professional Engineer registered in Florida, where required by Chapter 471, Florida Statutes.
- E. Attach 8 1/2" x 11" USGS site location map indicating township, range and section and latitude/longitude for the project.

#### PART II. General Information

A.	Applicant Name Florida Water Services Corp. Title
	Address p.O. Box 609520
	City Orlando State Florida Zip 32860
	Telephone Number (407) 880-0058
В.	Project Status: New Existing
	Modification (specify)
"Engi Opera	neering and Hydrogeologic Data Required for Support of Application to Construct, ate and Abandon Class I, III, or V Injection Wells"
C.	Well Type:   Exploratory Well  Fact/Injection Well

DBP Form No: 62-528.900{1}

Porm Title: Application to Construct/
Operate/Abandon Class I, III,
or V Injection Well Systems

8ffective Date:
DBP Application No.:
(Filled in by DBP)

L (Filled in by D
D. Type of Permit Application
Class I Test/Injection Well Construction and Testing Permit
Class I Well Operation Permit
Class I Well Operation Repermitting
Class I Well Plugging and Abandonment Permit
Class III Well Construction/Operation/Plugging and Abandonment Permit
Class I Exploratory Well Construction and testing Permit
Class V Well Construction Permit
Class V Well Operation Permit
Class V Well Plugging and Abandonment Permit
☐ Monitor Well Only
E. Facility Identification:
Name Marco Island Raw Water Source at Marco Lakes
Facility Location: Street <u>C.R. 951</u>
City N/A County Collier County
SIC Code(s)
F. Proposed facility located on Indian Lands: Yes \( \sumset \) No \( \sumset \)
G. Well Identification:
Well No. 3 of 3 Wells (total #)
Purpose (Proposed Use) Storage of Partially Treated Surface Water
Well Location: Latitude: 26° 4'4.2054" Longitude: 81° 41 30.7843' (attach separate sheet(s), if necessary, for multiple wells)
Subpart B. General Project Description:
H. General Project Description: Describe the nature, extent and schedule of the injection well project. Refer to existing and/or future pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance with the requirements of Chapter 403, F.S., and all rules of the Department. Attach additional sheet(s) if necessary or cross-reference the engineering report.

DEP Form No: 62-528.900(1)
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Operate/Abandon Class I, III,
or V Injection Well Systems
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(Filled in by DEP)

(407) 598-4100 Telephone Number

#### PART III. Statement by Applicant and Engineer

Α.	Αp	рl	ic	a	nt

I, the owner/authorized representative* of Florida Water Services Corp.  certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I understand that this certification also applies to all subsequent reports submitted pursuant to this permit. Where construction is involved, I agree to retain the design engineer, or other professional engineer registered in Florida, to provide inspection of construction in accordance with Rule 62-528.455(1)(c), F.A.C.  Signed  A-3-03  Date
Signed Date
~~************************************

\*Attach a Letter of Authorization.

Name and Title (Please Type)

Craiq J. Anderson, Vice President Environmental Services

B. Professional Engineer Registered in Florida

This is to certify that the engineering features of this injection well have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that the well, when properly maintained and operated, will discharge the effluent in compliance with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for proper maintenance and operation of the well.

Signed

Lloyd E. Horvath, P.E. Name (Please Type)

Water Resource Solutions, Inc. Company Name (Please Type)

(Please Affix Seal)

428 Pine Island Road, S.W., Cape Coral, Florida 33991 Mailing Address(Please Type)

Harring Madress (rreals 1)ps/

Florida Registration No. 25260 Date 3-3/-0.7 Phone No. (239) 574-1919

DEP Form No: 62-528.900(1)
Form Title: Application to Construct/
Operate/Abandon Class I, III,
or V Injection Well Systems

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#### ENGINEERING AND HYDROLOGIC DATA REQUIRED FOR SUPPORT OF APPLICATION TO CONSTRUCT, OPERATE, AND ABANDON CLASS I, III, OR V INJECTION WELL SYSTEMS

The following information shall be provided for each type of permit application.

# A. CLASS I TEST/INJECTION WELL CONSTRUCTION AND TESTING PERMIT

- 1. A map showing the location of the proposed injection wells of well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.
- 2. A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone, confining zone, or proposed monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.
- 3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.
- 4. Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 5. Generalized maps and cross sections illustrating the regional geologic setting.
- 6. Proposed operating data.
  - (a) Average and maximum daily rate and volume of the fluid to be injected;
  - (b) Average and maximum injection pressure; and,
  - (c) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids.
- 7. Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection zone.
- 8. Proposed stimulation program.
- 9. Proposed injection procedure.
- 10. Engineering drawings of the surface and subsurface construction details of the system.

DEP Form No: 62-528.900(1)
Form Title: Application to Construct/
Operate/Abandon Class I, III,
or V Injection Well Systems

Bffective Date:
OEP Application No.:
(Filled in by DEP)

- 11. Contingency plans to cope with all shut-ins or well failures, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.
- 12. Plans (including maps) and proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.
- 13. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.
- 14. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, proposed blowout protection (if necessary), and a drilling, testing and coring program.
- 15. A certification that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.

#### B. CLASS I INJECTION WELL OPERATION PERMIT

- 1. A report shall be submitted with each application for a Class I Well operating permit, which shall include, but not be limited to, the following information:
  - (a) Results of the information obtained under the construction permit described in A. CLASS I TEST/INJECTION WELL CONSTRUCTION AND TESTING PERMIT, including:
    - (1) All available logging and testing program data and construction data on the well or well field;
    - (2) A satisfactory demonstration of mechanical integrity for all new wells pursuant to Rule 62-528.300(6), F.A.C;
    - (3) The actual operating data, including injection pressures versus pumping rates where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;
    - (4) The actual injection procedure;
    - (5) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone; and,
    - (6) The status of corrective action on defective wells in the area of review.
  - (b) Record drawings, based upon inspections by the engineer or persons under his direct supervision, with all deviations noted;
  - (c) Certification of completion submitted by the engineer of record;
  - (d) If requested by the Department, operation manual including emergency procedures;

- (e) Proposed monitoring program and data to be submitted;
- (f) Proof that the existence of the well has been recorded on the surveyor's plan at the county courthouse; and,
- (g) Proposed plugging and abandonment plan pursuant to Rule 62-528.435(2), F.A.C.

#### C. CLASS I WELL OPERATION REPERMITTING

- 1. An updated map showing the location of the injection wells or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of pubic record and pertinent information known to the applicant is required to be included on this map.
- 2. A tabulation of data on all wells within the area of review which penetrate into the injection zone, confining zone, or monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.
- 3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the injection.
- Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 5. Generalized maps and cross sections illustrating the regional geologic setting.
- 6. Contingency plans to cope with all shut-ins or well failures, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.
- 7. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.
- 8. A certification that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.
- 9. A report shall be submitted with each application for repermitting of Class I Well operation which shall include the following information:
  - (a) All available logging and testing program data and construction data on the well or well field;

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- (b) A satisfactory demonstration of mechanical integrity for all wells pursuant to Rule 62-528.300(6), F.A.C.;
- (c) The actual operating data, including injection pressures versus pumping rates where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;
- (d) The actual injection procedure;
- (e) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone;
- (f) The status of corrective actin on defective wells in the area of review;
- (g) Record drawings, based upon inspections by the engineer or persons under his direct supervision, with all deviations noted;
- (h) Certification of completion submitted by the engineer of record;
- (i) An updated operation manual including emergency procedures;
- (j) Proposed revisions to the monitoring program or data to be submitted; and,
- (k) Proposed plugging and abandonment plan pursuant to Rule 62-528.435(2), F.A.C.

#### D. CLASS I WELL PLUGGING AND ABANDONMENT PERMIT

- 1. The reasons for abandonment.
- 2. A proposed plan for plugging and abandonment describing the preferred and alternate methods, and justification for use.
  - (a) The type and number of plugs to be used;
  - (b) The placement of each plug including the elevation of the top and bottom;
  - (c) The type and grade and quantity of cement or any other approved plugging material to be used; and,
  - (d) The method for placement of the plugs.
- 3. The procedure to be used to meet the requirements of Rule 62-528.435, F.A.C.

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(Filled in by DEP)

# E. CLASS III WELLS CONSTRUCTION/OPERATION/PLUGGING AND ABANDONMENT PERMIT

#### Construction Phase

- 1. A map showing the location of the proposed injection wells or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water system, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.
- 2. A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone, confining zone, or proposed monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.
- 3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.
- Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 5. Generalized maps and cross sections illustrating the regional geologic setting.
- 6. Proposed operating data:
  - (a) Average and maximum daily rate and volume of the fluid to be injected;
  - (b) Average and maximum injection pressure; and,
  - (c) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids, including any additives.
- Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection zone.
- 8. Proposed stimulation program.
- 9. Proposed injection procedure.
- 10. Engineering drawings of the surface and subsurface construction details of the system.

DBP Form No:

Form Title: Application to Construct/
Operate/Abandon Class I, III,
or V Injection Well Systems

Effective Date:
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- 11. Contingency plans to cope with all shut-ins or well failures or catastrophic collapse, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.
- 12. Plans (including maps) and proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.
- 13. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.
- 14. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, and a drilling, testing and coring program.
- 15. A certificate that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.
- 16. Expected changes in pressure, native fluid displacement, direction of movement of injection fluid.
- 17. A proposed monitoring plan, which includes a plan for detecting migration of fluids into underground sources of drinking water, a plan to detect water quality violation in the monitoring wells, and the proposed monitoring data to be submitted.

#### Operation Phase

- 1. The following information shall be provided to the Department prior to granting approval for the operation of the well or well field:
  - (a) All available logging and testing program data and construction data on the well or well field;
  - (b) A satisfactory demonstration of mechanical integrity for all new wells pursuant to Rule 62-528.300(6), F.A.C.;
  - (c) The actual operating data, including injection pressure versus pumping rate where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;
  - (d) The results of the formation testing program;
  - (e) The actual injection procedure; and,
  - (f) The status of corrective action on defective wells in the area of review.

#### Plugging and abandonment Phase

1. The justification for abandonment.

DEP Form No:

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or V Injection Mell Systems

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- 2. A proposed plan for plugging and abandonment describing the preferred and alternate methods.
  - (a) The type and number of plugs to be used;
  - (b) The placement of each plug including the elevation of the top and bottom;
  - (c) The type and grade and quantity of cement or any other approved plugging material to be used; and,
  - (d) The method for placement of the plugs.
- 3. The procedure to be used to meet the requirements of Rule 62-528.435, F.A.C.

#### F. EXPLORATORY WELL CONSTRUCTION AND TESTING PERMIT

- Conceptual plan of the injection project. Include number of injection wells, proposed injection zone, nature and volume of injection fluid, and proposed monitoring program.
- 2. Preliminary Area of Review Study. Include the proposed radius of the area of review with justification for that radius. Provide a map showing the location of the proposed injection well or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.
- 3. Proposed other uses of the exploratory well.
- 4. Drilling and testing plan for the exploratory well. The drilling plan must specify the proposed drilling program, sampling, coring, and testing procedures.
- 5. Abandonment Plan.

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#### G. CLASS V WELL CONSTRUCTION PERMIT

signature.

(This form should be used for Class V Wells instead of Form 62-528.900(3), F.A.C., when there is a need for a Technical Advisory Committee and an engineering report.)

1. Ту	pe and number of proposed Class V Wells:					
	Wells Receiving Domestic Waste					
	Desalination Process Concentrate Wells (Reverse Osmosis, etc.)					
	Aquifer Storage and Recovery Wells					
	Aquifer Remediation Wells					
	Salt-water Intrusion Barrier Wells					
	Cooling Water Return Flow Wells Open-looped System					
	Subsidence Control Wells					
	Sand Backfill Wells					
	Experimental Technology Wells					
	Wells used to inject spent brine after halogen recovery					
<del></del> .	Radioactive Waste Disposal Wells*					
	Borehole Slurry Mining Wells					
	Other non-hazardous Industrial or Commercial Disposal Wells					
	(explain)					
<del></del>	Other (explain)					
*Pro	ovided the concentrations of the waste do not exceed drinking water standards					
2. Pro	ject Description:					
(a)	Description and use of proposed injection system;					
(b)	Nature and volume of injected fluid (the Department may require an analysis including bacteriological analysis) in accordance with Rule 62-528.635(2)(b), F.A.C.; and,					
(c)	Proposed pretreatment.					

3. Water well contractor's name, title, state license number, address, phone number and

DBP Form No:

Form Title: Application to Construct/
Operate/Abandon Class I, III,
Or V Injection Well Systems

Effective Date:
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(Filled in by DBP)

	(1711cu ili by bar)
	Design and Construction Details. (For multi-casing configurations or unusual ruction provisions, an elevation drawing of the proposed well should be thed.)
(a)	Proposed total depth;
(b) 1	Proposed depth and type of casing(s);
(c) I	Diameter of well;
(d) (	Cement type, depth, thickness; and,
(e) ]	Injection pumps (if applicable): gpm @ psi
	Controls:
radius when sof wa approx 6. Area of Includeradius field the a produce water, water The ma	Supply Wells - When required by Rule 62-528.635(1), F.A.C., attach a map on showing the locations of all water supply wells within a one-half (1/2) mile is of the proposed well. The well depths and casing depths should be included. required by Rule 62-528.635(2), F.A.C., results of bacteriological examinations atter from all water supply wells within one-half (1/2) mile and drilled to eximate depth of proposed well should be attached.  Of review (When required by Rule 62-528.300(4), F.A.C.)  The definition of the area of review with justification for that is. Provide a map showing the location of the proposed injection well or well area for which a permit is sought and the applicable area of review. Within rea of review, the map must show the number or name, and location of all sing wells, injection wells, abandoned wells, dry holes, surface bodies of springs, public water systems, mines (surface and subsurface), quarries, wells and other pertinent surface features including residences and roads. The should also show faults, if known or suspected. Only information of public and pertinent information known to the applicant is required to be included as map.
H. CLASS V W	ELL OPERATION PERMIT
(Final repor	t of the construction that includes the following information may be submitted lication to operate.)
1. Permit	Number of Class V Construction Permit: 14128-002UIC
2. Owner'	s Name: Florida Water Services Corporation
3. Type o	f Wells: Class V Aquifer Storage and Recovery

H.

DBP Form No: 62-528.900(1)
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or V Injection Well Systems
Effective Date:
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(Filled in by DBP)

							(Filled in by DEP)
4.	Cons	struction	and Testing Sur	mmary: See A	ttached Report	for Details.	- · · · · · · · · · · · · · · · · · · ·
	(a) Actual Dimensions:						
	Dia	meter		Well Depth		Casing Depth	
		·	(inches)		(feet)	cusing bepon	(feet)
					-		
		•					
		•					
	(h)	Regult of	Initial Testi				
_				_			
5.	5. Proposed Operating Data: See Attached Report for Details.						
	(a)	Injection	Rate (GPM);				
	(b)	Descripti	on of injected	waste; and,			
	(c)	Injection	pressure and p	oump controls.			
6.	Prop	osed Monit	oring Plan (if	any): See A	ttached Report	for Details	
	(a)		of monitoring w			Tot becaries.	
	(b)	Depth(s)		C115,			
	(c)	Paramete	rs;				
	(d) .	Frequenc	y of sampling;	and,			
	(e)	Instrument	ation (if appl	icable) Flow			
				Pressure			

# I. CLASS V WELLS PLUGGING AND ABANDONMENT PERMIT

- 1. Permit number of Class V construction or operating permit.
- 2. Type of well.
- 3. Proposed plugging procedures, plans and specifications.
- 4. Reasons for abandonment.

DEP Form No:

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Operate/Abandon Class I, III.
or V Injection Well Systems

Effective Date:
DEP Application No.:

(Filled in by DEP)

#### J. MONITOR WELL PERMIT

This section should be used only when application is made for a monitor well only. If a monitor well is to be constructed under a Class I, III, or V injection well construction permit, it is necessary to fill in this section.

- A site map showing the location of the proposed monitor wells for which a permit is sought. The map must be to scale and show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, water wells and other pertinent surface features including structures and roads.
- 2. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.
- 3. Maps and cross sections detailing the hydrology and geologic structures of the local area.
- 4. Generalized maps and cross sections illustrating the regional geologic setting.
- 5. Proposed formation testing program to obtain an anlysis of the chemical, physical and radiological characteristics of and other information on the monitor zone(s).
- 6. Proposed monitoring procedure.
- 7. Engineering drawings of the surface and subsurface construction details of the monitoring system.
- 8. Proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.
- 9. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, proposed blowout protection (if necessary), and a drilling, testing and coring program

10.	Mon	nitor Well	Information:	
		On-site	☐ Multizone ☐ Single-zone	
		Regional	Other (specify)	
	Pro	posed Moni	itoring Interval(s)	
	Distance and Direction From Associated Injection Well			
_				-

# PART II ENGINEERING REPORT

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#### **ENGINEERING REPORT**

SUBMITTED WITH THE APPLICATION FOR A CLASS V
UIC OPERATING PERMIT FOR FLORIDA WATER SERVICES CORPORATION
MARCO LAKES RAW WATER FACILITY ASR WELLS 2 AND 3 (ASR#2 and ASR#3)
PERMIT NUMBERS 141218-001UIC AND 141218-002UIC

#### 1.0 INTRODUCTION

This report and accompanying application are being submitted in accordance with the basic permitting requirements specified in Rule 62-528.640 F.A.C. and the information requested on FDEP Form 62-528.900(1) for Florida Water Services Corporation (Florida Water) regarding the Marco Lakes ASR#2 and ASR#3 wells. Marco Lakes is located on County Road 941, just north of the intersection with Route 41, in Collier County, Florida. Figure 1.1 provides a site location map. Well locations at this site are indicated on Figure 1.2.

### 2.0 AREA OF REVIEW UPDATE

The previous area of review (AOR) based on a 1-mile radius of investigation has been utilized for this investigation. The anticipated plume radius is not expected to extend beyond 4000 feet. The current plume radius based on measured concentrations in the monitoring wells is less than 1100 feet from any well.

# 2.1 Updated Area of Review

The 1-mile radius for the area of review around ASR wellfield has been reviewed and an updated Area of Review Map has been created (Figure 2.1). An inventory was conducted to identify wells constructed or previously unidentified during the previous area of reviews undertaken during the permitting for the original ASR well and for the wellfield expansion. The AOR encompasses an area within a 1-mile radius from the site. The study area includes Sections 26, 27, 28, 33, 34, and 35 in Township 50 S., Range 26 E. and Sections 2, 3, 4, 9, 10, and 11 in Township 51 S., Range 26 E. The study area also lies within the area bounded by latitude 26° 02' N. to 26° 05' N. and longitude 81° 40' W. to 81° 43' W. The locations of the identified wells are shown on Figure 2.1. Many of the wells are listed by section only and their precise location within the section is not discernible. Also, as some sections may not be wholly within the 1-mile radius, some of the wells listed on the inventory may be outside of the AOR.

Records from the South Florida Water Management District, the U. S. Geological Survey, the Florida Geological Survey in Tallahassee, the Florida Geological Survey Oil and Gas section in Fort Myers, Collier County well construction permitting, and our inhouse data base were searched to inventory wells. A tabulation of wells that lie within the area of review is included in Table 2.1.

# 2.2 Wells within the Area of Review That Penetrate the Injection, Confining or Monitoring Zones

Over 390 wells were identified during the new inventory. Other than wells drilled as part of the Marco Lakes ASR project; only three wells were identified that penetrate deeper than 210 feet. The Marco Lake wells include three ASR wells, a dual-zone monitor well, an ASR zone monitor well, and an upper zone ASR monitor well. The borings that are deeper than 210 feet not associated with the Marco Lakes project are a test core and two oil test wells. The oil test wells were abandoned shortly after completion in 1952. The abandonment records are on file in the Florida Geological Survey, Oil and Gas Section's Fort Myers office. The abandoned oil test wells are the only identified wells that penetrate the injection, confining, or monitoring zones.

# 2.3 Base of the USDW, Hydrogeology, and Geology

The base of the underground source of drinking water (USDW), defined in applicable state of federal regulations as 10,000 mg/l total dissolved solids (TDS), was not penetrated at the project site. Native groundwater in the storage interval and overlying aquifers is most appropriately classified as G-II, which is groundwater with a TDS content between 3,000 and 10,000 mg/l (F.A.C. 62-520.410).

Detailed geological information for the ASR pilot project, including geophysical logs, water quality encountered during drilling, and a geologist's log, was previously submitted with the original engineering construction report (ViroGroup, 1998).

Additional geological information for the subsequent ASR wellfield expansion, including geophysical logs, water quality encountered during drilling, and a geologist's log, was previously submitted with the engineering construction report (Water Resource Solutions, 2000).

# 2.4 Corrective Action Plan for Improperly Plugged Wells

Currently there are no improperly completed or plugged wells that penetrate the injection, confining or monitoring zones within the Area of Review.

### 3.0 WELL OPERATIONS

# 3.1 Wellfield Operating History

ASR activity at this site was initiated in July 1997 when water was first injected into the ASR1 well. Between July 1997 and August 2001, six ASR cycles were performed using ASR1. The volumes injected into ASR1 during the first six cycles were 19.6 MG, 86 MG, 21 MG, 110 MG, 132 MG, and 125 MG. The volumes of water recovered from the large cycle tests including Cycles 2, 4, 5, and 6 were 20 MG, 50 MG, 67 MG, and 80 MG respectively. In August of 2001, the first phase of the ASR site expansion was completed for ASR wells ASR2 and ASR3, and injection into these wells was initiated. Since operation was initiated, 7 major cycles have now been completed.

The last cycle, identified as Cycle 1E, was conducted using the three ASR wells, ASR1, ASR2, and ASR3. The total volume injected during Cycle 1E was 325 MG with 100 MG injected into ASR1, 130 MG injected into ASR2, and 95 MG injected into ASR3. Water was recovered from these wells beginning April 2, 2002. The total volume recovered during this cycle was 142.5 MG. The water quality limit of 350 mg/l chlorides was reached in ASR2 after recovery of 49 MG and in ASR3 after recovery of 38.5 MG. After recovering 55 MG from ASR1, the water quality was only approaching 250 mg/l chlorides when this well was shut-in to begin the next ASR cycle. Injection rates for individual wells ranged up to 1864 gpm and the maximum injection pressure was 64 psi recorded for injection into ASR3.

Details for injection and recovery during Cycle 1E are provided for review in the remainder of this document. Data for ASR1 are included for comparison purposes since this well has the longest operational history at this site. The data recorded during Cycle 1E show that the behavior of ASR2 and ASR3 is very similar to the behavior of ASR1 and therefore similar long-term results are expected.

#### 3.2 Cycle 1E Injection

## 3.2.1 Flow Rates, Pressures, and Injectivity

#### **ASR Wells**

Daily flow rates to the ASR expansion system during injection cycle 1E were highly variable. Generally, daily flows ranged from under 0.5 to 2.25 million gallons a day (MGD) to individual wells. Injection rates ranged between 214 and 1861 gpm for ASR1. The average injection rate into ASR1 was 1072 gpm during Cycle 1E. Injection rates ranged between 113 and 1864 gpm for ASR2. The average injection rate into ASR2 was 1030 gpm during Cycle 1E. Injection rates ranged between 231 and 1401 gpm for ASR3. The average injection rate into ASR3 was 755 gpm during Cycle 1E. Total cumulative volumes injected into each ASR well are plotted in Figure 3.1. Injection rates are tabulated in Table 3.1 for each ASR well.

Injection pressures were correspondingly variable, with maximum daily values generally ranging between 30 and 50 psi above static (40 to 60 psi wellhead-pressure). The maximum pressure that was recorded during this cycle was 64 psi. Average injection pressures are plotted in Figure 3.2. Injection pressures are also tabulated in Table 3.1.

The specific injectivity of the two new ASR wells was generally maintained within the acceptable target range between 10 to 20 gpm/ft during Cycle 1E.

As indicated in previous submissions, a small reduction in the pH of the injected water is required to prevent plugging of the formation and loss of injectivity. Addition of hydrochloric acid was used during the majority of the injection cycle to lower the pH of the raw water by approximately 1.0 pH unit (assuming a drop from 8.0 to 7.0). This reduction in pH is recommended initially to prevent plugging and maintain good injectivity. Once target injectivity is reached, the pH adjustment may be scaled back to

a lower maintenance level. The acid injection system was switched from hydrochloric acid to CO<sub>2</sub> in mid-November 2001. The injection of CO<sub>2</sub> was maintained with good results until injection ceased and the wells were shut-in on December 11, 2002.

#### **Monitoring Wells**

For the purposes of this report, nomenclature for the monitor wells in the ASR expansion system will follow Florida Water Services' use in their prepared Monthly Operations Reports. The following monitor well terminology is used throughout the remainder of this report: Shallow Zone #1 (SZ#1), Deep Zone #1 (DZ#1), Shallow Zone #2 (SZ#2) and Deep Zone #2 (DZ#2). The corresponding well names for the above monitor wells that are listed in the FDEP operating permit are indicated with parenthesis: SZ#1 (DMW-1), DZ#1 (ASR1MW), SZ#2 (MHZ2MW) and DZ#2 (ASR2MW). The data provided in this section summarizes data included in the monthly operating reports submitted by Florida Water Services to the Florida Department of Environmental Protection.

SZ#1 and DZ#1 were completed with the pilot project as a dual zone monitoring well with the shallow monitoring well (SZ#1) completed between 293 and 350 feet below land surface (bls). The deep monitoring well (DZ#1) is completed in the ASR storage unit between the depths of 745 to 800 feet bls. The dual zone monitoring well is located approximately 375 feet southeast of ASR1 (Figure 1.2).

SZ#2 and DZ#2 were completed as part of the expansion project including wells ASR2 and ASR3. SZ#2 is completed in the mid-Hawthorn Zone II from 440 to 470 feet bls, and is located approximately 250 feet northwest of ASR2 and 250 feet southwest ASR3. DZ#2 is completed in the ASR storage unit from 725 to 774 feet bls, and is located approximately 1250 feet north-northwest of ASR3.

Surface pressure data at SZ#1 and DZ#1 are recorded in psi on a circular seven-day chart. Pressures were consistently reported as 8 psi at SZ#1 and 18 psi at DZ#1 during

the injection cycle. These data indicate no discernable pressure increase in SZ#1 and a 9 to 10 psi increase at DZ#1 due to injection.

Monitor well pressures, recorded during injection and recovery, are displayed graphically for SZ#2 and DZ#2 in Figure 3.3. With the exception of data collected during the month of December, water levels in SZ#2 remained near 35 feet NGVD during recharge. Water levels in SZ#2 ranged near 33 feet NGVD during recovery. Thus, there does not appear to be a strong impact in aquifer pressure in this zone that can be attributed to ASR activity. A large drop in pressure in SZ#2 beginning in early December from 35 feet to 14 feet is not readily explained based on ASR activity since injection into the ASR wells did not end until mid-December as indicated by the response in DZ#2 (Figure 3.3). The water levels observed in SZ#2 during recovery remained near 33 to 34 feet NGVD. The minimum change in water levels between recovery and recharge indicates little impact due to ASR activity on water levels in SZ#2.

The data provided for DZ#2 (Figure 3.3), which is completed in the ASR storage zone, clearly indicate responses to ASR activity. The background water level for this well is approximately 34 feet NGVD. The water level during recharge increased to near 48 feet NGVD and dropped to approximately 28 feet during recovery.

Data from the monitoring system indicates large, simultaneous water level fluctuations in excess of 100 feet occurred for both SZ#2 and DZ#2 during late June and July of this year. The source of these large fluctuations are not known, but the magnitude would indicate that these spikes are most likely due to electrical signal corruption rather than actual water level changes in the aquifers. Similar fluctuations were not noted on the SZ#1 or DZ#1 charts where surface pressures remained at 8 psi for SZ#1 and 6 psi for DZ#1. The absence of fluctuations on these charts provide further evidence that the fluctuations are not likely due to actual aquifer water level changes. Finally, it should be noted that all four monitoring wells operate under artesian pressure. There are no pumps in these wells.

## 3.2.2 Water Quality

Water quality monitoring of injection parameters designated in the FDEP permit (See Table 3.2) is discussed in this section. The majority of the parameters identified in Table 3.2 are required to be monitored in the current FDEP permit on a weekly basis and reported on a monthly basis for the ASR wells (ASR1, ASR2 and ASR3) and the monitoring wells SZ#1 and SZ#2 (shallow-zone monitoring wells) and DZ#1 and DZ#2 (ASR-zone monitoring wells). The exceptions to these parameters are gross alpha (monthly) and Cryptosporidium, Giardia Lamblia, and Primary/Secondary Drinking Water Standards (annually). Total alkalinity was not recorded during Cycle 1E but will be monitored on a weekly basis during future cycles as required by the FDEP permit. Primary/Secondary drinking water standard analyses for the injected water and two monitoring wells are provided in Appendix 3.1.

#### **ASR Wells**

A summary of the water quality data collected during recharge for the ASR wells is discussed in the following paragraphs. Table 3.3 provides the data upon which this discussion is based.

Chloride ion, sulfate ion, total dissolved solids (TDS) and conductance are graphically displayed for water injected into the ASR wells in Figure 3.4. The data provided in Figure 3.4 show that the chloride concentration remained fairly constant during the 2001 injection period at approximately 100 mg/l. Sulfate and TDS concentrations are seen to increase slightly during injection. Sulfate concentrations ranged between 49 and 80 mg/l and TDS values increased from 480 mg/l near the middle of recharge to 600 mg/l at the end of recharge. Initial TDS values ranged between 310 mg/l and 620 mg/l.

Dissolved oxygen (DO), pH, total organic carbon (TOC), and color data are graphically displayed for water injected into the ASR wells in Figure 3.5. Color ranged between a low of 22 and a high of 38 c.u. during recharge. Although the color measurements of the

injected water exceed secondary drinking water standards, a water quality exemption was granted for ASR1 that allows color to reach 100 color units (c.u.) and an exemption for ASR2 and ASR3 allows the color to reach 60 c.u. All measured color values were under the exempted levels. None of the other constituents were found to be outside the limits established for injection.

The results of the analytical analyses for THM's and iron are provided in Figure 3.6. These values show that during injection, iron concentrations were below regulated levels. THM values were observed to exceed the drinking water standard on two separate occasions. The largest THM concentration was a measured value of 0.13 mg/l that occurred on October 10, 2002. The second largest excursion was 0.11 mg/l that occurred on September 5, 2002. Over this injection period THM concentrations ranged between undetected to 0.13 mg/l with a median value of 0.061 mg/l.

A review of the coliform data (Table 3.3 and Figure 3.7) indicates that the injected water met the standards for coliforms over the injection period with the exception of a high reading for total coliforms (700 colonies per 100 ml of sample) sampled on October 17, 2002 and a 100 colonies/ 100ml concentration measured on October 23, 2002. In addition, two readings that indicated 100U and one reading of too numerous to count (TNTC) were also recorded. Samples that are analyzed with results of 100U indicate that the original 100-ml sample had various growth components (undifferentiated bacteria, algae, coliform, etc.) that were too numerous to count, making the count of coliform colonies impossible. In these cases, one ml of the sample in question was diluted 100 fold and the sample was re-inspected for the presence of coliform, at which point no coliforms were detected. Data provided from the monitor well sampling indicates that the high measurements of coliform activity are due to contamination associated with sampling or laboratory technique rather than well contamination.

Gross alpha data are graphically displayed for water injected into the ASR wells in Figure 3.8.

Yearly cryptosporidium and giardia lamblia sampling was performed prior to the injection cycle on 3/2/01. As indicated in Appendix 3.2, no giardia or cryptosporidium were detected.

#### **Monitoring Wells**

The results of the monitoring well analyses are provided in Table 3.4 (Monitoring well SZ#1), Table 3.5 (Monitoring well DZ#1), Table 3.6 (Monitoring well SZ#2), and Table 3.7 (Monitoring well DZ#2). Figures 3.9 through 3.12 provide graphical representations for the chloride, sulfate, TDS, and conductance data recorded for these four monitoring wells. The data presented for wells SZ#1, SZ#2, and DZ#2 are similar in that these bulk water quality parameters, as shown in Figures 3.9, 3.11, and 3.12, remain fairly stable over the injection period. However, the analyses from DZ#1 (Figure 3.10), as noted in earlier reports, shows that the concentration of these constituents decline after injection is initiated into ASR1. It is clear from reviewing Figure 3.10 that low chloride. injected water has reached and moved beyond the DZ#1 monitoring well.

Figures 3.13 through 3.16 provide graphical representations for the remaining chemical parameters that are included in the monitoring plan for wells SZ#1, SZ#2, DZ#1, and DZ#2. The data in these graphs, and presented in Tables 3.4, 3.5, 3.6, and 3.7, do not indicate that arsenic is found in the ground water at measurable concentrations. The data from DZ#1 (Figure 3.14) do not indicate that arsenic is being generated to any measurable extent within the recharge bubble since only one measurement of 0.0008 mg/l was measured at a concentration above the detection limit of 0.0005 mg/l.

Iron concentrations in SZ#1 and DZ#1 appear to have increased above background levels. However, since both of these wells are constructed using black steel, it is likely that the source of this iron is the steel casing. This conclusion is based on the fact that the SZ#1 has not been exposed to injected water while the DZ#1 has. Yet, both wells indicate slightly elevated iron concentrations ranging from 0.28 to 1.1 mg/l iron.

Gross alpha levels measured in the water recovered from the monitoring wells typically fluctuates between 20 and 60 piC/l (Figure 3.17), which is fairly normal for this type ground water in Florida. The gross alpha values from the DZ#1 well fluctuated between 5.4 and 68 Pci/l. The majority of measurements were values below 10 Pci/l.

Since the coliform data do not indicate the presence of coliforms, graphs are not provided for the monitoring wells. However, it is of some interest to note that fecal coliforms were found in the samples collected from SZ#2 on October 23, 2002. Problems with coliform analyses also occurred in the DZ#2 well (Table 3.7), while no problems with coliform monitoring were encountered in SZ#1 and DZ#1. Since it is highly unlikely that fecal coliform contamination would have occurred within the formation, it is suspected that samples from SZ#2, DZ#2, and by similarity of data, the injected water samples, were contaminated during sampling or testing.

A comparison of the data provided in Figures 3.4 and 3.14 indicates that if color is moving through the storage interval, it is moving at a much slower rate than the freshwater front. This observation is based on the fact that the color reading in DZ#1 remains near background levels while the chloride content is approaching injected water quality levels. If color was moving with the freshwater front, then color readings approaching 20 c.u. or higher would be expected in DZ#1.

A single THM reading near the detection limit was measured in DZ#1 near the end of the cycle. The THM data provided in Figures 3.4 and 3.8 also indicate that THM movement, like color, is retarded in this aquifer when compared with the movement of the injected freshwater front. No THMs were measured in the SZ#1, SZ#2, or DZ#2 monitoring wells.

Sampling of the shallow zone monitor wells (SZ#1 and SZ#2) indicates that the water quality in these wells fluctuates around the original background levels. Thus, there is no indication of vertical migration of injected fluids at these monitoring points.

It is noted here for reference that the historic discharge of monitoring well purge water (approximately 10,000 gallons of water/week) to Henderson Creek downstream of the weir during recharge and recovery is no longer authorized by the FDEP. Based on FDEP advice, the monitoring well purge water is now discharged into the Marco Lakes. At this time monitoring well water is and will continue to be discharged into the north end of the northern Marco Lake.

# 3.3 Cycle 1E Recovery

# 3.3.1 Recovery Volumes

Approximately 49 and 38.5 MG of water that met the minimum target criteria of 350 mg/l chlorides were recovered from ASR2 and ASR3, respectively (Figure 1.2). At the time of recovery cycle shut-in, approximately 55 MG were recovered from ASR1 with chloride levels below 250 mg/l. This corresponds to approximately 38% recovery for ASR2 and ASR3 at the 350 mg/l chloride cut-off and over 58% at a 250 mg/l cut-off level for ASR1. Based on a comparison with data from previous years, recovery efficiency for ASR1 at 350 mg/l would likely have exceeded 70% recovery.

Figure 3.18 provides a comparison of the chloride concentrations from ASR1 during the first major pilot test (87 MG) and chloride concentrations measured during recovery from ASR2 and ASR3 during Cycle 1E versus volume recovered. Initial cycle recovery volumes with chloride levels under 350 mg/l, noted at ASR2 and ASR3, are significantly higher than those realized during the first large cycle (Cycle 2) in ASR1 for a similar volume. These data indicate that the use of multiple wells with overlapping freshwater bubbles can increase recovery efficiency over wells acting independently. Further expansion of the wellfield, using overlapping bubbles, will likely continue to enhance recovery efficiency of the ASR system.

Average flow rates measured for individual ASR wells and total flow rates for all three wells are summarized in Table 3.8 and have been previously submitted to the FDEP with the monthly monitoring reports.

## 3.3.2 Water Quality

### **ASR Wells**

The required monitoring parameters were previously presented in Table 3.2. Total alkalinity was not monitored during Cycle 1E recovery, but will be monitored during future cycles on a weekly basis as required. Table 3.9 provides a complete summary of the chemical analyses performed on the water samples collected from each of the three ASR wells during recovery.

# Chlorides, Sulfate, TDS, and Conductance

Chloride ion, sulfate ion, total dissolved solids (TDS) and conductance for each of the ASR wells are graphically displayed for water recovered from the ASR wells in Figures 3.19, 3.20, and 3.21. These parameters represent the bulk properties of the recovered water. The recovery curves for each well indicate a slow increase of the listed parameters in the recovered water. The curve shapes for each of these parameters for each well indicate good ASR performance since their progression to higher concentrations is slow and concave up.

#### <u>Arsenic</u>

Figure 3.22 provides a graphical representation of the arsenic measured in the recovered water. As indicated in Figure 3.21 and Table 3.9, measured arsenic concentrations in the recovered waters did not exceed the current regulatory limit for this constituent. The maximum arsenic level measured in the recovered water from ASR1 was 0.0064 mg/l. The measured concentration of arsenic in the water recovered from ASR2 ranged between 0.03 and 0.014 mg/l. The median value was 0.0175 mg/l. Approximately eighty percent of measured arsenic concentrations in ASR2 fell within +/-

0.003 mg/l of the median value. Arsenic levels in ASR3 ranged between 0.049 and 0.018 mg/l. The median value was 0.023 mg/l. The spread in the arsenic values from the median was slightly larger than observed for ASR2 (Table 3.9). The low levels of arsenic in the samples from ASR1, which has experienced significantly more use, indicate that arsenic is progressively removed from the aquifer system by flushing. It is anticipated that the arsenic concentration in the recovered water will gradually diminish to levels similar to those measured for ASR1 during future cycles.

### Dissolved Oxygen, pH, and Color

Dissolved oxygen, pH, and color data are graphically displayed for water recovered from the three ASR wells in Figures 3.23, 3.24, and 3.25. Color levels in the recovered water ranged between an initial high of 50 c.u. and a low of 5. Most values for color ranged in the mid-teens.

A comparison between the color of the injected water and the color of the recovered water (Figures 3.23, 3.24 and 3.25) indicates that the color of the water is reduced during storage in the ASR well.

#### THM

A similar result is noted for THM concentrations (Table 3.9) as indicated for color. In this case, no THM's are observed during recovery in any of the ASR wells. Since no THM's were noted in the recovered water, no graph is provided. These data continue to indicate that both color and THMs, as previously reported, are removed during storage and movement of water through this subsurface unit. Based on these observations, movement of THMs or colored water off-site is unlikely.

#### Iron

Iron concentrations in the water recovered from the ASR wells are summarized in Figure 3.26. The data provided in Figure 3.26 and Table 3.9 indicate initially elevated iron concentrations of a few mg/l. The iron concentrations fall to levels ranging between 0.4 and 0.25 mg/l a few weeks after recovery is initiated.

#### **Coliforms**

No total or fecal coliforms were detected in the recovered water except one reporting of too numerous to count for ASR1 on April 17, 2002 (Table 3.9). This sample appears to have been contaminated since there are no other incidences of coliform being detected before or after this incident.

### Gross Alpha

Gross alpha data collected at the start of recovery are provided in Table 3.9. The limited data show readings of less than 15 PCi/l.

#### Monitoring Wells

# Chlorides, Sulfate, TDS, and Conductance

The chloride, sulfate, TDS, and conductance data, are presented in Table 3.10 and Figures 3.27, 3.28, 3.29, and 3.30. Data for the shallow monitoring zones SZ#1, SZ#2, and DZ#2 do not indicate that any vertical migration of injected water is occurring since the measured values fluctuate around the original background levels and do not reflect cyclical concentration fluctuations that would be representative of an ASR cycle.

The chloride, sulfate, TDS, and conductance data for the deep monitoring zone well DZ#1 (Figure 3.28), clearly show that injected water is being cycled through the subsurface region surrounding DZ#1 in response to recharge and recovery activities. This is indicated by TDS and chloride concentration fluctuations in the DZ#1 that correspond to injection and recovery activities.

### **Arsenic**

With the exception of one reading in the SZ#1 well and one reading in the DZ#2 well, all measurements for arsenic in the four monitoring wells were below detection limits (BDL).

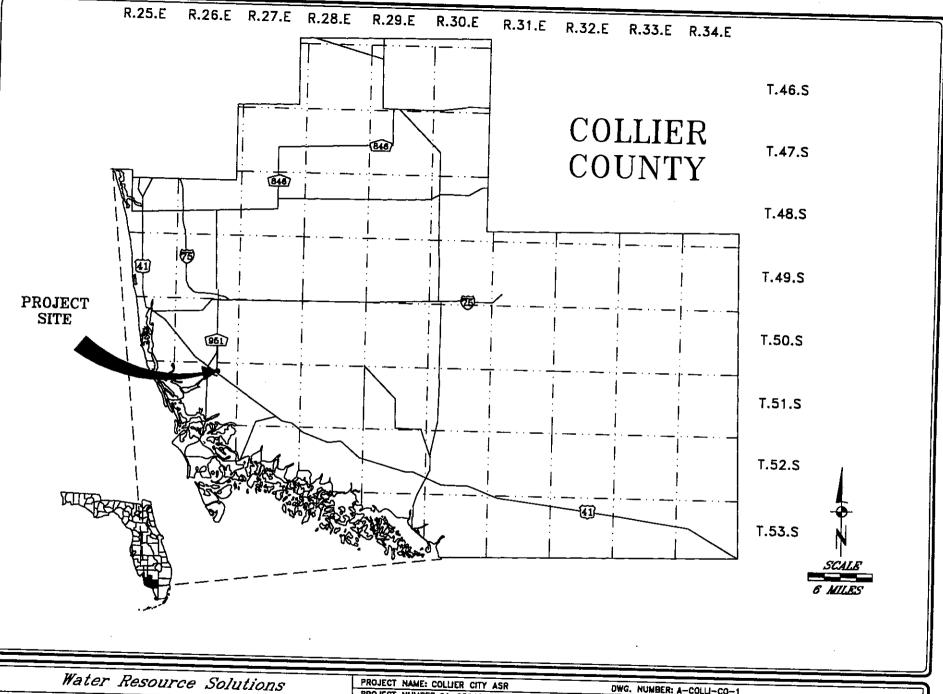
# Iron, THM, Dissolved Oxygen, pH and Color

The data provided in Table 3.10 and Figures 3.31, 3.32, 3.33 and 3.34 show iron, color and pH measurements routinely being reported at background levels with no apparent data trends. The 5/22/02 readings for dissolved oxygen appeared to be high in all wells.

#### 4.0 FLUID COMPATIBILITY

Florida Water has been injecting treated raw water from Marco Lakes since 1997 into the current ASR interval without incident. The formation matrix materials (limestone), is essentially non-reactive with the typical 7.0-8.0 pH range of treated raw water and therefore, little dissolution of the formation is anticipated. No dissolution of the confining materials are anticipated since the injected fluid will be saturated with respect to calcium carbonate by the time the injected fluids come in contact with the first confining beds near 740 feet below land surface.

