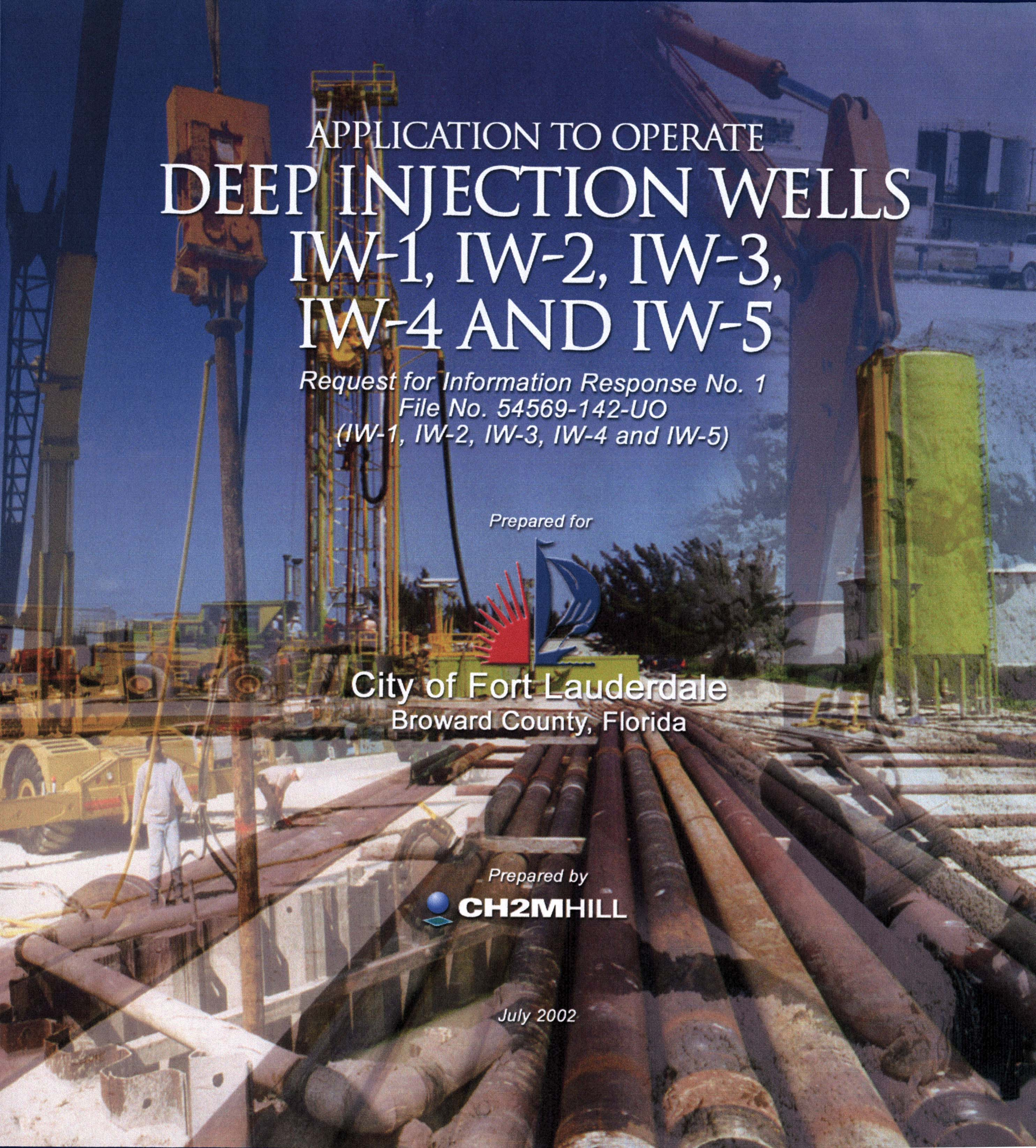


APPLICATION TO OPERATE
DEEP INJECTION WELLS IW-1, IW-2, IW-3, IW-4 AND IW-5

Request for Information Response No. 1
File No. 54569-142-UO
(IW-1, IW-2, IW-3, IW-4 and IW-5)

Prepared for

City of Fort Lauderdale
Broward County, Florida

Prepared by

CH2MHILL

July 2002

CH2M HILL
Hillsboro Executive Center North
800 Fairway Drive
Suite 350
Deerfield Beach, FL 33441-1831
Tel 954.426.4008
Fax 954.698.6010

CH2MHILL

July 12, 2002

Mr. Joseph May, P.G.
Program Manager
Underground Injection Control
Florida Department of Environmental Protection
P.O. Box 15425
West Palm Beach, FL 33416

RE: Request for Information (RFI)—City of Fort Lauderdale's Operation Permit Application for Injection Wells IW-1, IW-2, IW-3, IW-4 and IW-5, Located at the G.T. Lohmeyer Wastewater Treatment Plant (WWTP)

BROWARD COUNTY
UIC – G.T. LOHMEYER WWTP
FILE #: 54569-142-UO (IW-1, IW-2,
IW-3, IW-4 and IW-5)

Dear Joe:

This letter is in response to the Department's request for information (RFI) dated April 30,2002 regarding the above mentioned project. For your convenience, responses included in this submittal have been italicized and correspond directly to the RFI questions.

1. *General - The operating renewal permit application for this facility contains frequent general references to previous documents without including - in the application package itself - those portions of the cited documents which actually contain the pertinent information. With the exclusion of video surveys and geophysical logs previously submitted to the Department, please submit all such referenced information so that these materials may be an integral part of the operating permit application.*

   In lieu of submitting a full document, the document may be referenced if the following information is supplied: document name, document date, and page number and section(s) (if applicable) which apply to the item for which documentation is required. This information is necessary so that there is no question as to which part(s) of the document is being used to satisfy the permit application requirements and/or information requirement. Once the document is identified or the information is resubmitted then the responses will be reviewed for completeness and accuracy.

Response:

Please see the attached documents provided in Attachment 1.

2. *DEP Form No. 62-528.900(1), Page 2; and Section 2 of application document, Page 6 - Please provide the latitude/longitude coordinates for each of the injection wells.*

Response:

Latitude and longitude for wells MW-3 and IW-4 are provided in Attachment 2

3. *Application Items C.1. and C.2 and Area of Review (AOR) Information –*

   a. *The City's proposed AOR for this injection well system includes land within two miles of the WWTP. Please justify how the two-mile AOR meets the requirements of Rule 62-528.300(4)(a) and (b), F.A.C. (including formulas and actual calculations used to determine the two-mile area of review); alternately, please provide AOR information for a minimum radius* ***five*** *miles from the edge of the* ***injection well field****.*

   The thorough narrative for the wells located with the original two-mile AOR is commendable. However, as required by Rule 62-528.300(4)(a) and (b), F.A.C., the area of review needs to "take into account the zone of endangering influence, which is the area in which the buoyant forces or increased pressures in the injection zone may cause the migration of the injected and formation fluid into an underground source of drinking water. The area of review is the land surface overlying the zone of endangering influence." The Department does not believe that the proposed AOR is large enough to adequately address the requirements of Rule 62-528.300(4), F.A.C. (Informational requirements applicable to AOR size justification are included in Rules 62-528.300(4)(a) and (b), F.A.C. and 62-528.455(3)(b)1., F.A.C. Copies of these relevant portions of Chapter 62-528, F.A.C. are included in Attachment ***A****.)*

   In regard to AOR size justification: the more that a defined injection zone includes discrete narrow zones of very high permeability (which may hydraulically function as 'lateral conduits'), the more likely it is that fluids will migrate further in a lateral direction than may be predicted from a simple calculation based on homogeneity and isotropy assumed across the total thickness of a defined injection zone (whether it be defined as 500-ft, 1500-ft, etc.). The AOR size justification should recognize and take into account such factors, so as to derive a reasonably conservative AOR size.

Response:

A 5-mile area of review has been conducted for the Ft. Lauderdale site. The figure is presented in Attachment 3.

   b. *Once the AOR is extended, please provide the following information:*

      i) *Construction details of any wells located within the revised area of review, as was originally done (in the operation permit application document received in April 2002). The construction details must include total depth, casing depth and size, date drilled, well's use, and record of plugging and/or completion. This information is also needed for* ***Well Number 18*** *(listed on Table 3-3 and shown within the AOR on Figure 3-3 and discussed on Page 5) since this well is 3,010 feet deep.*

Response:

Well construction details are provided in Attachment 3.

ii) *If any wells are found within the expanded AOR which penetrate the injection zone or confining zone and they are not properly completed or plugged, then the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C., must be submitted. If needed, the corrective action for well number 18 as discussed above must also be addressed.*

Response:

Well #18, drilled by Port Everglades Oil and Gas Company in 1929 is located approximately 1.5 miles north-northwest of the G.T. Lohmeyer site. As documented in the "Application to Construct Deep Injection Well" (July, 18,1978), the well was abandoned and the steel casings removed in the early 1940's (see Attachment 3).

c. *Please submit Florida Geological Survey (FGS) well data from both its Oil and Gas Section and its Geological Investigations Section, for the full AOR. Well information for the AOR survey is available from both of these FGS sections. In addition to the oil and gas related wells which the FGS permits, the FGS also maintains information on other wells throughout the State. Both of the FGS sections may store information on wells that penetrate the Floridan aquifer.*

Response:

As requested data from the applicable agencies is presented in Attachment 3.

4. *Application Items C.3., C.4. and C.5 - Please submit cross-sections detailing the hydrology and geologic structures locally* ***and*** *regionally for the north to south and east to west directions. Also, please include a site map (to scale and with the north direction indicated) showing the location of the wells used for the cross-sections. On the cross-sections, please include: formation names and boundaries, the base of underground sources of drinking (USDWs), boundaries of confining intervals and injection zones, and flow directions of the USDWs. Cross-sections used in recent application submittals may be used, however, the cross-sections should be modified to include some of the Miami-Dade wells to the south and if available some additional wells to the west of the Fort Lauderdale injection well facility.*

Response:

The requested cross sections are presented in Attachment 4.

5. *Application Item C.8 - As required by Rules 62-528.435(9) and 62-528.455(3)(b)8., F.A.C., a permittee must demonstrate and maintain financial responsibility and resources necessary to close, plug, and abandon the underground injection system. Therefore, please submit a plugging and abandonment (P&A) plan for each of the wells along with an estimate of cost to plug and abandon these wells. If — after the P&A cost estimate is revised — the cost estimate for P&A is more than what was originally approved, a new demonstration of financial responsibility must be submitted. (Approved costs: $210,00.00 each for Injection Wells IW-1, IW-2, IW-3, and IW-5; $328,800.00 for Injection Well IW-4 and Monitor Well MW-3 [$249,360 Injection Well IW-4 and $79,440 for Monitor Well MW-3]; $70,000.00 for Monitor Well MW-1; and $83,070.00 each for the regional monitor well and Monitor Well MW-2.) If a new demonstration is required, please submit a complete application for a Certification of Financial Responsibility to Mr. Richard Deuerling, FDEP, Mail Station 3530, Bureau of Water Facilities, 2600 Blair*

*Stone Road, Tallahassee, FL 32399-2400. Since the facility is defined as a local government, Items 2 and 3 of the documentation listed in Attachment **B** can be used to demonstrate financial responsibility. Please forward a copy of the transmittal letter for any financial responsibility documentation to the Technical Advisory Committee chairman (Joe May).*

Response:

The plugging and abandonment plan and the respective cost estimates for each well have been reviewed and found to be current with expected costs today, thus requiring no modification.

6. *Item C.9.(a) - Please complete the list of major engineering summary reports that include all available logging and testing program data and construction data on the injection well systems at the G.T. Lohmeyer WWTP.*

   The response to this application item references two reports. One of the referenced reports was prepared in 1984 for IW-1, IW-2 and IW-3; the other was prepared in 1999 for IW-4. However, the response does not reference a report prepared for IW-5, nor does it reference other major engineering/injection well system summary reports received from the City. For instance, the response does not reference the report written on the 'Rehabilitation of Monitor Well MW-1 and Construction and Testing of Monitor Well MW-2 and Regional Monitor Well RMW' (received at FDEP in July of 1995). It also does not cite the report written on the 'Construction and Testing of Monitor Well MW-3' (received at FDEP in September of 1996).

Response:

The following list summarizes the various reports that have been prepared since 1981 for matters related to the City of Fort Lauderdale Injection Well System. This list does not include the various permit applications and technical memorandum that are also part of the record for this system.

1. Geraghty and Miller, September 1981. Construction and Testing of the Test Injection Well IW-5, City of Fort Lauderdale, Florida
2. Geraghty and Miller, February 1984. Construction and Testing of Disposal Wells 1, 2, and 3 at the George T. Lohmeyer Plant, Fort Lauderdale, Florida.
3. Report for Mechanical Integrity Testing of Injection Wells IW 1, IW 2, IW 3 and IW 5 for Ft. Lauderdale (May 1991)
4. Report for Mechanical Integrity Testing of Monitor Well MW 1 for City of Ft. Lauderdale (March 93)
5. Mechanical Integrity Testing of Injection Wells IW 1, IW 2, IW 3 IW 5 for Ft. Lauderdale; Volumes 1 and 2, (March 95)
6. Engineering report on the Rehabilitation of Monitor Well MW-1 and Construction and Testing of Monitor Well MW-2 and Regional Monitor Well RMW-1 at the G.T. Lohmeyer Wastewater Treatment Plant (June 95)

7. Engineering Report on the Construction and Testing of Monitor Well MW 3 at the G.T. Lohmeyer Wastewater Treatment Plant (September, 1996)

8. Operation and Maintenance Manual Update for Deep Injection Well System at the G.T. Lohmeyer Wastewater Treatment Plant (January 1997).

9. Engineering report on the Construction and Testing of Injection Well IW 4 at the G. T. Lohmeyer Wastewater Treatment Plant (March 1997)

10. Report on the Construction and Testing of Injection Well IW 4 at the City of Ft. Lauderdale G.T. Lohmeyer Wastewater Treatment Plant, Volumes 1 and 2 (February 1999)

11. Engineering Report for Mechanical Integrity Testing of Injection Well IW 1, IW 2, IW 3, IW 4, IW 5; Volumes 1 and 2 (January 2000)

7. *Application Item C.9.(b) - Please submit a copy of the calibration certificate and the field report for the casing pressure test performed on IW-4. Also, please submit a copy of the field report for the video survey and the Geiger counter survey for IW-4 (see Page 24 of Attachment B of the CH2MHill July 12, 2001, response to the Department's May 3, 2001, Request For Information).*

Response:

Copies of the requested calibration certificate, field report for the IW-4 casing pressure test, video and Geiger survey are provided in Attachment 5.

8. *As required by Rule 62-528.455(3)(b)3., F.A.C., a recent analysis of the injection fluids must be submitted. Therefore, please submit or reference an analysis of the effluent, which includes primary and secondary drinking water standards and minimum criteria parameters (see Attachment **C** for list).*

Response:

A copy of the most recent injection fluid analysis is provided in Attachment 6.

9. *Monitor Well Sampling Information - Monitoring trends (seen in data submitted for the Floridan aquifer monitor wells at the facility) have been the subject of recent RFIs from the Department. Based upon inspection of the most recently compiled monitor well water quality graphs (included in the City's current operation permit application), and the seeming trends noted below, the Department is concerned that fluid movement may be occurring at this facility. Thus, please respond to the following comments:*

   a. *Monitor Well MW-1 was modified from a three-zone monitor well to a two-zone monitor well in 1994. This modification was made because a leak in the tubing was allowing water from the original lower zone (2,568 to 2,670 feet) to migrate into the then intermediate zone (1,493 to 1,534 feet). The well was modified by plugging the lower zone and relocating the intermediate zone (new lower zone) and upper zone to 1,449 to 1,557 and 1,288 to 1,320 feet, respectively. Since the leak and tubing repairs were completed on MW-1 on October 14, 1994, it would seem that total kjeldahl nitrogen (TKN) and ammonia concentrations from the lower zone of this monitor well should be decreasing if fluid movement were not continuing to occur. In recent discussions, the City has provided its explanation (interpretation) as to*

why the TKN and ammonia have not decreased as expected if fluid movement were not continuing to occur. If the City has additional thoughts in this regard, please provide comment.

Response:

On July 5, 2002 representatives from the City (Mike Bailey and Mike Just) and CH2M HILL (Sean Skehan) met with FDEP (Joe May, Mark Silverman, and Cathy McCarty by conference call) to discuss water quality issues presented in question 9 of this RFI. A historical review of the site (made by Sean Skehan) from initial permitting in 1978 to present, presented data that supports the City's request for operational permits for Injection Wells IW-1, IW-2, IW-3, IW-4 and IW-5. The review traced a list of documents that have been prepared since 1978 (see Attachment 7) as follows:

An application to construct a test injection well was submitted in July, 1978. The application outlined a test well program that would install an exploratory test hole constructed for the purposes of gathering site specific geologic and hydrogeologic data that would be used to control all subsequent design and construction. The wells installed under the first phase included the test injection well to the Boulder Zone, Floridan aquifer monitor well, a Biscayne Aquifer water supply well and Biscayne Aquifer monitor wells. The application noted the presence of a 3,000-foot oil test well drilled by the Port Everglades Oil and Gas Company in 1929, 1.5 miles north-northwest of the site. It also noted this well had been abandoned and steel casings removed in the early 1940's, for which there was no additional data available.

In September 1981, a report on the Construction and Testing of The Test injection Well (Geraghty & Miller) presented the findings of the test well that included the data collected, subsurface conditions, well drilling and construction techniques, pumping and injection test and prospects for additional wells in the future. A section on the construction of the Floridan aquifer monitor well reviewed the results of a cement bond log (CBL) that reported, "Between 1,950 and 2,200 feet, both low and high amplitude signals as well as some pipe signal can be seen, indicating places where the bonding is incomplete." (See page 41 of report) It was also reported that, "A mix of low and high amplitude signals can be seen between 1,822 and bottom of the gravel pack in Monitor Zone #2 at 1,596 feet." This data indicates that there was the potential for effluent to move along the annulus of the lower monitor tubing once it failed and subsequently invade the uncemented interval. This was especially true of the interval that corresponded to the intermediate monitor interval. It should be noted that the original design of the multi-zone monitor well had the lower tubing set at a shallower depth, but due to a desire to understand the movement of fluid after it was injected it was requested that this zone be constructed into the top of the injection interval. It is reported that during the injection test at the test well (IW-5) that an immediate response was observed in the lower zone of the monitor well, thus demonstrating the direct connection of this interval to the injection interval.

In May 1991, after completing the first series of mechanical integrity tests on the injection wells it was noted that monitoring well water quality data demonstrated the effects of effluent parameters in the lower and intermediate monitor intervals. Soon there after, an initial evaluation of the monitor well was conducted, which included a video survey of the

lower monitor zone. Results of the video survey indicated a very rough interior surface of the tubing that was described as a heavy buildup of concretions over the full extent of the tubing. The final two descriptions of the survey state, "...casing not apparent... ,... and that the diameter becomes more restrictive" thus limiting access of the tool to a depth of 2,259 feet as compared to the total depth of the well at 2,705 feet.

In the Report for Mechanical Integrity of MW-1, March 1993, multiple logging events were conducted using the fluid resistivity (FR) tool to understand water quality conditions in the lower monitor zone tubing prior to cleaning out the tubing. The methodology for one particular test, had the FR tool placed at a depth of approximately 2,259 feet (limited by the build up on the inside of the tubing noted above). This was followed by displacing the theoretical volume of the tubing with fresh water and then locking the well in over-night. The following day the tool was logged up out of position back to land surface. The resulting log (see report) indicated that a significant amount of the fresh water had been displaced by native formation water, thus demonstrating the lack of mechanical integrity for the lower zone tubing. This log clearly demonstrated a significant potential for a broad interval to be affected by the failed tubing at MW-1.

While constructing MW-2 in 1994, a total of eight drill stem packer tests were conducted on the pilot hole between the depths of 900 feet and 2,000 feet bpl Packer test data (see attached Packer Test Data Table) indicated that a broad interval, from approximately 1,400 feet through to at least 1,850, had been affected by ammonia and TKN (effluent parameters). Coincidentally, this broad interval closely correlated to the section of failed tubing at MW-1 that also correlated to intermediate monitor interval of MW-1 and the intervals where the CBL showed little or no cement bond of the lower tubing and FR tracer log run at MW-1. Fortunately the packer interval from 1,970 to 2,025 demonstrated minimal affects from the tubing failure and made it possible to select a monitor interval as required by the consent order. The fact that an interval was identified that demonstrated little to no effluent parameter concentrations also confirmed

Similar to the construction testing program conducted at MW-2, a number of packer tests were conducted while constructing MW-3 and IW-4. Data from these tests conducted at MW-3 (see attached excerpt from Engineering Report on the Construction and Testing of Monitor Well MW-3) verified that effluent parameters had affected the interval from 1,374 to 1,900 bpl with the highest concentrations corresponding to the original intermediate monitor interval of MW-1. Data from the packer tests conducted at IW-4 demonstrated that that below 2,130 feet to 2,396 feet bpl effluent parameters were present in concentrations similar to the treated effluent coming from the WWTP (see attached excerpt from Engineering Report on the Construction and Testing of Injection Well IW-4, February, 1999). The fact that a relatively clear interval was identified sandwiched between the higher concentrations below the monitor interval and moderate concentrations above the interval clearly confirmed the presence of an interval of confinement between the depths of 2,030 to 2,120 feet bpl. Confinement was further demonstrated by the significant pressure differences in the formations above and below the unit. A numeric flow model used to evaluate confinement indicated, a range of leakance and conductivity values that were indicative of confinement as defined by Freeze and Cherry (see page 29, 1979).

It has become evident with the accumulation of monitoring data (see attached Figures 4 and 6) from the lower monitor intervals for MW-2 and MW-3, that slightly higher concentrations of effluent are present in MW-3 than are observed at MW-2. Although subtle and slight, this difference in concentrations (about .5 mg/L) is likely caused by a difference in the location of the two monitor wells with respect to MW-1, where the leak originated. With MW-3 the closest to MW-1, it can be assumed that that the concentrations would be the greater there than at MW-2. Over time, it is likely that the concentrations at MW-2 will also increase slightly as the flow across the site (from west to east) carries that higher concentration plume to the east. It is possible that as this pattern continues, concentrations at MW-1 and MW-3 will be begin to decrease.

Since the primary confinement present at this site is acknowledged to have been breached by the monitor tube set originally set into the injection zone as a required design feature (an occurrence recognized at most of the early injection sites, and a practice since abandoned by the regulatory community) and since the confinement for the new lower monitoring intervals is not as extensive in depth as the original design, the Engineer recommends against extensive free flowing or pumping of the lower monitor intervals because of the potential for stressing the confinement and causing movement of effluent. The accumulated monitoring data and the weight of evidence still indicate that the very slight changes in concentrations detected are the related to the original monitor tube failure and that the confining interval below the new lower monitor zones remains intact.

b. *From the monitoring data submitted for the upper monitor zones of MW-2 and MW-3, it appears that the concentration of TKN has been increasing since approximately July 2001. Please provide an explanation as to why the TKN for these zones are increasing.*

Response:

See response above for 9 a.

c. *From the monitoring data submitted from the lower monitor zones of MW-2 and MW-3, it appears that the concentrations of TKN and ammonia are increasing over time. Please provide an explanation of this phenomenon.*

Response:

See response above for 9 a.

d. *Because of the occurrences of increasing TKN and ammonia and the lack of a decrease in the TKN and ammonia concentrations discussed in the comments above, the Department is concerned that fluid movement may be occurring at this facility. The City needs to address this issue.*

Response:

See response above for 9 a.

We look forward to your timely review of the enclosed information. Should you have any questions regarding the responses provided above or issues related to this project, please contact me at (954) 426-4008.

Sincerely,

CH2M HILL

Sean Skehan
7/12/02

Sean Skehan, P.G.
Project Manager

DFB/17878.doc

c: Frank Coulter/Ft. Lauderdale
Mike Just/Ft. Lauderdale
Maurice Tobon/Ft. Lauderdale
Mark Silverman/FDEP-WPB
Richard Deuerling/FDEP-Tlh.
Ron Reese/USGS
Steve Anderson/SFWMD
Garth Hinkle/BCHD
Tom McCormick/CH2M HILL

Attachment 1

(See Historical Summary Provided In Attachment 7 for Document References)

Attachment 2

PLAT OF SURVEY

AREA IN
SECTION 23, TOWNSHIP 50 SOUTH, RANGE 42 EAST,
BROWARD COUNTY, FLORIDA.

0 20 40
GRAPHIC SCALE
1"= 40'

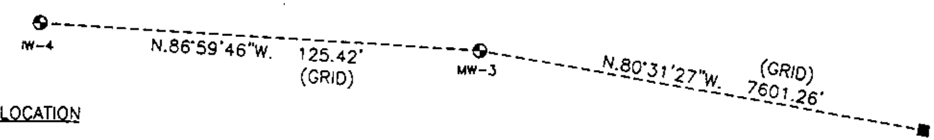
N

MW-3 LOCATION

LATITUDE N 26°05'43.825"
LONGITUDE W 80°07'52.060"

STATE PLANE COORDINATE
(FEET)

NORTHING 641354.370
EASTING 941323.520



IW-4 LOCATION

LATITUDE N 26°05'43.898"
LONGITUDE W 80°07'53.433"

STATE PLANE COORDINATE
(FEET)

NORTHING 641360.943
EASTING 941198.269

USN NORTH RANGE 2
CONTROL STATION

LATITUDE N 26°05'30.929"
LONGITUDE W 80°06'29.920"

STATE PLANE COORDINATE
(FEET)

NORTHING 640102.954
EASTING 948821.058

SURVEYOR'S CERTIFICATION:

THIS SURVEY PREPARED IN ACCORDANCE WITH THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 61G17-6 OF THE FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES AND IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL SEAL OF THE FLORIDA LICENSED SURVEYOR AND MAPPER.

Scott M. Shore 11-16-98

SCOTT M. SHORE, · 'SIONAL SURVEYOR AND MAPPER
FLORIDA CERTIFICAT 5743

NOTES:

THIS PLAT PREPARED AS A SPECIFIC PURPOSE SURVEY FOR THE PURPOSE OF OBTAINING GEOGRAPHIC AND STATE PLANE COORDINATES ON WELL IW-4 & MW-3 AT THE PLANT ON S.E. 21st STREET NEAR PORT EVERGLADES.

UNDERGROUND AND ABOVE GROUND IMPROVEMENTS, OTHER THAN THOSE SHOWN, WERE NOT LOCATED.

COORDINATES SHOWN ARE PLANE COORDINATE FOR THE FLORIDA EAST ZONE, NORTH AMERICAN DATUM OF 1983, 1990 ADJUSTMENT.

DATE OF LAST FIELD WORK: 11-4-98

AL 6:10

DATE:	
REVISIONS:	

PREPARED FOR: YOUNGQUIST BROTHERS, INC.

FILE NO.: 98-7683SR F.B./PG. N/A

SCALE: 1" = 40' SURVEY DATE: 11-4-98

BCI
ENGINEERS & SCIENTISTS, INC.
ENGINEERS • SCIENTISTS • SURVEYORS
2776 SWAMP CABBAGE COURT, FORT MYERS, FL 33901
PHONE: (941) 274-0081
FAX: (941) 274-0082
FLORIDA CERTIFICATE OF AUTHORIZATION [illegible]

Attachment 3

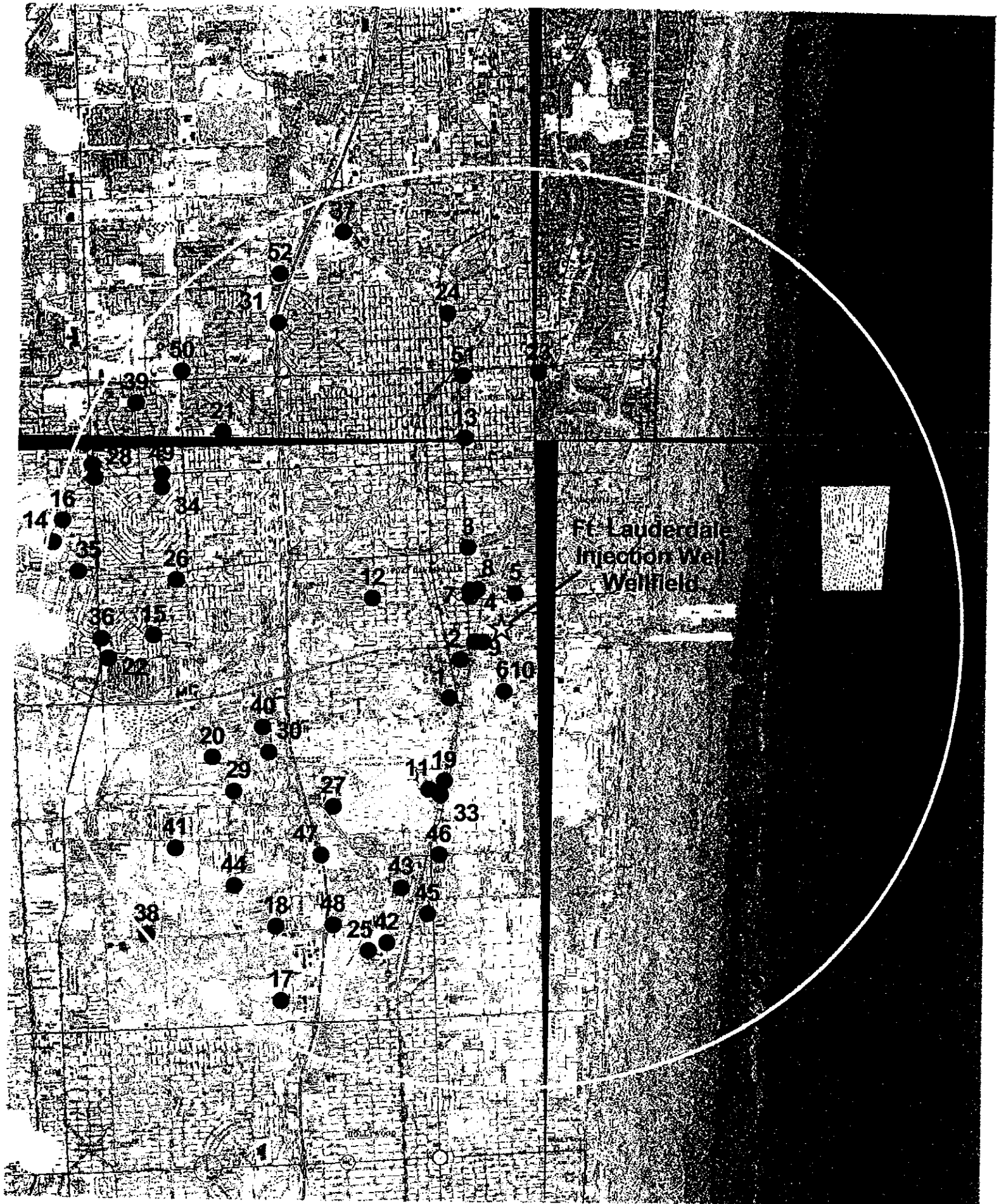


EXHIBIT 5
City of Ft. Lauderdale
IW-4 Five Mile Area of Review

7000 0 7000 Feet
1:84000
1in = 7000ft

N

CH2MHILL

City of Fort Lauderdale Well Inventory Area of Review
IW-4 Operating Permit
(5-Mile Radius)
Prepared: May 2001

Map No.	Owner/Address	Diameter (inches)	Well Depth (feet)	Usage	SFWMD Permit No.
1	Rinker, 20 S.W. 33 St.	8	20	Cement Production	06-01426-W
2	Alamo Rent-A-Car, 2601 S. Federal Highway	6	25	Hydrocarbon Recovery	06-01455-W
3	Southland, 1199 S. Federal Highway	8	25	Hydrocarbon Recovery	06-01383-W
4	Amoco, 601 S.E. 17th St.	8 8	30 30	Hydrocarbon Recovery	06-01270-W
5	Exxon, 1499 S.E. 17th St.	4 4	20 20	Hydrocarbon Recovery	06-01588-W
6	Shell, 909 S.E. 24th St.	24	16	Hydrocarbon Recovery	06-01608-W
7	Hess, 1600 S. Federal Highway	5	20	Hydrocarbon Recovery	06-01697-W
8	Harbor Place East, 1700 S. Ocean Lane	12	21	Hydrocarbon Recovery	06-00378-W
9	Exxon, 2330 S. Federal Highway	6	25	Hydrocarbon Recovery	06-01839-W
10	3391 S.E. 14th Ave (owner unknown)	2	15	(Bioremediation) Irrigation	06-01031-W
11	Boward County Aviation Authority, Ft. Lauderdale-Hollywood International Airport	8 8 8 6 6 6 8	27 30 17 17 17 17	Hydrocarbon Recovery	06-02223-W

12	R.H. Gore Orchids, Inc., 1611 S.W. 9th Ave	6	150	Irrigation	06-02754-W
		6	150		
		2	85		
13	Texaco, 300 N. Federal Highway	6	45	Hydrocarbon Recovery	06-02073-W
		6	45		
		6	20		
14	Ft Lauderdale Country Club, 415 E Country Club Circle	12.00	90	Irrigation	06-00056-W
		12.00	90	Irrigation	
		6.00	90	Irrigation	
		6.00	90	Irrigation	
		12.00	90	Irrigation	
		4.00	90	Irrigation	
15	City Wide Irrigation, City of Ft Lauderdale, P.O. Box 14250, 100 N Andrews Ave	4.00	0	Irrigation	06-00122-W
		12.00	133	Irrigation	
		4.00	0	Irrigation	
		6.00	75	Irrigation	
		12.00	75	Irrigation	
		12.00	80	Irrigation	
		12.00	84	Irrigation	
		12.00	98	Irrigation	
		4.00	0	Irrigation	
		4.00	0	Irrigation	
		4.00	0	Irrigation	
		10.00	84	Irrigation	
		4.00	0	Irrigation	
		12.00	105	Irrigation	
		10.00	90	Irrigation	
		4.00	0	Irrigation	
16	City of Fort Lauderdale, P.O. Box 14250, Ft Lauderdale	12.00	125	PWS	06-00123-W
		12.00	125	PWS	
		12.00	125	PWS	
		12.00	99	PWS	

		12.00	189	PWS	
		12.00	125	PWS	
		12.00	104	PWS	
		12.00	117	PWS	
		12.00	148	PWS	
		12.00	126	PWS	
		12.00	126	PWS	
		12.00	125	PWS	
		12.00	125	PWS	
		12.00	125	PWS	
		12.00	125	PWS	
		12.00	125	PWS	
		12.00	125	PWS	
		12.00	125	PWS	
		10.00	114	PWS	
		10.00	114	PWS	
		10.00	115	PWS	
		10.00	114	PWS	
		10.00	115	PWS	
		10.00	115	PWS	
		12.00	118	PWS	
17	Topeekeegee Yugnee Park, 3300 N Park Rd	6.00	65	Irrigation	06-00130-W
		3.00	65	Irrigation	
18	City of Dania Beach, 100 W Dania Beach Blvd	18.00	69	PWS	06-00187-W
		18.00	65	PWS	
19	Ft Lauderdale/Hollywood International Airport, 320 Terminal Dr	6.00	30	Irrigation	06-00431-W
		6.00	30	Irrigation	
		4.00	60	Irrigation	
		6.00	70	Irrigation	
		4.00	80	Irrigation	
		6.00	80	Irrigation	

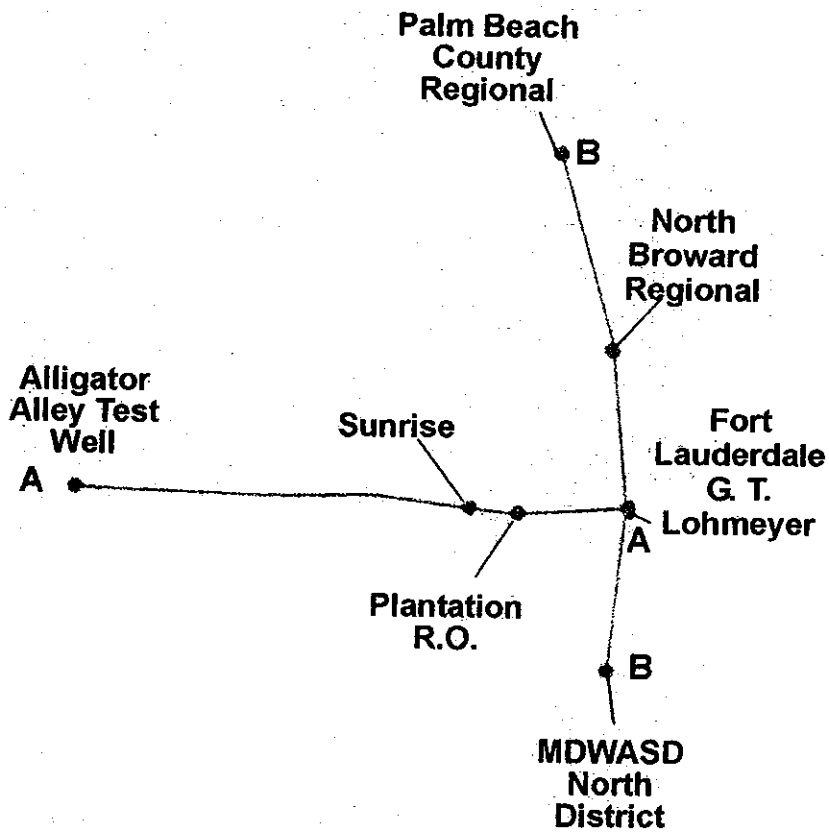
49	Maverick Management Inc, Curtis Deem, 2664 N Dixie Hwy	2.00	70	Irrigation	06-02929-W	
	Lighthouse Worship Center, 2201 NW 24th St	3.00	95	Irrigation	06-03074-W	
50	Swap Shop Thunderbird, 3291 West Sunrise Blvd.	2.00	80	Irrigation	06-03081-W	
51	Sears #1195, 901 N. Federal Hwy	4.00	20	Remediation	06-03100-W	
		4.00	20	Remediation		
		4.00	20	Remediation		"Industrial water supply for
		4.00	20	Remediation		Aquifer remediation"
		4.00	20	Remediation		
52	Auto Shuttle USA, 2100 NW 21 Ave	3.00	100	Irrigation	06-03135-W	

20	Port 95 Commerce Park, Alandco, Inc, 11770 US Hwy One	8.00	65	Irrigation	06-01575-W	
		8.00	65	Irrigation		
21	Forest Lawn Central, 499 NW 27 Ave	4.00	100	Irrigation	06-01795-W	
22	Former Exxon 4-4078, 2396 SW 40th Ave, Exxon Company USA	6.00	25	Industrial	06-01804-W	Industrial use
		6.00	25	Industrial		
		6.00	25	Industrial		
23	Exxon Station No 4-5272, 1730 E Sunrise Blvd, Exxon Company USA Inc	6.00	25	Hydrocarbon Recovery	06-01902-W	Hydrocarbon recovery/remediation
		6.00	25	Hydrocarbon Recovery		
24	Star Service and Petroleum, 1440 NE Ave, Stapler Enterprises	5.00	24	Hydrocarbon Recovery	06-01960-W	Hydrocarbon recovery/remediation
		5.00	24	Hydrocarbon Recovery		
25	Bethune Elementary, Broward County School Board, NW 22nd Ave	6.00	60	Irrigation	06-02001-W	
26	Melrose Park, Broward County School Board, SW 34th Ave	6.00	72	Irrigation	06-02035-W	
27	Paradise Island Airlines, 1550 SW 43rd St	4.00	20	Remediation	06-02119-W	Hydrocarbon recovery/remediation
28	Westgate & West Broward Shopping Center, 3885 West Broward Blvd	4.00	80	Irrigation	06-02152-W	

29	Ft Lauderdale Airport Parking Facility, Broward County Board of County Commissioners, Aviation Dept, 1400 Lee Wagener Blvd	8.00	20	Irrigation	06-02164-W	
30	Garside's Aircrafting Agent Parts & Services Inc, Broward County Aviation Dpt, 1400 Lee Wagener Blvd	4.00	50	Remediation	06-02167-W	Hydrocarbon recovery/remediation
31	AT&T Wireless Services, 1420 NW 23rd Ave	3.00	100	Remediation	06-02176-W	Hydrocarbon recovery/remediation
32	Valeteria Dry Cleaners, Procacci Commercial Realty, Inc, 255 NW 12th Ave	5.00	30	Remediation	06-02222-W	Hydrocarbon recovery/remediation
33	Ft Lauderdale International Airport- South Terminal, Broward County Aviation Authority, c/o Ft Lauderdale International Airport, 300 Terminal Dr	8.00	27	Remediation	06-02223-W	Hydrocarbon recovery/remediation
		8.00	31	Remediation		
		8.00	17	Remediation		
		6.00	17	Remediation		
		6.00	17	Remediation		
		8.00	17	Remediation		
34	Taco Bell Restaurant, Taco Bell Coorp, 9769 S Dixie Hwy, Ste 101	2.00	25	Irrigation	06-02299-W	
35	FL Tool and Cage, David Green, 4120 SW 12th St	4.00	50	Irrigation	06-02346-W	
36	State Road 7 (US 441) Riverland Rd to Broward Blvd,	4.00	100	Irrigation	06-02423-W	

	Florida Department of Transportation, 3400 W Commercial Blvd	4.00	100	Irrigation	
		4.00	100	Irrigation	
		4.00	100	Irrigation	
		4.00	100	Irrigation	
37	Mapei Corporation, 1501 Wallstreet	2.00	95	Irrigation	06-02463-W
38	Temple B'nai Sephardim, 3670 Stirling Rd	1.50	60	Irrigation	06-02532-W
		2.00	65	Irrigation	
39	All Service Refuse	4.00	90	Irrigation	06-02595-W
40	Conner Warehouse, Nathan & Maria Conner, 5761 SW 17 St	2.00	50	Irrigation	06-02624-W
41	Oakridge Plaza, Griffin Partners Inc, 3300 N 29th St, Ste 101	1.50	30	Irrigation	06-02663-W
		2.00	40	Irrigation	
42	Rhonda Hollander, 323 SW 1st Ave	2.00	50	Irrigation	06-02671-W
43	Victory Villas Inc, 851 West Dania Beach Blvd	3.00	50	Irrigation	06-02678-W
44	Estates of Ft Lauderdale,	6.00	NR	Irrigation	06-02683-W
	Estates of Ft Lauderdale Property Owners Assoc.,2850 SW 54th St	6.00	NR	Irrigation	
45	Willow Manor North, Andie's Incorportated, 150 Stirling Rd	2.00	65	Irrigation	06-02685-W
46	Dania Farms Inc, 704 N Federal Hwy	3.00	150	Irrigation	06-02733-W
47	International Game Fish Association, 300 Gulfstream Way	6.00	125	Industrial	06-02801-W
48	Oakridge Hotel, LTD, 77 North Hibiscus Dr	4.00	50	Irrigation	06-02857-W

Attachment 4



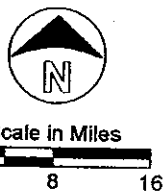
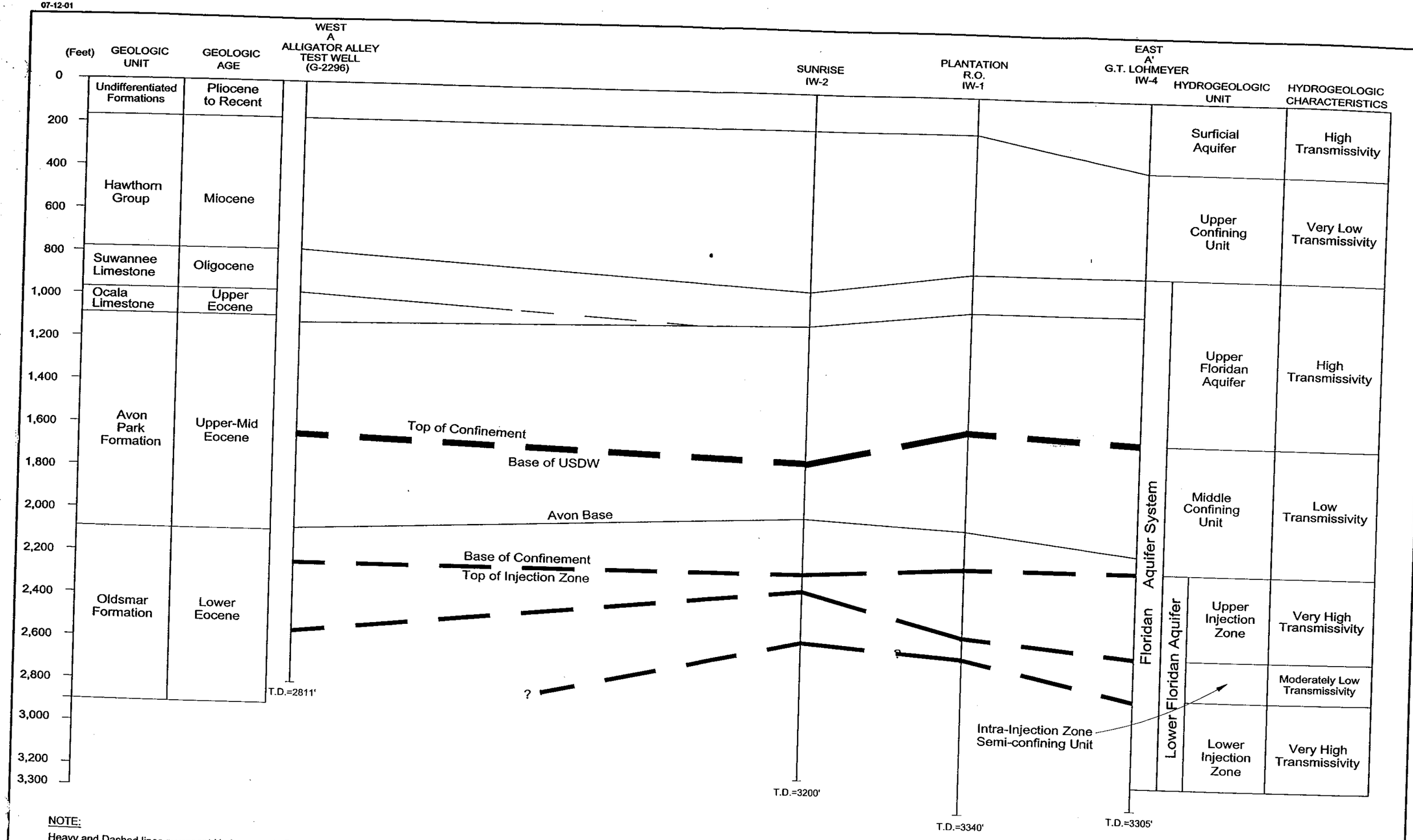


Figure 1

07-12-01



NOTE:

Heavy and Dashed lines represent Hydrogeologic Boundaries when Hydrogeologic Boundaries do not correspond to Formation Boundaries. USDW flow direction is from West to East.

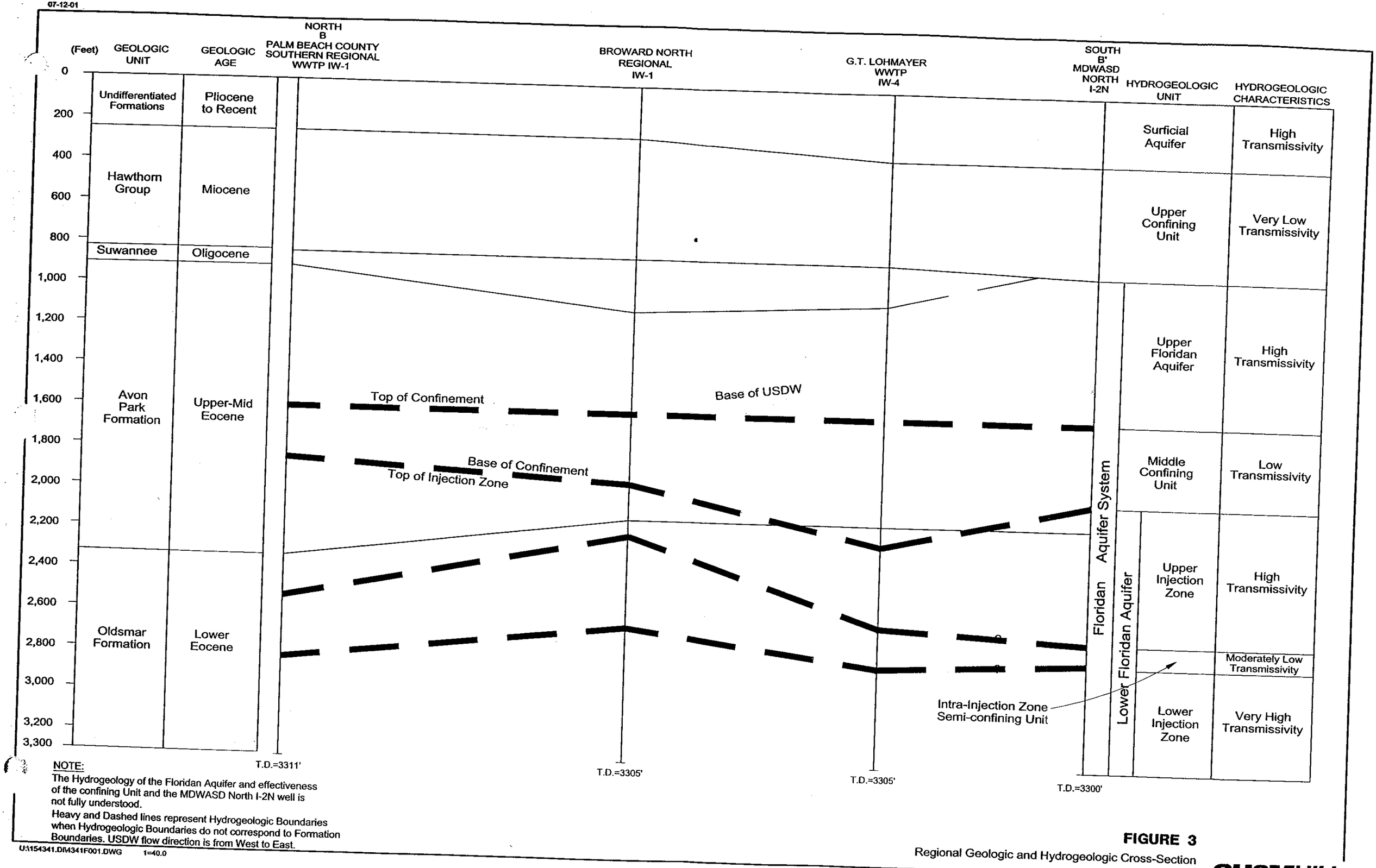
FIGURE 2

Regional Geologic and Hydrogeologic Cross-Section

U:\154341.DR\4341F002.DWG 1=40.0

CH2MHILL

07-12-01



NOTE:
The Hydrogeology of the Floridan Aquifer and effectiveness of the confining Unit and the MDWASD North I-2N well is not fully understood.
Heavy and Dashed lines represent Hydrogeologic Boundaries when Hydrogeologic Boundaries do not correspond to Formation Boundaries. USDW flow direction is from West to East.

U:\154341.DI\4341F001.DWG 1=40.0

FIGURE 3
Regional Geologic and Hydrogeologic Cross-Section

CH2MHILL

Attachment 5

KELI

Kimball Electronic Laboratory, Inc.

Precision Measurement Equipment Specialists

Certificate of Calibration

Customer: YOUNGQUIST BROTHERS, INC.
Certificate # 0000071981
Manufacturer: MC
Model Number: 200 PSI
Nomenclature: PRESSURE GAUGE
Serial/I.D. # 7868113
Specifications: +/- 0.25% FS
Cal. Procedure: MP06/C1-NAV
KELI Control # YOU-68502

The accuracy and calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Inc. or derived by the ratio type of self-calibration techniques and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL Z540-1.

In Tolerance When Received? Y Cal. Tech:045 Relative Humidity: 51% Temperature: 73 Deg. F

In-House [Y] Cal. Cycle: 12 Mos. Calibration Date: 12/08/1999 Calibration Due: 12/08/2000

Remarks: ROUTINE CALIBRATION/CERTIFICATION/PREVENTIVE MAINTENANCE.

Standards Used

I.D. #		Cal. Date	Cal. Due
391	EATON UPS 3000BAA PRESSURE INDICATOR	11/09/1999	11/09/2000

Fred King
Quality Assurance

mlcert 9/99

8081 West 21st Lane, Hialeah, Fl. 33016 • Ph (305) 822-5792 • Fax (305) 362-3125

KELI
Kimball Electronic Laboratory, Inc.
Precision Measurement Equipment Specialists

YOUNGQUIST BROTHERS, INC.

Certificate Of Test # 197234

KELI Control # YOU-68502

Manufacturer: MC
Model: 200 PSI
Serial / I.D: 7868113
Description: PRESSURE GAUGE

RANGE	APPLIED	READING PRE-CAL	READING POST-CAL	LOW LIMIT	HIGH LIMIT	SPECIFICATIONS
0 - 200 PSI	40	40.0	40.0	39.5	40.5	+/- 0.25% of Full Scale
	80	80.2	80.2	79.5	80.5	
	120	120.2	120.2	119.5	120.5	
	160	160.4	160.4	159.5	160.5	
	200	200.4	200.4	199.5	200.5	

In tolerance when received' *YES* Temperature: Deg. F *73* R.H. *51*
Remarks: *ROUTINE CALIBRATION/CERTIFICATION/PREVENTIVE MAINTENANCE.*

I.D.#	STANDARDS USED	CAL. DATE	CAL. DUE
391	*EATON UPS 3000BAA PRESSURE INDICATOR*	*November 1999*	*November 2000*

Procedure Used: *MP06/C1-NAV* *Accuracy: MANUFACTURERS*

The accuracy & calibration of this instrument is traceable to the National Institute of Standards and Technology through certified standards maintained in the laboratories of KELI Inc. and is guaranteed to meet published specifications. The metrology procedures utilized satisfy the requirements set forth in ANSI/NCSL Z540-1.