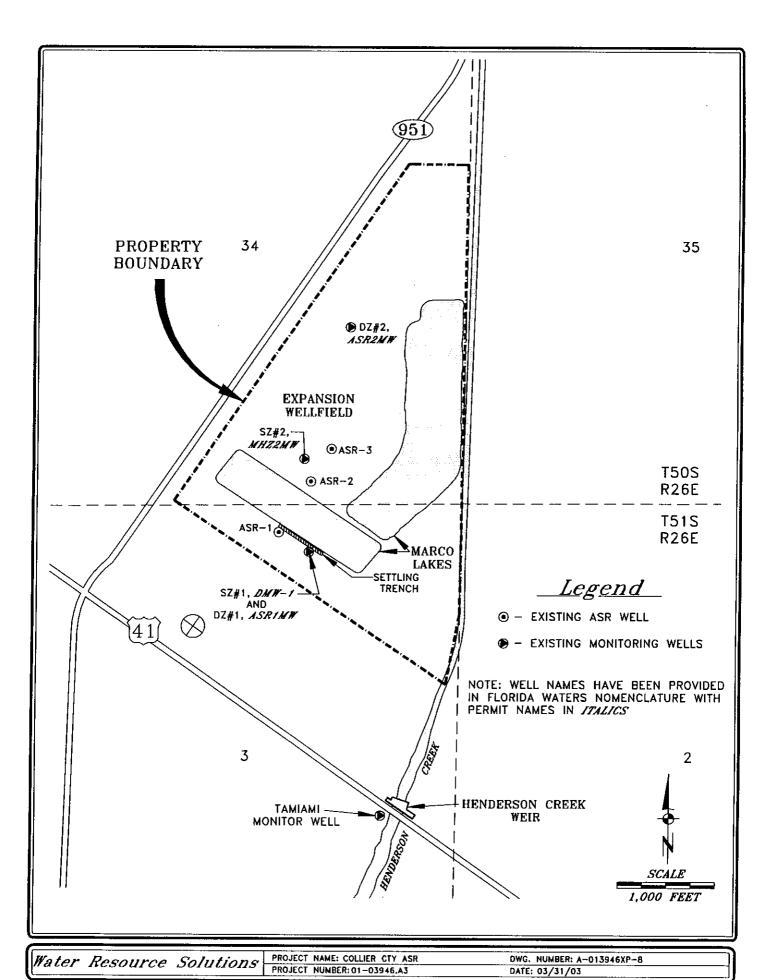
# FIGURES

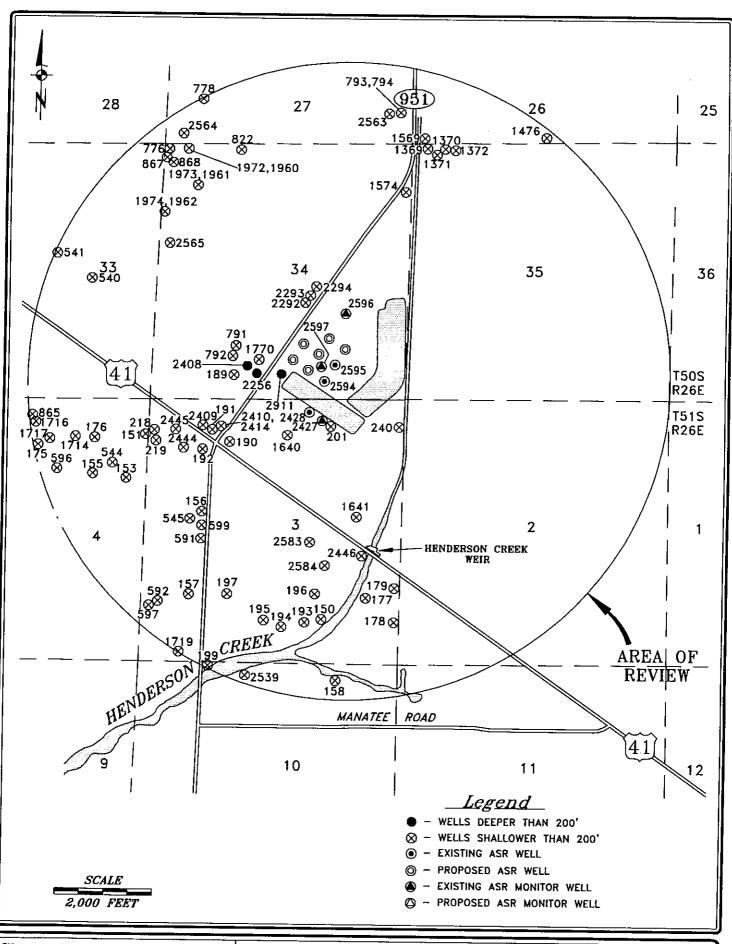


SURE 1.1 MAP SHOWING PROJECT AREA.

PROJECT NAME: COLLIER CITY ASR PROJECT NUMBER: 01-03946.A3

DWG. NUMBER: A-COLU-CO-1 DATE: 11/12/02





Water Resource Solutions PROJECT NAME: MARCO ASR EXPANSION DWG. NUMBER: A-013733KA-3 PROJECT NUMBER: 01-03733.HO DATE: 03/31/03 FIGURE 2.1

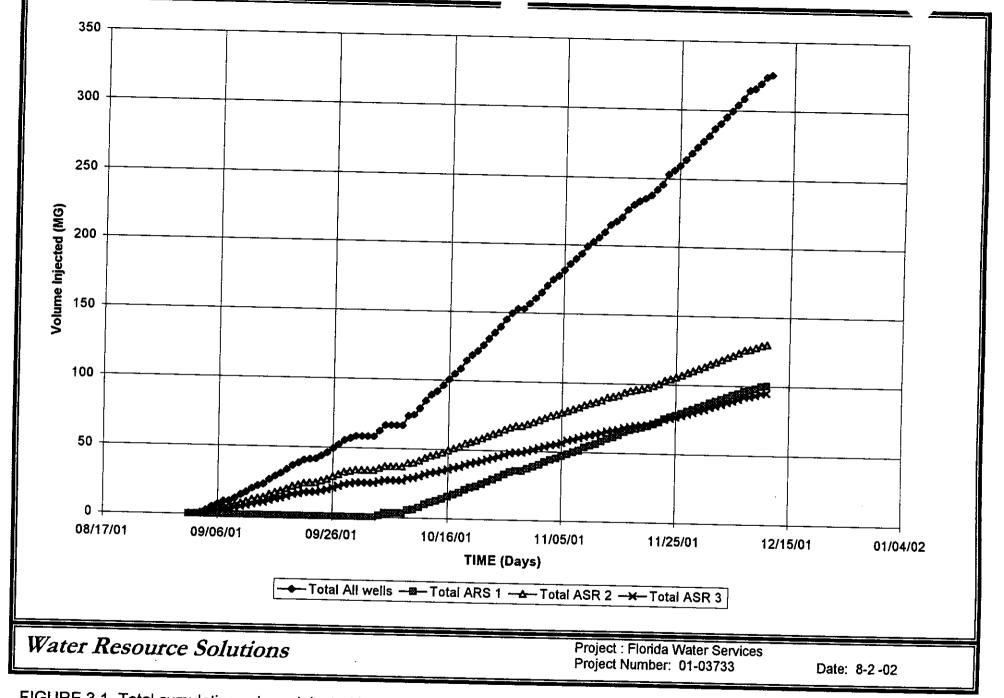


FIGURE 3.1 Total cumulative volume injected into each ASR well and the total volume injected for the system during Cycle 1E

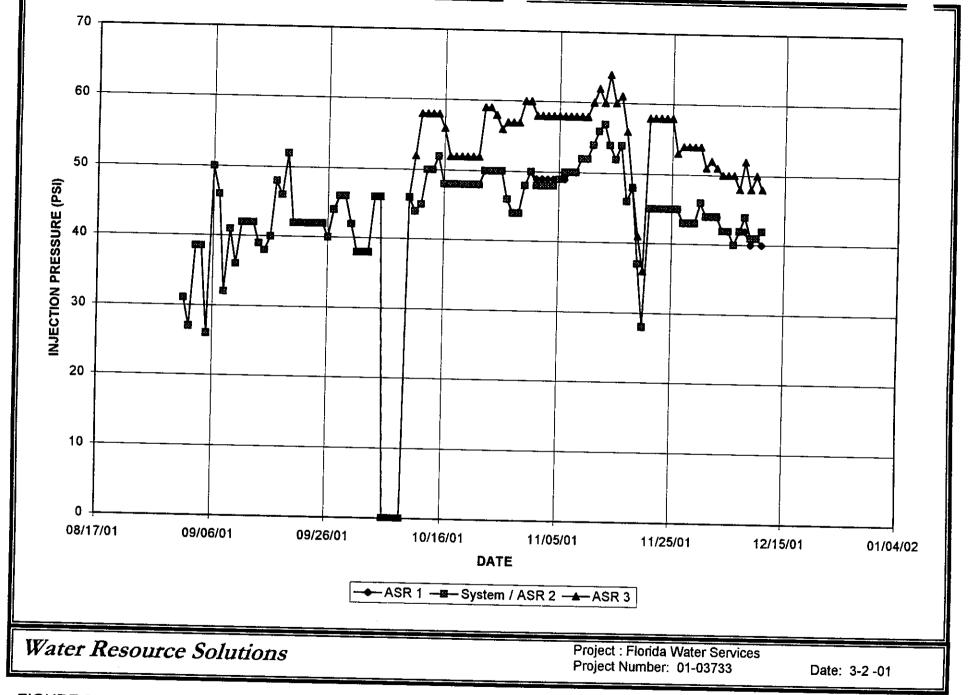


FIGURE 3.2 Daily injection pressures for each ASR well during Cycle 1E.

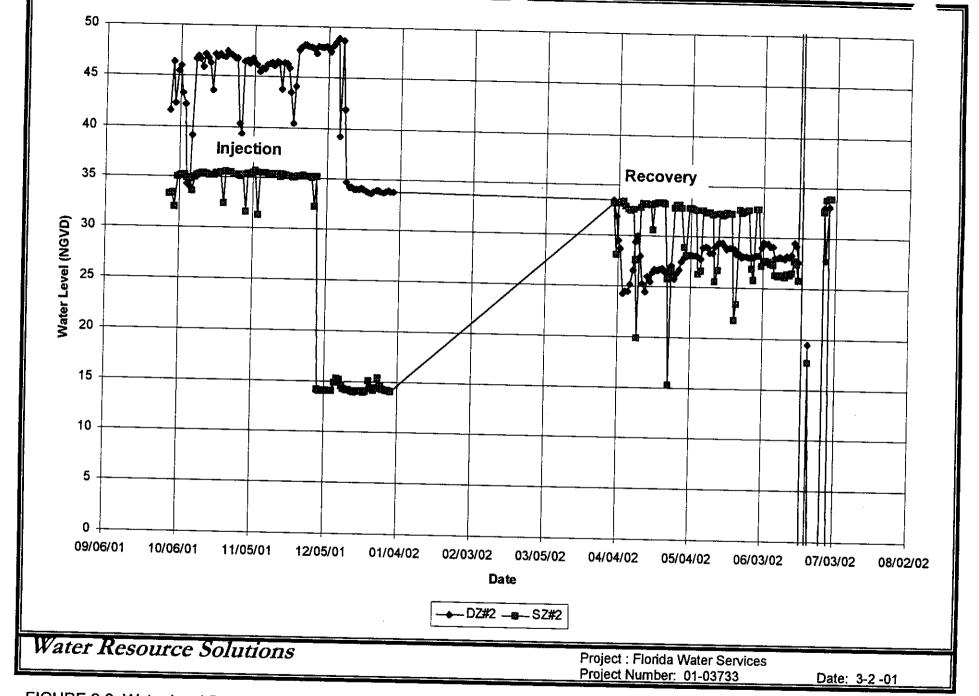


FIGURE 3.3 Water level fluctuations in SZ#2 and DZ#2 measured during Cycle 1E

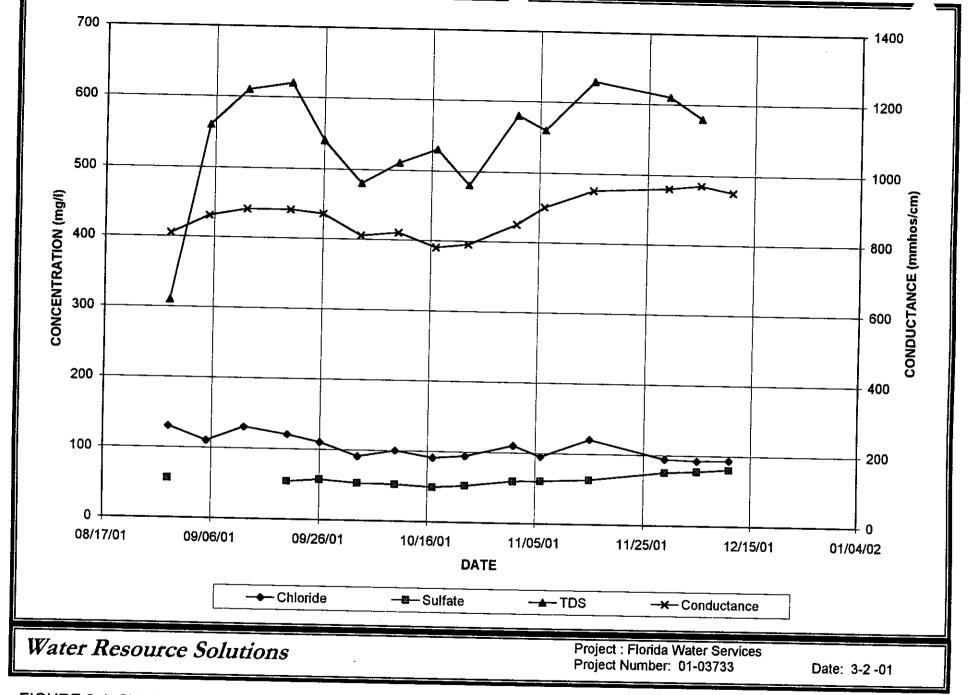


FIGURE 3.4 Chloride, sulfate, TDS, and conductance measured for all ASR wells during Cycle1E injection.

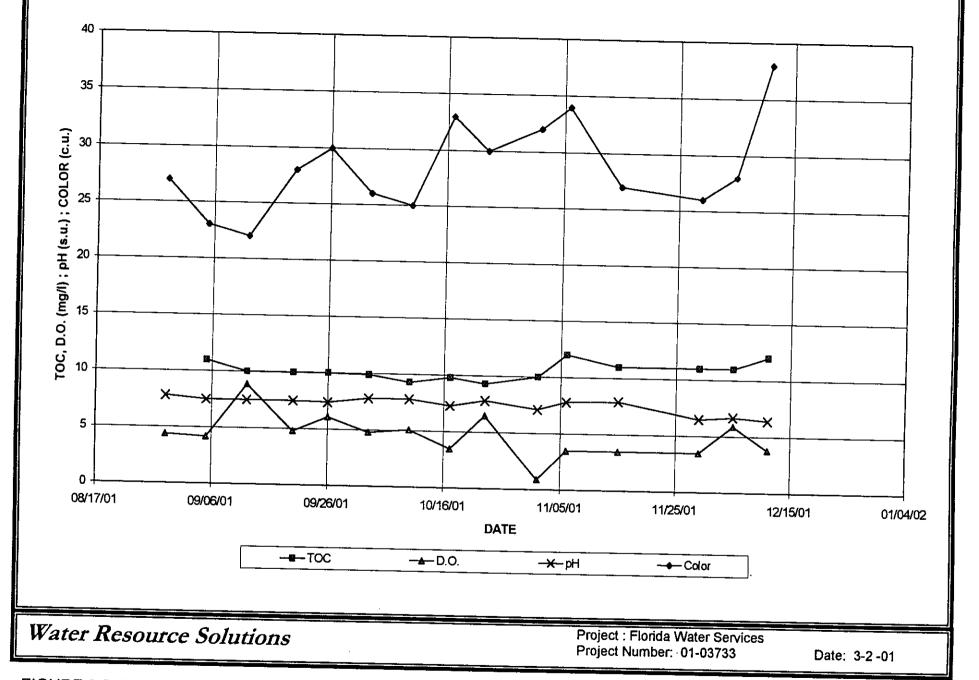


FIGURE 3.5 Total organic carbon, dissolved oxygen, pH, and color measured for ASR wells during Cycle 1E injection.

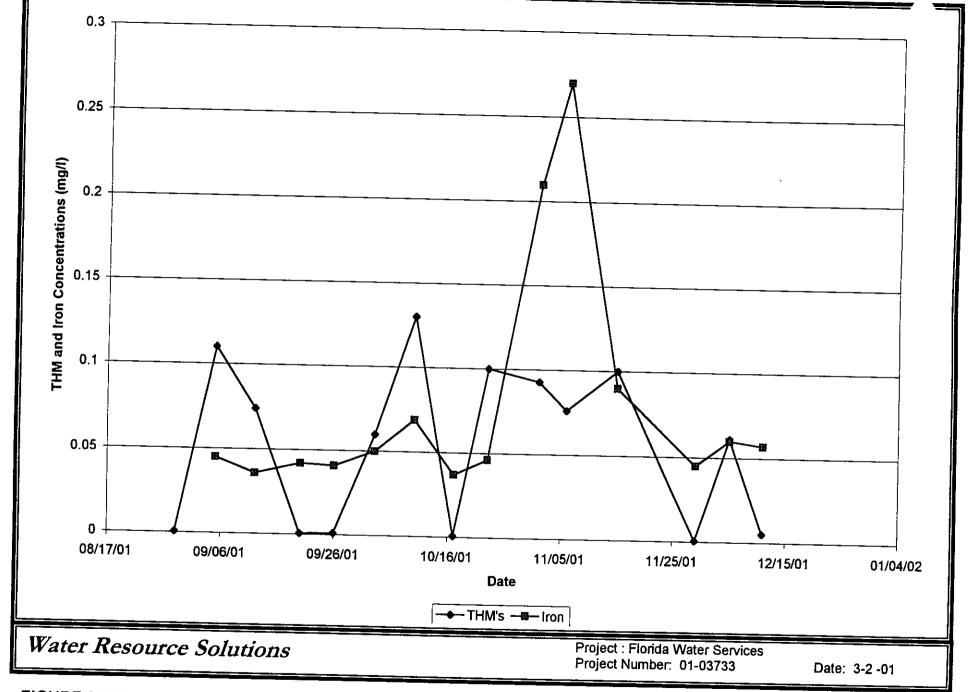


FIGURE 3.6 THM and iron concentrations measured for ASR wells during Cycle 1E injection.

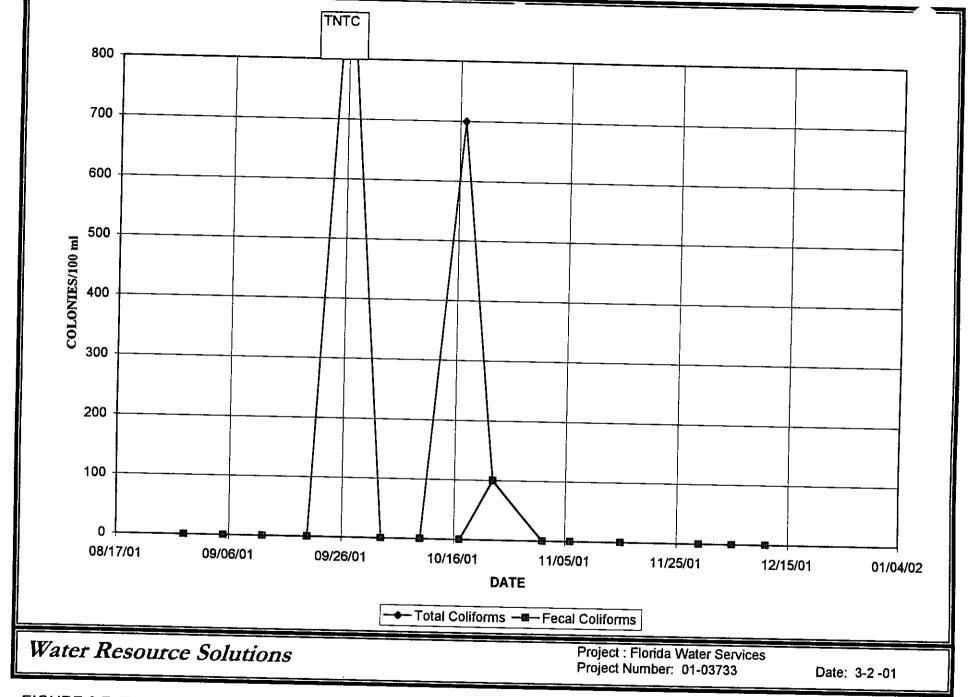


FIGURE 3.7 Total and fecal coliforms measured for ASR wells during Cycle 1E injection.

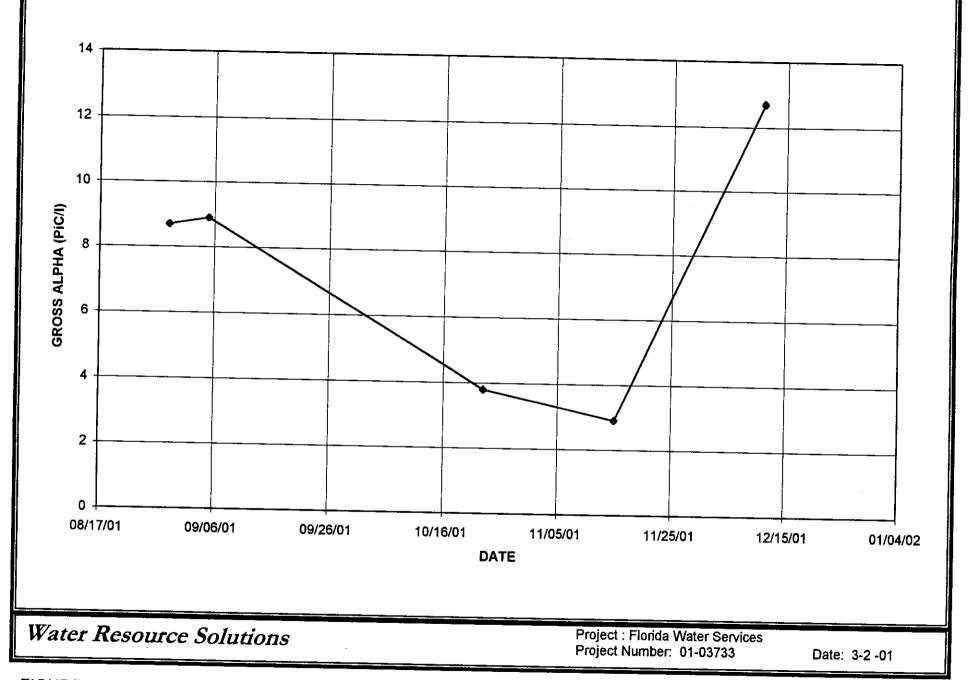


FIGURE 3.8 Gross alpha measured for ASR wells during Cycle 1E injection.

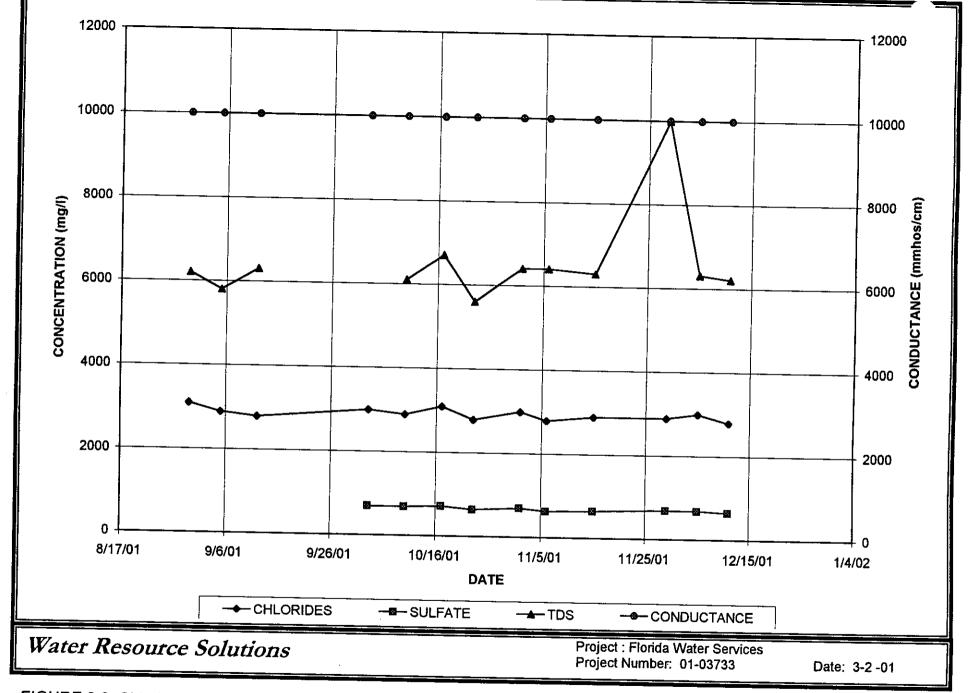


FIGURE 3.9 Chlorides, sulfate, TDS, and conductance measured for SZ#1 during Cycle 1E injection.

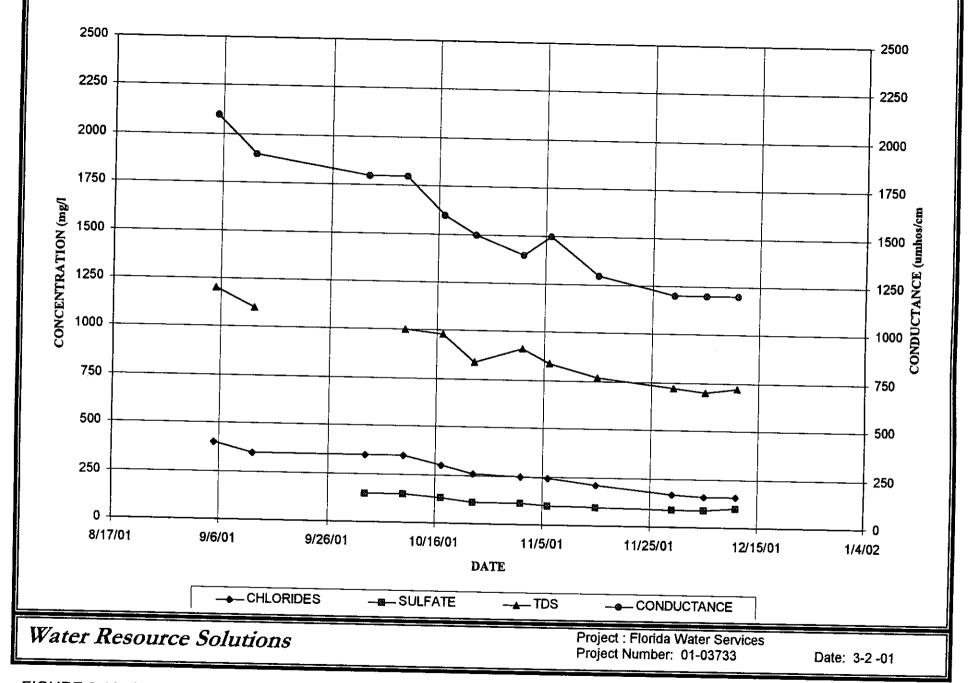


FIGURE 3.10 Chlorides, sulfate, TDS, and conductance measured at DZ#1 during Cycle 1E injection.

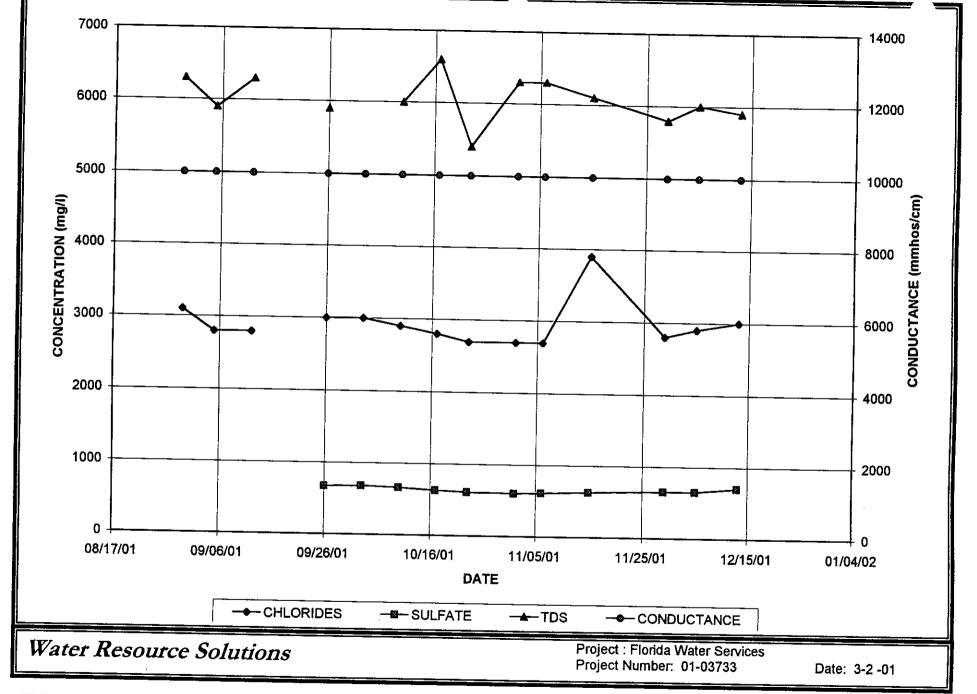


FIGURE 3.11 Chloride, sulfate, TDS, and conductance measured at SZ#2 during Cycle 1E injection.

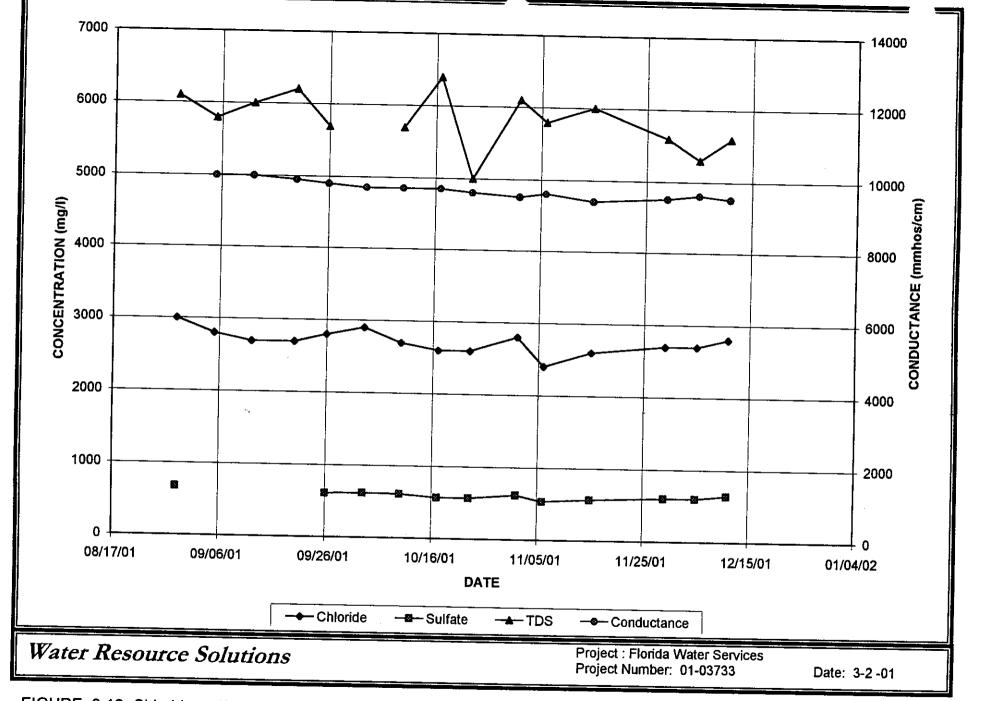


FIGURE 3.12 Chloride, sulfate, TDS, and conductance measured at DZ#2 during Cycle 1E injection.

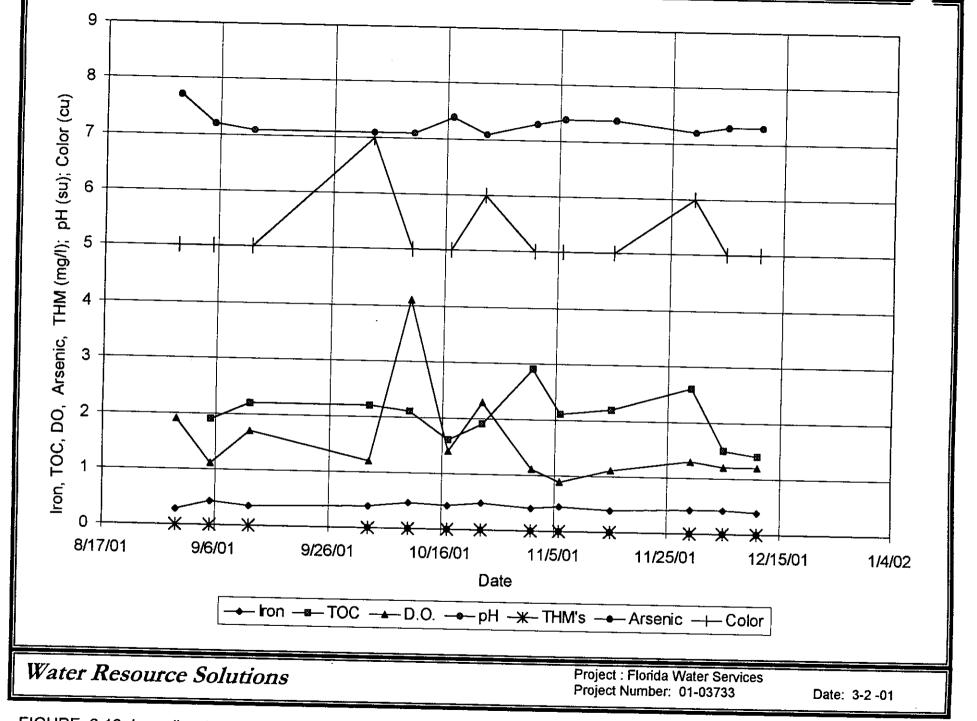


FIGURE 3.13 Iron, dissolved oxygen, T.O.C., arsenic, THM's, pH, and color measured at SZ#1 during Cycle 1E injection.

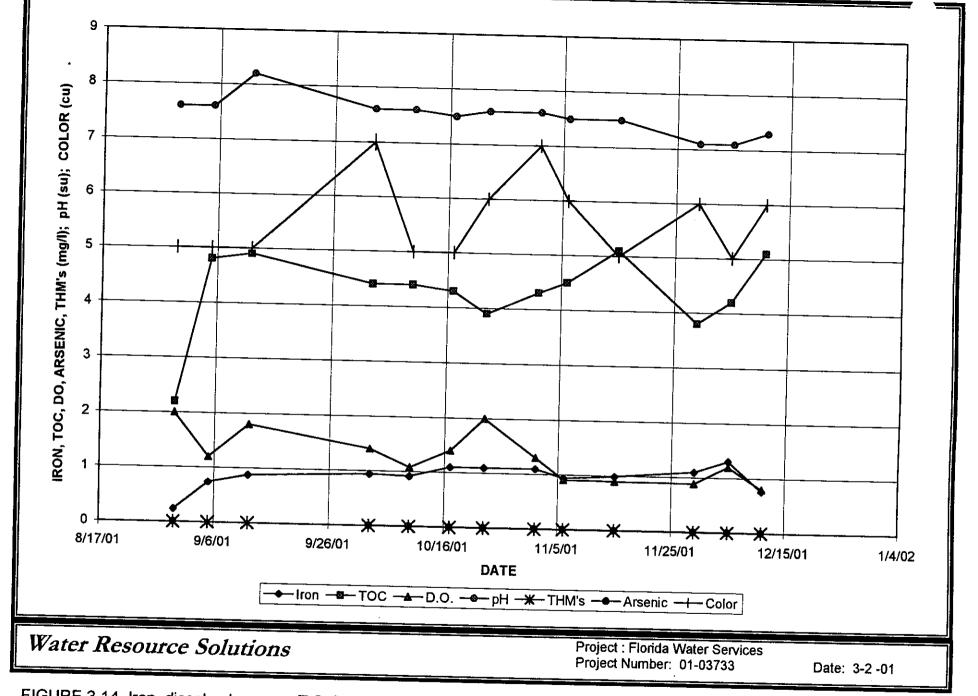


FIGURE 3.14 Iron, dissolved oxygen, T.O.C., arsenic, THM's, pH, and color levels measured at DZ#1 during Cycle 1E injection.

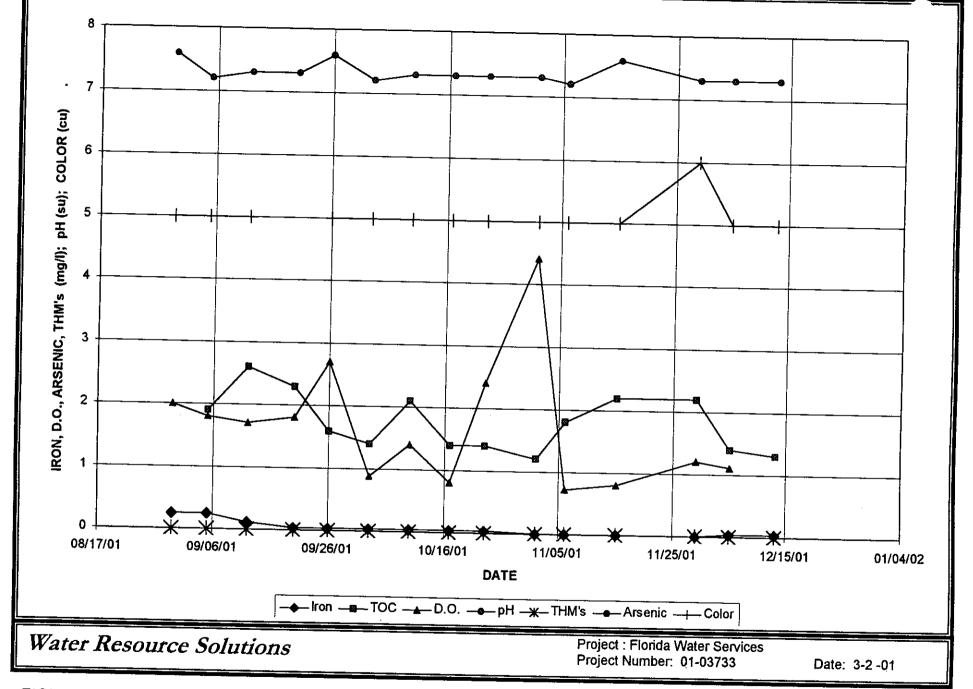


FIGURE 3.15 Iron, dissolved oxygen, T.O.C., arsenic, THM's, pH and color levels measured at SZ#2 during Cycle 1E injection.

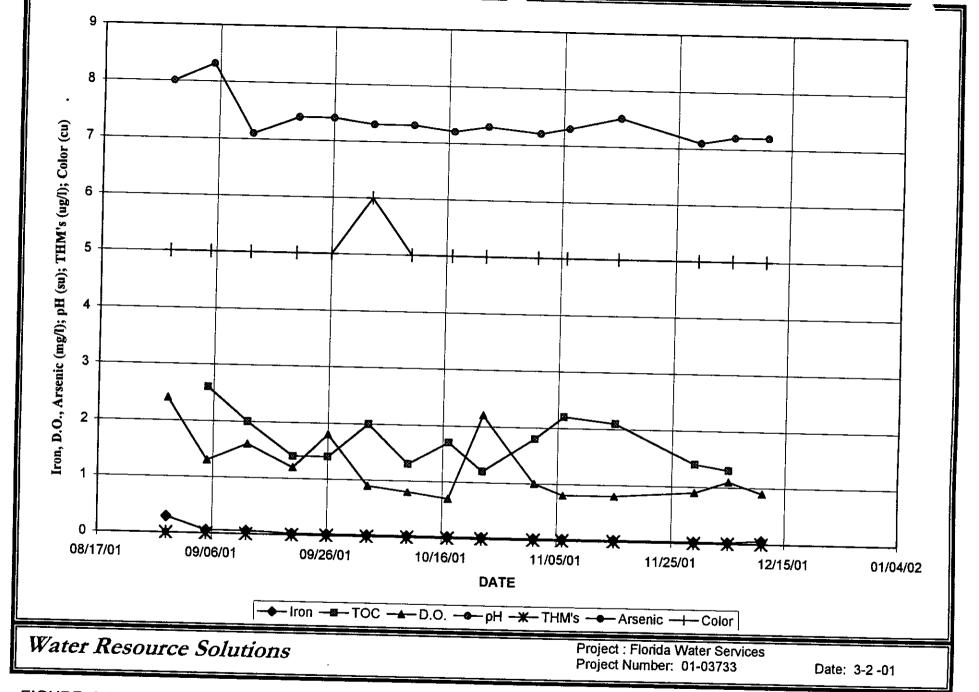


FIGURE 3.16 Iron, dissolved oxygen, T.O.C., arsenic, THM's, pH, and color levels measured at DZ#2 during Cycle 1E injection.

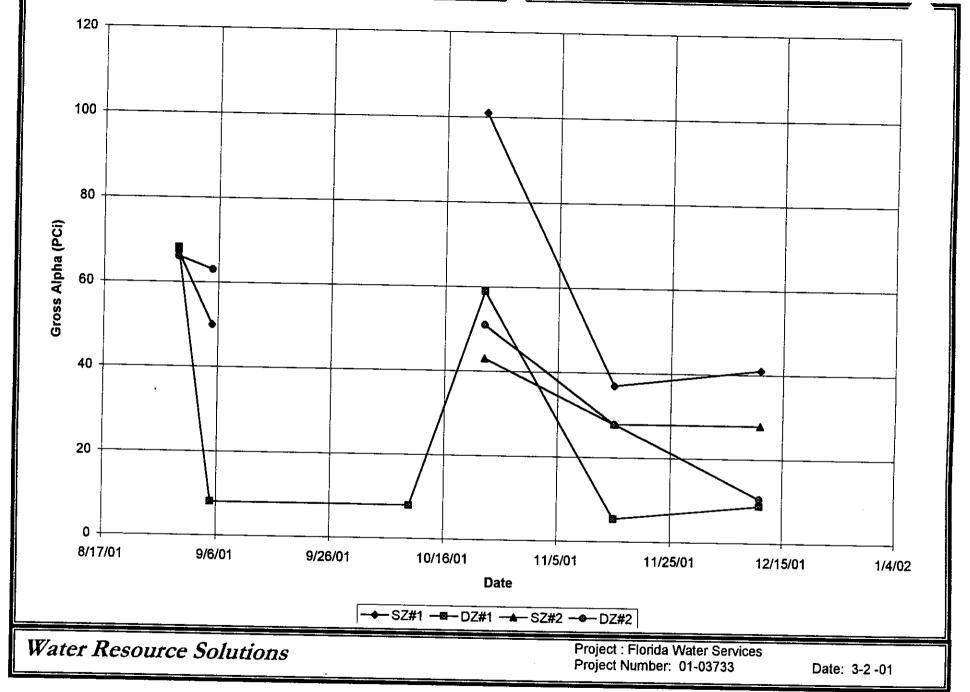


FIGURE 3.17 Gross alpha concentrations measured at individual monitoring wells during Cycle 1E injection.