Calibration Date: *12/08/1999* Cal. Tech: *045*
Calibration Due: *12/08/2000*

Approved By

gen1page 2/98

8081 West 21st Lane, Hialeah, Fl. 33016 • Ph (305) 822-5792 • Fax (305) 362-3125

Fort Lauderdale G.T. Lohmeyer WWTP
Injection Well IW-4
Casing Pressure Test Data

Date: 07-Feb-2000
Observers: Sean Skehan/CH2M HILL
Len Fishkin/FDEP, WPB

Packer Setting: 2,778 feet bpl
Bottom of Casing: 2,804 feet bpl
Casing Pressure: 152 psi
Packer Pressure: 610 psi

Time	Lapse Time (minutes)	Csg Press (psi)	Gallons	Comments
1010	0	152.0		Start Test
1015	5	152.0		
1020	10	152.0		
1025	15	152.0		
1030	20	151.8		
1035	25	151.5		
1040	30	151.3		
1045	35	151.2		
1050	40	151.1		
1055	45	151.0		
1100	50	151.0		
1105	55	151.0		
1110	60	151.0		
1115	65	151.0		
1120	70	151.0		
1125	75	151.0		
1130	80	151.0		
1135	85	151.0		
1140	90	150.5		
1145	95	150.5		
1150	100	150.5		
1155	105	150.5		
1200	110	150.5		
1205	115	150.2		
1210	120	150.0		Test Complete
		120.5	5	Bleed Off
		98.5	10	
		78.0	15	
		57.0	20	
		36.5	25	
		19.0	30	
		5.5	35	
		0.0	38	T. Water Released

bpl = below pad level
psi = pounds per square inch

IW-4
Video Survey
Data Report

Client: City of Fort Lauderdale
Injection Well: IW-4
Date: 30-Dec-99
Resident Observer: Curt Weeden/CH2M HILL

From	To	Observations
0	100	Video quality good, picture clear, minor scale on walls, casing joints at 28 and 68
100	200	As above, casing casing joints at 108, 144, and 184
200	300	As above, casing casing joints at 223 and 263
300	400	As above, casing casing joints at 303, 341, and 381
400	500	As above, casing casing joints at 419, 458, and 497
500	600	As above, casing casing joints at 532 and 570
600	700	As above, casing casing joints at 609, 649, and 689
700	800	As above, casing joints at 728 and 766
800	900	As above, casing joints at 803, 841, and 880
900	1,000	As above, casing joints at 918, 957, and 997
1,000	1,100	As above, casing joints at 1,037 and 1,076
1,100	1,200	As above, casing joints at 1,115, 1,155, and 1,195
1,200	1,300	As above, casing joints at 1,235 and 1,274
1,300	1,400	As above, casing joints at 1,314, 1,354, and 1,391
1,400	1,500	As above, casing joints at 1,430 and 1,469
1,500	1,600	As above, casing joints at 1,545, and 1,582
1,600	1,700	As above, casing joints at 1,620, 1,659, and 1,698
1,700	1,800	As above, casing joints at 1,735 and 1,774
1,800	1,900	As above, casing joints at 1,811, 1,851, and 1,891
1,900	2,000	As above, casing joints at 1,929 and 1,970
2,000	2,100	As above, casing joints at 2,010, 2,047, and 2,087
2,100	2,200	As above, casing joints at 2,127 and 2,164
2,200	2,300	As above, casing joints at 2,205 and 2,280
2,300	2,400	As above, casing joints at 2,320, 2,359, and 2,396
2,400	2,500	As above, casing joints at 2,436 and 2,474
2,500	2,600	As above, casing joints at 2,513, 2,552, and 2,589
2,600	2,700	As above, casing joints at 2,628 and 2,667
2,700	2,800	More scale on walls and more suspended solids starting at 2,710; casing joints at 2,704 and 2,743; base of casing att 2,794
2,800	2,900	Walls smooth to 2,80, caverns and ledges to 2,860; 2,860 to 2,879 smooth walls; at 2,888 picture quality declines due to suspended solids.
2,900	3,000	Caverns and boulders, at 2,990 water flowing upwards
3,000	3,100	Cavernous
3,100	3,200	Cavernous
3,200	3,290	As above, at 3,200 swift upward flow, at 3,280 upward flow ceases; bottom of hole 3,290

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: Dodge P/U
Departed From: Ft Myers
Destination: Port Everglades IW #3 via Most Direct Route
Date of Departure: 12/20/97
FGL Engr's Initials: MP

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before Current Activity	Before Volume	Before T.I.	After Current Activity	After Volume	After T.I.
I-131	12/17	20mCi	10ml	0.1	none		n/a

Label: Yellow II TOTALS: 20mCi 10ml 0.1

WASTE MAT'L

Description: gloves, diaper, ziplock bags
Date to Pit: 12/22 T.I.: 0

Contractor/Owner: CH2MHill
Location: Port Everglades (Ft. Lauderdale)
County: Broward
Survey Meter: 8683
Well Name: IW #3
Field Name: Lahmeyer
State: FL
Serial #:
Cal. Date: 12/14

TRUCK SURVEYS

SHOP
Please Indicate Location of Source(s)

Empty: .03 .03 .03 .03 .03 mRem/hr
Loaded: .03 .03 .03 .03 .15 .05 mRem/hr

LOCATION

Arrival: .03 .04 .10 .04 mRem/hr
Depart: .03 .03 .03 .03

SHOP RETURN

Loaded: .07 .03 .03 .03 mRem/hr
Empty: .03 .03 .03 .03

JOB SITE DIAGRAM & SURVEYS

mRem/hr

B .03
A .03
B .03 A .03
B .05 A .03
B .03 A .03

.03
.03 Wellhead
.03 .03
.03 .03
.03

WELLHEAD SKETCH:

Please Indicate Location of Source(s)
*Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION EXTERNAL

Amount of Tracer Injected into Well:

1st Inj.	2nd Inj.	3rd Inj.	4th Inj.	5th Inj.	DUMP	TOTAL
1mCi +	1mCi +	1mCi +	1mCi +	2mCi +	14mCi =	20 mCi

FGL Engineer Signature:
Date (post job): 12/22

FLORIDA GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: Dodge P/U
Departed From: Ft Myers
Destination: Pt Everglades IW #5 via Most Direct Route
Date of Departure: 12/27/99
FGL Engr's Initials: [illegible]

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	12/13	10mCi	10ml	0.1	0mCi	0ml	0
I-131	12/13	10mCi	10ml	0.1	10mCi	10ml	0.1
Label: Yellow II	TOTALS:	20mCi	20ml	0.2			0.1

WASTE MAT'L

Description: gloves, diapers, 2 plastic bag, tape
Date to Pit: 12/29
T.I.: 0

Contractor/Owner: CH2MHILL
Location: Port Everglades (Ft. Lauderdale)
County: Broward
Survey Meter: 8683
Serial #:
Well Name: IW#5
Field Name: GT Lonnezen
State: FL
Cal. Date: 12/14

TRUCK SURVEYS

SHOP

Please Indicate Location of Source(s)

Empty: .03, .03, .03, .03
Loaded: .03, .03, .08, 1.1, .04, .07

mRem/hr

LOCATION

Arrival: .02, .05, 1.0, .04, .07
Depart: .03, .04, 1.0, .03, .06

mRem/hr

SHOP RETURN

Loaded: .02, .05, 1.0, .04, .07
Empty: .03, .03, .03, .03

mRem/hr

JOB SITE DIAGRAM & SURVEYS

mRem/hr

B .08, A .03
B .03, A .02
B 1.2, A 1.0
B .09, A .07

.02
.32 .03 Wellhead
.02 .02 .02
.03
.02

WELLHEAD SKETCH:

Please Indicate Location of Source(s)

*Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION EXTERNAL

Amount of Tracer Injected into Well:

1st Inj.	2nd Inj.	3rd Inj.	4th Inj.	5th Inj.	Dump	TOTAL
1mCi	1mCi	1mCi	1mCi	2mCi	4mCi	10 mCi

FGL Engineer Signature: [signature]
Date (post job): 12/29

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: Panel truck
Departed From: Ft Myers
Destination: Port Everglades IW#2
Date of Departure: 1/3/00 via Most Direct Route
FGL Engr's Initials: [illegible]

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	1/3	10mCi	10ml	0.1	0mCi		
"	"	10mCi	10ml	0.1	10mCi	10ml	0.1
"	"	10mCi	10ml	0.1	10mCi	10ml	0.1
TOTALS:		30mCi	30ml	0.3	20mCi	20ml	0.2

Label: Yellow II

WASTE MAT'L

Description: gloves, ziplock bag, diapers, rags
Date to Pit: 1/3/00
T.I.: 0

Contractor/Owner: CH2MHill
Location: Port Everglades (Ft Lauderdale)
County: Broward
Survey Meter: Ludlum
Serial #: 8683
Well Name: IW#2
Field Name: E/J Lohmeyer
State: FL
Cal. Date: 12/14

TRUCK SURVEYS

SHOP (Please Indicate Location of Source(s)) — mRem/hr
Empty: .02 — .02, .02, .02
Loaded: 0.03 — .02, X pig, 0.02

LOCATION — mRem/hr
Arrival: .02 — .02, X .10, .02
Depart: .02 — .02, .02, .01

SHOP RETURN — mRem/hr
Loaded: — N/A
Empty: .02 — .02, .02, .02

JOB SITE DIAGRAM & SURVEYS

mRem/hr
panel van

B .02, A .02 (top); B .02, A .02 (left); B .02, A .02 (right); B .02, A .02 (bottom)

Wellhead: .02, .02, .02, .02, .02, .02, .02, .02, .02

Please Indicate Location of Source(s)

WELLHEAD SKETCH:

*Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION EXTERNAL

Amount of Tracer Injected into Well: 1st Inj. 1mCi + 2nd Inj. 1mCi + 3rd Inj. 1mCi + 4th Inj. 1mCi + 5th Inj. 3mCi + Dump 3mCi = TOTAL ____ mCi

FGL Engineer Signature: [signature]
Date (post job): 1/3/00

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: #02 Destination: Port Everglades IW #1 via Most Direct Route
Departed From: Pt Everglades IW #1 Date of Departure: 11/7/00 FGL Engr's Initials: JC

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	1/3	7mCi	0ml	0.1	0	0	0
1'	1/3	7mCi	0ml	0.1	4mCi	4ml	0.1
					4mCi	4ml	0.1

Label: Yellow II TOTALS: 14mCi 10ml 0.2

WASTE MAT'L

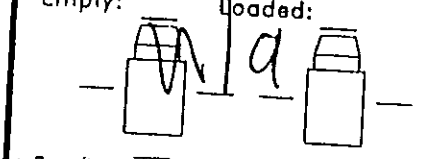
Description: glove, large diaper, plastic bag Date to Pit: 11/8 T.I.: 0

Contractor/Owner: GH2MHill
Location: Port Everglades (Ft Lauderdale) Well Name: IW #1
County: Broward Field Name: Gas Transfer
Survey Meter: Ludlum Serial #: 8683 State: FL
Cal. Date: 12/14

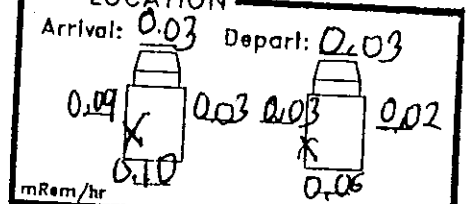
TRUCK SURVEYS

SHOP

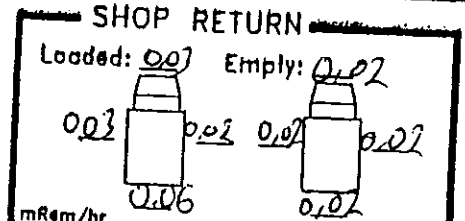
Please Indicate Location of Source(s)



LOCATION

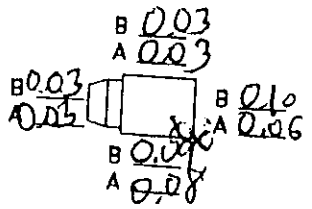


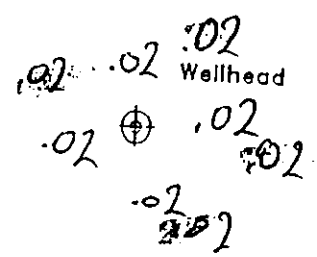
SHOP RETURN



JOB SITE DIAGRAM & SURVEYS

mRem/hr





WELLHEAD SKETCH:

Please Indicate Location of Source(s) *Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION EXTERNAL

Amount of Tracer Injected into Well: 1st Inj. 1mCi + 2nd Inj. 1mCi + 3rd Inj. 1mC + 4th Inj. 1mC + 5th Inj. 2mCi + 6th Inj. 4mCi = total 10 mCi

FGL Engineer Signature: [signature] Date (post job): 11/8/00

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: 103 Destination: Port Everglades via Most Direct Route
Departed From: Ft. Myers Date of Departure: 1/8/00 FGL Engr's Initials: JV

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before Current Activity	Before Volume	Before T.I.	After Current Activity	After Volume	After T.I.
I-131	1/7/00	30 mCi	15ml	1.0	0	0	
I-131	1/7/00	30 mCi	15ml	1.0	30mCi	15ml	1.0
Label: Yellow III	TOTALS:	60 mCi	30ml	2.0			

WASTE MAT'L

Description: gloves, drape, tape, plastic bag Date to Pit: 1/10/00 T.I.: 0.0

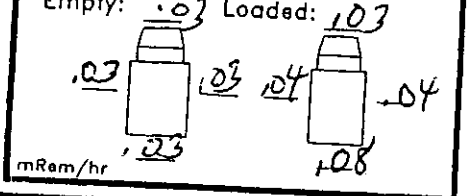
Contractor/Owner: CH2M HILL Well Name: IW#4
Location: Port Everglades Field Name: GT. Lehmofer
County: Broward State: FL
Survey Meter: Ludlum Serial #: 8682 Cal. Date: 12/14

TRUCK SURVEYS

SHOP

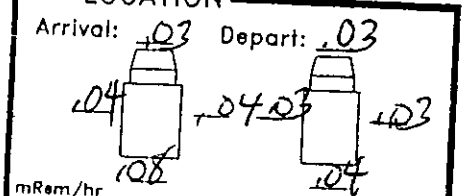
Please Indicate Location of Source(s)

Empty: .03 Loaded: .03



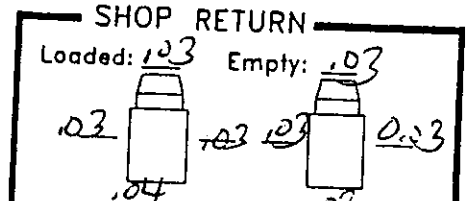
LOCATION

Arrival: .03 Depart: .03



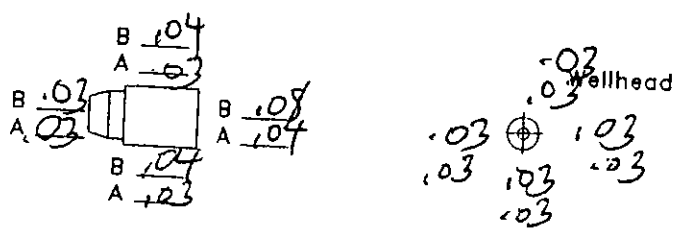
SHOP RETURN

Loaded: .03 Empty: .03



JOB SITE DIAGRAM & SURVEYS

mRem/hr



Please Indicate Location of Source(s)

WELLHEAD SKETCH:

Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION INTERNAL

Amount of Tracer Injected into Well:

1st Inj.	2nd Inj.	3rd Inj.	4th Inj.	5th Inj.	6th Inj	TOTAL
4mCi +	4mCi +	4mCi +	8mCi +	10mCi		= 30 mCi

FGL Engineer Signature: [signature] Date (post job): 1/9/00

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: #107 Destination: Port Everglades Jetty #4
Departed From: Ft Myers Date of Departure: 1/11/00 via Most Direct Route
FGL Engr's Initials: JP

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	1/12	10mCi	10ml	0.1	∅	∅	∅
c'	1/10	10mCi	10ml	0.1	10mCi	10ml	0.1
							0.1

Label: Yellow I TOTALS: 20mCi 0.2

WASTE MAT'L

Description: gowns, diapers, tapes, gloves Date to Pit: 1/12 T.I.: 0.9

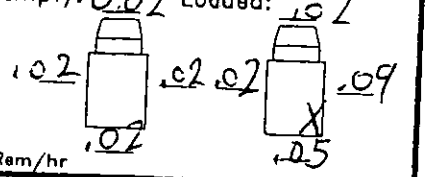
Contractor/Owner: CH2MHill
Location: Port Everglades Jetty #4
County: Broward
Survey Meter: Ludlum Serial #: 8683
Well Name: Jetty #4
Field Name: G.T. Lohmeyer
State: FL
Cal. Date: 12/14

TRUCK SURVEYS

SHOP

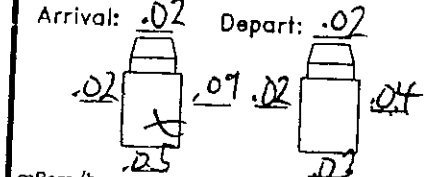
Please Indicate Location of Source(s)

Empty: 0.02 Loaded: .02



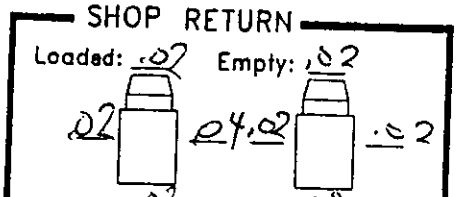
LOCATION

Arrival: .02 Depart: .02



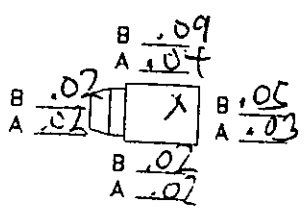
SHOP RETURN

Loaded: .02 Empty: .02



JOB SITE DIAGRAM & SURVEYS

mRem/hr



.02
.02 .02 Wellhead
.02 ⊕ .02
.02 .02
.02

WELLHEAD SKETCH:

Please Indicate Location of Source(s)

Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION EXTERNAL

Amount of Tracer Injected into Well:

1st Inj.	2nd Inj.	3rd Inj.	4th Inj.	~~5th Inj.~~ Drop	6th Inj	TOTAL
1mCi +	1mCi +	1mCi +	1mCi +	6mCi +	___ =	10 mCi

FGL Engineer Signature: JP Date (post job): 1/11/00

FLORIDA
GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: 102 Destination: Fort Lauderdale JW #5
Departed From: FTMYRS Date of Departure: 2/21/00 via Most Direct Route
FGL Engr's Initials:

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	2/18	70mCi	15ml	2.0	0 mCi	0	0
I-131	2/18	30mCi	15ml	1.0	30 mCi	15ml	1.5

Label: Yellow III TOTALS: 100 mCi 30ml 3.0

WASTE MAT'L

Description: gloves, diaper, tape, cloth Date to Pit: 2/22/00 T.I.: 0.2

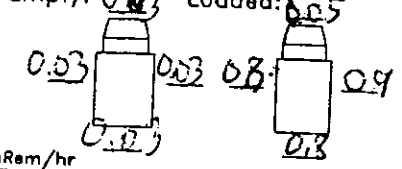
Contractor/Owner: CH2M HILL Well Name: JW #5
Location: Ft Lauderdale Field Name: Port Everglades
County: Broward State: FLA
Survey Meter: Ludlum 3 Serial #: 8752 Cal. Date: 6/21/99

TRUCK SURVEYS

SHOP

Please Indicate Location of Source(s)

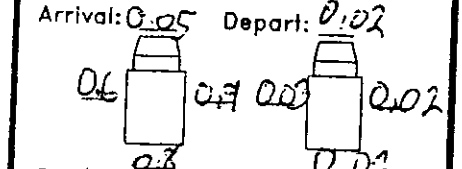
Empty: 0.03 Loaded: 0.05



mRem/hr

LOCATION

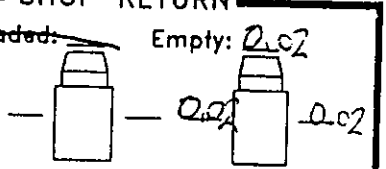
Arrival: 0.05 Depart: 0.02



mRem/hr

SHOP RETURN

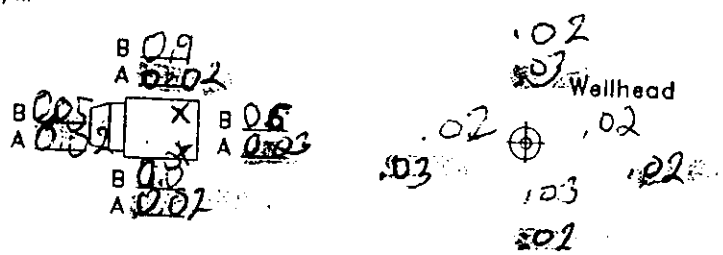
~~Loaded:~~ Empty: 0.02



mRem/hr

JOB SITE DIAGRAM & SURVEYS

mRem/hr



WELLHEAD SKETCH:

Please Indicate Location of Source(s)

*Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION

Amount of Tracer Injected into Well: Internal Test

1st Inj.	2nd Inj.	3rd Inj.	4th Inj.	5th Inj.	6th Inj.	TOTAL
10mCi +	10mCi +	10mCi +	10mCi	10mCi	Pump + 20mCi	70 mCi

FGL Engineer Signature: [signature] Date (post job): 2/22/00

FLORIDA GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: 103
Departed From: Ft Myers
Destination: Port Every
Date of Departure: 2/23/00
via Most Direct Route
FGL Engr's Initials: [illegible]

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
~~I-131~~	~~2/23~~	~~70mCi~~	~~15ml~~	2.0	Ø	Ø	Ø
~~I-131~~	~~2/23~~	~~30mCi~~	~~15ml~~	~~1.0~~	~~Ø~~		
Label: Yellow II	TOTALS:	100mCi	30ml	3.0	30mCi	15ml	1.0

WASTE MAT'L

Description: gloves, diaper, tape, plastic bag
Date to Pit: 2/25/00
T.I.: 1.0

Contractor/Owner: CH2MHILL
Location: Port Everglades
County: Broward
Survey Meter: Ludlum
Serial #: 8683
Well Name: IW #4
Field Name: G.I. [illegible]
State: FL
Cal. Date: 12/14

TRUCK SURVEYS

SHOP
Please Indicate Location of Source(s)

Empty: .03 — sides .03, .03; rear .03
Loaded: .05 — sides .08, .09; rear .08

mRem/hr

LOCATION

Arrival: .05 — sides .08, .09; rear .08
Depart: .03 — sides .05, .05; rear .06

mRem/hr

SHOP RETURN

Loaded: .03 — sides .05, .05; rear .06
Empty: .03 — sides .03, .03; rear .03

mRem/hr

JOB SITE DIAGRAM & SURVEYS

mRem/hr

Truck: front B .09, A .05; left B .05, A .03; right B .08, A .06; rear B .08, A .05

Wellhead: .03, .03, .03, .03, .03, .03, .03, .03

Please Indicate Location of Source(s)

WELLHEAD SKETCH:

Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION INTERNAL #2

Amount of Tracer Injected into Well: 1st Inj. 10mCi + 2nd Inj. 10mCi + 3rd Inj. 10mCi + 4th Inj. 10mCi + 5th Inj. 10mCi + 6th Inj. 10mCi + 7th inj 10 mCi TOTAL 70mCi

FGL Engineer Signature: [signature]
Date (post job): 2/24/00

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: Dodge Ply — Destination: Port Everglades — IW#2
Departed From: Palmetto — Date of Departure: 3/20/00 — via Most Direct Route — FGL Engr's Initials:

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	3/20/00	70mCi	10ml	2.0			
Label: Yellow III		TOTALS: 70mCi	10ml	2.0			

WASTE MAT'L

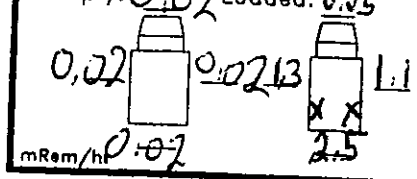
Description: gloves, syringe, diaper, ziplock — Date to Pit: 3/23/00 — T.I.: 0.2

Contractor/Owner: CH2M Hill — Well Name: IW#2
Location: Port Everglades — Field Name: GTL Limestone
County: Broward — State: FL
Survey Meter: Ludlum — Serial #: 3683 — Cal. Date: 12/7

TRUCK SURVEYS

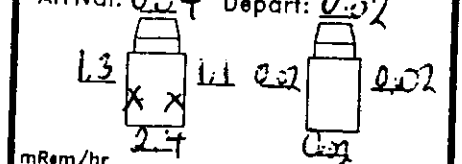
SHOP
Please Indicate Location of Source(s)

Empty: 0.02 Loaded: 0.05



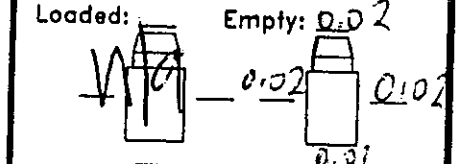
LOCATION

Arrival: 0.02 Depart: 0.02



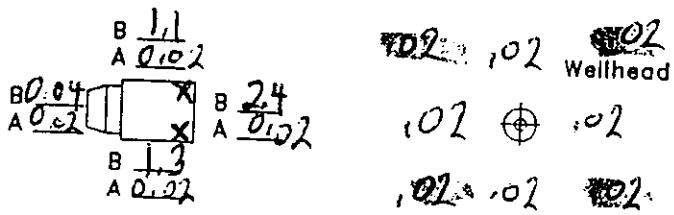
SHOP RETURN

Loaded: Empty: 0.02



JOB SITE DIAGRAM & SURVEYS

mRem/hr



Please Indicate Location of Source(s)

WELLHEAD SKETCH:

*Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION — INTERNAL

Amount of Tracer Injected into Well:

1st Inj.	2nd Inj.	3rd Inj.	4th Inj.	5th Inj.	6th Inj.	TOTAL
10mCi	10mCi	10mCi	10mCi	10mCi	20mCi	70 mCi

FGL Engineer Signature: — Date (post job): 3/23/00

GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: 02 | Destination: Port Everglades | IW #3
Departed From: Ft Myers | Date of Departure: 3/28/00 | via Most Direct Route | FGL Engr's Initials:

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	3/28	70mCi	15ml	2.0	0	0	0
I-131	3/28	30 mCi	15ml	1.0	30mCi	15ml	1.0
Label: Yellow III	TOTALS:	100 mCi		3.0			

WASTE MAT'L

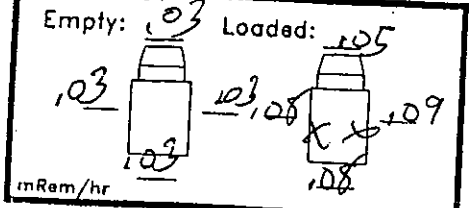
Description: gloves, diapers, tape, plastic bags | Date to Pit: 3/30/00 | T.I.: 1.0

Contractor/Owner: CH2M HILL
Location: Port Everglades | Well Name: IW #3
County: Broward | Field Name: G.T. Lahmeyer
Survey Meter: Ludlum | State: FL
Serial #: 8683 | Cal. Date: 12/14

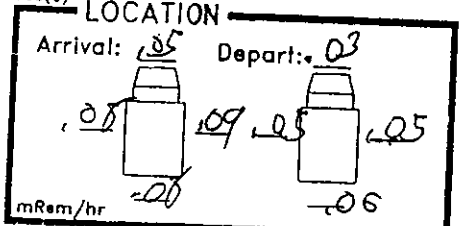
TRUCK SURVEYS

SHOP

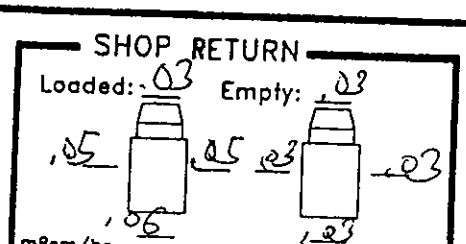
Please Indicate Location of Source(s)



LOCATION

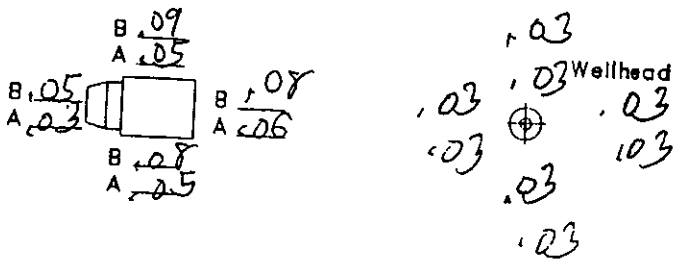


SHOP RETURN



JOB SITE DIAGRAM & SURVEYS

mRem/hr



Please Indicate Location of Source(s)

WELLHEAD SKETCH:

Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION

Amount of Tracer Injected into Well: 1st Inj. 8mCi + 2nd Inj. 8mCi + 3rd Inj. 8mCi + 4th Inj. 8mCi + 5th Inj. 8mCi + 6th Inj. 8mCi = 70 mCi

FGL Engineer Signature: _____ Date (post job): 3/30

FLORIDA GEOPHYSICAL LOGGING, INC.
15465 Pine Ridge Road, Fort Myers, FL 33908
(813) 489-0044

HAZARDOUS MATERIAL MANIFEST/UTILIZATION

TRUCK #: 123
Departed From: Fort Myers
Destination: Port Everglades IW #1 via Most Direct Route
Date of Departure: 4/3/00
FGL Engr's Initials: [illegible]

RADIOACTIVE MAT'L

SEALED SOURCES

Source Type	Serial #	Pkg	Wt. (lbs.)	Specific Activity	Label	T.I.
					Yellow	
					Yellow	
					Yellow	
					Yellow	
					Yellow	

TRACER MAT'L

Isotope Name	Assay Date	Before: Current Activity	Before: Volume	Before: T.I.	After: Current Activity	After: Volume	After: T.I.
I-131	4/3	70mCi	15ml	2.0	0mCi	0	
I-131	4/3	30mCi	15ml	1.0	30mCi	15ml	1.0
TOTALS:		100mCi	30ml	3.0			

Label: Yellow III

WASTE MAT'L

Description: gloves, diaper, tape, plastic bag
Date to Pit: 4/5/00
T.I.: 1.0

Contractor/Owner: CH2M HILL
Location: Ft. Lauderdale
County: Broward
Survey Meter: Ludlum
Serial #: 8252
Well Name: IW #1
Field Name: G. T. Lohmeyer
State: FL
Cal. Date: 6/21/99

TRUCK SURVEYS

SHOP (Please Indicate Location of Source(s)) — mRem/hr
Empty: .03 — readings .03, .03, .03
Loaded: .05 — readings .08, .09, .08

LOCATION — mRem/hr
Arrival: .05 — readings .08, .04, .08
Depart: .03 — readings .03, .05, .05

SHOP RETURN — mRem/hr
Loaded: .03 — readings .05, .05, .06
Empty: .03 — readings .03, .03, .03

JOB SITE DIAGRAM & SURVEYS

mRem/hr

Truck: B .09 / A .05 (front); B .05 / A .03 (left); B .08 / A .06 (right); B .08 / A .05 (rear)

Wellhead: .03, .03, .03, .03, .03, .03, .03, .03

Please Indicate Location of Source(s)

WELLHEAD SKETCH:

Please, Color Code/Indicate "befores" & "afters"

TRACER UTILIZATION INTERNAL

Amount of Tracer Injected into Well: 1st Inj. 8mCi + 2nd Inj. 8mCi + 3rd Inj. 8mCi + 4th Inj. 8mCi + 5th Inj. 8mCi + 6th Inj. (Dump) 30mCi = TOTAL 70 mCi

FGL Engineer Signature: [signature]
Date (post job): 4/3/00

Attachment 6

CITY OF
FORT LAUDERDALE

Venice of America

April 5, 2002

Mr. Len Fishkin, P.G.
Professional Geologist
Underground Injection Control (UIC) Program
Florida Department of Environmental Protection
400 N. Congress Avenue
P.O. Box 15425
West Palm Beach, Florida 33416

RE: Wastestream Analysis for Primary and Secondary Drinking Water Standards (Chapter 62-550, F.A.C.)

GEORGE T. LOHMEYER RWWTP (GTL). Wastewater Permit No. FL041378.

Injection Well Permit Nos.	UO-06-279401	(IW-1, MW-2)
	UO-06-279508	(IW-2, MW-2)
	UO-06-279510	(IW-3, MW-3)
	UC-06-264391	(IW-4, MW-3)
	UO-06-279512	(IW-5, MW-1)

Dear Mr. Fishkin:

As required by and stated in the aforementioned permits, please find attached a wastestream analysis (24-hour composite sample) for primary and secondary drinking water standards (Chapter 62-550), F.A.C.) and minimum criteria, which is to be submitted annually (sampled in February and submitted by April).

Should you have any questions or require additional comment, please contact me at 954/523-1002 extension 2022.

Sincerely,

Michael A. Just
Regional WW Facilities Manager

c: Michael F. Bailey, P.E., Assistant Utilities Director
Susan Chen, Acting Treatment Division Manager
Karl Shallenberger, Environmental Program Coordinator
Joseph R. May, Program Manager, UIC, FDEP-WPB

PUBLIC SERVICES DEPARTMENT
949 N.W. 38TH STREET, FORT LAUDERDALE, FLORIDA 33309
TELEPHONE:(954) 828-8000, FAX (954) 828-7881
www.ci.fort-lauderdale.fl.us

CITY OF FORT LAUDERDALE
PUBLIC SERVICES DEPARTMENT
ENVIRONMENTAL LABORATORY

949 NW 38th Street, Fort Lauderdale, Florida 33309 (954) 828-8000

Sample ID No.:	02-1029	Lab Certification No.: DOH # E56084 DEP COM QAP # 87247G
Sample Date:	2/28/02	
Sampler:	JB	
Extraction Date:	3/3, 3/7, 3/9/2002	

Sample Location: GTL Regional Wastewater Treatment Plant Effluent

ID No.	PARAMETER NAME (MCL ug/L)	ANALYSIS RESULT ug/L	METHOD DET. LT. ug/L	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
	PESTICIDE / PCB CHEMICAL ANALYSIS 62-550.310 (2) (c)					
2005	Endrin (2)	<0.4	0.4	EPA525.2	3/11/02	PB
2010	Lindane (.2)	<0.2	0.2	EPA525.2	3/11/02	PB
2015	Methoxychlor (40)	<1.0	1.0	EPA525.2	3/11/02	PB
2020	Toxaphene (40)	<0.2	0.2	EPA608	3/5/02	JC
2031	Dalapon (200)	<0.2	0.2	EPA515.1	3/10/02	JC
2032	Diquat (20)	*		EPA549.1		
2033	Endothal (100)	*		EPA548.1		
2034	Glyphosate (700)	*		EPA547.1		
2035	Di(2-ethylhexyl) adipate (400)	<0.4	0.4	EPA525.2	3/11/02	PB
2036	Oxamyl (Vydate) (200)	*		EPA531.1		
2037	Simazine (4)	<0.3	0.3	EPA525.2	3/11/02	PB
2039	Di(2-ethylhexyl)-phthalate (6)	<0.4	0.4	EPA525.2	3/11/02	PB
2040	Picloram (500)	<0.2	0.2	EPA515.1	3/10/02	JC
2041	Dinoseb (7)	<0.2	0.2	EPA515.1	3/10/02	JC
2042	Hexachlorocyclopentadiene (50)	<1.0	1.0	EPA525.2	3/11/02	PB
2046	Carbofuran (40)	*		EPA531.1		
2050	Atrazine (3)	<0.2	0.2	EPA525.2	3/11/02	PB
2051	Alachlor (2)	<0.2	0.2	EPA525.2	3/11/02	PB
2063	Dioxin (0.00003) (Screen)	Not Detected	Screen	EPA525.2	3/11/02	PB
2065	Heptachlor (.4)	<0.15	0.15	EPA525.2	3/11/02	PB
2067	Heptachlor epoxide (.2)	<0.15	0.15	EPA525.2	3/11/02	PB
2105	2,4-D (70)	<0.2	0.2	EPA515.1	3/10/02	JC
2110	2,4,5-TP (Silvex) (50)	<0.2	0.2	EPA515.1	3/10/02	JC
2274	Hexachlorobenzene (1)	<0.2	0.2	EPA525.2	3/11/02	PB
2306	Benzo(a)pyrene (.2)	<0.2	0.2	EPA525.2	3/11/02	PB
2326	Pentachlorophenol (1)	<0.1	0.1	EPA515.1	3/10/02	JC
2383	PCBs (.5)	<0.2	0.2	EPA508	3/5/02	JC
2931	Dibromochloropropane (.2)	<0.02	0.02	EPA504.1	3/7/02	JC
2946	Ethylene dibromide (.02)	<0.02	0.02	EPA504.1	3/7/02	JC
2959	Chlordane (2)	<0.2	0.2	EPA525.2	3/11/02	PB

Comments: * See separate reports. Analyzed by USBiosystems.
Reagent blank results all below detection limits.
All analyses were analyzed using EPA Methods and certified to meet NELAC requirements.

Environmental Lab Supervisor

CITY OF FORT LAUDERDALE
PUBLIC SERVICES DEPARTMENT
ENVIRONMENTAL LABORATORY

949 NW 38th Street, Fort Lauderdale, Florida 33309 (954) 828-8000

Sample ID No.:	02-1029		Lab Certification No.:
Sample Date:	2/28/02		DOH # E58084
Sampler:	JB		DEP COM QAP # 87247G

Sample Location: GTL Regional Wastewater Treatment Plant Effluent

ID No.	PARAMETER NAME (MCL mg/L)	ANALYSIS RESULT mg/L	METHOD DET. LT. mg/L	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
	TRIHALOMETHANE ANALYSIS 62-550.310 (2) (a)					
2950	Total THMs (0.1)	0.0080	0.0004	EPA502.2	3/7/02	JC

ID No.	PARAMETER NAME (MCL ug/L)	ANALYSIS RESULT ug/L	METHOD DET. LT. ug/L	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
	VOLATILE ORGANIC ANALYSIS 62-550.310 (2) (b)					
2378	1,2,4-Trichlorobenzene (70)	<0.4	0.4	EPA502.2	3/7/02	JC
2380	Cis-1,2-Dichloroethylene (70)	<0.4	0.4	EPA502.2	3/7/02	JC
2955	Xylenes (Total) (10000)	2.66	0.4	EPA502.2	3/7/02	JC
2964	Dichloromethane (5)	<0.4	0.4	EPA502.2	3/7/02	JC
2968	o-Dichlorobenzene (600)	<0.4	0.4	EPA502.2	3/7/02	JC
2969	para-Dichlorobenzene (75)	<0.4	0.4	EPA502.2	3/7/02	JC
2976	Vinyl Chloride (1)	<0.7	0.7	EPA502.2	3/7/02	JC
2977	1,1-Dichloroethylene (7)	<0.4	0.4	EPA502.2	3/7/02	JC
2979	trans-1,2-Dichloroethylene (100)	<0.4	0.4	EPA502.2	3/7/02	JC
2980	1,2-Dichloroethane (3)	<0.4	0.4	EPA502.2	3/7/02	JC
2981	1,1,1-Trichloroethane (200)	<0.4	0.4	EPA502.2	3/7/02	JC
2982	Carbon tetrachloride (3)	<0.4	0.4	EPA502.2	3/7/02	JC
2983	1,2-Dichloropropane (5)	<0.4	0.4	EPA502.2	3/7/02	JC
2984	Trichloroethylene (3)	<0.4	0.4	EPA502.2	3/7/02	JC
2985	1,1,2-Trichloroethane (5)	<0.4	0.4	EPA502.2	3/7/02	JC
2987	Tetrachloroethylene (3)	0.696	0.4	EPA502.2	3/7/02	JC
2989	Monochlorobenzene (100)	<0.4	0.4	EPA502.2	3/7/02	JC
2990	Benzene (1)	<0.4	0.4	EPA502.2	3/7/02	JC
2991	Toluene (1000)	0.826	0.4	EPA502.2	3/7/02	JC
2992	Ethylbenzene (700)	0.572	0.4	EPA502.2	3/7/02	JC
2996	Styrene (100)	<0.4	0.4	EPA502.2	3/7/02	JC

Comments: Reagent blank results all below detection limits.
All analyses were analyzed using EPA Methods and certified to meet NELAC requirements.

Environmental Lab Supervisor

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PUBLIC SERVICES DEPARTMENT
ENVIRONMENTAL LABORATORY

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Sample ID No.:	02-1029		Lab Certification No.: DOH # E56084 DEP COM QAP # 87247G
Sample Date:	2/28/02		
Sampler:	JB		

Sample Location: GTL Regional Wastewater Treatment Plant Effluent

PARAMETER ID No.	PARAMETER NAME (MCL mg/L)	ANALYSIS RESULT mg/L*	METHOD DETECTION LIMIT mg/L*	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
INORGANIC ANALYSIS 62-550.310 (1)						
1005	Arsenic (0.05)	<0.001	0.001	SM3113-B	3/12/02	SEV
1010	Barium (2)	<0.25	0.25	SM3111-D	3/15/02	SEV
1015	Cadmium (0.005)	0.661	0.0002	SM3113-B	3/6/02	SEV
1020	Chromium (0.1)	<0.005	0.005	SM3113-B	3/5/02	SEV
1024	Cyanide (0.2)	<0.022	0.022	SM4500CN-E	3/12/02	TB
1025	Fluoride (4)	0.6	0.1	SM4500F-C	2/28/02	EM
1030	Lead (0.015)	0.118	0.013	EPA239.1	3/15/02	SEV
1035	Mercury (0.002)	0.0005	0.0002	EPA245.1	3/12/02	SEV
1036	Nickel (0.1)	0.005	0.001	SM3113-B	3/8/02	SEV
1040	Nitrate (10)	0.121	0.01	EPA353.2	3/1/032	KH
1041	Nitrite (1)	0.244	0.02	EPA354.1	2/28/02	KH
1045	Selenium (0.05)	<0.004	0.004	SM3113-B	3/5/02	SEV
1052	Sodium (160)	366	1.07	SM3111-B	3/15/02	SEV
1074	Antimony (0.006)	<0.002	0.002	SM3113-B	3/9/02	SEV
1075	Beryllium (0.004)	0.00024	0.0001	SM3113-B	3/8/02	SEV
1085	Thallium (0.002)	<0.001	0.001	EPA200.9	3/12/02	SEV
	Turbidity (NTU)	7.14	0.1	EPA180.1	2/28/02	JC

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949 NW 38th Street, Fort Lauderdale, Florida 33309 (954) 828-8000

Sample ID No.:	02-1029		Lab Certification No.:
Sample Date:	2/28/02		DOH # E56084
Sampler:	JB		DEP COM QAP # 87247G

Sample Location: GTL Regional Wastewater Treatment Plant Effluent

PARAMETER ID No.	NAME (MCL mg/L)	ANALYSIS RESULT mg/L*	METHOD DETECTION LIMIT mg/L*	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
SECONDARY CHEMICAL ANALYSIS 62-550.320						
1002	Aluminum (0.2)	0.233	0.17	SM3111-B	3/11/02	SEV
1017	Chloride (250)	660	2	SM4500Cl-D	3/7/02	TB
1022	Copper (1)	<0.002	0.002	SM3113-B	3/15/02	SEV
1025	Fluoride (2)	0.6	0.1	SM4500F-C	2/28/02	EM
1028	Iron (0.3)	0.296	0.002	SM3113-B	3/9/02	SEV
1032	Manganese (0.05)	0.0185	0.0004	SM3113-B	3/9/02	SEV
1050	Silver (0.1)	0.00046	0.0002	SM3113-B	3/8/02	SEV
1055	Sulfate (250)	100	1	EPA375.4	2/28/02	EM
1095	Zinc (5)	0.05	0.014	SM3111-B	3/15/02	SEV
1905	Color (15 Color units)	122	2	SM2120-B	2/28/02	EM
1920	Odor (3 Ton)	1	1	SM2150-B	2/28/02	EM
1925	pH (6.5-8.5)	7.55	0.1	EPA150.1	2/28/02	JC
1930	Total Dissolved Solids (300)	1344	1	SM2540-C	2/28/02	JC
2905	Foaming Agents (0.5)	0.057	0.025	SM5540-C	3/1/02	EM
	Alkalinity	198	20	EPA310.1	2/28/02	JC

Comments: * Except as noted.
All analyses were analyzed using EPA Methods and certified to meet NELAC requirements.

Environmental Lab Supervisor

CITY OF FORT LAUDERDALE
PUBLIC SERVICES DEPARTMENT
ENVIRONMENTAL LABORATORY

949 NW 38th Street, Fort Lauderdale, Florida 33309 (954) 828-8000

Sample ID No.:	02-1029		Lab Certification No.: DOH # E56064 DEP COM QAP # 87247G
Sample Date:	2/28/02		
Sampler:	JB		

Sample Location: GTL Regional Wastewater Treatment Plant Effluent

MUNICIPAL WASTEWATER MINIMUM CRITERIA GROUND WATER MONITORING PARAMETERS

PARAMETER ID No.	NAME (MCL mg/L)	ANALYSIS RESULT mg/L*	METHOD DETECTION LIMIT mg/L*	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
INORGANICS						
	Ammonia	12.49	0.01	EPA350.1	3/1/02	KH
	Nitrogen (organic)	1.13	0.06	EPA351.2 - 350.1	3/5/02	KH
	Ortho-P (soluble)	0.96	0.06	EPA365.1	2/28/02	KH
	Phosphorus	1.2	0.05	EPA365.4	3/5/02	KH
	TKN	13.62	0.06	EPA351.2	3/5/02	KH
VOLATILE ORGANICS						
	Chloro-ethane	<0.0004	0.0004	EPA502.2	3/7/02	JC
	Chloroform	0.00778	0.0004	EPA502.2	3/7/02	JC
	1,4-dichloro-benzene	0.00114	0.0004	EPA502.2	3/7/02	JC
	cis-1,2-dichl-oroethene	<0.0004	0.0004	EPA502.2	3/7/02	JC
BASE/NEUTRAL ORGANICS						
	Anthracene	<0.003	0.0030	EPA625	3/12/02	PB
	Butylbenzyl-phthalate	<0.01	0.0100	EPA625	3/12/02	PB
	Dimethyl-phthalate	<0.007	0.0070	EPA625	3/12/02	PB
	Naphthalene	<0.005	0.0050	EPA625	3/12/02	PB
	Phenan-threne	<0.005	0.0050	EPA625	3/12/02	PB
PESTICIDES AND PCB'S						
	Aldrin	<0.005	0.005	EPA625	3/12/02	PB
	Dieldrin	<0.010	0.010	EPA625	3/12/02	PB
	Dioxin	Not Detected	Screening	EPA525	3/12/02	PB

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949 NW 38th Street, Fort Lauderdale, Florida 33309 (954) 828-8000

Sample ID No.:	02-1029		Lab Certification No.: DOH # E56084 DEP COM QAP # 87247G
Sample Date:	2/28/02		
Sampler:	JB		

Sample Location: GTL Regional Wastewater Treatment Plant Effluent

MUNICIPAL WASTEWATER MINIMUM CRITERIA GROUND WATER MONITORING PARAMETERS

PARAMETER ID No.	PARAMETER NAME (MCL mg/L)	ANALYSIS RESULT mg/L*	METHOD DETECTION LIMIT mg/L*	ANALYSIS METHOD	ANALYSIS DATE	ANALYST
ACID EXTRACTABLES						
	2-chloro-phenol	<0.010	0.010	EPA625	3/12/02	PB
	Phenol	<0.010	0.010	EPA625	3/12/02	PB
	2,4,6-trichlo-rophenol	<0.005	0.005	EPA625	3/12/02	PB
OTHER						
	CONDUCTI-VITY	2450	1 uMHOs/cm	EPA120.1	2/28/02	JC
	BOD	7.7	2.00	EPA405.1	2/28/02	JC
	COD	61.9	3.00	SM5220D	3/7/02	TB
	Total Coliform	28,500	1 CFU/100 mL	SM9222B	2/28/02	DT

Comments:

* Except as noted.

** Analyzed by USBiosystems, reports attached.

All analyses were analyzed using EPA Methods and certified to meet NELAC requirements.

Environmental Lab Supervisor

Client #: PTL-95-080104
Address: City of Port Lauderdale
Public Service Department
949 NW 38 St.
Ft. Lauderdale, FL 33309
Susan Chen

Page: Page 1 of 2
Date: 03/19/2002
Log #: L60975

Sample Description:

Analytical Report: 02-1029E
Date Sampled: 02/27/2002
Time Sampled: 22:00
Date Received: 03/01/2002
Collected By: Client

General Chemistry

Parm ID	Name	MCL	Units	Samplenum	Result	Units	Method	RDL	Analysis Date	Lab ID
4000	Gross Alpha	15	pCi/l	L60975-3	8.0+/-2.4	pCi/l	900.0	3.3	03/09/02	E86240
4020	Radium 226	5.0	pCi/l	L60975-3	<0.2+/-0.1	pCi/l	903.1	0.20	03/14/02	E86240
4030	Radium 228	5.0	pCi/l	L60975-3	<0.9+/-0.6	pCi/l	Ra-05	0.90	03/14/02	E86240

Subcontracted Services

ID	Name	MCL	Units	Samplenum	Result	Units	Method	RDL	Analysis Date	Lab ID
	Subcontract Lab 1			L60975-3	E83033		Radiology		03/08/02	
	Subcontract Lab 2			L60975-3	E83049		531.549		03/08/02	

Carbamates/Carbamoyloximes

Parm ID	Name	MCL	Units	Samplenum	Result	Units	Method	RDL	Analysis Date	Lab ID
2047	Aldicarb		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2044	Aldicarb sulfone		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2043	Aldicarb sulfoxide		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2021	Carbaryl		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2046	Carbofuran	40	ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2066	3-Hydroxycarbofuran		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
	Methiocarb		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2022	Methomyl		ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240
2036	Oxamyl	200	ug/l	L60975-3	BDL	ug/l	531.1	1.0	03/08/02	E86240

Glyphosate

Parm ID	Name	MCL	Units	Samplenum	Result	Units	Method	RDL	Analysis Date	Lab ID
2034	Glyphosate	700	ug/l	L60975-3	BDL	ug/l	547	6.0	03/11/02	E86240

Client #: FTL-95-080104
Address: City of Fort Lauderdale
Public Service Department
949 NW 38 St.
Ft. Lauderdale, FL 33309
Susan Chen

Date: 03/19/2002
Log #: L60975

Sample Description:

Analytical Report: 02-1029E
Date Sampled: 02/27/2002
Time Sampled: 22:00
Date Received: 03/01/2002
Collected By: Client

Endothall

Parm ID	Name	MCL	Units	Samplenum	Result	Units	Method	RDL	Analysis Date	Lab ID
2033	Endothall	100	ug/l	L60975-3	BDL	ug/l	548.1	9.0	03/11/02	E86240

Diquat/Paraquat

Parm ID	Name	MCL	Units	Samplenum	Result	Units	Method	RDL	Analysis Date	Lab ID
2032	Diquat	20	ug/l	L60975-3	BDL	ug/l	549.1	0.40	03/11/02	E86240
	Paraquat		ug/l	L60975-3	BDL	ug/l	549.1	0.40	03/11/02	E86240

All analyses were performed using EPA, ASTM, NIOSH, USGS, or Standard Methods and certified to meet NELAC requirements.
Flags: BDL or U-below reporting limit; DL-diluted out; IL-meets internal lab limits; MI-matrix interference; NA-not appl.
Flags: CFR-Pb/Cu rule; ND-non detect(RL estimated); NFL-no free liquids; dw-dry wt; ww-wet wt; C(#)-see attached USB code
FLDEP Flags: J(#)-estimated 1:surr. fail 2:no known QC req. 3:QC fail %R or %RPD; 4:matrix int. 5:improper fld. protocol
FLDEP Flags: L-exceeds calibration; Q-holding time exceeded; T-value < MDL; V-present in blank
FLDEP Flags: Y-improper preservation; B-colonies exceed range; I-result between MDL and PQL

#980126	DOH# E86240	NC CERT# 444
A HRS# 86122,86109,E86048	ADEM ID# 40850	RI CERT# 191
SC CERT# 96031001	TN CERT# 02985	CT CERT# PH-0122
ELPAT# 13801	GA CERT# 917	MA CERT# M-FL449
VA CERT# 00395	USDA Soil Permit# S-35240	

Respectfully submitted,

Monalisa Beasley
Project Manager

CITY OF FORT LAUDERDALE
PUBLIC SERVICES DEPARTMENT

CHAIN OF CUSTODY RECORD

SAMPLE ID # 02-1029

Sample / Project site: GTL EFFLUENT

Sample Type: [X] Comp. [ ] Grab
Matrix: [X] Water [ ] Solid

Sampled By: J. Bell (Print) J. Bell (Sign)

Item #	Sampling Date	Sampling Time	Sample Location / Description	TOT # CONT	ANALYSIS REQUIRED: See attached sheet — # CONTAINERS SUBMITTED FOR EACH ANALYSIS
1	2/28/02	10:45	EFFLUENT SAMPLER	24	24
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Comments: 24 Hr. Composite Sampler Set 2/27 11:45 AM

Relinquished By: (Print)	(Sign)	Date / Time	Relinquished By: (Print)	(Sign)	Date / Time
J. Bell	J. Bell	2/28/02			
Received By:		**Date / Time**	**Received By:**		**Date / Time**
U Besley	BESLEY	2/28/02 12:00			

FORM AW-418 Rev 2/99

1

USBIOSYSTEMS

CHAIN OF CUSTODY RECORD

Log # 60975   Quote: 350/45/75/45

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp____	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIME?	✓		
CUSTODY SEALS INTACT?	✓		
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

Company Name: City of Ft Lauderdale POP
Address: 949 NW 38 St
City: Ft Lauderdale State: FL Zip: 33309
Attn: Susan Chen Fax: (954) 828-7897
Project Name: Proj#:
Sampler Name/Signature: DT/JB Phone: (954) 828-7888

Matrix Codes

SD Solid Waste; GW Ground Water; EFF Effluent; AFW Analyte Free H_2O; WW Waste Water; DW Drinking Water; SU Surface Water; OL Oil; SL Sludge; SO Soil Sediment; AQ Aqueous; NA Nonaqueous; PE Petroleum; O Other (Please Specify)

Pres Codes

A. None; B. HNO_3; C. H_2SO_4; D. NaOH; E. HCL; F. MeOH; G. $Na_2S_2O_3$; H. $NaHSO_4$; I. Ice; J. MCAA; O. Other

(8)

#	Sample ID	Date	Time	Matrix	Containers		EPA 531.1	EPA 547	EPA 548	EPA 549	Gross α	Radium 226/228	REMARKS
1	02-1027I	2/26/02	10am	WW	5	① [illegible]	✓	✓	✓	✓	✓	✓	① [illegible] KEPT HERE
2	02-1027E	2/26/02	10am	Eff	5 6		✓	✓	✓	✓	✓	✓	1
3	02-1029E	2/27/02	2pm	Eff	5	[illegible]	✓	✓	✓	✓	✓	✓	
4													
5													
6													
7													
8													
9													
0													

NO

Y/N Date required____ Y____ N ✓ None ✓ 1____ 2____ 3____ Other____ (Y) N (N) FL

	Relinquished by	Date	Time	Received by	Date	Time
	P Beasley	3/1/02	815Am	Phil Dayton, Jr.	3-1-02	08:15
	Phil Dayton, Jr	3-1-02	10:15	[illegible]	3/1/02	1110

#____

3231 N.W. 7th Avenue
Boca Raton, FL 33431
888-862-LABS
561-447-7373
888-456-4846 Fax
561-447-6136 Fax

C.O.C. # 35650

ORIGINAL

Attachment 7

Ft. Lauderdale Summary of Injection Well Related Activities

TO: File

FROM: Sean Skehan

DATE: July 5, 2002

The purpose of this memorandum is to provide a summary of major events that have taken place for the Fort Lauderdale Injection Well System since construction of the first test well (IW-5) to the current permitting activities for the operation of the injection system. Questions related to the current permitting activities are to be discussed in a meeting with FDEP staff on July 5, 2002, where this summary and related data will be presented.

1. Geraghty and Miller, July 1978, application to construct Deep Injection Well Test Program for City of Fort Lauderdale.
   - Provided information on the Port Everglades Oil Company well – 1929. Other options for disposal.

2. Geraghty and Miller, September 1981. Construction and Testing of the Test Injection Well IW-5, City of Fort Lauderdale, Florida.
   - Discussion on construction of test well (IW-5) and MW-1, indentified difficulties with deviated hole and poor cementing of MW-1 (pg 40) - documented resolution of construction issues.
   - Provided data on injection testing and effects on MW-1, demonstrated that MW-1 was connected directly to the injection zone.

3. Geraghty and Miller, February 1984. Construction and Testing of Disposal Wells 1, 2, and 3 at the George T. Lohmeyer Plant, Fort Lauderdale, Florida.

4. Report for Mechanical Integrity Testing of Injection Wells IW 1, IW 2, IW 3 and IW 5 for Ft. Lauderdale (May 1991)
   - Monitor well water quality data indicates effects of effluent parameters in the lower and intermediate monitor intervals

5. Monitor Well background data, 1991. Diagram, water quality plots, background data, video survey of deep zone tubing.

6. Negotiate consent order – requires rehabilitation of MW-1, construction of MW-2 and based on testing results of MW-2, construction of RMW-1, April 27, 1992.

7. Plan for MIT of MW-1, May 1992. Description of preliminary investigation

8. Report for Mechanical Integrity Testing of Monitor Well MW 1 for City of Ft. Lauderdale (March 93)

9. Application to Rehabilitate Multi-Zone Monitor Well MW-1, October, 1993.

10. Application to Construct Well MW-2 and Regional Monitor Well RMW, October, 1993.

11. Video, 1994. on cleaned deep zone tubing. Holes evident

12. Technical Specifications for MIT of IW-1, IW-2, IW-3, and IW-5, July, 1994

13. Application to construct IW-4 and MW-3, January 1995.

14. Mechanical Integrity Testing of Injection Wells IW 1, IW 2, IW 3 IW 5 for Ft. Lauderdale; Volumes 1 and 2, (March 95)

15. Engineering report on the Rehabilitation of Monitor Well MW-1 and Construction and Testing of Monitor Well MW-2 and Regional Monitor Well RMW-1 at the G.T. Lohmeyer Wastewater Treatment Plant (June 95).

    - See Appendix I for packer test data

16. RFI response to Construction Permit Application, July 1995. Provides background on status of consent order, response to questions related to water quality and other issues.

17. Application to Operate Deep Injection Well Effluent Disposal System, October, 1995.

18. Engineering Report on the Construction and Testing of Monitor Well MW 3 at the G.T.Lohmeyer Wastewater Treatment Plant (September, 1996).

    - See Appendix I for packer test data

19. Operation and Maintenance Manual Update for Deep Injection Well System at the G.T. Lohmeyer Wastewater Treatment Plant (January 1997).

20. Engineering report on the Construction and Testing of Injection Well IW 4 at the G. T. Lohmeyer Wastewater Treatment Plant (March 1997)

21. Report on the Construction and Testing of Injection Well IW 4 at the City of Ft. Lauderdale G.T. Lohmeyer Wastewater Treatment Plant, Volumes 1 and 2 (February 1999)

22. Engineering Report for Mechanical Integrity Testing of Injection Well IW 1, IW 2, IW 3, IW 4, IW 5; Volumes 1 and 2 (January 2000)

23. Application to Operate Deep Injection Well IW-4, March 2001.

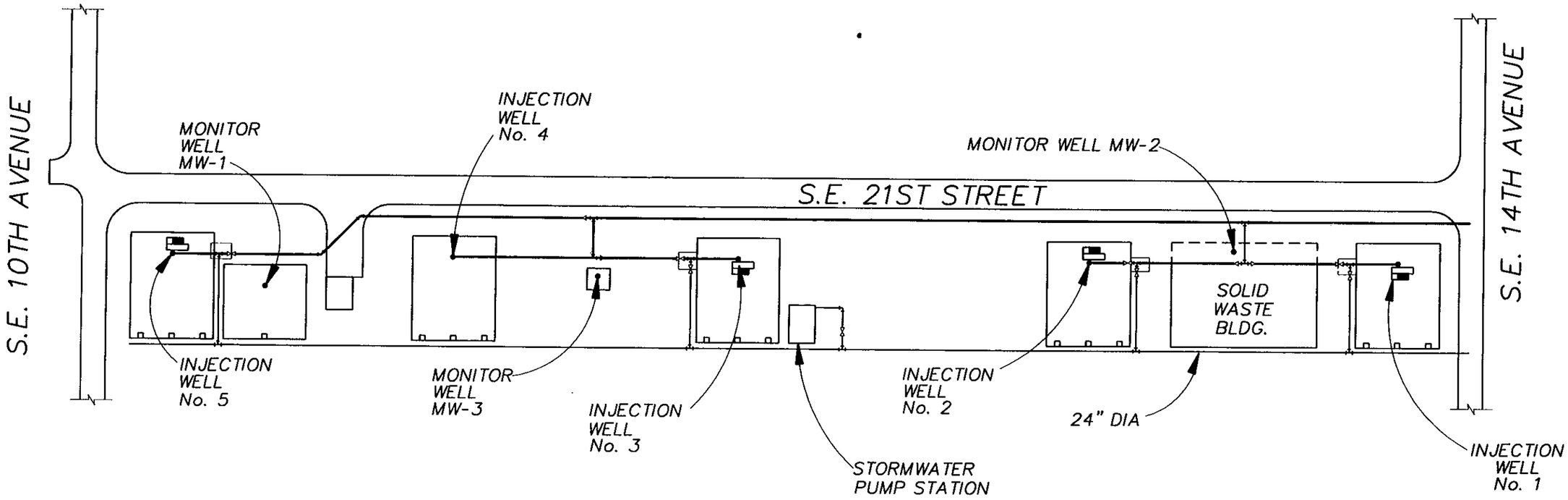
    - RFI response #1 for the Application to Operate Deep Injection Well IW-4, July, 2001

08-25-02

N

0 160'

SCALE IN FEET



NOTE:

1. SITE PLAN GENERATED FROM AS-BUILT DRAWINGS PREPARED BY HAZEN AND SAWYER, JANUARY 20, 1982.

INJECTION FACILITY SITE PLAN

CH2MHILL

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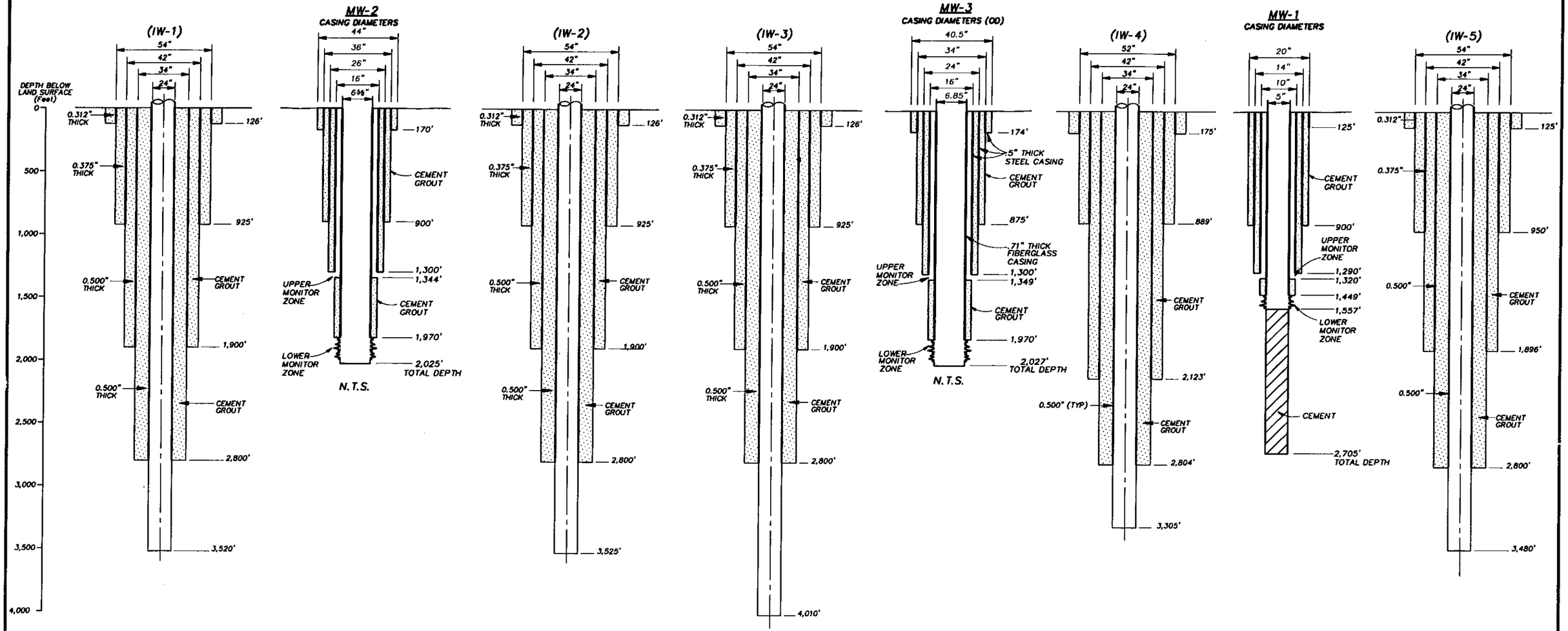
06-26-02



COMPLETION DIAGRAM FOR THE
FORT LAUDERDALE INJECTION WELL SYSTEM

CH2MHILL

U:\154341.DR\DI01F03.DWG 1=1.0

APPLICATION TO CONSTRUCT

DEEP INJECTION WELL

TEST PROGRAM

FOR

CITY OF FORT LAUDERDALE, FLORIDA
CENTRAL WASTEWATER REGION

PROJECT NO. 7089

EPA C 120474180

July 18, 1978

HAZEN AND SAWYER
Engineers

GERAGHTY & MILLER, INC.
Ground Water Geologists

Contract I - Test Well Program

Install an exploratory test hole constructed explicitly for the purpose of gathering site specific geologic and hydrogeologic data. This data will be used to control all subsequent design and construction. The specific wells to be installed under this first phase are:

- Test Injection Well to the Boulder Zone.
- Floridan Aquifer Monitor Well.
- Biscayne Aquifer Water Supply Well.
- Biscayne Aquifer Monitor Wells.

* * * *

The well site is located within the Port Everglades commercial area. It is approximately 1200 feet long and 125 feet wide. The ultimate plan is to construct five (5) 24-inch diameter injection wells on the site spaced apart at nominal 300 foot centers. Each 24-inch diameter injection well is capable of injecting up to 20 mgd flow rate. Four (4) wells can handle the 74 mgd peak flow rate. The fifth well (the original test injection well) is a standby unit required when an injection well is down for periodic inspection and maintenance.

* * * *

LOCAL CONDITIONS

Geologic

It was possible to make an estimate of geologic conditions in the vicinity of the Port Everglades/Hollywood regional wastewater treatment sites, based on data from two nearby wells. At Margate, about 10 miles from the Port Everglades site, a private utility has been operating a deep disposal well for the past three years or so. Electric logs and some core data are available. Also, the logs of a 3000-foot-deep oil test well drilled by the Port Everglades Oil Company in 1929 were found and employed in the analysis. This well is located approximately 1.5 miles north-northwest of the Port Everglades site. Interpretation and correlation of the various data from these two wells were used to prepare a geologic section for the treatment plant area and to develop design criteria for well construction and formulate procedures for drilling and testing. The most complete data are from the Margate disposal well in the form of electric, cement bond, and gamma ray logs and core descriptions.

Based on interpretation of the logs, a description of geologic conditions is as follows:

One active disposal well is located approximately one mile east of the Port Everglades injection well site. The well is owned by Star Overall Uniforms, 2701 S. W. 2 Avenue, Fort Lauderdale, and is used to inject 5,800 gpd of commercial laundry wastewater into the Biscayne Aquifer. The well terminates at a depth of 260 feet.

One well (Plate II) has been drilled into the Floridan Aquifer within a two-mile radius of the injection site. This well was drilled by the Port Everglades Oil and Gas Company in 1929, and was bottomed at a depth of 3010 feet. This well has been abandoned and the steel casings removed in the early 1940's. No additional data is available. At Margate, approximately ten miles northwest of the Port Everglades site, a deep wastewater disposal well has been in operation for the past four years. Interpretation and correlation of the various data obtained from these two wells were used to estimate geologic conditions in the area and to develop design criteria for well construction and formulate procedures for drilling and testing.

One additional Floridan well was located in the general vicinity: the Carlsbad Spa well at 3800 Ocean Drive, Hollywood, which was drilled to a depth of 1,030 feet in 1960. Very little pertinent information is contained in the available report on this well except that it had a natural flow of 115 GPM through a 3-inch casing, the water temperature was 67.5°F, and the chloride content was approximately 1800 mg/l.

Geraghty & Miller, Inc.

CONSTRUCTION AND TESTING OF THE TEST INJECTION WELL CITY OF FORT LAUDERDALE, FLORIDA

September 1981

Prepared by:
Geraghty & Miller, Inc.
Ground-Water Consultants
1665 Palm Beach Lakes Blvd., Suite 604
West Palm Beach, Florida
33401

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- Water Analyses
- Pressure Test

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Water Supply Well
- Geologic Log

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- Cement Bond
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- Caliper (T.I.W.)
- Flow Meter (T.I.W.)
- Cement Bond Log Variable Density (F.A.M.W.)
- Electric (F.A.M.W.)
- Temperature (F.A.M.W.)
- Caliper (F.A.M.W.)
- Gamma Ray (F.A.M.W.)

log was run with the well being produced at 1380 gpm. Examination of that log shows definite evidence of fluid entry at 2090 feet and beginning at 1860 feet (in an upward direction). The former point correlates approximately with observations made during the television survey, during the drilling, and from the caliper log. No anomalies can be seen below 2090 feet; the temperature remained about the same from the bottom up to that depth. The television survey revealed that water was entering at the bottom of the pilot hole. If water were entering at points between 2090 feet and the bottom of the hole, it would have been warmer and, therefore, would have influenced the temperature log. This would be particularly so for the interval above 2500 feet, where shut-in temperatures were 70 ^{o}F and greater.

The television surveys and drill stem tests revealed that fluid enters the borehole at a number of points in the interval between 2600 and 2700 feet. During the pump-out test, this zone (Monitor Zone #1) responded to pumping from the Boulder Zone, indicating some connection between the two. The shut-in temperature log shows little difference in temperature between the two zones, so that it is possible fluid was entering during the flowing temperature survey, but the differential was small and did not show as an anomaly on the temperature log.

report. After these operations were completed, the rig was demobilized, the site cleaned up, and the well head completed in accordance with the specifications.

Floridan Aquifer Monitor Well

The Floridan Aquifer Monitor Well was constructed to tap three separate zones. Prior to completion it was used as an observation well for the Floridan aquifer pumping test. The initial plans called for monitoring zones at +/-2400 feet, +/- 1600 feet, and +/- 1100 feet, based on the evaluation of data available at that time. The plans were changed when analysis of the various data revealed the presence of a deep potential monitor zone in the 2570- to 2690-foot interval (Monitor Zone #1). Accordingly, the well's construction plans were modified; the deep zone was tapped with a gravel-packed, 3-1/2-inch-diameter fibercast screen attached to 3-1/2-inch-diameter casing. The other two monitor zones were close to the ones originally selected; Monitor Zone #2 is in the interval between 1457 and 1562 feet, and Monitor Zone #3 is in the interval between 1008 and 1072 feet. Details of the well's construction and relationship to the geologic section are given in Plate 1. That illustration also contains a plan view of the well with each monitor tube identified for future reference.

After the well was completed, each monitor tube was developed and either flowed or pumped to insure that each zone was producing representative formation water and that water levels would respond. Evidence of this is demonstrated by the hydrographs for the various zones given on Figures 2 through 7. Water samples were collected from each monitor zone and analyzed by Geotec Laboratories, West Palm Beach, Florida. Copies of the lab report are included in Appendix A. The various monitor tubes were disinfected following the collection of water samples.

The head, or water level, in each monitor zone is different, indicating that they are effectively isolated from each other. The head differences appear to be due primarily to the different salinity (density) of the water in each zone. As an example, at 0900 hours on June 5, 1981, the water-level elevation (referenced to NGVD) in each zone were as follows: Monitor Zone #1 = +1.08 feet; Monitor Zone #2 = +16.72 feet; and Monitor Zone #3 = +32.05 feet.

The cement bond log of the well also indicates that an effective seal was obtained. The top of sand or gravel pack in Monitor Zone #1 can be seen at 2520 feet. Between that depth and 2200 feet, the amplitude of the signal is low and formation signals can be seen, indicating that sealing between pipe, cement-filled annulus, and the formation was

achieved. Between 1950 and 2200 feet, both low and high amplitude signals as well as some pipe signal can be seen, indicating places where the bonding is incomplete. However, a low amplitude signal (good bond) and formation signal indicating good bonding are shown for the interval between 1950 and 1826 feet, so that this section between 1950 and 2200 feet is sealed both above and below. A mix of low and high amplitude signals can be seen between 1822 feet and the bottom of the gravel pack in Monitor Zone #2 at 1596 feet. The signal from Monitor Zone #2 is quite distinctive and is characterized by very high amplitude, strong pipe signal, and no formation signal. Above Monitor Zone #2 the bonding appears good with the exception of three small points in the interval between 1420 and 1080 feet; these are at 1294, 1158, and 1120 feet and they should not affect the quality of the seal between the monitor zones. The presence of Monitor Zone #1 is quite obvious in the bond log, as shown for the interval between 980 and 1080 feet. Based on this information and the water-level data, the Floridan Aquifer Monitor Well was constructed in accordance with the specifications and approved changes and should be capable of serving its intended purpose when the system is placed in operation.

#6

PUMPING TEST

Following completion of the drilling at 3480 feet, the contractor removed the drilling fluid from the well and made preparations to perform a pumping test, which was followed by the injection tests. The pumping test was performed first so as to avoid introducing "non-native" water into the Boulder Zone in order to collect more representative data and water samples. A vertical turbine pump capable of producing in excess of 10,000 gpm was used to run a constant-rate test for a period of 72 hours.

Data on water levels, bottom-hole pressure, and pumping rate were collected from the pumping well. Water levels were measured using an electric tape (M-scope). Bottom-hole pressures were measured and recorded with a Lynes DSR-300 (Digital Surface Recorder). The transducer for this unit was run in the hole on a wire line and was used to measure pressure changes (to 0.01 psi) and temperatures. By measuring bottom-hole pressures prior to and during testing, it was possible to obtain reliable data that were not influenced by temperature-induced density changes of the Boulder Zone water and friction loss in the 24-inch casing so that a more accurate measurement of drawdown could be

and then recovered at a much slower rate as the cool water in the well gradually warmed to its ambient temperature.

The behavior of the water level in Monitor Zones #1, #2, and #3 is shown on Figures 2 through 5, respectively (two figures show the water level in Monitor Zone #1). These hydrographs are reproductions of the original Stevens water-level recorder charts using daily time gears and a vertical scale of one major division equal to 0.5 foot (1:5 gears). Examination of these records reveals a number of important facts. First, Figure 2 (Monitor Zone #1 levels) shows an abrupt change in water level of about 0.06 foot that corresponds to the start of pumping. Similarly, an abrupt rise in water level occurred (Figure 3) when the test was stopped. This indicates that some connection exists between the Boulder Zone and Monitor Zone #1.

The observed drawdown in Monitor Zone #1 was small (about 10 percent) in comparison to that measured in the Boulder Zone. It also occurred simultaneously with the drawdown in the Boulder Zone; there was no delay after the start of pumping. This is indicative of a rapid transfer of pressure such as accompanies the start of pumping from an artesian aquifer. Also, it could have been the result of the redistribution of stress within the system that accompanied the start of pumping. The rapid response to the start of pumping suggests

City of Fort Lauderdale

MONITOR WELL
Background Data

UNDERWATER VIDEO SURVEY OF THE DEEP ZONE MONITOR

RECORD OF UNDERWATER VIDEO SURVEY

Project: SEF32544.02

Well: Fort Lauderdale Injection System Deep Monitor

Survey By: Deep Venture

Survey Date: September 23, 1991

Witnessed By: Sean Skehan and Tom McCormick/CH2M Hill
Mike Bailey/Fort Lauderdale

Reviewed By: Sean Skehan

DEPTH IN FEET From	To	OBSERVATIONS
0	300	Visibility poor due to suspended black material in the water and on the casing, caliper arm tracks clearly visible
300	400	As above, at 325 feet a concentric concretion of material built up on the casing, very rough, camera shifts as it passes, shows up on the caliper log, at 345 and 351 feet appears to be a rock on the side of the casing, at 364 feet appears to be a breach in casing, concentric ring of built up material, appears on the caliper as a larger diameter, from 364 to 394 feet well wall is very rough, at 396 feet concentric ring of built up material, appears to be a breach in the casing
400	500	Continue to have numerous concretions on well bore, very rough, camera will shift as it passes by, at 432 and 472 feet appears to be rocks, possible hole in casing, at 489 feet a large concretion
500	600	Casing continues to have numerous concretions, very rough, at 511 feet - appears to be rocks, possible hole in the casing, at 537 feet a large concretion
600	700	Visibility continues to be poor, casing very rough, small to large concretions on casing
700	800	As above, at 728 feet very large concentric concretion, from 712 to 745 feet casing extremely rough
800	900	As above, visibility is somewhat improved, well bore continues to

		be very rough, small to large concretions on casing cause camera to shift
900	1000	Visibility becomes poor from 910 to 975 feet, possibly due to camera offset, at 985 feet an apparent casing joint, from 995 to 1000 feet well bore appears to be some what smoother
1,000	1,100	Improved visibility, realatively smooth with concretions; apparent casing joints at 1,025 and 1,065, large concretions at 1,077 and 1,092 feet
1,100	1,200	As above, with apparent casing joints at 1,104, 1,144, and 1,184 feet; area around 1,144 feet is very rough; an apparent hole in the well bore at 1,177 feet
1,200	1,300	As above, well bore is very rough with large to small concretions; apparent casing joints at 1,224 and 1,264 feet
1,300	1,400	Apparent casing joint at 1,342 feet, large concretions at 1,351 and 1,381 feet, continue to have uphole flow
,400	1,500	Possible casing joints at 1,420 and 1,459 feet, well bore is extremely rough with heavy concretions that appear to be rocks down to 1,500 feet
1,500	1,600	Relatively smooth well bore with fewer concretions, a possible casing joint at 1,538 feet, uphole flow still apparent at 1,550 feet
1,600	1,700	Picture becomes darker, relatively smooth with large to small concretion, a possible casing joint at 1,697 feet
1,700	1,800	As above; a very rough concentric ring at 1,737 and 1,778 feet - possible casing joints
1,800	1,900	As above; from 1,850 feet concretions become more numerous, extremely rough at 1,858 feet, diameter of well bore becomes smaller, casing does not appear to be present, uphole flow continues to be present, a heavy concretion ring at 1,897 feet
1,900	2,000	Buildup appears to be less down to a depth of 1,977 feet, at 1,977 feet well bore becomes extremely rough down to 2,000 feet
2,000	2,100	Well bore continues to be extremely rough, casing is not apparent, at 2,018 and 2,057 feet heavy concentric concretions

,100	2,200	Well bore continues to be extremely rough, casing is not apparent; at 2,137, 2,178, 2,193 feet heavy concentric concretions
2,200	2,259	Well bore continues to be extremely rough; at 2,218 feet diameter becomes smaller because of large concretions; a 2,257 feet hole diameter becomes more restrictive, camera hanging up, can not proceed any further than 2,259 feet because of extremely heavy buildup as shown on the caliper.

Plan for

Mechanical Integrity Testing

of Monitor Well MW-1

George T. Lohmeyer

Wastewater Treatment Plant

Prepared for the

City of Fort Lauderdale

Broward County, Florida

Consent Order No. 91-2455

Prepared by

CH2M HILL Southeast Inc.

Deerfield Beach, Florida

May 1992
SEF32544.03

CONTENTS

TABLES

FIGURES

Introduction

The City of Fort Lauderdale, Florida operates a deep injection well (DIW) system at the George T. Lohmeyer Waste Water Treatment Plant (WWTP) to dispose of secondary-treated municipal effluent. Figure 1-1 is a location map and Figure 1-2 is a site map of the DIW system layout. The system consists of four injection wells (IW-1, IW-2, IW-3, IW-5) and a multi-zone deep monitor well (MW-1). Each injection well is cased with a nominal 24-inch-diameter steel casing to an approximate depth of 2,800 feet below land surface (bls). The well is completed with open-hole construction to a depth of approximately 3,500 feet bls. The injection zone is locally known as the "Boulder Zone", a highly transmissive zone in the Floridan aquifer system capable of receiving large effluent flows.

Water quality data from MW-1 indicates a freshening trend (i.e., decreasing chloride, conductivity, and total dissolved solids (TDS) concentrations) in the middle and lower monitor zones. Increasing concentrations of total kjeldahl nitrogen (TKN) and ammonia-nitrogen are also observed in these monitor zones. It is difficult to determine the exact time that the apparent freshening trend began, but chloride and TDS concentrations in the middle monitor zone began declining almost immediately during operational testing in 1985. The Florida Department of Environmental Regulation (FDER) has expressed concern that these trends may indicate migration of effluent from the injection zone upward to monitor intervals within the upper Floridan aquifer system. Water quality parameters from the upper monitoring zone are stable throughout the monitoring period. Mechanical Integrity Tests (MITs) were conducted by CH2M HILL (1991) on the four injection wells in accordance with procedures set forth in Chapter 17-28, Florida Administrative Code (FAC). The results of those tests demonstrated that the injection well casings and cement seals met regulatory standards for mechanical integrity.

The City of Fort Lauderdale and FDER entered into a Consent Order (No. 91-2455), dated April 27, 1992, to take steps to determine the cause of the apparent freshening

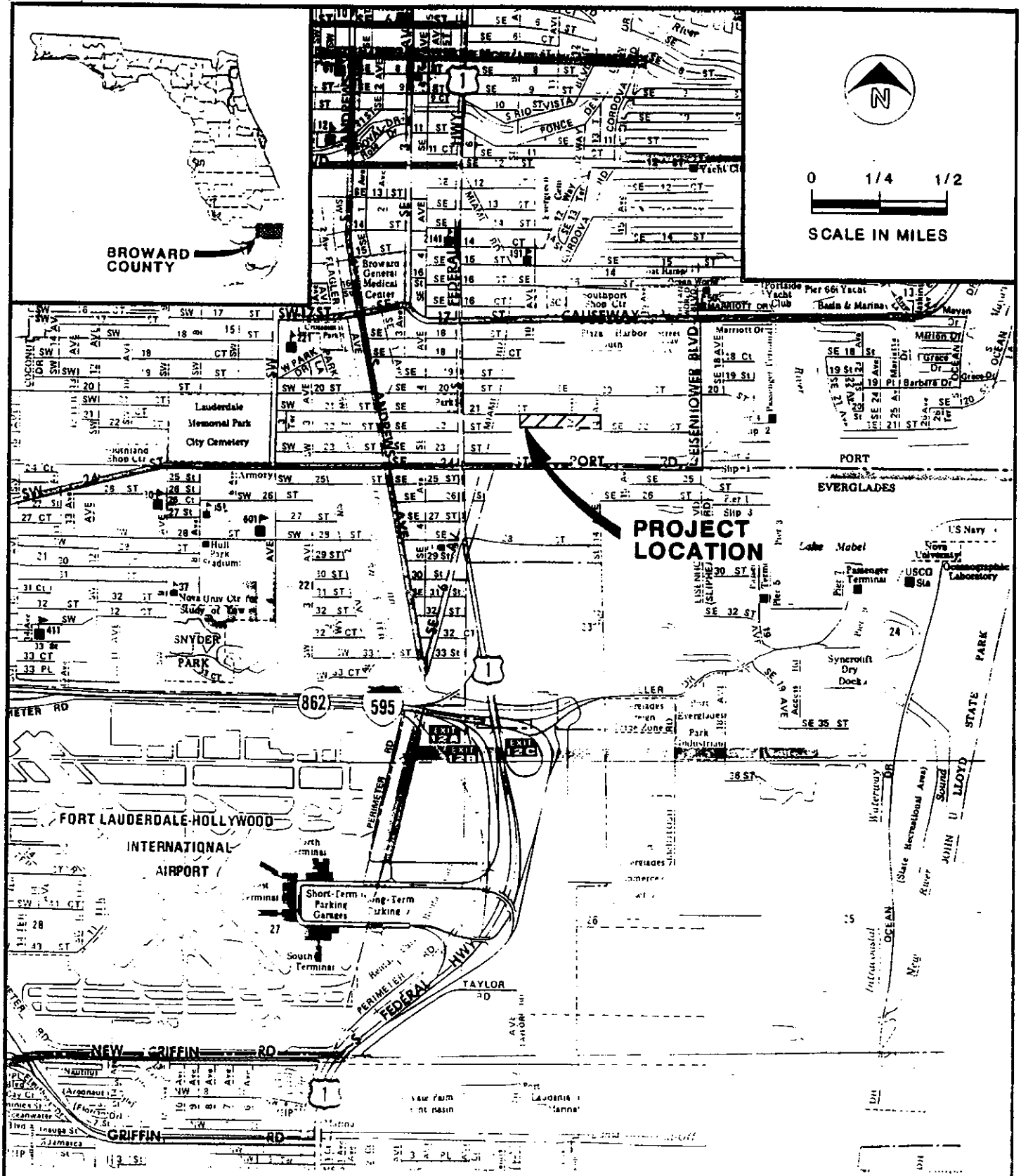

FIGURE 1-1

PROJECT LOCATION MAP

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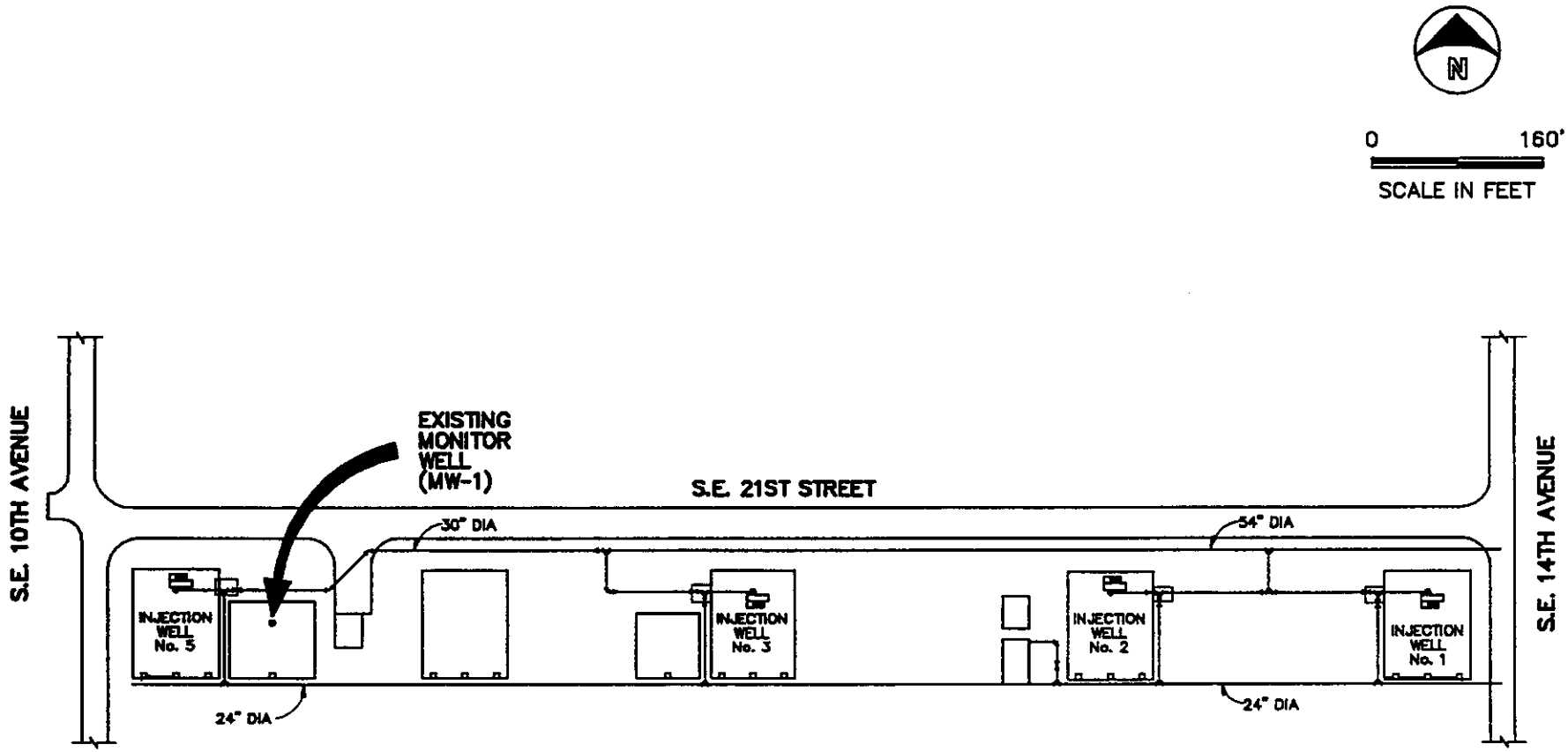

NOTE:

1. SITE PLAN GENERATED FROM AS-BUILT DRAWINGS PREPARED BY HAZEN AND SAWYER, JANUARY 20, 1982.

FIGURE 1-2
SITE MAP

CH2MHILL

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trend in monitor well and establish whether effluent from the injection zone is indeed migrating vertically upward into the upper Floridan aquifer system, which is classified as an underground source of drinking water (USDW). USDW is defined as an aquifer with water containing less than 10,000 milligrams per liter (mg/l) of TDS.

The results of mechanical integrity testing of the injection wells (CH2M HILL, 1991) suggest that the injection wells may not be the cause of suspected migration of effluent into the USDW. Therefore, it was proposed that mechanical integrity testing be conducted on Monitor Well MW-1 to evaluate the condition of the deep monitor casing, and to determine whether casing or cement seal failure on the monitor well might be the cause of the observed monitoring trends.

Paragraph 21 (page 6) of the Consent Order requires that the following techniques be considered in the MIT Plan:

- Analysis of radionuclides of Hydrogen, Nitrogen, and Oxygen in the wastestream and the waters of the monitoring zones
- Historical evaluation of monitor well construction
- Geophysical log evaluations, including oxygen activation, camera, etc.

The goal of this plan once implemented is to evaluate the present condition of MW-1 and determine if the condition of MW-1 may account for the apparent upward movement of effluent from the injection zone. Upon implementation of this plan, results will be analyzed and presented to FDER with recommendations for further field investigations of MW-1. Recommendations could include mechanical integrity testing (i.e., casing pressure tests, radioactive tracer surveys, etc.) or modification or abandonment of MW-1.

In accordance with Paragraph 21 (page 6) of the referenced Consent Order, a plan for mechanical integrity testing of the existing Floridan aquifer monitor well (MIT-MW-1

Plan) is hereby presented to FDER for review. A brief historical evaluation of MW-1 precedes the MIT MW-1 Plan.

Historical Evaluation of MW-1 Construction

MW-1 was constructed as part of the first effluent disposal well (IW-5) system designed by Hazen and Sawyer Inc. and Geraghty and Miller Inc. for the City of Fort Lauderdale in 1981. Alsay-Pippin Corporation of Lake Worth, Florida, was awarded the contract to perform this work, and began actual well drilling on November 7, 1980. MW-1 was designed with three separate monitor tubes to sample water from different zones within the Floridan aquifer system. These zones are the shallow zone (1,030 to 1,060 feet bls), the intermediate zone (1,493 to 1,534 feet bls) and the deep zone (2,568 to 2,670 feet bls). A fourth potential monitor zone—a dolomite interval at a depth of approximately 2,100 feet bls—was also delineated with geophysical logging by Geraghty & Miller (1981), but was not constructed.

The shallow and intermediate zones are constructed of fibercast reinforced pipe and well screen with outside diameters of 2.375 inches. The deep zone is constructed with 3.5-inch-outside-diameter steel pipe attached to a fibercast screen. Each of the three monitor zones was completed with gravel pack material and then cemented to surface. Construction details of IW-5 and MW-1, showing the three monitoring intervals, are shown in Figure 1-3.

A cement bond log (CBL) was conducted by Schlumberger Well Services at MW-1 (Geraghty & Miller, 1981). The CBL is a geophysical log used to indicate the presence of cement around the casing and the strength of the bond between the casing and the cement. Geraghty & Miller (1981) report that an effective cement seal around the 3.5-inch-outside-diameter tubing was obtained at MW-1. They do report, however, that "low and high amplitude signals as well as some pipe signal can be seen" between 1,950

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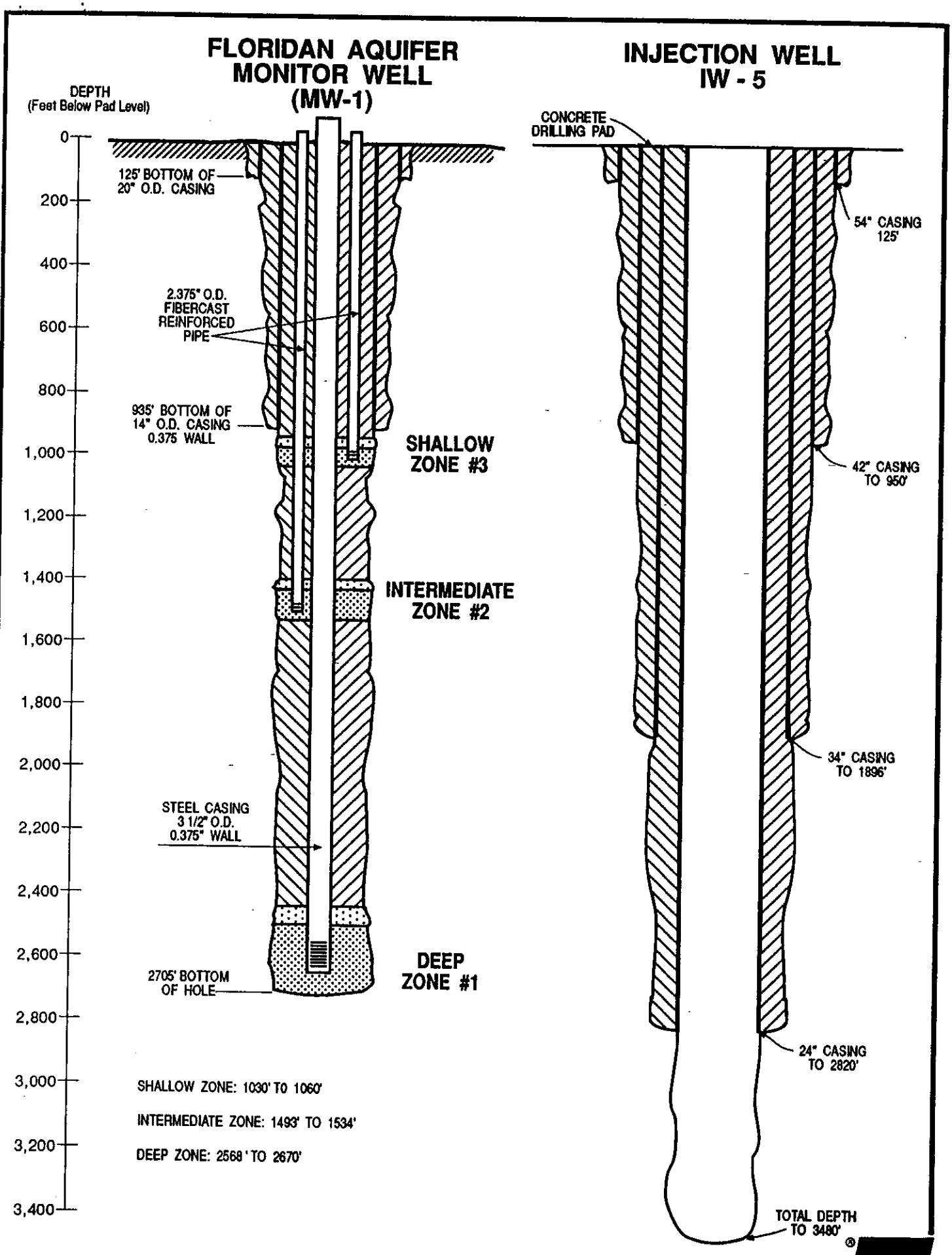

FIGURE 1-3
Construction Details of MW-1 and IW-5

and 2,200 feet, which would indicate an incomplete cement seal. The depth of this poor cement seal corresponds to the fourth potential monitor zone delineated by Geraghty & Miller (1981). They state that good bonding (low amplitude signal) occurred from 1,826 to 1,950 feet and below 2,200 feet, thereby sealing off the 1,950 to 2,200 foot zone. A combination of low and high amplitude signals was observed from a depth of 1,822 feet to the bottom of the gravel pack of the intermediate monitor zone. The CBL also delineated three areas of high amplitude signals that correspond to the depths of the uncemented screened intervals.

Geraghty & Miller (1981) also reported that certain problems occurred during construction at IW-5. In particular, directional surveys of the 42-inch-diameter reamed and pilot holes indicated that the boreholes were parallel, but were apart from each other. Reaming of the 42-inch-diameter hole was planned to facilitate installation of the 34-inch-diameter casing. Ultimately, the 34-inch-diameter casing was set to 1,896 feet bls, shallower than planned because of this borehole deviation. The remainder of the 42-inch-diameter reamed hole below the bottom of the casing was filled with gravel and topped with a cement plug to prevent cement loss during casing cementing operations. Following this 34-inch casing, the cement plug and gravel were drilled out and IW-5 construction continued until completion.

Preliminary Investigation

CH2M HILL conducted preliminary logging at MW-1 to obtain better information on the condition of MW-1. A caliper log was conducted by CH2M HILL at MW-1 on August 30, 1991. A weight section was lowered into the well first to confirm access to the well's total depth. The tool would not go below 2,373 feet bls. The caliper log also confirmed a maximum logging depth of 2,373 feet bls. The total depth from the record drawing of MW-1 is reported to be 2,670 feet bls (Geraghty & Miller, 1981). The caliper log showed a gradual decrease in inside diameter (from approximately 2.9 to 2.6 inches) throughout the log, and was less than 2.5 inches from 2,260 to 2,275 feet bls.

A downhole video survey of MW-1 was conducted on September 23, 1991. Throughout the length of the casing to 2,259 feet bls, what appeared to be hard concretions were observed on the inside of the casing. At 2,259 feet bls, build-up of these concretions prevented the camera from proceeding further down the well. The casing also appeared heavily corroded and at some intervals below 2,000 feet bls, it appeared that the casing might be absent. Results of this log indicated that logging tools greater than approximately 1.5 inches in diameter would not fit down the casing.

A temperature log was conducted at MW-1 by CH2M HILL on October 6, 1991, to determine if any leaks were present in the casing. Results of this survey indicated a relatively gradual decrease in temperature from 64.5° F. to 63.5° F. with depth from the top of the casing to 1,000 feet bls. Inflections in the temperature log occur at depths of 1,025 and 1,475 feet bls, corresponding closely to the depths of the shallow and intermediate monitoring intervals, respectively, of MW-1. Below 1,500 feet bls, the temperature log shows a relatively constant temperature of 62.1° F. to a depth of 2,371 feet bls, where the tool was obstructed from proceeding further downward. Since further investigation of the well would require cleaning of the casing, it was decided to postpone further activity until completion of the consent order with FDER.

Proposed MIT-MW-1 Plan

The following MIT-MW-1 Plan is proposed:

Geophysical logging will be conducted on the 3.5-inch-outside diameter monitor tube (deep zone) in three phases: Phase 1—prior to cleaning of the tubing; Phase 2—following cleaning (scraping or brushing) of the tubing; and Phase 3—logs conducted by an outside logging service to evaluate the condition of the casing and the cement seal exterior to the tubing. CH2M HILL will conduct Phases 1 and 2 logging services. After each phase of logging, the data will be evaluated and distributed to the TAC.

Engineers
Planners
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Scientists

July 12, 1995

103617.17

Mr. Alfred Mueller, Jr., P.E., P.G.
Florida Department of Environmental Protection
P.O. Box 15425
West Palm Beach, FL 33416

Dear Mr. Mueller:

Subject: Engineering Report on the Rehabilitation of Monitor Well MW-1 and Construction and Testing of Monitor Well MW-2 and Regional Monitor Well RMW-1 for the G.T. Lohmeyer Wastewater Treatment Plant Injection Well System

Hereby submitted are two signed and sealed copies of the above-referenced Engineering Report. The report includes the data collected during the construction and testing of monitor wells MW-1, MW-2, and RMW-1 for the City of Fort Lauderdale. Work on each of the monitor wells was in accordance with the specific conditions of Consent Order No. 91-2455 and Construction Permits UC06-233311 (MW-1), UC06-233314 (MW-2), and UC06-249353 (RMW-1).

To review the above-mentioned report, weekly test operation data (submitted under separate cover), and the pending Construction Permit for IW-4 and MW-3, the City of Fort Lauderdale requests a TAC meeting be scheduled for July 26, 1995.

If you have any questions regarding the enclosed material, please call me or Tom McCormick at (305) 426-4008.

Sincerely,

CH2M HILL

Sean T. Skehan

Sean T. Skehan, P.G.

DFB100148DE.DOC

c: Greg Kisela/City of Fort Lauderdale
Tim Welch/City of Fort Lauderdale
Mike Just/City of Fort Lauderdale
J.P. Listick/FDEP
Tom McCormick/CH2M HILL
Members of the TAC

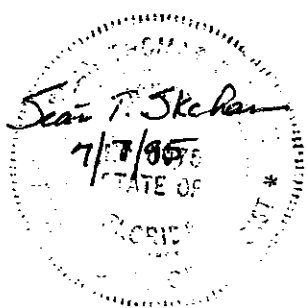
Engineering Report
on the
Rehabilitation of Monitor Well MW-1 and
Construction and Testing of
Monitor Well MW-2 and
Regional Monitor Well RMW-1 at the
G. T. Lohmeyer Wastewater Treatment Plant

Prepared for the

City of Fort Lauderdale Utilities

Prepared by

CH2M HILL
800 Fairway Drive, Suite 350
Deerfield Beach, Florida 33441



FLW32544.03
June 1995

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Section 4

Hydrogeologic Testing

Surficial Monitor Wells

Prior to the start of and during construction at MW-1, MW-2, and RMW-1, water samples were collected on a weekly basis from the four surficial pad monitor wells (one located at each corner of each drilling pad). Samples were field-analyzed for temperature, conductivity, and chlorides, and were also sent to the City of Fort Lauderdale laboratory for TDS analysis. Because the sites are near the saline water of Port Everglades, it appeared that variability in water quality values were in response to rainfall recharge and tidal influences and not due to construction activities. Field analytical data from each of the shallow monitor well locations is presented in Appendix H.

Pilot Hole Water Quality

Water samples were collected at approximately 30-foot intervals during reverse air open circulation drilling of monitor wells MW-2 and RMW-1 to provide a generalized profile of water quality changes with respect to depth. The samples were field-analyzed for temperature, conductivity, and chlorides. Field analytical results from pilot hole drilling are presented in Appendix G.

Packer Tests

FDEP requires that the upper and lower monitor zones be placed above and below the base of the Underground Source of Drinking Water (USDW), respectively. The USDW includes all water with a total dissolved solids (TDS) content of less than 10,000 mg/L. Drill stem packer tests were conducted at each of the dual-zone monitor wells to assist in the selection of the monitor intervals. While conducting each test, water samples were collected at approximate 2-hour intervals for 24 hours in order to establish a consistent water quality profile.

MW-1

At MW-1, one packer test was conducted on the interval from 1,296 to 1,350 feet bpl to assist in the selection of the upper monitor zone and to determine the extent of upward migration of effluent. Samples (every 2 hours) collected during the 24-hour test were field

analyzed for measurements of conductivity, temperature, and chloride concentrations. Four representative samples taken at approximately 6-hour intervals were sent to a laboratory for measurements of ammonia (NH_3) concentrations. Of the four samples collected, the first sample had an ammonia concentration of 2.0 µg/L. Subsequent samples had concentrations of 1.7, 1.7, and 1.6 µg/L, respectively. Field analyses for conductivity and chlorides indicated values ranging from 6,000 to 4,250 umhos and 4,177 to 3,619 mg/L respectively. Based on this water quality data a recommendation was made to and approved by FDEP and TAC to set the 10-inch casing at 1,288 feet.

MW-2

At MW-2 packer testing was conducted on seven intervals between 1,105 feet and 1,999 feet. The depths of those intervals and the results of water quality analyses is presented in Appendix I. Each test was run for approximately 24 hours, with water samples collected every 2 hours. The samples were field analyzed by CH2M HILL personnel for measurements of conductivity, temperature, and chloride concentrations. Samples were also sent to the City of Fort Lauderdale laboratory for analysis of effluent parameters. The results of these analyses were used to identify the base of the 10,000 mg/L TDS interface so that casing depths could be better selected.

In general, analyses indicated that the 10,000 mg/L TDS interface at MW-2 occurs between 1,420 and 1,530 feet bpl. Packer testing at 1,394 to 1,420 feet bpl showed TDS values to be 9,296 mg/L while the 1,485 to 1,530 foot interval showed TDS values to be 10,827 mg/L. Testing below 1,530 (3 intervals) indicated increased TDS, conductivity, and chloride concentrations with each progressively deeper interval. The analytical results also indicate the presence of ammonia and TKN at depths ranging from 1,485 feet bpl to 1,850 feet bpl. This data corresponds to the leaks identified in the tubing of the deep monitor zone at MW-1. As a result, the upper and lower monitor zones were established in intervals (1,300 to 1,344 and 1,970 to 2,025 feet, respectively) that were unaffected by these constituents. (See CH2M HILL Report, MIT of Monitor Well MW-1, March 1993).

RMW-1

At RMW-1, four packer tests, similar to those conducted at MW-2, were conducted on the following intervals: 1,107 to 1,150 feet bpl; 1,263 to 1,305 feet bpl; 1,408 to 1,455 feet bpl;

and 1,465 to 1,600 feet bpl. A summary of the water quality data from the packer tests is presented in Appendix I.

In general the results of water quality analyses at RMW-1 were similar to MW-2, indicating the 10,000 mg/L TDS interface occurring between 1,408 and 1,600 feet bpl. Water quality from the 1,408 to 1,450 foot interval showed TDS values to be 5,030 mg/L, while the 1,563 to 1,600 foot interval showed TDS values to be 28,880 mg/L. Analytical results for ammonia and TKN indicate concentrations consistent with background conditions that are unaffected by effluent.

Based on the results of water quality analyses a recommendation was made to and approved by FDEP and the TAC to establish the upper and lower monitor zones between the depths of 1,300 to 1,350 and 1,500 to 1,600 feet, respectively. Due to the placement of cement, the upper monitoring zone was completed from 1,300 to 1,339 feet bpl.

Fort Lauderdale G.T. Lohmeyer WWTP
Monitor Well MW-2
Packer Test Data

PARAMETER	Interval 900 to 1000 ft.	1105 to 1150 ft.	1260 to 1300 ft.	1394 to 1420 ft.	1485 to 1530 ft.	1674 to 1700 ft.	1803 to 1850 ft.	1953 to 1999 ft.
Conductivity (umhos/cm)	9,510	11,300	12,000	15,800	16,800	25,800	28,900	46,800
pH (units)	8.50	7.90	7.90	8.06	8.07	7.90	7.74	7.60
TDS (mg/L)	5,774	7,071	7,350	9,296	10,827	15,530	20,036	35,763
TKN (mg/L)	1.41	1.10	1.23	2.06	9.53	7.63	5.60	
Alkalinity (mg/L)	146	148	138	159	275	297	221	129
Nitrate/Nitrite (mg/L)	0.01	0.01	0.01	0.01	0.01	0.04	0.01	
Total Phosphorus (mg/L)	0.537	0.048	0.061	0.044	0.044	0.408	0.101	
Sulfate (mg/L)	416	608	736	448	656	1,120	1,325	1,856
BOD5 (mg/L)	4	5	7	3	5			
Chloride (mg/L)	2,963	3,600	3,800	4,900	5,500	9,900	10,900	18,750
Ammonia (mg/L)	1.19	0.95	1.01	1.52	8.90	6.99	5.06	0.21
Ft. of Head (NGVD)		39	40	39	39	35	34	12
Analytical Verification								
Ammonia 5/4/94								
Original Sample				1.86	9.87	6.91	3.13	
Duplicate Sample				0.99	8.09	2.13	4.36	
Nitrate/Nitrite 5/4/94								
Original Sample				0.01	0.01	0.01	0.01	
Duplicate Sample				0.01	0.01	0.01	0.01	
Ammonia 5/5/94								
Original Sample				1.81	9.50	7.22	3.08	
Duplicate Sample				0.98	8.51	1.97	4.90	

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July 18, 1995

103617.14

Mr. Al Mueller, P.E., P.G.
Florida Department of Environmental Protection
P.O. Box 15425
West Palm Beach, FL 33416

Dear Al:

Subject: Application to Construct Injection Well IW-4 and Monitor Well MW-3 at the G.T. Lohmeyer Wastewater Treatment Plant

This letter is in response to your request for information dated July 17, 1995, regarding the construction permit application (submitted January 27, 1995) for Injection Well IW-4 and Monitor Well MW-3 at the City of Fort Lauderdale G. T. Lohmeyer Wastewater Treatment Plant (WWTP). For your convenience, responses included in this submittal reference the item numbers used in the request for information (RFI).

1. A review of the monitoring data from each of the monitoring zones at MW-1, MW-2, and RMW-1 for the City of Fort Lauderdale G.T. Lohmeyer WWTP injection well system demonstrates stable water quality conditions consistent with external mechanical integrity and adequate confinement at the injection wells. Analysis of water quality from both the upper and lower monitor zones of monitor wells MW-2 and RMW-1 and the upper monitor zone of monitor well MW-1 give no indication of effluent affecting these zones (please see the "Monitor Well System Water Quality Analysis Report for the G.T. Lohmeyer Wastewater Treatment Plant Injection Well System" in Attachment A which contains monitoring data presented in tabular and graphical form).