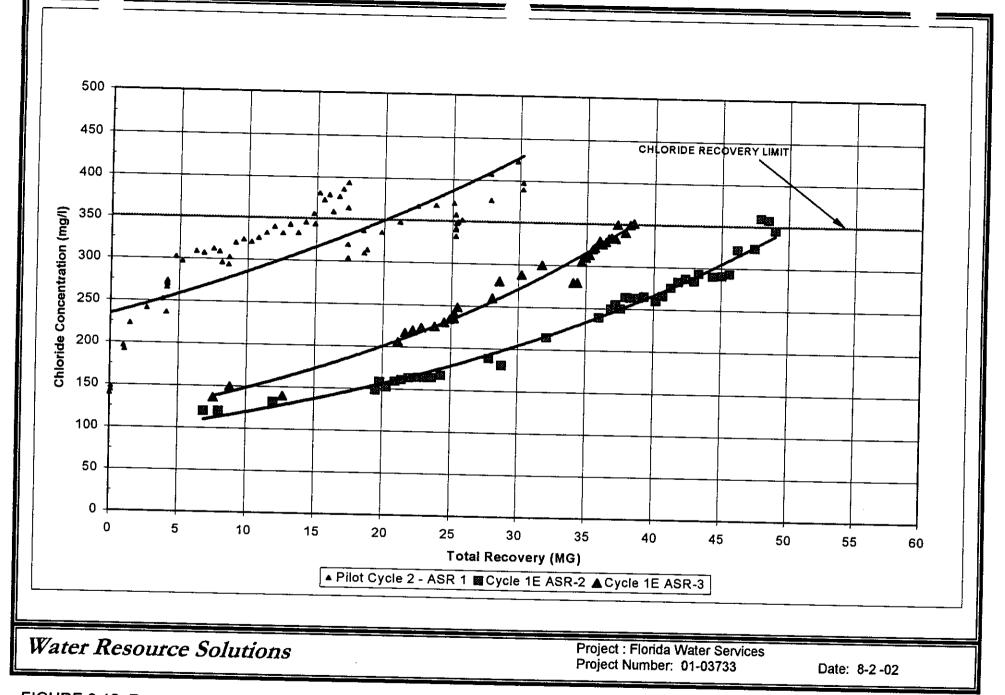


FIGURE 3.18 Recovery performance of the first large cycle for each of the ASR wells.

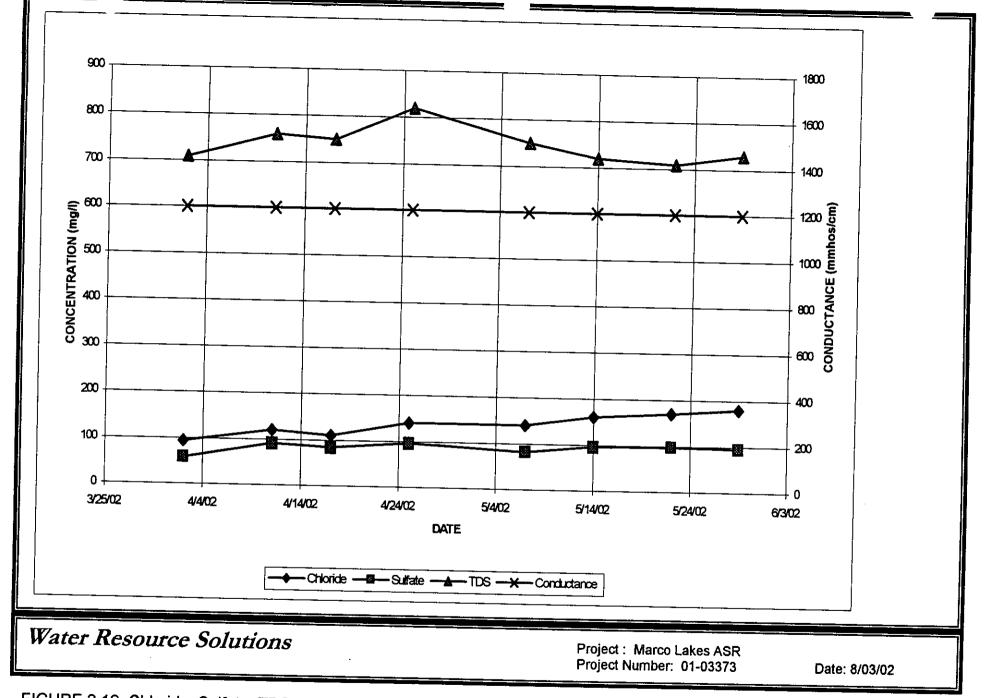


FIGURE 3.19 Chloride, Sulfate, TDS, and Conductance values measured at ASR1 during Cycle 1E recovery.

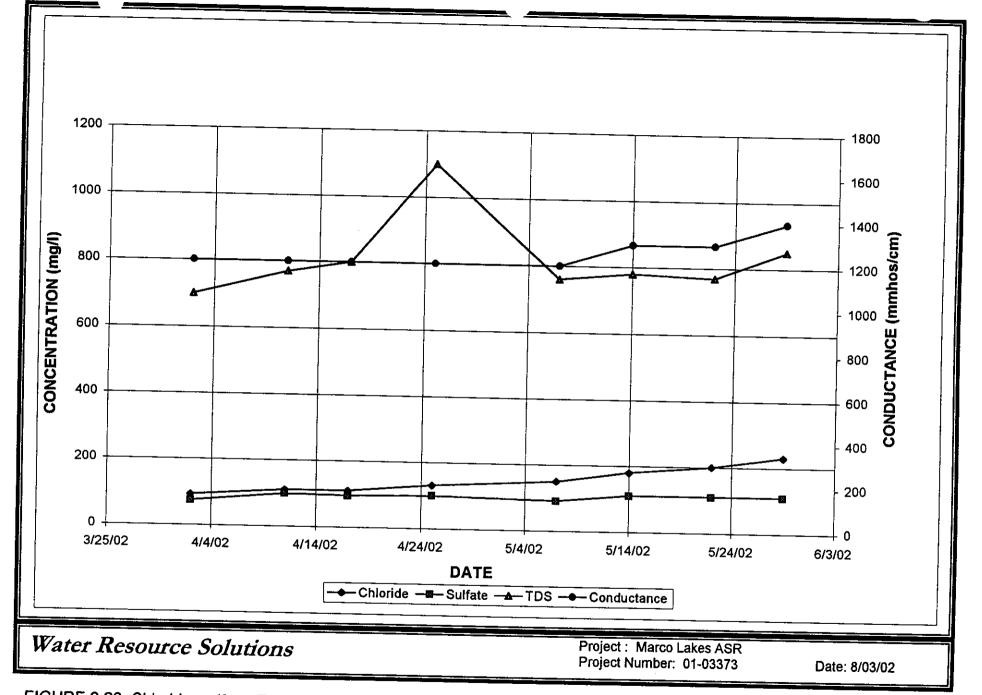


FIGURE 3.20 Chloride, sulfate, TDS, and conductance values measured at ASR2 during Cycle 1E recovery.

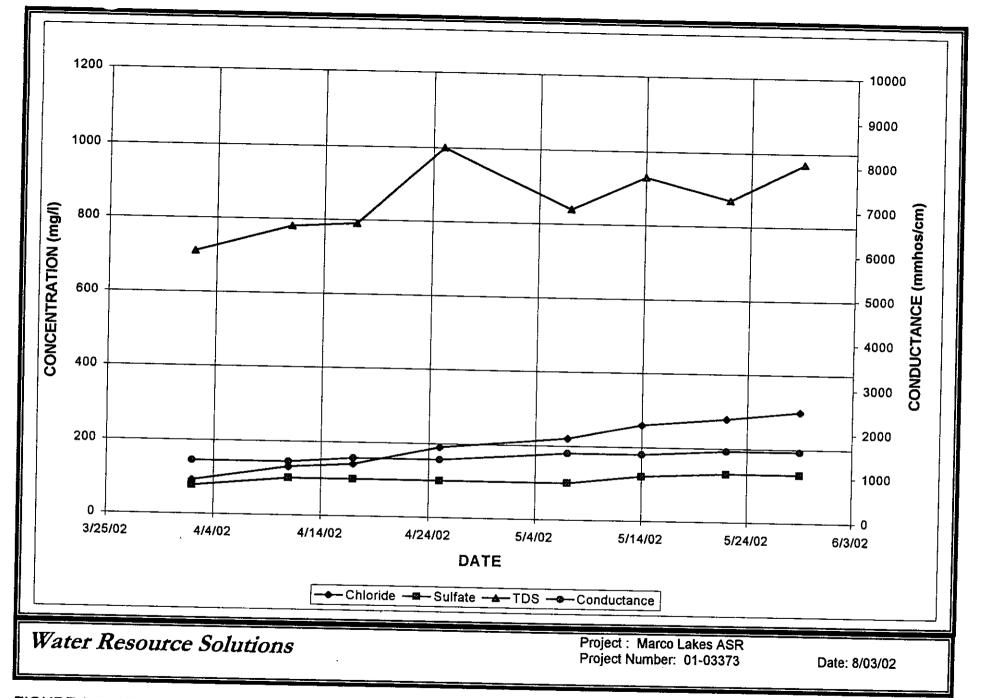


FIGURE 3.21 Chloride, sulfate, TDS, and conductance measured ASR3 during Cycle 1E recovery.

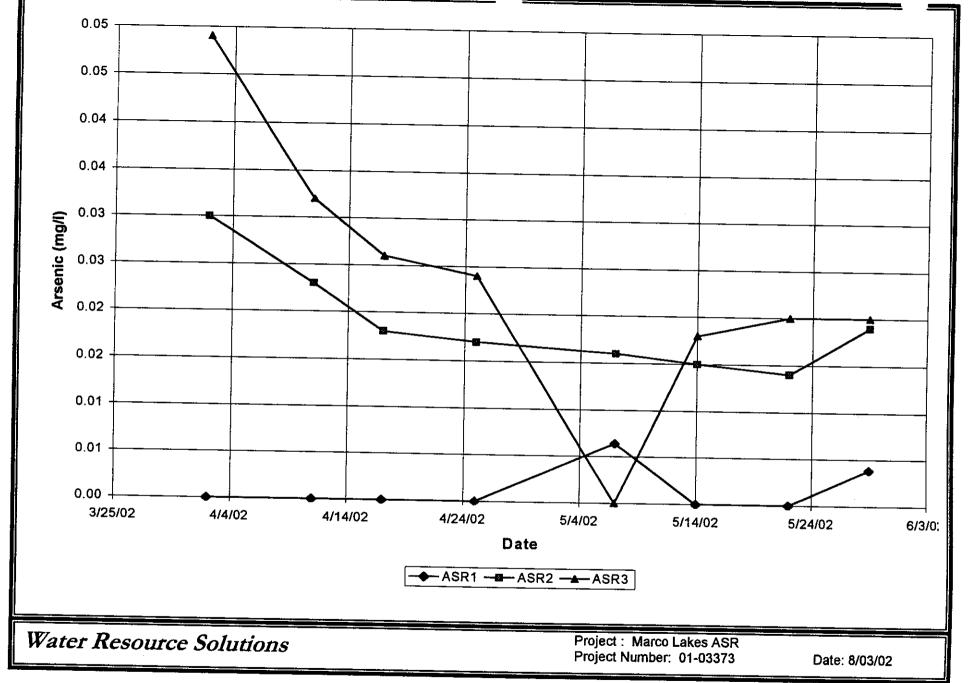


FIGURE 3.22 Arsenic concentration in recovered water from all ASR wells.

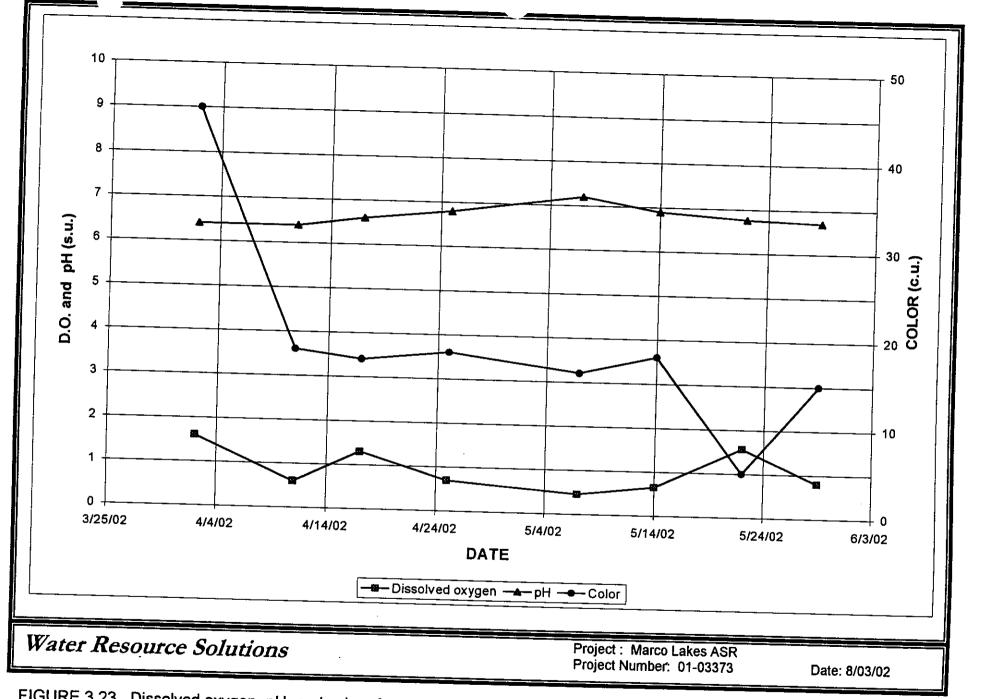


FIGURE 3.23 Dissolved oxygen, pH, and color of water recovered from ASR 1 during Cycle 1E

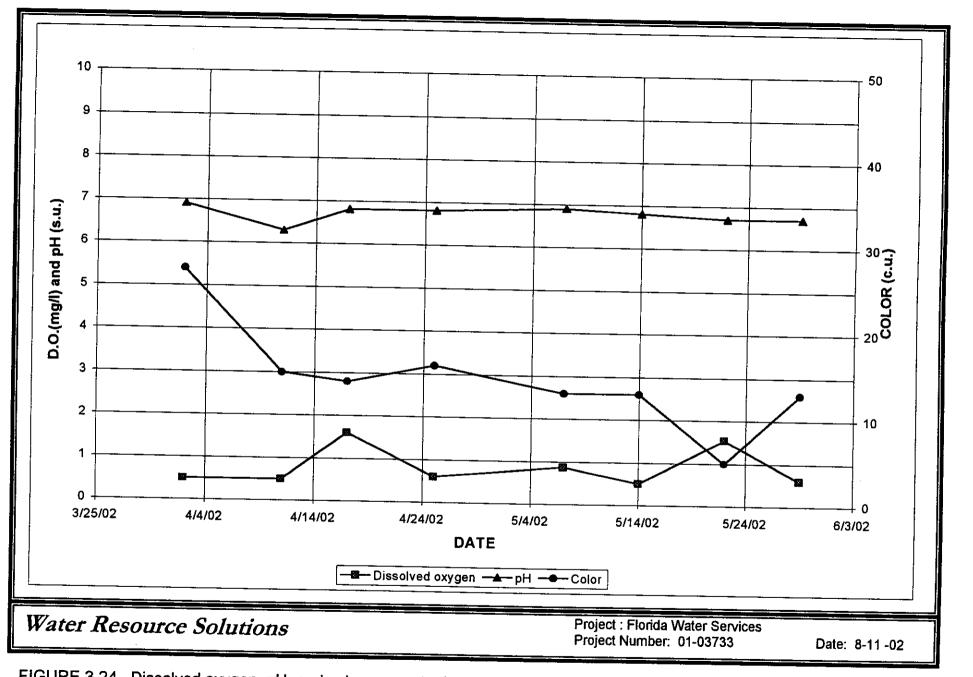


FIGURE 3.24 Dissolved oxygen, pH, and color concentrations measured at ASR2 during Cycle 1E recovery

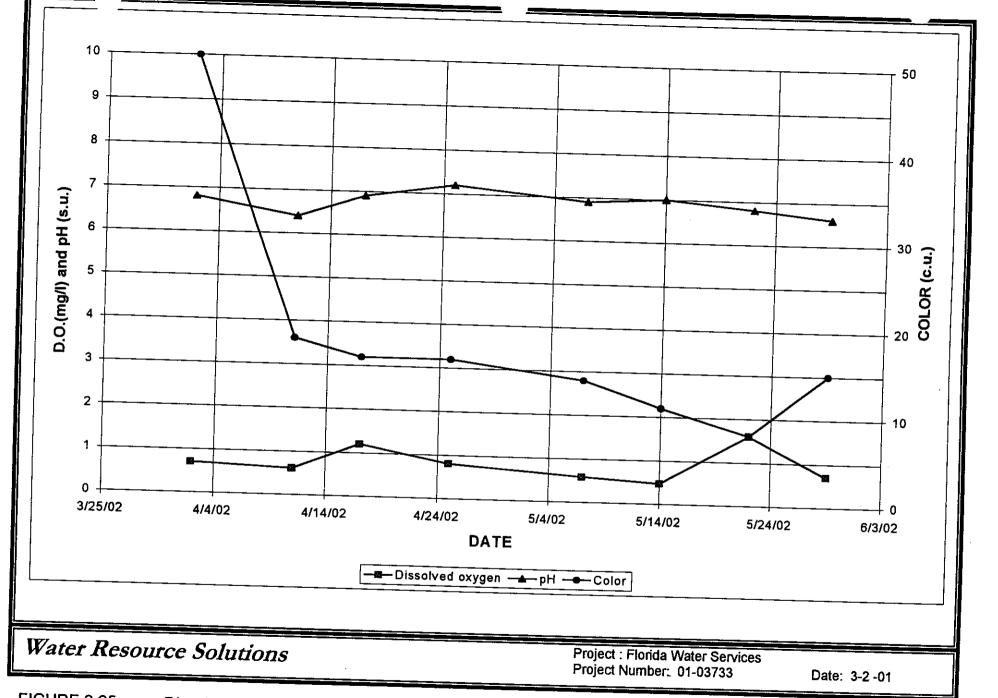


FIGURE 3.25 Dissolved oxygen, pH and color concentrations measured at ASR3 during Cycle 1E recovery.

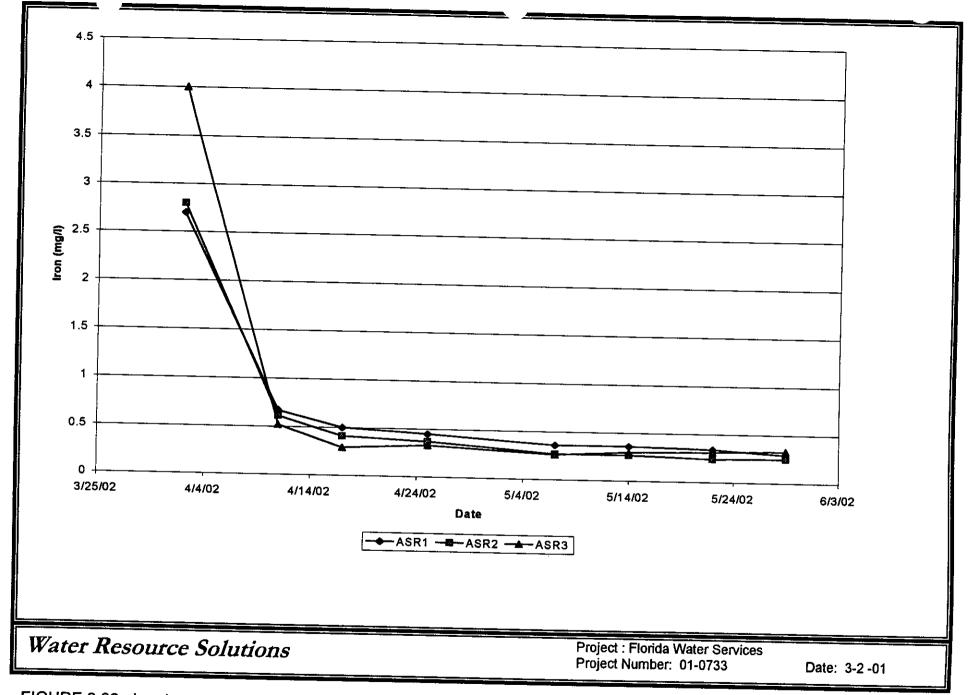


FIGURE 3.26 Iron in water recovered from all ASR wells during Cycle 1E

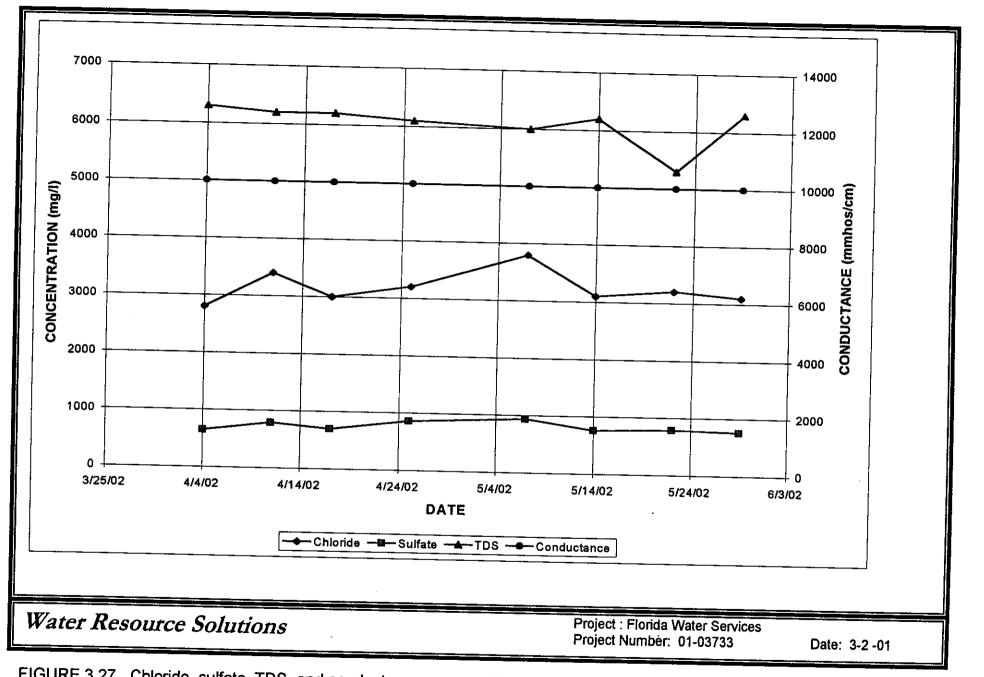


FIGURE 3.27 Chloride, sulfate, TDS, and conductance measured levels in SZ#1 during Cycle 1E recovery

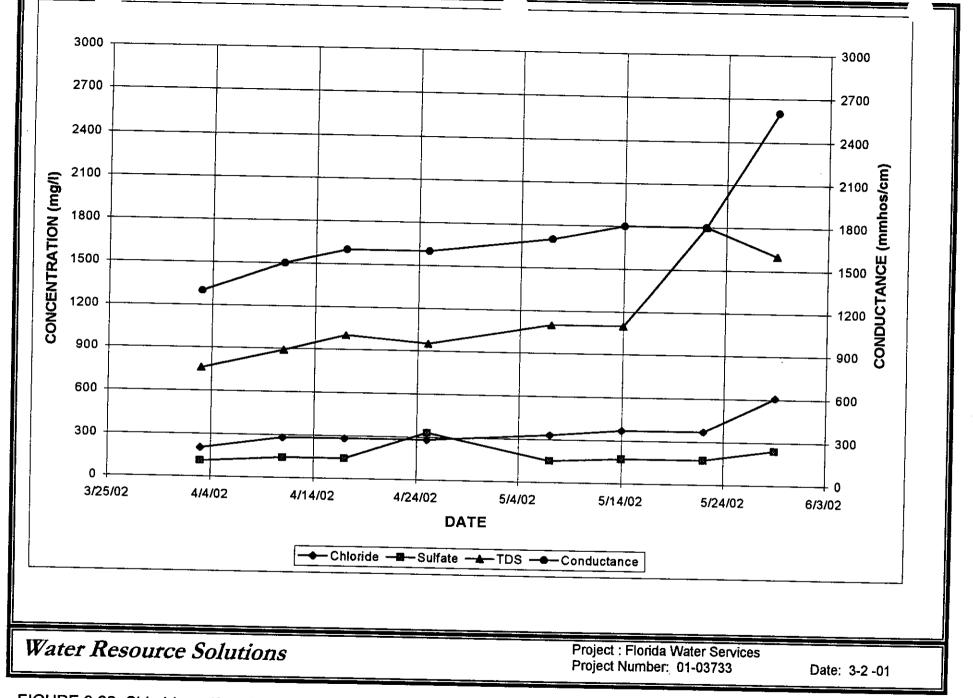


FIGURE 3.28 Chloride, sulfate, TDS, and conductance levels measured at DZ#1 during Cycle 1E recovery.

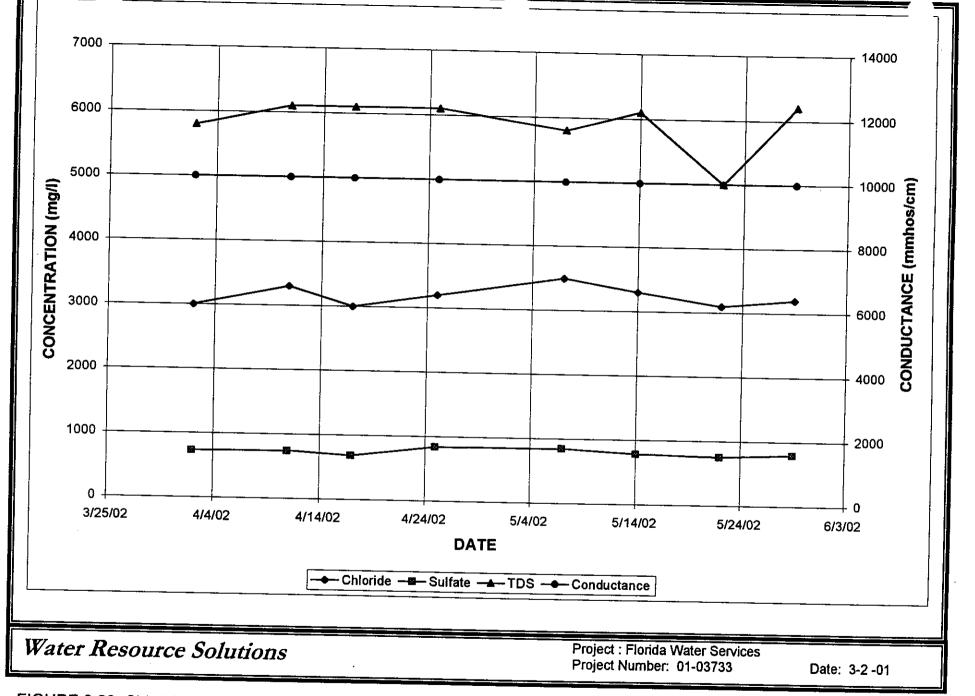


FIGURE 3.29 Chloride, sulfate, TDS and conductance levels measured at SZ#2 during Cycle 1E recovery.

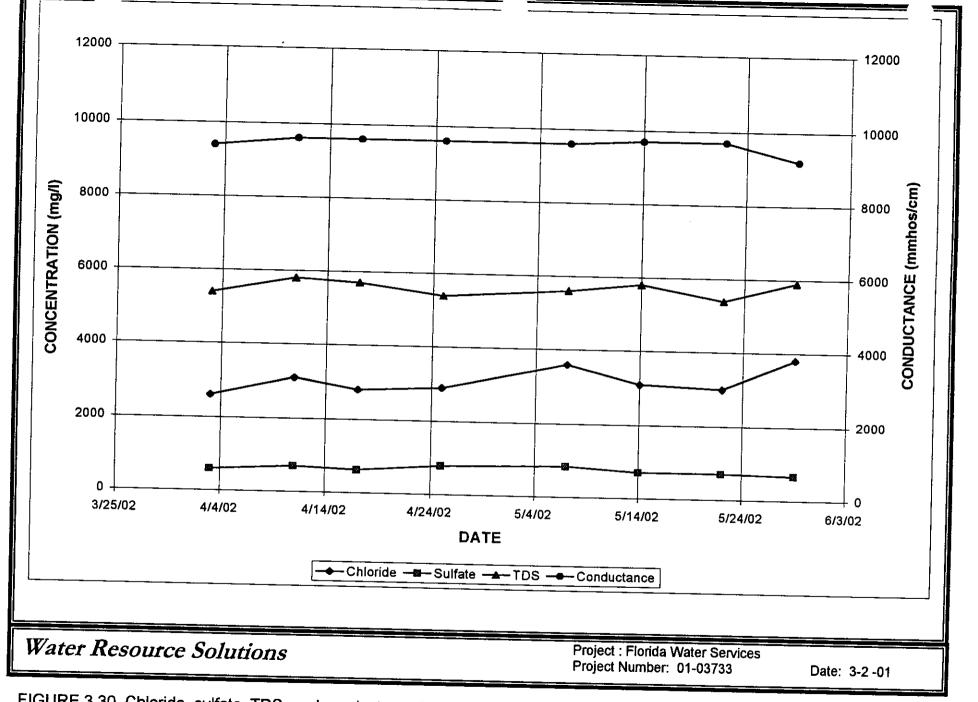


FIGURE 3.30 Chloride, sulfate, TDS, and conductance levels measured at DZ#2 during Cycle 1E recovery.

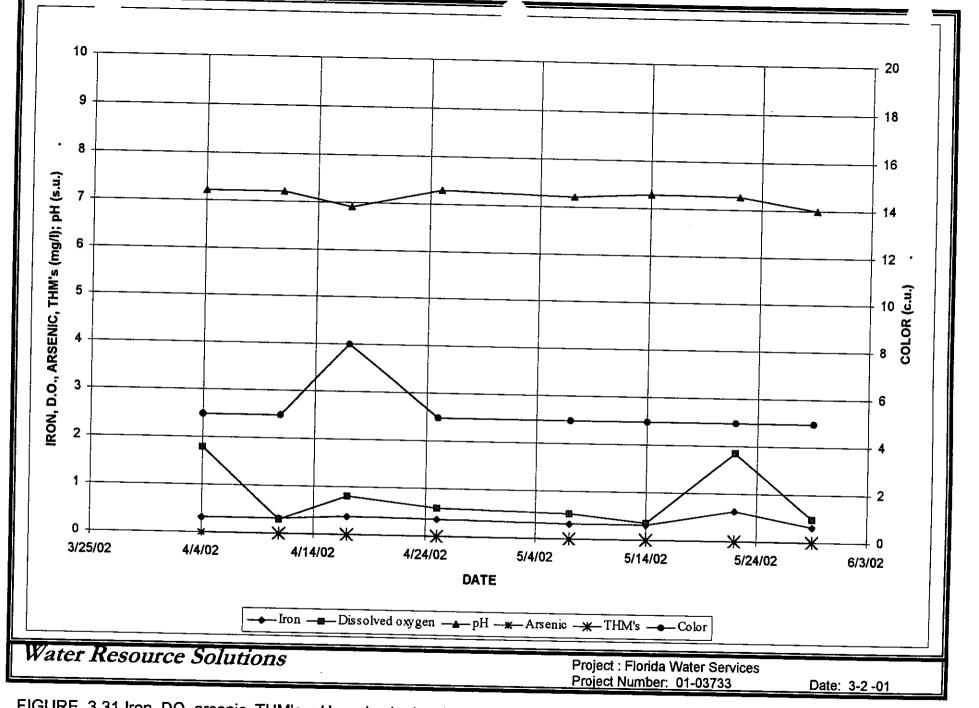


FIGURE 3.31 Iron, DO, arsenic, THM's, pH, and color levels measured at SZ#1 during Cycle 1E recovery.

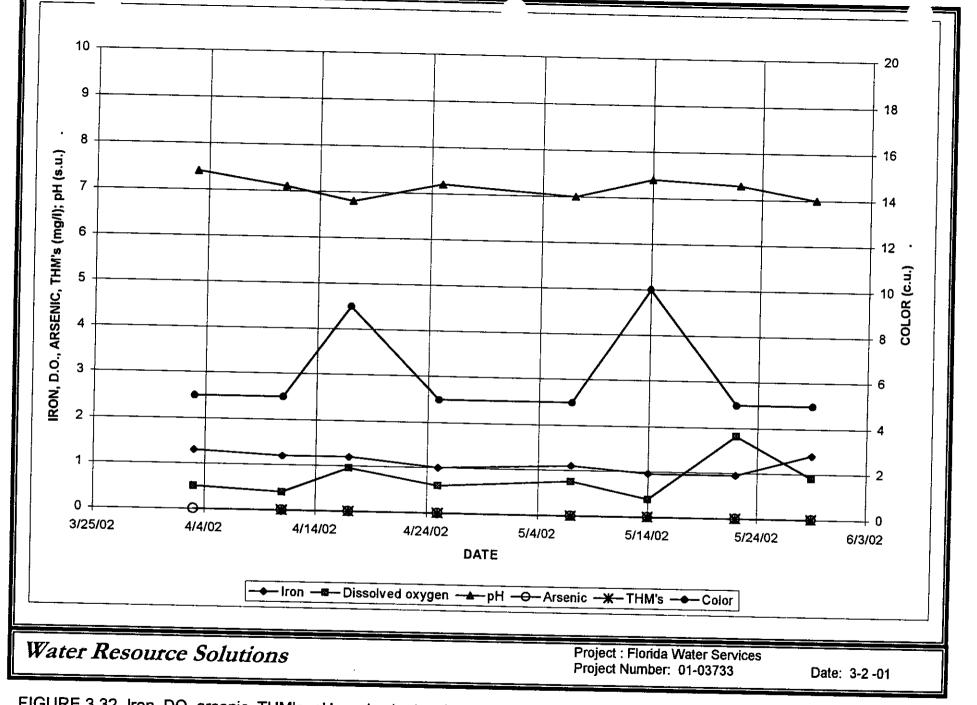


FIGURE 3.32 Iron, DO, arsenic, THM's, pH, and color levels measured at DZ#1 during Cycle 1E recovery.

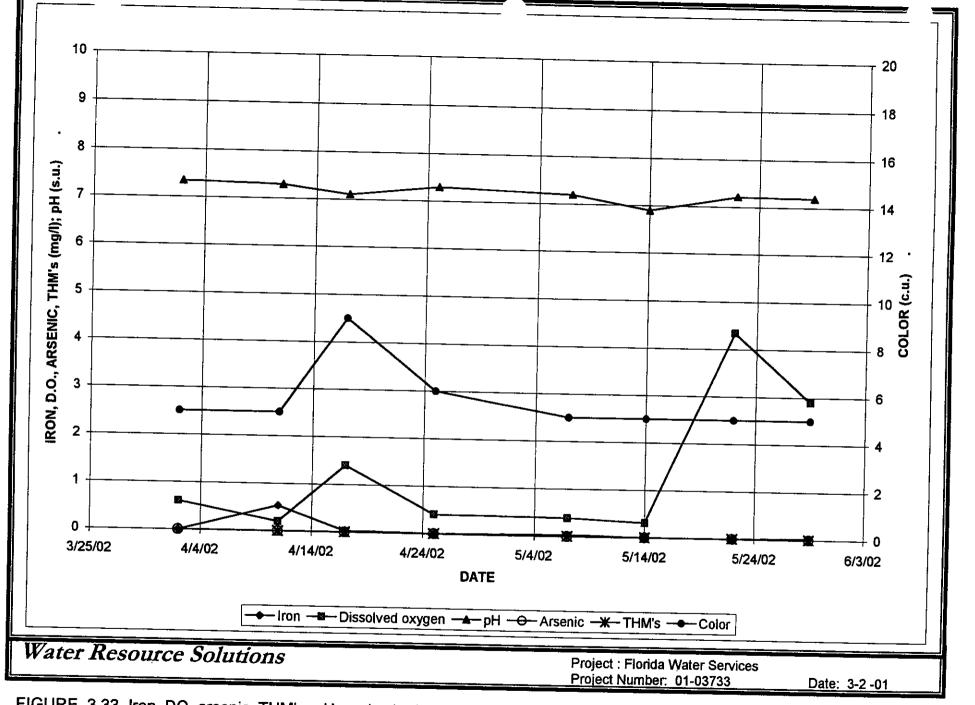


FIGURE 3.33 Iron, DO, arsenic, THM's, pH, and color levels measured at SZ#2 during Cycle 1E recovery.

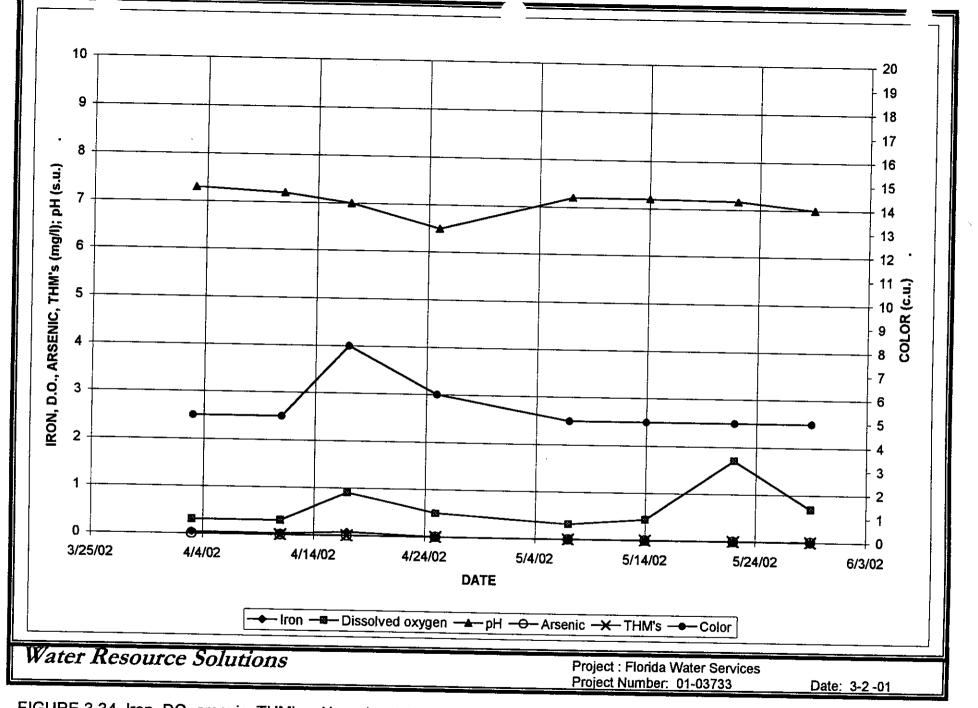


FIGURE 3.34 Iron, DO, arsenic, THM's, pH, and color levels measured at DZ#2 during Cycle 1E recovery.

### TABLES

WRS Well No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
CO-1476				26	50		<u> </u>				
CO-1569				26		26	20	2		MON	
	CC06188-D				50	26	95	4	11	MON	
	CC04230-D			26	50	26	120			SOIL	
	CC08188-G			26	50	26	44	2	44	DOM	
	CC08188-H		<del></del>	26	50	26				MON	
	CC08188-I			26	50	26				MON	
	CC06303-C			26	50	26	15	8	8	MON	
	CC07303-C			26	50	26	50	4	38	DOM	
	CC06176-A			26	50	26				SOIL	<u> </u>
	CC02257-E			26	50	26				SOIL	
CO-778			<del></del>	26	50	26	60	4	50	IRR	
CO-793		<del></del>		27	50	26		8		IRR	
CO-794		<del></del>		27	50	26	60	2	45	MON	
CO-2560		11-00044-W		27	50	26	15	2	10	MON	
CO-2561		11-00044-W		27	50	26	30	10	20	IRR	
CO-2562		11-00044-W		27	50	26	30	10	20	IRR	
CO-2563		11-00044-W		27	50	26	30	10	20	IRR	
CO-2564		11-00044-W		27	50	26	30	10	20	IRR	
	CC070502H	71-00044-VV		27	50	26	30	10	20	IRR	
	CC10144-D			27	50	26	15	2	5	MON	
	CC06190-M	<del></del>		27	50	26				SOIL	
	CC04219-A			27	50	26	60			- 5012	
	CC04219-B			27	50	26	65	2	60	MON	
	CC04219-B			27	50	26	65	2	60	MON	
				27	50	26				SOIL	
<del></del>	CC04288-G CC04288-H			27	50	26	60	4	40	3011	
<del></del> +	CC04288-H	[		27	50	26	60	4	40		
<del></del>	CC06261-E			27	50	26	75	2	60	MON	
				27	50	26	28	10	18	IRR	
+	CC05309C			27	50	26	75		<del></del>	MON	
	CC03293-I			27	50	26	73	4	70	DOM	
	CC03230-F		<u>_</u>	27	50	26	50	<del></del>	<del></del>	FIRE	
<del></del>	CC03230-E			27	50	26	60	<del> </del> -		FIRE	
	CC03066-D			27	50	26	15	4	5	MON	
	CC03066-E			27	50	26	<del></del>		<del></del>		
	CC05246-B			27	50	26	<del></del>	<del></del>		SOIL	
	CC091499G			27	50	26	20		<del></del>	SOIL	
ليبي	CC071400A			27	50	26				TEST	

WRS Well No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Nove Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet	Use	Notes
	CC07250-B			28	50	26	<del>                                     </del>		<u> </u>	<del> </del>	
	CC08200-A			28	50	26	47		ļ	SOIL	
	CC08200-B			28	50	26	47	10	35	IRR	
	CC08200-C			28	50	26	50	10	35	IRR	
	CC05021-A			28	50	26	<del>  30  </del>	10	35	IRR	
	CC07139-F			28	50	26	50			SOIL	
	CC07139-H			28	50	26	50	10	35	IRR	
	CC10232-A			28	50	26	25	10	35	IRR	
	CC05173-G			28	50	26	140			SOIL	
	CC06136-B			28	50	26	70		110	MON	
	CC07256-E			28	50	26	39	4	58	MON	
	CC02187-K			28	50	26	60	6	29	IRR	
	CC01144-A			28	50	26	22	4	50	DOM	
	CC01256-F			28	50	26	- 22			ELEV	
	CC03286-B			28	50	26	<del></del>			IRR	
	CC010899L			28	50	26	<del>  </del> -			SOIL	
	CC120899A			28	50	26	8	4	60	IRR	
	CC070502I			28	50	26	15			TEST	
	CC0705020			28	50	26		2	5	MON	
	CC070502V			28	50	26	8	2	3	MON	
	CC080502B			28	50	26	8	2	3	MON	
	CC120899A			28	50	26	16			SOIL	
	CC1212201H			28	50	26					
	CC1211011			28	50	26	82 82	4	60		
CO-540				33	50	26	- 82	4	60		
00-541				33	50	26	63	8		IRR	
	CC07265-A			33	50	26	- 03	8		IRR	
	CC02104-A			33	50	26				SOIL	
	CC03190-I			33	50	26	35			SOIL	
	CC04154-D			33	50	26		6	23	TEST	
	CC10244-B			33	50	26	45	2	42	MON	
	CC07120-E		<del></del>	33	50	26	70	_4	60	TEST	
	CC12074-A			33	50	26				SOIL	
	CC06198-R			33	50	26				SOIL	
	CC09050-EE			33	50	26	20		T	SOIL	
	CC10300-K			33	50	26	15	2	15	MON	
	CC10300-J			33	50		5			TEST/SOIL	
	CC07011-E			33	50	26 26	12	2	12	MON	

WRS Well No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diarneter (inches)	Cased Depth (feet)	Use	Notes
	CC08192-A			33	50	26	13	2	3	MON	
	CC10082-J			33	50	26	12	4	2		
	CC12022-B			33	50	26	20		<del>  </del>	MON SOIL	
	CC11077-C			33	50	26	<del>                                     </del>		<del>  </del>		
	CC02023-A			33	50	26	12	4	25	MON	
	CC04116-AA			33	50	26			<del> </del>	SOIL	
	CC061499B			33	50	26	40	8	30		
	CC102899D			33	50	26		8	30	IRR FIRE	
	CC010300A			33	50	26		<u> </u>		TEST	<u> </u>
	CC123099A			33	50	26			<del></del>	1631	
	CC021202B			33	50	26	15	4	5	MON	
	CC021202C			33	50	26	15	4	5	MON	
	CC021202D			33	50	26	15	4	5	MON	
	CC070502K			33	50	26	8	2	3	MON	
	CC070502L			33	50	26	8	2	3	MON	<u> </u>
	CC070502M			33	50	26	8	2	3	MON	
	CC073002C			33	50	26	90	4		MON	
CO-189				34	50	26		4	80	DOM	
CO-776				34	50	26	52	8		IRR	
CO-791				34	50	26	60		<del></del>	IRR	
CO-792				34	50	26	15	2	45	OBS	
CO-822				34	50	26	- 13	2	10	OBS	
CO-867				34	50	26	50	8		IRR	
CO-868				34	50	26	50	2	35	TEST	
CO-1574				34	50	26	155	2	35	TEST	
CO-1770				34	50	26	35			OBS	SFWMD C-2008D
CO-1960				34	50	26	74	4	13	OBS	
CO-1961				34	50	26	74	2	63	OBS	
CO-1962				34	50	26	75	2	60	OBS	
CO-1972				34	50	26	40	2	70	OBS	
CO-1973				34	50	26	40	10	25		
CO-1974				34	50	26	50	10	27.5		
CO-2256				34	50	26		10	26.5		
20 2222						20	5900			ABND	Oil Test Well #134 - Plugged and Abandoned (Collier Corp. #2)
00-2292				34	50	26	16	4	10	OBS	<del></del>
0-2293			. 7	34	50	26	16	4	10	OBS	

WRS Well No.	Collier Co. Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
CO-2294				34	50	26			<u></u>	<u> </u>	
CO-2408			W-2628	34	50		4	4	4	OBS	
CO-2597	CC061899K				30	26	2515	9 5/8	1022	ABND	Oil Test Well #136 - Plugged and Abandone (Collier Corp. #3)
				34	50	26	540	6.9	460	MON	Upper Zone Monitor We
CO-2596	CC061899L			34	50	26	790	6.9	745	MON	ASR Zone Monitor We
CO-2594	CC061899M		<del></del>	34	50						
CO-2595	CC061899N			34	50	26	790	16	745	ASR	ASR Well 2
CO-2565		11-00044-W		34	50	26	790	16	745	ASR	ASR Well 3
CO-2911	CC11196-B		W-17454	34	50	26	30	10	20	IRR	
	CC05165-A					26	210	2		CORE	Southern States Utilitie
	CC05165-B			34	50	26	22	4	11	MON	COLE
	CC05165-C			34	50	26	20	4	10	MON	
	CC02010-G			34	50	26	20	4	10	MON	
	CC02010-G			34	50	26	10	6	10		
	CC07110-B			34	50	26	15			PWSMON	
	CC03128-B			34	50	26				SOIL	
	CC03128-C			34	50	26	80	8	60		<del></del>
	CC10170-A			34	50	26	80	8	60		
	CC11290-B	<del> </del>		34	50	26				SOIL	
<del></del> +	CC02151-F	<del></del>		34	50	26	50			FIRE	
	CC07291-U			34	50	26	70	2	70	MON	
	CC07291-V			34	50	26	25			MON	
	CC11181-A			34	50	26	25			MON	
	CC11181-B			34	50	26	16			TEST/MON	
	CC11181-C			34	50	26	16			TEST/MON	
	CC07139-E			34	50	26	7			TEST/MON	
	CC07139-G		<del></del> -	34	50	26	50	10	35	IRR	
	CC07139-I	<del></del>	<del></del> -	34	50	26	50	10	35	IRR	
	CC05173-C			34	50	26	50	10	35	IRR	
	CC05213-E			34	50	26	25		20	MON	
	CC12297-J			34	50	26	25			SOIL	
	CC03230-A		<del></del>	34	50	26	60	4	50	DOM	
	CC11293-K			34	50	26				SOIL	
				34	50	26	13	4	3	MON	

WRS Welf No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
	CC03109-F			34	50	26	15	4	15	MOV	
	CC03109-G			34	50	26	15	4	15	MON	
	CC03109-H			34	50	26	15	4		MON	
	CC03109-I			34	50	26	15	4	15	MON	
	CC04167-G			34	50	26	<del> '~ </del>		15	MON	<u> </u>
	CC04055-C			34	50	26	50	8	40	SOIL	
<del></del>	CC061899B			34	50	26	20	4		IRR	
	CC061002G			34	50	26	27	18	20	MON	
	CC070502P			34	50	26	8	2	<del>   </del>	ELEV	
	CC070502R			34	50	26	8		3	MON	. <u> </u>
	CC061899B			34	50	26	<del> </del>	2	3	MON	
	CC061899K			34	50	26		<del></del>		MON	
	CC061899L			34	50	26				MON	
	CC061899M			34	50	26				MON	
	CC061899N			34	50	26				MON	
00 (000	CC082500B			34	50	26				MON	
CO-1369				35	50	26	20			TEST	
CO-1370				35	50	26	20	2	15	OBS	
CO-1371				35	50	26		2	15	OBS	
CO-1372				35	50	26	45	2	40	OBS	
	CC04264-B			35	50	26	20	2	15	OBS	
	CC06118-B			35	50	26	<del></del>			SOIL	
	CC09271-A			35	50	26	120			SOIL	
	CC09271-B			35	50	26	40			MON	
	CC09271-C			35	50	26	40			MON	
	CC09271-D			35	50		40			MON	
	CC10231-B		·	35	50	26	100	4	70	TEST	
	CC10231-C			35	50	26	8			MON	
	CC06118-C			2	51	26	8			MON	
	CC05090-C			2	51	26	120			SOIL	
	CC05090-D			2	51	26	46		46		
	CC08188-J		<del></del>	2	51	26	46	2	46		
	CC08188-K		<del></del>	2		26	65	4	25	MON	
	CC08188-L	<del></del>	<del></del>	2	51	26	65	4	25	MON	
	CC07119-B				51	26	15	8	15	MON	
	CC01113-D	<del></del>	<del></del>	2	51	26	13	2	10	MON	
	CC121900A			2	51	26				SOIL	
CO-150			<del></del>	2	51	26	40	4	30	IRR	
				3	51	26				IRR	

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WRS Well No.	Collier Co. Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diarneter (inches)	Cased Depth (feet)	Use	Notes
CO-151				3	51	26	103		^^		
CO-156				3	51	26	63	2	98	OBS	
				3	51	26	-	2	58	OBS	
CO-177				3	51	26	<del> </del>	·			
CO-178				3	51	26	<del>                                     </del>	<del></del>	<del> </del>	IRR	
CO-179				3	51	26	<del>                                     </del>	<del></del>		IRR	
CO-190				3	51	26	<del>   </del>			ABND	
CO-191				3	51	26				IRR	
CO-192	<u> </u>			3	51	26	<del> </del>		<del></del>	IRR	
CO-193				3	51	26	40	<del></del>	<del>                                     </del>	IRR	
CO-194				3	51	26	40	2	ļ. — — —	IRR	
CO-195	<b> </b>			3	51	26	40	2		IRR	
CO-196				3	51	26	34	4	<del></del>	IRR	
CO-197				3	51	26	40	2		IRR	
CO-201				3	51	26	195	2	186	IRR	
CO-218				3	51	26	45	2	40	000	<u> </u>
CO-219				3	51	26	15	2		OBS	<u> </u>
CO-240				3	51	26	- 10	2	10	OBS	
CO-545				3	51	26	45	8	40 26	OBS	
CO-591				3	51	26	11.5	2	6.5	IRR	<u> </u>
CO-592				3	51	26	12.5	2	7.5	OBS	
CO-597				3	51	26	40	2	38	OBS	
CO-599				3	51	26	50	2	43	OBS	
O-1640				3	51	26	96		+3	OBS	
O-1641				3	51	26	23	2	23	000	<u> </u>
0-2444				3	51	26	45	6		OBS	
0-2445				3	51	26	45	8	30	IRR	
0-2583		11-01309-W		3	51	26	45	6	- 30 +	IRR	
0-2584		11-01309-W		3	51	26	30	6		IRR	
0-2409				3	51	26	55	2	45	IRR	
0-2410				3	51	26	14	6	2	MON	
0-2411				3	51	26	14	6	2	MON	
0-2412				3	51	26	14	6	2	MON	
0-2413				3	51	26	14	6	2	MON	
0-2414				3	51	26	14	6		MON	
0-2446	CC10186-A			3	51	26	50	4	30	MON	
0-2428	CC05146-A			3	51	26	791	12	745	MON	Henderson Creek MV
	CC05226-A			3	51	26	25	6	6	ASR MON	ASR Well 1 ASR Pad Monitor We

WRS Well No.	Collier Co. Well Permit No.	SFWMD WUP No.	FGS Welf No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
CO-2427	CC09135-A			3	51	20	<u> </u>				
	CC09135-B			3	51	26	817	6	745	TEST	ASR Dual Zone MW
	CC09135-C			3		26	14	4	4	MON	ASR Pad Monitor We
	CC10189-A			3	51 51	26	15	4	5	MON	ASR Pad Monitor We
	CC04204-D			3		26	12			MON	
	CC10195-B			3	51	26				SOIL	
	CC11015-A			3	51	26	20	5	15	MON	
	CC11295-A			3	51	26			_ <del> </del>	SOIL	
	CC11295-B			3	51	26	20	4	10	MON	
	CC11305-B			3	51	26	20	4	10	MON	
	CC12075-A	<del>+</del>			51	26	20	4	10	MON	
	CC03074-D			3	51	26	20	4	10	MON	<del>                                     </del>
	CC03074-E			3	51	26				IRR	
	CC021199-A				51	26				IRR	
	CC01170-C	<del></del>		3	51	26				SOIL	
	CC01170-E			3	51	26	35	2	30	DOM	
	CC02220-B			3	51	26	30	2	30	DOM	
	CC05068-D			3	51	26	10			MON	
	CC07227-M	<del></del>		3	51	26	12				
	CC12294-H			3	51	26				SOIL	
	CC12294-I			3	51	26	11	4	3	MON	
	CC08130-C			3	51	26	25	4	20	MON	
	CC10150-G			3	51	26	20	10			
	CC10150-G			3	51	26	15	2	15	MON	
	CC10130-F			3	51	26	10			SOIL	
	CC12110-E			3	51	26		2		MON	
	CC12110-E			3	51	26	6		<del></del>	TEST	
	CC12110-D			3	51	26	20	2	30	MON	
	CC03111-F			3	51	26	30	2	30	MON	
				3	51	26	36	2	36	MON	
	CC03261-E			3	51	26		2	40	WOR	
	CC03261-F			3	51	26	55	$\frac{2}{2}$	55	<del></del>	
	CC05071-C			3	51	26	37	2	35	MON	
	CC07021-A			3	51	26	<del></del>	╼╼┼		MON	
	CC07021-B			3	51	26				SOIL	
	CC10091-A			3	51	26	13	2	13	MON	
-	CC11011-A	<u>-</u>		3	51	26	25		- 13  -		
	CC02202-C			3	51	26	12	6	<del>  </del> -	SOIL	
(	CC10067-H			3	51	26	12	2		MON	

### Tabl. ..1 MARCO LAKES ASR

### UPDATED AREA OF REVIEW November 2002

WRS Well No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
	CC10067-I			3	51	26	20	10	<u> </u>		
	CC04032-E			3	51	26	10	10	<del>                                      </del>	MON	
	CC07202-A			3	51	26	14		<del>  </del>	IRR	
	CC07202-B			3	51	26	14	<u>6</u>			
	CC07202-C			3	51	26	14	6	<del> </del>		
	CC10237-F			3	51	26	<del>                                     </del>				
	CC04153-C			3	51	26	10		<del> </del>	SOIL	<u> </u>
	CC10058-B			3	51	26	<del>  '0  </del>	<del></del>	<del> </del>	SOIL	
	CC08183-H			3	51	26	50	<del></del>	<b></b>	SOIL	
	CC06286-C			3	51	26	30		<b></b>	SOIL	
	CC07026-A			3	51	26	12			SOIL	
	CC09186-O			3	51	26	12	44	2	MON	
	CC11196-E			3	51	26				SOIL	
	CC12303-F			3	51	26	11	2	200	MON	
	CC03187-A			3	51	26	15	8	6	ELEV	
	CC04117-B			3	51	26	12	4	3	MON	
	CC021199A		——————————————————————————————————————	3	51	26	12	4	2	MON	
	CC031599A			3	51	26				TEST	
	CC033699D			3	51	26				TEST	
	CC032699E			3	51	26				MON	
	CC033099DT HRU N			3	51	26	10	4	10	MON	
	CC042199G			3	51	26					
	CC061899J			3	51	26	90	4	80	DOM	
	CC090899E		<del></del>	3	51	26				MON	
	CC110499B			3	51					TEST	
	CC042400A			3	51	26 26	15	4	5	MON	
	CC063000A	<del> </del> _		3	51	26				TEST	
	CC101601A			3	51	26				TEST	
	CC121201A		<del></del> -	3	51	26				SOIL	
	CC070502Q			3	51	26	20			TEST	
	CC122100E			3	51	26	8	2	3	MON	
	CC122000M		<del></del>	3	51	26				MON	
	CC031301P			3	51	26					
	CC042701J			3	51					IRR	
	CC103001A		<del></del>	3	51	26				TEST	
	CC070302A		<del></del>	3	51	26	20			TEST	
	CC071002A		<del></del>	$\frac{3}{3}$	51	26				SOIL	
					31	26	30	4		SOIL	

WRS Well No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	mber 20 Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
	CC052301C			3	51	26	38	18	<u> </u>		
	CC082802F			3	51	26	80	10		ELEV	
CO-153				4	51	26	66			SOIL	
CO-155				4	51	26	62	2	61	OBS	
CO-157				4	51	26	65	2	57	OBS	
CO-175				4	51	26	<del> </del>	2	60	OBS	
CO-176				4	51	26	30	2		DOM	
CO-544				4	51	26	45	2		IRR	
CO-596				4	51	26	11	8	30	IRR	
CO-865				4	51	26	60	2	6	MON	
CO-1714				4	51	26	27	8	30	IRR	
CO-1716				4	51	26	- 21	2	<del>                                     </del>	DOM	
CO-1717				4	51	26	60		<b></b>	DOM	
	CC02184-B			4	51	26	75	2		DOM/IRR	
	CC02184-C			4	51	26	75	44	60	DOM	
	CC09024-D			4	51	26	<del>/3</del>			DOM	
	CC02208-B			4	51	26	50			PWS	
	CC08194-F			4	51	26	75	4	40	DOM	
	CC11164-B			4	51	26	<del>- /3</del> -	4	60	IRR	
	CC03118-I			4	51	26	70	<del>- ,-  </del>		ELEV	
	CC09227-A			4	51	26	70	4	60	IRR	
	CC11151-E			4	51	26	32			SOIL	
	CC11151-F			4	51	26	45		32	DOM	
	CC02242-E			4	51	26	<del>- 40</del>			DOM	
	CC08252-A			4	51	26	40				
	CC08252-B			4	51	26	40	2	30		
	CC07189-C			4	51	26	50	2	30		
	CC07013-C			4	51	26	15	<del></del> +	50	TEST	
	CC06106-E			4	51	26	50	<del>,</del> +		SOIL	
	CC10176-L			4	51	26	26	4	40	DOM	
	CC11066-C			4	51	26	50	10	21	ELEV	
	CC12266-I			4	51	26	30	4	40	DOM	
	CC04176-B			4	51	26	55	<del></del>		SOIL	
	CC110499H			4	51	26		4	50	DOM	
	CC022100C			4	51	26				TEST	
	CC022100D			4	51	26	<del></del>			DOM	
	CC052402I		<del></del>	4	51	26	60			DOM	
(	CC070502S			4 +	51	26	50	4	40	DOM	
						40	8	2	3	MON	

WRS Well No.	Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
	CC070502T			4	51	26	8	2	<del> </del>		
	CC070508U			4	51	26	8		3	MON	
	CC090402A			4	51	26	25	2	3	MON	
	CC082300E			4	51	26	-25	4		SOIL	
	CC10168-U			9	51	26	<del>                                      </del>			DOM	
	CC10168-V			9	51	26	<del> </del>			IRR	
CO-158				10	51	26	20			IRR	
CO-199				10	51	26	20	2		IRR	
CO-2939				10	51	26	199	<del></del>		IRR	
	CC010599-E			10	51	26	133	<del></del>		<del></del>	SFWMD C-2004D
	CC01240-A			10	51	26	12			IRR	
	CC05230-A			10	51	26	<del>                                     </del>	2	2	MON	
	CC09204-E			10	51	26	<del></del>				
	CC09204-F			10	51	26				DOM	
	CC07020-F			10	51	26	12			DOM	
	CC12024-B			10	51	26	<del>'2</del>			SOIL	
	CC08060-C			10	51	26				SOIL	
	CC11160-D			10	51	26	35			SOIL	
	CC03261-C			10	51	26	12			DOM	
	CC03261-D			10	51	26	12	2	2	MON	
	CC09257-A			10	51	26	12	2	2	MON	
	CC08032-H			10	51	26	100			SOIL	
	CC08032-I			10	51	26	100	18	40	IRR	
	CC08032-J			10	51	26	100	18	40	IRR	
	CC08032-K			10	51	26	<del></del>	8			
	CC09172-F			10	51	26		8			
	CC11102-A			10	51	26	21	4	11	MON	
	CC11252-D			10	51	26	27	<del></del>		SOIL	
	CC01043-FF			10	51	26	20	4	20	DOM	
	CC01043-GG			10	51	26	12	4	2	MON/SOIL	
	CC01043-H			10	51	26	12	4	2	MON	
	CC01043-I			10	51	26	12	4	2	MON	
	CC01043-J			10	51	26	12	4	2	MON	
	CC01043-K		<del></del>	10	51	26	12	4	2	MON	
	CC02123-G			10	51	26		4	2	MON	
	C04203-OO			10	51	26	25	4	20	MON	
	CC05113-A			10	51	26	12	4	2	MON	
	CC05173-J			10	51		52	2	51	TEST	
				10	31	26	25		20	MON	

WRS Well No.	Collier Co. Well Permit No.	SFWMD WUP No.	FGS Well No.	Section	Township	Range	Total Depth (feet)	Diameter (inches)	Cased Depth (feet)	Use	Notes
	CC10168-N			10	51	26	<u> </u>				
	CC10168-O			10	51	26	<del>                                     </del>		<del> </del>	IRR	
	CC10168-P			10	51	26	<del> </del>			IRR	
	CC10168-Q			10	51	26	<del> </del>		<u> </u>	IRR	
	CC10168-R			10	51	26	<del> </del> -		ļ	IRR	
	CC10168-S			10	51	26	<del>                                     </del>			IRR	
	CC02035-A			10	51	26	<del>   </del>			IRR	
	CC07316-B			10	51	26	15				
	CC11196-F			10	51	26	45	4	40	IRR	
	CC10053-C			10	51	26		2	200	MON	
	CC12303-D			10	51		30	44	20	IRR	
	CC12303-E			10	51	26	12	4	2	MON	
	CC04296-D			10	51	26	25	4	20	MON	
	CC03280-B			10	51	26	35	4	25	DOM	
	CC05230-A		<del></del>	10	51	26					
	CC03261-D		<del></del>	10	51	26				ABND	
	CC092800A			10		26	12	2	2	MON	
	CC062901F			10	51	26				TEST	
	CC10179-C			11	51	26	50			TEST	
	CC10179-F			11	51	26	80			MON	
	CC02174-L			11	51	26	50			MON	
	CC02174-M			11	51	26				IRR	
	CC05203-A			11	51	26				IRR	
	CC082099B	<del></del>		11	51	26	15			SOIL	
<del></del>			<del></del>		51	26				TEST	

Table 3.1 Average injection Pressures and Injection Rates For ASR1, ASR2, and ASR3

	ASR 1		┰	ASR2	<del></del>	_	A0040	<del></del>
<b>I</b>	ASIC	Average		ASK2	<b>A</b>		ASR#3	
i	Average	Daily	1	A.zaza	Average			Average
	Injection	Flow	ł	Average	Daily		Average	Daily
#	Pressure			Injection			Injection	
DATE	(psi)	(MGD)		Pressure		1	Pressure	
BAIL	(psi)	(WGD)	╬	(psi)	(MGD)	╀	(psi)	(MGD)
09/01/01	n/a	0.00	+			╀		·   · · · · · · · · · · · · · · · · · ·
09/02/01	n/a	0.00	╁	31	0.203	╄	31	0.147
09/03/01	n/a	0.00	╫	39	0.000	╀	27	0.000
09/04/01	n/a	0.00	┿	39	0.475 1.049	╀	39	0.344
09/05/01	n/a	0.00	╁	26	1.529	1	39	0.759
09/06/01	n/a	0.00	╫	50	1.199	┝	26 50	1.108
09/07/01	n/a	0.00	╁	46	1,129	H	46	0.868
09/08/01	n/a	0.00	+	32	0.165	Н	32	0.119
09/09/01	n/a	0.00	╅╴	41	1.243	Н	41	0.900
09/10/01	n/a	0.00	+	36	1.502	Н	36	1.087
09/11/01	n/a	0.00	┪	42	1.134	H	42	0.821
09/12/01	n/a	0.00	$\top$	42	1,590	Н	42	1.152
09/13/01	n/a	0.00	Ħ	42	1.126	Н	42	0.815
09/14/01	n/a	0.00	Н	39	0.697	Н	39	0.505
09/15/01	n/a	0.00	17	38	1.913	H	38	1.385
09/16/01	n/a	0.00	H	40	1.604	H	40	1.161
09/17/01	n/a	0.00	$\dagger \dagger$	48	1.152	┝╅	48	0.835
09/18/01	n/a	0.00	$\Box$	46	1.633	+	46	1,183
09/19/01	n/a	0.00	Ħ	52	1.865	┪	52	1.351
09/20/01	n/a	0.00	$\Box$	42	0.972	+	42	0.704
09/21/01	n/a	0.00	Ħ	42	1.383	+	42	1.001
09/22/01	n/a	0.00	П	42	0.314	7	42	0.228
09/23/01	n/a	0.00	П	42	0,315	寸	42	0.228
09/24/01	n/a	0.00	П	42	1.279	+	42	0.926
09/25/01	n/a	0.00	П	42	1.279	+	42	0.926
09/26/01	n/a	0.00	П	40	1.832	1	40	1.326
09/27/01	n/a	0.00	П	44	1.706	1	44	1.236
09/28/01	n/a	0.00	П	46	1.872	Ť	46	1.355
09/29/01	n/a	0.00		46	0.878	T	46	0.636
09/30/01	n/a	0.00		42	0.879	7	42	0.636
10/01/01	38			38	_	7	38	-
10/02/01	38			38		T	38	-
10/03/01	38	<u> </u>		38	-	T	38	-
10/04/01	46	1.41	$\perp$	46	1.508	floor	46	1.099
10/05/01	46	1.63	$\perp$	46	1.589	$\prod$	46	1.105
10/06/01	0	0.00	┵	0	0.000		0	0.000
10/07/01	0	0.00	$\downarrow$	0	0.000	$oldsymbol{\mathbb{L}}$	0	0.000
10/08/01	0	0.00	1	0	0.000	$\perp$	0	0.000
10/09/01	0	2.60	4	0	2.687	L	0	1.731
10/10/01	46	0.32	$\bot$	46	0.163	L	46	0.346
10/11/01	44	1.73	$\bot$	44	1.674	1_	52	1.210
10/12/01	45	2.15	4	45	2.060	$\perp$	58	1.482
10/13/01	50	1.71	4	50	1.613	L	58	1.147
10/14/01	50	1.06	+	50	1.008	<u> </u>	58	0.728
10/15/01	52	1.62	+	52	1.548	L	58	1.103
10/16/01	48	1.70	╂-	48	1.592	Ļ	56	1.126
10/17/01	48	1.50		48	1.436		52	1.014

Table 3.1 Average injection Pressures and Injection Rates For ASR1, ASR2, and ASR3

	ASR 1	<del></del>	-r	Acno	<del></del>	_	A 0.5 "-	
	ASK 1	Average		ASR2	A		ASR#3	
	Average	_			Average			Average
į	Average   Injection	Daily Flow		Average	Daily	ł	Average	Daily
	Pressure	J	-	Injection			Injection	Į.
DATE	(psi)	(MGD)	-	Pressure	ľ	İ	Pressure	1
10/18/01	48	<del></del>	ᅷ	(psi)	(MGD)	╀	(psi)	(MGD)
10/19/01	48	1.50	+	48	1.436	╀	52	1,014
10/20/01	48	2.22 1.52	-	48	2.184	╀	52	1.570
10/21/01	48	1.19	╬	48	1.492	╀	52	1.095
10/22/01	48	1.53	╌├╴	48	1.134	╄	52	0.835
10/23/01	50	1.85	╁	50	1.473	╀	52	1.074
10/24/01	50	1.72	+	50	1.592	H	59 59	1.287
10/25/01	50	1.59	+	50	1.392	Н		1.162
10/26/01	50	2.11	┪	50	1.947	Н	58 56	1.057
10/27/01	46	1.79	╅	46	1.627	Н	57	1.409
10/28/01	44	1.31	╁	44	1.027	Н		1.176
10/29/01	44	0.00	┿	44	0.000	Н	57	0.873
10/30/01	48	1.49	十	48	1.424	Н	57 60	0.000
10/31/01	50	1,50	+	50	1.453	Н	60	1.038
11/01/01	49	1.66	+	48	1.561	Н	58	1.031
11/02/01	49	1.88	╁	48	1.733	Н	56 58	1.088
11/03/01	49	1.80	╅	48	1.636	Н	58	1.143
11/04/01	49	1.13	T	48	1.010	Н	<u>5</u> 0	0.694
11/05/01	49	1.58	╁	49	1.400	H	58	1.001
11/06/01	49	1.57	†	50	1.373	+	58	1.937
11/07/01	50	1.54	T	50	1.343	┪	58	0.922
11/08/01	50	1.54	┪	50	1.343	$\dashv$	58	0.922
11/09/01	52	2.17	$\top$	52	1.884	7	58	1.308
11/10/01	52	1.32	T	52	1.147	✝	58	0.815
11/11/01	54	1.41		54	1.229	7	60	0.832
11/12/01	56	1.67		56	1.321	T	62	1.008
11/13/01	57	2.10		57	1.907	T	60	1.301
11/14/01	54	1.04	Ш	54	0.936	T	64	0.643
11/15/01	52	1.59	Ш	52	0.967		60	0.671
11/16/01	54	2.26	Ш	54	1.951		61	1.338
11/17/01	46	1.57	Ш	46	1.329		56	0.902
11/18/01	48	1.12	Ц	48	0.942		48	0.632
11/19/01	37	0.88	Ц	37	0.693		41	0.419
11/20/01	28	1.13	Ш	28	0.887	┸	36	0.561
11/21/01	45	1.61		45	1.464	$\perp$	58	1.070
11/22/01	45	1.44	Н	45	1.395	┵	58	1.048
11/23/01	45	2.68	Н	45	2.685	$\bot$	58	2.019
11/24/01	45	1.16	Н	45	1.198	┸	58	0.897
11/25/01	45	1.18	Н	45	1.226	1	58	0.920
11/26/01 11/27/01	45	1.60	1	45	1.677	+	53	1.256
11/28/01	43	1.60	dash	43	1.671	4	54	1.251
11/28/01	43	1.61	4	43	1.683	4	54	1.262
11/30/01	43 46	1.48	4	43	1.550	+	54	1.168
12/01/01	46	1.43	+	46	1.535	-	54	1.153
12/02/01	44	1.88 1.33	+	44	2.043	╀	51	1.536
12/03/01	44	1.55	+	44	1.438	+	52	1.070
12/04/01	42	1.48	+	44	1.726	╀	51	1.293
,20,001	74	1.40	Щ.	42	1.657	L	50	1.233

Table 3.1
Average injection Pressures and Injection Rates For ASR1, ASR2, and ASR3

DATE	ASR 1 Average Injection Pressure (psi)	Average Daily Flow Rate (MGD)	ASR2  Average Injection Pressure (psi)	Average Daily Flow Rate (MGD)	ASR#3 Average Injection Pressure (psi)	Average Daily Flow Rate (MGD)
12/05/01	42	1.49	42	1.680	50	1.258
12/06/01	40_	1.48	40	1.680	50	1.258
12/07/01	42	1.81	42	2.438	48	1.834
12/08/01	42	0.66	44	0.440	52	0.333
12/09/01	40	1.18	41	1.325	48	1.001
12/10/01	41	1.55	41	1.796	50	1.361
12/11/01	40	0.52	42	0.551	48	0.414

# TABLE 3.2 ASR SYSTEM MONITORING PROGRAM

#### **ASR WELL PARAMETERS**

Parameters	Recording Frequency	Reporting Frequency
Injection Pressure (p.s.i.)		
Monthly Maximum Injection Pressure	Monthly during recharge	Monthly during recharge
Monthly Minimum Injection Pressure	Monthly during recharge	Monthly during recharge
Monthly Average Injection Pressure	Monthly during recharge	Monthly during recharge
Daily Maximum Injection Pressure	Della to the	
Daily Minimum Injection Pressure	Daily during recharge	Monthly during recharge
Daily Average Injection Pressure	Daily during recharge	Monthly during recharge
2011) Treatago Injection (Tessing	Daily during recharge	Monthly during recharge
Flow Rate (g.p.m.)		
Monthly Maximum Flow Rate	36 41 1	
Monthly Minimum Flow Rate	Monthly during recharge/recovery	Monthly during recharge/recovery
Monthly Avenue Elem Dete	Monthly during recharge/recovery	Monthly during recharge/recovery
Monthly Average Flow Rate	Monthly during recharge/recovery	Monthly during recharge/recovery
Daily Maximum Flow Rate	Daily during recharge/recovery	Monthly during southerns /
Daily Average Flow Rate	Daily during recharge/recovery	Monthly during recharge/recovery
	- my mg resimago recovery	Monthly during recharge/recovery
Total Volume Injected (gallons)	Daily/Monthly during and and	
Total Volume Recovered (gallons)	Daily/Monthly during recharge/ recovery Daily/Monthly during recharge/ recovery	Monthly during recharge
(guilotis)	Daily Monthly during Techarge/ Tecovery	Monthly during recharge
Parameters	Recording Frequency	Reporting Frequency
	Recording Frequency	Reporting Frequency
Injection Fluid Parameters		
Injection Fluid Parameters Specific Conductance (umhos/cm)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l)	Weekly during recharge/recovery Weekly during recharge/recovery	Monthly during recharge/recovery Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units)	Weekly during recharge/recovery Weekly during recharge/recovery Weekly during recharge/recovery	Monthly during recharge/recovery Monthly during recharge/recovery Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l)	Weekly during recharge/recovery Weekly during recharge/recovery Weekly during recharge/recovery Weekly during recharge/recovery	Monthly during recharge/recovery Monthly during recharge/recovery Monthly during recharge/recovery Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l) Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l) Total Iron (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l) Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l) Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l) Total Iron (mg/l) Gross Alpha (pCi/l) Primary and Secondary Water Standards	Weekly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l) Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l) Total Iron (mg/l) Gross Alpha (pCi/l) Primary and Secondary Water Standards Cryptosporidium	Weekly during recharge/recovery Monthly during recharge/recovery	Monthly during recharge/recovery
Injection Fluid Parameters Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l) Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l) Total Iron (mg/l) Gross Alpha (pCi/l) Primary and Secondary Water Standards	Weekly during recharge/recovery	Monthly during recharge/recovery

# TABLE 3.2 ASR SYSTEM MONITORING PROGRAM - CONTINUED -

#### **MONITORING WELL PARAMETERS**

Parameters	Measuring Frequency	Reporting Frequency
Maximum Water Level/Pressure	Daily/.Monthly during recharge/recovery	Monthly during recharge/recovery
Minimum Water Level/Pressure	Daily/Monthly during recharge/recovery	Monthly during recharge/recovery
Average Water Level/Pressure	Daily/Monthly during recharge/recovery	Monthly during recharge/recovery
Water Quality Specific Conductance (umhos/cm) Total Alkalinity (mg/l) pH (std units) Total Dissolved Solids (TDS) (mg/l) Chloride (mg/l) Sodium (mg/l) Sulfate (mg/l Field Temperature (°C) Color (color units) Total Coliform (colonies/100 ml) Fecal Coliform (colonies/100 ml) Arsenic (mg/l) Dissolved Oxygen (mg/l) Total Trihalomethanes (mg/l) Total Iron (mg/l) Gross Alpha (pCi/l)	Weekly during recharge/recovery	Monthly during recharge/recovery
Cryptosporidium	Annually	Annually
Giardia Lamblia	Annually	Annually

Table 3.3
Analytical Results From Analysis Of Injected Water

					_				
CHLORIDES (mg/l)	SULFATE (mg/l)	TDS (mg/l)	DISSOLVED OXYGEN (mg/l)	IRON (mg/l)	THM'S (mg/i)	pH (s.u.)	Arsenic (mg/l)	TOC (mg/L)	SPECIFIC CONDUCT. umhos/cm
100	<del>   </del>			<del></del>			1 (3//	(iiig/L/	uninos/cm
<del> </del>	56	310	4.4	0.025u	0.0005	7.8	0.002211	<del> </del>	
		560	4.2	0.045			0.00320		810
<del></del>		610	8.9				+	1	860
		620	4.8				0.0020-		880
		540	6.1			+			880
<del></del>	53	480	4.8						870
	52	510							810
	49	530			<del></del>				820
94	52	480							780
110	59				<del>- </del>			9.3	790
95	60							10	850
120	63				<del></del>			12	900
94	75		<del></del>					11	950
92	77				++		<del></del>	11	960
93							0.0032u	11	970
			3.0	0.057	0.0005u	6.4	0.0032u	12	950
	(mg/l)  130 110 130 120 110 91 100 91 100 91 94 110 95 120 94 92	(mg/l)         (mg/l)           130         56           110         56           120         54           110         57           91         53           100         52           91         49           94         52           110         59           95         60           120         63           94         75           92         77	(mg/l)         (mg/l)         (mg/l)           130         56         310           110         560         560           130         610         610           120         54         620           110         57         540           91         53         480           100         52         510           91         49         530           94         52         480           110         59         580           95         60         560           120         63         630           94         75         610           92         77         580	CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)           130         56         310         4.4           110         560         4.2           130         610         8.9           120         54         620         4.8           110         57         540         6.1           91         53         480         4.8           100         52         510         5.1           91         49         530         3.5           94         52         480         6.5           110         59         580         0.9           95         60         560         3.5           120         63         630         3.5           94         75         610         3.5           92         77         580         5.9	CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)         IRON (mg/l)           130         56         310         4.4         0.025u           110         560         4.2         0.045           130         610         8.9         0.036           120         54         620         4.8         0.042           110         57         540         6.1         0.041           91         53         480         4.8         0.05           100         52         510         5.1         0.069           91         49         530         3.5         0.037           94         52         480         6.5         0.046           110         59         580         0.9         0.21           95         60         560         3.5         0.27           120         63         630         3.5         0.09           94         75         610         3.5         0.045           92         77         580         5.9         0.06	CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)         IRON (mg/l)         THM'S (mg/l)           130         56         310         4.4         0.025u         0.0005u           110         560         4.2         0.045         0.11           130         610         8.9         0.036         0.074           120         54         620         4.8         0.042         0.0005u           110         57         540         6.1         0.041         0.001           91         53         480         4.8         0.05         0.06           100         52         510         5.1         0.069         0.13           91         49         530         3.5         0.037         0.0007           94         52         480         6.5         0.046         0.1           110         59         580         0.9         0.21         0.093           95         60         560         3.5         0.27         0.076           120         63         630         3.5         0.045         0.005U           94         75         610         3.5         0.045 </td <td>CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)         IRON (mg/l)         THM'S (mg/l)         pH (mg/l)           130         56         310         4.4         0.025u         0.0005u         7.8           110         560         4.2         0.045         0.11         7.5           130         610         8.9         0.036         0.074         7.5           120         54         620         4.8         0.042         0.0005u         7.5           110         57         540         6.1         0.041         0.001         7.4           91         53         480         4.8         0.05         0.06         7.8           100         52         510         5.1         0.069         0.13         7.8           91         49         530         3.5         0.037         0.0007         7.3           94         52         480         6.5         0.046         0.1         7.8           110         59         580         0.9         0.21         0.093         7.1           95         60         560         3.5         0.27         0.076         7.8</td> <td>CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)         IRON (mg/l)         THM'S (mg/l)         pH (s.u.)         Arsenic (mg/l)           130         56         310         4.4         0.025u         0.0005u         7.8         0.0032u           110         560         4.2         0.045         0.11         7.5         0.0032u           120         54         620         4.8         0.042         0.0005u         7.5         0.0032u           110         57         540         6.1         0.041         0.001         7.4         0.0032u           91         53         480         4.8         0.05         0.06         7.8         &lt;0.0032u</td> 91         49         530         3.5         0.037         0.0007         7.3         <0.0032u	CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)         IRON (mg/l)         THM'S (mg/l)         pH (mg/l)           130         56         310         4.4         0.025u         0.0005u         7.8           110         560         4.2         0.045         0.11         7.5           130         610         8.9         0.036         0.074         7.5           120         54         620         4.8         0.042         0.0005u         7.5           110         57         540         6.1         0.041         0.001         7.4           91         53         480         4.8         0.05         0.06         7.8           100         52         510         5.1         0.069         0.13         7.8           91         49         530         3.5         0.037         0.0007         7.3           94         52         480         6.5         0.046         0.1         7.8           110         59         580         0.9         0.21         0.093         7.1           95         60         560         3.5         0.27         0.076         7.8	CHLORIDES (mg/l)         SULFATE (mg/l)         TDS (mg/l)         OXYGEN (mg/l)         IRON (mg/l)         THM'S (mg/l)         pH (s.u.)         Arsenic (mg/l)           130         56         310         4.4         0.025u         0.0005u         7.8         0.0032u           110         560         4.2         0.045         0.11         7.5         0.0032u           120         54         620         4.8         0.042         0.0005u         7.5         0.0032u           110         57         540         6.1         0.041         0.001         7.4         0.0032u           91         53         480         4.8         0.05         0.06         7.8         <0.0032u	CHLORIDES   SULFATE   (mg/l)   (mg/l)

DATE	COLOR c.u.	FIELD. TEMP. (°C)	TOTAL COLIFORMS (COL/100ml)	FECAL COLIFORMS (COL/100ml)	GROSS ALPHA (Pci/l) 1,2
08/29/01	<del>- 37 +</del>	<del>   </del>			
	27	30.2	1.0u	1.0u	8.7
09/05/01	23	32.3	10u	10u	8.9
09/12/01	22	27.5	1.0u	1.0u	
09/20/01	28	28.8	100u	100u	<del> </del>
09/26/01	30	29.4	TNTC	TNTC	
10/03/01	26	27.5	1.0u	1u	<u> </u>
0/10/01	25	28	1.0u	1 1u	
0/17/01	33	29.1	700	100u	
0/23/01	30	28	100	1000	
1/01/01	32	27.1	1.00	1.0U	3.8
1/06/01	34	22.8	1.00	+	
1/15/01	27	23.5	1.00	1.00	
1/29/01	26	23.1		1.00	2.9
2/05/01	28	23.1	1.00	1.0U	
2/11/01	38		1.00	1.0U	L
21001	30	23.1	1.00	1.0U	12.7

Table 3.4
Analytical Results From Analyses of Water Recovered From SZ#1 During Recharge

DATE	CHLORIDES (mg/l)	SULFATE (mg/l)	TDS (mg/l)	DISSOLVED OXYGEN (mg/l)	IRON (mg/l)	THM'S (ug/l)	pH (s.u.)	Arsenic (mg/l)	TOC (mg/l)	SPECIFIC CONDUCT, umhos/cm
8/30/01	3100	<del>                                     </del>	6200	+					T T	
9/5/01	2900	<del>                                     </del>		1.9	0.28	0.0005u	7.7		1.9	10000
9/12/01	2800	<del> </del>  -	5800	1.1	0.43	0.0005u	7.2		2.2	10000
10/3/01	3000	700	6300	1.7	0.35	0.0005u	7.1		2.2	10000
10/10/01	2900			1.2	0.38	0.0005u	7.1	0.0077	2.1	10000
10/17/01	3100	690	6100	4.1	0.47	0.0005u	7.1	0.0032u	1.6	10000
10/23/01	<del></del>	710	6700	1.4	0.42	0.0005u	7.4	0.0032u	1.9	10000
11/1/01	2800	640	5600	2.3	0.48	0.0005u	7.1	0.0032u	2.9	10000
	3000	690	6400	1.1	0.41	0.0005u	7.3	0.0032u	2.1	
11/6/01	2800	630	6400	0.89	0.44	0.0005u	7.4	0.0032u	2.2	10000
11/15/01	2900	640	6300	1.1	0.39	0.0005u	7.4	0.0032u		10000
11/29/01	2900	690	10000	1.3	0.42	0.0005u			2.6	10000
12/5/01	3000	680	6300	1.2	0.42		7.2	0.0032u	1.5	10000
12/11/01	2800	640	6200	1.2		0.0005u	7.3	0.0032u	1.4	10000
				1.6	0.39	0.0005u	7.3	0.004		10000

DATE	COLOR c.u.	FIELD TEMP. (°C)	TOTAL COLIFORMS (COL/100ml)	FECAL COLIFORMS (COL/100ml)	GROSS ALPHA (Pci/l) 1,2
				7	1 4 5 11 1 1 1 1
8/30/01	5u	27.8	1.0u	1.0u	67
9/5/01	5u	28.3	1.0u	1.0u	50
9/12/01	5u	28.4	1.0u	1.0u	1-30
10/3/01	7	28.9	1.0u	1.0u	<del> </del>
10/10/01	5u	28.1	1.0u	1.0u	<del> </del>
10/17/01	5u	29	1.0u	1.0u	<del>                                     </del>
10/23/01	6	28.1	1.0u	1.0u	
11/1/01	32	27.8	1.0u	1.0u	101
11/6/01	5.0U	24.6	1.0u		<del></del>
11/15/01	5,0U	24.3	1.0u	1.0u	ļ
11/29/01	6	26.9	<del></del>	1.0u	37
12/5/01	5u	25.6	1.0u	1.0u	
12/11/01	5u	24.8	1.0u	1.0u	<u> </u>
		24.0	1.0u	1.0u	41

Table 3.5
Analytical Results From Analyses of Water Recovered From DZ#1 During Recovery

DATE	CHLORIDES (mg/l)	SULFATE (mg/l)	TDS (mg/l)	DISSOLVED OXYGEN (mg/l)	IRON (mg/I)	THM'S (ug/l)	pH (s.u.)	Arsenic (mg/l)	TOC (mg/L)	SPECIFIC CONDUCT umhos/cm
8/29/01	3100	<del> </del>	6300	<del></del>						
9/5/01	400	<del> </del>		2	0.24	0.0005u	7.6	0.0032u	2.2	10000
9/12/01	350	╉╼╌╼╌╼╁╅	1200	1.2	0.74	0.0005u	7.6		4.8	2100
10/3/01	350	<del>                                     </del>	1100	1.8	0.88	0.0005u	8.2		4.9	1900
10/10/01		150		1.4	0.94	0.0005u	7.6	0.0042	4.4	1800
	350	150	1000	1.08	0.92	0.0005u	7.6	0.0032U	4.4	
10/17/01	300	130	980	1.4	1.1	0.0005u	7.5	0.0032U	<del></del>	1800
10/23/01	260	110	840	2	1.1	0.0005u	7.6		4.3	1600
11/1/01	250	110	910	1.3	1.1	0.0005u		0.0032U	3.9	1500
11/6/01	240	100	840	0.91			7.6	0.0032U	4.3	1400
11/15/01	210	96	770	0.9	0.94	0.0005u	7.5	0.0032U	4.5	1500
11/29/01	170	92	720		0.99	0.0005u	7.5	0.0032U	5.1	1300
12/5/01	160	91		0.89	1.1	0.0005u	7.1	0.0032U	3.8	1200
12/11/01	160	100	700	1.2	1.3	0.0008	7.1	0.0032u	4.2	1200
	1 100	100	720	0.8	0.77	0.0005u	7.3	0.0032u	5.1	1200