   The lower monitor zone of MW-1 was placed in the interval known to be affected by effluent parameters so that conditions in the affected interval could be tracked over time and remediation of the interval could be carried out by long-term pumping, if this is judged to be of any significant environmental value. Please note that no increase in effluent indicating parameters has taken place in the lower monitor zone of MW-1 since being put into service following rehabilitation.

2. The presence of effluent in the impacted zone of Monitor Well MW-1 was shown to be caused by a lack of mechanical integrity in the deep zone monitor tube of MW-1. In accordance with the requirements of paragraph 24 of Consent Order No. 91-2455, extensive testing was conducted on monitor well MW-1. This testing concluded corrosion had taken place in the tubing of the lower monitor zone and that corrosion

penetrations were present at a depth that corresponded to the intermediate monitor zone between 1,493 to 1,534 feet. For your reference, the "Conclusions " and "Recommendations" sections from the ,"Mechanical Integrity Testing Report of Monitor Well MW-1 at the George T. Lohmeyer Wastewater Treatment Plant" is presented in Attachment B.

Confinement at the site has been demonstrated in two different ways: (1) While constructing MW-2, packer testing was conducted in the pilot hole in order to establish a water quality profile with depth. The results of analyses (see Attachment C) conducted on these samples clearly demonstrated that effluent indicating parameters are not present below a certain depth and thus confirming the adequacy of confinement. (2) The mechanical integrity testing of the injection wells at the site has, on two occasions (February of 1991 and January of 1995), demonstrated that each of the injection wells met the requirements for both internal and external mechanical integrity as set forth in FAC 62-528.250(1)(c). See Attachment D for the Executive Summary from each of the Injection Well Mechanical Integrity Reports referenced above.

3. In accordance with Consent Order OGC 91-2455, the City has complied with the conditions set forth in Paragraph 54. Those conditions call for specific paragraphs of the Consent Order to be met. Those paragraphs and the status of associated activities are as follows:

Paragraph 18, The City has operated the injection wells since date (activation date of consent order) in accordance with the Consent Order

Paragraph 21, On May 27, 1992, the City submitted (within the prescribed time) a schedule for the investigation of mechanical integrity at monitor well MW-1

Paragraph 26, On March 5, 1993, the City submitted and the Department subsequently approved a plan of corrective actions and remediation (construction permit)for MW-1

Paragraph 32, On June 17, 1993, the City submitted and the Department subsequently approved a plug and abandonment plan for MW-1

Paragraph 35, On June 9, 1993, the City submitted for MW-1 an "Application to Rehabilitate a Multi-Zone Monitor Well." On February 14, 1994, the Department issued a construction permit for this work.

Paragraph 37, On January 31, 1994, the City began on-site construction of the exploratory monitor well MW-2 (within 90 days of the construction permit date of issuance).

Paragraph 40, On September 1, 1994, the City began construction of the regional monitor well within 120 days of the determination that effluent indicators were present at MW-2.

Paragraph 41, On November 21, 1991, the City submitted and the Department subsequently approved a plug and abandonment plan for each of the injection wells.

Paragraph 47, The City has submitted a monitor well report for the rehabilitation of MW-1 and the construction of MW-2 and RMW-1. MW-1 has been reconstructed with a deep monitoring interval ~~free of effluent indicators~~ and is useful as an associated monitor well for IW-5. MW-2 (exploratory monitor well) has been constructed with monitor zones above and below the USDW that are free of effluent indicating parameters. RMW-1 (regional monitor well) has been constructed and the data collected demonstrates that vertical or lateral migration of effluent indicators into a USDW is not occurring.

As required by **Paragraph 47** a construction permit application for injection well IW-4 and monitor well MW-3 has been submitted on January 27, 1995.

The reconstructed MW-1 has been confirmed as a viable monitor well since it provides an upper monitor interval that is above the USDW and the lower monitor interval was placed so that remediation of the affected interval could take place if necessary. Additionally, it is expected that with time, the current levels of effluent indicating parameters will either remain constant or gradually decrease. Any significant increase in the effluent indicating parameters above the current baseline would be cause for concern and, thus, the monitor zone will be able serve as a monitor for external mechanical integrity.

4. On two occasions, mechanical integrity testing of the injection wells at the site (February of 1991 and January of 1995) has demonstrated that each of the injection wells met the requirements for both internal and external mechanical integrity as set forth in FAC 62-528.250(1)(c). See Attachment D for the Executive Summary from each of the Injection Well Mechanical Integrity Reports referenced above. A determination was made while conducting mechanical integrity testing on multi-zone monitor well MW-1 that the lower monitor tubing did not have mechanical integrity and that it was the cause of the effluent parameters detected in the intermediate monitor interval. For your reference, the "Conclusions" sectcion from the "Mechanical Integrity Testing Repott of Monitor Well MW-1" is presented in Attachment B.

As required by paragraph 32 of the Consent Order, the lower monitor zone of MW-1 was plugged and abandoned on April 11, 1994. Additionally, after abandoning the lower monitor zone, each of the monitor tubes (total of three) were completely removed from the well and the original borehole for the lower monitor zone was plugged with cement and abandoned from 2,550 to 1,557 feet to restore the integrity

of the confining intervals and to eliminate any potential conduit for effluent. See Attachment E for a description of construction activities at MW-1, excerpted from the engineering report on the, "Rehabilitation of Monitor Well MW-1 and Construction and Testing of Monitor Well MW-2 and Regional Monitor Well RMW-1 at the G.T. Lohmeyer Wastewater Treatment Plant." No other wells are known to exist in the area of review that lack mechanical integrity.

5. Updated monitoring data in tabular and graph format were submitted to the Department on July 12, 1995 ("Monitor Well System Water Quality Analysis Report for the G.T. Lohmeyer Wastewater Treatment Plant Injection Well System"). This report has been copied and included for your reference in Attachment A of this RFI response. With the exception of the new lower monitor zone at MW-1, the data provided in this report indicates stable water quality trends at background levels for all effluent indicating parameters in each of the monitor wells. The data from the impacted interval (the new lower monitor zone of MW-1) demonstrates elevated but stable levels of ammonia and TKN. This data confirms the integrity of the confining intervals and provides assurance that the pathway for migration of effluent out of the injection zone has been eliminated.

6. As stated in Item 2 above, while constructing MW-2, packer testing was conducted in the pilot hole in order to establish a water quality profile with depth. The results of analyses (see Attachment C) conducted on these samples clearly demonstrated that effluent indicating parameters are not present in transmissive intervals below 1,953 feet and thus demonstrated that the confinement above the injection zone was intact.

   Under the construction permits issued to date, the investigations have been restricted to the intervals overlying the confinement. Confinement at the injection well site will be investigated in greater detail during construction of injection well IW-4. In order to provide data related to confinement a testing program that includes packer tests, geophysical logs, lithologic descriptions and water quality analyses will be conducted during construction .

7. The lack of elevated effluent indicating parameters in all monitor zones (with the exception of the impacted lower monitor zone of MW-1) at the site demonstrates external mechanical integrity of the injection well system and confirms the existence of competent confining units at the site. If there were a lack of competent confinement or external mechanical integrity at the injection well site, the lower monitor zone of MW-2, at a depth of 1,970 to 2,025 feet bls, would have detected elevated effluent indicating parameters. However, this is not the case, and this condition coupled with the stability of the TKN and ammonia values in the impacted zone provide evidence that the pathway for migration of effluent has been eliminated.

8. An analysis of the effluent for primary and secondary drinking water standard parameters and minimum criteria is presented in Attachment F.

9. An analysis of the background water quality of the monitor zones for primary and secondary drinking water standards and minimum criteria parameters is presented in Attachment G.

10. The referenced well was constructed in 1928 to a depth of approximately 3,000 feet and successfully plugged and abandoned in 1979. The plugging and abandonment was accomplished by completely filling the well from total depth to land surface with cement. Unfortunately, records showing the location, casing size and thickness, and total depth of the well are unavailable. There is no record of the test well at the South Florida Water Management District.

11. Figures 3 of the permit application and 3-1 of the Conceptual Design are in error. The actual diameter of the second casing string for the injection well should be 52-inch (OD) diameter, not 54-inch diameter as is indicated on the figures.

12. Figures 4 of the permit application and 3-2 of the Conceptual Design are in error. The actual diameter of the second casing string for the monitor well should be 34-inch (OD) diameter, not 36-inch diameter as is indicated on the figures.

13. The 60-inch diameter casing indicated on Figures 3 of the permit application and 3-1 of the Conceptual Design are in error. The actual diameter of the surface casing for the injection well should be 58-inch (OD) diameter, not 60-inch diameter as is indicated on the figures.

14. As is indicated in the geophysical logging schedule presented in the conceptual design and section 02679 of the technical specifications, a dual induction log will be included in the logging the logging program.

15. A borehole televiewer will be conducted of the interval from 1,900 feet bls to the total depth of the injection well.

16. A cement bond log (CBL) will be conducted on the final casing string after completion of cementing.

17. The primary purposes of conducting packer tests, is to identify the base of the USDW, identify appropriate monitoring intervals, and evaluate confining intervals. A total of five packer tests will be conducted in the interval from 1,300 to 2,500 feet . The precise intervals to be tested will be determined in the field following geophysical logging in order to determine the intervals most appropriate for testing. It is anticipated that three packer tests will be conducted at depths below 1,900 feet in order to evaluate confinement at the site. These tests will be used to confirm and calibrate the data gathered with the borehole televiewer. A detailed description of the packer testing

procedures was included in the construction application supporting information package in section 02990, inflatable packer testing, of the technical specifications. For your reference a copy of section 2990 is presented in Attachment H.

18. The proposed depth of the lower monitor interval will be changed from 1,500 to 1,550 feet bls to the first unaffected, transmissive interval below 1,550 feet bls. Review of geophysical logs and packer test data collected during the construction of MW-2 (see Attachment C) suggests such an interval will occur at approximately 1,970 to 2,025 feet bls (the depth of the lower monitor zone at MW-2).

19. An application for a Certificate of Financial Responsibility has been forwarded to Mr. McNeal.

Sincerely,

CH2M HILL

Sean T. Skehan
7/20/95

Sean T. Skehan, P.G.
Project Manager

DFB10014908.DOC

c: Members of the TAC
J.P. Listick/FDEP
Greg Kisela/City of Fort Lauderdale
Frank Coulter/City of Fort Lauderdale
Tim Welch/City of Fort Lauderdale
Tom McCormick/CH2M HILL

Engineering Report on the Construction and Testing of Monitor Well MW-3 at the G. T. Lohmeyer Wastewater Treatment Plant

Prepared for the

City of Fort Lauderdale Utilities

Prepared by

CH2M HILL
800 Fairway Drive, Suite 350
Deerfield Beach, Florida 33441

115468.17.30
September 1996

Contents

SECTION 1

Introduction

Background Information

The City of Fort Lauderdale, Florida, operates a deep injection well (DIW) system at the George T. Lohmeyer Waste Water Treatment Plant (WWTP) to dispose of secondary treated municipal effluent. The location map for the WWTP, the injection well site, and RMW-1 is depicted in Figure 1-1. The site layout of the DIW system is shown in Figure 1-2. Prior to this project, the injection system consisted of four injection wells (IW-1, IW-2, IW-3, IW-5), two on-site dual-zone monitor wells (MW-1 and MW-2), and one dual-zone regional monitor well (RMW-1). Each injection well is cased with nominal 24-inch-diameter steel to an approximate depth of 2,800 feet below pad level (bpl), and is completed with open-hole construction to a depth of approximately 3,500 feet bpl except for IW-3, which is completed to a depth of approximately 4,000 feet bpl. The injection zone, also known as the "Boulder Zone," is a highly transmissive interval in the Floridan aquifer system capable of receiving large effluent flows.

Mechanical Integrity Tests (MITs) were conducted by CH2M HILL in 1991 on the four injection wells in accordance with procedures set forth in Chapter 17-28 (currently 62-528), Florida Administrative Code (FAC). The results of those tests demonstrated that the injection well casings and cement seals met regulatory standards for mechanical integrity (see CH2M HILL, MIT of IW-1, IW-2, IW-3 and IW-5; May 1991).

However, water quality data for MW-1 indicated a freshening trend (i.e., decreasing chloride, conductivity, and total dissolved solids [TDS] values) in the intermediate monitor zone. Increased concentrations of total kjeldahl nitrogen (TKN) and ammonia-nitrogen were also observed in these monitor zones. It is difficult to determine the exact time that the apparent freshening trend began, but chloride and TDS concentrations in the middle monitor zone began declining soon after operational testing began in 1985. Water quality parameters from the upper monitoring zone have been stable since the start of operational testing.

The City of Fort Lauderdale and FDEP entered into Consent Order No. 91-2455, dated April 27, 1992, to take steps to determine the cause of the apparent freshening trend in the intermediate monitor zone of monitor well MW-1.

The MIT conducted on monitor well MW-1 in 1992 (see Report for MIT of Monitor Well MW-1, March 1993), concluded that the cause of freshening in the intermediate monitor zone was the lack of mechanical integrity of the deep monitor tubing. It was determined that corrosion penetrations of the lower monitor tube provided a direct conduit for effluent from the lower monitor zone (the upper portion of the injection zone) to escape into the intermediate monitor interval. As a result, MW-1 was modified to a dual-zone monitor well to provide long term monitoring of the injection system.

In addition to the modifications at MW-1, an exploratory, dual-zone monitor well (MW-2) between injection wells IW-1 and 2, and a regional monitor well (RMW-1) were constructed. The RMW was constructed at Snyder Park, approximately 1.5 miles southwest of the injection well site (see site location diagram in Figure 1-1).

Following modification of MW-1 and construction of MW-2 and RMW-1, a construction permit application was submitted to FDEP for the construction of MW-3 (as required by paragraph 47 of the Consent Order) and IW-4. Construction permit UC 06-26439 was issued on December 1, 1995, to allow construction of MW-3 and IW-4. A copy of the construction permit is presented in Appendix A. Construction of MW-3 was completed prior to construction of IW-4 in order to meet the requirements of Consent Order paragraph 49. It is anticipated that construction of IW-4 will begin in August 1996.

Project Description

CH2M HILL served as the engineer of record for the design, permitting, and construction activities for monitor well MW-3. Youngquist Brothers, Inc., selected as the low bid contractor to construct monitor well MW-3, was issued a Notice to Proceed on December 27, 1995.

Construction activities at MW-3 included the installation of a temporary drilling pad and shallow pad monitor wells, drilling of the dual-zone monitor well, and the completion of wellhead piping, and instrumentation on a permanent concrete pad.

The FDEP TAC coordinated the actions of local, state, and federal agencies, including FDEP's state and local representatives, the South Florida Water Management District (SFWMD), the Environmental Protection Agency (EPA), and the United States Geological Survey (USGS). A tabulated summary of construction activities and weekly summaries of the construction progress are presented in Appendix B and Appendix C, respectively.

APPENDIX I

Packer Tests Water Quality Data

City of Fort Lauderdale G. T. Lohmeyer Injection Well System Monitor Well MW-3 Packer Test Water Quality (1,374 to 1,445 ft. bpl)						
Date	Time	TDS	Chloride	Cond.	Ammonia	TKN
		(mg/L)	(mg/L)	(umhos/cm)	(mg/L)	(mg/L)
3/13/96	0600	10,000	5,230	16,000	5.27	7.29
3/13/96	0800		5,290	16,100		
3/13/96	1000	9,800	5,620	16,200		
3/13/96	1200		5,760	16,100		
3/13/96	1400	10,000	6,140	16,000		
3/13/96	1600		5,890	16,200		
3/13/96	1800	10,000	5,820	16,200		
3/13/96	2000		5,990	16,200		
3/13/96	2200	10,000	5,960	16,300		
3/14/96	0000		5,940	16,300		
3/14/96	0200	10,000	6,310	16,300		
3/14/96	0400	10,200	5,720	16,300	6.11	7.02
ft. bpl = feet below pad level						
mg/L = milligrams per liter						
umhos/cm = micromhos per centimeter						

City of Fort Lauderdale G. T. Lohmeyer Injection Well System Monitor Well MW-3 Packer Test Water Quality (1,800 to 1,855 ft. bpl)						
Date	Time	TDS	Chloride	Cond.	Ammonia	TKN
		(mg/L)	(mg/L)	(umhos/cm)	(mg/L)	(mg/L)
3/26/96	0100	23,777	12,000	32,700	4.39	5.10
3/26/96	0500	22,224	12,800	33,200		
3/26/96	0900	22,130	12,200	32,500		
3/26/96	1300	22,293	11,800	32,400		
3/26/96	1700	21,690	11,800	32,100	4.46	5.34
3/26/96	2100	21,907	11,600	32,400	4.68	5.30
3/26/96	2300	21,772	11,600	32,300		
3/27/96	0100	21,680	11,200	32,000	4.36	5.33
ft. bpl = feet below pad level						
mg/L = milligrams per liter						
umhos/cm = micromhos per centimeter						

City of Fort Lauderdale G. T. Lohmeyer Injection Well System						
Monitor Well MW-3 Packer Test Water Quality (1,979 to 2,027 ft. bpl)						
Date	Time	TDS	Chloride	Cond.	Ammonia	TKN
		(mg/L)	(mg/L)	(umhos/cm)	(mg/L)	(mg/L)
3/29/96	1500	35,227	19,600	51,500	0.133	0.294
3/29/96	1900	35,616	19,600	51,300	0.107	0.315
3/29/96	2300	35,660	19,600	51,400	0.109	0.230
3/30/96	0300	35,946	19,400	51,700	0.151	0.255
3/30/96	0700	35,405	19,800	51,200	0.191	0.407
3/30/96	1100	35,327	19,800	50,800		
3/30/96	1300				0.123	0.331
3/30/96	1500	35,431	19,400	50,900		
3/30/96	1900	35,375	19,600	51,200	0.120	0.278
3/30/96	2100	35,104	19,600	51,600		
3/30/96	2300	33,782	19,200	49,400		
3/30/96	2400	35,046	19,600	51,400	0.082	0.307
ft. bpl = feet below pad level						
mg/L = milligrams per liter						
umhos/cm = micromhos per centimeter						

Evaluation of Confinement Using a Numerical Groundwater Flow Model - Construction of the City of Fort Lauderdale Injection Well IW-4

PREPARED FOR: Bill Cocke/FDEP-West Palm Beach
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PREPARED BY: CH2M HILL, Inc.

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Tom McCormick/CH2M HILL
Paul Linton/CH2M HILL

DATE: January 10, 1997

Purpose

The purpose of this technical memorandum is to summarize the method and results of a groundwater flow model that was used to confirm the presence of confinement in an interval from 2,030 to 2,120 feet below pad level (bpl). The evaluation of this confining interval above the proposed injection zone at IW-4 is required by the Florida Department of Environmental Protection (FDEP) per Florida Administrative Code 62-528.

Introduction

Construction of a fourth deep injection well (IW-4) is ongoing at the City of Fort Lauderdale G.T. Lohmeyer site (Figure 1). As required by the FDEP construction permit (No. UC 06-264391), an evaluation of the confinement above the proposed injection zone was performed.

During the construction of IW-4, it was observed that the water quality below 2,120 feet bpl had been affected by effluent. The lower monitor interval (1,970 to 2,027 feet bpl) of nearby MW-3, however, is unaffected by the effluent injection. Since injection has been ongoing since the mid-1980s, this is clear evidence of confinement in the interval between 2,027 and 2,120 feet bpl. There is significant pressure difference in the formations above and below this interval, which also indicates the presence of a confining layer(s).

Field Testing

In an attempt to quantify the level of confinement in the interval from 2,030 to 2,120 feet bpl, a pumping test was conducted during the construction of IW-4. Water was pumped from the interval below the 34-inch casing from 2,120 to 2,160 feet bpl. Water levels were recorded at IW-4 and monitor wells MW-2 and MW-3 during the test (Attachment A).

For the test, IW-4 was pumped at 285 gallons per minute (gpm) for 46 hours with a drawdown of 104 feet (37 feet bpl). Water levels at MW-2 and MW-3 did not show a clear response during the pumping at IW-4 (Attachment A). The cyclic fluctuations seen during the pumping test are likely the results of tidal influences; however, it is possible that a response at either monitor well was masked by these outside influences. This pumping test at IW-4, and the response at MW-3 will be simulated to estimate the leakance of the overlying confining layer. The simulated response at MW-3 was chosen instead of MW-2 because it is closer to the pumped well, and would be expected to be have a greater response during pumping.

Other field testing which was considered for this effort included a measurement of the specific capacity of the lower monitor interval at MW-3, and core permeability tests of samples collected from IW-4. A specific capacity of 0.51 gpm per foot (gpm/ft) was recorded at MW-3. The test was conducted at a pumping rate of about 100 gpm with a corresponding drawdown of about 195 feet. The pumping test at MW-3 will also be simulated by the model to estimate the properties of that pumped interval (1,970 to 2,030 feet bpl). The permeabilities of the cores collected between 2,110 and 2,190 feet bpl ranged between 0.2 and 0.9 feet per day.

Conceptual Hydrogeology

The purpose of this modeling effort is to simulate the characteristics of a potential confining interval between 2,030 to 2,120 feet bpl. The hydrogeological focus, therefore, is on the confining interval and the intervals above and below it. The confining interval is primarily a dense, hard dolomite. Above the confinement is a broad interval of low to moderately permeable limestone. For the purposes of this modeling, this limestone interval is assumed to extend from 1,550 to 2,030 feet bpl. Below the confinement is another broad interval of limestone, which is low to moderately permeable. This interval is simulated in the model from 2,120 to 2,500 feet bpl.

In summary, the conceptual site hydrogeology encompasses the interval from 1,550 to 2,500 feet bpl. Three distinct intervals were identified for the modeling effort:

- Low to moderately permeable limestone — 1,550 to 2,030 feet bpl
- Confining layer (dolomite) — 2,030 to 2,160 feet bpl
- Low to moderately permeable limestone — 2,160 to 2,500 feet bpl

It is this conceptual hydrogeological model that is incorporated into the numerical model. Figure 2 depicts the conceptual hydrogeology.

Model Description

The model was developed using the U.S. Geological Survey modular three-dimensional finite-difference ground water flow model, commonly known as MODFLOW. This code was used because it provides the necessary evaluation of groundwater flow, is available in the public domain, and is compatible with most computer systems. The following sections describe how the model was setup and used to simulate groundwater flow.

Model Setup

The model was setup to reflect the conceptual hydrogeologic conditions listed above, and to incorporate the area of concern. A uniformly-spaced, square grid, 75 x 75 cells was created and centered around well IW-4 (the pumped well). Each cell is 20 feet square, so the grid encompasses an area of 1,500 feet by 1,500 feet. Figure 3 shows a plan view of the model grid, with the locations of IW-4, MW-2, and MW-3.

A total of four layers were used in the model (Table 1). The drawdown observed while pumping the MW-3 lower interval will be simulated in the model; therefore, the interval above 2,030 feet bpl was divided into two model layers (Layers 1 and 2). The interval below 2,120 feet bpl was divided into two model layers (Layers 3 and 4) in order to simulate the pumping from IW-4 within this interval. Figure 4 shows the model layers with the locations of IW-4 and MW-3.

Table 1
Model Layers

Layer	Depth (ft bpl)	Description
1	1,550 to 1,970	Low/moderately permeable interval above MW-3
2	1,970 to 2,030	MW-3 lower monitor zone
3	2,120 to 2,160	IW-4 pumped interval
4	2,160 to 2,500	Low to moderately permeable interval below IW-4

The interval from 2,030 to 2,120 feet bpl is simulated as a confining layer and, therefore, is not a separate layer in the model. The MODFLOW code simulates the confining layer by defining a leakance (transmittal of water) between Layers 2 and 3.

Model Input

Once the model had been setup and the layers defined, site-specific information from previous field tests was gathered. This information included:

- Water level in Layers 1 and 2 above the confining layer (1,550 to 2,030 feet bpl) is about 67 feet above pad level
- Water level in Layers 3 and 4 below the confining layer (2,120 to 2,500 feet bpl) is about 16 feet above pad level
- Specific capacity of the lower monitor interval at MW-3 (1,970 to 2,027 feet bpl) was 0.51 gpm/ft, when pumping at about 100 gpm for 1 day (drawdown of about 195 feet).
- Hydraulic conductivity estimates from cores between 2,110 and 2,190 feet bpl ranged between 0.2 and 0.9 feet per day.
- Drawdown at IW-4 during the pumping test (2,120 to 2,160 feet bpl) was about 104 feet (specific capacity of 2.7 gpm/ft) when pumping at 285 gpm for 46 hours.

Using this information as direct input, or as an indication of an input value, the necessary parameters were entered into the model. The boundary conditions of the model are indicated by the general-head cells, as shown on Figure 3. General head cells allow the heads (water levels) of the model boundary to vary. This was important because it was deter-

mined that the pumping effects would affect the model boundary, and constant head cells would not be appropriate in that situation. With the initial values input, and boundary condition defined, the model was ready for simulations.

Model Simulations

With the model setup, and the input values estimated, a total of six simulations (runs) were performed. The following sections describe the purpose of each simulation and the changes made to the input values. Table 2 provides a summary of the simulations. The modeling logs are included in Attachment B. A copy of all input and output files have been copied onto diskettes and are provided in Attachment C. For those simulations which refer to the pumping test at IW-4, the water level observations at IW-4, MW-2, and MW-3 are provided in Attachment A.

Table 2
Summary of Model Simulations

Simulation	Purpose
No. 1	Calibrate the model to the specific capacity results at the MW-3 lower interval. This allows a better estimate of the properties (i.e. hydraulic conductivity and leakance) of Layers 1 and 2. These values could then be fixed for the remaining simulations.
No. 2	Calibrate the model to the results of the pumping test at IW-4. This allows a better estimate of the properties (i.e. hydraulic conductivity and leakance) of Layers 3 and 4. These values could then be fixed for the remaining simulations.
No. 3	Estimate the leakance of the confining layer given long-term, "static" conditions at the site.
No. 4	Estimate the leakance of the confining layer while simulating the pumping test at IW-4. A response of 0.04 feet was simulated at the MW-3 lower interval.
No. 5	Estimate the leakance of the confining layer while simulating the pumping test at IW-4. A response of 0.01 feet was simulated at the MW-3 lower interval.
No. 6	Estimate the leakance of the confining layer while simulating the pumping test at IW-4. A response of 0.30 feet was simulated at the MW-3 lower interval.

Simulation No. 1

The purpose of Simulation No. 1 was to calibrate the model to the observed specific capacity at the MW-3 lower interval. In this way, reasonable estimates of the hydraulic conductivity of Layer 2, and the leakance between Layers 1 and 2 could be made. The pumping rate from MW-3 was set at 100 gpm and allowed to pump for 1 day. The hydraulic conductivity of Layer 2 (the MW-3 lower interval) was adjusted until a reasonable approximation of the observed drawdown (about 195 feet) was simulated.

The final calibrated values were:

- Hydraulic Conductivity (Layer 1) = 10 feet/day
- Hydraulic Conductivity (Layer 2) = 1.3 feet/day

The hydraulic conductivity of Layer 1 is representative of a moderately permeable limestone as designated in the conceptual hydrogeology of the site. The hydraulic conductivity of Layer 2 was calibrated to the observed drawdown during the MW-3 pumping test. The leakance between Layers 1 and 2 (3.75×10^{-4} per day) was calculated using a vertical hydraulic conductivity one-tenth of the horizontal hydraulic conductivity, divided by the thickness between layer centers. These values were kept constant throughout the remaining simulations.

Simulation No. 2

The purpose of Simulation No. 2 was to calibrate the model to the results from the pumping test at IW-4. This would allow reasonable estimates of the hydraulic conductivity of Layer 3, and the leakance between Layers 3 and 4. As was done during the pumping test, IW-4 was simulated to pump at 285 gpm for 46 hours. The values for hydraulic conductivity and leakance were adjusted until the simulated drawdown reasonably approached the observed drawdown (104 feet).

The final calibrated values were:

- Hydraulic Conductivity (Layer 3) = 25 feet/day
- Hydraulic Conductivity (Layer 4) = 25 feet/day

The leakance between Layers 3 and 4 (1.3×10^{-2} per day) was calculated using the procedure in Simulation No. 1. It was assumed that the properties of Layer 3 would be similar to those calibrated to for Layer 4. These values were kept constant throughout the remaining simulations (see Figure 5).

Simulation No. 3

The purpose of Simulation No. 3 was to estimate the leakance of the confining layer. The model was used to simulate the long-term, "static" conditions (a 1-year simulation without pumping) at the site and the goal was to keep the observed pressure difference between Layers 2 and 3. The value of the leakance between Layers 2 and 3 (confining layer) was adjusted until the change in water level (increase in Layer 2 and decrease in Layer 3) was greater than 5 feet over a 1-year period. A change in water level greater than 5 feet within 1 year was considered a violation of the observed conditions.

Simulation No. 4

The purpose of Simulation No. 4 was to estimate the leakance of the confining layer given the following conditions. While simulating the pumping test at IW-4, the leakance across the confining layer (Layers 2 and 3) was adjusted until *a response of 0.04 feet was predicted at the MW-3 lower interval.* The 0.04-foot criterion was chosen because it was considered to be (for this simulation) the greatest response at MW-3 which may not have been detected during the pumping test at IW-4. In other words, if the highest non-detected response at MW-3 during the pumping test is assumed to be 0.04 feet, then the leakance of the confining layer should be less than or equal to the value used in the model.

Simulation No. 5

The purpose of Simulation No. 5 was to estimate the leakance of the confining layer given the following conditions (same as Simulation No. 4). The difference with Simulation No. 4 is that the leakance across the confining layer (Layers 2 and 3) was adjusted until *a response of 0.01 feet was predicted at the MW-3 lower interval.* The 0.01-foot criterion was chosen because it was considered to be (for this simulation) the greatest response at MW-3 that may not have been detected during the pumping test at IW-4. In other words, if the highest non-detected response at MW-3 during the pumping test is assumed to be 0.01 feet, then the leakance of the confining layer should be less than or equal to the value used in the model.

Simulation No. 6

The purpose of Simulation No. 6 was to estimate the leakance of the confining layer given the following conditions (same as Simulations Nos. 4 and 5). The difference with those simulations is that the leakance across the confining layer (Layers 2 and 3) was adjusted until *a response of 0.30 feet was predicted at the MW-3 lower interval.* The 0.30-foot criterion was chosen because it was considered to be (for this simulation) the greatest response at MW-3 which may not have been detected during the pumping test at IW-4. In other words, if the highest non-detected response at MW-3 during the pumping test is assumed to be 0.30 feet, then the leakance of the confining layer should be less than or equal to the value used in the model.

Model Results

A total of six simulations were performed in an effort to evaluate the characteristics of the confining layer. Simulations Nos. 1 and 2 were used to 'calibrate' the model to some existing information. Simulations Nos. 3 through 6 used the 'calibrated' model to estimate the leakance in the confining layer. Table 3 provides a summary of the leakance (and corresponding vertical hydraulic conductivity) estimates generated by Simulations Nos. 3 through 6.

Simulation No. 3 yielded the lowest leakance (most confinement) of all the simulations because it forces the confining layer to act as an effective barrier between the significant pressure differences over a long period of time. The remaining simulations (Nos. 4 through 6) predicted the leakance based on an assumed response at the lower interval of MW-3 during the pumping at IW-4. Even though no response was observed at MW-3 during pumping, it is possible that the water level in MW-3 did respond during the test, but was masked by the tidal influences. The difference between Simulations Nos. 4 through 6 is the assumed response which was not observed. These 'non-detected' responses were 0.04 feet (Simulation No. 4), 0.01 feet (Simulation No. 5), and 0.30 feet (Simulation No. 6).

Table 3
Summary of Estimated Leakance Values for the Confining Interval

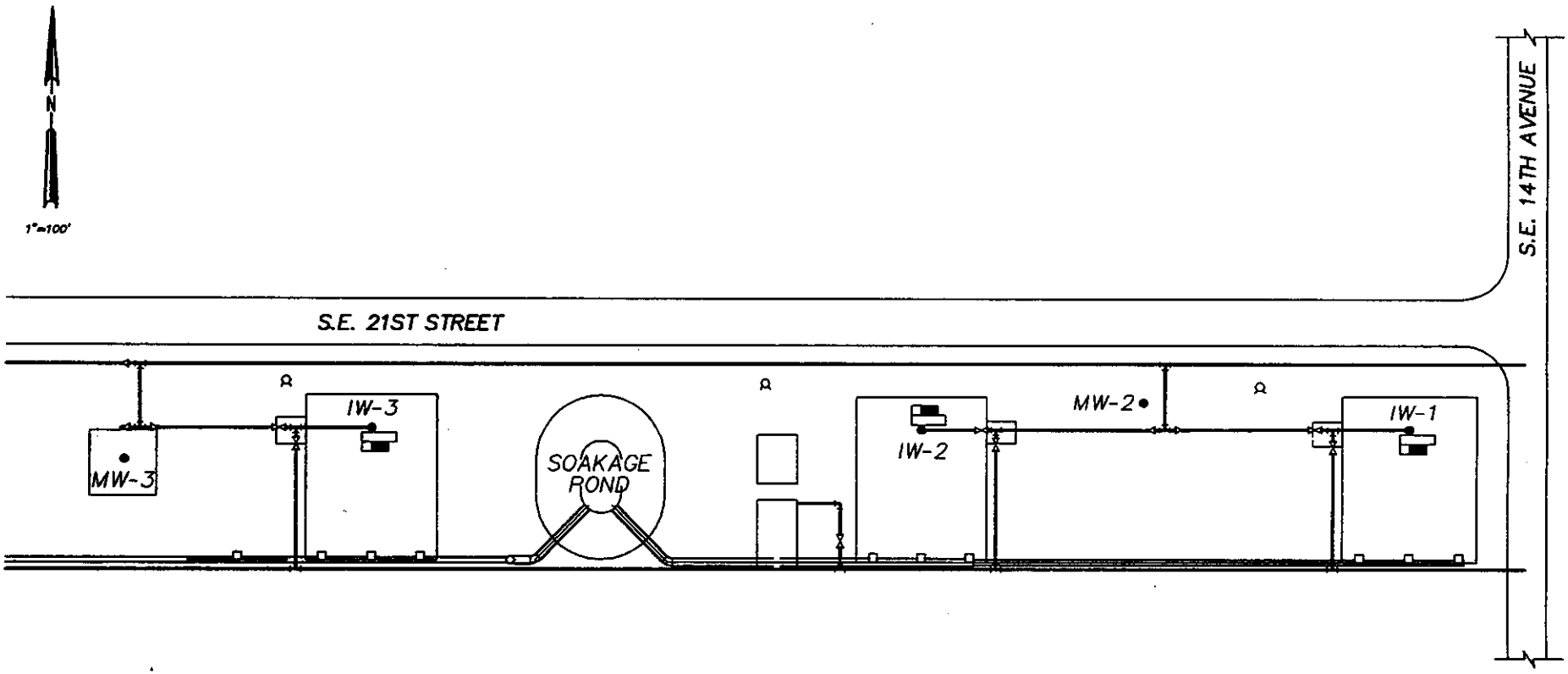
Simulation	Leakance (day^{-1})	Vertical Hydraulic Conductivity (cm/s)	Comments
No. 3	$\leq 2.5 \times 10^{-7}$	$\leq 7.9 \times 10^{-9}$	Simulate long-term layer pressure differences
No. 4	$\leq 1.0 \times 10^{-5}$	$\leq 3.2 \times 10^{-7}$	Simulate 0.04' response at MW-3 during IW-4 test
No. 5	$\leq 3.0 \times 10^{-4}$	$\leq 9.5 \times 10^{-6}$	Simulate 0.01' response at MW-3 during IW-4 test
No. 6	$\leq 1.0 \times 10^{-4}$	$\leq 3.2 \times 10^{-6}$	Simulate 0.30' response at MW-3 during IW-4 test

Summary and Conclusions

The purpose of this modeling effort was to estimate the confining properties (i.e. leakance) of an interval between 2,030 and 2,120 feet bpl. A numerical groundwater flow model was developed to simulate observed conditions, then used to estimate the leakance of the confining layer. Reasonable estimates of hydraulic conductivity for the limestone intervals, above and below the confining interval, were first determined. Using these estimates, and calibrating them to pumping tests at IW-4 and MW-3, the estimates of hydraulic conductivity were further refined. The model was then used to predict the leakance of the confining layer.

Several estimates of the leakance were predicted by the model, depending on an assumed condition. The range of leakance values ranged from 1.0×10^{-4} to 2.5×10^{-7} per day. The corresponding vertical conductivities of the confining layer ranged from 3.2×10^{-6} to 7.9×10^{-9} centimeters per second. This range in conductivity may be considered representative of a low-permeability limestone or dolomite as indicated in Freeze and Cherry (page 29, 1979). In addition, the leakance across the confining layer is indicative of adequate confinement above the proposed injection zone at IW-4. The significant difference in pressure and water quality above and below the confining layer also support this conclusion.

Figures



SITE PLAN

FIGURE 1.
Site Map

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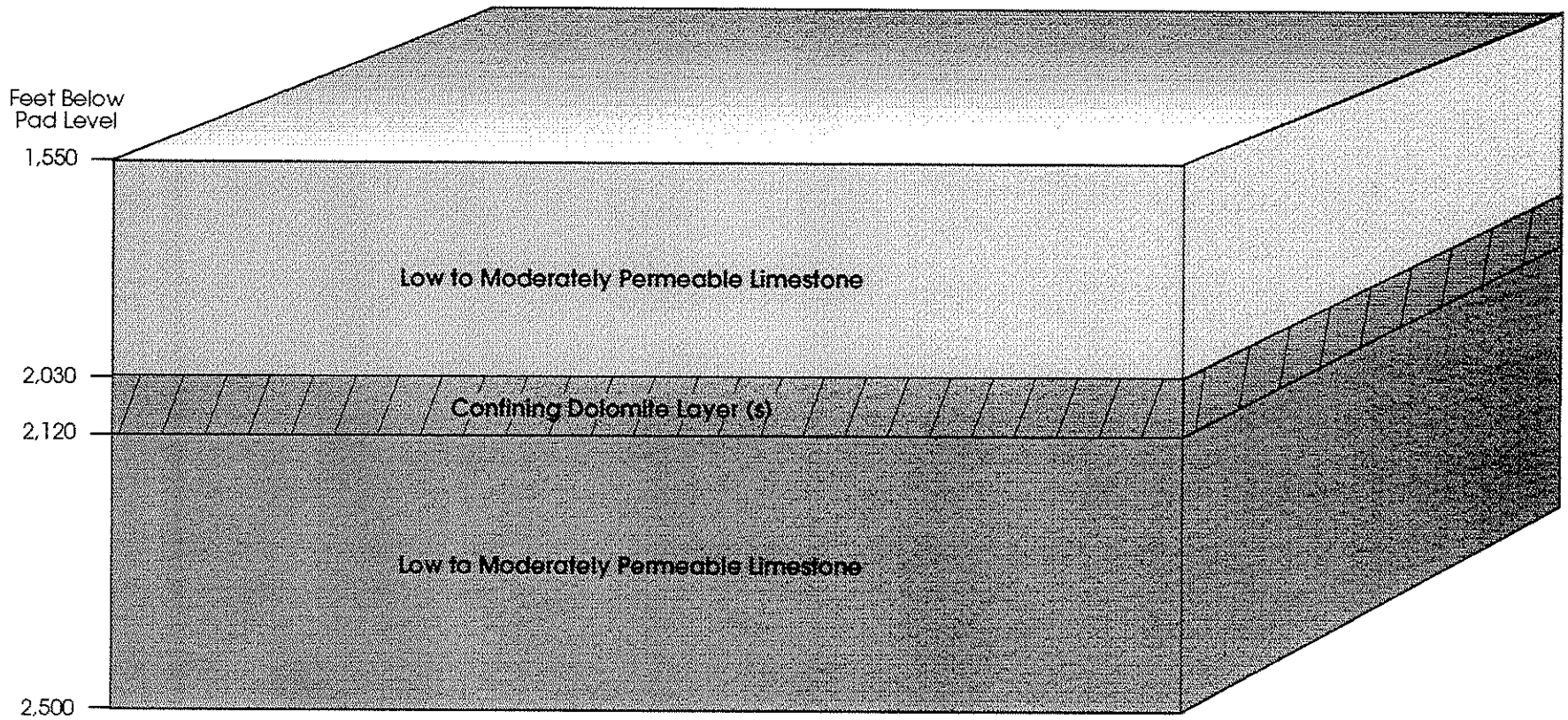
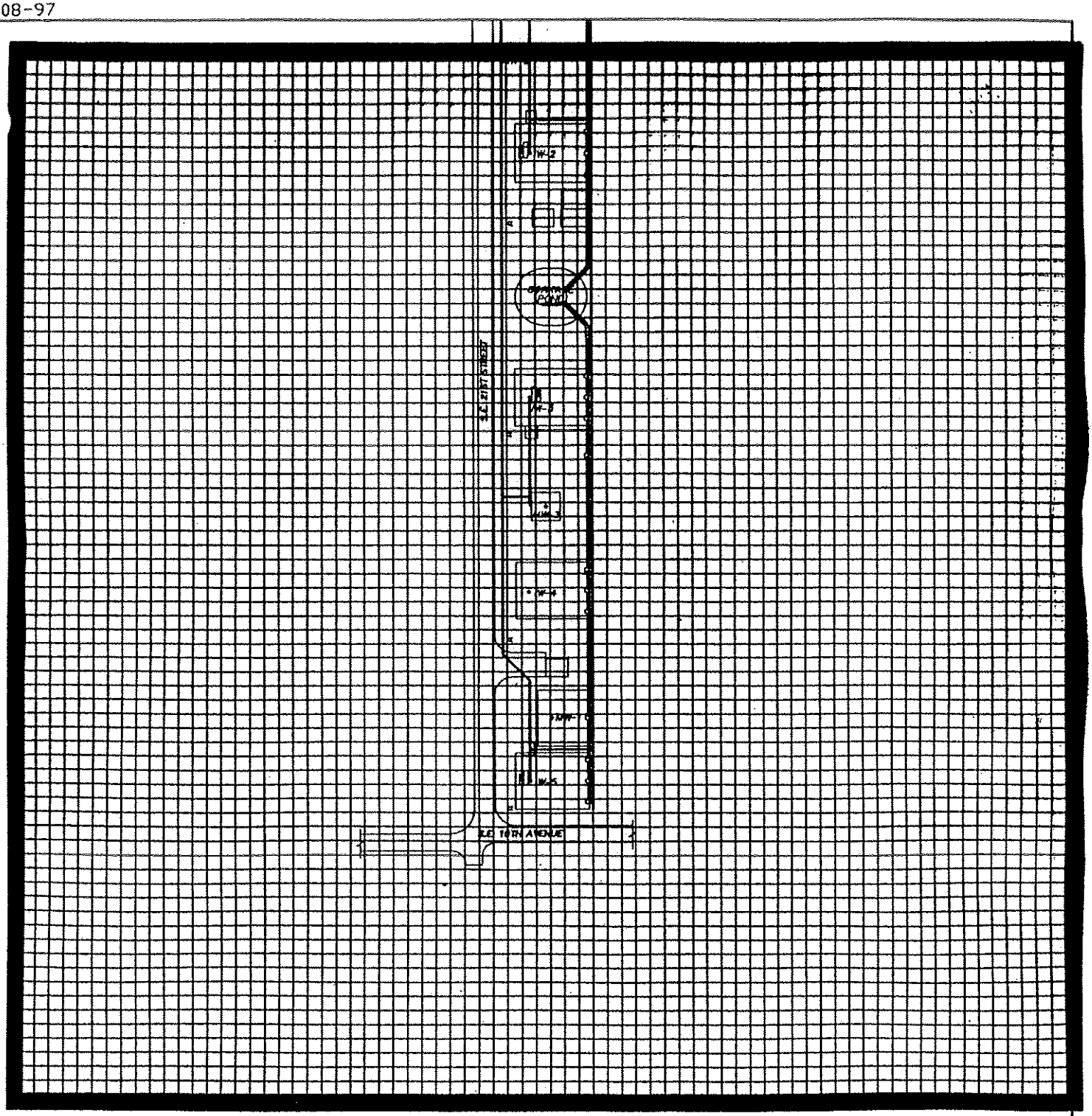


Figure 2
Conceptual Hydrogeology
Used in Model Setup



LEGEND

General Head Boundary

1"=200'

FIGURE 3.
MODFLOW Model Grid

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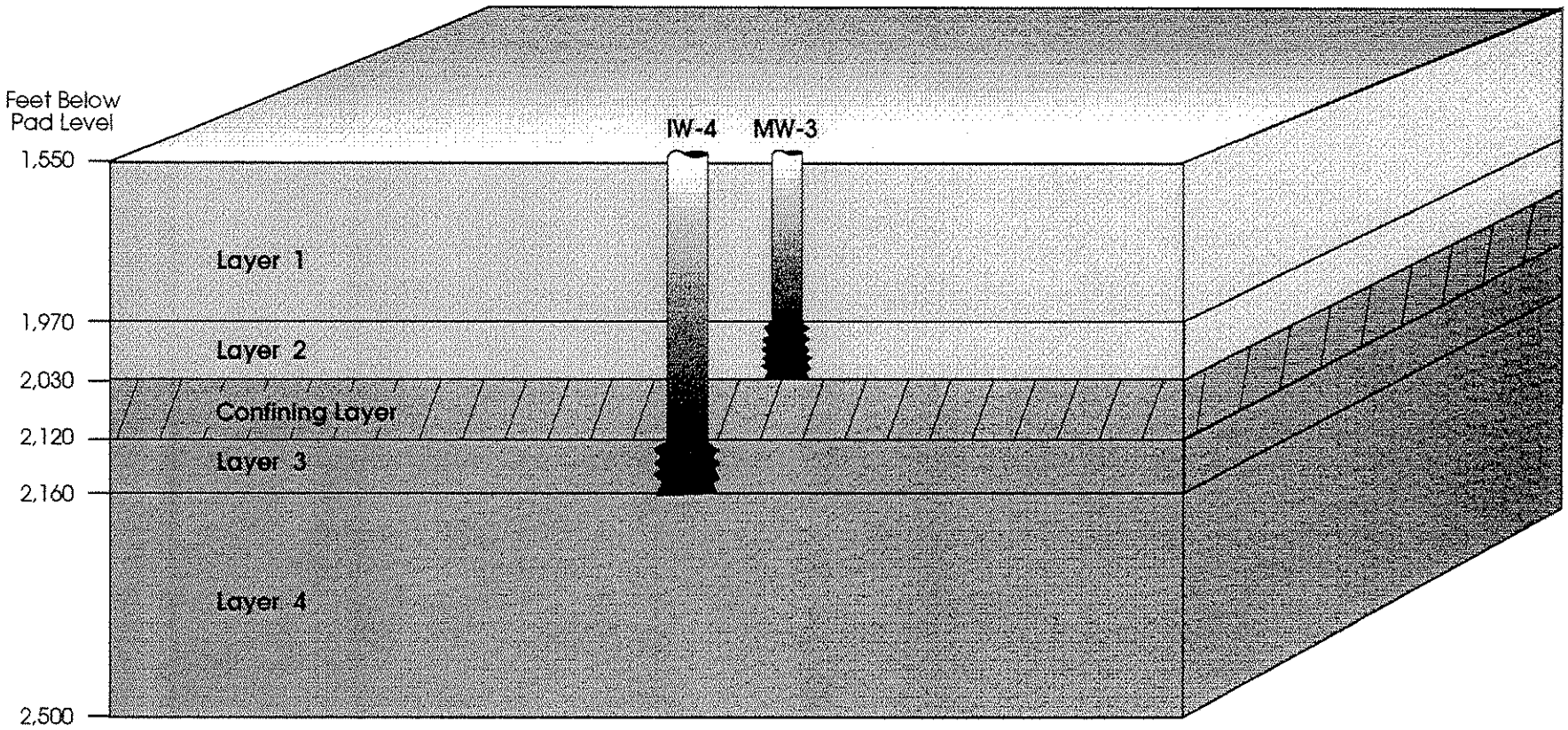
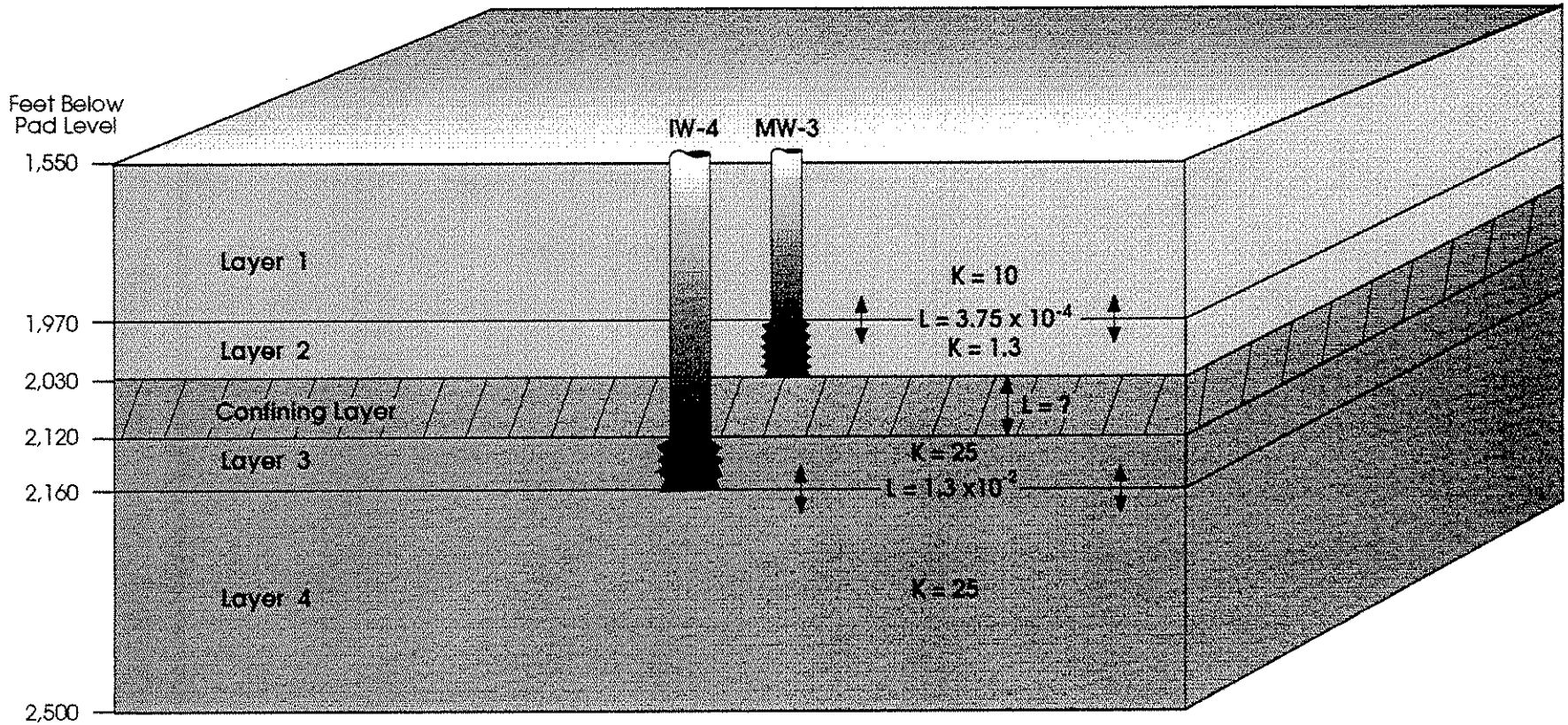


Figure 4
MODFLOW Model Layers



Legend

K = Horizontal Hydraulic Conductivity (feet/day)

L = Leakance (1/day)

S = Storage Coefficient (5.0 x 10^{-4} for all layers)

Figure 5
MODFLOW Model Input Valves

ENGINEERING REPORT ON THE

Construction and Testing of Injection Well IW-4 at the City of Fort Lauderdale G. T. Lohmeyer Wastewater Treatment Plant

Submitted to:
City of Fort Lauderdale

Prepared by:
CH2MHILL

February 1999

Volume 1

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February 26, 1999

115468.17.30

Mr. Jose Calas, P.E.
UIC/Groundwater Program Manager
Florida Department of Environmental Protection
P.O. Box 15425
West Palm Beach, FL 33416-5425

Subject: Engineering Report of the Construction and Testing of Injection Well IW-4 at the Fort Lauderdale G.T. Lohmeyer Wastewater Treatment Plant Injection Well System

Dear Jose:

Hereby submitted are two signed and sealed copies of the above-referenced Engineering Report (Volumes 1 and 2). The report includes the data collected during the construction and testing of injection well IW-4 at the Fort Lauderdale G.T. Lohmeyer Wastewater Treatment Plant injection well system. Injection well IW-4 is now complete and was constructed in accordance with the specific conditions of Construction Permit UC 06-264391.

If you have any questions regarding the enclosed material, please call me or David McNabb at 561/737-6665.

Sincerely,

CH2M HILL

Sean T. Skehan

Sean T. Skehan, P.G.
Project Manager

DFB/13724.doc
Attachments
c Mike Just/City of Fort Lauderdale
Maurice Tobon/City of Fort Lauderdale
Cathy McCarty/FDEP-Tlh.
Ron Reese/USGS
Steve Anderson/SFWMD
Garth Hinckle/BCDNRP
Scot Hoskins/USEPA
Tom McCormick/CH2M HILL
David McNabb/CH2M HILL

Contents

Tables **Page**

Figures

Drill Stem Packer Tests

Drill stem packer tests were conducted to determine water quality and hydrogeologic characteristics of the tested intervals. Tests were conducted on the following intervals: 1,150 to 1,388, 1,450 to 1,990, 2,130 to 2,185, 2,238 to 2,286, and 2,347 to 2,396 feet bpl. While conducting each test, water samples were collected at approximate 2-hour intervals in order to establish a consistent water quality profile. Each test also consisted of at least two flow or pumping rates and drawdown measurements in order to provide data for a specific capacity determination of the tested interval.

Samples collected during packer tests underwent analyses for TDS, chlorides, conductivity, ammonia, and TKN. Results of these analyses and analyses of pilot hole water samples indicated the presence of effluent effected water from the total depth of the well (3,305 feet bpl) up to a depth of 2,130 feet bpl. Specific capacities ranged from 17.39 to 1.01 gpm/ft over the intervals of 1,450 to 1,990 and 2,347 to 2,396 ft bpl, respectively. A summary of the drill stem packer tests water quality and specific capacity data from each of the tested intervals is presented in Appendix J.

Drill stem packer tests were used to identify the base of the Underground Source of Drinking Water (USDW) between 1,374 and 1,445 feet bpl during the construction of monitor well MW-3. See Engineering Report on the Construction and Testing of Monitor Well MW-3 at the G.T. Lohmeyer Wastewater Treatment Plant, September 1996.

Pumping Test

A pumping test was conducted to evaluate the confining characteristics of the interval between the base of the lower monitor zone of monitor wells MW-2 and MW-3 (approximately 2,030 feet bpl) and the top of the injection zone (2,120 feet bpl). The interval from 2,120 to 2,160 feet was pumped at a rate of approximately 285 gallons per minute for 46 hours. Fluid produced during the pumping test was discharged to IW-5. Water levels at IW-4 and the lower monitor zone of MW-2 and MW-3 were recorded during the test. The recorded data was then used in a modeling effort to simulate the characteristics of the confining intervals between 2,030 and 2,120 feet bpl. A modular three-dimensional finite-difference ground water flow model, known as MODFLOW was used for this evaluation.

Several estimates of the leakance of the interval from 2,030 to 2,120 feet bpl were predicted by the model, depending on an assumed condition. The range of leakance values ranged from $1.0x10^{-4}$ to $2.5x10^{-7}$ per day. The corresponding vertical conductivities of the confining layer ranged from $3.2x10^{-6}$ to $7.9x10^{-9}$ centimeters per second. Results of the pumping test were provided to the FDEP in a report titled "Evaluation of Confinement Using a Numerical Groundwater Flow Model - Construction of the City of Fort Lauderdale Injection Well IW-4", which was submitted to the FDEP on January 10, 1997. A copy of the report is provided in Appendix K.

Data from the formation samples, cores, geophysical logs, drill stem packer tests, and the pumping test were used to determine the confining intervals at the site. The main confining sequence below the lower monitor zones of MW-2 and MW-3 extends from the top of the injection zone at 2,120 feet bpl up to approximately 2,030 feet bpl. Additional confining intervals are present in the interval from approximately 1,520 to 2,000 feet bpl.

Injection Test

An injection test was conducted at IW-4 on October 14 through 16, 1998, to evaluate the hydraulic characteristics of the injection well and verify the integrity of the confining units between the injection zone and the monitoring intervals of the injection well system. The test included 24 hours of background data collection, 12 hours of injection, and 24 hours of recovery data collection. Flowrate at IW-4 and wellhead pressure for IEW-4 and each of the monitor zones of MW-1 and MW-3 were recorded at 1-minute intervals throughout the testing period. Figures 4-1 through 4-5 present flowrate at IW-4 superimposed on wellhead pressure data for IW-4 and each of the monitor zones of MW-1 and MW-3. As shown in the figures, there is no response on the wellhead pressure of the monitor wells as a result of injection at IW-4.

Wellhead pressure at IW-4 was approximately 40 to 41 psi prior to starting the test. Pressure ranged from approximately 55 to 69 psi (due to fluctuations in flowrate) and averaged approximately 67 psi while flowing at a rate of 18.0 million gallons per day (mgd) during the injection test. Wellhead pressure returned to approximately 40 to 41 psi almost immediately following completion of testing. The 27 psi increase in wellhead pressure at a pumping rate of 18.0 mgd (12,500 gpm) represents specific capacity of 200 gpm/foot.

SECTION 6

Summary and Conclusions

Construction of injection well IW-4 began August 12, 1996, and was completed January 13, 1997. Casings for the injection well include a 52-inch-diameter casing installed through the fresh waters of the surficial aquifer to a depth of 175 feet bpl, a 42-inch-diameter casing installed through the confining clays to a depth of 889 feet bpl, a 34-inch-diameter casing installed below the 10,000 mg/L total dissolved solids interface to a depth of 2,123 feet bpl, and a 24-inch-diameter casing installed below the confining intervals overlying the injection zone to a depth of 2,804 feet bpl. The injection zone extends over the interval from 2,120 feet bpl to the total depth of the well at 3,305 feet bpl. The interval from 2,120 feet to approximately 2,030 feet bpl provides confinement directly above the injection zone. Additional confinement is present in the interval from approximately 1,520 to 2,000 feet bpl.

The well was constructed in accordance with the applicable sections of Chapter 62-528, FAC, the specific conditions of Construction Permit No. UC-06-264391, and the construction contract documents prepared by CH2M HILL.

Mechanical integrity testing of the final 24-inch-diameter casing at the injection well was successfully performed by geophysical logging, pressure testing, a video survey, and a radioactive tracer survey. Each of the testing procedures confirmed that the 24-inch casing demonstrated mechanical integrity and met the standards established in Chapter 62.528, FAC.

APPENDIX J

Packer Tests Water Quality and Drawdown Data

Fort Lauderdale G. T. Lohmeyer WWTP
Injection Well IW-4
Packer Test Water Quality Summary

Parameter	Interval				
	1,160 to 1,388 ft. bpl	1,450 to 1,990 ft. bpl	2,130 to 2,185 ft. bpl	2,238 to 2,293 ft. bpl	2,347 to 2,396 ft. bpl
Conductivity (umhos/cm)	11,100	21,000	3,010	2,140	2,180
TDS (mg/L)	7,370	14,158	1,794	1,230	1,227
Chloride (mg/L)	3,750	7,600	850	550	490
TKN (mg/L)	1.19	9.13	13.80	12.50	12.16
Ammonia (mg/L)	0.74	7.62	12.10	11.50	11.94

ft. bpl = feet below pad level
mg/L = milligrams per liter
umhos/cm = micromhos per centimeter

Fort Lauderdale G.T. Lohmeyer WWTP
Injection Well IW-4
Packer Test Data

Tested Interval: 1,450 -1,990 feet bpl
Date: 9/11/96
Observer: D. McNabb

Flow Rate (gpm)	Head (ft. above pad level)	Drawdown (ft.)	Specific Capacity (gpm/ft.)
0	40.8	0.0	N/A
160	32.5	8.3	19.28
280	25.2	15.6	17.95
360	20.1	20.7	17.39

ft. = feet
gpm = gallons per minute
bpl = below pad level

Fort Lauderdale G.T. Lohmeyer WWTP
Injection Well IW-4
Packer Test Data

Tested Interval: 1,160 - 1,388 feet bpl
Date: 9/17/96
Observer: D. McNabb

Flow Rate (gpm)	Head (ft. above pad level)	Drawdown (ft.)	Specific Capacity (gpm/ft.)
0	35.1	0.0	N/A
100	28.2	6.9	14.49
200	18.9	16.2	12.35
260	14.0	21.1	12.32

ft. = feet
gpm = gallons per minute
bpl = below pad level

Fort Lauderdale G.T. Lohmeyer WWTP
Injection Well IW-4
Packer Test Drawdown Data

Tested Interval: 2,130 - 2,185 feet bpl
Date: 10/16/96
Observer: D. McNabb

Flow Rate (gpm)	Head (ft. above pad level)	Drawdown (ft.)	Specific Capacity (gpm/ft.)
0	69.8	0.0	N/A
90	51.3	18.5	4.86
140	35.1	34.7	4.03
195	17.8	52.0	3.75

ft. = feet
gpm = gallons per minute
bpl = below pad level

Fort Lauderdale G.T. Lohmeyer WWTP
Injection Well IW-4
Packer Test Data

Tested Interval: 2,238 - 2,293 feet bpl
Date: 10/18/96
Observer: D. McNabb

Flow Rate (gpm)	Head (ft. above pad level)	Drawdown (ft.)	Specific Capacity (gpm/ft.)
0	81.3	0.0	N/A
73	39.7	41.6	1.75
108	17.8	63.5	1.70

ft. = feet
gpm = gallons per minute
bpl = below pad level

Fort Lauderdale G.T. Lohmeyer WWTP
Injection Well IW-4
Packer Test Drawdown Data

Tested Interval: 2,347 - 2,396 feet bpl
Date: 10/25/96
Observer: D. McNabb

Flow Rate (gpm)	Head (ft. above pad level)	Drawdown (ft.)	Specific Capacity (gpm/ft.)
0	83.5	0.0	N/A
62	21.2	62.3	1.00
95	-10.5	94.0	1.01

ft. = feet
gpm = gallons per minute
bpl = below pad level

City of Fort Lauderdale
MW-1 Upper Monitor Zone

Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/01/1995	7,097	3,750	12,100	1.16	1.10	8.22	0.01	0	848
03/10/1995	7,184	3,950	11,900	1.39	1.20	7.99	0.01	0	925
03/17/1995	7,624	4,200	9,460	1.15	1.18	8.03	0.01	0	825
03/24/1995	7,535	3,900	8,820	1.16	1.07	7.95	0.14	0	850
03/31/1995	7,451	4,350	12,200	1.56	0.87	7.88	0.01	0	875
04/07/1995	7,577	4,000	12,300	1.20	1.29	8.02	0.01	0	775
04/11/1995	7,784	3,650	12,300	1.20	0.99	7.87	0.01	0	875
04/19/1995	7,501	3,600	9,590	1.19	0.99	8.01	0.01	0	775
04/25/1995	7,489	3,600	10,800	1.19	0.97	7.84	0.03	0	850
05/02/1995	7,505	3,700	11,400	1.35	1.14	7.69	0.02	0	875
05/09/1995	7,708	3,750	12,700	1.34	1.18	7.98	0.01	0	875
05/16/1995	7,632	3,800	12,400	1.21	1.15	7.72	0.04	0	875
05/23/1995	7,582	4,000	12,600	1.29	1.36	7.81	0.02	0	900
05/30/1995	7,580	3,850	12,600	1.22	1.15	7.76	0.12	0	775
06/05/1995	7,590	3,800	12,600	1.10	1.15	7.85	0.01	0	825
06/13/1995	7,621	3,800	12,500	1.18	1.22	7.89	0.05	0	875
06/20/1995	7,587	3,850	12,800	1.17	1.22	7.94	0.03	0	825
06/27/1995	7,634	3,800	12,600	1.18	0.99	7.94	0.01	0	825
07/04/1995	7,306	3,750	12,200	1.33	1.13	7.93	0.01	0	900
07/11/1995	7,475	3,900	12,600	1.33	1.02	7.76	0.01	0	825
07/18/1995	7,530	3,800	12,800	1.34	1.13	7.73	0.01	0	800
07/25/1995	7,450	3,900	12,700	1.28	0.96	7.80	0.01	0	825
07/31/1995	7,520	4,000	12,800	1.35	0.85	7.79	0.01	0	725
08/08/1995	7,460	3,950	12,600	1.33	1.05	7.72	0.02	0	700
08/15/1995	7,519	3,900	12,700	1.29	1.00	7.66	0.01	0	775
08/22/1995	7,603	3,850	12,600	1.33	1.00	7.68	0.08	0	875
08/29/1995	7,552	4,050	13,100	1.42	0.90	7.62	0.16	0	800
09/05/1995	7,628	3,950	13,400	1.55	1.12	7.57	0.01	0	725
09/12/1995	7,550	3,950	12,700	1.69	1.01	7.59	0.01	0	900
09/19/1995	7,540	3,900	12,700	1.53	0.84	7.55	0.01	0	900
09/26/1995	7,540	3,900	13,000	1.36	1.08	7.58	0.01	0	850
10/03/1995	7,500	4,000	12,900	1.39	1.08	7.52	0.01	0	725
10/10/1995	7,530	4,000	12,600	1.37	1.05	7.37	0.01	0	750
10/17/1995	7,490	4,000	12,500	1.41	1.02	7.67	0.01	0	850
10/24/1995	7,670	3,850	12,500	1.18	0.89	7.37	0.01	0	950
10/31/1995	7,649	3,950	12,600	1.25	0.81	7.75	0.01	0	825
11/07/1995	7,250	3,750	12,200	1.23	0.95	7.91	0.01	0	725
11/14/1995	7,387	3,800	12,400	1.38	0.78	7.69	0.02	0	900
11/21/1995	7,548	3,950	12,300	1.46	1.00	7.90	0.01	0	800
11/28/1995	7,499	3,800	12,600	1.43	1.05	7.63	0.01	0	825
12/05/1995	7,456	3,900	12,700	1.06	0.90	7.65	0.01	0	700
12/12/1995	7,660	3,850	12,800	1.17	0.59	7.68	0.01	0	750
12/19/1995	7,419	4,000	12,500	2.32	1.01	7.66	0.01	0	800
12/27/1995	7,521	3,950	12,100	1.47	0.92	7.70	0.01	0	825
01/02/1996	7,214	3,600	11,000	1.25	0.97	7.74	0.01	0	750

City of Fort Lauderdale MW-1 Upper Monitor Zone									
Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
01/09/1996	7,441	3,900	12,200	1.19	0.90	7.61	0.01	0	750
01/16/1996	7,633	3,800	12,400	1.18	0.98	7.67	0.01	0	650
01/23/1996	7,454	4,000	12,400	0.96	0.92	7.64	0.06	0	800
01/30/1996	7,750	3,800	12,600	1.22	0.93	7.74	0.01	0	825
02/06/1996	7,540	3,850	12,400	1.24	0.97	7.72	0.01	0	825
02/13/1996	7,468	3,750	12,200	1.40	0.93	7.75	0.04	0	700
02/20/1996	7,348	3,900	12,300	1.49	0.96	7.67	0.06	0	850
02/27/1996	7,484	4,000	12,200	1.38	0.95	7.73	0.05	0	1,000
03/05/1996	7,435	3,750	12,600	1.36	0.97	7.67	0.05	0	750
03/12/1996	7,520	3,800	12,300	1.32	0.98	7.67	0.01	0	675
03/19/1996	7,449	3,750	12,300	1.55	1.06	8.05	0.03	0	675
03/26/1996	7,391	3,850	12,400	1.23	0.96	7.60	0.01	0	700
04/02/1996	7,515	3,800	12,200	1.66	0.98	7.73	<0.01	0	850
04/09/1996	7,250	3,800	12,200	1.20	1.03	7.86	<0.01	0	825
04/16/1996	7,265	3,950	12,700	1.23	0.95	7.83	<0.01	0	875
04/23/1996	7,782	3,900	12,500	1.17	0.97	7.71	<0.01	0	825
04/30/1996	7,480	3,900	12,600	1.24	1.06	8.04	0.04	0	825
05/07/1996	7,466	4,100	12,400	1.41	1.02	7.84	<0.01	0	925
05/14/1996	7,308	3,800	12,300	1.29	0.96	7.79	<0.01	0	850
06/04/1996	7,393	3,950	12,400	1.26	1.00	7.76	<0.01	0	700
06/11/1996	7,414	3,800	12,300	1.56	0.97	7.83	0.01	0	750
06/19/1996	7,840	3,700	12,500	1.39	0.95	7.80	<0.01	0	850
06/25/1996	7,342	4,150	12,600	1.30	1.02	7.73	<0.01	0	800
07/02/1996	7,377	3,800	12,400	1.34	0.85	7.78	0.02	0	900
07/09/1996	7,561	3,900	12,500	1.24	0.77	7.85	0.05	0	900
07/16/1996	7,420	3,850	12,500	1.17	0.79	7.87	<0.01	0	825
07/23/1996	7,430	3,800	12,400	1.20	0.91	8.02	<0.01	0	800
07/30/1996	7,580	3,750	12,200	1.21	0.97	7.84	<0.01	0	950
08/06/1996	7,400	3,750	12,300	1.25	0.80	7.98	<0.01	0	800
08/15/1996	7,559	3,500	12,400	1.29	1.01	7.78	<0.01	0	850
08/20/1996	7,510	3,900	12,300	1.38	0.98	7.80	<0.01	0	875
08/27/1996	7,774	3,800	12,200	1.40	1.03	7.79	<0.01	0	750
09/04/1996	7,371	3,800	12,200	1.30	0.96	7.81	<0.01	0	875
09/17/1996	7,380	3,750	12,300	1.25	0.84	7.80	<0.01	0	800
10/08/1996	7,325	3,650	12,000	1.51	1.05	7.85	0.04	0	700
10/15/1996	7,360	3,700	12,200	1.23	0.95	7.94	<0.01	0	750
10/22/1996	7,450	3,800	12,500	1.16	0.95	7.77	<0.01	0	875
10/29/1996	7,447	3,750	12,300	1.25	1.12	7.91	<0.01	0	750
11/05/1996	7,320	3,700	12,300	1.17	0.95	7.80	<0.01	0	900
11/12/1996	7,360	3,750	12,100	1.18	0.76	8.00	0.05	0	900
11/18/1996	7,385	3,650	12,100	1.20	0.94	7.79	0.04	0	1,000
11/26/1996	7,384	3,800	12,300	1.23	0.93	7.95	0.02	0	950
12/02/1996	7,148	3,750	12,400	1.39	0.97	7.74	0.01	0	900
12/10/1996	7,460	3,800	12,500	1.42	0.92	7.80	<0.01	0	950
12/17/1996	7,354	3,750	12,500	1.06	0.95	8.05	<0.01	0	950

City of Fort Lauderdale MW-1 Upper Monitor Zone									
Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
12/24/1996	7,333	3,700	12,400	1.05	0.94	7.89	<0.01	0	1,050
12/31/1996	7,502	3,650	12,400	1.20	0.91	7.81	0.05	0	950
01/07/1997	7,436	3,750	12,300	1.34	0.92	7.77	<0.01	0	950
01/14/1997	7,410	3,800	12,600	1.18	0.68	7.88	<0.01	0	950
01/21/1997	7,363	3,950	12,500	1.28	0.84	8.02	0.07	0	950
01/28/1997	7,370	3,750	12,700	1.23	0.95	7.94	<0.01	0	1,000
02/04/1997	7,400	3,750	12,600	1.16	0.94	7.77	<0.01	0	1,050
02/11/1997	7,461	3,700	12,400	1.38	0.91	7.89	<0.01	0	900
02/18/1997	7,329	3,850	12,400	1.15	0.89	7.69	<0.01	0	900
02/25/1997	7,365	3,800	12,500	1.24	0.58	7.91	<0.01	0	1,000
03/04/1997	7,292	3,700	12,500	1.19	0.95	7.83	<0.01	0	1,150
03/11/1997	7,406	3,800	12,600	1.26	1.00	7.77	<0.01	0	700
03/18/1997	7,391	3,700	12,600	1.22	0.79	7.78	<0.01	0	900
03/25/1997	7,433	3,750	12,400	1.25	0.85	8.02	<0.01	0	900
04/01/1997	7,364	3,600	12,500	1.19	0.93	7.98	<0.01	0	850
04/08/1997	7,373	3,650	12,500	1.13	0.97	7.86	<0.01	0	900
05/06/1997	7,360	3,700	12,300	1.14	0.98	7.73	<0.01	0	950
05/13/1997	7,331	3,450	12,500	1.15	1.00	7.84	<0.01	0	900
05/20/1997	7,351	3,600	12,200	1.10	0.99	7.65	<0.01	0	950
05/27/1997	7,329	3,650	12,300	1.17	0.96	7.65	<0.01	0	950
06/03/1997	7,410	3,750	12,400	1.11	0.98	7.95	0.02	0	950
06/10/1997	7,191	3,650	12,600	1.26	1.02	7.91	<0.01	0	950
06/18/1997	7,348	3,700	12,500	1.21	0.97	7.70	<0.01	0	900
06/24/1997	7,425	4,050	12,200	1.13	0.99	7.85	0.01	0	800
07/01/1997	7,164	3,700	12,300	1.10	0.97	8.03	0.02	0	950
07/08/1997	7,363	3,550	12,300	1.31	0.93	7.91	0.02	0	950
07/15/1997	7,063	3,550	12,300	1.22	0.98	7.98	<0.01	0	850
07/22/1997	7,260	3,600	12,300	1.17	0.95	8.09	0.01	0	1,050
07/29/1997	7,327	3,000	12,300	1.13	0.98	7.83	<0.01	0	900
08/05/1997	7,391	3,600	12,400	1.06	0.93	7.87	<0.01	0	750
08/12/1997	7,446	3,700	12,400	1.18	0.93	8.04	<0.01	0	750
08/18/1997	7,430	3,750	12,400	1.12	0.95	7.94	<0.01	0	750
08/26/1997	7,255	3,600	12,400	1.04	0.90	8.13	<0.01	0	750
09/03/1997	7,391	3,700	12,400	1.03	0.89	8.04	0.02	0	1,000
09/09/1997	7,416	3,800	12,300	1.22	0.95	7.91	<0.01	0	1,050
09/16/1997	7,454	3,650	12,600	1.07	0.93	8.03	<0.01	0	900
09/23/1997	7,350	3,650	12,380	1.06	0.94	7.85	0.04	0	900
09/30/1997	7,380	3,750	12,440	1.06	0.95	7.97	<0.01	0	950
10/07/1997	7,464	3,650	12,430	1.06	0.90	7.93	<0.01	0	900
10/14/1997	7,418	3,750	12,370	1.17	0.97	7.80	0.04	0	1,000
10/22/1997	7,325	3,750	12,800	1.05	0.95	7.72	<0.01	0	900
10/29/1997	7,335	3,650	12,260	1.04	0.94	7.85	<0.01	0	1,150
11/05/1997	7,336	3,650	12,210	1.07	0.93	7.97	<0.01	<1	1,050
11/12/1997	7,303	3,700	12,330	1.02	0.96	7.83	<0.01	<1	900
11/18/1997	7,337	3,750	12,230	1.08	0.93	7.95	<0.01	0	950

City of Fort Lauderdale MW-1 Upper Monitor Zone									
Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
11/25/1997	7,170	3,650	12,230	1.13	0.91	7.75	<0.01	0	950
12/02/1997	7,430	3,700	12,230	1.14	0.95	7.96	<0.01	<1	1,000
12/09/1997	7,243	3,550	11,940	1.07	0.95	7.94	<0.01	<1	900
12/16/1997	7,379	3,700	12,270	1.08	0.96	7.93	<0.01	<1	1,000
12/23/1997	7,520	3,750	12,240	0.95	0.90	7.77	<0.01	<1	950
12/30/1997	7,466	3,650	12,200	1.21	1.04	7.98	<0.01	<1	900
01/06/1998	7,340	3,650	12,300	1.26	0.90	7.99	0.01	<1	950
01/13/1998	7,396	3,750	12,300	1.35	1.01	7.93	<0.01	<1	800
01/20/1998	7,310	3,650	12,350	1.44	0.94	7.84	<0.01	<1	1,050
01/27/1998	7,360	3,700	12,330	1.03	0.94	7.77	<0.01	<1	1,000
02/03/1998	7,370	3,650	12,320	1.05	0.87	7.85	0.02	<1	1,050
02/10/1998	7,398	3,650	12,340	1.13	0.74	7.85	0.03	<1	1,050
02/17/1998	7,290	3,650	12,180	1.24	0.65	8.04	<0.01	<1	900
02/24/1998	7,278	3,750	12,310	1.07	0.92	7.88	0.02	<1	900
03/03/1998	7,391	3,600	12,260	1.04	0.86	7.69	<0.01	<1	750
03/10/1998	7,417	3,700	12,180	1.00	0.82	7.88	0.01	<1	800
03/17/1998	7,280	3,600	12,220	1.19	0.78	7.86	0.05	<1	700
03/24/1998	7,308	3,650	12,200	1.16	0.80	7.91	0.06	<1	1,150
03/31/1998	7,444	3,800	12,180	1.18	0.82	7.82	0.04	<1	800
04/07/1998	7,320	3,250	12,110	1.17	0.99	7.87	0.03	<1	750
04/14/1998	7,426	3,500	12,050	1.01	0.92	7.80	0.04	<1	950
04/21/1998	7,433	3,500	12,150	1.03	0.89	7.65	<0.01	<1	850
04/28/1998	7,286	3,600	12,270	1.01	0.95	7.68	<0.01	<1	850
05/05/1998	7,587	3,750	12,290	1.12	0.95	7.91	<0.01	<1	950
05/12/1998	7,600	3,500	12,240	1.11	0.79	7.84	0.11	<1	1,000
05/19/1998	7,304	3,550	12,240	1.13	1.01	7.97	0.03	<1	1,000
05/26/1998	7,351	3,850	12,220	1.00	0.86	7.83	0.02	<1	1,000
06/02/1998	7,782	3,550	12,270	1.14	0.95	7.97	0.02	<1	950
06/09/1998	7,584	3,600	12,240	1.29	1.00	7.92	0.03	<1	950
06/16/1998	7,334	3,600	12,280	1.14	0.99	7.94	0.03	<1	1,000
06/23/1998	7,505	3,450	12,280	1.09	0.80	7.93	0.03	<1	650
06/30/1998	7,484	3,550	12,050	1.09	0.88	7.84	<0.01	<1	1,050
07/07/1998	7,430	3,800	12,260	1.14	0.47	7.88	<0.01	<1	1,100
07/14/1998	7,450	3,600	12,330	1.26	0.75	7.85	<0.01	<1	950
07/21/1998	7,326	3,600	12,260	1.10	0.95	7.98	<0.01	<1	1,050
07/28/1998	7,366	3,600	12,280	1.16	1.06	7.97	<0.01	<1	1,050
08/04/1998	7,430	3,650	12,290	1.19	0.85	7.82	<0.01	<1	850
08/11/1998	7,434	3,600	12,250	1.17	0.71	7.89	<0.01	<1	1,050
08/18/1998	7,580	3,750	12,320	1.21	0.91	7.92	<0.05	<1	1,050
08/25/1998	7,490	3,650	12,300	1.23	0.81	7.98	<0.05	<1	1,050
09/01/1998	7,350	3,700	12,290	1.26	0.97	7.99	<0.05	<1	1,050
09/08/1998	7,360	3,800	12,310	1.21	0.88	7.84	<0.05	<1	1,050
09/15/1998	7,290	3,600	12,300	1.08	0.97	7.93	<0.05	<1	1,300
09/22/1998	7,500	3,700	12,280	1.19	0.84	7.94	<0.05	<1	1,100
09/29/1998	7,358	3,650	12,010	1.14	0.89	7.93	<0.05	<1	1,150

City of Fort Lauderdale MW-1 Upper Monitor Zone									
Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
10/06/1998	7,470	3,800	11,970	1.07	0.97	7.86	<0.05	<1	1,000
10/13/1998	7,328	3,700	12,020	1.12	0.92	8.13	<0.05	<1	950
10/20/1998	7,336	3,750	11,950	1.13	0.95	8.13	<0.05	<1	1,050
10/27/1998	7,525	3,650	11,980	1.23	0.96	7.99	<0.05	<1	1,000
11/03/1998	7,413	3,850	11,970	1.09	0.51	8.00	<0.05	<1	850
11/10/1998	7,711	3,850	11,980	1.25	0.77	8.03	<0.05	<1	850
11/17/1998	7,337	3,750	11,940	1.06	0.71	7.93	<0.05	<1	1,000
11/24/1998	7,287	3,950	11,960	1.08	0.74	7.96	<0.05	<1	950
12/01/1998	7,443	3,800	11,780	1.08	0.97	7.95	<0.05	<1	1,100
12/08/1998	7,349	3,850	11,820	1.09	0.98	7.88	<0.05	<1	1,100
12/15/1998	7,462	3,850	11,830	1.15	1.00	8.02	<0.05	<1	1,000
12/22/1998	7,474	3,900	11,810	1.27	0.51	7.98	<0.05	<1	850
12/29/1998	7,438	3,800	11,880	1.12	0.96	8.01	<0.05	<1	900
01/05/1999	7,318	3,650	11,840	1.10	0.96	7.94	<0.05	<1	1,050
01/12/1999	7,553	3,800	11,840	1.17	0.93	7.98	<0.05	<1	850
01/19/1999	7,514	3,850	11,810	1.09	0.44	7.72	<0.05	<1	900
01/26/1999	7,414	3,900	11,790	1.24	0.34	7.84	<0.05	<1	850
02/02/1999	7,371	3,850	12,400	1.23	1.02	7.76	<0.05	<1	900
02/09/1999	7,466	3,850	11,910	1.10	1.00	7.88	<0.05	<1	1,000
02/16/1999	7,608	3,850	11,900	1.29	0.91	8.28	<0.05	<1	950
02/23/1999	7,300	3,800	11,810	1.30	0.89	7.87	<0.05	<1	1,050
03/02/1999	7,485	3,900	11,910	1.25	1.02	8.10	<0.05	<1	1,000
03/09/1999	7,448	3,950	11,880	1.18	0.99	7.98	<0.05	<1	1,100
03/16/1999	7,555	3,800	11,780	1.06	0.99	8.07	<0.05	<1	1,000
04/06/1999	7,417	3,850	11,870	1.13	0.94	8.04	<0.05	<1	950
04/13/1999	7,380	4,000	11,870	1.15	0.89	8.11	<0.05	<1	950
04/20/1999	7,542	3,900	11,800	1.08	0.99	8.10	0.05	<1	850
04/27/1999	7,304	3,350	11,840	1.06	0.97	8.16	<0.05	<1	1,150
05/04/1999	7,486	3,900	11,940	1.15	0.99	8.09	<0.05	<1	1,150
05/11/1999	7,453	3,900	11,820	1.13	1.02	8.05	<0.05	<1	900
05/18/1999	7,446	3,800	11,940	1.19	0.97	7.96	<0.05	<1	950
05/25/1999	7,715	3,900	11,900	1.30	0.97	8.05	<0.05	<1	950
06/01/1999	7,510	3,850	11,880	1.09	0.98	8.23	<0.05	<1	850
06/08/1999	7,411	3,850	11,870	1.24	1.01	8.00	<0.05	<1	1,000
06/15/1999	7,425	3,900	11,820	1.34	0.96	8.24	<0.05	<1	950
06/22/1999	7,500	3,900	11,840	1.20	0.97	8.06	<0.05	<1	850
06/29/1999	7,460	3,900	11,960	1.22	0.96	8.02	<0.05	<1	900
07/06/1999	7,416	3,900	11,990	1.19	0.98	8.01	<0.05	<1	1,000
07/13/1999	7,450	4,000	11,780	1.38	0.95	8.02	<0.05	<1	850
08/03/1999	7,400	3,900	11,910	1.37	1.00	8.09	<0.05	<1	800
08/10/1999	7,524	3,900	11,960	1.24	0.96	8.00	<0.05	<1	950
08/17/1999	7,450	3,950	11,900	1.06	0.97	7.88	<0.05	<1	900
08/24/1999	7,450	3,800	11,970	1.06	0.96	8.01	<0.05	<1	900
08/31/1999	7,490	3,900	11,910	1.09	0.94	7.85	<0.05	<1	750
09/07/1999	7,615	4,000	12,020	1.16	0.95	7.43	<0.05	<1	900

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City of Fort Lauderdale MW-1 Upper Monitor Zone									
Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
09/15/1999	7,491	3,700	11,820	0.96	0.95	7.88	<0.05	<1	950
09/21/1999	7,473	3,350	12,300	1.04	0.95	7.94	0.08	<1	850
09/28/1999	7,534	3,750	12,710	1.02	0.96	7.97	0.10	<1	950
10/05/1999	7,460	3,850	12,330	1.02	0.96	8.04	<0.05	<1	800
10/12/1999	7,540	3,850	12,350	1.02	0.98	8.05	<0.05	<1	950
10/19/1999	7,360	3,950	12,120	1.14	0.99	7.91	0.08	<1	950
10/26/1999	7,640	4,000	12,130	1.03	0.98	7.96	0.06	<1	850
11/02/1999	7,400	3,900	12,150	1.03	0.98	8.01	<0.05	<1	850
11/09/1999	7,410	3,700	12,140	1.03	0.99	7.97	<0.05	<1	850
11/16/1999	7,373	3,950	12,150	1.08	0.99	7.90	0.16	<1	800
11/23/1999	7,440	3,900	12,150	1.01	0.99	7.94	0.09	<1	1,000
11/30/1999	7,596	3,500	12,170	1.08	0.98	7.81	0.08	<1	800
12/07/1999	7,359	3,900	12,130	1.06	0.98	7.94	<0.05	<1	1,000
12/14/1999	7,255	3,950	12,100	1.16	0.98	7.91	<0.05	<1	750
12/21/1999	7,320	4,000	12,140	1.12	0.98	7.95	0.17	<1	750
12/28/1999	7,370	4,000	12,150	1.07	0.99	7.90	0.07	<1	900
01/04/2000	7,456	3,650	12,180	1.11	0.99	7.74	<0.05	<1	850
01/11/2000	7,369	3,800	12,150	1.28	0.98	7.91	0.18	<1	700
01/18/2000	7,765	3,900	12,170	1.21	0.97	8.00	0.12	<1	750
01/25/2000	7,240	3,850	12,150	1.25	0.99	7.86	0.11	<1	800
02/01/2000	7,360	3,900	12,180	1.28	1.00	7.99	<0.05	<1	800
02/08/2000	7,570	4,050	12,250	1.21	1.05	7.86	<0.05	<1	950
02/15/2000	7,180	3,600	12,100	1.22	0.98	7.53	<0.05	<1	700
02/22/2000	7,280	3,850	12,190	1.29	0.97	7.90	<0.05	<1	800
02/29/2000	7,330	3,800	12,170	1.25	0.97	7.89	<0.05	<1	850
03/07/2000	7,110	4,000	12,190	1.22	0.98	7.73	<0.05	<1	750
03/14/2000	7,390	3,950	12,120	1.26	0.96	7.83	<0.05	<1	1,000
03/21/2000	7,381	4,000	12,180	1.26	0.93	7.85	<0.05	<1	900
03/28/2000	7,330	3,850	12,140	1.27	0.93	7.88	<0.05	<1	800
04/04/2000	7,058	3,940	12,030	1.23	0.96	7.73	0.05	<1	950
04/11/2000	7,403	3,970	12,120	1.26	0.96	8.02	0.10	<1	800
04/18/2000	7,363	3,970	12,210	1.29	0.94	8.14	0.13	<1	850
05/02/2000	7,417	3,310	12,190	1.33	0.95	7.99	<0.05	<1	700
05/09/2000	7,382	3,530	12,230	1.25	0.77	8.11	0.28	<1	800
05/16/2000	7,341	3,355	12,190	1.15	0.96	7.93	0.09	<1	850
05/23/2000	7,298	3,695	11,910	1.23	0.99	7.53	0.08	<1	750
05/30/2000	7,210	3,870	12,160	1.09	0.82	7.76	<0.05	<1	800
06/06/2000	7,533	3,950	12,160	1.17	0.93	7.99	<0.05	<1	650
06/13/2000	7,755	3,740	12,120	1.21	0.95	8.05	<0.05	<1	750
06/20/2000	7,293	3,645	12,140	1.15	0.87	8.04	<0.05	<1	600
06/27/2000	7,199	4,130	12,180	1.13	0.94	8.32	<0.05	<1	550
07/05/2000	7,409	3,495	12,170	1.24	0.92	8.07	<0.05	<1	600
07/11/2000	7,330	3,960	12,150	1.20	0.93	8.12	<0.05	<1	800
07/25/2000	7,341	3,995	12,160	1.13	0.96	8.13	<0.05	<1	750
08/01/2000	7,329	4,000	12,100	NA	0.91	7.99	<0.05	<1	700

City of Fort Lauderdale
MW-1 Upper Monitor Zone

Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
08/08/2000	7,410	3,980	12,140	0.96	0.92	8.11	<0.05	<1	750
08/15/2000	7,310	4,140	12,140	1.10	1.03	8.21	<0.05	<1	800
08/22/2000	7,264	3,805	12,150	1.06	1.00	8.06	<0.05	<1	700
08/29/2000	7,310	3,955	12,170	1.13	0.97	8.11	<0.05	<1	600
09/05/2000	7,280	4,020	12,150	1.12	1.02	8.07	<0.05	<1	700
09/12/2000	7,330	4,230	12,130	1.17	0.96	8.11	<0.05	<1	950
09/19/2000	7,689	4,080	12,110	1.14	1.00	8.02	<0.05	<1	850
09/26/2000	7,440	4,260	12,130	1.09	0.94	8.07	<0.05	<1	700
10/03/2000	7,438	4,070	12,140	1.28	0.96	8.13	<0.05	<1	750
10/10/2000	7,233	4,150	12,100	1.17	0.97	8.06	<0.05	<1	750
10/17/2000	7,320	3,055	12,180	1.07	0.97	7.99	0.06	<1	700
10/24/2000	7,140	4,095	11,890	1.23	0.93	7.95	<0.05	<1	850
10/31/2000	7,516	3,990	12,170	0.73	0.62	8.21	<0.05	<1	750
11/07/2000	7,333	4,025	12,160	1.08	0.94	8.21	<0.05	<1	650
11/14/2000	7,460	3,710	12,160	1.08	0.96	8.18	<0.05	<1	700
11/21/2000	7,455	3,615	12,160	1.11	0.92	8.07	<0.05	<1	700
11/28/2000	7,315	4,445	12,130	1.29	0.95	8.20	<0.05	<1	750
12/05/2000	7,320	4,050	12,160	1.14	0.97	8.06	<0.05	<1	700
12/12/2000	7,452	4,100	12,140	1.07	0.73	8.10	<0.05	<1	600
12/19/2000	7,930	4,040	11,920	1.18	0.84	7.95	<0.05	<1	650
12/26/2000	7,980	4,100	9,440	1.12	0.74	8.12	<0.05	<1	700
01/02/2001	7,430	4,140	12,230	1.00	0.94	8.20	<0.05	<1	850
01/09/2001	7,270	4,390	12,180	0.99	0.95	8.26	<0.05	<1	850
01/16/2001	7,565	4,075	12,190	0.99	0.92	8.24	<0.05	<1	750
01/23/2001	7,321	4,105	12,200	1.09	1.01	8.10	<0.05	<1	700
01/30/2001	7,307	7,150	12,150	1.10	0.97	8.14	<0.05	<1	800
02/06/2001	7,450	3,340	12,160	1.17	1.00	8.17	0.06	<1	800
02/13/2001	6,967	3,550	12,170	1.04	1.00	8.34	<0.05	<1	750
02/20/2001	7,266	3,500	12,170	1.06	0.93	8.12	<0.05	<1	650
02/27/2001	7,460	3,475	12,170	1.12	0.92	8.31	<0.05	<1	800
03/06/2001	7,420	3,440	11,250	1.13	0.94	8.12	<0.05	<1	850
03/13/2001	7,600	3,300	11,080	1.05	0.98	8.35	<0.05	<1	800
03/20/2001	7,470	3,350	11,190	1.14	0.93	8.43	<0.05	<1	850
03/27/2001	7,367	3,400	11,130	1.16	0.96	8.37	<0.05	<1	850
04/03/2001	7,530	3,250	11,200	1.13	0.96	8.40	<0.05	0	850
04/10/2001	7,470	3,300	11,090	1.17	0.91	8.29	<0.05	<1	750
04/17/2001	7,158	3,900	11,060	1.23	0.92	8.02	<0.05	<1	800
04/24/2001	7,380	3,850	11,110	1.11	0.73	8.24	<0.05	<1	850
05/01/2001	7,447	3,900	11,110	1.40	0.83	8.40	<0.05	<1	700
05/08/2001	7,469	3,950	11,120	1.07	0.98	7.97	<0.05	<1	750
05/15/2001	7,322	3,850	11,080	1.06	0.96	7.95	<0.05	<1	700
05/22/2001	7,350	3,850	11,030	1.12	0.93	8.01	<0.05	<1	800
05/29/2001	7,676	3,850	11,080	1.14	0.62	8.03	<0.05	<1	900
06/05/2001	7,390	3,500	11,110	1.08	0.90	7.93	0.07	<1	850
06/12/2001	7,370	3,650	11,110	1.14	0.97	8.07	<0.05	<1	900

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City of Fort Lauderdale MW-1 Upper Monitor Zone									
Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/19/2001	7,420	3,800	11,100	1.12	0.85	7.99	<0.05	<1	850
06/26/2001	7,590	3,600	11,130	1.32	0.97	7.94	<0.05	<1	800
07/03/2001	7,478	3,600	11,090	1.32	0.96	8.02	0.08	<1	850
07/10/2001	7,310	3,900	11,180	1.27	0.92	8.16	<0.05	<1	750
07/17/2001	7,400	3,900	11,120	1.27	0.99	8.13	<0.05	<1	850
07/24/2001	7,300	3,850	11,090	1.29	0.93	8.13	<0.05	<1	800
07/31/2001	7,370	3,850	11,110	1.22	0.97	8.10	<0.05	<1	800
08/07/2001	7,390	3,800	11,150	1.40	1.00	8.04	<0.05	<1	800
08/14/2001	7,507	3,800	11,120	1.39	1.00	8.05	<0.05	<1	800
08/21/2001	7,340	3,900	11,050	1.30	0.99	8.11	<0.05	<1	850
08/28/2001	7,393	3,850	11,190	1.06	1.00	8.01	<0.05	<1	750
09/04/2001	7,400	3,900	11,080	1.11	0.89	8.02	<0.05	<1	750
09/11/2001	7,203	3,900	11,140	1.13	0.99	8.19	<0.05	<1	750
09/18/2001	7,198	3,800	11,160	1.28	0.95	8.08	<0.05	<1	550
09/25/2001	7,414	3,900	11,430	1.88	1.00	7.73	<0.05	<1	700
10/02/2001	7,320	3,850	11,490	1.89	0.99	8.26	<0.05	<1	750
10/09/2001	7,250	3,750	11,490	1.66	0.94	7.98	<0.05	<1	700
10/16/2001	7,397	3,850	11,510	1.78	1.01	8.03	<0.05	<1	800
10/23/2001	7,210	3,900	11,530	1.66	0.99	7.86	<0.05	<1	750
10/30/2001	7,362	3,850	11,520	1.77	0.99	7.94	<0.05	<1	750
11/06/2001	7,250	3,800	11,500	1.28	0.98	7.98	<0.05	<1	850
11/13/2001	7,234	3,750	11,510	1.46	0.75	8.00	<0.05	<1	750
11/20/2001	7,305	3,800	11,480	1.47	1.00	8.11	<0.05	<1	800
11/27/2001	7,370	3,850	11,540	1.36	0.99	8.10	<0.05	<1	850
12/04/2001	7,310	3,850	11,490	1.42	1.00	8.33	<0.05	<1	900
12/11/2001	7,473	3,650	11,450	1.53	1.01	7.98	<0.05	<1	850
12/18/2001	7,232	3,650	11,490	1.26	1.02	8.05	<0.05	<1	950
12/25/2001	7,177	3,800	11,560	1.42	0.89	8.05	<0.05	<1	850
01/01/2002	7,535	3,800	11,480	1.47	1.00	8.10	<0.05	<1	900
01/08/2002	7,300	3,700	11,480	1.39	1.02	8.12	<0.05	<1	1,000
01/15/2002	7,340	3,800	11,460	1.45	0.99	8.09	0.07	<1	900
01/22/2002	7,370	3,850	11,480	1.47	1.05	8.05	<0.05	<1	850
01/29/2002	7,330	3,800	11,530	1.43	1.00	8.04	<0.05	<1	750
02/05/2002	7,252	3,900	11,530	1.51	1.05	8.10	<0.05	<1	800
02/12/2002	7,360	3,900	11,490	1.44	1.00	8.07	<0.05	<1	950
02/19/2002	7,464	3,900	11,490	1.37	1.31	8.05	<0.05	<1	950
02/26/2002	7,479	3,850	11,490	LOST	0.98	8.03	<0.05	<1	900
03/05/2002	7,460	3,800	11,530	1.49	1.05	8.11	<0.05	<1	950
03/12/2002	7,410	3,850	11,490	1.52	1.05	8.10	<0.05	<1	900
03/19/2002	7,294	3,800	11,480	1.34	1.05	8.05	<0.05	<1	900
03/26/2002	7,330	3,850	11,520	1.50	1.00	8.02	<0.05	<1	800
04/02/2002	7,260	3,850	11,510	1.51	1.02	8.05	<0.05	<1	900
04/09/2002	7,294	3,850	11,520	1.47	1.04	8.04	<0.05	<1	900
04/16/2002	7,200	3,850	11,500	1.79	1.04	7.98	<0.05	<1	900
04/23/2002	7,314	3,900	11,540	1.78	1.02	8.02	<0.05	<1	850

City of Fort Lauderdale
MW-1 Upper Monitor Zone

Date	1,290-1,320 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
05/07/2002	7,246	3,800	11,520	1.31	1.02	8.01	<0.05	<1	900
05/14/2002	7,330	3,850	11,530	1.29	1.05	8.05	<0.05	<1	750
05/21/2002	7,430	3,850	11,490	1.50	1.02	8.00	<0.05	<1	800
05/28/2002	7,536	3,800	11,706	1.13	1.07	7.91	<0.05	<1	800

mg/L = milligrams per liter
umhos = micromhos

City of Fort Lauderdale
MW-1 Lower Monitor Zone

Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/01/1995	10,861	5,250	16,600	9.03	9.22	7.81	0.01	0	925
03/10/1995	10,112	5,550	16,600	8.94	9.52	7.67	0.50	0	900
03/17/1995	10,650	5,400	18,600	9.10	9.55	7.57	0.32	0	800
03/24/1995	10,636	5,800	16,500	9.46	9.43	7.55	0.29	0	700
03/31/1995	10,452	6,100	16,700	10.55	8.43	7.59	0.01	0	775
04/07/1995	10,345	5,500	16,500	10.50	9.31	7.54	0.01	0	725
04/11/1995	10,249	5,600	16,900	10.25	9.06	7.62	0.04	0	825
04/19/1995	10,407	5,200	12,300	8.98	8.38	7.53	0.01	0	925
04/25/1995	10,540	5,250	14,000	9.73	9.12	7.58	0.02	0	725
05/02/1995	10,370	5,400	15,000	8.73	9.07	7.39	0.01	0	825
05/09/1995	10,493	5,350	17,300	9.40	9.22	7.84	0.01	0	825
05/16/1995	10,335	5,400	16,700	9.18	9.54	7.24	0.01	0	800
05/23/1995	10,411	5,500	17,200	9.71	9.54	7.24	0.10	0	775
05/30/1995	10,410	5,200	17,200	9.09	9.85	7.32	0.01	0	900
06/05/1995	10,400	5,500	17,400	8.97	9.28	7.32	0.01	0	850
06/13/1995	10,451	5,450	17,200	9.01	9.52	7.24	0.07	0	800
06/20/1995	10,535	5,850	17,600	9.42	9.51	7.30	0.04	0	725
06/27/1995	10,540	5,650	17,100	8.69	9.45	7.22	0.01	0	950
07/04/1995	10,600	5,650	17,600	10.08	9.28	7.27	0.01	0	1,000
07/11/1995	10,754	5,700	17,600	9.50	9.16	7.25	0.01	0	800
07/18/1995	10,535	5,500	17,500	9.58	9.15	7.30	0.32	0	750
07/25/1995	10,317	5,600	17,700	9.52	8.95	7.26	0.01	0	900
07/31/1995	10,400	5,750	16,800	9.96	7.71	7.41	0.02	1	750
08/08/1995	10,400	5,750	17,500	10.00	8.79	7.22	0.04	0	825
08/15/1995	10,396	5,650	17,500	9.22	9.30	7.17	0.01	0	825
08/22/1995	10,538	5,500	17,600	10.28	9.43	7.25	0.01	0	925
08/29/1995	10,390	5,550	17,900	9.59	9.14	7.32	0.12	0	725
09/05/1995	10,477	5,650	18,000	10.28	9.14	7.34	0.01	0	800
09/12/1995	10,348	5,500	17,200	10.06	9.06	7.24	0.01	0	875
09/19/1995	10,388	5,550	17,400	8.91	8.52	7.26	0.01	0	800
09/26/1995	10,410	5,650	17,500	10.00	9.42	7.14	0.01	0	750
10/03/1995	10,298	5,800	17,500	9.59	8.97	7.18	0.01	0	850
10/10/1995	10,324	5,550	17,200	9.52	9.50	7.18	0.03	0	900
10/17/1995	10,235	5,500	17,000	9.30	9.44	7.28	0.01	0	875
10/24/1995	10,427	5,400	17,000	9.08	8.91	7.04	0.01	0	825
10/31/1995	10,413	5,500	16,900	8.94	8.91	7.30	0.01	0	700
11/07/1995	11,581	5,450	16,900	9.18	8.81	7.25	0.01	0	825
11/14/1995	10,160	5,250	16,800	9.60	8.93	7.18	0.02	0	900
11/21/1995	10,159	5,450	16,600	9.10	8.95	7.22	0.01	0	875
11/28/1995	10,125	5,150	16,800	9.10	8.90	7.28	0.01	0	850
12/05/1995	10,050	5,350	17,000	10.42	8.92	7.15	0.01	0	850
12/12/1995	10,263	5,000	17,200	10.07	8.66	7.23	0.01	0	875
12/19/1995	10,167	5,450	16,700	10.65	9.47	7.54	0.01	0	850
12/27/1995	10,157	5,400	16,400	9.50	9.35	7.29	0.01	0	875
01/02/1996	10,014	5,150	15,400	10.06	9.63	7.42	0.01	0	850

City of Fort Lauderdale
MW-1 Lower Monitor Zone

Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
01/09/1996	10,114	5,250	16,300	9.19	8.79	7.36	0.01	0	900
01/16/1996	10,302	5,550	16,600	12.39	10.23	7.21	0.02	0	700
01/23/1996	9,889	5,300	16,600	10.18	7.79	7.24	0.05	0	900
01/30/1996	10,350	5,100	16,800	11.62	8.09	7.13	0.01	0	900
02/06/1996	10,004	5,400	16,300	9.82	9.07	7.26	0.01	0	875
02/13/1996	9,986	5,300	16,300	8.72	8.48	7.31	0.01	0	900
02/20/1996	9,936	5,350	16,400	8.97	8.63	7.18	0.07	0	800
02/27/1996	10,030	5,650	16,400	9.16	8.82	7.22	0.01	0	700
03/05/1996	10,006	5,150	16,600	9.51	8.81	7.22	0.04	0	700
03/12/1996	9,994	5,300	16,100	8.58	7.46	7.22	0.01	0	650
03/19/1996	9,758	5,300	16,300	9.65	8.89	7.61	0.06	0	625
03/26/1996	9,821	5,350	16,400	9.32	8.55	7.27	0.03	0	700
04/02/1996	10,055	5,250	16,100	9.29	8.88	7.16	<0.01	0	800
04/09/1996	9,550	5,300	16,100	10.09	8.98	7.52	<0.01	0	875
04/16/1996	9,794	5,400	16,700	9.22	8.80	7.51	<0.01	0	825
04/23/1996	10132	5400	16500	9.45	8.24	7.48	<0.01	0	850
04/30/1996	10153	5400	16700	9.82	9.25	7.52	<0.01	0	825
05/07/1996	10,180	5,400	16,500	9.56	8.92	7.36	<0.01	0	925
05/14/1996	9,955	5,400	16,400	9.39	8.89	7.36	<0.01	0	825
06/04/1996	9,941	5,550	16,400	9.06	8.71	7.28	<0.01	0	775
06/11/1996	10,020	5,300	16,300	9.70	8.71	7.31	<0.01	0	850
06/19/1996	9,900	5,300	16,600	9.65	8.55	7.43	<0.01	0	900
06/25/1996	9,883	5,200	16,700	9.70	8.70	7.33	<0.01	0	850
07/02/1996	9,984	5,200	16,800	9.88	7.04	7.25	<0.01	0	950
07/09/1996	10,065	5,250	16,700	9.87	7.19	7.30	0.06	0	850
07/16/1996	10,059	5,400	16,700	9.27	8.83	7.36	<0.01	0	800
07/23/1996	10,000	5,300	16,700	10.16	8.70	7.42	<0.01	0	900
07/30/1996	10,130	5,300	16,400	9.51	8.94	7.28	<0.01	0	925
08/06/1996	9,808	5,250	16,500	9.16	8.60	7.57	0.03	0	1,000
08/15/1996	10,376	4,950	16,700	10.20	8.60	7.27	<0.01	0	825
08/20/1996	10,126	5,350	16,500	9.34	8.76	7.26	0.02	0	900
08/27/1996	9,973	5,350	16,400	9.23	8.57	7.25	<0.01	0	775
09/04/1996	10,019	5,300	16,600	10.03	8.99	7.28	<0.01	0	925
09/17/1996	10,050	5,200	16,700	9.85	8.85	7.21	0.04	0	875
10/08/1996	10,114	5,200	16,600	9.46	8.22	7.41	0.01	0	775
10/15/1996	10,000	5,300	16,600	9.83	8.57	7.42	<0.01	0	700
10/22/1996	10,030	5,300	16,800	9.65	8.40	7.25	<0.01	0	825
10/29/1996	10,160	5,300	16,800	9.79	8.95	7.29	<0.01	0	1,000
11/05/1996	10,060	5,250	16,800	9.22	8.55	7.32	<0.01	0	1,000
11/12/1996	10,091	5,350	16,500	9.01	8.74	7.55	0.05	0	800
11/18/1996	10,085	5,300	16,600	9.93	8.34	7.25	0.04	0	1,000
11/26/1996	10,174	5,350	16,600	9.84	5.86	7.37	<0.01	0	900
12/02/1996	10,081	5,400	16,800	9.63	8.35	7.48	<0.01	0	900
12/10/1996	10,213	5,500	17,100	9.04	8.16	7.30	<0.01	0	750
12/17/1996	9,975	5,300	16,800	9.88	8.77	7.52	<0.01	0	800