DATE	COLOR c.u.	FIELD TEMP. (°C)	TOTAL COLIFORMS (COL/100ml)	FECAL COLIFORMS (COL/100mi)	GROSS ALPHA (Pci/l) 1,2
					1
8/29/01	5.0u	29.1	1.0U	1.0U	68
9/5/01	5.0u	30.5	1.0U	1.0U	8.1
9/12/01	5.0u	28.1	1.0U	1.00	0.1
10/3/01	7	28.9	1.0U	1.00	<del> </del>
10/10/01	5u	28.1	1.0U	1.00	7.9
10/17/01	5u	29	1.0U	1.0U	1.9
10/23/01	6	28.1	1.0U	1.0U	
11/1/01	7	28	1.00	1.0U	59
11/6/01	6	26.1	1.00		<del></del>
11/15/01	5.0u	25.7	1.00	1.0U	<u> </u>
11/29/01	6	26	1.00	1.0U	5.4
12/5/01	5u	24	<del></del>	1.0U	
12/11/01	6	25.2	1.0U	1.0U	
		25.2	1.0U	1.0U	8.8

Table 3.6
Analyses of Water Recovered From SZ#2 During Recharge
(MHZ2MW)

DATE	CHLORIDES (mg/l)	SULFATE (mg/l)	TDS (mg/l)	DISSOLVED OXYGEN (mg/l)	IRON (mg/l)	THM'S (ug/l)	pH (s.u.)	Arsenic (mg/l)	TOC (mg/L)	SPECIFIC CONDUCT
08/30/01	3100	<del> </del>	6300	<del></del>		J				
09/05/01	2800	<del>     </del>	5900	2	0.24	0.0005u	7.6		1.9	10000
09/12/01	2800	<del>                                     </del>	6300	1.8	0.24	0.0005u	7.2		2.6	10000
09/20/01		<del>╏╸╸╸┪╏</del>	0300	1.7	0.12	0.0005u	7.3		2.3	10000
09/26/01	3000	670	5900	1.8	0.037	0.0005u	7.3	0.0032u	1.6	1000
10/3/01	3000	680	5900	2.7	0.038	0.0005u	7.6	0.0032u	1.4	10000
10/10/01	2900	660	6000	0.88	0.025u	0.0005u	7.2	0.0032U	2.1	10000
10/17/01	2800	630	6000	1.4	0.032	0.0005u	7.3	0.0032U	1.4	10000
10/23/01	2700	610	6600	0.8	0.025	0.0005u	7.3	0.0032U	1.4	10000
11/01/01	2700	600	5400	2.4	0.029	0.0005u	7.3	0.0032U	1.2	10000
11/06/01	2700	610	6300	4.4	0.025u	0.0005u	7.3	0.0032U	1.8	10000
11/15/01	3900	630	6300	0.72	0.025u	0.0005u	7.2	0.0032U	2.2	10000
11/29/01	2800	650	6100	0.8	0.025u	0.0005น	7.6	0.0032U	2.2	10000
12/5/01	2900	650	5800	1.2	0.025u	0.0005u	7.3	0.0032U	1.4	10000
12/13/01	3000	700	6000	1.1	0.026	0.0005u	7.3	0.0032u	1.3	10000
	3330	100	5900		0.032	0.0005u	7.3	0.0032u		10000

	COLOR	FIELD	TOTAL	FECAL	
DATE	l i	TEMP.	COLIFORMS	COLIFORMS	GROSS ALPHA
DATE	c.u.	(°C)	(COL/100ml)	(COL/100mi)	(Pci/l) 1,2
1 00 00 00 t					
08/30/01	5.0U	27.8	100u	100u	68
09/05/01	5.0U	30.9	1u	1u	
09/12/01	5.0U	27.8	100u	100u	
09/20/01		28.1	100u	100u	
09/26/01	5.0U	26.3	1.0U	1.00	
10/3/01	5.0∪	28	1	1.0U	
10/10/01	5.0∪	28	1.0U	1.00	
10/17/01	5.0U	26.8	1.00	1.0U	
10/23/01	5u	28.6	100		
11/01/01	5.0U	25.5	1.0U	100	43
11/06/01	5.0U	24.5		1.0U	
11/15/01	5.0U	26.5	1.0U	1.0U	
11/29/01	6		1.0U	1.0U	28
12/5/01	5u	25.1	1.0U	1.0U	
12/13/01		25.9	1.0U	1.0U	
12/10/01	5u	<u></u>	1.00	1.0U	28

Table 3.7
Analytical Results From Analyses of Water Recovered From DZ#2 During Recharge
(ASRZMW2)

DATE	CHLORIDES (mg/l)	SULFATE (mg/l)	TDS (mg/l)	DISSOLVED OXYGEN (mg/l)	IRON (mg/l)	THM'S (ug/l)	pH (s.u.)	Arsenic (mg/l)	TOC (mg/L)	SPECIFIC CONDUCT umhos/cm
08/29/01	3000	680	6100	2.4	0.29	10,0005	++			
09/05/01	2800		5800	1.3	0.057	0.0005u	8	<0.0032u		
09/12/01	2700		6000	1.6	+	0.0005u	8.3		2.6	10000
09/20/01	2700		6200	1.2	0.056	0.0005u	7.1	<u> </u>	2	10000
09/26/01	2800	610	5700	1.8	0.025u	0.0005u	7.4	<0.0032u	1.4	9900
10/3/01	2900	620	0.00	0.9	0.025u	0.0005u	7.4	<0.0032u	1.4	9800
10/10/01	2700	610	5700	0.8	0.025u	0.0005u	7.3	0.01	2	9700
10/17/01	2600	570	6400	0.8	0.025u	0.0005u	7.3	<0.0032u	1.3	9700
10/23/01	2600	570	5000	2.2	0.025u	0.0005u	7.2	<0.0032u	1.7	9700
11/01/01	2800	620	6100	2.2	0.025u	0.0005u	7.3	<0.0032u	1.2	9600
11/06/01	2400	540	5800		0.025u	0.0005u	7.2	<0.0032u	1.8	9500
11/15/01	2600	570	6000	0.8	0.025u	0.0005u	7.3	<0.0032u	2.2	9600
11/29/01	2700	600	5600	0.8	0.025u	0.0005u	7.5	<0.0032u	2.1	9400
12/5/01	2700	600	5300	0.9	0.025u	0.0005u	7.1	<0.0032u	1.4	9500
12/11/01	2800	640	5600	1.1	0.25u	0.0005u	7.2	<0.0032u	1.3	9600
		<u> </u>	3000	0.9	0.055	0.0005u	7.2	<0.0032u		9500

DATE	COLOR c.u.	FIELD TEMP. (°C)	TOTAL COLIFORMS	FECAL COLIFORMS	GROSS ALPHA
		+ (0)	(COL/100mi)	(COL/100ml)	(Pci/I)
08/29/01	5	<del>-  </del>			
09/05/01	5.0U	1 20	100u	100u	66
09/12/01		29	1u	1u	63
	5.0U	28.4	100u	100u	
09/20/01	5.0U	28.6	100u	100u	<u> </u>
09/26/01	5	27.2	1u	1u	
10/3/01	6	28	1u	1u	<del>                                     </del>
10/10/01	5.0U	28.5	1u	1u	<del>                                     </del>
10/17/01	5.0U	28	1u	1u	<del>                                     </del>
10/23/01	5.0U	29.5	1u	1u	51
11/01/01	5.0U	28.8	1u	1u	<del>                                     </del>
11/06/01	5.0U	26.6	1u	1u	<del>                                     </del>
11/15/01	5.0U	26.9	1u	<u> </u>	<del> </del> _
11/29/01	5	24.9	1u	1u 1	28
12/5/01	5.0U	27	1u	1u	<del> </del>
12/11/01	5.0U	26.1	1u	10	10.5

Table 3.8

Average Daily Recovery Rates (MGD)

	ASR-1 Average Daily Recovery Rate	ASR-2 Average Daily Recovery Rate	ASR-3 Average Daily Recovery Rate	Total Average Daily Recovery Rate
DATE	(MGD)	(MGD)	(MGD)	(MGD)
		<del></del>		(11102)
4/1/02	0.000	0.000	0.000	0.000
4/2/02	0.806	0.744	0.701	2.251
4/3/02	0.506	0.497	0.521	1.524
4/4/02	0.371	0.642	0.570	1.583
4/5/02	1.260	1.096	1.010	3.366
4/6/02	0.640	0.644	0.636	1.920
4/7/02	1.022	1.031	1.019	3.072
4/8/02	0.859	0.853	0.830	2.542
4/9/02	0.991	0.281	0.838	2.110
4/10/02	0.576	0.374	0.328	1.278
4/11/02	0.461	0.374	0.329	1.164
4/12/02	0.682	0.357	0.853	1.892
4/13/02	0.990	1.135	1.166	3.291
4/14/02	0.999	0.509	0.504	2.012
4/15/02	0.864	0.918	0.942	2.724
4/16/02	0.864	0.887	0.874	2.625
4/17/02	0.649	0.640	0.629	1.918
4/18/02	0.772	0.764	0.750	2.286
4/19/02	0.879	0.866	0.850	2.595
4/20/02	0.878	0.866	0.849	2.593
4/21/02	0.670	0.656	0.647	1.973
4/22/02	0.833	0.843	0.833	2.509
4/23/02	0.674	0.753	0.743	2.170
4/24/02	0.618	0.529	0.502	1.649
4/25/02	0.990	0.990	1.005	2.985
4/26/02	0.863	0.849	0.834	2.546
4/27/02	0.802	0.802	0.791	2.395
4/28/02	0.567	0.215	0.559	1.341
4/29/02	0.847	0.259	0.849	1.955
4/30/02	0.653	0.392	0.650	1.695
5/1/02	0.571	0.520	0.569	1,660
5/2/02	0.645	0.645	0.635	1.925
5/3/02	0.461	0.460	0.450	1.371
5/4/02	0.542	0.532	0.520	1.594
5/5/02	0.716	0.703	0.688	2.107
5/6/02	0.410	0.440	0.426	1.276
5/7/02	0.559	0.520	0.302	1.381
5/8/02	0.693	0.679	0.343	1.715
5/9/02	0.482	0.487	0.253	1.222
5/10/02	0.470	0.446	0.999	1.915
5/11/02	0.620	0.608	1.401	2.629
5/12/02	0.620	0.608	0.555	1.783
5/13/02	0.376	0.312	0.149	0.837
5/14/02	0.574	0.470	0.402	1.446
5/15/02	0.314	0.346	0.218	0.878

Table 3.8

Average Daily Recovery Rates (MGD)

	ASR-1	ASR-2	ASR-3	Total
	Average	Average	Average	Average
ĮĮ.	Daily Recovery	Daily Recovery	Daily Recovery	Daily Recovery
#	Rate	Rate	Rate	Rate
DATE	(MGD)	(MGD)	(MGD)	(MGD)
5/16/02	0.373	0.217	0.258	0.848
5/17/02	0.501	0.481	0.262	1.244
5/18/02	0.588	0.574	0.298	1.460
5/19/02	0.586	0.556	0.320	1.462
5/20/02	0.989	0.800	0.309	2.098
5/21/02	0.104	0.248	0.304	0.656
5/22/02	0.409	0.383	0.165	0.957
5/23/02	0.777	0.649	0.249	1.675
5/24/02	0.842	0.696	0.273	1.811
5/25/02	0.952	0.797	0.315	2.064
5/26/02	0.706	0.589	0.228	1.523
5/27/02	0.607	0.501	0.207	1.315
5/28/02	0.870	0.775	0.285	1.930
5/29/02	0.780	0.594	0.249	1.623
5/30/02	0.765	0.639	0.258	1.662
5/31/02	0.602	0.492	0.259	1.353
6/1/02	0.443	0.358	0.301	1.102
6/2/02	0.411	0.332	0.279	1.022
6/3/02	0.438	0.356	0.298	1.092
6/4/02	0.439	0.373	0.309	1.121
6/5/02	0.439	0.339	0.291	1.069
6/6/02	0.703	0.584	0.233	1.520
6/7/02	0.513	0.419	0.153	1.085
6/8/02	0.525	0.883	0.359	1.767
6/9/02	1.144	0.498	0.198	1.840
6/10/02	0.990	0.613	0.240	1,843
6/11/02	1.000	0.543	0.220	1.763
6/12/02	1.171	0.522	0.225	1.918
6/13/02	0.777	0.640	0.273	1.690
6/14/02	0.392	0.323	0.152	0.867
6/15/02	0.462	0.625	0.347	1.434
6/16/02	0.373	0.417	0.247	1.037
6/17/02	0.518	0.689	0.341	1.548
6/18/02	0.393	0.573	0.255	1.221
6/19/02	0.473	0.578	0.000	1.051
6/20/02	0.473	0.579	0.000	1.052
6/21/02	0.593	0.710	0.000	1.303
6/22/02	0.366	0.428	0.000	0.794
6/23/02	0.466	0.564	0.000	1.030
6/24/02	0.446	0.514	0.000	0.960

Table 3.9
Analyses of Water Recovered from ASR Wells During Cycle 1E Recovery

DATE	Chlorida			Dissolved					Specific.		<del></del>	Total		
DATE	Chlorides	Sulfate	TDS	Oxygen	Iron	THM'S	pН	Arsenio	1 '	Color	Temp		Fecal	Gros
4 10 100	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(s.u)	(mg/l	(umhos/cm	(c.u.)	(oC)	Coliform	Coliform	Alph
4/2/02	93	58	710	1.6	2.7		6.4	BDL	1200	45		(col./100ml)	13	(Pci/l
4/11/02	120	91	760	0.6	0.67	BDL	6.4	BDL	1200	18	25.8	0	0	10
4/17/02	110	84	750	1.3	0.5	BDL	6.6	BDL	1200	17	25	0	00	
4/25/02	140	96	820	0.7	0.45	BDL	6.8	BDL	1200	18	26.1	0	0	
5/7/02	140	82	750	0.46	0.36	BDL	7.2	0.0064	1200	16	26.9	0	0	
5/14/02	160	96	720	0.65	0.36	BDL	6.9	BDL	1200		30.6	00	0	
5/22/02	170	97	710	1.56	0.34	BDL	6.76	BDL	1200	18	28	0	0	
5/29/02	180	95	730	0.8	0.29	BDL	6.7	0.0038		5	27.6	1100	0	
SR-2	<u> </u>						0.7	0.0036	1200	15	30	0	0	
				Dissolved				<del>,</del>	_					
DATE	Chlorides	Sulfate	TDS	Oxygen	(man	T. 0.40	İ	1.	Specific.			Total	Fecal	Gross
	(mg/i)	(mg/l)	(mg/l)	1	Iron	THM'S	рH	Arsenic	Conduct.	Color	Temp	Coliform	Coliform	Alpha
4/2/02	92	75	700	(mg/l)	(mg/l)	(mg/l)	(s.u)	(mg/l	(umhos/cm	(c.u.)	(oC)	(col./100ml)		(Pci/l)
4/11/02	110	99		0.5	2.8		6.9	0.03	1200	27	25.5	0	0	6.4
4/17/02	110	95	770	0.5	0.61	BDL	6.3	0.023	1200	15	25.4	0	0	0.4
4/25/02	130	100	800	1.6	0.41	BDL	6.8	0.018	1200	14	25.5	0	0	
5/7/02	150	91	1100	0.6	0.37	BDL	6.8	0.017	1200	16	26.7	0	0	<del></del>
5/14/02	180	110	760	0.87	0.27	BDL	6.9	0.016	1200	13	29.8	0	0	
5/22/02	200	110	780	0.51	0.27	BDL	6.8	0.015	1300	13	26.9	0	0	
5/29/02	230		770	1.54	0.24	BDL	6.7	0.014	1300	5	28.2	0	0	
	230	110	850	0.6	0.25	BDL	6.7	0.019	1400	13	29.9	0	0	
SR-3														
				Dissolved					Specific.	<del></del>				
DATE	Chlorides	Sulfate	TDS	Oxygen	Iron	THM'S	pН	Arsenic	Conduct.	Color	T	Total	Fecal	Gross
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(s.u)		(umhos/cm		Temp	Coliform	Coliform	Alpha
4/2/02	91	77	710	0.7	4	<u> </u>	6.8	0.049		(c.u.)	(oC)	(col./100ml)	(col./100ml)	(Pci/l)
4/11/02	130	100	780	0.6	0.52	BDL	6.4		1200	50	26.6	0	0	11.4
4/17/02	140	100	790	1.2	0.29	BDL	6.9	0.032	1200	18	25.2	0	0	
4/25/02	190	100	1000	0.8	0.33	BDL	7.2	0.026	1300	16	25.8	0	0	
5/7/02	220	100	840	0.58	0.35	BDL		0.024	1300	16	26.4	0	0	
5/14/02	260	120	930	0.47	0.3	BDL	6.9 7	0.00	1500	14	29.7	0	0	
5/22/02	280	130	870	1.6	0.31	BDL	<del></del>	0.018	1500	11	29.5	0	0	
5/29/02	300	130	970	0.7	0.33	BDL	6.8	0.02	1600	8	28.1	0	0	
L = Belo	w Detection L			<u> </u>	0.00	BUL	6.6	0.02	1600	15	28.6	0	0	

Table 3.10
Analytical Results of Analyses Performed on Water
Recovered From Monitoring Wells During Recovery

	OW ZONE	#1	SZ#1	<del></del>	<del></del>	<del></del>		<del></del>		<del></del>				·
1			<del></del>	Dissolved	11	Τ	1	·	Specific	<del></del>	——			
Date	Chloride	Sulfate	TDS	Oxygen	Iron	THM'S	pH	Arsenio		Colo		Total	Fecal	Gros
1	(mg/l)	(mg/l)	(mg/i)	,	(mg/l)		(s.u.						Coliform	Alpha
4/4/02		650	6300	1.8	0.32	(ug/i)			(umhos/cm)		(°C)	(Col./100ml)	(Col./100ml)	(Pci/l
4/11/02		790	6200	0.3	0.32	BDL	7.2	0.0043	10000	5	25.1	0	0	39
4/17/02		700	6200	0.8	0.39	BDL	7.2	8DL	10000	5	24.5	0	0	
4/25/02		860	6100	0.6	0.36	BDL	6.9	BDL	10000	8	28.7	0	0	
5/7/02		940	6000	0.53	0.33		7.3	BDL	10000	5	27.7	0	0	
5/14/02	_4	760	6200	0.36	0.33	BDL	7.2	BDL	10000	5	30.4	0	0	
5/22/02		790	5300	1.85	0.52	BDL	7.3	BDL	10000	5	27.6	0	0	
5/29/02		760	6300	0.5	0.32	BDL	7.28		10000	5	29.5	0	0	$\vdash$
				0.5	0.32	BUL	7	BDL	10000	5	29.9	0	0	
DEEP 2	ONE-#1		DZ#1						·					
l				Dissolved					Specific	]	$\overline{}$	Total	Fecal	Gross
Date	Chloride	Sulfate	TDS	Oxygen	iron	THM'S	pН	Arsenic		Color	Temp	Coliform	Coliform	
	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/t)	(ug/l)	(s.u.)	1	(umhos/cm)	(c.u.)	(°C)	(Col./100ml)	1	Alpha
4/3/02	200	110	760	0.5	1.3	( <u>J</u> /	7.4	BDL	1300	5	28	<del></del>	(Col./100ml)	(Pci/i)
4/11/02		140	890	0.4	1.2	BDL	7.1	BDL	1500	5	24.8	0	0	31
4/17/02		140	1000	0.95	1.2	BDL	6.8	BDL	1600	9	29	<u> </u>	0	
4/25/02	280	330	950	0.6	1	8DL	7.2	BDL	1600	5		0	0	
5/7/02	330	150	1100	0.75	1.1	BDL	7	BDL	1700	5	28.5	0	0	
5/14/02	370	170	1100	0.39	0.96	BDL	7.4	BOL	1800		27.4	0	0	·-·
5/22/02	370	170	1800	1.82	0.95	BDL	7.3	BDL	1800	10	29.2	6	3	
5/29/02	610	240	1600	0.9	1.4	BDL	7	BDL	2600	5	27.8	0	0	
CHALL	3144 TONE +							L DOL	2600	5	27.8	0	0	
SHALL	OW ZONE-#	<u>z</u>	SZ#2							<u>"</u>		·		
Date	Chioride	0.16-4-		Dissolved	_				Specific			Total	Fecal	Gross
Date	1 1	Sulfate	TDS	Oxygen	iron	THM'S	pН	Arsenic	Conduct.	Color	Temp	Coliform	Coliform	Alpha
4/0/00	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(ug/l)	(s.u.)	(mg/l)	(umhos/cm)	(c.u.)	(°C)	(Col./100ml)		
4/2/02	3000		5800	0.6	0								I CONTRACTOR OF THE PROPERTY O	/Осілу
		730				_	7.35	BDL	10000	5	25.4		(Col./100ml)	(Pci/l)
4/11/02	3300	740	6100	0.2	0.53	BDL	7.35 7.3	BDL BDL	10000	5 5	25.4	0	0	(Pcl/l) 35
4/17/02	3000	740 680	6100 6100			BDL BDL		BDL.	10000 10000	5	24.5	0	0 0	
4/17/02 4/25/02	3000 3200	740 680 840	6100	0.2	0.53		7.3	BDL BDL	10000 10000 10000	5 9	24.5 24.8	0 0 0	0 0	
4/17/02 4/25/02 5/7/02	3000 3200 3500	740 680 840 850	6100 6100	0.2 1.4	0.53 0.025	BDL	7.3 7.1 7.3	BDL BDL BDL	10000 10000 10000 10000	5 9 6	24.5 24.8 26.6	0 0 0	0 0 0 0	
4/17/02 4/25/02 5/7/02 5/14/02	3000 3200 3500 3300	740 680 840 850 780	6100 6100 6100 5800 6100	0.2 1.4 0.4	0.53 0.025 0	BDL BDL	7.3 7.1	BDL BDL BDL BDL	10000 10000 10000 10000 10000	5 9 6 5	24.5 24.8 26.6 27.4	0 0 0 0	0 0 0 0	
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02	3000 3200 3500 3300 3100	740 680 840 850 780 750	6100 6100 6100 5800	0.2 1.4 0.4 0.38	0.53 0.025 0 0.034	BDL BDL BDL	7.3 7.1 7.3 7.2 6.9	BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000	5 9 6 5 5	24.5 24.8 26.6 27.4 29	0 0 0 0 0	0 0 0 0 0	
4/17/02 4/25/02 5/7/02 5/14/02	3000 3200 3500 3300	740 680 840 850 780	6100 6100 6100 5800 6100	0.2 1.4 0.4 0.38 0.31 4.34	0.53 0.025 0 0.034 0	BDL BDL BDL	7.3 7.1 7.3 7.2	BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000	5 9 6 5 5	24.5 24.8 26.6 27.4 29 30.1	0 0 0 0 0 0	0 0 0 0 0 0	
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02 5/29/02	3000 3200 3500 3300 3100 3200	740 680 840 850 780 750 790	6100 6100 6100 5800 6100 5000 6200	0.2 1.4 0.4 0.38 0.31 4.34	0.53 0.025 0 0.034 0	BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22	BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000	5 9 6 5 5	24.5 24.8 26.6 27.4 29	0 0 0 0 0	0 0 0 0 0	
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02	3000 3200 3500 3300 3100 3200	740 680 840 850 780 750 790	6100 6100 5800 6100 5000 6200	0.2 1.4 0.4 0.38 0.31 4.34 2.9	0.53 0.025 0 0.034 0	BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22	BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000	5 9 6 5 5	24.5 24.8 26.6 27.4 29 30.1	0 0 0 0 0 0	0 0 0 0 0 0	
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02 5/29/02 DEEP ZO	3000 3200 3500 3300 3100 3200 ONE-#2	740 680 840 850 780 750 790	6100 6100 5800 6100 5000 6200 DZ#2	0.2 1.4 0.4 0.38 0.31 4.34 2.9	0.53 0.025 0 0.034 0 0 0.028	BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22	BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000	5 9 6 5 5 5	24.5 24.8 26.6 27.4 29 30.1 30.2	0 0 0 0 0 0	0 0 0 0 0 0 0	35
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02 5/29/02	3000 3200 3500 3300 3100 3200 ONE#2	740 680 840 850 780 750 790	6100 6100 6100 5800 6100 5000 6200 DZ#2	0.2 1.4 0.4 0.38 0.31 4.34 2.9	0.53 0.025 0 0.034 0 0 0.028	BDL BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2	BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000	5 9 6 5 5 5	24.5 24.8 26.6 27.4 29 30.1 30.2	0 0 0 0 0 1 0 0	0 0 0 0 0 0 0 0	35 Gross
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02 5/29/02 DEEP ZO	3000 3200 3500 3300 3100 3200 DNE-#2 Chloride (mg/l)	740 680 840 850 780 750 790 Sulfate (mg/l)	6100 6100 6100 5800 6100 5000 6200 DZ#2	0.2 1.4 0.4 0.38 0.31 4.34 2.9	0.53 0.025 0 0.034 0 0 0.028	BDL BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2	BDL BDL BDL BDL BDL BDL BDL Arsenic	10000 10000 10000 10000 10000 10000 10000 Specific Conduct.	5 9 6 5 5 5 5	24.5 24.8 26.6 27.4 29 30.1 30.2	0 0 0 0 0 1 0 0	0 0 0 0 0 0 0 0	35  Gross Alpha
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02 5/29/02 DEEP ZO Date	3000 3200 3500 3300 3100 3200 DNE-#2 Chloride (mg/l) 2600	740 680 840 850 780 750 790 Sulfate (mg/l)	6100 6100 6100 5800 6100 5000 6200 DZ#2	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l)	0.53 0.025 0 0.034 0 0 0.028	BDL BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2 pH (s.u.)	BDL BDL BDL BDL BDL BDL BDL Arsenic (mg/l)	10000 10000 10000 10000 10000 10000 10000 \$pecific Conduct. (umhos/cm)	5 9 6 5 5 5 5 Color (c.u.)	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C)	0 0 0 0 0 1 0 0 0 Total Coliform (Col./100ml)	0 0 0 0 0 0 0 0 0 0 Fecal Collform (Col./100ml)	35 Gross Alpha (Pcl/I)
4/17/02 4/25/02 5/7/02 5/14/02 5/22/02 5/29/02 DEEP ZC Date 4/3/02 4/11/02	3000 3200 3500 3100 3200 3200 ONE-#2 Chloride (mg/l) 2600 3100	740 680 840 850 780 750 790 Sulfate (mg/l)	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l)	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3	0.53 0.025 0 0.034 0 0 0.028	BDL BDL BDL BDL BDL THM'S	7.3 7.1 7.3 7.2 6.9 7.22 7.2 pH (s.u.)	BDL BDL BDL BDL BDL BDL BDL Arsenic (mg/l)	10000 10000 10000 10000 10000 10000 10000 \$pecific Conduct. (umhos/cm)	5 9 6 5 5 5 5 Color (c.u.)	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1	0 0 0 0 0 1 0 0 0 Total Coliform (Col./100ml)	0 0 0 0 0 0 0 0 0 0 0 Collform (Col./100ml)	35 Gross Alpha
4/17/02 4/25/02 5/7/02 5/7/02 5/22/02 5/29/02 Date Date 4/3/02 4/11/02 4/17/02	3000 3200 3500 3100 3200 3100 3200 ONE-#2 Chloride (mg/l) 2600 3100 2800	740 680 840 850 780 750 790 Sulfate (mg/l) 580 690	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l)	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3 0.3	0.53 0.025 0 0.034 0 0 0.028 Iron (mg/l) 0.04 0.025	BDL BDL BDL BDL BDL THM'S (ug/l)	7.3 7.1 7.3 7.2 6.9 7.22 7.2 pH (s.u.) 7.3 7.2	BDL BDL BDL BDL BDL BDL BDL Arsenic (mg/l) BDL BDL	10000 10000 10000 10000 10000 10000 10000 5pecific Conduct. (umhos/cm) 9400	5 9 6 5 5 5 5 Color (c.u.)	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1 24.9	0 0 0 0 0 1 0 0 0 Total Coliform (Col./100ml)	0 0 0 0 0 0 0 0 0 0 0 Collform (Col./100ml)	35 Gross Alpha (Pcl/I)
4/17/02 4/25/02 5/7/02 5/7/02 5/22/02 5/29/02 Date Date 4/3/02 4/11/02 4/17/02 4/25/02	3000 3200 3500 3100 3200 3100 3200 ONE-#2 Chloride (mg/l) 2600 3100 2800 2900	740 680 840 850 780 750 790 Sulfate (mg/l) 580 690 620	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l) 5400 5800	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3 0.3	0.53 0.025 0 0.034 0 0 0.028 Iron (mg/l) 0.04 0.025 0.075	BDL BDL BDL BDL BDL THM'S (ug/l)	7.3 7.1 7.2 6.9 7.22 7.2 pH (s.u.) 7.3 7.2	BDL BDL BDL BDL BDL BDL BDL Arsenic (mg/l) BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000 Specific Conduct. (umhos/cm) 9400 9600	5 9 6 5 5 5 5 5 Color (c.u.) 5	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1 24.9 29.8	0 0 0 0 0 1 0 0 0 Total Coliform (Col./100ml)	0 0 0 0 0 0 0 0 0 0 0 0 Collform (Col./100ml)	35 Gross Alpha (Pcl/I)
4/17/02 4/25/02 5/7/02 5/7/02 5/22/02 5/29/02 Date Date 4/3/02 4/11/02 4/17/02 1/25/02 5/7/02	3000 3200 3500 3100 3200 3100 3200 ONE-#2 Chloride (mg/l) 2600 3100 2800	740 680 840 850 780 750 790 Sulfate (mg/l) 580 690 620 770	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l) 5400 5800 5700	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3 0.3 0.9 0.5	0.53 0.025 0 0.034 0 0 0.028 Iron (mg/l) 0.04 0.025 0.075 0	BDL BDL BDL BDL BDL BDL THM'S (ug/l) BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2 7.2 pH (s.u.) 7.3 7.2 7	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000 Specific Conduct. (umhos/cm) 9400 9600 9600	5 9 6 5 5 5 5 Color (c.u.) 5 8 6	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1 24.9 29.8 26.4	0 0 0 0 0 1 0 0 0 0 Total Coliform (Col./100mi) 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	35 Gross Alpha (Pcl/I)
4/17/02 4/25/02 5/7/02 5/7/02 5/22/02 5/29/02 Date Date 4/3/02 4/11/02 4/17/02 1/25/02 5/7/02 5/14/02	3000 3200 3500 3100 3200 3100 3200 ONE-#2 Chloride (mg/l) 2600 3100 2800 2900	740 680 840 850 780 750 790 Sulfate (mg/l) 580 690 620 770 830	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l) 5400 5800 5700 5400	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3 0.3 0.9 0.5 0.32	0.53 0.025 0 0.034 0 0 0.028 Iron (mg/l) 0.04 0.025 0.075 0	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2 7.2 pH (s.u.) 7.3 7.2 7 6.5 7.2	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000 Specific Conduct. (umhos/cm) 9400 9600 9600 9600	5 9 6 5 5 5 5 Color (c.u.) 5 8 6	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1 24.9 29.8 26.4 30.9	0 0 0 0 0 1 0 0 0 0 Total Coliform (Col./100ml) 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	35 Gross Alpha (Pcl/I)
4/17/02 4/25/02 5/7/02 5/7/02 5/22/02 5/29/02 Date Date 4/3/02 4/11/02 4/17/02 4/17/02 5/7/02 5/7/02 5/14/02 5/22/02	3000 3200 3500 3100 3200 3100 3200 ONE-#2 Chloride (mg/l) 2600 3100 2800 2900 3600	740 680 840 850 780 750 790 Sulfate (mg/l) 580 690 620 770 830 700	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l) 5400 5800 5400 5400 5600 5800	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3 0.3 0.9 0.5 0.32 0.44	0.53 0.025 0 0.034 0 0 0.028 Iron (mg/l) 0.04 0.025 0.075 0 0	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2 7.2 pH (s.u.) 7.3 7.2 7 6.5 7.2 7.2	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000 5pecific Conduct. (umhos/cm) 9400 9600 9600 9600 9600 9700	5 9 6 5 5 5 5 Color (c.u.) 5 8 6 5	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1 24.9 29.8 26.4 30.9 29.5	0 0 0 0 0 1 0 0 0 0 Total Coliform (Col./100mi) 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	35 Gross Alpha (Pcl/I)
4/17/02 4/25/02 5/7/02 5/7/02 5/22/02 5/29/02 Date Date 4/3/02 4/11/02 4/17/02 1/25/02 5/7/02 5/14/02	3000 3200 3500 3100 3200 3100 3200 ONE-#2 Chloride (mg/l) 2600 3100 2800 2900 3600 3100	740 680 840 850 780 750 790 Sulfate (mg/l) 580 690 620 770 830 700 700	6100 6100 6100 5800 6100 5000 6200 DZ#2 TDS (mg/l) 5400 5800 5700 5400 5600	0.2 1.4 0.4 0.38 0.31 4.34 2.9 Dissolved Oxygen (mg/l) 0.3 0.3 0.9 0.5 0.32	0.53 0.025 0 0.034 0 0 0.028 Iron (mg/l) 0.04 0.025 0.075 0	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	7.3 7.1 7.3 7.2 6.9 7.22 7.2 7.2 pH (s.u.) 7.3 7.2 7 6.5 7.2	BDL BDL BDL BDL BDL BDL BDL BDL BDL BDL	10000 10000 10000 10000 10000 10000 10000 10000 Specific Conduct. (umhos/cm) 9400 9600 9600 9600	5 9 6 5 5 5 5 Color (c.u.) 5 8 6 5	24.5 24.8 26.6 27.4 29 30.1 30.2 Temp (°C) 28.1 24.9 29.8 26.4 30.9	0 0 0 0 0 1 0 0 0 0 Total Coliform (Col./100ml) 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	35 Gross Alpha (Pcl/I)

#### **APPENDIX 3.1**

# PRIMARY AND SECONDARY DRINKING WATER ANALYSIS SUMMARY

mice, FL 34348			_	- 1	Phone: (561	) 465-2400, Ext. 285	₩ #	iren	L L.	1DU	na i	UK	Y		CI	hain-of-Cւ	dy
82500/E82417 irst Coast Hwy., Suite 1 lina Beach, FL 32034	Comp			ond	2 Wa	ater Sen	100	(301) Met	hod of SI	ipment:	fea	$l \in$	X			BALL POINT P	•
	Addre	ess:	<u>/00</u>	770,0	olli	er Blvd			er #'s				- \		Standard 1	Turn Around Tim	18
83486/E83509 Perprise Road, Suite 1 . FL 32725		Con		rco	Slan	d ft-3410	15			29-c	Time				Rush in	Busing	ess Days
	Phone	174	<u>U3</u>	<u> 74-3</u>	<u>353</u> fa	(241)394-406	O Ten	nperatur	e	Custody	Caala	F		lse Only		·	
85512/E85370 lidge Avenue	Client	Contac	t: _	tran	K Ka	inc		becked	-	intac Y			pH Check		HPN#	200	793C
cres, FL 33936	Projec	t Name:	:	Macc	o Cal	Kes ASR				POEC	ERVATIV	<u> </u>	<u></u>	N			
84256/E84418 awaw Bivd.	Sample	ed By:		51	MO	2				ित	S REQUE	To	10	<u> </u>	H - Hydrochloric Acid	Preservation Ke P-Phosph	-
I. FL 34607	Purcha	se Orde	r#:		<u> </u>		3	प्रकृ		f	o neuve	I V	T = {	12	H=Mitric Acid S=Suthuric Acid		Thiosallata
ELD ID COLLE DATE	CTION TIME	Sample Type	MAIRIX		SAMPLE	LOCATION	338	FD Diggs	508 Per	15	OBR	525,	3/6	42/nc	SH-Sadum Hydracide	OMMENT	50.
08-270	1730			Mon.	Well	Deep 2,3	Î	IN	1	5	1	J	7		Do. 1	PH /- 2.012	Sil
		_ _	4						<del> </del>						<u> </u>		
		$\dashv$	- -	<del></del>													
		$\dashv$	+	+	<del></del>												
			-	<del> </del>	·												
ype: G-Grab C-Comp	osite 0-Other		1	Matrix: S-Sa	lid SI = Sludos	DW Drietin W							_			<del></del>	
y S.SMO	<u>s                                    </u>		$\geqslant$	RELINQUIS	HED RY	DWDrinking Water GW-Gr	ound War	ter SW-	Surface	Water V	/W - Was	ewater					
8-27-01	210	0		DATEITIME							ISHED B	Ý			<del></del>	-	
				RECEIVED E						DATE/TIA						<u> </u>	
				DATE/TIME			<del></del>		—— <u> </u>	ECEIVE	FOR HE	EL CUS	TODY B		all		
with REPORT; YELLOW for	FILE: PINK to CL	IENT; GO	LD for R	ECEIVING: GRI	EN Inc SAMPLED			<del></del> -		ATE/TIM	IE			-8	30.01 (	7945	
				,,										PA	<b>A</b>	3_	

t. FL 34946				Phone: (561) 465-24	UU EAT SOE	E.	TA	L LA	RUI	KAI	UK	Y		ſ	hain of C
500/E82417	Comp	anv: £	-0,	prida Water	- C	ra <sub>av</sub>	(561)	467-1	584		ſ				Chain-of-Cusy
Coast Hwy., Suite 1		T	0/	riad Water	Serv	ìœ	<b>SMeth</b>	od of Shi	pment:	te	d- 6	=x	•	US	E BALL POINT PEN ONLY
Beach, FL 32034	Addre	ss: <u> </u>	760	ON. Collies	-Blv	d	Coole					<b>∠</b> /\	Z	Standard	Turn Around Time
188/E83509			Иа	rco Sland								<del></del>		_	
ise Road, Suite 1 32725	o/	ariy			16.54	卍	> Date	08-	29-0	<b>Prime</b>			<u> </u>		Business Days
	rnone:	TAN	39	4-3353 Fax: (941)=	394-4069	Ten	perature		Sustody S	Saala	F	or Lab U	•		
12/E85370	Client (	Contact:	+	Tank Kane	,		ecked	•	intact			pH Check		LIDN A	2007031
Avenus FL 33938	Project	Mama		A = [ W			N		Y	N		Y	N		2007936
	, , pier?	wane,	70	Marco Lakes	ASR				PRESE	RVATIV	ıF			7	
i6/E844 i 8 n Blvd.	Sample	d By:		SIMAS		A	d w	H	77	H	IJ	X	13	H = Hydrachlaric Ac	Preservation Key
34607	Purcha	se Order				2	<u>y</u>	<del>T (                                   </del>	ALYSES	REQUE	STED		4-2-	M-Mitric Acid	ns P+Phospharic Acid ST+Sockum Thiosphlata
						ہے اور	<b>1</b> Λ	12	3		16	7	*	S-Sulluis Acid	U-Unpresented
OID COLLEC.	TION	Sample Type* MATRIX**				300	4	7	ULU	اما	HM	10 5	6	SH - Seeken Hydron	ide
DATE	TIME.	Sample Type*	Containers	SAMPLE LOCATION	ON	S	100	B	300	12	1	1996	1/		
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08-29-01	17.30	6 G	V	Mon. Well Dec		70	<del>                                     </del>	7	N.	٧,	1	N			
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G-Grab C-Compos	ite (I=Other		<u> </u>												
	- United	_	Ma	atrix: S—Solid SL—Sludge DW—Drinkin	g Water GW-Gro	und Wat	er SW-	Surface Y	Vater WV	W - W	lews!er		L		
SIMES		$\Rightarrow$		RELINQUISHED BY											
29-01	210	00		DATEITIME					LINQUIS		γ				
	<del></del>			RECEIVED BY					TE/TIM		El sire				
			TE.	DATEITIME				Iur	PEILER	LAN KR	EL CUST	ODY BY		Heth	
REPORT. VELLOUIS				CEIVING; GREEN for SAMPLER				DA	TE/TIME	<u> </u>				77	0745

			Phone: (561) 465 2400 Fm 205	IL INF	<b>TARRINAT</b>	ORY	01 :
2500/E82417	Company	: £	Phone: (561) 465-2400, Ext. 285	Fax: (561) 467	7-1584	,	Chain-of-Cus.udy
Coast Hwy., Suite 1 Beach, FL 32034	Address:	0/	O M C CO	CES Method of	Shipment: ted	-EX	USE BALL POINT PEN ONLY
	Vorti 622;	_70	O N. Collier Bly	Cooler #'s		` [2	Standard Turn Around Time
488/E83509		$\mathcal{M}$				<del></del>	
rise Roed, Suite 1 32725	n: (a	` `		34/45 0	8-24 Time	<u> </u>	Rush in Business Days
	Phone (9	4113	394-3353 Fax 941)394-4069	Temperature		For Lab Use Only	
12/685370	Client Con	tact: {	Tank Kane	Checked	Custody Seals Intact	pH	
Avenue FL 33938		•	THINK RAITE	(A) N	YN	Checked Y N	HPN # 2007934
	Project Na	me: -	Marco Lakes ASE	<del>}</del>	Dacasau		
6/E84418	Sampled B		SIMOS	لاتحانا	PRESERVATIV	<u>E</u>	Preservation Kay
v Blvd. 34607	<b>.</b> .	-			MALYSES REQUE	STED	H-Hydrachlaric Acid P-Phosphoric Acid
	Purchase (	rder #:		317 10	(4)		N-Nitric Acid ST-Sachum Thiosaffalo S-Sulturic Acid U-Ungrassarved
COLLEC	CTION :			る個点には	$\mathcal{H}$		SH - Sadium Hydrasida
DATE	TIME TIME	MATRIX	SAMPLE LOCATION	1, 35 TX	7		
DATE	TIME   B	M	S CONTRACT FORM INM	である。	\$		COMMENTS
08-29-01	1730 6	Culs	2 44 14 22 1	1030	3		COMMENTS
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G-Grab C-Composi	site 0-Other	••	Matrix: S-Solid SL-Sludge DW-Drinking Water CW Co.	111			
G-Grab C-Composi	site 0-Other	<del></del>	Matrix: S-Solid SL-Sludge DW-Drinking Water GW-Grou	nd Water SW-Surfac	ce Water WW-Wast	water	
SSMOS	site 0-Other	2	UCCIMUOISHED BA	nd Water SW-Surfac			·
	55		Matrix: S-Solid SL-Sludge DW-Drinking Water GW-Groud RELINQUISHED BY DATE/TIME RECEIVED BY	nd Water SW-Surfac	ce Water WW-Wast RELINQUISHED BY DATE/TIME		
29-01	2100		DATE/TIME RECEIVED BY DATE/TIME		RELINQUISHED BY DAYE/TIME RECEIVED FOR HB		WEH
S.S[MOS 29-01	2100		DATE/TIME RECEIVED BY		RELINQUISHED BY DATE/TIME	EL CUSTODY BY	Well (380.6) 0945

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

eptember 20, 2001



Frank Kane Florida Water Services 960 N Collier Blvd Marco Island, FL 341452721

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

[2007936]

Received:

8/30/01 9:45

#### Dear Frank Kane:

Analytical results presented in this report have been reviewed for compliance with the Harbor Branch Environmental Laboratory Comprehensive Quality Assurance Plan (FDEP CQAP #870174) and applicable quality control criteria. The quality control parameters evaluated have met all method and compliance criteria unless otherwise noted on a Quality Control Summary Page immediately following this coversheet.

FDOH Safe Drinking Water Act, Clean Water Act and RCRA Certification #'s:

E96080, E83509, E82417, E85370, E84418

Note: This report is not to be copied, except in full, without the expressed written consent of the Harbor Branch Environmental Laboratory.