City of Fort Lauderdale MW-1 Lower Monitor Zone									
Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
12/24/1996	10,179	5,500	17,200	9.65	8.56	7.43	<0.01	0	1,050
12/31/1996	9,296	5,250	16,900	9.76	8.93	7.34	0.02	0	950
01/07/1997	10,236	5,400	16,700	9.19	8.94	7.25	<0.01	0	850
01/14/1997	10,050	5,300	17,000	8.59	8.69	7.44	0.03	0	900
01/21/1997	10,062	5,450	16,900	9.09	8.77	7.47	0.02	0	850
01/28/1997	10,197	5,450	17,200	9.47	8.89	7.65	<0.01	0	950
02/04/1997	10,260	5,300	17,000	9.61	8.50	7.24	0.04	0	1,000
02/11/1997	10,211	5,250	17,000	9.44	8.81	7.49	<0.01	0	950
02/18/1997	10,112	5,300	16,600	9.79	8.93	7.36	0.06	0	900
02/25/1997	10,044	5,350	17,000	9.94	8.59	7.37	0.03	0	950
03/04/1997	10,052	5,250	16,800	9.96	8.61	7.34	<0.01	0	1,100
03/11/1997	10,151	5,400	17,000	9.97	8.22	7.38	0.01	0	800
03/18/1997	10,126	5,350	17,000	9.69	8.50	7.27	<0.01	0	850
03/25/1997	10,179	5,400	16,800	9.52	8.50	7.45	0.01	0	800
04/01/1997	10,010	5,000	16,800	10.08	8.30	7.40	0.03	0	1,050
04/08/1997	10,050	4,450	16,800	9.27	8.15	7.29	0.01	0	900
05/06/1997	10,042	4,900	16,100	9.75	8.66	7.29	<0.01	0	1,000
05/13/1997	9,875	5,400	16,800	9.14	8.73	7.39	0.01	0	900
05/20/1997	9,938	5,650	16,800	9.41	8.76	7.24	0.02	0	1,000
05/27/1997	9,905	5,050	16,500	10.33	9.17	7.22	0.02	0	900
06/03/1997	10,282	5,600	17,100	9.73	8.48	7.55	0.06	0	950
06/10/1997	9,875	5,200	16,300	9.24	8.57	7.33	<0.01	0	950
06/18/1997	9,667	5,200	16,800	9.01	8.85	7.28	0.05	0	950
06/24/1997	9,767	5,250	16,400	9.15	8.79	7.37	0.03	0	850
07/01/1997	9,905	5,350	16,800	9.51	7.70	7.34	0.02	0	1,000
07/08/1997	9,581	4,800	16,000	10.03	8.62	7.30	0.02	0	900
07/15/1997	9,755	4,800	16,700	9.28	8.54	7.43	<0.01	0	800
07/22/1997	10,173	5,000	16,600	9.77	8.44	7.51	0.01	0	850
07/29/1997	9,825	4,300	16,400	8.90	8.13	7.29	0.01	0	850
08/05/1997	9,991	5,050	16,700	9.04	8.42	7.27	<0.01	0	800
08/12/1997	10,230	5,200	16,900	9.10	8.49	7.54	<0.01	0	900
08/18/1997	10,000	5,200	16,600	9.14	8.54	7.38	<0.01	0	650
08/26/1997	9,962	5,200	16,800	8.90	8.04	7.77	<0.01	0	800
09/03/1997	9,745	5,900	17,600	8.92	8.10	7.52	0.04	0	1,000
09/09/1997	9,980	5,600	16,600	8.70	7.95	7.31	<0.01	0	1,050
09/16/1997	9,086	5,400	16,900	8.99	8.60	7.42	0.02	0	950
09/23/1997	10,107	5,000	17,000	9.36	8.49	7.30	0.05	0	850
09/30/1997	10,100	5,400	17,360	8.80	8.37	7.42	<0.01	0	900
10/07/1997	10,084	5,200	17,040	9.34	8.48	7.36	<0.01	0	1,000
10/14/1997	10,114	5,100	17,040	8.80	8.65	7.25	0.03	0	1,050
10/22/1997	9,891	5,300	17,610	9.12	8.60	7.24	0.03	0	1,000
10/29/1997	9,930	5,300	16,700	8.94	8.36	7.34	<0.01	0	1,200
11/05/1997	9,825	5,200	16,640	9.21	8.49	7.40	<0.01	<1	950

City of Fort Lauderdale
MW-1 Lower Monitor Zone

Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
11/12/1997	10,020	5,500	17,030	8.94	8.37	7.30	<0.01	<1	950
11/18/1997	10,057	5,300	17,020	9.10	8.35	7.50	<0.01	0	1,000
11/25/1997	9,665	5,400	16,740	9.87	8.00	7.26	0.02	0	900
12/02/1997	9,850	5,100	16,810	9.70	8.99	7.40	<0.01	<1	850
12/09/1997	9,980	5,300	16,830	9.03	8.89	7.24	<0.01	<1	700
12/16/1997	9,904	5,000	16,910	9.07	8.88	7.44	<0.01	<1	950
12/23/1997	10,100	5,200	16,730	8.40	8.10	7.24	0.01	<1	850
12/30/1997	9,994	5,300	16,560	9.01	8.85	7.40	<0.01	<1	850
01/06/1998	10,170	5,300	17,260	9.95	8.69	7.43	0.03	<1	950
01/13/1998	10,140	5,300	17,330	9.67	8.58	7.40	<0.01	<1	850
01/20/1998	10,130	5,100	17,180	9.30	8.97	7.28	0.01	<1	950
01/27/1998	9,950	5,100	16,790	8.92	8.54	7.28	<0.01	<1	900
02/03/1998	9,970	5,300	16,790	#N/A	#N/A	7.36	<0.01	<1	900
02/10/1998	10,143	5,200	17,000	9.65	8.57	7.32	0.02	<1	950
02/17/1998	9,760	5,200	16,950	10.69	8.68	7.38	<0.01	<1	750
02/24/1998	9,509	5,300	16,630	10.22	8.41	7.37	0.02	<1	700
03/03/1998	9,648	5,100	16,610	10.14	8.58	7.27	<0.01	<1	700
03/10/1998	9,697	5,100	16,530	9.29	8.48	7.35	0.01	<1	850
03/17/1998	9,590	5,100	16,600	9.65	8.74	7.36	0.05	<1	1,000
03/24/1998	9,770	5,200	16,510	9.81	8.96	7.39	0.03	<1	950
03/31/1998	9,975	5,300	16,570	9.01	8.81	7.37	0.04	<1	900
04/07/1998	9,793	5,100	16,300	9.57	8.89	7.41	0.01	<1	600
04/14/1998	9,986	3,800	16,580	9.57	8.86	7.29	<0.01	<1	650
04/21/1998	9,989	5,000	16,600	9.36	8.77	7.47	<0.01	<1	800
04/28/1998	9,813	5,100	16,540	8.34	7.91	7.29	<0.01	<1	800
05/05/1998	10,030	5,300	16,690	9.45	8.61	7.33	<0.01	<1	850
05/12/1998	10,185	5,000	16,770	9.67	8.57	7.34	<0.01	<1	800
05/19/1998	9,967	5,100	16,810	9.76	8.79	7.42	0.04	<1	1,000
05/26/1998	10,262	4,900	16,840	8.77	7.90	7.29	<0.01	<1	1,000
06/02/1998	10,464	4,800	16,980	9.69	8.29	7.31	0.02	<1	950
06/09/1998	9,976	5,100	16,570	9.83	9.18	7.40	0.04	<1	900
06/16/1998	9,040	5,100	16,460	9.20	8.26	7.34	0.02	<1	950
06/23/1998	10,340	5,100	16,440	8.66	7.59	7.29	0.02	<1	650
06/30/1998	9,985	5,100	16,410	10.63	8.64	7.25	<0.01	<1	1,050
07/07/1998	9,820	5,300	16,630	10.18	8.54	7.39	0.02	<1	950
07/14/1998	10,200	5,300	16,920	9.19	8.10	7.28	<0.01	<1	1,000
07/21/1998	9,783	5,300	16,660	9.35	8.90	7.38	<0.01	<1	1,000
07/28/1998	9,840	5,000	16,670	9.14	8.69	7.43	<0.01	<1	1,050
08/04/1998	9,910	5,200	16,620	9.12	8.73	7.29	<0.01	<1	900
08/11/1998	9,870	5,300	16,900	8.76	8.03	7.43	<0.01	<1	1,200
08/18/1998	10,130	5,300	16,820	9.24	8.50	7.33	<0.05	<1	950
08/25/1998	9,964	5,300	16,700	9.29	8.78	7.48	<0.05	<1	950
09/01/1998	9,890	5,100	16,670	9.70	8.72	7.48	<0.05	<1	1,100
09/08/1998	9,910	5,200	16,580	8.90	8.41	7.39	<0.05	<1	1,100
09/15/1998	9,700	5,000	16,600	9.10	8.51	7.35	<0.05	<1	1,350

City of Fort Lauderdale
MW-1 Lower Monitor Zone

Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
09/22/1998	9,930	5,300	16,710	9.71	8.68	7.43	<0.05	<1	1,100
09/29/1998	9,920	5,200	16,490	9.45	8.75	7.41	<0.05	<1	1,000
10/06/1998	11,068	5,300	16,390	9.05	8.69	7.42	<0.05	<1	1,000
10/13/1998	9,801	5,200	16,270	9.27	8.90	7.58	<0.05	<1	1,000
10/20/1998	10,066	5,200	16,640	9.49	8.89	7.61	<0.05	<1	1,050
10/27/1998	10,041	5,400	16,220	9.40	8.64	7.48	<0.05	<1	950
11/03/1998	10,183	5,700	16,740	9.17	8.85	7.47	<0.05	<1	800
11/10/1998	10,277	5,500	16,390	9.98	9.07	7.45	<0.05	<1	850
11/17/1998	10,077	5,400	16,620	9.40	8.99	7.36	<0.05	<1	900
11/24/1998	10,172	5,400	16,580	10.17	8.50	7.39	<0.05	<1	1,000
12/01/1998	10,368	5,600	16,560	8.98	8.26	7.32	<0.05	<1	1,000
12/08/1998	10,050	5,500	16,390	9.50	8.76	7.28	<0.05	<1	1,000
12/15/1998	10,173	5,500	16,370	10.03	9.09	7.48	<0.05	<1	850
12/22/1998	10,233	5,500	16,320	9.91	8.95	7.33	<0.05	<1	850
12/28/1998	10,045	5,500	16,210	9.39	8.90	7.47	<0.05	<1	850
01/05/1999	10,183	5,300	16,490	10.47	8.56	7.27	<0.05	<1	1,100
01/12/1999	10,085	5,300	16,340	9.40	8.99	7.44	<0.05	<1	900
01/19/1999	10,182	5,300	16,180	9.77	8.37	6.94	<0.05	<1	900
01/26/1999	9,906	5,400	16,130	9.74	8.43	7.04	0.05	<1	850
02/02/1999	10,041	5,400	16,830	10.02	9.23	7.09	<0.05	<1	950
02/09/1999	10,098	5,400	16,400	10.15	9.00	7.15	<0.05	<1	950
02/16/1999	10,250	5,500	16,410	9.23	7.54	7.18	<0.05	<1	950
02/23/1999	10,040	5,300	16,560	9.09	8.01	7.26	<0.05	<1	1,050
03/02/1999	10,030	5,700	16,400	9.45	7.72	7.46	<0.05	<1	1,000
03/09/1999	10,043	5,700	16,430	9.48	8.86	7.36	<0.05	<1	950
03/16/1999	10,181	5,500	16,160	10.41	9.12	7.47	<0.05	<1	850
04/06/1999	10,022	5,700	16,390	9.48	8.94	7.45	0.05	<1	900
04/13/1999	9,981	5,500	16,430	9.77	9.04	7.50	0.06	<1	900
04/20/1999	9,980	5,600	16,320	10.24	9.22	7.52	0.08	<1	850
04/27/1999	10,484	5,300	17,030	9.09	8.50	7.61	<0.05	<1	1,050
05/04/1999	10,175	5,300	16,660	10.23	9.33	7.44	0.08	<1	1,150
05/11/1999	9,982	5,300	16,470	9.83	9.30		0.07	<1	900
05/18/1999	10,121	5,400	16,360	9.49	9.04	7.28	<0.05	<1	900
05/25/1999	10,456	5,600	16,380	9.30	8.97	7.56	0.08	<1	1,000
06/01/1999	10,002	5,500	16,480	9.70	9.01	7.60	<0.05	<1	850
06/08/1999	10,002	5,400	16,490	9.57	8.73	7.36	0.09	<1	900
06/15/1999	9,934	5,600	16,300	9.39	8.85	7.70	<0.05	<1	900
06/22/1999	10,140	5,500	16,470	10.10	8.91	7.48	<0.05	<1	750
06/29/1999	10,270	5,700	16,600	10.72	8.77	7.53	<0.05	<1	1,000
07/06/1999	10,172	5,500	16,590	10.73	8.79	7.30	0.08	<1	900
07/13/1999	10,010	5,300	16,600	10.38	9.63	7.48	<0.05	<1	800
08/03/1999	10,000	5,400	16,450	10.08	7.50	7.51	0.13	<1	850
08/10/1999	10,314	5,500	16,670	9.38	9.13	7.40	<0.05	<1	900
08/17/1999	10,140	5,500	16,500	9.34	9.14	7.33	<0.05	<1	800
08/24/1999	10,140	5,500	16,700	9.50	9.08	7.45	<0.05	<1	900

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City of Fort Lauderdale MW-1 Lower Monitor Zone									
Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
08/31/1999	10,226	5,500	16,630	9.38	9.33	7.35	<0.05	<1	900
09/07/1999	10,433	5,600	16,690	9.39	9.23	8.09	0.09	<1	850
09/15/1999	10,154	5,150	16,970	9.54	9.30	7.32	<0.05	<1	850
09/21/1999	10,169	5,200	17,110	9.95	9.22	7.41	<0.05	<1	850
09/28/1999	10,215	5,400	17,100	11.10	9.67	7.50	<0.05	<1	1,000
10/05/1999	10,420	5,500	17,300	9.99	9.44	7.46	<0.05	<1	850
10/12/1999	10,488	5,700	17,240	10.34	10.03	7.50	<0.05	<1	900
10/19/1999	10,250	5,600	16,740	10.56	9.19	7.38	0.07	<1	800
10/26/1999	10,490	5,600	16,780	9.21	9.14	7.41	0.12	<1	900
11/02/1999	10,260	5,600	17,070	9.29	9.18	7.44	0.07	<1	750
11/09/1999	10,160	5,400	16,900	9.39	9.23	7.38	<0.05	<1	700
11/16/1999	10,020	5,400	16,870	9.40	9.14	7.41	0.14	<1	850
11/23/1999	10,500	5,700	17,070	9.72	9.12	7.33	0.05	<1	850
11/30/1999	10,111	5,200	16,740	10.57	9.33	7.14	<0.05	<1	800
12/07/1999	9,935	5,700	16,750	9.75	9.24	7.34	<0.05	<1	900
12/14/1999	10,030	5,400	16,990	10.48	8.93	7.33	<0.05	<1	850
12/21/1999	10,070	5,500	16,750	9.76	9.15	7.39	0.16	<1	850
12/28/1999	10,070	5,600	16,940	10.43	9.30	7.32	<0.05	<1	850
01/04/2000	10,140	5,300	16,790	10.20	9.45	7.25	<0.05	<1	600
01/11/2000	9,610	5,400	16,600	10.23	9.51	7.31	0.14	<1	850
01/18/2000	10,542	5,440	16,800	9.35	9.05	7.40	0.17	<1	850
01/25/2000	9,880	5,600	16,640	10.05	9.23	7.23	<0.05	<1	750
02/01/2000	10,110	5,500	16,730	10.01	9.11	7.34	<0.05	<1	750
02/08/2000	9,840	5,400	16,600	9.02	8.82	7.42	<0.05	<1	850
02/15/2000	9,760	5,600	16,410	9.95	9.19	7.41	<0.05	<1	800
02/22/2000	9,650	5,400	16,530	10.04	9.13	7.30	<0.05	<1	700
02/29/2000	9,630	5,400	16,550	10.81	9.50	7.31	<0.05	<1	950
03/07/2000	9,660	5,500	16,440	9.77	9.10	7.23	<0.05	<1	750
03/14/2000	9,780	5,400	16,350	10.01	9.39	7.32	<0.05	<1	900
03/21/2000	9,651	5,400	16,350	9.08	8.68	7.37	<0.05	<1	750
03/28/2000	9,800	5,300	16,020	10.06	9.42	7.41	0.11	<1	800
04/04/2000	9,765	5,640	16,350	10.19	8.97	7.22	<0.05	<1	900
04/11/2000	10,000	5,520	16,570	9.63	8.79	7.63	0.05	<1	800
04/18/2000	9,763	5,470	16,350	11.09	9.10	7.46	<0.05	<1	800
05/02/2000	9,726	5,220	16,210	9.25	9.09	7.66	<0.05	<1	650
05/09/2000	9,691	4,990	16,200	10.65	9.18	7.64	0.19	<1	850
05/16/2000	9,604	4,220	16,190	10.57	8.98	7.35	0.06	<1	1,000
05/23/2000	9,372	3,695	16,000	11.21	9.23	7.38	<0.05	<1	700
05/30/2000	9,700	3,870	16,760	10.72	8.82	7.19	<0.05	<1	650
06/06/2000	9,791	6,190	16,110	10.33	8.97	7.51	<0.05	<1	700
06/13/2000	9,999	5,820	16,090	10.19	9.12	7.48	0.12	<1	650
06/20/2000	9,480	5,890	16,090	9.63	9.11	7.40	<0.05	<1	650
06/27/2000	9,438	6,480	16,120	9.74	9.27	7.82	<0.05	<1	550
07/05/2000	9,312	5,300	15,740	8.63	8.21	7.72	<0.05	<1	600
07/11/2000	9,509	6,120	16,140	9.43	8.41	7.58	<0.05	<1	700

City of Fort Lauderdale MW-1 Lower Monitor Zone									
Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
07/25/2000	10,433	5,990	16,060	9.51	9.06	7.56	<0.05	<1	650
08/01/2000	9,600	6,500	15,980	8.84	8.17	7.45	<0.05	<1	700
08/08/2000	9,610	7,280	16,060	9.78	9.47	7.74	<0.05	<1	650
08/15/2000	9,440	7,500	16,040	9.46	9.38	7.79	<0.05	<1	850
08/22/2000	9,490	5,560	16,090	9.19	8.51	7.49	<0.05	<1	650
08/29/2000	9,450	5,570	16,050	9.47	8.94	7.50	<0.05	<1	650
09/05/2000	9,520	5,510	16,240	9.27	9.17	7.61	<0.05	<1	650
09/12/2000	9,550	6,390	16,020	8.74	8.43	7.64	<0.05	<1	850
09/19/2000	10,476	6,710	16,980	9.02	8.76	7.47	<0.05	<1	950
09/26/2000	9,700	6,750	16,020	9.25	9.05	7.50	<0.05	<1	700
10/03/2000	9,662	6,390	16,040	9.08	8.51	7.57	<0.05	<1	700
10/10/2000	9,448	6,100	15,940	9.90	9.41	7.59	<0.05	<1	700
10/17/2000	9,580	5,130	16,020	9.38	8.94	7.45	0.08	<1	750
10/24/2000	9,320	6,000	15,820	8.92	8.57	7.40	<0.05	<1	900
10/31/2000	9,584	5,960	16,110	9.38	8.14	7.66	<0.05	<1	1,000
11/07/2000	9,570	5,880	16,050	8.80	7.17	7.65	<0.05	<1	700
11/14/2000	9,520	5,100	16,140	8.70	8.41	7.72	<0.05	<1	700
11/21/2000	9,969	5,560	16,060	7.88	7.73	7.46	<0.05	<1	650
11/28/2000	9,526	6,830	16,110	7.85	#N/A	7.73	<0.05	<1	750
12/5/2000	9,567	6,300	16,090	7.85	7.87	7.66	<0.05	<1	600
12/12/2000	9,487	6,420	16,110	8.61	8.48	7.65	0.06	<1	600
12/19/2000	10,720	6,130	15,660	9.21	8.89	7.36	0.15	<1	650
12/26/2000	10,233	6,310	12,770	10.22	8.99	7.57	<0.05	<1	650
01/02/2001	9,600	6,240	16,170	9.38	9.15	7.70	<0.05	<1	800
01/09/2001	9,490	6,790	16,210	9.37	9.05	7.78	<0.05	<1	800
01/16/2001	9,802	5,960	16,180	10.00	9.54	7.65	<0.05	<1	850
01/23/2001	9,408	6,110	16,200	10.05	9.49	7.57	<0.05	<1	650
01/30/2001	9,638	5,500	16,150	10.00	9.62	7.63	<0.05	<1	750
02/06/2001	9,820	7,320	16,120	9.89	9.47	7.64	<0.05	<1	800
02/13/2001	9,790	5,700	16,140	9.44	8.69	7.78	<0.05	<1	650
02/20/2001	9,449	5,930	16,070	9.12	8.66	7.59	<0.05	<1	900
02/27/2001	9,690	5,860	16,080	9.62	9.39	7.78	<0.05	<1	700
03/06/2001	9,650	5,760	14,920	10.07	9.85	7.66	<0.05	<1	750
03/13/2001	9,840	6,100	14,630	9.73	9.37	7.83	<0.05	<1	700
03/20/2001	9,660	6,250	14,730	9.50	9.31	7.90	<0.05	<1	850
03/27/2001	9,610	6,240	14,720	9.90	9.33	7.85	<0.05	<1	850
04/03/2001	9,820	6,180	14,710	10.15	9.33	7.91	<0.05	0	750
04/10/2001	9,700	6,280	14,700	9.30	9.21	7.77	<0.05	<1	700
04/17/2001	9,644	5,400	14,580	9.41	9.16	7.57	<0.05	<1	750
04/24/2001	9,425	5,500	14,670	9.20	9.20	7.78	<0.05	<1	800
05/01/2001	9,609	5,300	14,740	9.88	9.09	7.81	<0.05	<1	700
05/08/2001	9,600	5,300	14,670	9.66	9.48	7.37	<0.05	<1	850
05/15/2001	9,650	5,500	14,710	9.49		7.30	<0.05	<1	750
05/22/2001	9,470	5,400	14,660	9.61	9.46	7.46	<0.05	<1	800
05/29/2001	10,155	5,400	14,610		9.29	7.36	<0.05	<1	800

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City of Fort Lauderdale
MW-1 Lower Monitor Zone

Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/05/2001	9,610	5,300	14,730	9.73	9.47	7.36	<0.05	<1	750
06/12/2001	9,466	5,400	14,670	9.97	9.17	7.44	<0.05	<1	800
06/19/2001	9,880	5,500	14,750	9.66	9.26	7.36	<0.05	<1	850
06/26/2001	9,560	5,400	14,690	9.77	9.19	7.34	<0.05	<1	800
07/03/2001	9,267	5,400	14,620	9.66	9.53	7.34	0.06	<1	800
07/10/2001	9,500	5,300	14,830		9.37	7.45	<0.05	<1	750
07/17/2001	9,770	5,300	14,700	9.47	9.24	7.47	<0.05	<1	750
07/24/2001	9,570	5,400	14,740	9.92	8.96	7.58	<0.05	<1	800
07/31/2001	9,614	5,300	14,690	10.70	9.13	7.54	<0.05	<1	650
08/07/2001	9,600	5,300	14,800	10.43	9.59	7.55	<0.05	<1	750
08/14/2001	9,393	5,300	14,660	11.03	9.87	7.51	<0.05	<1	800
08/21/2001	9,580	5,300	14,700	9.83	9.35	7.55	<0.05	<1	750
08/28/2001	9,861	5,200	14,870	#N/A	9.62	7.48	<0.05	<1	700
09/04/2001	9,676	5,300	14,740	13.89	9.37	7.53	<0.05	<1	850
09/11/2001	9,330	5,300	14,790	9.96	9.65	7.48	<0.05	<1	700
09/18/2001	9,764	5,300	14,830	#N/A	9.95	7.53	<0.05	<1	500
09/25/2001	9,693	5,000	15,010	10.55	9.16	7.02	<0.05	<1	750
10/02/2001	9,660	5,300	15,350	10.29	9.31	7.62	<0.05	<1	700
10/09/2001	9,537	5,300	15,380	9.48	8.70	7.41	<0.05	<1	750
10/16/2001	9,576	5,200	15,190	9.36	9.18	7.45	<0.05	<1	700
10/23/2001	9,400	5,300	15,330	9.28	9.27	7.34	<0.05	<1	650
10/30/2001	9,810	5,200	15,300	9.43	9.28	7.39	<0.05	<1	750
11/06/2001	9,730	5,300	15,550	10.86	9.13	7.38	<0.05	<1	900
11/13/2001	9,620	5,300	15,390	10.41	8.61	7.41	<0.05	<1	700
11/20/2001	9,460	5,300	15,400	10.72	9.34	7.55	<0.05	<1	750
11/27/2001	9,850	5,400	15,540	10.56	9.64	7.57	<0.05	<1	800
12/04/2001	9,690	5,400	15,340	10.37	9.23	7.81	<0.05	<1	850
12/11/2001	9,908	5,800	15,150	10.21	9.30	7.38	<0.05	<1	800
12/18/2001	9,330	5,500	15,320	9.43	9.29	7.44	<0.05	<1	900
12/25/2001	9,525	5,300	15,340	10.17	9.31	7.50	<0.05	<1	850
01/01/2002	9,638	5,600	15,490	11.28	9.73	7.46	<0.05	<1	1,000
01/08/2002	9,740	5,300	15,350	10.80	9.51	7.51	<0.05	<1	1,000
01/15/2002	9,617	5,200	15,340	10.40	9.66	7.57	<0.05	<1	800
01/22/2002	9,490	5,300	15,170	10.26	9.79	7.49	<0.05	<1	850
01/29/2002	9,520	5,300	15,260	10.70	8.91	7.41	<0.05	<1	750
02/05/2002	9,430	5,400	15,290	9.32	9.00	7.48	<0.05	<1	800
02/12/2002	9,560	5,200	15,220	9.65	9.35	7.47	<0.05	<1	850
02/19/2002	9,490	5,300	15,210	9.76	9.35	7.45	<0.05	<1	900
02/26/2002	9,859	5,300	15,210	LOST	9.51	7.44	<0.05	<1	950
03/05/2002	9,694	5,300	15,190	11.38	10.12	7.54	<0.05	<1	1,000
03/12/2002	9,670	5,300	15,160	11.04	10.20	7.55	<0.05	<1	750
03/19/2002	9,490	5,300	15,180	11.69	9.48	7.45	<0.05	<1	800
03/26/2002	9,506	5,400	15,160	10.81	9.81	7.37	<0.05	<1	850
04/02/2002	9,430	5,400	15,050	9.70	9.16	7.50	<0.05	<1	800
04/09/2002	9,581	5,300	15,060	10.65	8.92	7.48	<0.05	<1	800

City of Fort Lauderdale
MW-1 Lower Monitor Zone

Date	1,449-1557 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
04/16/2002	9,420	5,400	15,260	11.07	10.18	7.35	<0.05	<1	850
04/23/2002	9,510	5,200	15,130	11.17	10.17	7.44	<0.05	<1	850
05/07/2002	9,660	5,300	15,270	9.79	9.49	7.38	<0.05	<1	850
05/14/2002	9,490	5,300	15,080	10.47	9.50	7.48	<0.05	<1	750
05/21/2002	9,580	5,200	15,200	11.53	9.32	7.38	<0.05	<1	750
05/28/2002	9,829	5,000	14,960	11.15	9.70	7.36	<0.05	<1	700

mg/L = milligrams per liter
umhos = micromhos

City of Fort Lauderdale
MW-2 Upper Monitor Zone

Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/01/1995	7,145	3,550	11,700	1.43	1.12	8.07	0.01	0	825
03/10/1995	6,944	3,850	11,700	1.35	1.23	7.92	0.37	0	900
03/17/1995	7,234	3,600	13,400		1.23	7.88	0.13	0	875
03/24/1995	7,295	3,900	11,700	1.19	1.08	7.90	0.20	0	950
03/31/1995	7,294	4,500	11,800	1.61	1.00	7.97	0.80	0	825
04/07/1995	7,296	3,300	11,700	1.41	1.23	7.94	0.01	0	825
04/11/1995	7,376	3,700	12,100	1.25	1.04	7.85	0.00	0	850
04/19/1995	7,424	3,400	10,000	1.31	1.01	7.92	0.01	0	850
04/25/1995	7,415	3,450	10,700	1.31	1.01	7.82	0.05	0	900
05/02/1995	7,242	3,550	11,100	1.27	1.20	7.75	0.01	0	1,125
05/09/1995	7,350	3,650	12,200	1.32	1.23	7.84	0.01	0	775
05/16/1995	7,350	3,600	11,600	1.25	1.29	7.71	0.01	0	800
05/23/1995	7,327	3,600	12,100	1.21	1.25	7.70	0.01	0	825
05/30/1995	7,300	3,600	12,200	1.16	1.24	7.80	0.01	0	775
06/05/1995	7,325	3,650	12,500	1.18	1.10	7.94	0.01	0	750
06/13/1995	7,151	3,450	12,100	1.26	1.33	7.80	0.04	0	850
06/20/1995	7,376	3,650	12,400	1.16	1.08	7.85	0.02	0	850
06/27/1995	7,480	3,650	12,100	1.20	1.14	7.75	0.01	0	750
07/04/1995	7,602	3,900	12,600	1.27	1.07	7.66	0.01	0	850
07/11/1995	7,280	3,750	12,200	1.29	1.09	7.78	0.01	0	725
07/18/1995	7,260	3,800	12,100	1.34	1.15	7.76	0.04	0	750
07/25/1995	7,344	3,800	12,500	1.24	1.00	7.76	0.01	0	800
07/31/1995	7,290	3,800	11,700	1.22	0.85	8.04	0.01	0	775
08/08/1995	7,350	3,700	12,400	1.24	1.07	7.77	0.01	0	700
08/15/1995	7,340	3,750	12,400	1.15	1.03	7.69	0.01	0	800
08/22/1995	7,368	3,700	12,400	1.34	1.02	7.80	0.01	0	700
08/29/1995	7,270	3,850	12,600	1.26	0.94	7.78	0.01	0	700
09/05/1995	7,395	3,750	12,500	1.32	0.92	7.74	0.01	0	750
09/12/1995	7,350	3,800	12,200	1.01	0.87	7.67	0.01	0	800
09/19/1995	7,322	3,750	12,100	1.03	0.80	7.71	0.01	0	775
09/26/1995	7,386	3,800	12,400	1.10	0.87	7.72	0.01	0	750
10/03/1995	7,304	4,000	12,400	1.27	1.01	7.72	0.01	0	825
10/10/1995	7,297	3,850	12,200	1.16	1.10	7.68	0.01	0	850
10/17/1995	7,287	3,750	12,000	1.26	1.02	7.81	0.01	0	725
10/24/1995	7,419	3,800	12,100	1.20	0.86	7.79	0.01	0	875
10/31/1995	7,693	3,700	12,000	1.31	0.81	7.80	0.01	0	825
11/07/1995	7,250	3,750	12,200	1.23	0.95	7.91	0.01	0	725
11/14/1995	7,255	3,650	12,000	1.30	0.81	7.77	0.02	0	800
11/21/1995	7,311	3,650	11,900	1.16	0.96	7.83	0.01	0	825
11/28/1995	7,297	3,550	12,200	1.32	1.02	7.68	0.01	0	850
12/05/1995	7,152	3,650	12,400	1.26	0.86	7.74	0.01	0	825
12/12/1995	7,340	3,750	12,500	1.01	0.72	7.82	0.01	0	850
12/19/1995	7,213	3,800	11,900	1.13	0.96	7.93	0.01	0	850
12/27/1995	7,242	3,750	11,800	0.96	0.90	7.96	0.01	0	825
01/02/1996	7,562	3,800	11,500	1.04	0.95	7.88	0.01	0	950

City of Fort Lauderdale
MW-2 Upper Monitor Zone

Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
01/09/1996	7,218	3,800	11,800	1.12	0.95	8.02	0.01	0	650
01/16/1996	7,390	3,300	12,000	1.20	1.16	7.81	0.01	0	750
01/23/1996	7,190	3,750	12,000	0.94	0.79	7.81	0.05	0	825
01/30/1996	7,480	3,700	12,300	1.21	1.04	7.83	0.01	0	1,000
02/06/1996	6,270	3,650	11,700	1.25	0.99	7.92	0.01	0	700
02/13/1996	5,879	3,700	11,900	1.33	0.97	7.88	0.01	0	650
02/20/1996	7,270	3,700	12,000	1.36	0.84	7.86	0.05	0	675
02/27/1996	7,260	3,750	12,000	1.30	0.98	7.87	0.01	0	700
03/05/1996	7,239	3,650	12,100	1.33	0.99	7.88	0.05	0	750
03/12/1996	7,280	3,650	11,800	1.23	1.02	7.81	0.01	0	675
03/19/1996	7,119	3,750	12,100	1.25	1.08	8.17	0.02	0	675
03/26/1996	7,213	3,800	12,000	1.14	0.97	7.90	0.01	0	800
04/02/1996	7,267	3,750	11,800	1.32	1.03	7.88	0.06	0	800
04/09/1996	6,006	3,700	11,900	1.21	1.09	7.91	<0.01	0	850
04/16/1996	7,186	3,800	12,500	1.09	1.00	7.91	<0.01	0	875
04/23/1996	7,580	3,750	12,000	1.08	0.97	7.61	<0.01	0	825
04/30/1996	7,408	3,750	12,100	1.37	1.15	8.07	<0.01	0	775
05/07/1996	7,352	3,900	12,000	1.24	1.01	7.96	0.02	0	800
05/14/1996	7,100	3,650	12,000	1.30	0.94	7.94	<0.01	0	850
06/04/1996	7,274	4,150	12,000	1.22	1.07	8.16	<0.01	0	825
06/11/1996	7,304	3,600	11,900	1.19	1.00	8.11	0.01	0	625
06/19/1996	7,171	3,750	12,000	1.31	0.98	8.00	<0.01	0	850
06/25/1996	7,200	3,750	12,200	1.27	1.05	7.88	<0.01	0	750
07/02/1996	7,243	3,600	12,000	1.16	0.81	7.94	<0.01	0	800
07/09/1996	7,348	3,650	12,100	1.33	0.78	7.97	0.02	0	800
07/16/1996	7,200	3,800	12,000	1.21	0.83	7.89	<0.01	0	800
07/23/1996	7,212	3,650	12,200	1.42	0.94	8.11	<0.01	0	800
07/30/1996	7,410	3,650	11,900	1.50	1.01	7.94	<0.01	0	800
08/06/1996	7,182	3,650	12,000	1.37	0.67	8.11	<0.01	0	950
08/15/1996	7,452	3,350	11,900	1.44	1.05	7.90	<0.01	0	750
08/20/1996	8,347	3,650	12,000	1.29	0.99	7.92	<0.01	0	800
08/27/1996	7,291	3,650	11,900	1.24	1.02	7.96	<.01	0	800
09/04/1996	7,107	3,650	12,000	1.54	0.99	7.95	0.04	0	825
09/17/1996	7,300	3,650	12,000	1.30	0.85	7.97	0.02	0	825
10/08/1996	7,422	3,700	12,400	1.17	1.00	8.03	0.02	0	725
10/15/1996	7,210	3,650	11,800	1.11	0.97	7.98	<0.01	0	725
10/22/1996	7,250	3,700	12,000	1.41	1.04	7.87	<0.01	0	900
10/29/1996	7,214	3,650	11,900	1.37	1.01	7.94	<0.01	0	950
11/05/1996	7,170	3,600	12,100	1.25	0.99	7.87	<0.01	0	900
11/12/1996	7,286	3,650	11,800	1.15	0.79	7.99	0.01	0	800
11/18/1996	7,269	3,600	11,700	1.29	0.98	7.93	0.03	0	1,000
11/26/1996	7,231	3,700	11,800	1.48	0.97	8.02	<0.01	0	950
12/02/1996	7,249	3,700	11,900	1.29	0.97	7.97	<0.01	0	900
12/10/1996	7,303	3,600	12,100	1.24	0.92	7.95	<0.01	0	900
12/17/1996	7,078	3,600	12,500	1.13	0.94	8.21	<0.01	0	900

City of Fort Lauderdale MW-2 Upper Monitor Zone									
Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
12/24/1996	7,197	3,650	12,000	1.09	0.96	8.01	<0.01	0	1,000
12/31/1996	7,255	3,650	12,000	1.16	0.98	8.10	<0.01	0	950
01/07/1997	7,223	3,700	12,000	1.14	0.96	8.01	<0.01	0	950
01/14/1997	7,260	3,750	12,200	1.32	0.71	7.98	<0.01	0	950
01/21/1997	7,170	3,600	12,100	1.34	0.73	8.15	<0.01	0	900
01/28/1997	7,212	3,650	12,300	1.25	0.96	8.08	<0.01	0	850
02/04/1997	7,150	3,650	11,800	1.13	0.92	7.56	0.01	0	950
02/11/1997	7,075	3,600	12,000	1.38	0.85	7.84	<0.01	0	850
02/18/1997	7,010	3,550	11,800	1.16	0.81	7.96	<0.01	0	950
02/25/1997	6,935	3,650	11,900	1.47	0.52	8.58	<0.01	0	850
03/04/1997	6,902	3,650	11,800	1.11	0.84	8.65	<0.01	0	1,000
03/11/1997	6,984	3,650	11,800	1.11	0.85	8.66	<0.01	0	700
03/18/1997	6,931	3,750	11,900	1.01	0.76	8.76	<0.01	0	800
03/25/1997	6,982	3,650	11,700	1.20	0.75	9.02	<0.01	0	850
04/01/1997	7,258	3,550	11,900	1.12	0.96	8.10	0.02	0	950
04/08/1997	7,196	3,600	12,100	1.15	0.99	7.99	<0.01	0	950
05/06/1997	7,234	3,650	11,900	1.22	1.01	7.91	<0.01	0	900
05/13/1997	7,039	3,550	12,200	1.18	1.00	7.95	0.01	0	900
05/20/1997	7,060	3,800	12,000	1.15	1.00	8.00	0.01	0	900
05/27/1997	7,149	3,450	12,100	1.20	0.99	8.03	<0.01	0	950
06/03/1997	7,170	3,700	12,100	1.15	0.97	8.13	<0.01	0	950
06/10/1997	7,007	3,850	12,800	1.16	1.03	7.98	<0.01	0	950
06/18/1997	7,058	3,650	12,000	1.29	1.00	7.96	<0.01	0	950
06/24/1997	6,956	3,750	11,900	1.15	1.02	8.00	<0.01	0	850
07/01/1997	7,110	3,650	11,900	1.21	1.00	8.26	<0.01	0	900
07/08/1997	7,043	3,600	11,900	1.47	0.96	8.00	<0.01	0	900
07/15/1997	7,028	3,400	11,700	1.25	0.99	8.15	<0.01	0	900
07/22/1997	7,163	2,300	11,800	1.12	0.99	8.21	<0.01	0	950
07/29/1997	7,209	3,200	11,800	1.14	0.98	8.04	0.01	0	900
08/05/1997	7,387	3,450	12,000	1.13	0.98	8.04	0.01	0	900
08/12/1997	7,244	3,700	12,100	1.13	0.94	8.25	0.01	0	600
08/18/1997	7,270	3,650	12,000	1.18	0.95	8.10	<0.01	0	650
08/26/1997	7,281	3,700	12,100	1.09	0.92	8.22	<0.01	0	700
09/03/1997	7,252	3,750	11,800	1.10	0.90	8.07	<0.01	0	950
09/09/1997	7,291	3,550	12,100	1.06	1.01	8.01	<0.01	0	1,000
09/16/1997	8,227	3,700	12,400	1.08	0.95	8.07	<0.01	0	900
09/23/1997	7,230	3,500	12,070	1.10	0.97	8.04	<0.01	0	950
09/30/1997	7,220	3,600	12,050	1.05	0.93	8.08	<0.01	0	950
10/07/1997	7,271	3,600	12,120	1.02	0.93	8.02	<0.01	0	900
10/14/1997	7,245	3,650	12,090	1.04	0.99	7.95	0.06	0	950
10/22/1997	7,136	3,600	12,810	1.14	0.97	7.92	<0.01	0	1,000
10/29/1997	7,254	3,550	11,930	1.11	0.96	7.91	<0.01	0	1,200
11/05/1997	7,168	3,550	11,920	1.06	0.94	7.97	<0.01	<1	950
11/12/1997	7,201	3,650	12,010	1.21	0.97	7.92	<0.01	<1	950
11/18/1997	7,142	3,650	11,920	1.08	0.98	8.08	<0.01	0	950

City of Fort Lauderdale MW-2 Upper Monitor Zone									
Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
11/25/1997	7,000	3,550	11,870	1.15	0.95	7.90	<0.01	0	1,000
12/02/1997	7,236	3,600	11,970	1.15	0.94	8.08	<0.01	<1	1,000
12/09/1997	7,411	3,700	12,250	1.12	0.96	7.81	<0.01	<1	800
12/16/1997	7,042	3,550	11,920	1.23	1.02	7.99	<0.01	<1	900
12/23/1997	7,250	3,600	11,840	1.03	0.91	8.02	<0.01	<1	900
12/30/1997	7,314	3,450	11,980	1.18	1.05	7.98	<0.01	<1	850
01/06/1998	7,220	3,600	12,020	1.27	1.00	8.01	<0.01	<1	950
01/13/1998	7,215	3,600	12,010	1.23	1.02	8.11	<0.01	<1	800
01/20/1998	7,100	3,550	12,010	1.39	0.98	8.02	<0.01	<1	850
01/27/1998	7,206	3,650	12,020	1.04	0.99	8.01	<0.01	<1	850
02/03/1998	7,258	3,600	12,120	1.13	0.99	8.12	<0.01	<1	850
02/10/1998	7,156	3,600	12,000	1.37	0.73	8.08	<0.01	<1	850
02/17/1998	7,154	3,600	12,000	1.26	0.91	8.09	<0.01	<1	800
02/24/1998	7,183	3,650	12,050	1.08	0.94	8.08	<0.01	<1	850
03/03/1998	7,147	3,500	11,970	1.13	0.84	7.98	<0.01	<1	700
03/10/1998	7,184	3,450	11,950	1.10	0.87	8.10	<0.01	<1	900
03/17/1998	7,130	3,600	11,970	1.29	0.75	8.03	<0.01	<1	950
03/24/1998	7,179	3,450	11,940	1.17	0.83	8.06	<0.01	<1	1,000
03/31/1998	7,205	4,000	11,950	1.17	0.89	8.04	0.01	<1	900
04/07/1998	7,250	3,650	11,740	1.20	0.97	8.11	<0.01	<1	650
04/14/1998	7,279	3,100	11,790	1.18	1.02	8.02	0.02	<1	700
04/21/1998	7,556	3,300	12,200	1.07	0.89	7.95	<0.01	<1	700
04/28/1998	7,445	3,600	11,900	1.04	0.93	8.03	<0.01	<1	700
05/05/1998	7,385	3,400	11,880	1.08	1.06	8.11	<0.01	<1	750
05/12/1998	7,315	3,600	11,890	1.12	0.86	8.11	<0.01	<1	950
05/19/1998	7,258	3,350	11,900	1.13	0.98	8.10	0.01	<1	900
05/26/1998	7,358	3,450	11,930	1.08	0.87	8.05	<0.01	<1	1,000
06/02/1998	7,461	3,500	11,880	1.19	0.95	8.10	<0.01	<1	950
06/09/1998	7,218	3,600	11,900	1.47	1.02	8.06	0.02	<1	950
06/16/1998	7,276	3,700	11,920	1.22	0.95	8.00	<0.01	<1	950
06/23/1998	7,659	3,500	12,000	1.18	0.82	8.02	<0.01	<1	500
06/30/1998	7,233	3,500	11,890	1.17	0.88	7.93	<0.01	<1	1,000
07/07/1998	7,280	3,700	11,970	1.19	0.53	7.97	<0.01	<1	950
07/14/1998	7,340	3,600	12,020	1.27	0.56	7.99	<0.01	<1	950
07/21/1998	6,921	3,550	11,940	1.25	0.77	8.15	<0.01	<1	950
07/28/1998	7,234	3,550	12,010	1.09	0.99	8.04	<0.01	<1	1,100
08/04/1998	7,200	3,550	12,010	1.29	0.88	8.02	<0.01	<1	950
08/11/1998	7,162	3,500	11,950	1.18	0.66	8.08	<0.01	<1	1,050
08/18/1998	7,250	3,750	11,950	1.16	0.95	8.05	<0.05	<1	1,050
08/25/1998	7,798	3,550	11,950	1.31	0.78	8.09	<0.05	<1	950
09/01/1998	7,190	3,500	12,000	1.28	0.98	8.10	<0.05	<1	1,150
09/08/1998	7,248	3,700	12,000	1.16	0.91	7.39	<0.05	<1	1,100
09/15/1998	7,310	3,550	12,000	1.12	1.01	8.01	<0.05	<1	1,200
09/22/1998	7,250	3,600	11,990	1.20	0.85	8.01	<0.05	<1	950
09/29/1998	7,169	3,550	11,730	1.27	0.88	8.03	<0.05	<1	1,150

City of Fort Lauderdale
MW-2 Upper Monitor Zone

Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
10/06/1998	7,285	3,600	11,680	1.19	0.99	8.02	<0.05	<1	1,000
10/13/1998	7,180	3,600	11,680	1.15	0.84	8.10	<0.05	<1	900
10/20/1998	7,182	3,550	11,650	1.11	0.98	8.19	<0.05	<1	950
10/27/1998	7,295	3,600	11,710	1.25	0.99	8.10	<0.05	<1	1,000
11/03/1998	7,120	3,750	11,620	1.17	0.50	8.01	<0.05	<1	900
11/10/1998	7,491	3,700	11,690	1.19	0.78	8.17	<0.05	<1	850
11/17/1998	7,226	3,650	11,670	1.06	0.70	8.08	<0.05	<1	950
11/24/1998	7,187	3,750	11,690	1.12	0.69	8.05	<0.05	<1	1,050
12/01/1998	7,303	3,650	11,470	1.16	0.97	8.04	<0.05	<1	1,050
12/08/1998	7,176	3,650	11,520	1.17	0.98	8.01	<0.05	<1	1,000
12/15/1998	7,223	3,700	11,570	1.12	0.98	8.20	<0.05	<1	950
12/22/1998	7,281	3,750	11,490	1.26	0.50	8.09	<0.05	<1	800
12/29/1998	7,207	3,750	11,560	1.47	0.99	8.07	<0.05	<1	950
01/05/1999	7,325	3,650	11,560	1.13	0.97	8.05	<0.05	<1	1,100
01/12/1999	7,250	3,750	11,560	1.23	0.96	8.10	<0.05	<1	800
01/19/1999	7,296	3,700	11,570	1.05	0.46	7.87	<0.05	<1	900
01/26/1999	7,142	3,750	11,500	1.24	0.62	8.03	<0.05	<1	850
02/02/1999	7,290	3,800	12,150	1.29	1.03	7.96	<0.05	<1	900
02/09/1999	7,283	3,750	11,610	1.20	1.02	7.87	<0.05	<1	1,100
02/16/1999	7,444	3,700	11,590	1.33	1.02	8.32	<0.05	<1	950
02/23/1999	7,160	3,700	11,530	1.63	1.07	7.88	<0.05	<1	1,000
03/02/1999	7,320	3,750	11,600	1.30	0.98	8.13	<0.05	<1	950
03/09/1999	7,246	3,850	11,570	1.20	1.01	8.05	<0.05	<1	1,200
03/16/1999	7,335	3,750	11,520	1.30	1.01	8.07	<0.05	<1	1,000
04/06/1999	7,242	3,800	11,580	1.16	0.96	8.04	<0.05	<1	1,000
04/13/1999	7,196	3,850	11,610	1.22	0.90	8.13	<0.05	<1	1,050
04/20/1999	7,196	3,800	11,580	1.20	1.01	8.09	<0.05	<1	750
04/27/1999	7,226	3,500	11,640	1.07	1.00	8.15	<0.05	<1	925
05/04/1999	7,303	3,750	11,640	1.20	1.03	8.21	<0.05	<1	1,100
05/11/1999	7,272	3,800	11,620	1.34	1.02	8.07	<0.05	<1	1,000
05/18/1999	7,346	3,750	11,640	1.52	0.98	7.97	<0.05	<1	950
05/25/1999	7,545	3,800	11,670	1.34	1.02	8.11	<0.05	<1	1,000
06/01/1999	7,372	3,850	11,600	1.27	1.00	8.25	<0.05	<1	850
06/08/1999	7,191	3,750	11,580	1.29	0.99	8.16	0.06	<1	950
06/15/1999	7,209	3,800	11,560	1.37	0.96	8.26	<0.05	<1	800
06/22/1999	7,400	3,800	11,660	1.27	0.96	8.10	<0.05	<1	800
06/29/1999	7,350	3,800	11,670	1.18	0.98	8.19	<0.05	<1	850
07/06/1999	7,200	3,650	11,700	1.14	1.00	8.07	<0.05	<1	850
07/13/1999	7,230	3,800	11,720	1.27	0.98	8.08	<0.05	<1	750
08/03/1999	7,290	3,800	11,590	1.28	1.03	8.17	0.06	<1	950
08/10/1999	7,312	3,800	11,640	1.70	0.98	8.15	<0.05	<1	800
08/17/1999	7,300	3,800	11,660	1.16	1.00	8.01	<0.05	<1	850
08/24/1999	7,210	3,850	11,660	1.21	0.98	8.14	<0.05	<1	950
08/31/1999	7,208	3,800	11,700	1.46	0.96	8.00	<0.05	<1	850
09/07/1999	7,395	3,800	11,720	1.26	0.97	8.16	<0.05	<1	900

City of Fort Lauderdale MW-2 Upper Monitor Zone									
Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
09/15/1999	7,275	3,900	12,060	1.00	0.98	8.00	<0.05	<1	800
09/21/1999	7,195	3,500	12,060	1.10	0.99	8.01	<0.05	<1	900
09/28/1999	7,395	3,800	12,020	1.05	1.00	7.98	<0.05	<1	900
10/05/1999	7,305	3,750	12,020	1.08	0.99	8.17	<0.05	<1	850
10/12/1999	7,300	3,800	12,050	1.12	0.99	8.20	<0.05	<1	900
10/19/1999	7,290	3,850	11,840	1.14	1.01	8.03	<0.05	<1	750
10/26/1999	7,450	3,750	11,910	1.04	0.98	8.00	<0.05	<1	750
11/02/1999	7,390	3,750	11,870	1.09	1.00	8.09	<0.05	<1	900
11/09/1999	7,200	3,700	11,890	1.15	1.00	8.08	<0.05	<1	800
11/16/1999	7,324	3,800	11,860	1.08	0.98	8.15	0.15	<1	850
11/12/1999	7,338	3,800	11,890	1.04	1.01	8.02	0.08	<1	800
11/30/1999	7,143	3,400	11,890	1.24	0.99	7.90	<0.05	<1	800
12/07/1999	7,233	3,800	11,880	1.06	1.00	7.99	<0.05	<1	850
12/14/1999	7,015	3,700	11,860	1.17	1.00	7.96	<0.05	<1	850
12/21/1999	7,180	3,850	11,860	1.24	0.98	8.05	0.18	<1	800
12/28/1999	7,134	3,750	11,870	1.20	1.01	8.05	<0.05	<1	850
01/04/2000	7,109	3,650	11,890	1.29	1.00	8.00	<0.05	<1	700
01/11/2000	7,227	3,650	11,890	1.37	1.00	7.98	0.16	<1	750
01/18/2000	7,257	3,800	49,400	1.22	0.94	7.98	0.13	<1	900
01/25/2000	7,005	3,800	11,930	1.41	0.98	7.97	0.15	<1	850
02/01/2000	7,220	3,800	11,900	1.32	1.00	8.08	<0.05	<1	850
02/08/2000	7,233	3,800	11,880	1.32	1.01	8.00	<0.05	<1	800
02/15/2000	7,060	3,250	11,930	1.28	1.00	8.02	<0.05	<1	750
02/22/2000	7,050	3,800	11,900	1.37	0.98	7.98	<0.05	<1	750
02/29/2000	7,020	3,800	11,860	1.37	0.97	7.93	<0.05	<1	950
03/07/2000	7,110	3,800	11,900	1.32	1.00	8.03	<0.05	<1	800
03/14/2000	7,150	3,900	11,900	1.38	1.00	7.93	<0.05	<1	900
03/21/2000	7,226	3,850	11,900	1.34	0.95	7.94	<0.05	<1	850
03/28/2000	7,140	3,800	11,980	1.41	0.94	8.01	0.14	<1	850
04/04/2000	6,965	4,090	11,900	1.44	0.95	7.95	<0.05	<1	900
04/11/2000	7,067	3,900	11,770	1.42	0.99	8.16	0.06	<1	750
04/18/2000	7,137	3,900	11,870	1.40	0.92	7.90	<0.05	<1	750
05/02/2000	7,220	3,270	11,920	1.51	0.97	8.09	<0.05	<1	650
05/09/2000	7,188	3,500	12,030	1.34	0.72	8.07	0.17	<1	750
05/16/2000	7,124	3,165	11,900	1.31	0.97	8.03	<0.05	<1	1,200
05/23/2000	7,158	3,710	11,980	1.34	0.99	7.88	0.06	<1	750
05/30/2000	7,100	4,200	12,120	1.13	0.86	8.02	<0.05	0	700
06/06/2000	7,478	3,930	11,890	1.26	0.95	8.05	<0.05	<1	650
06/13/2000	7,575	3,785	11,910	1.27	0.93	8.07	<0.05	<1	750
06/20/2000	7,151	3,685	11,870	1.21	0.97	8.12	<0.05	<1	650
06/27/2000	7,402	3,985	11,950	1.19	0.94	8.36	<0.05	<1	500
07/05/2000	7,206	3,935	11,790	1.32	0.93	8.18	<0.05	<1	650
07/11/2000	7,224	3,735	11,920	1.17	0.94	8.18	<0.05	<1	700
07/25/2000	7,199	3,995	11,920	1.23	0.97	8.19	<0.05	<1	750
08/01/2000	7,293	4,040	11,880	0.92	0.92	8.04	<0.05	<1	750