Respectfully submitted,

indy Cromer

aboratory Director

east Florida

ort Pierce, FL 34946 OOH # E96080 inted: 9/20/01

Orlando Area

Deltona, FL 32725 FDOH # E83509

Jacksonville Area Fernandina Beach, FL 32034 FDOH # E82417

Fort Myers Area Lehigh Acres, FL 33936 FDOH # E85370

West Central Florida Spring Hill, FL 34607 FDOH # E84418

300 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007936001

Sample ID:

Matrix:

MW Deep 2,3 Grab

**Environmental Water** 

Sampled:

08/29/01 17:30

Received:

08/30/01 9:45

### Analytical Results:

Parameter Specific Conductance	Method	Analyze Date/Tim		llyst Result	<u>Units</u>	Reporting Limit	<u>Data</u> Qualifier	Lab <u>ID</u>
pH [6.5-8.5]	EPA 120.1 EPA 150.1	08/31/01 15: 09/5/01 13:3			umhos/cm	0.36		96080
Aluminum	EPA 200.7	09/5/01 13:0		••••	SU	0.200	Q E	96080
Arsenic	EPA 200.7	09/5/01 13:02		0.57	mg/L	0.020	E	96080
Barium	EPA 200.7	09/5/01 13:02		0.0032 U	mg/L	0.0032	E	96080
£ .um	EPA 200.7	09/5/01 13:02		2.3	mg/L	0.0018	E9	96080
Cadmium	EPA 200.7	09/5/01 13:02		0.00010 U	9-2	0.00010	ES	96080
Chromium	EPA 200.7	09/5/01 13:02		0.00070 U	mg/L	0.00070	ES	96080
Copper	EPA 200.7	09/5/01 13:02		0.0018 U	mg/L	0.0018	E9	6080
Iron	EPA 200.7	09/5/01 13:02		0.0014 U	mg/L	0.0014	E9	6080
Manganese	EPA 200.7	09/5/01 13:02	SP	0.29	mg/L	0.025	E9	6080
Nickel	EPA 200.7	09/5/01 13:02	SP	0.0093 0.0020 U	mg/L	0.0038	E90	6080
Silver	EPA 200.7	09/5/01 13:02	SP	0.0020 U	mg/L	0.0020	E9 <del>(</del>	6080
Sodium	EPA 200.7	09/5/01 13:02	SP	2100	mg/L	0.0010	E96	6080
Zinc	EPA 200.7	09/5/01 13:02	SP		mg/L	0.50	E96	080
Antimony	EPA 200.9	09/6/01 16:45	DM	0.013	mg/L	0.010	E96	080
Lead	EPA 200.9	09/6/01 12:34	DM	0.0010 U	mg/L,	0.0010	E96	080
Selenium	EPA 200.9	09/5/01 17:08	DM	0.0074	mg/L	0.0011	E96	080
Thailium	EPA 200.9	09/7/01 10:26	DM	0.0020 U	mg/L	0.0020	E960	080
Mercury	EPA 245.1	09/5/01 18:20	DM	0.0010 U	mg/L	0.0010	E960	080
Chloride	EPA 300.0	09/7/01 9:46	SMB	0.000060 U	mg/L	0.000060	E960	080
Fluoride	EPA 300.0	08/31/01 9:59	SMB	3000	mg/L	20	E960	180
Nitrate as N	EPA 300.0	08/30/01 23:29	SMB	2.0	mg/L	0.055	E960	80
Mitrita as N	EPA 300.0	08/30/01 23:29	SMB	0.0030 U	mg/L	0.0030	E960	80
Sulte	EPA 300.0	09/7/01 9:46	SMB	0.0022 U	mg/L	0.0022	E960	80
ılkalinity -	EPA 310.1	09/5/01 10:00		680	mg/L	5.6	E9608	80
		00,001 10,00	GG	150	mg/L CaCO3	2.0	E9608	30
4								

500 U.S. 1 North, Fort Pierce, FL 34946 (ʊð1) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007936001

Sample ID:

MW Deep 2,3 Grab

Sampled:

08/29/01 17:30

Matrix:

**Environmental Water** 

Received:

08/30/01 9:45

### Analytical Results:

Parameter	Method	Analyzed	<u>Analy</u>	st Result	Units	Reporting	Data i ab
1,2-Dibromo-3-chloropropane	504 504	Date/Time	3			Limit	Lau
1,2-Dibromoethane	EPA 504.1	08/30/01 22:5	2 RS	0.0022 U	ug/L	0.0022	
Chlordane	EPA 504.1	08/30/01 22:5	_	0.0024 U	ug/L	0.0024	E96080
Endrin	EPA 505	08/30/01 23:5		0.086 U	ug/L	0.086	E96080
gamma-BHC (Lindane)	EPA 505	08/30/01 23:50		0.038 บ	ug/L	0.038	E96080
He thior	EPA 505	08/30/01 23:56	S RS	0.020 ป	ug/L	0.020	E96080
Heptachlor epoxide	EPA 505	08/30/01 23:56		0.084 ป	ug/L	0.084	E96080
Methoxychior	EPA 505	08/30/01 23:56	RS	0.020 U	ug/L	0.020	E96080
Toxaphene	EPA 505	08/30/01 23:56	RS	0.016 U	ug/L	0.016	E96080
PCB	EPA 505	08/30/01 23:56	RS	0.95 U	ug/L	0.95	E96080
2,4,5-TP	EPA 508	09/8/01 6:27	RS	0.23 U	ug/L	0.23	E96080
2,4-D	EPA 515.1	09/8/01 0:28	RS	0.41 U	ug/L	0.41	E96080
Dalapon	EPA 515.1	09/8/01 0:28	RS	0.53 U	ug/L	0.53	E96080
Dinoseb	EPA 515.1	09/8/01 0:28	RS	2.6 U	ug/L	2.6	E96080
Pentachiorophenoi	EPA 515.1	09/8/01 0:28	RS	0.58 U	ug/L	0.58	E96080
Pictoram	EPA 515.1	09/8/01 0:28	RS	0.34 U	ug/L	0.34	E96080
1,1,1,2-Tetrachloroethane	EPA 515.1	09/8/01 0:28	RS	0.26 U	ug/L	0.26	E96080
1,1,1-Trichloroethane	EPA 524.2	08/30/01 22:03	WR	0.15 U	ug/L	0.15	E96080
1,1,2,2-Tetrachloroethane	EPA 524.2	08/30/01 22:03	WR	0.25 U	ug/L	0.25	E96080
1,1,2-Trichloroethane	EPA 524.2	08/30/01 22:03	WR	0.39 U	ug/L	0.39	E96080
,1-Dichloroethane	EPA 524.2	08/30/01 22:03	WR	0.23 U	ug/L	0.23	E96080
,1-Dichloroethene	EPA 524.2	08/30/01 22:03	WR	0.11 U	ug/L	0.11	E96080
	EPA 524.2	08/30/01 22:03	WR	0.21 U	ug/L	0.11	E96080
,1-Dichloropropene	EPA 524.2	08/30/01 22:03	WR	0.10 U	ug/L	0.10	E96080
2.3-Trichloropropane 2.4 hlorobenzene	EPA 524.2	08/30/01 22:03	WR	0.26 U	ug/L	0.70	E96080
	EPA 524.2	08/30/01 22:03	WR	0.37 ป	ug/L	0.26	E96080
2-Dicnlorobenzene	EPA 524.2	08/30/01 22:03		0.35 U	ug/L		E96080
2-Dichloroethane	EPA 524.2	08/30/01 22:03		0.45 U	ug/L	0.35	E96080
				<del>-</del>	ug/L	0.45	E96080

<sup>3</sup>00 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007936001

Sample ID:

Matrix:

MW Deep 2,3 Grab **Environmental Water** 

Sampled:

08/29/01 17:30

Received:

08/30/01 9:45

### Analytical Results:

Parameter	Method	Analyzed		st Result	Units	Reporting	Data (ab
1,2-Dichloropropane	EPA 524.2	Date/Time	-	<del></del>	<del></del>	Limit	Qualifier ID
1,3-Dichlorobenzene		08/30/01 22:0		0.23 U	ug/L	0.23	E96080
1,3-Dichloropropane	EPA 524,2	08/30/01 22:0		0.22 U	ug/L	0.22	E96080
1,3-Dichtoropropene	EPA 524.2	08/30/01 22:0	-	0.30 U	ug/L	0.30	E96080
1,4-Dichlorobenzene	EPA 524.2	08/30/01 22:0		0.30 U	ug/L	0.30	E96080
2 chloropropane	EPA 524.2	08/30/01 22:00	='	0.28 U	ug/L	0.28	E96080
2-Uniorotoluene	EPA 524.2	08/30/01 22:03		0.47 U	ug/L	0.47	E96080
4-Chlorotoluene	EPA 524.2	08/30/01 22:03		0.18 U	ug/L	0.18	E96080
Benzene	EPA 524.2	08/30/01 22:03		0.16 ป	ug/L	0.16	E96080
Bromobenzene	EPA 524.2	08/30/01 22:03		0.090 U	ug/L	0.090	E96080
Bromodichloromethane	EPA 524.2	08/30/01 22:03	WR	0.20 U	ug/L	0.20	E96080
Bromoform	EPA 524.2	08/30/01 22:03	WR	0.27 U	ug/L	0.27	E96080
Bromomethane	EPA 524.2	08/30/01 22:03	WR	0.48 U	ug/L	0.48	E96080
Carbon tetrachloride	EPA 524.2	08/30/01 22:03	WR	0.41 U	ug/L	0.41	E96080
Chloroberizene	EPA 524.2	08/30/01 22:03	WR	0.28 U	ug/L	0.28	•
Chloroethane	EPA 524.2	08/30/01 22:03	WR	0.23 U	ug/L	0.23	E96080
Chloroform	EPA 524.2	08/30/01 22:03	WR	0.42 U	ug/L	0.42	E96080
	EPA 524.2	08/30/01 22:03	WR	0.18 U	ug/L	0.18	E96080
Chloromethane	EPA 524.2	08/30/01 22:03	WR	0.43 U	ug/L	0.43	E96080
cis-1,2-Dichloroethene	EPA 524.2	08/30/01 22:03	WR	0.23 U	ug/L	0.43	E96080
Dibromochloromethane	EPA 524.2	08/30/01 22:03	WR	0.40 U	ug/L	0.23	E96080
Dibromomethane	EPA 524.2	08/30/01 22:03	WR	0.41 U	ug/L	0.40	E96080
Dichlorodifluoromethane	EPA 524.2	08/30/01 22:03	WR	0.49 U	ug/L		E96080
Ethylbenzene	EPA 524.2	08/30/01 22:03 ·		0.19 U	ug/L	0.49	E96080
Methyl-tert-butyl-ether	EPA 524.2	08/30/01 22:03		0.24 U	ug/L	0.19	E96080
vie' e chloride	EPA 524.2	08/30/01 22:03		0.49 U	•	0.24	E96080
tyrene	EPA 524.2			0.43 U 0.24 U	ug/L	0.49	E96080
etrachioroethene	EPA 524.2		•	0.24 U	ug/L	0.24	E96080
	-	- 3.00.01 12.00	****	7.20 U	ug/L	0.26	E96080

outheast Florida nt Pierce, FL 34946 OH # FORDRO

Orlando Area Deltona, FL 32725

Jacksonville Area Fernandina Beach, FL 32034

Fort Myers Area Lehiah Acres Fl 12026

5600 U.S. 1 North, Fort Pierce, FL 34946 ເມ61) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007936001

Sample ID:

Matrix:

MW Deep 2,3 Grab

Sampled:

08/29/01 17:30

**Environmental Water** 

Received:

08/30/01 9:45

### Analytical Results:

<u>Parameter</u>	Method	<u>Analyze</u>		yst Result	Units	Reporting	Data Lab
Toluene	EPA 524.2	Date/Tim 08/30/01 22:	_			<u>Limit</u>	Qualifier ID
Total THMs	EPA 524.2	08/30/01 22:		0.100	ug/L	0.18	E96080
Total Xylenes	EPA 524.2	08/30/01 22:0		0.00050 (	J mg/L	0.00050	E96080
trans-1,2-Dichloroethene	EPA 524.2	08/30/01 22:0		0.30 U	ug/L	0.30	E96080
Trichloroethene	EPA 524.2	08/30/01 22:0		0.18 U	ug/L	0.18	E96080
T horofluoromethane	EPA 524.2	08/30/01 22:0		0.21 U	ug/L	0.21	E96080
V, chloride	EPA 524.2	08/30/01 22:0		0.20 U	ug/L	0.20	E96080
Alachior	EPA 525	09/3/01 1:28	WR	0.33 U	ug/L	<b>0.33</b> .	E96080
Atrazine	EPA 525	09/3/01 1:28	WR	0.67 U	ug/L	0.67	E96080
Benzo(a)pyrene	EPA 525	09/3/01 1:28	WR	0.53 U	ug/L	0.53	E96080
bis(2-ethylhexyl)phthalate	EPA 525	09/3/01 1:28	WR	0.077 ป 0.93 ป	ug/L	0.077	E96080
Di(2-ethylhexyl)adipate	EPA 525	09/3/01 1:28	WR	0.93 U 0.75 U	ug/L	0.93	E96080
Hexachlorobenzene	EPA 525	09/3/01 1:28	WR	0.75 U 0.34 U	ug/L	0.75	E96080
Hexachlorocyclopentadiene	EPA 525	09/3/01 1:28	WR	0.34 U	ug/L	0.34	E96080
Simazine	EPA 525	09/3/01 1:28	WR	0.28 U	ug/L	0.26	E96080
Carbofuran	EPA 531.1	09/3/01 14:56	JJM	0.18 U	ug/L	0.69	E96080
Oxamyl	EPA 531.1	09/3/01 14:56	JJM	0.10 U	ug/L	0.18	E96080
Glyphosate	EPA 547	09/12/01 17:09	SAL	10 U	ug/L	0.10	E96080
Endothail	EPA 548.1	09/19/01 14:42	WR	2.8 U	ug/L	10	E84129
Diquat	EPA 549.1	09/10/01 14:10	JIM	2.6 U	ug/L	2.8	E96080
Gross Alpha	EPA 900.0	09/12/01 0:00	KNL	66 +/- 16	ug/L	2.6	E96080
Radium 226	EPA 903.1	09/13/01 0:00	KNL	7.8 +/- 1.3	pCi/L		E84025
Radium 228	EPA Alter.	09/20/01 0:00	KNL	0.0 +/- 0.7	pCi/L		E84025
Color	SM2120 B	08/30/01 14:30	TCL	5.0	pCi/L		E84025
Od	SM2150 B	08/30/01 12:00	PHM	1.1	CU	5.0	E96080
Tota: Dissolved Solids	SM2540 C	56 10 4 10 4 1 1 1 1		6100	T.O.N,	1.0	E96080
Cyanide -	SM4500CN E				mg/L	50	E96080
		2501101 17,01		0.016 U	mg/L	0.016	E96080

outheast Florida ort Pierce, FL 34946 OOH # E96080

Orlando Area Deltona, FL 32725 FOOH # Engen

Jacksonville Area Fernandina Beach, FL 32034

Fort Myers Area Lehigh Acres, FL 33936

West Central Florida Spring Hill El 24007

~600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007936001

Sample ID:

Matrix:

MW Deep 2,3 Grab

**Environmental Water** 

Sampled:

08/29/01 17:30

Received:

08/30/01 9:45

### Analytical Results:

Parameter  Surfactants as LAS, Mol.wt.340  Background on Total Coli  Confirmed Fecal Coliform  Confirmed Total Coliform  Total Coliform	Method  SM5540 C SM9222 D SM9222 D SM9222 D SM9222 D	Analyzed Date/Time 08/31/01 11:20 08/30/01 12:30 08/30/01 12:30 08/30/01 12:30	Analysi JL GG GG GG GG	0.24 100 U 100 U 100 U 100 U	Units  mg/L  CFU/100mL  CFU/100mL  CFU/100mL  CFU/100mL	Reporting Limit 0.019 100 100 100 100	Qualifier  B  B	E96080 E96080 E96080 E96080
					CFO/TOOML	100	В	E96080

### DOH Certification #E84025 DEP COMPQAP # 870251

2742 N. Florida Ave. P.O. Box 1833 Tampa, Florida 33601 (813) 229-2879 Fax (813) 229-0002

Report Date: September 20, 2001

Harbor Branch Environmental Labs

5600 U.S. 1 North

Ft. Pierce, FL 34946

Attn: Eric Charest

Field Custody: Client

Client/Field ID: 2007936001

Sample Collection: 8-29-01

Lab ID No:

61143

Lab Custody Date:

8-31-01

Sample description: GW

Parameter	Units	R	esul	ts	Analysis Date	Method	Data Qualifier
Cross 33-1							
Gross Alpha	pCi/l	66	±	16	9-12-01	EPA 900.0	
Radium-226	pCi/l	7.8	±	1.3	0 10 01		
Radium-228				1.3	9-13-01	EPA 903.1	
1.00TAM-558	pCi/l	0.0	±	0.7	9-20-01	EPA Ra-05	

oha Standard: Th-210

James W. Hayes Laboratory Manager

# HARBOR BRANCH ENVIRONMENTAL .... BORATORY 5600 U. S. 1 North, Ft. Pierce, FL 34946, 561-465-2400 ext. 292

from 001A

Fax: (561) 467-1584 CHAIN OF CUSTODY RECORD

	oratory:						r COSTODY X						
mples	are to be	shipped	i by <u>F</u>	ا ال	Ex	to arrive	on_	<u>8.31.0</u> ) ·	TAT:	fd.			
OR BI	RANCH E	NVIR	DNMEN	ITAL .	LABORATO	RY	<u> </u>		ANALYSIS RE	QUIRED	· · · · · · · · · · · · · · · · · · ·	COLLECTION	REMARKS
NAME:									PRESERVA	TIVE			
	<del>-</del>	<del></del>		···	· · · · · · · · · · · · · · · · · · ·			FCANH					
TYPE: Co	mposile = C, (	ireb = G.		MATR SW, W	IX Drk Wir. = DV	V. Ord. Wir. = GV	V, Surface Wir. =	2.00					
	lydrochloric A	cid = 11; Nil	ric Acid = N	Sodium	Thiosulfate = 5; Si	lfuric Acid = SU		Gross of Conditions					·
Code	MATRIX	DATE	ECTION TIME	TYPE		el sample 10	•	00				2V7-WFE COP	ZTAIN
<u> </u>	GW	8/29	1545	<u>G</u>	20079			7				<del></del>	<del></del> .
<u>s</u>	GN		1730	G	200793 200793	7 001	1	7	+				
											++		
	<del>                                     </del>												
											+		
No	RELINGUESHE	D AY	<del></del>		8 · 30 · 61	TIME 1600			RECEIVED BY	<del></del>	<u> </u>	DATE	FIME:
	RELINQUISHE	D 8Y			DATE	TIME	inla	LABORATURY NOUS	NAME AND FECE	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		83110	TIMF

# SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOUILEVARD, OLOSMAR, FL 34677 813-855-1844 fax 813-855-2218

Harbor Branch Oceanographic Institution Inc. 5600 US 1 North Fort Pierce, FL 34946-

September 13, 2001 Project No: 25635

## **Laboratory Report**

Project Name	2007						
Parameters	Units	Results	Method		ection Date/Time	Date/Time	
Sample Description		<del></del>		Lim	it Analyzed	Prep	Analys
Matrix		935001					
SAL Sample Number		ndwater					
Date/Time Collected	25635						
Date/Time Received	08/29. 09/11/	/01 15:45 /01 14:00					
Pesticide Analyses							
Glyphosate	ua/l						
	ug/l	10 U	EPA 547	10	09/12/01 16:57		
Sample Description		-			03/12/01 16:57		DF
`fatrix	20079:	36001					
AL Sample Number	Groun	dwater					
Date/Time Collected	25635.						
Date/Time Received	08/29/0	11 17:30					
	09/11/0	11 14:00					
Pesticide Analyses							
Slyphosate							
	ug/l	10 U	EPA 547	10	004000		
ample Description			<del></del>		09/12/01 17:09		DF
fatrix	2007937	7001					
AL Sample Number	Ground	water					
ate/Time Collected	25635.0	3			•		
ate/Time Received	08/29/01	16:30					
	09/11/01	14:00					
sticide Analyses	,						
yphosate							
	ug/l	10 U	EPA 547	10			
mple Description	<del></del>			- 10	09/12/01 17:22		Œ
ınıx bis nazcubildu	20080320	101					
L Sample Number	Wastewa						
c Sample Number le/Time Collected	25635.04						
e/Time Received	09/07/01						
- une Macerseq	09/11/01	14:00					
ilicide Analyses							
phosate					•		
	ug/l	610	EPA 547		_		
				10	09/12/01 17:44	D	_

# SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOLILEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Harbor Branch Oceanographic Institution Inc. 5600 US 1 North Fort Pierce, FL 34946-

September 13, 2001 Project No: 25635

**Laboratory Report** 

Project Name

2007935-2007937, 2008032

#### Footnotes

U Analyte was not detected; indicated concentration is method detection limit.

5600 U. S. 1 North, Ft. Pierce, FL 3494

1-465-2400 ext. 292

Fax: (561) 467-1584

ving Laboratory: Southern Analytical.

GHAIN OF CUSTODY RECORD

samples are to be shipped by Fed Ex \_\_\_\_ to arrive on <u>9.11.01</u> .

		ENVIRON	MEN	ITAL L	ABORAT	ORY				٨	NALYSI	S REQU	IRED		COLLECTIO	N REMARKS
NAME:											PRESE	RVATIV	Е			
		<del></del>		<del></del>		<del></del>		·	ļ	<u> </u>						
PE: C	omposite = C, C	irah = G,		MATRIX SW, Was	C: Drk. Wir. = D	)W, Grd. Wir. = G' oil or solids = S, W	W, Surface W	lr. =								
TIVE: - U			_	; Sodium T	hiosulfate = S; !	Sulfuric Acid = SU	i,		th							
de 	<del></del>	<del></del>	TIME	TYPE	H	BEL SAMPLE ID		•	3					-	SAMPI.E CO	MAIENTS
	G10 G10	1 6 7 7 1	545 130	G		135 001		1	V					-	<u> </u>	
	Cal	8/29 10	منہ	G	20079	36 00;		<u> </u> 	7			-				
	100	7, 0	520	G	<u> 20030</u>	32.001			V					157	activite.	
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			<u>-</u>								· <del>-</del> · <del>-</del>					
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۲٥	REENGONOON DE人	163	-		DATE	TIME	:40		LAUCIDA	7710 7 11	AME AND R	RECEIVED	۱۱۲ بایمارنه برنی		DATE T/11/c 1	TIME

5600 U.S. 1 North, Fort Pierce, FL 34946 (F^1) 465-2400, Ext. 285



### INORGANIC ANALYSIS 62 - 550.310 (1) (PWS030)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep 2,3 Grab

Sample Number:

2007936001

ampling Date:

8/29/01 17:30

reservative:

Nitric Acid, Sodium Hydroxide, or None

ate Received:

8/30/01 9:45

_ID	Parameter	MCL	Result		_			
1005	Arsenic	[0.05]			Method	MDL	Date	Lab ID
1010	Barium	[2]	0.0032 ປ 2.3	mg/L	EPA 200.7	0.0032	9/05/01	E96080
1015	Cadmium	[0.005]	0.00070 U	mg/L	EPA 200.7	0.0018	9/05/01	E96080
1020	Chromium	[0.1]	0.0018 U	mg/L	EPA 200.7	0.00070	9/05/01	E96080
`?4	Cyanide	[0.2]	0.016 U	mg/L	EPA 200.7	0.0018	9/05/01	E96080
ı J25	Fluoride	[4]	2.0	mg/L	SM4500CN E	0.016	8/31/01	E96080
1030	Lead	[0.015]	0.0074	mg/L	EPA 300.0	0.055	8/31/01	E96080
1035	Mercury	[0.002]	0.000060 U	mg/L mg/L	EPA 200.9	0.0011	9/06/01	E96080
1036	Nickel	[0.1]	0.0020 U	mg/L	EPA 245.1	0.000060	9/05/01	E96080
1040	Nitrate as N	[10]	0.0030 บ	mg/L	EPA 200.7 EPA 300.0	0.0020	9/05/01	E96080
1041	Nitrite as N	[1]	0.0022 U	mg/L	EPA 300.0	0.0030	8/30/01 23:29	E96080
1045	Selenium	[0.05]	0.0020 U	mg/L	EPA 200.9	0.0022	8/30/01 23:29	E96080
1052	Sodium	[160]	2100	mg/L	EPA 200.7	0.0020	9/05/01	E96080
1074 1075	Antimony	[0.006]	0.0010 ប	mg/L	EPA 200.9	0.50	9/05/01	E96080 ·
1075 1085	Beryllium	[0.004]	0.00010 U	mg/L	EPA 200.7	0.0010	9/06/01	E96080
1085	Thallium	[0.002]	0.0010 บ	mg/L	EPA 200.9	0.00010	9/05/01	E96080
				<b>V</b> -	/ 1 200.0	0.0010	9/07/01	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946



### Trihalomethane Analysis 62-550.310 (2) (a) (PWS027)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep 2,3 Grab

Sample Number:

2007936001

Sampling Date:

8/29/01 17:30

Preservative:

1:1 Hydrochloric Acid

Date Received:

8/30/01 9:45

ΙD	Parameter	• • -	Chlorine						
	Parameter	MCL	Residual	Result		Method	MDL	Dete	
2950	Total THMs	[0.10]						Date	Lab ID
		(5.1.0)		0.00050 บ	mg/L	EPA 524.2	0.00050	8/30/01	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (^^1) 465-2400, Ext. 285



### Volatile Organic Analysis 62 - 550.310 (2) (b) (PWS028)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep 2,3 Grab

Sample Number:

2007936001

Sampling Date:

8/29/01 17:30

reservative:

1:1 Hydrochloric Acid and Sodium Thiosulfate

ate Received:

8/30/01 9:45

ID	Parameter	MCL	Result		B.A. et .			
2378	1,2,4-Trichlorobenzene	[70]	0.37 U		Method	MDL	Date	Lab ID
2380	cis-1,2-Dichloroethene		0.37 U	ug/L	EPA 524.2	0.37	8/30/01	E96080
2955	Total Xylenes	[10000]		ug/L	EPA 524.2	0.23	8/30/01	E96080
2964	Methylene chloride	[5]	0.49 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
`58	1,2-Dichlorobenzene	[600]	0.35 U	ug/L	EPA 524.2	0.49	8/30/01	E96080
∠∌69	1,4-Dichlorobenzene	[75]	0.33 U	ug/L	EPA 524.2	0.35	8/30/01	E96080
2976	Vinyl chloride	[1]	0.23 U	ug/L	EPA 524.2	0.28	8/30/01	E96080
2977	1,1-Dichloroethene	[7]	0.21 U	ug/L	EPA 524.2	0.33	8/30/01	E96080
2979	trans-1,2-Dichloroethene	[100]	0.18 U	ug/L	EPA 524.2	0.21	8/30/01	E96080
2980	1,2-Dichloroethane	[3]	0.45 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
2980	1,1,1-Trichloroethane	[200]	0.45 U	ug/L	EPA 524.2	0.45	8/30/01	E96080
2982	Carbon tetrachloride	[3]	0.28 U	ug/L	EPA 524.2	0.25	8/30/01	E96080
2983	1,2-Dichloropropane	[5]	0.23 U	ug/L	EPA 524.2	0.28	8/30/01	E96080
2984	Trichloroethene	[3]	0.21 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
2985	1,1,2-Trichloroethane	(5 <u>)</u>	0.23 U	ug/L	EPA 524.2	0.21	8/30/01	E96080
2987	Tetrachioroethene		0.26 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
2989	Chlorobenzene		0.23 U	ug/L	EPA 524.2	0.26	8/30/01	E96080
2990	Benzene		0.23 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
2991	Toluena		0.030 U	ug/L	EPA 524.2	0.090	8/30/01	E96080
2992	Ethydhann		0.18 U 0.19 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
2996	Chicago		0.19 U 0.24 U	ug/L	EPA 524.2	0.19	8/30/01	E96080
		(- <del>-</del> )	U.4 <b>4</b> U	ug/L	EPA 524.2	0.24	8/30/01	E96080

east Florida erce, FL 34946

Orlando Area
Deltona, Fl. 32725

Jacksonville Area

Fort Myers Area

5600 U.S. 1 North, Fort Pierce, FL 34946 5^1) 465-2400, Ext. 285



### PESTICIDES PCB CHEMICAL ANALYSIS 62 - 550.310 (2) (c) (PWS029)

lient:

Florida Water Services

Workorder: 2601 Marco Lakes ASR DW Scan

ample Location: ample Number:

MW Deep 2,3 Grab

2007936001

ampling Date:

8/29/01 17:30

eservative:

Sodium Thiosulfate

ate Received:

8/30/01 9:45

D 05	Parameter Endrin	MCI			Method	MDL	Date	l ah in
110		[2]	0.038 บ	ug/L	EPA 505	0.038	8/30/01	Lab ID
15	gamma-BHC (Lindane) Methoxychlor		0.020 U	ug/L	EPA 505	0.020	8/30/01	E96080
20	Toxaphene	[40]	0.016 U	ug/L	EPA 505	0.016	8/30/01	E96080
31	Dalapon	[3]	0.95 U	ug/L	EPA 505	0.95	8/30/01	E96080
32	Diquat	[200]	2.6 U	ug/L	EPA 515.1	2.6	9/08/01	E96080
,,,	Endothall	[20]	2.6 U	ug/L	EPA 549.1	2.6	9/10/01	E96080
4	Glyphosate	[100]	2.8 U	ug/L	EPA 548.1	2.8	9/19/01	E96080
5	Di(2-ethylhexyl)adipate	[700]	10 U	ug/L	EPA 547	10	9/12/01	E96080
6	Oxamyl	[400]	0.75 U	ug/L	EPA 525	0.75	9/03/01	E84129
7	Simazine	[200]	0.10 U	ug/L	EPA 531.1	0.10	9/03/01	E96080
9		[4]	0.69 U	ug/L	EPA 525	0.69		E96080
9	bis(2-ethylhexyl)phthalate Picloram	[6]	0.93 U	ug/L	EPA 525	0.93	9/03/01	E96080
) !	Dinoseb	[500]	0.26 U	ug/L	EPA 515.1	0.26	9/03/01	E96080
		[7]	0.58 ป	ug/L	EPA 515.1	0.58	9/08/01	E96080
2 6	Hexachlorocyclopentadiene	[50]	0.26 U	ug/L	EPA 525	0.26	9/08/01	E96080
) )	Carbofuran	[40]	0.18 U	ug/L	EPA 531.1	0.20	9/03/01	E96080
	Atrazine	[3]	0.53 ป	ug/L	EPA 525	0.78	9/03/01	E96080
	Alachior	[2]	0.67 U	ug/L	EPA 525	0.53 0.67	9/03/01	E96080
	Heptachlor	[0.4]	0.084 U	ug/L	EPA 505	0.07	9/03/01	E96080
	Heptachlor epoxide	[.2]	0.020 ป	ug/L	EPA 505		8/30/01	E96080
	2,4-D	[70]	0.53 U	ug/L	EPA 515.1	0.020	8/30/01	E96080
	2,4,5-TP	[50]	0.41 U	ug/L	EPA 515.1	0.53	9/08/01	E96080
	Hexachlorobenzene	[1]	0.34 U	ug/L	EPA 525	0.41	9/08/01	E96080
	Benzo(a)pyrene	[.2]	0.077 ป	ug/L	EPA 525	0.34	9/03/01	E96080
	Pentachlorophenol	[1]	0.34 U	ug/L	EPA 515.1	0.077	9/03/01	E96080
	PCB	[.5]	0.23 U	ug/L	EPA 508	0.34	9/08/01	E96080
1	,2-Dibromo-3-chloropropane	-	0.0022 U	_		0.23	9/08/01	E96080
1	,2-Dibromoethane	- •	0.0024 U	ug/L	EPA 504.1	0.0022	8/30/01	E96080
C	Chlordane		0.086 U	ug/L	EPA 504.1	0.0024	8/30/01	E96080
		()	U.000 U	ug/L	EPA 505	0.086	8/30/01	E96080

6600 U.S. 1 North, Fort Pierce, FL 34946



### RADIOCHEMICAL ANALYSIS 62 - 550.310 (5) (PWS033)

lient:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

ample Location:

MW Deep 2,3 Grab

ample Number:

2007936001

impling Date:

8/29/01 17:30

eservative:

Nitric Acid

te Received:

8/30/01 9:45

۵ĭ	Parameter	Result   Error		Method	Date	lat m
4000	Gross Alpha	66 +/- 16	pCi/L	EPA 900.0	9/12/01	Lab ID E84025
4020 4119	Radium 226 Radium 228	7.8 +/- 1.3 0.0 +/- 0.7	pCi/L pCi/L	EPA 903.1 EPA Alter.	9/13/01 9/20/01	E84025 E84025

ast Florida Ce. Fl. 3404e

Orlando Area

Jacksonville Area

Fort Myers Area

5600 U.S. 1 North, Fort Pierce, FL 34946 (^^1) 465-2400, Ext. 285



### SECONDARY CHEMICAL ANALYSIS 62 - 550.320 (PWS031)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep 2,3 Grab

Sample Number:

2007936001

ampling Date:

8/29/01 17:30

reservative:

Nitric Acid or None

ate Received:

8/30/01 9:45

ID	Parameter	MCL	Result		Method	MDL.	Date	Lab ID
1002	Aluminum	[0.2]	0.57	mall	554.000 5			
1017	Chloride	[250]		mg/L	EPA 200.7	0.020	9/05/01	E96080
1022	Copper	•	3000	mg/L	EPA 300.0	20	9/07/01	E96080
1025	Fluoride	[1]	0.0014 U	mg/L	EPA 200.7	0.0014	9/05/01	E96080
	_	[4]	2.0	mg/L	EPA 300.0	0.055	8/31/01	E96080
נו	Iron	[0.3]	0.29	mg/L	EPA 200.7	0.025	9/05/01	E96080
032	Manganese	[0.05]	0.0093	mg/L	EPA 200.7	0.0038	9/05/01	
050	Silver	[0.1]	0.0010 U	mg/L	EPA 200.7	0.0010		E96080
055	Sulfate	[250]	680	mg/L			9/05/01	E96080
095	Zinc	[5]	0.013	-	EPA 300.0	5.6	9/07/01	E96080
905	Color	[15]		mg/L	EPA 200.7	0.010	9/05/01	E96080
920	Odor	- •	5.0	CU	SM2120 B	5.0	8/30/01	E96080
925	pH	[3]	1.1	T.O.N.	SM2150 B	1.0	8/30/01	E96080
930	•	[6.5-8.5]	7.76	SU	EPA 150.1	0.200	9/05/01	E96080
	Total Dissolved Solids	[500]	610 <del>0</del>	mg/L	SM2540 C	50	8/31/01	E96080
905	Foaming Agents	[0.5]	0.24	mg/L	SM5540 C	0.019	8/31/01	E96080

theast Florida Pierce, FL 34946

Orlando Area Deltona FI 32725

Jacksonville Area

Fort Myers Area

5600 U.S. 1 North, Fort Pierce, FL 34946 (581) 465-2400, Ext. 285



#### Unregulated Group II Analysis 62 - 550.410 (PWS034)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep 2,3 Grab

Sample Number:

2007936001

Sampling Date:

8/29/01 17:30

reservative:

1:1 Hydrochloric Acid

ate Received:

8/30/01 9:45

ID	Parameter	Result		Method	MDL	Date	Lab ID
2210	Chloromethane	0.43 U	ug/L	EPA 524.2	0.43	9/20/04	
2212	Dichlorodifluoromethane	0.49 U	ug/L	EPA 524.2	0.49	8/30/01	E96080
2214	Bromomethane	0.41 ป	ug/L	EPA 524.2	0.49	8/30/01	E96080
2216	Chloroethane	0.42 ป	ug/L	EPA 524.2		8/30/01	E96080
; ;	Trichlorofluoromethane	0.20 U	ug/L	EPA 524.2	0.42	8/30/01	E96080
2251	Methyl-tert-butyl-ether	0.24 U	ug/L	EPA 524.2	0.20	8/30/01	E96080
2408	Dibromomethane	0.41 U	ug/L	.—	0.24	8/30/01	E96080
2410	1,1-Dichloropropene	0.10 U	_	EPA 524.2	0.41	8/30/01	E96080
2412	1,3-Dichloropropane	0.30 U	ug/L	EPA 524.2	0.10	8/30/01	E96080
2413	1,3-Dichloropropene	0.30 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
414	1,2,3-Trichloropropane	0.36 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
416	2,2-Dichloropropane	_	ug/L	EPA 524.2	0.26	8/30/01	E96080
941	Chloroform	0.47 U	ug/L	EPA 524.2	0.47	8/30/01	E96080
942	Bromoform	0.18 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
943	Bromodichloromethane	0.48 U	ug/L	EPA 524.2	0.48	8/30/01	E96080
944		0.27 U	ug/L	EPA 524.2	0.27	8/30/01	E96080
965	Dibromochloromethane	0.40 U	ug/L	EPA 524.2	0.40	8/30/01	E96080
	2-Chlorotoluene	0.18 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
966	4-Chlorotoluene	0.16 U	ug/L	EPA 524.2	0.16	8/30/01	E96080
967	1,3-Dichlorobenzene	0.22 U	ug/L	EPA 524.2	0.22	8/30/01	E96080
978	1,1-Dichloroethane	0.11 U	ug/L	EPA 524,2	0.11	8/30/01	E96080
986	1,1,1,2-Tetrachloroethane	0.15 U	ug/L	EPA 524.2	0.15	8/30/01	E96080
88	1,1,2,2-Tetrachloroethane	0.39 U	ug/L.	EPA 524.2	0.39	8/30/01	
93	Bromobenzene	0.20 U	ug/L	EPA 524.2	0.20	8/30/01	E96080 E96080

10 U.S. 1 North				ПА	ND	OR RKY	NCH F	NVIRO	NP^	LN.	ΓΔΙ	1 Δ	RAP	AT	nev	1				
Pierce, FL 349	946					Phone: (	561) 465-	2400, Ext. 2	285	Fax: (	561) 4	167-15	84	MI	UN I				Chain-of-u	ustody
IH # 82500/E82417 O First Coast Hwy., Suite 1		Phone: (561) 465-2400, Ext. 285 Company: Florida Water Service						S Method of Shipment: Eed EX							USE BALL POINT PEN ONLY					
endina Beach, i			lress:	9	60	N. Coll	ier B	lvd.			Cooler					<b>4</b> \		-6tandar	d Ture Around	Time
H # 83486/E83						co Isla			<b>U</b> <		Date /	70-7	امر			-		Rush in	8u	siness Days
Enterprise Road			6								nate C	0 C	201	Time						
ma, FL 32725		Pho	ne:(91	4//3	94	<u>-3353</u>	_Fax(94)	) <i>394-4</i>	069	Temp	erature	C	ustody S	eals	Fo	<i>r Lab Us</i> pH	e Only			
il // 85512/E85 Coolidge Avenu		Clie	nt Cont			rank K					cked N		intact	N_		Checke Y	d N	HPN	" <u>200</u>	7935
h Acres, FL 33	1936	Proj	ect Nar	ne:	M	arco La	Kes	As R					-PRESE	RVATIV						
H # 84256/E84418 4 Osawaw Blvd. ng Hill, FL 34607		Sampled By: SMOS							PRESERVATIVE  ANALYSES REQUESTED								Preservation Key H-Hydrochloric Acid P-Phosphoric Acid N-Minic Acid S. C. Scolor Things 1.1			
		Purchase Order #:							名》	T	3	T. C	2	4	ig P	34	S-Sulfuric Acid	ST - Sodium Thimsaffale U - Unpresented		
בובו ה וה	COLL	ECTION		: *	=				T	St.	78	0/0	SA	υ <del>▼</del>	20	EK PR	50	SH - Society Hyd	rexide	<del></del>
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	08-29-0	1545	6	SW.	2	ASR	INT.	H20	╮┸		1	1	17	7	31	120	1	111	V <sub>4</sub> U <sub>8</sub>	temp.
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ople Type: G	-Grab C-Co	mposite 0-(	ther		м	latrix: S-Solid SL-	Skudge DW-1	Orinkino Water	GW-Gr	ound Wa	tar SW	Curtons	Missa II	ner 101						
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			Phone: (561) 465-2400 Fee 2	AIC	A i V	LLA	/RII	RAT	ַ מַתְּ	V		
FDOH # 82500/E82417		- 0 -	Phone: (561) 465-2400, Ext. 26	. Fax	(561)	467-1	584		UII	1		Chain-or-Lustouy
5390 First Coast Hwy., Suite 1	Company: †	lorida	Water Service	-				$\overline{}$	ſ			
Fernandina Beach, FL 32034	Address:	960 N	Collier Blud	<b>∠</b> >	Meth	od of Shi	ipment:	ح	<u>d</u> (			USE BALL POINT PEN ONLY
FDOH # 83486/E83509		M	Collier Blvd		Coole	r F's				<del></del> `		Standard Turn Around Time
55 Enterprise Road, Suite 1	<u> </u>	Marco	Island FL, 34	145	— > Ωnta	10-9	<u>س</u> و	1				¬
eltona, FL 32725	Phone (94 [)	394_	3353 Fax(941)394-406		D446	08.5	TO	Time			<u> </u>	Business Days
DOH # 85512/E85370	- (, ι μ	<del></del>	3235 Fax 441/344-406	7) Te	nperature		Custody .	Casta	F		se Only	
37 Coolidge Avenue	Client Contact:	Iran	K Kane		lecked	•	intac			pH Check		
high Acres, FL 33938	Project Name:	M			N N		Υ	N		Слеск У	ea N	HPN # 2007935
IOH # 84256/E84418			rco Lakes ASR				PRECE	RVATIV			<del></del>	
14 Osawaw Blyd	Sampled By:	<u> SI/</u>	105				1		T	т	<del></del>	Preservation Key
ring Hill, FL 34607	Purchase Order				T-7	AN.	ALYSES	REQUE	STEE	<b>-</b>	ـــــــ	H-Hydrachteric Acid P-Pletybusic Acid N-Mitric Acid
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FIELD ID COLLE	CTION	.   2		0	Qu	1,0	12	12	12 S	1 h	11. 1	SH - Sedium Hydroxide
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ple Type: G-Grab C-Comp	osite 0-Other	** Matrix: S=	Solid SI - Shulpe Div Co		¯	T			-+			
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08-29-01	7100		MUEN PA		<u></u> _							
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HITE with REPORT; YELLOW for F	FILE; PINK to CLIENT: COLO	for OCCCURACE				DA	TE/TIME	. on nat	T C021	UUY BY		nica
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lina Beach, FL 32034	Address:	960	N Can	Water Ser lier Blud		> Meth	ood of Sh	ipment: *	[ <u>ca</u> (			032 8	BALL POINT PEN ONLY
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estableasolla Marise Road, Suite 1	_	$\Delta$	arco /	cland FL. 3	4111		~?	20.			[	- Push is	
.FL 32725	Dh(0		711	600	<u> </u>	Date	<u>W</u>	27-0	7 Time	·			Business Days
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85512/E85370 fidge Avenue	Client Con	itact:	FRANK	KANE		becked	•	Custody S Intaci			H cked		200700
res, FL 33938	Denings No.	. <b></b>	11	L KAJIA P	ىا	V N		Y	N	Y	N	HPN#_	2007935
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4258/E84418	Sampled B	y:	Simo	9			T	TAESE	WAYLIAF				reservation Key
waw Blvd. FL 34607	ь					,	AN	ALYSES	REQUESTE	<del></del>		M-Meric Acid  M-Meric Acid	P-Phosphoric Acid
	Purchase 0	Irder #:		<del></del>	1,0	100c	h a	FORTE				S-Sutheric Acid	ST - Sedium Thinesifete U - Unpreserved
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pe: G-Grab C-Com	osite 0-Other	••	Wallia, N=CYPS o		141 (5 1111	ter SW	Surface	Water IN	M Wast				
	posite 0-Other		matrix: S-Solid S	SL-Skidge BW-Drinking Water G	M - GLORUG MS		OM INCE	neres Mi	11 – M32[6M3	ter			
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rpe: G-Grab C-Comp		5>	DATE/TIME RECEIVED BY	SL-Skidge BW-Drinking Water G	W-Ground Wa		A D	ELINQUI ATE/TIM	SHED BY E		PV -	med	
SSIMOS	2.00	2	DATE/TIME RECEIVED BY DATE/TIME	) BY	W-Ground Wa		A D R	ELINQUI ATE/TIM	SHED BY E FOR HBEL (		BY G	8net/ 8:30 (1)	00/15

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

September 20, 2001



Frank Kane Florida Water Services 960 N Collier Blvd Marco Island, FL 341452721

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

[2007935]

Received:

8/30/01 9:45

Dear Frank Kane:

Analytical results presented in this report have been reviewed for compliance with the Harbor Branch Environmental Laboratory Comprehensive Quality Assurance Plan (FDEP CQAP #870174) and applicable quality control criteria. The quality control parameters evaluated have met all method and compliance criteria unless otherwise noted on a Quality Control Summary Page immediately following this coversheet.