City of Fort Lauderdale
MW-2 Upper Monitor Zone

Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
08/08/2000	7,220	3,725	11,900	1.01	0.94	8.18	<0.05	<1	700
08/15/2000	7,070	3,880	11,890	1.17	1.04	8.25	<0.05	<1	750
08/22/2000	7,200	3,765	11,890	1.29	1.05	8.14	<0.05	<1	800
08/29/2000	7,220	3,710	11,900	1.17	1.01	8.16	<0.05	<1	600
09/05/2000	7,160	3,975	12,000	1.19	1.01	8.14	<0.05	<1	850
09/12/2000	7,210	4,230	11,890	1.22	0.98	8.20	<0.05	<1	1,000
09/19/2000	7,393	4,005	11,890	1.25	0.99	8.09	<0.05	<1	950
09/26/2000	7,380	4,200	11,880	1.20	0.94	8.13	<0.05	<1	800
10/03/2000	7,301	4,000	11,910	1.20	0.94	8.22	<0.05	<1	850
10/10/2000	7,159	4,120	11,900	1.23	1.00	8.12	<0.05	<1	900
10/17/2000	7,140	3,400	11,820	1.27	0.97	8.00	<0.05	<1	850
10/24/2000	7,030	4,110	11,710	1.22	0.96	8.02	<0.05	<1	900
10/31/2000	8,237	4,005	11,920	1.18	0.53	8.25	<0.05	<1	850
11/07/2000	7,240	4,045	11,890	1.08	0.95	8.20	<0.05	<1	800
11/14/2000	7,220	3,585	11,920	1.20	0.97	8.25	<0.05	<1	750
11/21/2000	7,420	3,440	11,970	1.19	0.94	8.11	<0.05	<1	700
11/28/2000	7,312	4,250	11,890	1.35	0.93	8.32	<0.05	<1	850
12/05/2000	7,144	4,065	11,930	1.29	0.95	8.15	<0.05	<1	800
12/12/2000	7,309	4,145	12,010	1.26	0.95	8.14	0.65	<1	650
12/19/2000	7,740	4,090	11,770	1.28	0.75	7.98	<0.05	<1	650
12/26/2000	7,670	4,065	11,140	1.10	0.75	8.17	<0.05	<1	700
01/02/2001	7,200	4,155	1,190	1.39	0.96	8.28	<0.05	<1	800
01/09/2001	7,132	4,640	11,930	1.15	0.95	8.33	<0.05	<1	850
01/16/2001	7,395	4,025	11,920	1.10	0.94	8.24	<0.05	<1	850
01/23/2001	7,168	4,040	11,940	1.46	1.00	8.18	<0.05	<1	700
01/31/2001	7,265	4,400	11,880	1.30	0.97	8.25	<0.05	<1	850
02/06/2001	7,420	3,040	11,910	1.17	0.98	8.21	<0.05	<1	800
02/13/2001	7,270	3,370	11,850	1.25	1.02	8.40	<0.05	<1	750
02/20/2001	7,200	3,410	11,950	1.15	0.95	8.18	<0.05	<1	800
02/27/2001	7,260	3,425	11,990	1.29	0.94	8.32	<0.05	<1	750
03/06/2001	7,262	3,390	11,040	1.37	1.00	8.30	<0.05	<1	750
03/13/2001	7,390	3,250	10,870	1.23	0.99	8.45	<0.05	<1	850
03/20/2001	7,240	3,325	10,930	1.31	0.77	8.23	<0.05	<1	850
03/27/2001	7,317	3,350	10,900	1.27	0.96	8.46	<0.05	<1	850
04/03/2001	7,470	3,310	10,920	1.29	0.98	8.48	<0.05	0	850
04/10/2001	7,280	3,340	10,930	1.31	0.94	8.34	<0.05	<1	850
04/17/2001	7,194	3,700	10,790	1.23	0.96	8.18	<0.05	<1	900
04/24/2001	7,270	3,750	10,890	1.17	0.70	8.32	<0.05	<1	800
05/01/2001	7,137	3,700	10,910	1.29	0.77	8.42	<0.05	<1	750
05/08/2001	7,350	3,700	10,920	1.35	0.98	7.97	<0.05	<1	750
05/15/2001	7,190	3,850	10,890	1.16	0.97	7.96	<0.05	<1	700
05/22/2001	7,130	3,800	10,850	1.33	0.94	8.05	<0.05	<1	800
05/29/2001	7,507	3,800	10,860	1.38	0.61	8.05	<0.05	<1	800
06/05/2001	7,070	3,650	10,900	1.22	0.92	8.03	<0.05	<1	850
06/12/2001	7,220	3,650	10,870	1.43	1.00	8.07	<0.05	<1	800

City of Fort Lauderdale MW-2 Upper Monitor Zone									
Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/19/2001	7,266	3,650	10,890	1.41	0.87	8.07	<0.05	<1	900
06/26/2001	7,250	3,700	10,850	1.37	1.00	8.09	<0.05	<1	850
07/03/2001	7,081	3,700	10,900	1.45	0.98	8.07	<0.05	<1	900
07/10/2001	7,150	3,850	10,970	1.42	0.92	8.13	<0.05	<1	700
07/17/2001	7,350	3,800	10,860	1.52	1.00	8.11	<0.05	<1	850
07/24/2001	7,190	3,850	10,870	1.37	0.89	8.15	<0.05	<1	800
07/31/2001	7,200	3,800	10,890	1.55	0.99	8.12	<0.05	<1	700
08/07/2001	7,130	3,750	10,900	1.37	0.94	8.01	<0.05	<1	800
08/14/2001	7,647	3,750	11,310	1.54	1.00	8.06	<0.05	<1	750
08/21/2001	7,140	3,800	10,860	1.55	0.98	8.15	<0.05	<1	750
08/28/2001	7,356	3,750	10,900	1.43	1.00	8.15	<0.05	<1	750
09/04/2001	7,188	3,800	10,870	1.41	0.92	8.06	<0.05	<1	750
09/11/2001	7,028	3,750	10,950	1.32	1.01	8.13	<0.05	<1	800
09/18/2001	7,429	3,750	10,940	1.37	0.99	8.12	<0.05	<1	550
09/25/2001	7,268	3,850	11,190	2.02	1.00	7.77	<0.05	<1	600
10/02/2001	7,130	3,700	11,340	2.10	1.00	8.33	<0.05	<1	700
10/09/2001	7,210	3,750	11,240	1.78	0.94	8.09	<0.05	<1	750
10/16/2001	7,288	3,750	11,260	1.97	1.00	8.14	<0.05	<1	700
10/23/2001	7,110	3,750	11,260	1.78	1.01	8.01	<0.05	<1	700
10/30/2001	7,180	3,800	11,280	1.86	1.02	8.11	<0.05	<1	700
11/06/2001	7,040	3,800	11,180	1.43	0.95	7.75	<0.05	<1	800
11/13/2001	7,162	3,800	11,240	1.66	0.94	7.96	<0.05	<1	700
11/20/2001	7,228	3,800	11,280	1.68	1.01	8.19	<0.05	<1	750
11/27/2001	7,300	3,700	11,270	1.58	1.01	8.24	<0.05	<1	800
12/04/2001	7,230	3,850	11,260	1.67	1.01	8.38	<0.05	<1	850
12/11/2001	7,216	4,150	11,320	1.63	1.02	8.08	<0.05	<1	950
12/18/2001	6,962	3,700	11,250	1.42	1.02	8.11	<0.05	<1	900
12/25/2001	7,094	3,800	11,490	1.63	0.94	8.10	<0.05	<1	900
01/01/2002	7,258	3,800	11,600	1.56	1.02	8.15	<0.05	<1	900
01/08/2002	7,240	3,700	11,320	1.54	1.03	8.09	<0.05	<1	1,100
01/15/2002	7,190	3,750	11,230	1.49	1.01	8.10	<0.05	<1	900
01/22/2002	7,230	3,800	11,270	1.55	1.07	8.06	<0.05	<1	900
01/29/2002	7,200	3,750	11,280	1.47	1.02	8.02	<0.05	<1	750
02/05/2002	7,180	3,850	11,330	1.61	1.07	8.12	<0.05	<1	900
02/12/2002	7,230	3,750	11,270	1.55	1.02	8.07	<0.05	<1	850
02/19/2002	7,238	3,850	11,280	1.59	1.51	8.07	<0.05	<1	950
02/26/2002	7,504	3,750	11,280	1.79	1.00	8.04	<0.05	<1	950
03/05/2002	7,366	3,750	11,270	1.65	1.08	8.15	<0.05	<1	1,000
03/12/2002	7,324	3,800	11,260	1.60	1.04	8.14	<0.05	<1	850
03/19/2002	7,085	3,750	11,260	1.53	1.05	8.07	<0.05	<1	900
03/26/2002	7,205	3,750	11,270	1.52	1.03	8.09	<0.05	<1	850
04/02/2002	7,220	3,750	11,280	1.77	1.05	8.11	<0.05	<1	850
04/09/2002	7,332	3,800	11,290	1.68	1.01	8.06	<0.05	<1	850
04/16/2002	6,907	3,800	11,260	1.86	1.06	8.04	<0.05	<1	900
04/23/2002	7,260	3,800	11,230	1.78	1.03	8.03	<0.05	<1	800

City of Fort Lauderdale
MW-2 Upper Monitor Zone

Date	1,300-1,344 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
05/07/2002	7,280	3,750	11,290	1.46	1.02	8.06	<0.05	<1	800
05/14/2002	7,194	3,750	11,200	1.39	1.03	8.04	<0.05	<1	900
05/21/2002	7,340	3,750	11,300	1.42	1.03	8.03	<0.05	<1	850
05/28/2002	7,298	3,650	11,410	1.39	1.02	8.07	<0.05	<1	800

mg/L = milligrams per liter
umhos = micromhos

City of Fort Lauderdale
MW-2 Lower Monitor Zone

Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/01/1995	44,106	19,200	44,000	0.79	0.75	7.50	0.01	0	3,700
03/10/1995	33,609	18,600	43,500	0.86	0.77	7.67	0.62	0	2,250
03/17/1995	34,787	21,400	44,500	0.78	0.76	7.38	0.32	0	2,750
03/24/1995	34,487	20,000	44,200	0.78	0.77	7.63	0.08	0	3,050
03/31/1995	34,334	23,200	44,500	1.13	0.58	7.43	0.76	0	2,350
04/07/1995	34,165	19,200	44,400	0.77	0.83	7.53	0.01	0	2,350
04/11/1995	34,806	17,000	45,200	0.91	0.59	7.54	0.03	0	2,750
04/19/1995	34,691	17,200	24,100	0.80	0.60	7.47	0.03	0	2,900
04/25/1995	33,663	17,400	32,800	0.85	0.60	7.50	0.05	0	2,850
05/02/1995	33,901	18,200	37,400	0.80	0.79	7.39	0.05	0	2,700
05/09/1995	34,552	19,200	45,800	0.96	0.70	7.60	0.04	0	2,750
05/16/1995	34,424	18,400	46,100	0.94	0.89	7.43	0.08	0	2,500
05/23/1995	34,671	19,000	48,900	1.09	0.80	7.53	0.07	0	2,650
05/30/1995	34,080	17,800	47,600	0.74	1.00	7.47	0.01	0	2,400
06/05/1995	34,410	18,200	48,200	0.77	0.73	7.57	0.05	0	2,300
06/13/1995	34,371	18,200	47,600	0.85	1.02	7.47	0.22	0	2,350
06/20/1995	34,386	18,400	48,800	0.92	0.76	7.50	0.20	0	2,650
06/27/1995	34,740	18,000	47,900	1.35	0.86	7.58	0.20	0	2,550
07/04/1995	34,415	18,800	48,600	1.01	0.74	7.44	0.01	0	2,300
07/11/1995	34,170	18,600	49,200	0.94	0.75	7.53	0.01	0	2,350
07/18/1995	33,825	18,000	49,400	1.06	0.83	7.39	0.03	0	2,600
07/25/1995	34,257	19,400	49,200	0.84	0.72	7.42	0.01	0	2,850
07/31/1995	34,400	18,600	49,800	0.99	0.61	7.47	0.04	0	2,350
08/08/1995	34,238	18,600	50,600	0.89	0.81	7.42	0.35	0	2,700
08/15/1995	34,171	18,800	50,000	0.84	0.72	7.37	0.01	0	2,550
08/22/1995	34,370	18,400	50,200	1.15	0.73	7.32	0.01	0	2,350
08/29/1995	34,195	19,000	51,000	0.79	0.66	7.39	0.08	0	2,650
09/05/1995	34,126	18,800	50,800	0.83	0.65	7.45	0.08	0	2,750
09/12/1995	34,130	18,400	49,700	0.96	0.62	7.40	0.01	0	2,350
09/19/1995	34,500	18,400	49,500	0.59	0.58	7.34	0.01	0	2,400
09/26/1995	34,350	19,000	50,500	0.64	0.68	7.29	0.01	0	2,150
10/03/1995	33,902	19,200	48,700	0.80	0.72	7.46	0.01	0	2,600
10/10/1995	34,016	19,000	48,600	0.78	0.77	7.34	0.03	0	2,950
10/17/1995	33,766	18,400	48,600	1.01	0.77	7.31	0.01	0	2,200
10/24/1995	34,143	18,400	49,100	0.91	0.65	7.37	0.07	0	2,900
10/31/1995	34,296	18,400	49,000	0.94	0.60	7.43	0.01	0	2,850
11/07/1995	39,083	18,400	48,900	1.01	0.71	7.35	0.01	0	3,000
11/14/1995	33,110	18,200	49,000	0.87	0.60	7.58	0.06	0	2,750
11/21/1995	33,845	18,200	48,000	0.92	0.77	7.40	0.08	0	2,850
11/28/1995	33,661	18,000	49,900	1.23	0.84	7.28	0.01	0	2,800
12/05/1995	33,112	17,800	49,400	0.92	0.71	7.38	0.01	0	2,450
12/12/1995	34,400	19,200	50,200	1.02	0.58	7.39	0.01	0	2,300
12/19/1995	33,501	18,600	48,600	0.85	0.73	7.34	0.01	0	2,450
12/27/1995	34,068	19,000	48,200	1.38	0.74	7.77	0.01	0	2,600
01/02/1996	34,095	18,600	45,300	1.05	0.76	7.52	0.01	0	2,300

City of Fort Lauderdale
MW-2 Lower Monitor Zone

Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
01/09/1996	33,647	18,400	47,700	0.96	0.74	7.35	0.01	0	2,100
01/16/1996	34,401	18,400	48,600	1.37	0.87	7.44	0.09	0	2,100
01/23/1996	33,736	18,200	49,100	1.11	0.95	7.50	0.03	0	1,900
01/30/1996	35,110	18,400	49,900	1.61	0.80	7.52	0.01	0	2,400
02/06/1996	34,280	17,200	47,900	1.14	0.82	7.41	0.01	0	2,500
02/13/1996	33,703	17,600	48,200	1.22	0.81	7.39	0.06	0	2,500
02/20/1996	33,910	18,200	49,000	1.19	0.98	7.56	0.06	0	2,400
02/27/1996	33,156	17,400	48,000	1.21	1.02	7.53	0.01	0	2,600
03/05/1996	32,993	18,000	48,800	1.14	0.98	7.50	0.01	0	3,400
03/12/1996	33,600	18,400	47,300	1.06	0.95	7.49	0.01	0	2,300
03/19/1996	32,611	18,000	47,900	1.16	0.98	7.56	0.05	0	2,500
03/26/1996	33,532	18,000	48,200	1.03	0.93	7.38	0.02	0	1,020
04/02/1996	33,558	17,800	47,800	1.34	0.97	7.42	0.14	0	2,200
04/09/1996	32,260	18,000	47,600	1.11	0.94	7.50	<0.01	0	2,900
04/16/1996	33,025	18,200	48,800	1.06	0.94	7.57	<0.01	0	2,550
04/23/1996	34,100	18,400	48,300	1.01	0.95	7.53	<0.01	0	2,800
04/30/1996	33,980	18,200	48,500	1.23	1.14	7.55	<0.01	0	2,850
05/07/1996	33,738	17,000	48,200	1.19	1.00	7.56	<0.01	0	2,550
05/14/1996	33,135	17,800	48,000	1.05	0.98	7.52	<0.01	0	1,950
06/04/1996	33,301	19,200	48,400	1.19	1.01	7.52	0.05	0	2,650
06/11/1996	32,775	18,000	48,300	1.14	0.97	7.50	0.02	0	2,800
06/19/1996	32,855	17,200	48,300	1.24	0.98	7.55	<0.01	0	2,500
06/25/1996	32,910	18,000	48,800	1.24	1.03	7.36	<0.01	0	2,400
07/02/1996	33,026	17,000	48,700	1.46	0.78	7.46	0.05	0	2,450
07/09/1996	33,666	17,600	48,500	1.33	0.78	7.55	0.19	0	2,850
07/16/1996	32,820	18,200	48,300	1.16	0.81	7.42	<0.01	0	2,600
07/23/1996	33,493	17,600	49,000	1.08	0.87	7.50	<0.01	0	3,000
07/30/1996	33,750	17,800	47,900	1.25	0.98	7.51	<0.01	0	3,150
08/06/1996	32,970	17,800	47,900	1.45	0.48	7.63	<0.01	0	3,000
08/15/1996	33,818	17,400	47,900	1.5	1.01	7.39	<0.01	0	2,450
08/20/1996	33,590	17,400	48,300	1.26	0.97	7.39	<0.01	0	2,600
08/27/1996	33,132	18,200	47,800	1.16	1.00	7.40	0.02	0	2,550
09/04/1996	32,835	18,000	48,000	1.16	0.95	7.40	0.07	0	2,550
09/17/1996	31,340	18,200	48,000	1.51	0.87	7.41	0.08	0	2,800
10/08/1996	33,574	18,000	47,600	1.16	1.00	7.41	<0.01	0	2,700
10/15/1996	32,800	17,000	47,300	1.14	0.94	7.47	<0.01	0	2,650
10/22/1996	33,160	18,000	48,500	1.09	1.01	7.47	<0.01	0	3,000
10/29/1996	33,531	18,000	47,300	1.13	1.00	7.51	<0.01	0	2,900
11/05/1996	33,120	18,400	48,500	1.16	0.99	7.52	<0.01	0	2,700
11/12/1996	33,517	17,800	47,100	1.54	0.77	7.52	0.04	0	2,600
11/18/1996	32,761	18,000	47,000	1.05	0.96	7.47	0.04	0	2,400
11/26/1996	33,154	18,000	47,300	1.13	0.95	7.44	0.04	0	2,800
12/02/1996	33,084	18,000	47,600	1.45	0.98	7.50	<0.01	0	2,350
12/10/1996	33,014	18,000	48,500	1.35	0.94	7.47	<0.01	0	3,250
12/17/1996	32,606	17,800	49,800	1.22	0.97	7.49	0.01	0	1,000

City of Fort Lauderdale
MW-2 Lower Monitor Zone

Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
12/24/1996	32,732	17,200	48,600	1.03	0.96	7.41	<0.01	0	2,650
12/31/1996	32,281	18,500	48,500	1.25	0.98	7.39	0.02	0	2,850
01/07/1997	33,530	17,800	47,900	1.19	0.96	7.43	<0.01	0	2,550
01/14/1997	32,850	19,200	48,600	1.24	0.70	7.60	<0.01	0	2,900
01/21/1997	33,090	18,000	48,500	1.31	0.68	7.64	0.06	0	2,800
01/28/1997	32,316	17,600	48,200	1.44	1.17	7.54	0.04	0	2,600
02/04/1997	33,190	18,200	48,000	1.24	0.99	7.49	0.04	0	2,600
02/11/1997	32,236	17,800	47,000	1.72	1.32	7.48	0.07	0	2,500
02/18/1997	32,401	17,600	47,600	1.15	0.99	7.47	<0.01	0	2,700
02/25/1997	31,831	17,400	47,700	1.43	0.74	7.57	0.02	0	2,600
03/04/1997	31,900	17,000	47,000	1.44	1.26	7.48	<0.01	0	3,300
03/11/1997	31,540	17,000	46,400	1.74	1.51	7.42	0.06	0	1,800
03/18/1997	32,316	17,400	47,600	1.46	0.95	7.46	<0.01	0	2,700
03/25/1997	31,915	17,200	46,400	1.68	1.22	7.66	0.02	0	2,650
04/01/1997	32,951	17,100	48,700	1.1	0.97	7.55	0.09	0	2,800
04/08/1997	33,059	18,000	48,500	1.25	0.99	7.52	0.02	0	2,600
05/06/1997	32,929	16,400	47,900	1.18	1.00	7.44	0.09	0	2,600
05/13/1997	32,182	17,000	47,600	1.24	1.01	7.41	0.05	0	2,500
05/20/1997	32,626	21,600	48,000	1.1	1.02	7.42	0.09	0	2,900
05/27/1997	32,702	20,400	48,400	1.23	1.00	7.28	0.11	0	2,600
06/03/1997	33,230	18,000	48,600	1.15	0.97	7.66	0.05	0	3,100
06/10/1997	33,489	19,600	47,300	1.22	1.00	7.33	0.06	0	2,800
06/18/1997	32,838	16,600	48,500	1.25	0.99	7.45	<0.01	0	2,700
06/24/1997	31,854	21,000	47,800	1.12	1.04	7.44	<0.01	0	2,300
07/01/1997	33,193	17,600	48,000	1.22	1.04	7.66	0.04	0	2,800
07/08/1997	32,014	17,200	46,200	1.39	0.96	7.51	0.05	0	2,700
07/15/1997	32,501	15,600	47,200	1.1	1.01	7.57	<0.01	0	2,700
07/22/1997	33,370	13,200	47,200	1.02	0.98	7.64	<0.01	0	2,900
07/29/1997	32,450	16,400	47,800	1.07	0.98	7.41	0.04	0	2,600
08/05/1997	32,521	17,000	48,400	1.15	0.96	7.39	0.02	0	2,800
08/12/1997	33,230	17,800	47,900	1.1	0.96	7.37	0.12	0	2,600
08/18/1997	32,760	17,800	47,800	1.02	0.96	7.52	0.02	0	2,800
08/26/1997	32,766	18,000	46,400	0.94	0.94	7.69	0.03	0	2,000
09/03/1997	32,930	18,000	48,800	1.09	0.92	7.59	0.01	0	2,900
09/09/1997	32,831	18,200	48,400	1.08	1.01	7.49	0.04	0	2,700
09/16/1997	32,496	17,800	49,100	1.05	0.99	7.50	0.02	0	2,700
09/23/1997	32560	17000	49600	1.09	0.98	7.42	0.06	0	2700
09/30/1997	32,780	17,600	49,700	1.00	0.99	7.53	0.04	0	2,700
10/07/1997	33,133	17,400	49,900	1.03	0.96	7.46	0.08	0	2,500
10/14/1997	33,043	17,600	49,800	1.14	1.00	7.37	0.10	0	2,900
10/22/1997	32,649	18,000	51,400	1.11	1.00	7.43	0.02	0	2,800
10/29/1997	32,955	17,800	49,200	0.97	0.95	7.44	<0.01	0	3,100
11/05/1997	33,086	17,600	48,900	1.03	0.94	7.45	<0.01	<1	2,900
11/12/1997	32,761	17,600	50,100	1.03	0.99	7.41	<0.01	<1	2,900
11/18/1997	32,564	17,800	49,900	1.11	1.03	7.54	<0.01	0	2,800

City of Fort Lauderdale MW-2 Lower Monitor Zone									
Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
11/25/1997	31,670	17,600	49,000	1.11	0.97	7.39	0.07	0	2,600
12/02/1997	32,938	17,400	50,000	1.20	1.02	7.54	<0.01	<1	2,700
12/09/1997	32,645	17,800	49,700	1.13	0.99	7.38	<0.01	<1	2,200
12/16/1997	32,600	17,400	50,100	1.18	1.04	7.49	<0.01	<1	2,800
12/23/1997	33,200	18,000	49,800	1.07	0.95	7.42	0.10	<1	2,800
12/30/1997	33,306	17,600	50,100	1.14	1.07	7.47	<0.01	<1	2,700
01/06/1998	33,100	17,600	52,800	1.56	1.07	7.52	<0.01	1	2,800
01/13/1998	32,990	17,600	52,600	1.50	1.00	7.52	<0.01	<1	2,600
01/20/1998	32,310	17,800	49,100	1.42	1.01	7.39	<0.01	<1	3,200
01/27/1998	32,734	17,200	48,400	1.03	0.98	7.43	<0.01	<1	2,600
02/03/1998	32,724	17,400	49,400	1.02	#N/A	7.45	<0.01	<1	2,900
02/10/1998	32,864	17,200	49,400	1.22	0.84	7.44	<0.01	<1	2,600
02/17/1998	31,880	17,400	49,300	1.23	0.92	7.50	<0.01	<1	2,400
02/24/1998	31,708	15,600	49,400	1.09	0.99	7.46	0.12	<1	2,700
03/03/1998	32,984	15,600	49,400	1.09	0.90	7.37	0.02	<1	1,900
03/10/1998	32,790	17,400	49,200	1.08	0.74	7.48	0.02	<1	2,600
03/17/1998	32,560	17,000	49,100	1.15	0.86	7.46	0.06	<1	2,300
03/24/1998	32,712	16,600	49,200	1.28	0.86	7.46	0.03	<1	2,900
03/31/1998	32,720	15,600	48,900	1.13	0.88	7.45	0.05	<1	2,400
04/07/1998	33,050	16,600	48,500	1.25	0.98	7.47	0.07	<1	2,100
04/14/1998	33,520	17,600	48,400	1.17	1.03	7.41	<0.01	<1	2,300
04/21/1998	31,214	16,600	46,800	1.50	1.46	7.42	<0.01	<1	2,100
04/28/1998	33,107	16,800	49,400	0.93	0.93	7.46	<0.01	<1	2,100
05/05/1998	33,539	16,400	49,000	1.08	0.93	7.46	<0.01	<1	2,400
05/12/1998	33,817	17,400	49,000	1.08	0.83	7.44	<0.01	<1	2,900
05/19/1998	33,758	17,800	49,000	1.04	1.02	7.44	<0.01	<1	2,900
05/26/1998	32,986	17,400	49,000	1.12	0.96	7.41	0.01	<1	2,700
06/02/1998	34,359	16,000	49,200	1.11	1.00	7.45	0.02	<1	2,900
06/09/1998	32,156	16,000	49,000	1.28	1.02	7.44	0.03	<1	2,800
06/16/1998	33,077	17,200	49,200	1.14	0.97	7.46	<0.01	<1	2,500
06/23/1998	33,995	17,900	49,100	1.00	0.84	7.43	0.02	<1	1,800
06/30/1998	32,894	17,200	49,100	1.09	0.88	7.38	0.08	<1	3,100
07/07/1998	33,130	18,200	49,200	1.11	0.53	7.44	0.05	<1	3,000
07/14/1998	32,970	17,800	49,300	1.17	0.48	7.39	<0.01	<1	2,700
07/21/1998	32,166	17,400	48,900	1.44	0.82	7.47	<0.01	<1	2,700
07/28/1998	33,516	17,400	49,300	1.05	0.99	7.49	0.71	<1	3,200
08/04/1998	33,090	17,800	49,300	1.38	0.89	7.38	0.05	<1	3,200
08/11/1998	34,212	17,600	49,100	1.13	0.71	7.59	0.05	<1	3,000
08/18/1998	33,190	17,800	49,000	1.10	0.97	7.44	<0.05	<1	3,000
08/25/1998	33,206	17,600	49,300	1.15	0.86	7.53	<0.05	<1	3,100
09/01/1998	33,046	18,000	49,300	1.20	0.97	7.53	<0.05	<1	3,000
09/08/1998	32,980	18,000	49,200	1.12	0.94	7.43	<0.05	<1	3,000
09/15/1998	32,500	17,400	49,200	1.04	1.03	7.46	<0.05	<1	3,600
09/22/1998	33,210	17,600	49,200	1.17	0.89	7.43	<0.05	<1	3,000
09/29/1998	31,955	17,600	48,100	1.12	0.90	7.47	<0.05	<1	3,100

City of Fort Lauderdale
MW-2 Lower Monitor Zone

Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
10/06/1998	33,076	17,200	47,900	1.14	1.02	7.44	<0.05	<1	3,200
10/13/1998	32,891	17,800	48,000	1.12	1.01	7.57	<0.05	<1	3,100
10/20/1998	32,406	17,600	47,700	1.13	0.98	7.64	<0.05	<1	2,800
10/27/1998	33,531	17,800	48,000	1.16	1.03	7.50	<0.05	<1	3,000
11/03/1998	32,996	18,000	47,900	1.11	0.52	7.52	<0.05	<1	3,000
11/10/1998	33,714	19,200	48,000	1.08	0.79	7.51	<0.05	<1	2,700
11/17/1998	32,954	17,800	47,900	1.03	0.76	7.40	<0.05	<1	2,900
11/24/1998	32,677	17,200	48,000	1.08	0.74	7.45	<0.05	<1	2,900
12/01/1998	33,123	17,600	47,400	1.12	1.02	7.42	<0.05	<1	2,900
12/08/1998	32,890	17,200	47,400	1.17	1.02	7.39	<0.05	<1	3,100
12/15/1998	33,497	17,800	47,600	1.17	1.03	7.60	<0.05	<1	3,000
12/22/1998	33,564	17,800	47,200	1.27	0.53	7.48	<0.05	<1	2,800
12/29/1998	32,983	17,200	47,500	1.10	1.02	7.53	<0.05	<1	2,700
01/05/1999	32,778	18,200	47,300	1.10	1.00	7.44	<0.05	<1	3,000
01/12/1999	33,396	17,600	47,600	1.15	1.08	7.52	<0.05	<1	2,700
01/19/1999	33,461	18,400	47,400	1.20	0.41	7.27	<0.05	<1	2,700
01/26/1999	33,058	17,800	47,200	1.18	0.35	7.33	0.05	<1	2,700
02/02/1999	33,369	17,800	49,500	1.13	1.05	7.40	<0.05	<1	2,700
02/09/1999	33,300	18,000	49,900	1.14	1.05	7.25	<0.05	<1	2,900
02/16/1999	34,050	18,200	49,800	1.02	0.99	7.76	<0.05	<1	2,700
02/23/1999	32,990	18,000	49,600	1.28	1.03	7.37	<0.05	<1	3,000
03/02/1999	33,510	18,000	50,100	1.19	0.96	7.54	<0.05	<1	2,800
03/09/1999	32,726	18,600	49,700	1.05	1.00	7.46	<0.05	<1	3,000
03/16/1999	34,035	17,800	49,800	1.12	1.01	7.49	<0.05	<1	2,900
04/06/1999	33,350	18,200	50,100	1.05	0.92	7.54	0.11	<1	2,800
04/13/1999	33,140	18,600	50,200	1.09	0.82	7.60	0.09	<1	2,900
04/20/1999	33,008	18,400	50,000	0.99	0.97	7.53	0.07	<1	2,700
04/27/1999	33,495	17,400	50,200	1.18	0.94	7.59	<0.05	<1	2,800
05/04/1999	33,569	17,400	50,400	1.23	0.99	7.54	0.19	<1	3,500
05/11/1999	33,498	18,000	50,200	1.11	1.01	7.62	<0.05	<1	2,800
05/18/1999	33,595	18,200	50,300	1.11	0.94	7.38	<0.05	<1	3,000
05/25/1999	34,545	18,600	50,500	1.30	0.94	7.58	<0.05	<1	3,000
06/01/1999	33,901	18,200	50,000	1.01	0.96	7.67	<0.05	<1	2,800
06/08/1999	33,253	18,400	50,100	1.29	0.97	7.48	0.08	<1	2,700
06/15/1999	33,116	18,400	49,900	1.20	0.91	7.75	0.06	<1	2,900
06/22/1999	33,730	18,400	50,300	1.25	0.94	7.64	0.09	<1	2,500
06/29/1999	33,450	17,400	50,300	1.05	0.96	7.56	<0.05	<1	2,800
07/06/1999	33,003	18,000	50,300	1.23	0.97	7.46	<0.05	<1	2,900
07/13/1999	33,480	18,600	50,300	1.41	0.94	7.57	<0.05	<1	2,700
08/03/1999	32,580	17,600	49,900	1.22	1.00	7.68	0.22	<1	2,400
08/10/1999	37,717	17,600	49,900	1.20	1.01	7.46	<0.05	<1	2,900
08/17/1999	33,470	18,000	50,000	1.04	1.02	7.44	<0.05	<1	3,100
08/24/1999	33,150	18,000	50,000	1.17	1.02	7.54	<0.05	<1	2,800
08/31/1999	33,186	18,000	50,100	1.29	0.98	7.47	<0.05	<1	2,400
09/07/1999	33,260	18,200	50,200	1.16	1.00	7.54	<0.05	<1	2,500

City of Fort Lauderdale
MW-2 Lower Monitor Zone

Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
09/15/1999	33,253	17,200	49,500	1.07	0.98	7.44	<0.05	<1	3,000
09/21/1999	33,015	16,800	49,300	1.05	1.00	7.50	<0.05	<1	2,500
09/28/1999	33,027	17,400	49,200	1.06	1.04	7.51	0.08	<1	2,800
10/05/1999	32,630	17,600	49,200	1.03	1.01	7.57	<0.05	<1	2,600
10/12/1999	33,860	18,000	49,300	1.08	1.02	7.58	<0.05	<1	2,700
10/19/1999	33,230	18,000	49,200	1.05	1.03	7.50	<0.05	<1	2,600
10/26/1999	34,370	17,800	49,300	#N/A	1.02	7.52	<0.05	<1	2,300
11/02/1999	33,400	17,600	49,300	1.23	1.04	7.50	<0.05	<1	2,600
11/09/1999	32,756	17,400	49,300	1.08	1.05	7.47	<0.05	<1	2,700
11/16/1999	32,620	17,800	49,400	1.07	1.05	7.50	0.06	<1	2,300
11/23/1999	32,860	18,200	49,300	#N/A	1.05	7.43	<0.05	<1	3,000
11/30/1999	33,945	15,400	49,300	1.06	1.04	7.27	<0.05	<1	2,500
12/07/1999	33,177	17,600	49,300	1.09	1.04	7.41	<0.05	<1	2,600
12/14/1999	32,480	18,200	49,100	1.08	1.05	7.37	<0.05	<1	2,600
12/21/1999	33,284	18,400	49,300	1.04	1.04	7.46	0.18	<1	2,500
12/28/1999	32,820	17,800	49,400	1.05	1.05	7.46	<0.05	<1	2,600
01/04/2000	33,887	15,800	49,300	1.11	1.06	7.34	<0.05	<1	2,300
01/11/2000	32,408	18,600	49,200	1.34	1.06	7.45	0.15	<1	2,400
01/18/2000	33,895	17,800	49,400	1.19	1.05	7.49	0.08	<1	2,400
01/25/2000	32,630	18,400	49,600	1.23	1.06	7.34	<0.05	<1	2,500
02/01/2000	33,340	18,200	49,400	1.28	1.06	7.44	<0.05	<1	2,700
02/08/2000	31,976	18,000	49,400	1.21	1.05	7.49	<0.05	<1	2,500
02/15/2000	32,200	16,800	49,400	1.19	1.05	7.45	<0.05	<1	2,100
02/22/2000	32,070	17,600	49,400	1.42	1.06	7.39	<0.05	<1	2,500
02/29/2000	32,030	18,000	49,200	1.32	1.05	7.36	<0.05	<1	2,700
03/07/2000	31,740	18,200	49,000	1.29	1.08	7.43	<0.05	<1	2,500
03/14/2000	32,960	17,800	49,200	1.49	1.03	7.39	<0.05	<1	2,600
03/21/2000	32,182	18,000	49,400	1.39	1.01	7.41	<0.05	<1	2,300
03/28/2000	32,050	17,400	49,680	1.40	1.01	7.43	0.21	<1	2,600
04/04/2000	31,906	19,900	48,900	1.38	1.03	7.39	<0.05	<1	2,800
04/11/2000	32,663	19,200	49,100	1.44	1.05	7.70	0.05	<1	2,500
04/18/2000	32,715	19,500	49,300	1.42	1.03	7.51	<0.05	<1	2,200
05/02/2000	32,956	18,100	49,200	1.32	1.02	7.60	<0.05	<1	2,000
05/09/2000	32,584	15,000	49,500	1.47	0.69	7.58	0.19	<1	2,800
05/16/2000	32,481	15,233	49,300	1.33	1.05	7.44	<0.05	<1	2,500
05/23/2000	32,280	16,837	48,700	1.42	1.05	7.71	0.09	<1	2,200
05/30/2000	31,963	17,504	49,200	1.16	1.91	7.48	0.09	0	2,400
06/06/2000	33,202	17,504	49,100	1.24	1.04	7.54	<0.05	<1	2,200
06/13/2000	32,865	17,620	49,000	1.48	1.07	7.47	0.22	<1	2,400
06/20/2000	32,625	16,520	48,900	1.37	1.06	7.47	<0.05	<1	2,000
06/27/2000	32,177	20,375	49,000	1.30	1.05	7.82	<0.05	<1	2,300
07/05/2000	32,422	19,800	48,800	1.31	1.06	7.61	<0.05	<1	2,100
07/11/2000	32,171	18,950	48,800	1.28	1.10	7.62	<0.05	<1	2,200
07/25/2000	32,166	19,000	48,800	1.30	1.12	7.64	<0.05	<1	2,300
08/01/2000	32,820	19,500	48,600	1.12	1.12	7.57	<0.05	<1	2,400

City of Fort Lauderdale MW-2 Lower Monitor Zone									
Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
08/08/2000	32,700	18,080	48,800	1.16	1.09	7.69	<0.05	<1	2,000
08/15/2000	31,790	18,300	48,600	1.26	1.19	7.76	<0.05	<1	2,400
08/22/2000	32,460	17,340	48,700	1.28	1.21	7.55	<0.05	<1	2,400
08/29/2000	32,340	18,960	48,800	1.25	1.18	7.61	<0.05	<1	2,000
09/05/2000	30,200	18,260	46,000	2.01	1.94	7.60	<0.05	<1	2,300
09/12/2000	32,290	16,560	48,900	1.24	1.11	7.69	<0.05	<1	2,900
09/19/2000	34,040	18,460	48,800	1.25	1.12	7.54	<0.05	<1	2,800
09/26/2000	33,030	19,120	48,800	1.26	1.09	7.62	<0.05	<1	2,200
10/03/2000	33,557	18,260	48,900	1.38	1.07	7.70	<0.05	<1	2,300
10/10/2000	32,262	18,300	48,800	1.60	1.14	7.58	<0.05	<1	2,200
10/17/2000	32,590	15,280	48,700	1.38	1.12	7.47	<0.05	<1	2,300
10/24/2000	32,490	18,960	48,700	1.34	1.10	7.54	<0.05	<1	2,500
10/31/2000	32,380	18,620	48,900	1.29	0.81	7.75	<0.05	<1	2,300
11/07/2000	32,679	18,500	48,700	1.19	1.11	7.68	<0.05	<1	2,200
11/14/2000	32,566	17,160	49,000	1.19	1.15	7.73	<0.05	<1	2,000
11/21/2000	33,283	16,180	49,000	1.16	1.06	7.65	<0.05	<1	2,000
11/28/2000	32,310	19,620	48,700	1.24	1.10	7.85	0.07	<1	2,100
12/05/2000	33,006	18,400	48,800	1.32	1.11	7.70	<0.05	<1	2,200
12/12/2000	32,402	18,520	48,600	1.31	0.85	7.69	0.21	<1	2,000
12/19/2000	36,412	18,380	47,000	1.36	0.86	7.46	0.14	<1	2,400
12/26/2000	34,210	19,020	44,800	1.32	1.00	7.67	<0.05	<1	2,300
01/02/2001	31,980	18,600	49,500	1.32	1.12	7.83	0.12	<1	2,500
01/09/2001	32,450	20,800	49,600	1.26	0.92	7.91	<0.05	<1	2,400
01/16/2001	33,084	18,360	49,500	1.27	1.11	7.79	0.14	<1	2,800
01/23/2001	32,302	18,420	49,600	1.50	1.13	7.67	<0.05	<1	2,400
01/31/2001	32,860	17,180	49,400	1.38	1.14	7.80	<0.05	<1	2,600
02/06/2001	33,290	17,260	49,600	1.37	1.17	7.85	0.06	<1	2,500
02/13/2001	32,720	18,660	49,460	1.34	1.13	7.98	<0.05	<1	2,500
02/20/2001	32,043	18,520	49,200	1.23	1.09	7.77	<0.05	<1	2,500
02/27/2001	32,655	18,400	49,200	1.27	1.12	7.84	<0.05	<1	2,500
03/06/2001	32,670	18,160	45,000	1.35	1.16	7.95	<0.05	<1	2,600
03/13/2001	32,730	18,220	44,100	1.30	1.16	7.94	<0.05	<1	2,400
03/20/2001	32,890	18,400	44,400	1.31	0.94	7.86	<0.05	<1	2,800
03/27/2001	32,245	18,360	44,200	1.34	1.13	8.02	<0.05	<1	2,700
04/03/2001	32,980	18,560	44,200	1.38	1.21	8.07	<0.05	0	2,600
04/10/2001	33,000	18,640	44,200	1.33	1.12	7.94	<0.05	<1	2,500
04/17/2001	32,320	18,400	43,800	1.40	1.16	7.74	<0.05	<1	2,100
04/24/2001	32,830	18,000	44,100	1.25	0.86	7.96	<0.05	<1	2,700
05/01/2001	32,909	18,200	44,300	1.31	0.89	7.99	<0.05	<1	2,600
05/08/2001	32,814	18,200	44,200	1.29	1.13	7.46	<0.05	<1	2,500
05/15/2001	32,650	18,200	44,100	1.33	1.15	7.44	<0.05	<1	2,300
05/22/2001	32,170	18,000	43,900	1.40	1.13	7.52	<0.05	<1	2,500
05/29/2001	34,129	18,000	44,000	1.31	0.71	7.42	<0.05	<1	2,700
06/05/2001	32,230	17,400	44,000	1.38	1.10	7.43	0.141	<1	2,600
06/12/2001	32,200	17,000	43,900	1.52	1.14	7.52	<0.05	<1	2,600

City of Fort Lauderdale MW-2 Lower Monitor Zone									
Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/19/2001	32,970	17,200	43,900	1.51	1.09	7.43	<0.05	<1	2,600
06/26/2001	32,050	18,400	44,100	1.60	1.21	7.55	<0.05	<1	1,900
07/03/2001	32,499	18,800	43,900	1.47	1.18	7.47	<0.05	<1	2,300
07/10/2001	32,430	18,000	44,300	1.40	1.15	7.56	<0.05	<1	2,000
07/17/2001	33,150	18,500	44,000	1.53	1.19	7.54	<0.05	<1	2,400
07/24/2001	31,980	18,000	43,900	1.57	1.17	7.59	<0.05	<1	2,200
07/31/2001	32,490	18,000	43,900	1.71	1.19	7.61	<0.05	<1	2,300
08/07/2001	32,200	18,000	44,200	1.60	1.16	7.56	<0.05	<1	2,500
08/14/2001	31,714	18,000	43,700	1.61	1.23	7.43	<0.05	<1	2,500
08/21/2001	32,090	17,800	43,900	1.60	1.18	7.57	<0.05	<1	2,500
08/28/2001	32,787	18,000	44,100		1.16	7.48	<0.05	<1	2,400
09/04/2001	32,139	18,200	43,800	1.57	1.13	7.58	<0.05	<1	2,400
09/11/2001	31,801	17,800	44,100	1.34	1.21	7.58	<0.05	<1	2,300
09/18/2001	32,361	18,000	44,000	1.56	1.20	7.55	<0.05	<1	2,100
09/25/2001	31,253	17,800	45,400	2.12	1.21	7.12	<0.05	<1	2,500
10/02/2001	32,250	17,800	45,400	2.21	1.23	7.64	<0.05	<1	2,600
10/09/2001	32,010	17,800	45,300	1.96	1.20	7.54	<0.05	<1	2,500
10/16/2001	32,170	17,800	45,300	2.00	1.23	7.66	<0.05	<1	2,500
10/23/2001	31,907	17,800	45,500	1.27	1.27	7.48	<0.05	<1	2,300
10/30/2001	32,270	18,000	45,500	2.09	1.23	7.50	<0.05	<1	2,500
11/06/2001	31,680	17,800	45,600	1.60	1.23	7.55	<0.05	<1	2,600
11/13/2001	31,870	18,000	45,600	1.77	1.21	7.54	<0.05	<1	2,500
11/20/2001	32,061	17,800	45,500	1.78	1.23	7.62	<0.05	<1	2,400
11/27/2001	32,470	17,800	45,500	1.78	1.23	7.71	<0.05	<1	2,600
12/04/2001	32,250	18,250	45,600	1.75	1.23	7.89	<0.05	<1	2,700
12/11/2001	32,335	19,800	45,400	1.79	1.24	7.44	<0.05	<1	2,600
12/18/2001	31,721	17,800	45,500	1.60	1.24	7.51	<0.05	<1	2,800
12/25/2001	31,670	18,000	46,900	1.70	1.20	7.56	<0.05	<1	2,700
01/01/2002	32,579	18,000	47,000	1.44	1.23	7.57	<0.05	<1	2,800
01/08/2002	32,260	17,500	45,700	1.65	1.25	7.54	<0.05	<1	3,000
01/15/2002	32,100	18,000	45,500	1.72	1.23	7.59	<0.05	<1	2,600
01/22/2002	32,155	18,000	45,500	1.73	1.27	7.52	<0.05	<1	2,600
01/29/2002	32,170	18,000	45,400	1.67	1.25	7.47	<0.05	<1	2,400
02/05/2002	31,900	18,250	45,600	1.84	1.26	7.64	0.057	<1	2,400
02/12/2002	32,670	18,000	45,600	1.79	1.24	7.56	<0.05	<1	2,600
02/19/2002	31,990	18,400	45,500	1.71	1.50	7.49	<0.05	<1	2,700
02/26/2002	31,395	18,200	45,500	1.65	1.22	7.49	<0.05	<1	2,800
03/05/2002	32,070	18,000	45,500	1.76	1.31	7.59	<0.05	<1	2,800
03/12/2002	31,870	18,000	45,500	1.77	1.29	7.58	<0.05	<1	2,600
03/19/2002	32,050	18,200	45,400	1.65	1.29	7.55	<0.05	<1	2,600
03/26/2002	32,108	18,000	45,500	1.77	1.25	7.48	<0.05	<1	2,600
04/02/2002	32,050	18,200	45,600	1.80	1.22	7.54	<0.05	<1	2,800
04/09/2002	32,396	18,000	45,700	1.81	1.29	7.52	<0.05	<1	2,800
04/16/2002	31,168	17,800	45,500	2.04	1.27	7.44	<0.05	<1	2,600
04/23/2002	31,740	17,600	45,200	1.96	1.24	7.51	<0.05	<1	2,600

City of Fort Lauderdale
MW-2 Lower Monitor Zone

Date	1,970-2,025 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
05/07/2002	32,020	18,000	45,600	1.55	1.24	7.51	<0.05	<1	2,500
05/14/2002	32,950	18,000	45,500	1.61	1.26	7.51	<0.05	<1	2,800
05/21/2002	32,290	18,000	45,600	1.66	1.26	7.49	<0.05	<1	2,700
05/28/2002	32,627	17,800	46,100	1.39	1.23	7.48	<0.05	<1	2,600

mg/L = milligrams per liter
umhos = micromhos

City of Fort Lauderdale MW-3 Upper Monitor Zone									
Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/11/1996	7,573	3,800	12,300	1.49	1.02	7.71	<0.01	0	750
06/19/1996	7,377	3,700	12,300	1.40	1.02	7.87	<0.01	0	800
06/25/1996	7,300	3,650	11,500	1.33	1.02	7.79	<0.01	0	900
07/02/1996	7,468	3,800	12,200	1.29	0.79	7.71	<0.01	0	825
07/09/1996	7,526	3,700	12,300	1.22	0.77	7.94	0.04	0	450
07/16/1996	7,390	3,700	12,200	1.76	1.25	7.83	<0.01	0	875
07/23/1996	7,410	3,750	12,100	1.32	0.95	7.79	<0.01	0	875
08/15/1996	7,461	3,650	11,600	1.18	1.67	7.69	<0.01	0	850
08/20/1996	7,440	3,700	12,200	1.59	1.04	7.55	<0.01	0	900
08/27/1996	7,733	3,650	11,400	1.41	0.99	8.16	<0.01	0	1,100
09/04/1996	7,265	3,800	11,300	1.41	1.00	7.74	<0.01	0	
09/10/1996	7,390	3,750	12,000	1.04	0.72	7.81	<0.01	0	850
09/17/1996	7,400	3,850	12,100	1.25	0.84	8.11	0.02	0	875
10/08/1996	7,437	3,650	12,200	1.28	1.00	7.91	<0.01	0	875
10/15/1996	7,310	3,700	12,000	1.11	0.97	8.04	<0.01	0	800
10/22/1996	7,351	3,800	12,200	1.03	0.97	7.85	<0.01	0	900
10/29/1996	7,433	3,750	11,900	1.15	0.99	8.09	<0.01	0	1,000
11/05/1996	7,370	3,650	12,000	1.32	0.99	7.95	<0.01	0	875
11/12/1996	7,354	3,750	12,000	1.28	0.77	8.05	<0.01	0	1,499
11/18/1996	7,315	3,700	11,900	1.21	0.96	8.08	<0.01	0	1,200
11/26/1996	7,431	3,700	12,000	1.22	1.05	7.97	<0.01	0	800
12/02/1996	7,314	3,700	12,100	1.33	0.98	7.91	<0.01	0	850
12/10/1996	7,386	3,750	12,200	1.26	0.92	7.95	<0.01	0	800
12/17/1996	7,251	3,750	12,400	1.13	0.95	8.25	<0.01	0	850
12/24/1996	7,262	3,700	12,200	1.07	0.95	8.05	<0.01	0	1,050
12/31/1996	7,439	3,950	12,200	1.14	0.92	8.05	<0.01	0	1,000
01/07/1997	7,408	3,650	12,100	1.14	0.96	8.06	<0.01	0	900
01/14/1997	7,390	3,650	12,300	1.20	0.68	8.08	0.02	0	900
01/21/1997	7,330	3,800	12,300	1.14	0.73	8.05	<0.01	0	950
01/28/1997	7,270	3,750	12,400	1.38	0.95	8.16	<0.01	0	950
02/04/1997	7,420	3,750	12,400	1.31	0.93	8.12	0.01	0	1,100
02/11/1997	7,308	3,650	12,000	1.28	0.91	8.07	<0.01	0	1,000
02/18/1997	7,370	3,700	12,200	1.13	0.92	8.03	<0.01	0	850
02/25/1997	7,312	3,750	12,200	1.21	0.56	8.06	<0.01	0	950
03/04/1997	7,281	3,600	12,300	1.22	0.96	8.07	<0.01	0	1,150
03/11/1997	7,327	3,750	12,000	1.19	0.97	7.98	<0.01	0	900
03/18/1997	7,351	3,550	12,200	1.22	0.92	8.05	<0.01	0	950
03/25/1997	7,430	3,700	12,000	1.27	0.84	8.22	0.02	0	950
04/01/1997	7,351	3,600	12,400	1.09	0.94	8.12	<0.01	0	1,000
04/08/1997	7,337	3,650	12,300	1.19	0.96	8.02	0.02	0	950
05/06/1997	7,268	3,650	12,100	1.29	0.96	8.07	<0.01	0	900
05/13/1997	7,174	3,600	12,300	1.14	0.99	7.96	<0.01	0	950
05/20/1997	7,214	4,150	12,200	1.10	0.98	8.04	<0.01	0	1,100
05/27/1997	7,223	3,550	12,200	1.26	0.94	7.80	0.04	0	950
06/03/1997	7,267	3,700	12,400	1.17	1.00	8.12	0.02	0	1,050
06/10/1997	7,098	3,500	11,800	1.11	1.03	7.80	<0.01	0	1,000
06/18/1997	7,203	3,950	12,300	1.23	0.99	7.86	<0.01	0	950

City of Fort Lauderdale MW-3 Upper Monitor Zone									
Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/24/1997	7,328	4,200	11,800	1.08	0.96	7.94	<0.01	0	750
07/01/1997	7,226	3,700	12,100	1.20	0.96	8.09	<0.01	0	950
07/08/1997	7,273	3,750	11,800	1.28	0.91	8.05	<0.01	0	900
07/15/1997	7,230	3,850	12,200	1.17	1.00	8.00	<0.01	0	750
07/22/1997	7,282	3,550	11,800	1.15	1.00	8.20	<0.01	0	1,000
07/29/1997	7,300	3,450	12,000	1.07	0.99	7.97	<0.01	0	800
08/05/1997	7296	3550	12400	1.2	0.96	7.96	<0.01	0	650
08/12/1997	7,370	3,700	12,200	1.20	0.96	7.46	<0.01	0	850
08/18/1997	7,190	3,700	12,000	1.09	0.94	8.08	<0.01	0	700
08/26/1997	7,315	3,250	12,300	1.06	0.94	8.21	<0.01	0	750
09/03/1997	7,311	3,750	12,300	1.06	0.90	8.04	<0.01	0	1,100
09/09/1997	7,343	3,750	12,300	1.02	0.95	8.01	<0.01	0	950
09/16/1997	7,377	3,700	12,500	1.07	0.94	8.11	<0.01	0	900
09/23/1997	7,370	3,650	12,240	1.11	0.96	8.01	<0.01	0	950
09/30/1997	7,220	3,650	12,260	1.01	0.97	8.08	<0.01	0	1,000
10/07/1997	7,365	3,700	12,290	1.05	0.93	7.98	<0.01	0	950
10/14/1997	7,334	3,550	12,260	1.04	1.00	7.93	0.02	0	1,000
10/22/1997	7,318	3,650	12,670	1.06	0.93	7.90	<0.01	0	1,000
10/29/1997	7,311	3,650	12,110	1.12	0.96	7.95	<0.01	0	1,100
11/05/1997	7,223	3,650	12,050	1.07	0.92	8.02	<0.01	<1	950
11/12/1997	7,254	3,700	12,150	1.00	0.91	7.96	<0.01	<1	950
11/18/1997	7,268	3,650	12,090	1.06	0.93	8.13	0.04	0	900
11/25/1997	7,270	3,650	12,070	1.17	0.92	7.77	<0.01	0	900
12/02/1997	7,234	3,600	12,120	1.20	0.92	8.05	<0.01	<1	1,050
12/09/1997	7,352	3,150	12,050	1.17	1.09	7.92	<0.01	<1	850
12/16/1997	7,227	3,650	12,080	1.25	0.96	8.11	<0.01	<1	950
12/23/1997	7,440	3,350	11,980	1.08	0.93	8.01	<0.01	<1	900
12/30/1997	7,308	3,600	12,130	1.24	1.05	8.03	<0.01	<1	800
01/06/1998	7,300	3,650	12,130	1.34	0.99	7.90	<0.01	<1	800
01/13/1998	7,330	3,600	12,160	1.42	1.01	8.14	<0.01	<1	800
01/20/1998	7,242	3,600	12,220	1.36	0.96	7.96	<0.01	<1	850
01/27/1998	7,324	3,600	12,190	1.04	0.99	7.97	<0.01	<1	850
02/03/1998	7,324	3,600	12,210	1.05	0.95	7.96	<0.01	<1	850
02/10/1998	7,322	3,600	12,160	1.21	0.73	7.94	<0.01	<1	900
02/17/1998	7,236	3,650	12,130	1.24	0.83	7.91	<0.01	<1	750
02/24/1998	7,250	3,650	12,240	1.25	0.95	7.94	<0.01	<1	850
03/03/1998	7,379	3,400	12,150	1.13	0.84	7.92	<0.01	<1	800
03/10/1998	7,336	3,600	12,100	1.24	0.85	8.01	<0.01	<1	850
03/17/1998	7,220	3,550	12,120	1.25	0.78	7.96	<0.01	<1	900
03/24/1998	7,241	3,550	12,100	1.17	0.79	7.98	<0.01	<1	850
03/31/1998	7,338	3,500	12,150	1.22	0.92	8.00	0.03	<1	750
04/07/1998	7,380	3,400	11,850	1.29	0.96	7.79	0.03	<1	550
04/14/1998	7,453	3,150	11,950	1.49	0.97	7.95	<0.01	<1	700
04/21/1998	7,369	3,400	11,910	1.34	0.90	8.19	<0.01	<1	800
04/28/1998	7,399	3,450	12,140	1.26	0.98	7.95	<0.01	<1	750
05/05/1998	7,601	3,400	12,070	1.29	0.98	8.04	<0.01	<1	900
05/12/1998	7,254	3,550	12,060	1.36	0.82	7.88	<0.01	<1	1,000