FDOH Safe Drinking Water Act, Clean Water Act and RCRA Certification #'s:

E96080, E83509, E82417, E85370, E84418

Note: This report is not to be copied, except in full, without the expressed written consent of the Harbor Branch Environmental Laboratory.

espectfully submitted,

ndy Cromer

atory Director

theast Florida Pierce, FL 34946 H # E96080

Orlando Area Deltona, FL 32725 FDOH # E83509

Jacksonville Area Fernandina Beach, FL 32034 FDOH # E82417

Fort Myers Area Lehigh Acres, FL 33936 FDOH # E85370

West Central Florida Spring Hill, FL 34607 FDOH # FRAA18

5600 U.S. 1 North, Fort Pierce, FL 34946 /561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007935001

Sample ID:

Matrix:

ASR Injection Water Grab

**Environmental Water** 

Sampled:

08/29/01 15:45

Received: 08/30/01 9:45

#### Analytical Results:

<u>Parameter</u>	Method	Analyze Date/Tim		yst Result	Units	Reporting Limit	<u>Data</u> Lab Qualifier ID
pH (6.5-8.5)	EPA 150.1	09/5/01 13:3	0 TCL	7.33	SU	0.200	_
Aluminum	EPA 200.7	09/1/01 14:2	5 SP	0.0030 U	mg/L	0.200	Q E96080
Arsenic	EPA 200.7	09/1/01 14:25	5 SP	0.0032 U	mg/L	0.0032	E96080
Barium	EPA 200.7	09/1/01 14:25	SP SP	0.027	mg/L		E96080
Beryllium	EPA 200.7	09/1/01 14:25	SP	0.00010 U	•	0.0018	E96080
Cadmium	EPA 200.7	09/1/01 14:25	SP	0.00070 U	mg/L	0.00010	E96080
C. Jium	EPA 200.7	09/1/01 14:25	SP	0.0018 U	mg/L	0.00070	E96080
Copper	EPA 200.7	09/1/01 14:25	SP	0.0014 U	mg/L	0.0018	E96080
lron	EPA 200.7	09/1/01 14:25	SP	0.025 U	mg/L	0.0014	E96080
Manganes <del>e</del>	EPA 200.7	09/1/01 14:25	SP	0.0038 U	mg/L	0.025	E96080
Nickel	EPA 200.7	09/1/01 14:25	SP	0.0020 ป	mg/L	0.0038	E96080
Silver	EPA 200.7	09/1/01 14:25	SP	0.0010 U	mg/L	0.0020	E96080
Sodium 	EPA 200.7	09/1/01 14:25	SP	53	mg/L	0.0010	E96080
ûn <b>c</b>	EPA 200.7	09/1/01 14:25	SP	0.010 U	mg/L	0.50	E96080
Intimony	EPA 200.9	09/6/01 18:43	DM	0.0042 U	mg/L	0.010	E96080
ead	EPA 200.9	09/1/01 12:30	SP	0.0011 U	_	0.0042	E96080
<del>ele</del> nium	EPA 200.9	09/5/01 15:55	DM	0.0022 U	mg/L	0.0011	E96080
rallium	EPA 200.9	09/5/01 11:23	SP	0.0010 U	mg/L	0.0022	E96080
ercury	EPA 245.1	09/5/01 18:16	DM	0.000060 U	mg/L,	0.0010	· E96080
nloride	EPA 300.0	09/6/01 19:00	SMB	130	mg/L	0.000060	E96080
uoride	EPA 300.0	08/30/01 22:52	SMB	0.16	mg/L	5.0	E96080
rate as N	EPA 300.0	08/30/01 22:52	SMB	0.19	mg/L	0.011	E96080
rite as N	EPA 300.0	08/30/01 22:52	SMB	0.0022 U	mg/L	0.0030	E96080
ifate	EPA 300.0	09/6/01 19:00	SMB	56	mg/L -	0.0022	E96080
alinity	EPA 310.1	09/5/01 10:00			mg/L	1.4	E96080
mo-3-chloropropane	EPA 504.1	08/30/01 22:19	GG	110	mg/L CaCO3	2.0	E96080
		00/30/01 22:19	RS	0.0022 U	ug/L	0.0022	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007935001

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Matrix:

ASR Injection Water Grab

**Environmental Water** 

Sampled:

08/29/01 15:45

Received:

08/30/01 9:45

### Analytical Results:

Parameter	Method	Analyzed	Anai	lyst Result	Units	Reporting	Data Lab
1,2-Dibromoethane	<b>554 554</b> .	Date/Time					Qualifier ID
Chlordane	EPA 504.1	08/30/01 22:		0.0024 U	ug/L	0.0024	E96080
Endrin	EPA 505	08/30/01 22:1		0.084 U	ug/t,	0.084	E96080
gamma-BHC (Lindane)	EPA 505	08/30/01 22:1	0 RS	0.037 U	ug/L	0.037	E96080
Heptachlor	EPA 505	08/30/01 22:1	-	0.019 U	ug/L	0.019	E96080
Heptachlor epoxide	EPA 505	08/30/01 22:1		0.082 U	ug/L	0.082	E96080
Methoxychlor	EPA 505	08/30/01 22:10	O RS	0.020 U	ug/L	0.020	
phene	EPA 505	08/30/01 22:10	RS	0.016 U	ug/L	0.016	E96080
PCB	EPA 505	08/30/01 22:10	) RS	0.92 ป	ug/L	0.92	E96080
2,4,5-TP	EPA 508	09/8/01 5:17	RS	0.24 U	ug/L	0.24	E96080
2,4-D	EPA 515.1	09/7/01 23:51	RS	0.41 U	ug/L	0.41	E96080
Dalapon	EPA 515.1	09/7/01 23:51	RS	0.53 U	ug/L	0.53	E96080
Dinoseb	EPA 515.1	09/7/01 23:51	RS	2.6 U	ug/L	2.6	E96080
	EPA 515.1	09/7/01 23:51	RS	0.58 U	ug/L	0.58	E96080
<sup>Pentachlorophenol</sup>	EPA 515.1	09/7/01 23:51	RS	0.34 U	ug/L	0.34	E96080
icloram	EPA 515.1	09/7/01 23:51	RS	0.26 U	ug/L		E96080
.1.1,2-Tetrachloroethane	EPA 524.2	08/30/01 21:26	WR	0.15 U	ug/L	0.26	E96080
1,1-Trichloroethane	EPA 524.2	08/30/01 21:26	WR	0.25 U	ug/L ug/L	0.15	E96080
1,2,2-Tetrachloroethane	EPA 524.2	08/30/01 21:26	WR	0.39 U	-	0.25	E96080
1,2-Trichloroethane	EPA 524.2	08/30/01 21:26	WR	0.23 U	ug/L	0.39	E96080
1-Dichloroethane	EPA 524.2	08/30/01 21:26	WR	0.11 U	ug/L	0.23	E96080
-Dichloroethene	EPA 524.2	08/30/01 21:26	WR	0.71 U 0.21 U	ug/L	0.11	E96080
-Dichloropropene	EPA 524.2	08/30/01 21:26	WR		ug/t.	0.21	E96080
,3-Trichloropropane	EPA 524.2	08/30/01 21:26	WR	0.10 U	ug/L	0.10	E96080
.4-Trichlorobenzene	EPA 524.2	08/30/01 21:26		0.26 U	ug/L	0.26	E96080
-Dichlorobenzene	EPA 524.2		WR	0.37 U	ug/L	0.37	E96080
√ Noroethane	EPA 524.2	08/30/01 21:26	WR	0.35 U	ug/L	0.35	E96080
பளிoropropane	EPA 524.2		WR	0.45 U	ug/L	0.45	E96080
. b b. a.r.a	CFM 024.2	08/30/01 21:26	WR	0.23 U	ug/L	0.23	E96080

theast Florida Pierce, FL 34946 H # E96080

Orlando Area Deltona, FL 32725 FDOH # E83509

Jacksonville Area
Femandina Beach, FL 32034

Fort Myers Area Lehigh Acres, FL 33936

West Central Florida Spring Hill, FL 34607

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007935001

Sample ID: ASR Injection Water Grab Matrix:

**Environmental Water** 

Sampled:

08/29/01 15:45

MOTITUTION

Received: 08/30/01 9:45

#### Analytical Results:

_	Method	Analyzed	<u>Anal</u>	yst Result	Units	Reporting	Data Lab
1,3-Dichlorobenzene		Date/Time		<b>—</b> ———	Orma	Limit	
1,3-Dichloropropane	EPA 524.2	08/30/01 21:2	26 WR	0.22 U	ug/L	0.22	
	EPA 524.2	08/30/01 21:2	26 WR	0.30 U	ug/L	0.30	E96080
1,3-Dichloropropene 1,4-Dichlorobenzene	EPA 524.2	08/30/01 21:2	26 WR	0.30 U	ug/L	0.30	E96080
	EPA 524.2	08/30/01 21:2	6 WR	0.28 U	ug/L	0.28	E96080
2,2-Dichloropropane 2-Chlorotoluene	EPA 524.2	08/30/01 21:2	6 WR	0.47 U	ug/L	0.47	E96080
	EPA 524.2	08/30/01 21:2	6 WR	0.18 U	ug/L	0.47	E96080
4-Chlorotoluene	EPA 524.2	08/30/01 21:20	6 WR	0.16 ป	ug/L	0.16	E96080
. ine	EPA 524.2	08/30/01 21:26	6 WR	0.090 บ	ug/L	0.090	E96080
Bromobenzene	EPA 524.2	08/30/01 21:26	WR	0.20 U	ug/L	0.090	E96080
Bromodichloromethane	EPA 524.2	08/30/01 21:26	WR	0.27 U	ug/L	0.20	E96080
Bromoform	EPA 524.2	08/30/01 21:26	WR	0.48 U	ug/L		E96080
3romomethane	EPA 524.2	08/30/01 21:26	WR	0.41 U	ug/L	0.48	E96080
arbon tetrachloride	EPA 524.2	08/30/01 21:26	WR	0.28 U	ug/L	0.41	E96080
hlorobenzene	EPA 524.2	08/30/01 21:26	WR	0.23 U	-	0.28	E96080
hloroethane	EPA 524.2	08/30/01 21:26	WR	0.42 U	ug/L	0.23	E96080
hioroform	EPA 524.2	08/30/01 21:26	WR	0.18 U	ug/L	0.42	E96080
hioromethan <del>e</del>	EPA 524.2	08/30/01 21:26	WR	0.18 U	ug/L	0.18	E96080
s-1,2-Dichloroethene	EPA 524.2	08/30/01 21:26	WR		ug/L. -	0.43	E96080
bromochloromethane	EPA 524.2	08/30/01 21:26		0.23 U	ug/L	0.23	E96080
bromomethane	EPA 524.2	08/30/01 21:26	WR	0.40 U	ug/L	0.40	E96080
chlorodifluoromethane	EPA 524.2		WR	0.41 U	ug/L	0.41	E96080
nylbenzene	EPA 524.2	08/30/01 21:26	WR	0.49 U	ug/L	0.49	E96080
thyl-tert-butyl-ether	EPA 524.2	08/30/01 21:26	WR	0.19 U	ug/L	0.19	E96080
thylene chloride	EPA 524.2	08/30/01 21:26	WR	0.24 U	ug/L	0.24	E96080
rene		08/30/01 21:26	WR	0.49 U	ug/L	0.49	E96080
ra-hloroethene	EPA 524.2	08/30/01 21:26	WR	0.24 U	ug/L	0.24	E96080
ios	EPA 524.2	08/30/01 21:26	WR	0.26 U	ug/L	0.26	E96080
	EPA 524.2	08/30/01 21:26	WR	0.18 U	ug/L	0.18	E96080

theast Florida Pierce, FL 34946 H # E96080

Orlando Area Deltona, FL 32725 FDOH # E83509

Jacksonville Area Fernandina Beach, FL 32034 FDOH # F82417

Fort Myers Area Lehigh Acres, FL 33936

West Central Florida Spring Hill, FL 34607

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007935001

Sample ID:

Matrix:

**ASR Injection Water Grab** 

**Environmental Water** 

Sampled:

08/29/01 15:45

MOTITION

Received:

08/30/01 9:45

#### Analytical Results:

Parameter	Method	Analyze	d Anal	yst Result	Units	Reporting	Data Lab
Total THMs	EPA 524.2	Date/Tim	_		<del></del>		<u>Data</u> Lab
Total Xylenes	EPA 524.2	08/30/01 21:		0.00050 (	U mg/L	0.00050	E96080
trans-1,2-Dichloroethene	EPA 524.2	08/30/01 21:		0.30 U	ug/L	0.30	E96080
Trichloroethene		08/30/01 21:		0.18 U	ug/L	0.18	E96080
Trichlorofluoromethane	EPA 524.2 EPA 524.2	08/30/01 21:2		0.21 U	ug/L	0.21	E96080
Vinyl chloride		08/30/01 21:2		0.20 U	ug/L	0.20	E96080
Alachior	EPA 524.2	08/30/01 21:2	6 WR	0.33 U	ug/L	0.33	E96080
ine	EPA 525	09/3/01 0:46	WR	0.68 U	ug/L	0.68	E96080
Benzo(a)pyrene	EPA 525	09/3/01 0:46	WR	0.54 U	ug/L	0.54	E96080
bis(2-ethylhexyl)phthalate	EPA 525	09/3/01 0:46	WR	0.078 U	ug/L	0.078	E96080
Di(2-ethylhexyl)adipate	EPA 525	09/3/01 0:46	WR	0.94 U	ug/L	0.94	E96080
Hexachlorobenzene	EPA 525	09/3/01 0:46	WR	0.76 U	ug/L	0.76	E96080
Hexachlorocyclopentadiene	EPA 525	09/3/01 0:46	WR	0.34 U	ug/L	0.34	E96080
Simazine	EPA 525	09/3/01 0:46	WR	0.26 U	ug/L	0.26	E96080
Carbofuran	EPA 525	09/3/01 0:46	WR	0.70 U	ug/L	0.70	E96080
oxamy!	EPA 531.1	09/3/01 14:24	JJM	0.18 U	ug/L	0.18	E96080
•	EPA 531.1	09/3/01 14:24	JJM	0.10 U	ug/L	0.10	
llyphosate	EPA 547	09/12/01 16:57	SAL	10 U	ug/L	10	E96080
ndolhaif	EPA 548.1	09/19/01 14:20	WR	2.8 U	ug/L	2.8	E84129
iquat	EPA 549.1	09/10/01 14:03	<b>JJM</b>	2.6 U	ug/L	2.6	E96080
ross Alpha	EPA 900.0	09/12/01 0:00	KNL	8.7 +/- 1.6	pCi/L	2.0	E96080
adium 226	EPA 903.1	09/13/01 0:00	KNL	2.2 +/- 0.8	pCi/L		E84025
plor	SM2120 B	08/30/01 14:30	TCL	27	CU	E 0	E84025
for	SM2150 B	08/30/01 12:00	PHM	1.2	T.O.N.	5.0	E96080
tal Dissolved Solids	SM2540 C	08/31/01 16:00	JL	310		1.0	E96080
anide	SM4500CN E	08/31/01 14:01	JL	0.016 U	mg/L ma/i	10	E96080
fants as LAS, Mol.wt.340	SM5540 C	08/31/01 11:20	JL	0.095	mg/L	0.016	E96080
					mg/L	0.019	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285

Client:

Matrix:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007935001

Sample ID:

**ASR Injection Water Grab Environmental Water** 

Sampled:

08/29/01 15:45

Received:

08/30/01 9:45

#### Analytical Results:

Parameter	Method	Analyzed Date/Time	Analys	t Result	Units	Reporting		
Confirmed Fecal Coliform	SM9222 D	08/30/01 12:30	GG	1 mi filtered and background TNTC, Z qualifier used.		<u>Limit</u> 100	<u>Qualifi</u> Z	<u>E96080</u>
Confirmed Fecal Coliform	SM9222 D	08/30/01 12:30	GG	0.00	CFU/100mL	100	Z	E06000
Confirmed Total Coliform	SM9222 D	08/30/01 12:30	GG	1 ml filtered and background TNTC, Z qualifier used.		100	Z	E96080 E96080
Confirmed Total Coliform	SM9222 D	08/30/01 12:30	GG	0.00	CFU/100mL	100	Z	FOCOSO
Total Coliform  Fotal Coliform	SM9222 D	08/30/01 12:30		1 ml filtered and background was TNTC, Z qualifier used	CFU/100mL	100	Z	E96080 E96080
TOTAL CONTONTI	SM9222 D	08/30/01 12:30	GG	0.00	CFU/100mL	100	ż	E96080

# SOUTHERN ANALYTICAL LABORATORIES, INC.

1108AYVIEW BOUI EVARD, OLOSMAR, FL 34677 813-855-1844 fax 813-855-2218

Harbor Branch Oceanographic Institution Inc. 5600 US 1 North Fort Pierce, FL 34946-

Sep 13 01 04:05p

September 13, 2001 Project No: 25635

## **Laboratory Report**

Project Name	200	7935-2007937, 2					
Parameters	Units	Results	Method	Dete Lim	ection Date/Time	Date/Time Prep	Analys
Sample Description	1007	00000				-гер	
Matrix		935001					
SAL Sample Number		ndwater					
Date/Time Coffected	2563:						
Date/Time Received	09/11	/01 15:45 /01 14:00					
Pesticide Analyses							
Glyphosate	ug/l				•		
		10 U	EPA 547	10	09/12/01 16:57		
Sample Description		<u>-</u>					DF
Matrix	20079						<u></u>
SAL Sample Number		dwater					
Pate/Time Collected	25635.						
ate/Time Received		<b>11 17:30</b>					
- A LANG PARCE NAME OF THE PAR	09/11/0	14:00					
esticide Analyses							
Slyphosate	ug/I	10 U	EPA 547	10	50140104		
ample Description					09/12/01 17:09		DF
airix	200793	7001					
AL Sample Number	Ground						
ate/Time Collected	25635.0						
ite/Time Received	02/29/01	16:30					
	09/11/01	14:00			•		
sticide Analyses yphosate							
/priceate	ug/l	10 U	EPA 547	10	09/12/01 17:22		
mple Description			······································	<del></del> -	-3.1001 [1.22		OF
trix	20080320						
L Sample Number	Wastewa						
e/Time Collected	25635.04						
e/Time Received	09/07/01						
	09/11/01	14:00					
licide Analyses							
phosate	ten fi						
<del></del>	ug/l	610	EPA 547	10	09/12/01 17:44		

## SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLOSMAR, FL 34677 913-855-1844 fex 813-855-2218

Harbor Branch Oceanographic Institution Inc. 5600 US 1 North Fort Pierce, FL 34946-

September 13, 2001 Project No: 25635

**Laboratory Report** 

Project Name

2007935-2007937, 2008032

#### **Footnotes**

U

Analyte was not detected; indicated concentration is method detection limit.

5600 U. S. 1 North, Ft. Pierce, Fl. )46, 561-465-2400 ext. 292
Fax: (561) 46/-1584

Receiving Laboratory: Southern Analytical	
The samples are to be shipped by FELEX to arrive on 9.11.01. TAT:	

ECT NAME:	KANCHI	ENVIR	ONME	NTAL	LABORAT	ORY			٨١	NALYSI	S REQUIRE	D		COLLECTIO	N REMARKS
										PRESEI	RVATIVE		_		
		<del>-</del>	<del></del>												
LE TYPE: Cor - O	mposite = C, (	Grab = G,		MAT SW 1	RIX: Drk. Wtr. = D'	W, Grd. Wtr. = G	W, Surface Wir. =								
RVATIVE: 11 served = U	ydrochloric A	cid = II; Ni	tric Acid = }		Wastewtr. = WW, So m Thiosulfate = S; S			4	]						
Dieni Code	MATRIX	DATE	ECTION TIME	TYPE	360	IEL SAMPLE ID		54							
MS	GU	8/25	<del>  '~ '~</del>	G	20079	35 001								SAMPLE CO	MLIENTS
MS MS	Col	8/27	1730	G	ZC079	36 00;		7			<del>  -</del>				
(1-	14.1	9/7	0320	3	20079	37 (M) 38 (M)	l	7							
<del></del>	<del>                                     </del>	 				<u>Je. (2.7</u>		<u>\i</u>					107	icliate.	
														<del></del>	<del>-</del>
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14.7	REZINGUISHE	) NY			9.10.01	TIME 16200				CEIVED BY				DATE	TIME
	Aleinguisher Dex	> 11.7			DATE	ПМЕ	نام ا	DV-X LABOR	A 7000 M A 4 4	ME AND R	ECEIVED BY	<del></del>		DATE 9/11/c 1	TIME

#### DOH Certification #884025 DEP COMPQAP # 870251

LASORATORY SERVICES

2742 N. Florida Ave. P.O. Box 1833 Tampa, Florida 33601 (813) 229-2879 Fax (813) 229-0002 Report Date: September 20, 2001

Harbor Branch Environmental Labs

5600 U.S. 1 North

Ft. Pierce, FL 34946

Attn: Eric Charest

Field Custody:

Client

Client/Field ID:

2007935001

Sample Collection:

8-29-01

Lab ID No:

61142

Lab Custody Date:

8-31-01

Sample description: GW

: ameter	Units	R	esul	te	Analysis Date	Method	Data Qualifier
Gross Alpha	pCi/l	8.7	±	1.6	9-07-01	EPA 900.0	
Radium-226	pCi/l	2.2	±	0.8	9-13-01	EPA 903.1	

pha Standard: Th-230

ames W. Hayes
Laboratory Manager

# HARBOR BRANCH ENVIRONMEN .L LABORATORY 5600 U. S. 1 North, Ft. Pierce, FL 34946, 561-465-2400 ext. 292

Form 00 LA

Fax: (561) 467-1584 CHAIN OF CUSTODY RECORD

	ANCH E	NVIRO	NMEN	ITAL !	LABORATO	RY			ANALYSIS	REQUIRED		COLLECTION	REMARKS
ECT NAME:									PRESER	VATIVE			
						- <del></del>		HVM3					
PLE TYPE: Cor				3 10, 10	IX Dek Wir. = DW antewer. = WW, Soi	or achds = S, Wa	, Surface H'u. = ste = W	ditional					
	Yurocatone Ar	3d = 11; Nil	лс Acid + N	. Sodium	Thiosulfate = S; Sx	kiunic Acid = SU,		Gross					
Chest Code	XISTAN	COLLI	FETION TIME	TYPE	HRE	L Sample 10	•	00			\	\$AAPPLE CO	MMEATS
EWS	GW	8/29	1545	G	2079	35 001		17		<del>  </del>			
FMS	GW	8/19	1730	G	200793	6 001			<del>-  </del>	<del>  </del> -		<del></del>	<del></del>
FWS	GN	8/29	1630	G	200793	7 001		V					
	<del></del>												
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		·	<u> </u>									- <del></del>	
Se_M	RELINGUISHE	DRY			BATE 8 · 30 · 6)	TINE /600			RECEIVED BY			DATE	Tiss
	RELENQUESHE	D BY			DATE	ПМЕ	in a	L BORATO	AY HAME AND S	feception av /		831h	TIME (OO)

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### INORGANIC ANALYSIS 62 - 550.310 (1) (PWS030)

lient:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

ample Location:

ASR Injection Water Grab

ample Number:

2007935001

ampling Date:

8/29/01 15:45

eservative:

Nitric Acid, Sodium Hydroxide, or None

ite Received:

8/30/01 9:45

	Parameter	MCL	Result					
1005	Arsenic	[0.05]			Method	MDL	Date	Lab ID
1010	Barium	[2]	0.0032 U 0.027	mg/L	EPA 200.7	0.0032	9/01/01	E96080
1015	Cadmium	[0.005]	0.027 0.00070 U	mg/L	EPA 200.7	0.0018	9/01/01	E96080
1020	Chromium	[0.1]	0.00070 U 0.0018 U	mg/L	EPA 200.7	0.00070	9/01/01	E96080
1024	Cyanide	[0.2]	0.016 U	mg/L	EPA 200.7	0.0018	9/01/01	E96080
1025	Fluoride	[4]	0.16	mg/L	SM4500CN E	0.016	8/31/01	E96080
)	Lead	[0.015]	0.0011 U	mg/L	EPA 300.0	0.011	8/30/01	E96080
1035	Мегсигу	[0.002]	0.000060 U	mg/L	EPA 200.9	0.0011	9/01/01	E96080
1036	Nickel	[0.1]	0.0020 U	mg/L mg/L	EPA 245.1	0.000060	9/05/01	E96080
040	Nitrate as N	[10]	0.19	mg/L	EPA 200.7	0.0020	9/01/01	E96080
041	Nitrite as N	[1]	0.0022 U	mg/L	EPA 300.0	0.0030	8/30/01	E96080
045	Salaminum			mg/L	EPA 300.0	0.0022	8/30/01	E96080
052	Selenium Sodium	[0.05]	0.0022 U	mg/L	EPA 200.9	0.0022	22:52	1
074	Antimony	[160]	53	mg/L	EPA 200.7	0.50	9/05/01	E96080
D75	Beryllium	[0.006]	0.0042 U	mg/L	EPA 200.9	0.0042	9/01/01	E96080
85	Thallium	[0.004]	0.00010 ป	mg/L	EPA 200.7	0.00010	9/06/01	E96080
- 3	· ranun	[0.002]	0.0010 U	mg/L	EPA 200.9	0.0010	9/01/01	E96080
						2.0010	9/05/01	E96080

est Florida ce, FL 34946

Orlando Area Deltona, FL 32725

Jacksonville Area Fernandina Beach, FL 32034

Fort Myers Area

West Central Florida

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



### Trihalomethane Analysis 62-550.310 (2) (a) (PWS027)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

ASR Injection Water Grab

Sample Number:

2007935001

Sampling Date:

8/29/01 15:45

Preservative:

1:1 Hydrochloric Acid

Date Received:

8/30/01 9:45

ΙĎ	Parameter	MCL	Chlorine Residual	Result		<b>8.6</b>			
2950	Total THMs	[0.10]				Method	MDL	Date	Lab ID
	11 11113	(O. 10]		0.00050 U	mg/L	EPA 524.2	0.00050	8/30/01	E96080

d: 9/20/01

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### Volatile Organic Analysis 62 - 550.310 (2) (b) (PWS028)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

ASR Injection Water Grab

ample Number:

2007935001

ampling Date:

8/29/01 15:45

reservative:

1:1 Hydrochloric Acid and Sodium Thiosulfate

ate Received:

٥	Parameter	MCI	- Result		**			
2378	1,2,4-Trichlorobenzene	[70]	0.37 U		Method	MDL	Date	Lab ID
2380		e [70]	0.37 U 0.23 U	ug/L	EPA 524.2	0.37	8/30/01	E96080
2955		[10000		ug/L	EPA 524.2	0.23	8/30/01	E96080
2964	Methylene chloride	[5]	0.30 U 0.49 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
2968	1,2-Dichlorobenzene	[600]	0.49 U 0.35 U	ug/L	EPA 524.2	0.49	8/30/01	E96080
2969	1,4-Dichlorobenzene	[75]	- <del>-</del>	ug/L	EPA 524.2	0.35	8/30/01	E96080
ð	Vinyl chloride	[1]	0.28 U	ug/L	EPA 524.2	0.28	8/30/01	E96080
2977	1.1-Dichloroethene	(') [7]	0.33 U	ug/L	EPA 524.2	0.33	8/30/01	E96080
2979	trans-1,2-Dichloroethene	[100]	0.21 U	ug/L	EPA 524.2	0.21	8/30/01	E96080
2980	1,2-Dichloroethane	[3]	0.18 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
2980	1,1,1-Trichloroethane	[200]	0.45 U	ug/L	EPA 524.2	0.45	8/30/01	E96080
2982	Carbon tetrachloride	[3]	0.25 U	ug/L	EPA 524.2	0.25	8/30/01	E96080
2983	1,2-Dichloropropane	(5) [5]	0.28 U	ug/L	EPA 524.2	0.28	8/30/01	E96080
2984	Trichloroethene	[3]	0.23 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
985	1,1,2-Trichloroethane	-	0.21 U	ug/L	EPA 524.2	0.21	8/30/01	E96080
987	Tetrachloroethene	[5]	0.23 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
989	Chlorobenzene	[3]	0.26 U	ug/L	EPA 524.2	0.26	8/30/01	E96080
990	Doggo-	[100]	0.23 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
991	Toluena	• •	U 000.0	ug/L	EPA 524.2	0.090	8/30/01	E96080
992	Ethylhana		0.18 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
	Shires		0.19 U	ug/L	EPA 524.2	0.19	8/30/01	E96080
		[70]	0.24 U	ug/L	EPA 524.2	0.24	8/30/01	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### PESTICIDES PCB CHEMICAL ANALYSIS 62 - 550.310 (2) (c) (PWS029)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

ASR Injection Water Grab

Sample Number:

2007935001

Sampling Date:

8/29/01 15:45

reservative:

Sodium Thiosulfate

ate Received:

8/30/01 9:45

D	Parameter	МС	L Result		14mm			
200	5 Endrin	[2]	0.037 U	-	Method	MDL	Date	Lab ID
2010	) gamma-BHC (Lindane)	(- <u>.</u> (0.2)		ug/L	EPA 505	0.037	8/30/01	E96080
015		[40]	0.016 U	ug/L	EPA 505	0.019	8/30/01	E96080
020	Toxaphene	[3]	0.92 ป	ug/L	EPA 505	0.016	8/30/01	E96080
031	Dalapon	[200]		ug/L	EPA 505	0.92	8/30/01	E96080
032	Diquat	[20]	2.6 U	ug/L	EPA 515.1	2.6	9/07/01	E96080
033	Endothail	[100]		ug/L	EPA 549.1	2.6	9/10/01	E96080
•	Glyphosate	[700]		ug/L	EPA 548.1	2.8	9/19/01	E96080
)35	Di(2-ethylhexyl)adipate	[400]	0.76 U	ug/L	EPA 547	10	9/12/01	E84129
36	Oxamyl	[200]	0.76 U 0.10 U	ug/L	EPA 525	0.76	9/03/01	E96080
37	Simazine	[4]	0.70 U	ug/L	EPA 531.1	0.10	9/03/01	E96080
39	bis(2-ethylhexyl)phthalate	[6]	0.70 U 0.94 U	ug/L	EPA 525	0.70	9/03/01	E96080
40	Picloram	[500]	0.94 U 0.26 U	ug/L	EPA 525	0.94	9/03/01	E96080
41	Dinoseb	[7]	0.28 U	ug/L	EPA 515.1	0.26	9/07/01	E96080
42	Hexachlorocyclopentadiene	[50]	0.36 U	ug/L	EPA 515.1	0.58	9/07/01	E96080
46	Carbofuran	[40]	_	ug/L	EPA 525	0.26	9/03/01	E96080
50	Atrazine	[3]	0.18 U	ug/L	EPA 531.1	0.18	9/03/01	E96080
51	Alachior	[2]	0.54 U	ug/L	EPA 525	0.54	9/03/01	E96080
35	Heptachlor	(2) [0.4]	0.68 U	ug/L	EPA 525	0.68	9/03/01	E96080
37	Heptachlor epoxide		0.082 U	ug/L	EPA 505	0.082	8/30/01	E96080
5	2,4-D	[.2]	0.020 U	ug/L	EPA 505	0.020	8/30/01	E96080
0	2,4,5-TP	[70]	0.53 U	ug/L	EPA 515.1	0.53	9/07/01	E96080
4	Hexachlorobenzene	[50]	0.41 U	ug/L	EPA 515.1	0.41	9/07/01	E96080
6	Benzo(a)pyrene	[1]	0.34 U	ug/L	EPA 525	0.34	9/03/01	E96080
6	Pentachlorophenol	[.2]	0.078 U	ug/L	EPA 525	0.078	9/03/01	E96080
	PCB	[1]	0.34 U	ug/L	EPA 515.1	0.34	9/07/01	E96080
	1,2-Dibromo-3-chloropropane	[.5]	0.24 U	ug/L	EPA 508	0.24	9/08/01	E96080
	1,2-Dibromoethane	[.2]	0.0022 U	ug/L	EPA 504.1	0.0022	8/30/01	E96080
	Chlordane	[.02]	0.0024 U	ug/L	EPA 504.1	0.0024	8/30/01	E96080
	· · · · · · · · · · · · · · · · · · ·	[2]	0.084 U	ug/L	EPA 505	0.084	8/30/01	E96080
	t Florida Orlando Ar D. FL 34946 Deltona Fl		Jacksonvi	ille Area	Fort Myers		West Central	

neast Florida Pierce, FL 34946 I # E96080

Deltona, FL 32725 FDOH # E83509 Jacksonville Area Fernandina Beach, FL 32034 FDOH # FR2417 Fort Myers Area Lehigh Acres, FL 33936

West Central Florida Spring Hill, FL 34607

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### RADIOCHEMICAL ANALYSIS 62 - 550.310 (5) (PWS033)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

ASR Injection Water Grab

ample Number:

2007935001

ampling Date:

8/29/01 15:45

reservative:

Nitric Acid

ate Received:

D	Parameter	Result   Error					
4000	Gross Alpha		····	Method	Date	Lab ID	
	•	8.7 +/- 1.6	<b>PCVL</b>	EPA 900.0	9/12/01	E84025	
4020	Radium 226	2.2 +/- 0.8	pCi/L	EPA 903.1	9/13/01	E84025	

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### SECONDARY CHEMICAL ANALYSIS 62 - 550.320 (PWS031)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

ASR Injection Water Grab

Sample Number:

2007935001

Sampling Date:

8/29/01 15:45

reservative:

Nitric Acid or None

ate Received:

ID	Parameter	MCL	Result		Method	MDI	D-4-	
1002 1017 1022 1025 1028 000 055 095 920 925 930	Aluminum Chloride Copper Fluoride Iron Manganese Silver Sulfate Zinc Color Odor pH	[0.2] [250] [1] [4] [0.3] [0.05] [0.1] [250] [5] [15] [3] [6.5-8.5] [500]	0.0030 U 130 0.0014 U 0.16 0.025 U 0.0038 U 0.0010 U 56 0.010 U 27 1.2 7.33	mg/L mg/L mg/L mg/L mg/L mg/L cu T.O.N. SU mg/L	Method  EPA 200.7  EPA 300.0  EPA 200.7  EPA 300.0  EPA 200.7  EPA 200.7  EPA 200.7  EPA 200.7  EPA 300.0  EPA 200.7  SM2120 B  SM2150 B  EPA 150.1  SM2540 C	0.0030 5.0 0.0014 0.011 0.025 0.0038 0.0010 1.4 0.010 5.0 1.0 0.200	9/01/01 9/06/01 9/01/01 8/30/01 9/01/01 9/01/01 9/06/01 9/01/01 8/30/01 8/30/01 8/31/01	E96080 E96080 E96080 E96080 E96080 E96080 E96080 E96080 E96080 E96080
	Adel 1(2	[0.5]	0.095	mg/L	SM5540 C	0.019	8/31/01	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### Unregulated Group II Analysis 62 - 550.410 (PWS034)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

ASR Injection Water Grab

Sample Number:

2007935001

Sampling Date:

8/29/01 15:45

Preservative:

1:1 Hydrochloric Acid

Date Received:

ID	Parameter	Result		Method	MOL	<b>.</b>	•
2210	Chloromethane			11100100	MDL	Date	Lab ID
2212		0.43 U	ug/L	EPA 524.2	0.43	8/30/01	E96080
2214	- Anna Maria Maria Maria	0.49 U	ug/L	EPA 524.2	0.49	8/30/01	E96080
2216	Chloroethane	0.41 U	ug/L	EPA 524.2	0.41	8/30/01	E96080
2218	Trichlorofluoromethane	0.42 U	ug/L	EPA 524.2	0.42	8/30/01	E96080
, 1	Methyl-tert-butyl-ether	0.20 U	ug/L	EPA 524.2	0.20	8/30/01	E96080
2408	Dibromomethane	0.24 U	ug/L	EPA 524.2	0.24	8/30/01	E96080
2410	1,1-Dichloropropene	0.41 U	ug/L	EPA 524.2	0.41	8/30/01	E96080
2412	1,3-Dichloropropane	0.10 U	ug/L	EPA 524.2	0.10	8/30/01	E96080
2413	1,3-Dichloropropene	0.30 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
2414	1,2,3-Trichloropropane	0.30 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
2416	2,2-Dichloropropane	0.26 U	ug/L	EPA 524.2	0.26	8/30/01	E96080
2941	Chloroform	0.47 U	ug/L	EPA 524.2	0.47	8/30/01	E96080
942	Bromoform	0.18 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
943	Bromodichloromethane	0.48 U	ug/L	EPA 524.2	0.48	8/30/01	E96080
944		0.27 U	ug/L	EPA 524.2	0.27	8/30/01	E96080
965	Dibromochioromethane 2-Chlorotoluene	0.40 U	ug/L	<b>EPA 524.2</b>	0.40	8/30/01	
966	4-Chlorotoluene	0.18 U	ug/L	EPA 524.2	0.18	8/30/01	E96080 E96080
967		0.16 ป	ug/L	EPA 524.2	0.16	8/30/01	
978	1,3-Dichlorobenzene	0.22 U	ug/L	EPA 524.2	0.22	8/30/01	E96080
	1,1-Dichloroethane	0.11 U	ug/L	EPA 524.2	0.11	8/30/01	E96080
_	1,1,1,2-Tetrachloroethane	0.15 U	ug/L	EPA 524.2	0.15		E96080
	1,1,2,2-Tetrachloroethane	0.39 U	ug/L	EPA 524.2	0.13	8/30/01 8/30/01	E96080
93	Bromobenzene	0.20 U	ug/L	EPA 524.2	0.39	<del>-</del> -	E96080
			-		0.20	8/30/01	E96080

			SALVISON CIRALKOM	<i>P</i> 7	HAI		/BN	RAT	יםח	V		
		`n	Phone: (561) 465-2400, Ext. 285	Fax:	(561)	467.1		· • • • • • • • • • • • • • • • • • • •	VN)			Chain-of-Custody
Compan	y: t	Lo	rida Water Car	د	,551)	-TU/- [	J04		f			
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	Phone:() Client Co Project N Sampled I Purchase CTION TIME \$\frac{1}{2}\$  osite 0-Other	Phone: O L 3  Client Contact:  Project Name:  Sampled By:  Purchase Order #:  CTION  TIME. SW XIBLEW  16 30 G G W	Phone: 941374 Client Contact: Grant Project Name: Mail Sampled By: Purchase Order #:  CTION	Company: Florida Wafer Serva.  Address: 960 N. Collier Blvd.  Marco (sland fl. 34)  Phone: 94/374-3353 Fax 94/374-408  Client Contact: Frank Kane  Project Name: Marco Lakes ASR  Sampled By: S(MOS)  Purchase Order #:  SCTION	Company: Florida Water Service Address: 960 N. Collier Blvd.  Marco (Sland Fl. 34145)  Phone: 941374-3353 Fax: 941374-4019 Ten Client Contact: Frank Kane Project Name: Marco Lakes ASR Sampled By: SIMOS  Purchase Order #:  SCTION & Water Service  SAMPLE LOCATION  TIME: Sampled By: Marco Lakes ASR  TIME: Sampled By: SAMPLE LOCATION  TIME: Sampled By: SAMPLE LOCATION  TIME: Sampled By: SAMPLE LOCATION  TIME: Sampled By: SAMPLE LOCATION  Water Sampled By: Sample Deep Zone III	Company: Florida Water Services Methaddress: 960 N. Collier Blvd. Coole Methaddress: 960 N. Collier Blvd. Coole Marco (sland fl. 34/45 Date Phone: 94/334 - 3353 Fax (94)394 4019 Temperature Client Contact: Frank Kane Project Name: Marco Lakes ASR Sampled By: S(MOS)  Purchase Order #:  SCTION B SAMPLE LOCATION STIME. Sampled By: SAMPLE SAMPLE BY: SAMPLE SAMPLE BY: S	Company: Floridg Water Services Method of Sh  Address: 960 N. Collier Blvd. Cooler #'s  Marco (Sland Fl. 34145 Date 08-6  Phone: 941394-3353 Fax 941394-4099 Temperature Checked (Y) N  Project Name: Marco Lakes ASR  Sampled By: S(MOS  AM  Purchase Order #:  CITION  TIME: By W S  SAMPLE LOCATION  TIME: By W S  AM  SAMPLE LOCATION  1630 G-6-W S  Matrix: S-Solid SL-Sludge DW-Drinking Water GW-Ground Water SW-Surface	Company: Florida Water Services Method of Shipment:  Address: 960 N. Collier Blvd.  Marco (Sland Fl. 34145 Date 182-29-2  Phone: 94394-3353 Fax 941394-4067  Client Contact: Frank Kane  Project Name: Marco Lakes ASR PRES  Sampled By: S(MOS ANALYSE:  CTION R. S. SAMPLE LOCATION  TIME: R. S. SAMPLE LOCATION  TIME: R. S. SAMPLE LOCATION  Matrix: S-Solid SL-Studge DW-Drinking Water GW-Ground Water SW-Surface Water Water Water Students of Surface Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water Water Students of Surface Water	Company: Florida Water Services Method of Shipment: Fee Address: 960 N. Collier Beva. Cooler #'s  Marco (sland fl. 34145 Date 8-19 of Time Phone: 94) 334 - 3353 Fax: 94) 334 - 4009  Client Contact: Frank Kane Checked Intact (T) N Y N  Project Name: Marco Lakes ASR PRESERVATIVE Sampled By: S(MOS)  Furchase Order #:  CITION F. SAMPLE LOCATION SAMPLE LOCATION SAMPLES REQUES TIME For Sampled By: SAMPLE LOCATION SAMPLES REQUES TIME For SAMPLES REQUES TIME For SAMPLES REQUES TO SAMPLE LOCATION SAMPLES REQUES TO SAMPLE SAMPLES REQUES TO SAMPLES REQUES TO SAMPLES REQUES TO SAMPLES REQUES TO SAMPLES REQUES TO SAMPLES REQUES TO SAMPLES REQUESTED TO SAMPLES REQUES TO SAMPLES REQUES TO SAMPLES REQUESTED T	Company: Florida Wafer Services Method of Shipment: Fed E.  Address: 960 N. Collier Blvd.  Marco (Sland Fl. 34145)  Phone: 94334 - 3353 Fax 941334 - 4019  Client Contact: Frank Kane  Client Contact: Frank Kane  Project Name: Marco Lakes ASR  Sampled By: S(MOS)  Purchase Order #:  SCTION  Sampled By: SAMPLE LOCATION  TIME: Sampled By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE By: SAMPLE BY: SAMP	Address: 960 N. Collier Blvd.  Marco (sland fl. 34 145 Date 82.49-5) Time  Phone: 941374-3353 Fax: 941374-4019  Client Contact: Frank Kane  Project Name: Marco Lakes ASR  Sampled By: S(MOS)  Purchase Order #:  CITION  TIME: But you will be promise of the contact of the contac	Company: Flotida Water Services Method of Shipment: Fed EX  Addrass: 960 N. Collier Bevd. Cooler F's  Marco (Sland Fl. 34145 Date 29-0) Time  Phone: 94334-3353 Fax 941334 4099  Client Contact: Frank Kane Checked The Cooler F's  Project Name: Marco Lakes ASR PRESERVATIVE  Sampled By: S(MOS)  Purchase Order F:  CITION F. E. E. SAMPLE LOCATION  TIME: F. SAMPLE LOCATION  TIME: F. SAMPLE LOCATION  Matrix: S-Solid SL-Sludge DW-Drinking Water GW-Ground Water SW-Surface Water WW-Water Date of Street WW-Water Date

						5 .ax: (561) 467.1584								Chain-or_ustody			
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tona, FL 32725		Pho	ne(9)	41)	391	4-3353 Fax (941)394-406	1078						or lah l	Ise Only			
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igh Acres, FL 33		Project Name: Marco Lakes				arco Lakes ACD	(Y) N Y N Y N					N	WINT COUTTON				
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FIELD ID	COLL	CTION	T	<del>-</del>			7	45	Y	27.6			12	108	S-Sulfuric Acid U-Unpreserved SH-Softum Hydrocide		
	DATE	TIME	Sample Type	MATRIX.	Containe	SAMPLE LOCATION	C	MBA	547	185		33		3 Has	COMMENTS		
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		FILE; PINK to								ATE/TIN							

#### TATIBOTI BRANCH ENVIRONNE NTAL LABORATORY t Pierce, FL 34946 Phone: (561) 465-2400, Ext. 285 Fax: (561) 467-1584 Chain-of-Custody Florida Water Services Method of Shipment: Fed EX H# 82500/E82417 O First Coast Hwy., Suite 1 USE BALL POINT PEN ONLY andina Beach, FL 32034 160 N. Collier Blvd. Standard Turn Around Time H # 83486/E83509 34 [450ate[08-29-0] Time Enterprise Road, Suite 1 **Business Days** ma. FL 32725 For Lab Use Only Temperature **Custody Seals** # 85512/E85370 рH **Client Contact:** Checked Intact HPN#\_2007937 Coolidge Avenue Checked h Acres, FL 33936 Project Name: PRESERVATIVE # 84256/E84418 Preservation Key Sampled By: SIMOS Osawaw Blyd. **ANALYSES REQUESTED** HALFL 34607 Purchase Order #: U-Ungraseryad COLLECTION SK - Sedius Hydraud MATRIX\* FIELD ID **SAMPLE LOCATION** DATE TIME COMMENTS GWT Mon. Well Deep Boncl <u>(630</u> e Type: G-Grab C-Composite O-Other \*\* Matrix: S-Solid SL-Sludge DW-Drinking Water GW-Ground Water SW-Surface Water WW-Wastewater DBY S. SIMOS RELINQUISHED BY RELINQUISHED BY DATE/TIME DATE/TIME RECEIVED BY RECEIVED FOR HBEL CUSTODY BY DATE/TIME TE with REPORT; YELLOW for FILE; PINK to CLIENT; GOLD for RECEIVING; GREEN for SAMPLER DATEITIME 8:30-01 0945

PAGE 3 of 3

5600 U.S. 1 North, Fort Pierce, FL 34946 561) 465-2400, Ext. 285

September 20, 2001



Frank Kane Florida Water Services 960 N Collier Blvd Marco Island, FL 341452721

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

[2007937]

Received:

8/30/01 9:45

#### Lear Frank Kane;

Analytical results presented in this report have been reviewed for compliance with the Harbor Branch Environmental Laboratory Comprehensive Quality Assurance Plan (FDEP CQAP #870174) and applicable quality control criteria. The quality control parameters evaluated have met all method and compliance criteria unless otherwise noted on a Quality Control Summary Page immediately following this coversheet.

FDOH Safe Drinking Water Act, Clean Water Act and RCRA Certification #'s:

E96080, E83509, E82417, E85370, E84418

Note: This report is not to be copied, except in full, without the expressed written consent of the Harbor Branch Environmental Laboratory.

Respectfully submitted,

iridy Cromer

aboratory Director

utheast Florida n Pierce, FL 34946

Orlando Area Deitona, FL 32725

Jacksonville Area Fernandina Beach, Ft. 32034

Fort Myers Area

West Central Florida

5600 U.S. 1 North, Fort Pierce, FL 34946 561) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007937001

Sample ID:

Matrix:

MW Deep Zone 1 Grab

**Environmental Water** 

Sampled:

08/29/01 16:30

Received: 08/30/01 9:45

### Analytical Results:

<u>Parameter</u>	Method	Analyzed Date/Time		yst Result	<u>Units</u>	Reporting Limit	Data Lab Qualifier ID
Specific Conductance	EPA 120.1	08/31/01 15:4	15 GG	2300	umhos/cm	0.36	FOCOSO
pH [6.5-8.5]	EPA 150.1	09/5/01 13:30	) TCL	8.05	SU	0.200	E96080 Q E96080
Aluminum	EPA 200.7	09/1/01 14:32	SP	0.0030 U	mg/L	0.0030	
Arsenic	EPA 200.7	09/1/01 14:32	SP	0.0032 U	mg/L	0.0032	E96080
<sup>-</sup> rium	EPA 200.7	09/1/01 14:32	SP	0.014	mg/L	0.0032	E96080
beryllium	EPA 200.7	09/1/01 14:32	SP	0.00010 U	•		E96080
Cadmium	EPA 200.7	09/1/01 14:32	SP	0.00070 U	mg/L	0.00010	E96080
Chromium	EPA 200.7	09/1/01 14:32	SP	0.0018 U	mg/L	0.00070	E96080
Copper	EPA 200.7	09/1/01 14:32	SP	0.0014 U	-	0.0018	E96080
iron	EPA 200.7	09/1/01 14:32	SP	0.73	mg/L	0.0014	E96080
Manganese	EPA 200.7	09/1/01 14:32	SP	0.0041	mg/L	0.025	E96080
Nickel	EPA 200.7	09/1/01 14:32	SP		mg/L -	0.0038	E96080
Silver	EPA 200.7	09/1/01 14:32	SP	0.0020 U	mg/L	0.0020	E96080
Sodium	EPA 200.7			0.0010 U	mg/L	0.0010	E96080
Zinc	EPA 200.7	09/1/01 14:32	SP	340	mg/L	0.50	E96080
Antimony	EPA 200.9	09/1/01 14:32	SP	0.015	mg/L	0.010	E96080
Lead	EPA 200.9	09/6/01 18:48	DM	0.0042 U	mg/L	0.0042	E96080
Selenium		09/1/01 12:34	SP	0.0011 U	mg/L	0.0011	E96080
hallium .	EPA 200.9	09/5/01 16:02	DM	·0.0022 U	mg/L	0.0022	E96080
Mercury	EPA 200.9	09/5/01 11:27	SP	0.0010 U	mg/L	0.0010	E96080
- -	EPA 245.1	09/5/01 18:24	DM	0.000060 U	mg/L	0.000060	E96080
'e	EPA 300.0	09/6/01 19:42	SMB	470	mg/L	5.0	E96080
luoride .	EPA 300.0	08/30/01 23:10	SMB	1.1	mg/L	0.011	E96080

utheast Florida d Pierce, FL 34946

Orlando Area Deltona, FL 32725

Jacksonville Area Fernandina Beach, FL 32034

Fort Myers Area Lehigh Acres El 33036

West Central Florida

5600 U.S. 1 North, Fort Pierce, FL 34946 '561) 465-2400, Ext. 285

Client: Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007937001

Sample ID: MW Deep Zone 1 Grab Sampled: 08/29/01 16:30

Matrix: Environmental Water

Matrix: Environmental Water Received: 08/30/01 9:45



Parameter	Method	Analyzed Date/Time		st Result	<u>Units</u>	Reporting	Data Lab
Nitrate as N	EPA 300.0	08/30/01 23:1	•	0.0030 บ		Limit	Qualifier ID
Nitrite as N	EPA 300.0	08/30/01 23:10		0.0022 U	mg/L	0.0030	E96080
Sulfate	EPA 300.0	09/6/01 19:42		210	mg/L	0.0022	E96080
Alkalinity	EPA 310.1	09/5/01 10:00	GG		mg/L	1.4	E96080
1,2-Dibromo-3-chloropropane	EPA 504.1	08/30/01 23:25		220	mg/L CaCO3	2.0	E96080
Dibromoethane	EPA 504.1			0.0022 U	ug/L	0.0022	E96080
Chlordane	EPA 505	08/30/01 23:25		0.0024 U	ug/L	0.0024	E96080
Endrin	EPA 505	08/30/01 23:03		0.087 U	ug/L	0.087	E96080
gamma-BHC (Lindane)		08/30/01 23:03	RS	0.039 U	ug/L	0.039	E96080
Heptachlor	EPA 505	08/30/01 23:03	RS	0.020 U	ug/L	0.020	E96080
·	EPA 505	08/30/01 23:03	RS	0.085 U	ug/L	0.085	E96080
Heptachior epoxide	EPA 505	08/30/01 23:03	RS	0.021 U	ug/L	0.021	E96080
Methoxychlor _	EPA 505	08/30/01 23:03	RS	0.017 U	ug/L	0.017	E96080
Toxaphene	EPA 505	08/30/01 23:03	RS	0.96 U	ug/L	0.96	E96080
PCB	EPA 508	09/8/01 7:37	RS	0.24 U	ug/L	0.24	E96080
2,4,5-TP	EPA 515.1	09/8/01 1:04	RS	0.41 U	ug/L	0.41	
2,4-D	EPA 515.1	09/8/01 1:04	RS	0.53 U	ug/L	0.53	E96080
Dalapon	EPA 515.1	09/8/01 1:04	RS	2.6 ป	ug/L	2.6	E96080
Dinoseb	EPA 515.1	09/8/01 1:04	RS	0.58 U	ug/L	0.58	E96080
entachiorophenol	EPA 515.1	09/8/01 1:04	RS	0.34 U	ug/L		E96080
icloram	EPA 515.1	09/8/01 1:04	RS	0.26 U	_	0.34	E96080
1,1,2-Tetrachloroethane	EPA 524.2		WR	0.15 U	ug/L	0.26	E96080
richloroethane	EPA 524.2		WR		ug/L	0.15	E96080
1,2,2-Tetrachloroethane	EPA 524.2			0.25 U	ug/L	0.25	E96080
	LFA <b>J44.</b> 2	08/30/01 22:40	WR	0.39 U	ug/L	0.39	E96080
4							

utheast Florida Orlando Area Jacksonville Area Fort Myers Area West Central Florida 1 Pierce, FL 34946 Deltona, FL 32725 Femandina Beach, FL 32034 Lehigh Acres, FL 33936 Spring Hill FL 34607

5600 U.S. 1 North, Fort Pierce, FL 34946 (S1) 465-2400, Ext. 285

Client: Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007937001

Sample ID: MW Deep Zone 1 Grab Sampled: 08/29/01 16:30

Matrix: Environmental Water Received: 08/30/01 9:45



Parameter	Method	Analyzed Date/Time	Analy	/st Result	Units	Reporting	<u>Data</u> Lab
1,1,2-Trichloroethane	EPA 524.2	08/30/01 22:40	) WR	0.23 U	_		Qualifier ID
1,1-Dichloroethane	EPA 524.2	08/30/01 22:40			ug/L	0.23	E96080
1,1-Dichloroethene	EPA 524,2	08/30/01 22:40		0.11 U	ug/L	0.11	E96080
1,1-Dichloropropene	EPA 524.2	08/30/01 22:40		0.21 U	ug/L	0.21	E96080
1,2,3-Trichloropropane	EPA 524.2	08/30/01 22:40		0.10 U	ug/L	0.10	E96080
richlorobenzene	EPA 524.2		WR	0.26 U	ug/L	0.26	E96080
1.2-Dichlorobenzene	EPA 524.2	08/30/01 22:40	WR	0.37 U	ug/L	0.37	E96080
,2-Dichloroethane	EPA 524.2	08/30/01 22:40	WR	0.35 U	ug/L	0.35	E96080
,2-Dichloropropane	EPA 524.2	08/30/01 22:40	WR	0.45 U	ug/L	0.45	E96080
,3-Dichlorobenzene	_	08/30/01 22:40	WR	0.23 U	ug/L	0.23	E96080
3-Dichloropropane	EPA 524.2	08/30/01 22:40	WR	0.22 U	ug/L	0.22	E96080
3-Dichloropropene	EPA 524.2	08/30/01 22:40	WR	0.30 U	ug/L	0.30	E96080
4-Dichlorobenzene	EPA 524.2	08/30/01 22:40	WR	0.30 U	ug/L	0.30	E96080
	EPA 524.2	08/30/01 22:40	WR	0.28 U	ug/L	0.28	E96080
2-Dichloropropane	EPA 524.2	08/30/01 22:40	WR	0.47 U	ug/L	0.47	E96080
Chlorotoluene .	EPA 524.2	08/30/01 22:40	WR	0.18 U	ug/L	0.18	E96080
Chlorotoluene	EPA 524.2	08/30/01 22:40	WR	0.16 U	ug/L	0.16	E96080
nzene	EPA 524.2	08/30/01 22:40	WR	0.090 U	ug/L	0.090	E96080
mobenzene	EPA 524.2	08/30/01 22:40	WR	0.20 U	ug/L	0.20	E96080
modichioromethane	EPA 524.2	08/30/01 22:40	WR	0.27 U	ug/L	0.27	E96080
moform	EPA 524.2	08/30/01 22:40 \	WR	0.48 U	ug/L	0.48	E96080
momethane	EPA 524.2	08/30/01 22:40 V	WR	0.41 U	ug/L	0.41	
etrachloride	EPA 524.2	08/30/01 22:40 V		0.28 ป	ug/L		E96080
robenzene .	EPA 524.2			0.23 U	_	0.28	E96080
heast Florida	Odanda Area				ug/L	0.23	E96080

rheast Florida Orlando Area Jacksonville Area Fort Myers Area West Central Florida
Pierce, FL 34946 Deltona, FL 32725 Fernandina Beach, FL 32034 Lehigh Acres, FL 33936 Spring Hill EL 24807

5600 U.S. 1 North, Fort Pierce, FL 34946 '561) 465-2400, Ext. 285

Client: Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007937001

Sample ID: MW Deep Zone 1 Grab Sampled: 08/29/01 16:30

Matrix: Environmental Matrix

Matrix: Environmental Water Received: 08/30/01 9:45



### Analytical Results:

Parameter	Method	Analyze	d Ana	shipt D ii			
	<del></del>	Date/Tim		lyst Result	<u>Units</u>	Reporting	Data Lab
Chloroethane	EPA 524.2	08/30/01 22:		₹ 0.42 U	_		Qualifier ID
Chloroform	EPA 524.2	08/30/01 22:		0.42 0	ug/L	0.42	E96080
Chloromethane	EPA 524.2	08/30/01 22:4		0.100	ug/L	0.18	E96080
cis-1,2-Dichloroethene	EPA 524.2	08/30/01 22:4		5.140 0	ug/L	0.43	E96080
Dibromochloromethane	EPA 524.2				ug/L	0.23	E96080
omomethane	EPA 524.2	08/30/01 22:4	_	0.40 U	ug/L	0.40	E96080
Dichlorodifluoromethane		08/30/01 22:4		0.41 U	ug/L	0.41	E96080
Ethylbenzene	EPA 524.2	08/30/01 22:40		0.49 U	ug/L	0.49	E96080
Methyl-tert-butyl-ether		08/30/01 22:40		0.19 U	ug/L	0.19	E96080
Methylene chloride	EPA 524.2	08/30/01 22:40		0.24 U	ug/L	0.24	E96080
Styrene	EPA 524.2	08/30/01 22:40		0.49 U	ug/L	0.49	E96080
Tetrachloroethene	EPA 524.2	08/30/01 22:40	WR	0.24 U	ug/L	0.24	E96080
Toluene	EPA 524.2	08/30/01 22:40	WR	0.26 U	ug/L	0.26	E96080
	EPA 524.2	08/30/01 22:40	WR	0.18 U	ug/L	0.18	E96080
Total THMs	EPA 524.2	08/30/01 22:40	WR	0.00050 U	mg/L	0.00050	
Total Xylenes	EPA 524.2	08/30/01 22:40	WR	0.30 U	ug/L	0.30	E96080
rans-1,2-Dichloroethene	EPA 524.2	08/30/01 22:40	WR	0.18 ป	ug/L	0.18	E96080
richloroethene	EPA 524.2	08/30/01 22:40	WR	0.21 U	ug/L		E96080
richlorofluoromethane	EPA 524.2	08/30/01 22:40	WR	0.20 U	ug/L	0.21	E96080
inyl chloride	EPA 524.2	08/30/01 22:40	WR	0.33 U		0.20	E96080
lachior	EPA 525	09/3/01 2:10	WR	0.68 U	ug/L,	0.33	E96080
razine	EPA 525	09/3/01 2:10	WR		ug/L	0.68	E96080
. ,(a)pyrene	EPA 525	09/3/01 2:10	WR	0.54 U	ug/L	0.54	E96080
(2-ethylhexyl)phthalate	EPA 525			0.078 U	ug/L	0.078	E96080
		09/3/01 2:10	WR	0.94 U	ug/L	0.94	E96080
utheast Florida	Orlando Aron						

utheast Florida t Pierce, FL 34946 OH # EGENEN

Orlando Area Deltona, FL 32725

Jacksonville Area Femandina Beach, FL 32034

Fort Myers Area Lehigh Acres, FL 33936

West Central Florida

5600 U.S. 1 North, Fort Pierce, FL 34946 <sup>7</sup>61) 465-2400, Ext. 285

Client:

Florida Water Services

Workorder ID: 2601 Marco Lakes ASR DW Scan

Laboratory ID: 2007937001

Sample ID:

Matrix:

MW Deep Zone 1 Grab

**Environmental Water** 

Sampled:

08/29/01 16:30

Received:

08/30/01 9:45

#### Analytical Results:

Parameter	Method	Analyzed		st Result	Units	Reporting	Data Lab
Di(2-ethylhexyl)adipate	<b>**</b>	Date/Time	2		<del></del>	Limit	Qualifier ID
·	EPA 525	09/3/01 2:10	WR	0.75 U	ug/L	0.75	E96080
Hexachlorobenzene	EPA 525	09/3/01 2:10	WR	0.34 U	ug/L	0.34	
Hexachlorocyclopentadiene	EPA 525	09/3/01 2:10	WR	0.26 U	ug/L	0.26	E96080
Simazine	EPA 525	09/3/01 2:10	WR	0.70 U	ug/L		E96080
Carbofuran	EPA 531.1	09/3/01 15:28	JJM	0.18 U	,	0.70	E96080
ıyl	EPA 531.1	09/3/01 15:28	ML	0.10 U	ug/L	0.18	E96080
Glyphosate	EPA 547	09/12/01 17:22			ug/L	0.10	E96080
Endothall	EPA 548.1			10 U	ug/L	10	E84129
Diquat		09/19/01 15:05	WR	2.8 U	ug/L	2.8	E96080
Gross Alpha	EPA 549.1	09/10/01 14:17	JJM	2.6 U	ug/L	2.6	E96080
•	EPA 900.0	09/12/01 0:00	KNL	8.1 +/- 2.6	pCi/L		
Radium 226 L	EPA 903.1	09/13/01 0:00	KNL	1.7 +/- 0.5	pCi/L		
Colar	SM2120 B	08/30/01 14:30	TCL	7.0	CU	5.0	
Ddor	SM2150 B	08/30/01 12:00	РНМ	1.5	T.O.N.		E90080
otal Dissolved Solids	SM2540 C	08/31/01 16:00	JL	1400		1.0	E96080
yanide	SM4500CN E	08/31/01 14:01	JL		mg/L	10	E96080
urfactants as LAS, Mol.wt.340	SM5540 C			0.016 U	mg/L	0.016	E96080
ackground on Total Coli	SM9222 D	08/31/01 11:20	JL	0.11	mg/L	0.019	E96080
onfirmed Fecal Coliform		08/30/01 12:30	GG	1.0 ປ	CFU/100mL	1.0	E96080
	SM9222 D	08/30/01 12:30	GG	1.0 U	CFU/100mL	1.0	E96080
onfirmed Total Coliform	SM9222 D	08/30/01 12:30	GG	1.0 U	CFU/100mL	1.0	E96080
tal Coliform	SM9222 D	. 08/30/01 12:30	GG	1.0 U	CFU/100mL	1.0	E96080
						•••	L30000

## SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOUI EVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Harbor Branch Oceanographic Institution Inc. 5600 US 1 North Fort Pierce, FL 34946-

September 13, 2001 Project No: 25635

**Laboratory Report** 

Project Name	20079	935-2007937, 2	008032				<del>-</del>
Parameters	Units	Results	Method	Detection Limit	n Date/Time Analyzed	Date/Time Prep	Analys
Sample Description Matrix SAL Sample Number Date/Time Collected Date/Time Received	25635. 08/29/6	dwater					
Pesticide Analyses Glyphosate	ug/l	10 U	EPA 547	10	09/12/01 16:57		
Sample Description Matrix "AL Sample Number Jate/Time Collected Date/Time Received	200793 Ground 25635.0 08/29/0 09/11/0	iwater )2 1 17:30	-				
Pasticide Analyses Glyphosate	ug/l	10 U	EPA 547	10	09/12/01 17:09		
Sample Description fatrix IAL Sample Number Jate/Time Collected Jate/Time Received	2007937 Ground 25635,03 08/29/01 09/11/01	water 3 16:30			17.09		DF
esticide Analyses lyphosate	ug/l	10 U	EPA 547	10	09/12/01 17:22		
ample Description atrix L. Sample Number ate/Time Collected ate/Time Received	20080320 Wastewa 25635.04 09/07/01 09/11/01	ter 08:20	-		11.66		DF
Stigide Anatraes /phosate	ug/l	610	EPA 547	10 0	9/12/01 17:44	n	F

## SOUTHERN ANALYTICAL LABORATORIES, INC.

1 10 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Harbor Branch Oceanographic Institution inc. 5600 US 1 North Fort Pierce, FL 34946-

September 13, 2001 Project No: 25635

**Laboratory Report** 

Project Name

2007935-2007937, 2008032

#### **Footnotes**

Analyte was not detected; indicated concentration is method detection limit.

n 001A

Fax: (561) 467-1584

ceiving Laboratory: Southown Analytical.

GHAIN OF CUSTODY RECORD

ne samples are to be shipped by Fed Ex to arrive on 9.11.	(-0) TAT: Ad
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	BOR BRANCH ENVIRONMENTAL LABORATORY									SIS REQU		COLLECTION	V REMARKS	
									PRES	SERVATIV	'E			
<del></del>	mposite = C. (				RIX: Drk. Wtr. = D Vastewtr. = WW, Se	U 2 = 201102 10 U	acts - 11/							
VATIVE: F ved = U I Crde	lydrochloric A			N; Sodiun	n Thiosulfate = S; S	Sulfuric Acid = SU		the						
45	GIU 8/29 1545 G ZXX7935 001						7					SAMPLE CO	MENTS	
<u> </u>	CN	6/27	1730	G	20079	36,00%		7						
1_	(())	01	0520	G		37 (M) 32 (M)		7				4		
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													<del></del>	
14.7	AGEINGOISHEI	) II Y			9.10.01	TIME 16:00		<u> </u>	RECEIVED	эвү			DATE	TIME
RELINOURS OF DRAY					الم مل	LAIRORATOR	Y NAME AN	ID RECEIVED	)BY		DATE 9/11/61	TIME		

#### DOH Certification #E84025 DEP COMPQAP # 870251



2742 N. Florida Ave. P.O. Box 1833 Tampa, Florida 33601 (813) 229-2879 Fax (813) 229-0002 Report Date: September 20, 2001

Harbor Branch Environmental Labs

5600 U.S. 1 North

Ft. Pierce, FL 34946

Attn: Eric Charest

Field Custody:

Client

Client/Field ID:

2007937001

Sample Collection:

8-29-01

Lab ID No:

61144

Lab Custody Date:

8-31-01

Sample description:

GW

Parameter	Units	R	Results		Analysis Date	Method	Data Qualifier
Gross Alpha	pCi/l	8.1	±	2.6	9-12-01	EPA 900.0	
Radium-226	pCi/l	1.7	±	0.5	9-13-01	EPA 903.1	

lpha Standard: Th-230

James W. Hayes Laboratory Manager

#### HARBOR BRANCH ENVIRONMENTAL ABORATORY 5600 U. S. 1 North, Ft. Pierce, FL 34946, 561-465-2400 ext. 292 Fax: (561) 467-1584 CHAIN OF CUSTODY RECORD

	ratory: _													
amples a	re to be s	hipped	by <u>Fe</u>	<u>م کی کی</u>	<u> </u>	to arrive on	8/28	<u>(·3/·a</u> )	TAT:_	Sta	<u>'</u>			
BOR BR	ANCH E	NVIRO	NMEN	TAL I	ABORATOR	Υ			ANALY	SIS REQUIR	ED		COLLECTION R	EMARKS
CT NAME:									PRES	ERVATIVE				
			······································					HVN3						
E TYPE: Cor	nposite = C, G	reb = G,		MATR SW, W	IX: Drk Wtr. = DW,	Ord. Wit. = GW, S or solids = S, Wast	Surface Wir. = c = W	hond						
RVATIVE H erved = U	ydrochloric Ac	sid = 11; Nit	nic Acid = N	, Sedium	Thiosulfate = 5; Sul	furic Acid = SU,		Gross a.						
heat Code	MATRIX	COLL	ECTION TIME	TYPE	SIRCL	SAMPLE XD		00					SAMPLE COM	4ENTS
พร	GUS	8/29	1545	G	200793	5001		7						
INS	မေ	8/19	1730	G	20793	6001		7						
-WS	GN	8/29	1630	G	200793			7						
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In Ni	RELINGUASH	ED RY			8.30.01	TME /600		<del></del>	RECEIV	ED 84			DATE	TIME:
RELENQUISHED BY DATE TIME								anderson KNC 8316 1000						

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### INORGANIC ANALYSIS 62 - 550.310 (1) (PWS030)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep Zone 1 Grab

Sample Number:

2007937001

Sampling Date:

8/29/01 16:30

reservative:

Nitric Acid, Sodium Hydroxide, or None

ate Received:

ID	Parameter	MCL	Result		Method	MEN		
1005	Arsenic	[0.05]	0.0032 U		<del></del>	MDL	Date	Lab ID
1010	Barium	[2]		mg/L	EPA 200.7	0.0032	9/01/01	E96080
1015	Cadmium	[0.005]	0.014	mg/L	EPA 200.7	0.0018	9/01/01	E96080
1020	Chromium	•	0.00070 U	mg/L	EPA 200.7	0.00070	9/01/01	E96080
1024	Cyanide	[0.1]	0.0018 U	mg/L	EPA 200.7	0.0018	9/01/01	E96080
?5	Fluoride	[0.2]	0.016 U	mg/L	SM4500CN E	0.016	8/31/01	E96080
1030	Lead	[4]	1.1	mg/L	EPA 300.0	0.011	8/30/01	E96080
1035		[0.015]	0.0011 U	mg/L	EPA 200.9	0.0011	9/01/01	E96080
1036	Mercury	[0.002]	0.000060 U	mg/L	EPA 245.1	0.000060	9/05/01	E96080
1040	Nickel	[0.1]	0.0020 U	mg/L	EPA 200.7	0.0020	9/01/01	E96080
	Nitrate as N	[10]	0.0030 U	mg/L	EPA 300.0	0.0030	8/30/01	E96080
1041	Nitrite as N	[1]	0.0022 U	mg/L	EPA 300.0	0.0022	8/30/01	E96080
1045	Selenium	[0.05]	0.0022 U	mg/L	EPA 200.9	0.0022	9/05/01	E96080
1052	Sodium	[160]	340	mg/L	EPA 200.7	0.50		•
1074	Antimony	[0.006]	0.0042 U	mg/L	EPA 200.9	0.0042	9/01/01	E96080
1075	Beryllium	[0.004]	0.00010 U	mg/L	EPA 200.7		9/06/01	E96080
1085	Thallium	[0.002]	0.0010 U	mg/L	EPA 200.9	0.00010	9/01/01	E96080
		- •		a.r	LFA 400.9	0.0010	9/05/01	E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### Trihalomethane Analysis 62 - 550.310 (2) (a) (PWS027)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep Zone 1 Grab

Sample Number:

2007937001

Sampling Date:

8/29/01 16:30

Preservative:

1:1 Hydrochloric Acid

Date Received:

ID	Parameter	MCL	Chlorine Residual	Result		Method	MO	_	
2950	Total THMs	[0.10]		0.00050 U	mg/L	EPA 524.2	MDL 0.00050	Date 8/30/01	Lab ID E96080

5600 U.S. 1 North, Fort Pierce, FL 34946 (561) 465-2400, Ext. 285



#### Volatile Organic Analysis 62 - 550.310 (2) (b) (PWS028)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep Zone 1 Grab

Sample Number:

2007937001

Sampling Date:

8/29/01 16:30

Preservative:

1:1 Hydrochloric Acid and Sodium Thiosulfate

Date Received:

ID	Parameter	MCI	- Result		••			
2378	1,2,4-Trichlorobenzene	[70]	0.37 U		Method	MDL	Date	Lab ID
2380			0.37 U 0.23 U	ug/L	EPA 524.2	0.37	8/30/01	E96080
2955		[10000		ug/L	EPA 524.2	0.23	8/30/01	E96080
2964	Methylene chloride	[5]	0.49 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
2968	1,2-Dichlorobenzene	[600]	0.45 U	ug/L	EPA 524.2	0.49	8/30/01	E96080
)69	1,4-Dichlorobenzene	[75]	0.33 U 0.28 U	ug/L	EPA 524.2	0.35	8/30/01	E96080
2976	Vinyl chloride	[1]	0.23 U	ug/L	EPA 524.2	0.28	8/30/01	E96080
2977	1,1-Dichloroethene	[7]	0.33 U 0.21 U	ug/L	EPA 524.2	0.33	8/30/01	E96080
2979	trans-1,2-Dichloroethene	[100]	0.18 U	ug/L	EPA 524.2	0.21	8/30/01	E96080
2980	1,2-Dichloroethane	[3]	0.45 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
2980	1,1,1-Trichloroethane	[200]	0.25 U	ug/L	EPA 524.2	0.45	8/30/01	E96080
2982	Carbon tetrachioride	[3]	0.28 U	ug/L	EPA 524.2	0.25	8/30/01	E96080
2983	1,2-Dichloropropane	[5]	0.23 U	ug/L	EPA 524.2	0.28	8/30/01	E96080
2984	Trichloroethene	[3]	0.21 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
2985	1,1,2-Trichloroethane	[5]	0.23 U	ug/L	EPA 524.2	0.21	8/30/01	E96080
2987	Tetrachloroethene	[3]	0.26 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
2989	Chlorobenzene	[100]	0.23 U	ug/L	EPA 524.2	0.26	8/30/01	E96080
2990	Benzene	[1]	0.090 U	ug/L	EPA 524.2	0.23	8/30/01	E96080
2991	Toluene		0.18 U	ug/L	EPA 524.2	0.090	8/30/01	E96080
2992	Ethydhann		0.19 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
2996	Chiron		0.13 U 0.24 U	ug/L	EPA 524.2	0.19	8/30/01	E96080
		• -1	V.27 U	ug/L	EPA 524.2	0.24	8/30/01	E96080

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## PESTICIDES PCB CHEMICAL ANALYSIS 62 - 550.310 (2) (c)

(PWS029)

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

Client:

MW Deep Zone 1 Grab

Sample Number: 2007937001

Sampling Date:

8/29/01 16:30

Preservative:

Sodium Thiosulfate

Date Received:

8/30/01 9:45

ΙD	D	_						
2005	Parameter	MC	L Result		Method	MDL	Date	Lab ID
2005 2010		[2]	0.039 U	ug/L	EPA 505	0.039	8/30/01	
2010 2015	o ma arro (Emidano)	[0.2]	0.020 U	ug/L	EPA 505	0.020	8/30/01	E96080
2013 2020		[40]	0.017 U	ug/L	EPA 505	0.017		E96080
2020 2031	Toxaphene	[3]	0.96 U	ug/L	EPA 505	0.96	8/30/01 8/30/01	E96080
2031	Dalapon	[200]	2.6 U	ug/L	EPA 515.1	2.6	9/08/01	E96080
	Diquat Endother	[20]	2.6 U	ug/L	EPA 549.1	2.6		E96080
	Endothall	[100]	2.8 U	ug/L	EPA 548.1	2.8	9/10/01	E96080
034	Glyphosate	[700]	10 U	ug/L	EPA 547	10	9/19/01	E96080
035 036	Di(2-ethylhexyl)adipate	[400]	0.75 U	ug/L	EPA 525	0.75	9/12/01	E84129
036 037	Oxamyl	[200]	0.10 U	ug/L	EPA 531.1	0.10	9/03/01	E96080
037 039	Simazine	[4]	0.70 U	ug/L	EPA 525	0.70	9/03/01	E96080
	bis(2-ethylhexyl)phthalate	[6]	0.94 U	ug/L	EPA 525	0.94	9/03/01	E96080
040	Picloram	[500]	0.26 U	ug/L	EPA 515.1	0.26	9/03/01	E96080
)41	Dinoseb	[7]	0.58 U	ug/L	EPA 515.1	0.58	9/08/01	E96080
)42	Hexachiorocyclopentadiene	[50]	0.26 U	ug/L	EPA 525	0.26	9/08/01	E96080
146	Carbofuran	[40]	0.18 U	ug/L	EPA 531.1	0.18	9/03/01	E96080
50	Atrazine	[3]	0.54 U	ug/L	EPA 525	0.54	9/03/01	E96080
51	Alachlor	[2]	0.68 U	ug/L	EPA 525	0.68	9/03/01	E96080
65 	Heptachlor	[0.4]	0.085 U	ug/L	EPA 505	0.085	9/03/01	E96080
67 	Heptachlor epoxide	[.2]	0.021 U	ug/L	EPA 505	0.003	8/30/01	E96080
05	2,4-D	[70]	0.53 U	ug/L	EPA 515.1	0.53	8/30/01	E96080
10	2,4,5-TP	[50]	0.41 U	ug/L	EPA 515.1	0.33	9/08/01	E96080
	Hexachlorobenzene	[1]	0.34 U	ug/L	EPA 525	0.34	9/08/01	E96080
	Benzo(a)pyrene	[.2]	0.078 U	ug/L	EPA 525	0.078	9/03/01	E96080
	Pentachlorophenol	[1]	0.34 U	ug/L	EPA 515.1	0.076	9/03/01	E96080
	PCB	[.5]	0.24 U	ug/L	EPA 508		9/08/01	E96080
	1,2-Dibromo-3-chloropropane	[.2]	0.0022 U	ug/L	EPA 506	0.24	9/08/01	E96080
	1,2-Dibromoethane	[.02]	0.0024 U	ug/L	EPA 504.1	0.0022	8/30/01	E96080
9 (	Chlordane	[2]	0.087 U	ug/L	EPA 504.1	0.0024	8/30/01	E96080
lho				α <b>β</b> ι⊏	ELY 202	0.087	8/30/01	E96080
	l Florida Orlando Ari		Jacksonvil	le Area	Fort Myers	Area	West Centra	l Florida

Pierce, FL 34946 Deltona, FL 32725 Jacksonville Area Fernandina Beach, FL 32034

Fort Myers Area

West Central Florida

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### SECONDARY CHEMICAL ANALYSIS 62 - 550.320 (PWS031)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep Zone 1 Grab

Sample Number:

2007937001

Sampling Date:

8/29/01 16:30

Preservative:

ID

Nitric Acid or None

Date Received:

**Parameter** 

ID 	Parameter	MCL	Result		Method	Mar		
1002 1017 1022 1025 1038	Aluminum Chloride Copper Fluoride Iron	MCL [0.2] [250] [1] [4] [0.3]	0.0030 U 470 0.0014 U 1.1 0.73	mg/L mg/L mg/L mg/L mg/L	Method  EPA 200.7  EPA 300.0  EPA 200.7  EPA 300.0  EPA 200.7	0.0030 5.0 0.0014 0.011	9/01/01 9/06/01 9/01/01 8/30/01	E96080 E96080 E96080 E96080
1050 1055 1055 1095 1905 1920	Manganese Silver Sulfate Zinc Color Odor pH	[0.05] [0.1] [250] [5] [15] [3]	0.0041 0.0010 U 210 0.015 7.0 1.5	mg/L mg/L mg/L mg/L CU T.O.N.	EPA 200.7 EPA 200.7 EPA 300.0 EPA 200.7 SM2120 B SM2150 B	0.025 0.0038 0.0010 1.4 0.010 5.0	9/01/01 9/01/01 9/01/01 9/06/01 9/01/01 8/30/01	E96080 E96080 E96080 E96080 E96080 E96080
930	Total Dissolved Sollds	[6.5-8.5] [500] [0.5]	8.05 1400 0.11	SU mg/L mg/L	EPA 150.1 SM2540 C SM5540 C	0.200 10 0.019	9/05/01 8/31/01 8/31/01	E96080 E96080 E96080

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#### RADIOCHEMICAL ANALYSIS 62 - 550.310 (5) (PWS033)

Client:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

Sample Location:

MW Deep Zone 1 Grab

Sample Number:

2007937001

Sampling Date:

8/29/01 16:30

Preservative:

Nitric Acid

Date Received:

ID	Parameter	Result   Error				
4000	Gross Alpha	TOOLK   LITO	· (Oddic   Lift)		Date	Lab ID
		8.1 +/- 2.6	pCi/L	EPA 900.0	9/12/01	E84025
4020	Radium 226	1.7 +/- 0.5	pCi/L	EPA 903.1	9/13/01	E84025

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#### Unregulated Group II Analysis 62 - 550.410 (PWS034)

lient:

Florida Water Services

Workorder:

2601 Marco Lakes ASR DW Scan

ample Location:

MW Deep Zone 1 Grab

ample Number:

2007937001

ampling Date:

8/29/01 16:30

reservative:

1:1 Hydrochloric Acid

ate Received:

טו	Parameter	Result		Method	MDL	Date	Lab ID
2210	Chloromethane	0.43 U	ug/L	EPA 524.2	0.43	8/30/01	E96080
2212	Dichlorodifluoromethane	0.49 U	ug/L	EPA 524.2	0.49	8/30/01	
2214	Bromomethane Promomethane	0.41 U	ug/L	EPA 524.2	0.41	8/30/01	E96080
2216	Chloroethane	0.42 U	ug/L	EPA 524.2	0.42		E96080
2218	Trichlorofluoromethane	0.20 U	ug/L	EPA 524.2	0.42	8/30/01	E96080
2.	Methyl-tert-butyl-ether	0.24 U	ug/L	EPA 524.2	0.24	8/30/01	E96080
408	Dibromomethane	0.41 U	ug/L	EPA 524.2	0.41	8/30/01	E96080
410	1,1-Dichloropropene	0.10 U	ug/L	EPA 524.2	0.10	8/30/01	E96080
412	1,3-Dichloropropane	0.30 U	ug/L	EPA 524.2	0.10	8/30/01	E96080
413	1,3-Dichloropropene	0.30 U	ug/L	EPA 524.2	0.30	8/30/01	E96080
414	1,2,3-Trichloropropane	0.26 U	ug/L	EPA 524.2	0.36	8/30/01	E96080
416	2,2-Dichloropropane	0.47 U	ug/L	EPA 524.2	0.47	8/30/01	E96080
941	Chloroform	0.18 U	ug/L	EPA 524.2	0.47 0.18	8/30/01	E96080
942	Bromoform	0.48 U	ug/L	EPA 524.2	0.18	8/30/01	E96080
943	Bromodichloromethane	0.27 U	ug/L	EPA 524.2		8/30/01	E96080
944	Dibromochloromethane	0.40 U	ug/L ug/L	EPA 524.2	0.27	8/30/01	E96080
965	2-Chlorotoluene	0.18 U	ug/L		0.40	8/30/01	E96080
966	4-Chlorotoluene	0.16 U	ug/L ug/L	EPA 524.2	0.18	8/30/01	E96080
67	1,3-Dichlorobenzene	0.10 U	_	EPA 524.2	0.16	8/30/01	E96080
78	1,1-Dichloroethane	0.11 U	ug/L	EPA 524.2	0.22	8/30/01	E96080
86	1,1,1,2-Tetrachloroethane	0.11 U	ug/L	EPA 524.2	0.11	8/30/01	E96080
88	1,1,2,2-Tetrachloroethane	_	ug/L	EPA 524.2	0.15	8/30/01	E96080
93	Bromobenzene	0.39 U	ug/L.	EPA 524.2	0.39	8/30/01	E96080
50		0.20 U	ug/L	EPA 524.2	0.20	8/30/01	E96080

#### **APPENDIX 3.2**

# GIARDIA LAMBLIA AND CRYPTOSPORIDIUM TEST RESULTS



April 6, 2001

Mr. Frank Kane
Florida Water Services
960 Collier Blvd.
Marco Island, FL 34145

Dear Mr. Kane:

Enclosed are the results for the samples submitted Giardia/Cryptosporidium assay on March 19, 2001. These samples were processed and assayed according to the US EPA ICR Microbial Laboratory Manual (EPA/600/R-95/178) protocol for detecting Giardia cysts and Cryptosporidium oocysts. When organisms are detected, they are reported as calculated on the basis of a 100 liter sample. When no organisms are observed, the detection limit is reported.

This sample was also stained with DAPI in order to enhance determination of cyst/oocyst internal structure. Positive DAPI staining is an indicator of potential viability. One cryptosporidium oocyst was observed in the examined portion of sample E01-0051; it had amorphous structure and did not stain with DAPI.

In addition to the Assay Report, I have also enclosed copies of specimen submittal sheet and an invoice for these tests. Please forward it for payment.

Please contact me if you have any questions or need additional documentation.

Thank you for selecting our laboratory. I hope we will be able to meet your testing needs now and in the future. I look forward to hearing from you.

Sincerely,

Lillian M. Stark, Ph.D., M.P.H., M.S.

Biological Administrator I

LMS/als

Enclosure: 3



## Giardia/Cryptosporidium Assay Report

		Collection date	Volume examined	# Giardia cysts	# Cryptosporidium oocysts	Comments
E01- 0051	Henderson Creek 1730 Collier Blvd Naples, FL	03/26/01	17.0 L	<5.87 / 100 L	5.87 / 100 L	Cryptosporidium oocyst DAPI negative; heavy debris, algae;
* I6	7. Jan 1	· · · · · · · · · · · · · · · · · · ·				some crustaceans

\* If no oocysts (ox cys(s) are detected, the detection limit for the sample is reported as < per 100 liters

Reported by

Lillian M. Stark, Ph.D., M.P.H., M.S.

**Biological Administrator** 

Date: 04/06/01



Joh Rusch

## M water services

E01- **051** 

Tampa Branch Laboratory 3952 W. Dr. M.L. King Jr. Blvd. Tampa, FL 33614-8404 phone: (813)871-7465 ATTN: Dr. Stark

Robert G. Brooks, M.D.

## Submission Sheet: Water Samples (Potable and Non-potable) for Parasite, Enterovirus or Microscopic Particulate Analysis

Please complete separate form down to heavy dark line for each specimen.								
Send Reports to:								
Name: Trank Kene.								
Mailing Address								
City Marco Is	County	v						
State: Zip: 34145	County Collie Phone 941-394-3353	Fax 941-394-4069						
Collection Data:								
Site: Henderson Creek	Ł							
Address 1730 Collier 13	lod							
City Naples	County Caller							
State: Zip: 341/3	Collector's signature:	155						
Start Date Sample	Finish Date Sample	Sample						
Collected: 3-26-2001	Collected: 3-26-2601	temperature: pH: 8.2						
Start	Finish	Total Sampling						
Time 14:00	Time 14:26	Time 26 min						
Start Meter	Finish Meter	Total Volume Collected: 270AL						
Reading 257.0	Reading 259.7	gallons 🗗 liters 🔾						
Start	Finish	Sodium Thiosulfate added ?						
Turbidity N/A	Turbidity W/A	YES O NO O						
Callagran's Commence	·							
PILIER #5								
Test Requested: Giardia/Cryptosporidium MPA C								
Total Culturable Enteroviruses Other (specify):								
Do NOT write below this line > (For laboratory use only)								
Date Sample	Time Rec'd: AM Ø	Pao'd Dur V						
Received: 3/27/01	(0:45 PM C)	Rec'd By: La Japon						
Shipping (1.0)	Tracking #:	Specimen /// A						
Carrier: UPS 17.3	1798980145806361	Temperature: 40						
Laboratory	Specimen	remperature.						
Accession # $E01-051$								
Date 3/27/P1 +	condition: 600d							
Processed: 3/28/0/ Larson Kehoe, + Regar								
Date Technician:								
Assaved: 4/2,4/5 + 4/6/01 Larson + Kazanis								
Date By:								
Reported:	11107							
submit (res 3/12/98)								

Bureau of Laboratories