City of Fort Lauderdale MW-3 Upper Monitor Zone									
Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
05/19/1998	7,446	3,600	12,090	1.40	1.09	7.74	<0.01	<1	1,000
05/26/1998	7,333	3,550	12,100	1.14	0.90	7.85	<0.01	<1	1,000
06/02/1998	7,369	3,050	12,300	1.21	0.98	7.89	<0.01	<1	1,050
06/09/1998	7,304	3,050	12,080	1.54	1.08	8.06	<0.01	<1	950
06/16/1998	7,205	2,900	12,060	1.18	1.01	7.87	<0.01	<1	1,000
06/23/1998	7,392	3,600	12,290	1.16	0.87	7.98	0.01	<1	850
06/30/1998	7,196	3,650	12,060	1.10	0.91	7.88	<0.01	<1	1,050
07/07/1998	7,260	3,900	12,160	1.07	0.63	7.92	<0.01	<1	850
07/14/1998	7,430	3,550	12,180	1.27	0.49	7.87	0.01	<1	1,000
07/21/1998	7,197	3,550	14,080	1.43	0.79	8.01	<0.01	<1	1,150
07/28/1998	7,410	3,700	12,600	1.26	1.02	7.94	<0.01	<1	1,000
08/04/1998	7,263	3,600	12,600	1.22	0.95	7.84	<0.01	<1	900
08/11/1998	7,340	3,550	12,110	1.16	0.61	8.04	<0.01	<1	1,150
08/18/1998	7,500	3,600	12,160	1.18	1.03	7.92	<0.05	<1	1,050
08/25/1998	7,400	3,500	12,140	1.23	0.80	8.01	<0.05	<1	1,050
09/01/1998	7,260	3,650	12,130	1.18	1.00	7.98	<0.05	<1	1,100
09/08/1998	7,270	3,650	12,140	1.33	0.86	7.92	<0.05	<1	1,100
09/15/1998	7,260	3,600	12,160	1.24	1.07	8.02	<0.05	<1	1,000
09/22/1998	7,438	3,650	12,150	1.18	0.83	7.90	<0.05	<1	1,050
09/29/1998	7,335	3,550	11,870	1.24	0.88	7.93	<0.05	<1	1,100
10/06/1998	7,345	3,650	11,830	1.23	0.98	7.94	<0.05	<1	1,050
10/13/1998	7,107	3,600	11,880	1.12	0.92	8.09	<0.05	<1	1,000
10/20/1998	7,301	3,600	11,850	1.10	0.97	8.05	<0.05	<1	1,000
10/27/1998	7,475	3,650	11,850	1.25	1.06	7.95	<0.05	<1	1,000
11/03/1998	7,323	3,800	11,830	1.17	0.54	8.00	<0.05	0	900
11/10/1998	7,421	3,750	11,840	1.14	0.82	7.97	<0.05	<1	900
11/17/1998	7,339	3,750	11,830	1.19	0.83	7.91	<0.05	<1	950
11/24/1998	7,310	3,750	11,830	1.12	0.66	7.96	<0.05	<1	1,000
12/01/1998	7,386	3,700	11,680	1.23	0.97	7.88	<0.05	<1	1,050
12/08/1998	7,227	3,700	11,680	1.17	0.98	7.86	<0.05	<1	1,100
12/15/1998	7,362	3,700	11,730	1.19	1.00	8.02	<0.05	<1	900
12/22/1998	7,430	3,750	11,650	1.29	0.49	7.94	<0.05	<1	900
12/29/1998	7,417	3,750	11,730	1.12	1.01	8.05	<0.05	<1	1,000
01/05/1999	7,380	3,700	11,680	1.18	0.98	8.08	<0.05	<1	1,000
01/12/1999	7,404	3,750	11,690	1.15	0.98	8.06	<0.05	<1	850
01/19/1999	7,465	3,800	11,700	1.08	0.47	7.92	<0.05	<1	850
01/26/1999	7,333	3,800	11,670	1.21	0.37	7.97	<0.05	<1	900
02/02/1999	7,317	3,800	12,300	1.19	1.05	7.92	<0.05	<1	900
02/09/1999	7,410	3,750	11,740	1.17	0.99	7.85	<0.05	<1	1,000
02/16/1999	7,530	3,750	11,690	1.27	0.95	8.32	<0.05	<1	950
02/23/1999	7,310	3,700	11,670	1.36	1.15	7.89	<0.05	<1	1,000
03/02/1999	7,330	3,800	11,750	1.28	1.02	8.09	<0.05	<1	1,000
03/09/1999	7,361	3,900	11,720	1.03	0.98	8.03	<0.05	<1	1,150
03/16/1999	7,413	3,850	11,660	1.14	0.99	8.05	<0.05	<1	950
04/06/1999	7,301	3,850	11,720	1.11	0.95	8.06	<0.05	<1	950
04/13/1999	7,310	3,850	11,740	1.17	0.89	8.13	<0.05	<1	950
04/20/1999	6,862	3,800	11,720	1.15	1.00	8.07	<0.05	<1	800

City of Fort Lauderdale MW-3 Upper Monitor Zone									
Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
04/27/1999	7,311	3,550	11,950	1.05	0.96	8.19	<0.05	<1	1,000
05/04/1999	7,372	3,750	11,760	1.02	1.00	8.16	<0.05	<1	1,200
05/11/1999	7,350	3,750	11,740	1.22	1.02	8.06	<0.05	<1	950
05/18/1999	7,430	3,900	11,760	1.10	0.99	7.93	<0.05	<1	1,000
05/25/1999	7,655	3,850	11,820	1.49	1.04	8.09	<0.05	<1	1,100
06/01/1999	7,412	3,850	11,750	1.03	0.98	8.22	<0.05	<1	850
06/08/1999	7,256	3,800	11,760	1.44	0.98	8.07	<0.05	<1	1,000
06/15/1999	7,402	3,750	11,650	1.30	1.01	8.22	<0.05	<1	900
06/22/1999	7,410	3,850	11,830	1.22	1.01	8.11	<0.05	<1	850
06/29/1999	7,480	3,800	11,810	1.53	0.95	8.14	<0.05	<1	900
07/06/1999	7,351	3,600	11,800	1.21	1.01	8.04	0.07	<1	850
07/13/1999	7,390	3,850	11,790	1.34	1.03	8.08	<0.05	<1	950
08/03/1999	7,400	3,700	11,700	1.35	0.99	8.26	<0.05	<1	1,000
08/10/1999	7,542	3,800	11,750	1.29	0.97	8.09	<0.05	<1	950
08/17/1999	7,440	3,900	11,770	1.15	0.98	8.04	<0.05	<1	900
08/24/1999	7,370	3,850	11,820	1.18	0.96	8.11	<0.05	<1	850
08/31/1999	7,380	3,850	11,830	1.21	0.95	8.04	<0.05	<1	850
09/07/1999	7,586	3,850	12,000	1.22	0.98	8.14	0.05	<1	100
09/15/1999	7,315	3,600	12,200	0.97	0.96	8.02	<0.05	<1	800
09/21/1999	7,314	3,600	12,180	1.08	0.95	8.10	<0.05	<1	950
09/28/1999	7,338	3,750	12,210	1.03	0.97	8.05	<0.05	<1	900
10/05/1999	7,360	3,900	12,180	1.04	0.97	8.14	<0.05	<1	750
10/12/1999	7,570	3,800	12,180	1.07	0.99	8.19	<0.05	<1	950
10/19/1999	7,370	3,900	12,020	1.03	1.02	8.04	<0.05	<1	850
10/26/1999	7,600	3,800	12,040	1.10	1.03	8.05	<0.05	<1	900
11/02/1999	7,360	3,750	12,010	1.04	1.01	8.12	<0.05	<1	800
11/09/1999	7,370	3,650	12,030	1.06	1.00	8.08	<0.05	<1	800
11/16/1999	7,300	3,850	12,050	1.11	1.01	8.21	0.09	<1	800
11/23/1999	7,285	3,900	11,970	1.01	0.96	8.06	<0.05	<1	900
11/30/1999	7,210	3,150	12,060	1.09	1.00	7.86	<0.05	<1	950
12/07/1999	7,273	3,800	12,030	1.06	1.00	8.01	<0.05	<1	850
12/14/1999	7,215	3,800	12,010	1.14	0.99	7.95	<0.05	<1	900
12/21/1999	7,260	3,750	12,050	1.08	1.00	8.01	0.16	<1	850
12/28/1999	7,240	3,800	12,040	1.12	1.01	8.03	<0.05	<1	850
01/04/2000	7,371	3,750	12,010	1.18	1.02	7.91	<0.05	<1	850
01/11/2000	7,256	3,700	12,080	1.26	1.00	8.03	0.11	<1	950
01/18/2000	7,626	3,850	12,050	1.19	1.00	8.14	0.13	<1	800
01/25/2000	7,290	3,850	12,090	1.31	1.01	7.95	0.11	<1	850
02/01/2000	7,300	3,850	12,050	1.33	1.01	8.04	<0.05	<1	900
02/08/2000	7,440	3,800	12,000	1.32	1.01	8.06	<0.05	<1	950
02/15/2000	7,160	3,350	12,100	1.31	1.00	7.95	<0.05	<1	800
02/22/2000	7,120	3,850	12,060	1.42	1.04	7.95	<0.05	<1	800
02/29/2000	7,180	3,800	12,090	1.48	1.00	7.96	<0.05	<1	850
03/07/2000	7,240	3,800	11,990	1.36	1.02	8.02	<0.05	<1	900
03/14/2000	7,330	3,900	12,020	1.29	0.97	7.97	<0.05	<1	1,000
03/21/2000	7,214	3,900	12,060	1.32	0.96	8.00	<0.05	<1	800
03/28/2000	7,350	3,800	12,000	1.34	0.94	8.03	0.17	<1	800

City of Fort Lauderdale MW-3 Upper Monitor Zone									
Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
04/04/2000	7,811	4,010	12,150	1.42	0.99	8.05	<0.05	<1	1,050
04/11/2000	7,604	3,870	11,920	1.49	0.93	7.98	0.06	<1	700
04/18/2000	7,270	3,940	12,070	1.29	0.98	7.98	<0.05	<1	750
05/02/2000	7,333	3,250	12,050	1.36	0.97	8.13	<0.05	<1	700
05/09/2000	7,313	3,550	12,140	1.39	0.77	7.85	0.23	<1	900
05/16/2000	7,260	3,340	12,070	1.28	1.05	8.10	<0.05	<1	1,000
05/23/2000	7,198	4,390	12,950	1.30	1.00	8.15	<0.05	<1	750
05/30/2000	7,060	4,385	11,970	1.23	0.87	8.04	0.07	<1	750
06/06/2000	7,457	4,250	12,010	1.21	0.97	8.07	<0.05	<1	650
06/13/2000	7,375	4,050	12,060	1.36	0.93	8.10	<0.05	<1	650
06/20/2000	7,263	3,660	12,030	1.21	0.92	8.13	<0.05	<1	700
06/27/2000	7,245	4,130	11,860	1.20	0.93	8.35	<0.05	<1	650
07/05/2000	7,364	4,060	12,070	1.19	0.91	8.19	<0.05	<1	650
07/11/2000	7,382	3,980	12,140	1.21	0.94	8.20	<0.05	<1	750
07/25/2000	7,488	4,000	12,180	1.22	0.98	8.22	<0.05	<1	650
08/01/2000	7,331	4,115	11,970	0.93	0.93	8.07	<0.05	<1	600
08/08/2000	7,320	4,090	12,040	1.02	0.93	8.20	<0.05	<1	700
08/15/2000	7,260	4,190	12,010	1.12	1.03	8.30	<0.05	<1	850
08/22/2000	7,310	3,765	12,030	1.14	1.02	8.19	<0.05	<1	750
08/29/2000	7,250	4,000	12,000	1.22	0.99	8.19	<0.05	<1	550
09/05/2000	7,130	4,000	11,870	1.22	1.01	8.11	<0.05	<1	850
09/12/2000	7,270	4,265	12,030	1.14	0.98	8.25	<0.05	<1	1,000
09/19/2000	7,636	4,050	11,990	1.22	0.98	8.15	<0.05	<1	850
09/26/2000	7,370	4,240	12,000	1.15	0.97	8.18	<0.05	<1	800
10/03/2000	7,440	4,300	12,030	1.11	0.91	8.31	<0.05	<1	850
10/10/2000	7,196	4,175	11,990	1.17	1.00	8.18	<0.05	<1	700
10/17/2000	7,260	3,715	12,000	1.19	0.97	8.09	0.05	<1	750
10/24/2000	7,120	4,205	11,910	1.13	0.97	8.11	0.11	<1	850
10/31/2000	7,283	4,005	12,090	1.18	0.64	8.33	<0.05	<1	750
11/07/2000	7,230	4,005	12,130	1.17	0.99	8.25	0.10	<1	700
11/14/2000	7,300	3,745	12,140	1.19	0.97	8.33	<0.05	<1	750
11/21/2000	7,485	3,615	12,130	1.41	0.98	8.24	<0.05	<1	650
11/28/2000	7,264	4,335	12,040	1.19	0.97	8.44	<0.05	<1	800
12/05/2000	7,230	4,205	12,110	1.14	0.95	8.28	<0.05	<1	600
12/12/2000	7,315	4,055	12,110	1.10	0.78	8.21	0.14	<1	750
12/19/2000	7,920	4,045	11,830	1.18	0.92	8.07	0.11	<1	650
12/26/2000	8,055	4,150	11,310	1.13	0.74	8.11	<0.05	<1	700
01/02/2001	7,215	4,220	12,020	1.18	0.97	8.46	<0.05	<1	750
01/09/2001	7,200	4,440	12,070	1.12	0.75	8.46	0.11	<1	900
01/16/2001	7,422	4,040	12,040	1.11	0.95	8.39	<0.05	<1	800
01/23/2001	7,262	4,090	12,100	1.17	1.02	8.32	<0.05	<1	750
01/31/2001	7,335	4,400	12,040	1.18	1.00	8.37	<0.05	<1	800
02/06/2001	7,490	3,240	12,110	1.16	0.99	8.40	<0.05	<1	750
02/13/2001	7,360	3,410	12,020	1.12	1.01	8.58	<0.05	<1	700
02/20/2001	7,681	3,480	12,070	1.07	0.91	8.26	<0.05	<1	800
02/27/2001	7,336	3,450	12,100	1.17	0.91	8.38	<0.05	<1	800
03/06/2001	7,270	3,410	11,190	1.17	0.97	8.48	<0.05	<1	800

City of Fort Lauderdale MW-3 Upper Monitor Zone									
Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/13/2001	7,380	3,275	10,960	1.15	0.98	8.60	0.069	<1	850
03/20/2001	7,310	3,325	11,020	1.20	0.85	8.53	<0.05	<1	900
03/27/2001	7,434	3,375	11,050	1.20	0.97	8.63	<0.05	<1	850
04/03/2001	7,440	3,325	11,060	1.19	1.01	8.65	<0.05	0	850
04/10/2001	7,310	3,270	11,000	1.13	0.92	8.50	<0.05	<1	800
04/17/2001	7,545	3,850	11,030	1.16	0.95	8.27	<0.05	<1	800
04/24/2001	7,205	3,850	11,010	1.13	0.72	8.48	<0.05	<1	950
05/01/2001	7,294	3,800	11,080	1.16	0.77	8.56	<0.05	<1	700
05/08/2001	7,327	3,800	11,020	1.18	0.97	8.03	<0.05	<1	800
05/15/2001	7,302	3,800	11,020	1.16	0.96	8.05	<0.05	<1	750
05/22/2001	7,150	3,900	10,950	1.26	0.91	8.16	<0.05	<1	850
05/29/2001	7,593	3,750	10,990	1.23	0.65	8.13	<0.05	<1	850
06/05/2001	7,380	3,400	11,030	1.26	0.92	8.14	0.131	<1	850
06/12/2001	7,270	3,400	11,030	1.31	0.91	8.15	<0.05	<1	800
06/19/2001	7,410	3,400	11,010	1.31	0.85	8.14	<0.05	<1	850
06/26/2001	7,480	3,500	11,000	1.32	0.94	8.22	<0.05	<1	800
07/03/2001	7,337	3,500	11,060	1.35	0.99	8.15	<0.05	<1	850
07/10/2001	7,300	3,800	11,080	1.34	0.90	8.21	<0.05	<1	750
07/17/2001	7,430	3,850	11,020	1.49	1.00	8.16	<0.05	<1	900
07/24/2001	7,230	3,800	10,990	1.53	0.97	8.21	<0.05	<1	850
07/31/2001	7,230	3,750	11,020	1.44	0.99	8.25	<0.05	<1	750
08/07/2001	7,260	3,750	11,080	1.14	0.97	8.21	<0.05	<1	850
08/14/2001	7,753	3,800	11,260	1.49	1.02	8.14	<0.05	<1	800
08/21/2001	7,310	3,800	11,010	1.43	0.97	8.25	<0.05	<1	800
08/28/2001	7,428	3,800	11,050		0.99	8.21	<0.05	<1	750
09/04/2001	7,320	3,800	11,020	1.31	0.93	8.24	<0.05	<1	850
09/11/2001	7,189	3,700	11,060	1.17	0.97	8.25	<0.05	<1	800
09/18/2001	7,470	3,750	11,050	1.39	1.00	8.26	<0.05	<1	550
09/25/2001	7,498	3,800	11,320	1.69	0.98	7.97	<0.05	<1	700
10/02/2001	7,260	3,750	11,520	1.89	0.99	8.32	<0.05	<1	700
10/09/2001	7,234	3,800	11,390	1.63	0.92	8.26	<0.05	<1	750
10/16/2001	7,248	3,750	11,370	1.77	1.00	8.40	<0.05	<1	800
10/23/2001	7,100	3,800	11,400	1.70	0.98	8.17	<0.05	<1	750
10/30/2001	7,275	3,750	11,420	1.82	0.99	8.19	<0.05	<1	700
11/06/2001	7,158	3,750	11,400	1.36	1.00	8.34	<0.05	<1	800
11/13/2001	7,194	3,750	11,480	1.50	0.95	8.12	<0.05	<1	850
11/20/2001	7,265	3,800	11,410	1.46	0.99	8.20	<0.05	<1	850
11/27/2001	7,250	3,800	11,420	1.45	0.99	8.31	<0.05	<1	850
12/04/2001	7,340	3,850	11,420	1.53	1.00	8.43	<0.05	<1	950
12/11/2001	7,404	3,900	11,360	1.54	1.00	8.04	<0.05	<1	850
12/18/2001	7,091	3,650	11,350	1.34	1.02	8.14	<0.05	<1	950
12/25/2001	7,150	3,850	11,670	1.36	0.88	8.13	<0.05	<1	900
01/01/2002	7,638	3,850	11,870	1.48	1.00	8.19	<0.05	<1	900
01/08/2002	7,224	3,700	11,530	1.49	1.00	8.20	<0.05	<1	1,050
01/15/2002	7,200	3,800	11,440	1.52	1.00	8.15	<0.05	<1	950
01/22/2002	7,310	3,850	11,400	1.50	1.02	8.15	<0.05	<1	850
01/29/2002	7,170	3,800	11,360	1.44	1.00	8.12	<0.05	<1	750

City of Fort Lauderdale
MW-3 Upper Monitor Zone

Date	1,300-1,349 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
02/05/2002	7,228	3,850	11,450	1.54	1.02	8.18	0.114	<1	900
02/12/2002	7,490	3,800	11,410	1.42	1.00	8.14	<0.05	<1	900
02/19/2002	7,374	3,850	11,450	1.47	1.22	8.10	<0.05	<1	900
02/26/2002	7,565	3,800	11,440	1.48	0.97	8.11	<0.05	<1	900
03/05/2002	7,412	3,800	11,420	1.52	1.02	8.21	<0.05	<1	900
03/12/2002	7,330	3,800	11,470	1.47	1.04	8.20	<0.05	<1	900
03/19/2002	7,180	3,800	11,390	1.40	1.03	8.14	<0.05	<1	900
03/26/2002	7,304	3,850	11,410	1.46	0.99	8.14	<0.05	<1	850
04/02/2002	7,255	3,800	11,450	1.50	1.01	8.12	<0.05	<1	900
04/09/2002	7,345	3,800	11,460	1.60	1.01	8.09	<0.05	<1	850
04/16/2002	7,140	3,850	11,400	1.72	1.02	8.08	<0.05	<1	900
04/23/2002	7,180	3,750	11,390	1.62	1.02	8.12	<0.05	<1	850
05/07/2002	7,290	3,800	11,410	1.30	1.02	8.11	<0.05	<1	900
05/14/2002	7,260	3,800	11,370	1.36	1.01	8.06	<0.05	<1	900
05/21/2002	7,340	3,750	11,390	1.40	1.02	8.08	<0.05	<1	850
05/28/2002	7,521	3,600	11,580	1.24	0.99	8.16	<0.05	<1	600

mg/L = milligrams per liter
umhos = micromhos

City of Fort Lauderdale MW-3 Lower Monitor Zone									
Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
6/11/96*	7,591	3,800	12,300	1.27	1.05	7.68	<0.01	0	750
6/19/96*	7,510	3,700	12,300	1.25	0.97	7.88	<0.01	0	1,000
6/25/96*	7,350	3,650	11,400	1.23	1.04	7.80	0.04	0	900
7/2/96*	7,106	3,750	12,200	1.23	0.80	7.69	<0.01	0	875
7/9/96*	7,494	3,750	12,300	1.29	0.71	7.70	<0.01	0	525
7/16/96*	7,390	3,700	12,200	1.76	1.25	7.83	<0.01	0	875
07/23/1996	32,520	16,800	46,300	2.05	1.45	7.46	<0.01	0	1,450
08/15/1996	32,669	16,800	46,900	1.90	1.01	7.38	<0.01	0	2,800
08/20/1996	32,515	17,200	46,900	1.56	1.37	7.40	<0.01	0	2,300
08/27/1996				1.80	1.27		0.07	0	
09/04/1996	31,530	17,200	43,500	2.14	1.93	7.37			
09/10/1996	32,030	17,000	46,600	1.58	1.23	7.38	0.05	0	2,800
09/17/1996	31,960	17,200	46,000	1.60	1.21	7.29	0.04	0	3,000
10/08/1996	31,970	16,800	46,300	1.60	1.50	7.40	<0.01	0	2,350
10/15/1996	31,700	17,000	45,700	1.82	1.43	7.46	<0.01	0	2,250
10/22/1996	32,680	17,000	46,400	1.45	1.24	7.39	<0.01	0	1,325
10/29/1996	31,101	17,000	45,300	1.41	1.39	7.47	<0.01	0	2,700
11/05/1996	31,390	17,000	47,200	1.93	1.48	7.46	<0.01	0	2,500
11/12/1996	31,582	17,400	45,200	1.64	1.16	7.34	0.04	0	2,150
11/18/1996	31,730	17,400	45,000			7.43	0.03	0	2,350
11/26/1996	31,971	17,000	44,500	1.66	1.55	7.46	0.01	0	2,100
12/02/1996	31,826	17,400	45,400	1.96	1.43	7.44	<0.01	0	2,200
12/10/1996	31,602	17,200	46,600	1.45	1.39	7.46	<0.01	0	2,350
12/17/1996	31,087	16,800	47,300	1.56	1.50	7.49	0.01	0	2,250
12/24/1996	31,494	16,800	46,700	1.55	1.48	7.44	0.01	0	2,500
12/31/1996	32,202	17,600	44,900	1.60	1.47	7.40	0.01	0	2,600
01/07/1997	31,615	17,400	45,800	1.66	1.47	7.41	<0.01	0	2,650
01/14/1997	31,830	18,200	46,700	1.65	0.99	7.47	0.01	0	2,700
01/21/1997	31,542	17,400	46,300	1.91	1.18	7.62	0.09	0	2,700
01/28/1997	31,108	16,600	46,400	1.77	1.56	7.37	0.02	0	2,600
02/04/1997	31,450	17,200	46,500	1.93	1.54	7.39	0.02	0	2,800
02/11/1997	31,573	20,600	45,700	1.74	1.54	7.53	0.04	0	2,500
02/18/1997	31,254	16,400	45,000	1.70	1.56	7.41	<0.01	0	2,700
02/25/1997	31,181	17,000	46,000	1.72	1.17	7.52	<0.01	0	2,800
03/04/1997	30,378	16,600	46,300	1.85	1.55	7.47	<0.01	0	3,300
03/11/1997	31,450	16,800	45,800	1.72	1.55	7.36	0.04	0	2,200
03/18/1997	31,633	16,600	46,600	1.67	1.38	7.47	<0.01	0	2,700
03/25/1997	31,735	16,800	45,000	1.82	1.33	7.55	0.09	0	2,600
04/01/1997	31,394	16,600	46,400	1.54	1.32	7.65	0.11	0	2,600
04/08/1997	31,451	18,200	46,300	1.71	1.50	7.52	0.04	0	2,600
05/06/1997	31,166	17,200	45,700	1.81	1.58	7.49	0.09	0	2,600
05/13/1997	30,795	16,600	45,700	1.67	1.59	7.34	0.04	0	2,400
05/20/1997	30,980	19,600	45,600	1.81	1.59	7.40	0.03	0	2,600
05/27/1997	30,790	21,800	45,400	1.79	1.62	7.28	0.06	0	2,500
06/03/1997	31,340	16,600	46,200	1.82	1.61	7.62	0.03	0	2,800
06/10/1997	30,653	18,800	43,600	1.74	1.60	7.07	0.01	0	2,400
06/18/1997	30,840	18,400	45,400	1.79	1.61	7.45	<0.01	0	2,300
06/24/1997	31,290	22,000	45,100	1.91	1.56	7.47	<0.01	0	2,400
07/01/1997	31,195	17,200	45,500	1.96	1.64	7.64	0.07	0	2,500

City of Fort Lauderdale MW-3 Lower Monitor Zone									
Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
07/08/1997	30,676	19,200	46,000	1.85	1.54	7.47	0.01	0	2,500
07/15/1997	31,250	19,800	44,800	1.73	1.67	7.53	<0.01	0	2,300
07/22/1997	30,802	16,200	45,000	1.81	1.63	7.61	<0.01	0	2,500
07/29/1997	31,322	16,000	45,000	1.68	1.59	7.37	0.03	0	2,400
08/05/1997	31,283	16,600	46,800	1.68	1.56	7.38	<0.01	0	2,200
08/12/1997	31,460	17,200	45,700	1.66	1.59	7.55	0.05	0	2,800
08/18/1997	31,300	17,200	45,300	1.68	1.58	7.17	0.02	0	2,200
08/26/1997	30,984	17,400	46,100	1.61	1.58	7.70	<0.01	0	2,300
09/03/1997	31,241	18,400	48,600	1.74	1.47	7.60	<0.01	0	2,200
09/09/1997	31,342	18,400	46,300	1.64	1.44	7.55	<0.01	0	3,100
09/16/1997	30,713	16,600	46,700	1.70	1.59	7.51	0.03	0	2,500
09/23/1997	31,154	16,400	47,300	1.64	1.59	7.43	0.05	0	2,600
09/30/1997	30,980	16,600	47,400	1.70	1.63	7.45	0.05	0	2,600
10/07/1997	31,200	16,600	47,500	1.69	1.55	7.54	0.09	0	2,400
10/14/1997	31,325	16,600	47,500	1.76	1.65	7.46	0.15	0	2,600
10/22/1997	31,291	16,600	49,000	1.62	1.35	7.39	0.01	0	2,900
10/29/1997	31,171	16,800	46,600	1.67	1.57	7.43	0.02	0	2,800
11/05/1997	31,059	16,800	46,600	1.64	1.57	7.45	<0.01	<1	2,900
11/12/1997	31,214	16,800	47,700	1.60	1.55	7.40	<0.01	<1	2,700
11/18/1997	30,710	17,000	47,200	1.79	1.60	7.55	<0.01	0	2,400
11/25/1997	30,335	16,600	47,200	1.70	1.59	7.37	0.04	0	2,100
12/02/1997	30,875	16,400	47,500	1.80	1.32	7.48	<0.01	<1	2,800
12/09/1997	30,950	16,600	47,300	1.69	1.52	7.41	<0.01	<1	1,900
12/16/1997	30,960	16,600	47,600	1.70	1.59	7.54	<0.01	<1	2,000
12/23/1997	31,530	16,600	47,100	1.74	1.53	7.46	<0.01	<1	2,600
12/30/1997	31,586	16,600	47,800	1.71	1.69	7.48	<0.01	<1	2,600
01/06/1998	31,170	16,800	49,800	1.93	1.66	7.44	<0.01	<1	2,200
01/13/1998	30,850	16,000	49,500	1.90	1.73	7.53	<0.01	<1	2,300
01/20/1998	30,580	16,400	46,800	2.01	1.57	7.33	<0.01	<1	2,400
01/27/1998	31,040	16,600	47,100	1.75	1.66	7.38	0.03	<1	2,600
02/03/1998	30,900	16,400	47,100	1.71	1.64	7.40	<0.01	<1	2,600
02/10/1998	31,029	16,000	46,900	2.00	1.27	7.40	0.02	<1	2,200
02/17/1998	31,100	16,400	46,900	1.92	1.26	7.53	<0.01	<1	2,100
02/24/1998	30,260	16,600	46,900	1.67	1.61	7.36	0.10	<1	2,100
03/03/1998	30,947	16,400	46,800	1.69	1.54	7.41	0.01	<1	1,800
03/10/1998	31,108	16,000	46,800	1.83	1.50	7.49	0.08	<1	2,100
03/17/1998	30,680	16,600	46,800	1.77	1.51	7.44	0.09	<1	2,400
03/24/1998	31,154	16,200	46,800	1.88	1.28	7.43	0.05	<1	2,900
03/31/1998	31,015	16,200	47,100	1.91	1.14	7.46	0.11	<1	2,100
04/07/1998	31,690	16,200	46,100	1.86	1.61	7.47	0.05	<1	1,800
04/14/1998	30,850	15,600	46,200	1.99	1.58	7.38	<0.01	<1	1,900
04/21/1998	33,237	15,400	49,300	1.19	0.97	7.52	<0.01	<1	2,200
04/28/1998	31,490	16,000	46,800	1.83	1.69	7.38	<0.01	<1	2,200
05/05/1998	31,640	16,600	46,600	2.05	1.27	7.41	<0.01	<1	2,600
05/12/1998	31,001	16,200	46,800	1.89	1.35	7.37	<0.01	<1	2,600
05/19/1998	31,366	16,600	46,700	1.96	1.74	7.30	<0.01	<1	2,800
05/26/1998	32,337	16,400	46,600	1.82	1.61	7.36	0.03	<1	2,800
06/02/1998	31,362	13,800	46,900	1.85	1.64	7.33	<0.01	<1	2,800
06/09/1998	30,629	16,400	46,800	2.05	1.76	7.41	<0.01	<1	2,800

City of Fort Lauderdale
MW-3 Lower Monitor Zone

Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/16/1998	31,674	16,200	46,800	1.81	1.63	7.36	<0.01	<1	2,800
06/23/1998	32,859	16,200	46,600	1.78	1.45	7.35	0.02	<1	1,800
06/30/1998	31,286	16,000	46,500	1.73	1.59	7.31	<0.01	<1	3,000
07/07/1998	31,240	17,000	46,700	1.79	0.97	7.35	0.02	<1	2,800
07/14/1998	31,930	17,000	46,900	1.86	0.95	7.36	<0.01	<1	2,900
07/21/1998	31,359	16,400	46,500	2.11	1.43	7.48	<0.01	<1	3,000
07/28/1998	31,360	16,600	47,000	1.85	1.73	7.44	<0.01	<1	3,000
08/04/1998	31,365	16,000	47,000	1.84	1.55	7.32	<0.01	<1	2,900
08/11/1998	31,180	16,200	46,500	1.80	1.25	7.47	0.04	<1	3,100
08/18/1998	31,920	16,800	47,100	1.82	1.75	7.36	<0.05	<1	3,000
08/25/1998	31,540	16,800	47,100	1.77	1.39	7.48	<0.05	<1	2,900
09/01/1998	30,870	16,800	47,000	1.90	1.70	7.45	<0.05	<1	2,900
09/08/1998	31,000	17,000	46,900	1.91	1.59	7.42	<0.05	<1	2,900
09/15/1998	30,700	16,400	46,900	1.81	1.78	7.50	<0.05	<1	3,000
09/22/1998	31,572	16,400	46,900	1.86	1.39	7.40	<0.05	<1	3,200
09/29/1998	31,080	16,800	45,800	1.93	1.44	7.40	<0.05	<1	3,100
10/06/1998	31,302	16,600	45,700	1.88	1.69	7.38	<0.05	<1	3,000
10/13/1998	31,181	16,800	45,700	1.67	1.61	7.54	<0.05	<1	2,700
10/20/1998	31,063	16,800	45,500	1.74	1.69	7.57	<0.05	<1	4,400
10/27/1998	31,693	16,600	45,700	1.06	1.79	7.47	<0.05	<1	2,900
11/03/1998	30,966	16,600	45,700	1.76	1.00	7.45	<0.05	0	2,350
11/10/1998	32,002	16,600	45,700	1.79	1.33	7.45	<0.05	<1	2,700
11/17/1998	30,851	16,400	45,400	1.85	1.35	7.34	<0.05	<1	2,900
11/24/1998	31,132	16,600	45,500	1.82	1.16	7.46	<0.05	<1	2,800
12/01/1998	31,505	16,400	45,100	1.72	1.52	7.31	<0.05	<1	3,000
12/08/1998	30,867	16,000	45,100	1.79	1.70	7.25	<0.05	<1	2,900
12/15/1998	31,416	16,400	45,200	1.86	1.51	7.54	<0.05	<1	2,700
12/22/1998	31,521	16,400	44,800	1.99	0.93	7.43	<0.05	<1	2,700
12/29/1998	31,283	16,200	45,100	1.79	1.72	7.47	<0.05	<1	2,500
01/05/1999	31,040	16,800	45,200	1.82	1.70	7.44	<0.05	<1	2,800
01/12/1999	31,471	17,200	45,000	1.83	1.68	7.45	<0.05	<1	2,600
01/19/1999	31,703	17,200	44,900	1.86	0.76	7.32	<0.05	<1	2,700
01/26/1999	31,192	17,000	44,800	1.81	0.37	7.25	<0.05	<1	2,400
02/02/1999	31,223	16,800	46,800	1.87	1.79	7.28	<0.05	<1	2,500
02/09/1999	31,587	16,800	47,200	1.97	1.46	7.17	<0.05	<1	2,600
02/16/1999	31,870	16,800	47,000	2.02	1.54	7.58	<0.05	<1	2,700
02/23/1999	31,120	17,200	47,100	1.95	1.67	7.28	<0.05	<1	2,900
03/02/1999	31,130	16,400	47,100	1.88	1.77	7.47	<0.05	<1	2,800
03/09/1999	31,126	17,200	47,000	1.81	1.75	7.40	<0.05	<1	3,150
03/16/1999	31,765	17,000	46,800	2.21	1.72	7.45	<0.05	<1	2,600
04/06/1999	31,090	17,000	47,100	1.89	1.67	7.45	0.16	<1	2,900
04/13/1999	30,714	17,200	47,000	1.79	1.63	7.55	0.07	<1	2,900
04/20/1999	30,856	16,800	46,900	1.90	1.77	7.53	0.06	<1	2,300
04/27/1999	30,620	16,200	48,300	1.90	1.85		0.05	<1	2,800
05/04/1999	30,940	15,800	47,100	1.90	1.77	7.58	0.18	<1	3,200
05/11/1999	31,120	16,800	46,900	2.11	1.76	7.54	<0.05	<1	2,600
05/18/1999	31,531	16,600	47,200	2.21	1.72	7.33	0.11	<1	2,800
05/25/1999	32,014	16,800	47,300	2.08	1.70	7.53	<0.05	<1	2,900
06/01/1999	31,381	17,200	46,900	1.97	1.74	7.64	0.16	<1	2,600

City of Fort Lauderdale MW-3 Lower Monitor Zone									
Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/08/1999	31,282	18,400	47,000	1.85	1.73	7.47	0.08	<1	2,800
06/15/1999	30,962	17,000	46,400	1.91	1.76	7.72	0.11	<1	2,600
06/22/1999	31,190	16,800	47,200	1.98	1.79	7.54	0.12	<1	2,300
06/29/1999	31,670	16,800	47,100	1.83	1.75	7.55	0.05	<1	2,600
07/06/1999	30,781	14,400	47,100	1.94	1.76	7.39	0.08	<1	2,300
07/13/1999	31,170	17,000	47,100	2.03	1.85	7.50	<0.05	<1	2,400
08/03/1999	30,850	17,200	46,800	2.15	1.75	7.66	0.16	<1	2,900
08/10/1999	31,626	17,400	46,900	1.97	1.73	7.44	<0.05	<1	2,700
08/17/1999	30,850	18,600	47,100	1.81	1.76	7.42	<0.05	<1	2,500
08/24/1999	31,250	16,800	47,200	1.91	1.76	7.46	<0.05	<1	2,400
08/31/1999	31,510	18,200	47,200	1.92	1.78	7.45	<0.05	<1	2,500
09/07/1999	31,675	17,000	47,300	1.95	1.76	7.60	<0.05	<1	2,650
09/15/1999	31,271	16,600	47,000	1.79	1.69	7.47	<0.05	<1	2,600
09/21/1999	31,016	16,400	46,700	1.75	1.71	7.44	<0.05	<1	2,600
09/28/1999	31,137	16,800	46,700	#N/A	1.75	7.53	<0.05	<1	2,600
10/05/1999	30,980	16,800	46,600	#N/A	1.75	7.50	<0.05	<1	2,300
10/12/1999	31,540	17,200	46,700	1.80	1.77	7.53	<0.05	<1	2,700
10/19/1999	31,230	17,000	46,400	1.74	#N/A	7.41	<0.05	<1	2,200
10/26/1999	32,150	16,800	46,400	#N/A	1.80	7.48	0.22	<1	2,600
11/02/1999	31,070	16,600	46,200	1.87	1.86	7.48	<0.05	<1	2,300
11/09/1999	30,790	16,600	46,600	#N/A	1.78	7.44	<0.05	<1	2,400
11/16/1999	30,730	16,800	46,700	1.79	1.77	7.50	0.06	<1	2,400
11/23/1999	31,530	16,800	46,300	#N/A	1.83	7.41	<0.05	<1	2,600
11/30/1999	30,473	13,600	46,500	1.63	#N/A	7.24	<0.05	<1	2,000
12/07/1999	31,351	17,200	46,500	1.79	1.79	7.36	<0.05	<1	2,500
12/14/1999	30,280	17,000	46,100	1.86	1.85	7.34	<0.05	<1	2,300
12/21/1999	30,790	16,400	46,400	1.75	#N/A	7.42	0.19	<1	2,300
12/28/1999	30,770	16,800	46,500	1.80	1.80	7.41	0.11	<1	2,100
01/04/2000	30,240	16,600	46,500	1.88	1.84	7.16	<0.05	<1	2,100
01/11/2000	30,560	17,200	46,300	2.12	1.81	7.41	0.187	<1	2,400
01/18/2000	31,095	17,400	46,700	1.84	1.79	7.47	0.078	<1	2,400
01/25/2000	30,543	16,800	46,800	1.99	1.81	7.31	0.11	<1	2,200
02/01/2000	30,940	16,000	46,600	2.14	1.82	7.41	<0.05	<1	2,400
02/08/2000	30,580	16,600	46,300	2.11	1.81	7.49	<0.05	<1	2,300
02/15/2000	30,190	16,400	46,300	2.03	1.81	7.48	<0.05	<1	2,200
02/22/2000	30,150	17,200	46,500	2.20	1.84	7.37	<0.05	<1	2,500
02/29/2000	30,220	16,800	46,400	2.62	1.81	7.34	<0.05	<1	2,100
03/07/2000	33,430	16,800	45,900	2.26	1.83	7.33	<0.05	<1	2,300
03/14/2000	30,480	16,800	46,300	2.15	1.77	7.36	<0.05	<1	2,300
03/21/2000	30,591	17,000	46,500	2.11	1.76	7.41	<0.05	<1	2,400
03/28/2000	30,530	17,000	46,200	2.82	1.72	7.45	0.17	<1	2,300
04/04/2000	30,068	19,100	46,100	2.71	1.83	7.52	<0.05	<1	2,800
04/11/2000	29,887	17,400	45,300	2.63	2.01	7.69	0.12	<1	2,500
04/18/2000	30,591	18,900	46,700	3.75	1.83	7.41	0.07	<1	2,200
05/02/2000	30,622	17,400	46,400	3.59	1.80	7.58	<0.05	<1	1,900
05/09/2000	30,454	14,800	46,400	2.28	1.45	7.48	0.17	<1	2,300
05/16/2000	30,453	16,500	46,200	2.14	1.85	7.46	0.06	<1	2,600
05/23/2000	30,070	16,637	46,400	3.82	1.86	7.64	0.074	<1	2,200
05/30/2000	29,470	19,337	46,100	2.13	1.62	7.57	0.082	0	2,600

City of Fort Lauderdale MW-3 Lower Monitor Zone									
Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
06/06/2000	31,167	16,670	46,100	2.15	1.82	7.49	<0.05	<1	2,100
06/13/2000	31,098	17,400	46,100	2.86	1.80	7.43	0.20	<1	2,000
06/20/2000	30,556	19,837	46,000	2.18	1.85	7.44	<0.05	<1	2,000
06/27/2000	30,513	19,675	47,500	2.06	1.80	7.79	<0.05	<1	2,000
07/05/2000	30,218	18,775	45,900	2.03	1.77	7.63	<0.05	<1	2,100
07/11/2000	30,314	18,950	46,300	2.04	1.77	7.63	<0.05	<1	2,100
07/25/2000	30,362	17,500	45,900	2.02	1.83	7.60	<0.05	3	1,900
08/01/2000	30,480	19,175	45,800	1.81	1.79	7.51	<0.05	<1	1,900
08/08/2000	30,488	18,180	46,100	1.95	1.80	7.63	<0.05	<1	2,000
08/15/2000	30,360	18,020	45,900	2.05	1.91	7.74	<0.05	<1	2,200
08/22/2000	29,980	16,740	46,000	2.02	1.97	7.50	<0.05	<1	2,200
08/29/2000	30,200	18,460	45,700	2.06	1.93	7.56	<0.05	<1	1,800
09/05/2000	32,300	18,660	48,600	1.23	1.14	7.68	<0.05	<1	2,300
09/12/2000	30,550	16,060	46,000	2.09	1.87	7.69	<0.05	<1	2,700
09/19/2000	31,357	18,540	45,800	2.17	1.84	7.54	<0.05	<1	2,500
09/26/2000	31,000	19,220	45,900	2.07	1.83	7.59	<0.05	<1	2,300
10/03/2000	30,910	17,920	46,000	2.16	1.80	7.73	<0.05	<1	2,400
10/10/2000	30,126	17,940	45,700	2.15	1.91	7.58	0.11	<1	2,100
10/17/2000	30,420	11,980	45,900	2.16	1.86	7.45	<0.05	<1	2,200
10/24/2000	30,450	18,460	46,000	2.07	1.85	7.47	<0.05	<1	2,400
10/31/2000	30,504	18,320	46,000	2.03	1.32	7.73	<0.05	<1	2,000
11/07/2000	30,170	18,400	45,900	2.12	1.42	7.61	<0.05	<1	2,600
11/14/2000	30,360	16,560	46,100	2.09	1.86	7.71	0.06	<1	2,100
11/21/2000	30,788	15,580	46,100	1.96	1.77	7.60	<0.05	<1	1,900
11/28/2000	30,029	19,240	46,000	1.99	1.81	7.84	0.06	<1	2,200
12/05/2000	30,516	17,980	45,900	2.06	1.88	7.68	0.06	<1	1,900
12/12/2000	30,509	18,080	47,110	2.06	1.45	7.70	0.16	<1	1,900
12/19/2000	30,090	18,180	44,400	2.18	1.83	7.44	0.24	<1	2,300
12/26/2000	33,463	18,520	42,400	2.10	1.57	7.53	<0.05	<1	2,400
01/02/2001	30,338	18,360	46,300	2.23	1.91	7.86	<0.05	<1	2,100
01/09/2001	30,260	19,760	46,500	2.10	1.62	7.92	0.16	<1	2,500
01/16/2001	30,649	18,000	46,400	2.20	1.89	7.76	<0.05	<1	2,500
01/23/2001	30,187	18,020	46,660	3.06	1.95	7.69	<0.05	<1	2,200
01/31/2001	29,953	17,540	46,400	2.23	1.96	7.75	<0.05	<1	2,300
02/06/2001	31,110	18,160	46,400	2.24	2.03	7.83	0.09	<1	2,400
02/13/2001	30,290	18,020	46,300	2.09	1.94	7.94	<0.05	<1	2,300
02/20/2001	29,560	18,020	46,400	2.01	1.84	7.70	<0.05	<1	2,300
02/27/2001	29,720	18,160	46,300	2.15	1.90	7.72	<0.05	<1	2,500
03/06/2001	30,753	17,940	42,200	2.16	1.94	7.95	<0.05	<1	2,400

City of Fort Lauderdale MW-3 Lower Monitor Zone									
Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/13/2001	30,720	18,000	41,400	2.06	1.97	8.01	<0.05	<1	2,300
03/20/2001	30,540	17,900	41,700	2.17	1.69	7.99	<0.05	<1	2,600
03/27/2001	30,775	18,000	41,600	2.79	1.89	8.01	<0.05	<1	2,200
04/03/2001	31,030	18,320	41,500	2.21	2.00	8.07	<0.05	0.00	2,400
04/10/2001	30,480	18,360	41,500	2.37	1.90	7.93	<0.05	<1	2,400
04/17/2001	29,682	16,800	41,400	2.19	1.94	7.74	<0.05	<1	2,200
04/24/2001	29,940	17,000	41,400	2.12	1.48	7.91	<0.05	<1	2,400
05/01/2001	31,135	17,000	41,900	2.07	1.51	7.98	<0.05	<1	2,300
05/08/2001	30,755	17,000	41,900	2.16	1.87	7.44	<0.05	<1	2,400
05/15/2001	30,630	17,200	41,700	1.98	1.85	7.36	<0.05	<1	2,200
05/22/2001	30,090	16,800	41,600	2.26	1.84	7.45	<0.05	<1	2,300
05/29/2001	31,749	16,800	41,500	2.12	1.26	7.45	<0.05	<1	2,300
06/05/2001	30,500	16,200	41,700	2.81	1.83	7.46	0.13	<1	2,400
06/12/2001	30,280	17,200	41,500	2.74	1.89	7.45	<0.05	<1	2,500
06/19/2001	30,730	16,200	41,500	3.13	1.81	7.42	<0.05	<1	2,400
06/26/2001	30,430	16,200	41,600	2.28	2.03	7.40	<0.05	<1	1,900
07/03/2001	30,973	16,400	41,100	3.35	1.96	7.37	<0.05	<1	2,200
07/10/2001	30,590	16,750	41,900	3.15	1.90	7.50	<0.05	<1	1,800
07/17/2001	30,974	17,000	41,500	3.46	1.98	7.48	<0.05	<1	2,200
07/24/2001	30,340	17,000	41,500	3.34	1.90	7.57	<0.05	<1	1,900
07/31/2001	30,380	16,750	41,400	3.79	1.96	7.62	<0.05	<1	2,100
08/07/2001	30,360	16,600	41,600	3.79	1.92	7.57	<0.05	<1	2,000
08/14/2001	29,992	16,800	41,200	4.71	2.08	7.38	<0.05	<1	1,800
08/21/2001	31,180	16,800	41,400	3.37	1.96	7.54	<0.05	<1	2,200
08/28/2001	30,599	16,800	41,600	2.32	1.91	7.51	<0.05	<1	2,300
09/04/2001	30,623	17,000	41,900	2.21	1.71	7.55	<0.05	<1	2,200
09/11/2001	29,796	16,800	41,900	1.96	1.88	7.50	<0.05	<1	2,100
09/18/2001	30,740	17,000	41,700	2.54	1.87	7.56	<0.05	<1	1,800
09/25/2001	30,054	16,800	42,900	2.12	1.90	7.22	<0.05	<1	2,300
10/02/2001	30,420	16,600	43,500	2.21	1.93	7.62	<0.05	<1	2,100
10/09/2001	30,320	16,800	43,000	2.24	1.87	7.55	<0.05	<1	2,000
10/16/2001	30,261	16,600	42,900	1.96	1.91	7.70	<0.05	<1	2,200
10/23/2001	29,860	17,000	42,900	2.15	1.98	7.50	<0.05	<1	2,300
10/30/2001	30,320	16,800	42,800	2.09	1.96	7.50	<0.05	<1	2,400
11/06/2001	29,780	17,000	43,000	2.10	1.97	7.57	<0.05	<1	2,400
11/13/2001	20,470	17,000	42,700	2.28	1.99	7.58	<0.06	<1	2,300
11/20/2001	30,080	16,800	42,800	2.58	1.99	7.58	<0.05	<1	2,400
11/27/2001	30,100	16,600	42,800	2.26	1.98	7.68	<0.05	<1	2,400
12/04/2001	29,670	16,750	42,600	2.26	2.05	7.86	<0.06	<1	2,600
12/11/2001	30,062	14,200	42,700	2.23	2.01	7.39	<0.05	<1	2,300
12/18/2001	29,869	16,600	42,700		2.01	7.51	<0.05	<1	2,400
12/25/2001	29,896	17,000	43,900	2.10	1.91	7.51	<0.05	<1	2,500
01/01/2002	29,672	17,000	44,200	2.19	2.01	7.52	<0.05	<1	1,800
01/08/2002	30,230	17,250	42,900	2.13	1.98	7.51	<0.05	<1	2,200
01/15/2002	30,090	17,500	42,700	2.21	1.99	7.53	<0.05	<1	2,400
01/22/2002	30,130	17,250	42,600	2.20	2.05	7.49	0.06	<1	2,400
01/29/2002	29,770	17,250	42,500	2.12	2.04	7.47	<0.05	<1	2,200
02/05/2002	29,640	17,500	42,800	2.18	2.06	7.48	<0.05	<1	2,300
02/12/2002	29,940	16,800	42,500	2.18	2.03	7.51	<0.05	<1	2,300

City of Fort Lauderdale
MW-3 Lower Monitor Zone

Date	1,970-2,027 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
02/19/2002	29,940	17,000	42,700	2.17	LOST	7.49	<0.05	<1	2,400
02/26/2002	30,262	17,200	43,000	2.19	2.03	7.50	<0.05	<1	2,500
03/05/2002	30,015	17,000	42,800	2.29	2.17	7.60	<0.05	<1	2,400
03/12/2002	29,724	17,000	42,500	2.26	2.14	7.61	<0.05	<1	2,400
03/19/2002	29,770	16,800	42,500	2.11	2.13	7.50	<0.05	<1	2,400
03/26/2002	29,860	16,600	42,600	2.29	2.05	7.49	<0.05	<1	2,600
04/02/2002	29,900	16,600	43,100	2.16	1.95	7.55	<0.05	<1	2,400
04/09/2002	29,979	16,800	43,300	2.34	2.05	7.55	<0.05	<1	2,500
04/16/2002	29,380	16,600	42,800	2.61	2.00	7.39	<0.05	<1	2,500
04/23/2002	29,500	17,000	42,800	2.46	2.00	7.50	<0.05	<1	2,400
05/07/2002	29,770	16,600	42,800	2.04	2.04	7.44	<0.05	<1	2,400
05/14/2002	30,060	16,600	42,700	2.06	2.05	7.49	<0.05	<1	2,300
05/21/2002	29,880	16,600	42,700	2.20	2.09	7.46	<0.05	<1	2,100
05/28/2002	30,368	16,400	43,200	2.05	2.02	7.43	<0.05	<1	2,300

mg/L = milligrams per liter
umhos = micromhos

*Wellhead was initially incorrectly completed. Sample port was connected to upper monitor zone.

City of Fort Lauderdale
RMW-1 Lower Monitor Zone

Date	1,500-1600 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/31/1995	24,176	16,000	33,500	1.61	0.44	7.47	0.01	9	1,400
04/07/1995	25,190	13,800	35,100	0.66	0.72	7.52	0.01	0	1,350
04/11/1995	24,984	13,600	35,000	0.68	0.45	7.47	0.03	0	1,350
04/19/1995	24,734	12,200	18,900	0.46	0.46	7.43	0.02	0	1,350
04/25/1995	24,149	12,200	27,100	0.66	0.72	7.52	0.01	0	1,350
05/02/1995	23,611	13,000	30,100	0.66	0.66	7.33	0.02	0	1,350
05/09/1995	23,851	13,200	34,700	0.99	0.88	7.48	0.06	0	1,250
05/16/1995	24,466	13,400	35,000	0.76	0.65	7.38	0.03	0	1,450
05/23/1995	23,452	13,200	36,100	0.72	0.55	7.43	0.06	0	1,400
05/30/1995	23,230	13,000	35,400	0.62	0.90	7.35	0.01	0	1,450
06/05/1995	23,320	12,800	35,600	0.59	0.53	7.58	0.01	0	1,250
06/13/1995	23,410	12,400	35,200	0.68	0.61	7.40	0.01	0	1,500
06/20/1995	27,592	13,600	36,300	0.57	0.47	7.44	0.05	0	1,300
06/27/1995	23,990	13,200	35,700	0.58	0.63	7.45	0.01	0	1,550
07/04/1995	23,735	13,400	36,200	0.72	0.49	7.21	0.01	0	1,300
07/11/1995	26,870	13,000	36,600	0.66	0.51	7.40	0.01	0	1,200
07/18/1995	23,130	13,200	36,500	1.87	0.64	7.37	0.24	0	1,350
07/25/1995	23,570	13,400	37,200	0.66	0.48	7.45	0.01	0	1,200
07/31/1995	24,840	14,200	38,800	0.69	0.37	7.42	0.01	0	1,900
08/08/1995	22,221	13,000	35,800	0.79	0.54	7.41	0.24	0	1,350
08/15/1995	23,797	13,600	36,600	0.55	0.47	7.49	0.01	0	1,250
08/22/1995	23,880	13,200	36,800	0.64	0.49	7.34	0.01	0	1,150
08/29/1995	23,351	13,600	36,900	0.65	0.46	7.39	0.04	0	1,150
09/05/1995	23,846	13,600	36,800	0.55	0.53	7.42	0.02	0	1,200
09/12/1995	23,810	13,600	36,500	0.54	0.47	7.40	0.01	0	1,100
09/19/1995	23,563	13,600	34,500	0.50	0.43	7.40	0.01	0	1,200
09/26/1995	23,675	13,800	37,400	0.57	0.54	7.40	0.01	0	1,200
10/03/1995	23,842	13,800	37,000	0.44	0.42	7.46	0.01	0	1,200
10/10/1995	23,666	13,600	36,700	0.68	0.47	7.31	0.01	0	1,400
11/07/1995	24,605	13,800	37,200	0.62	0.12	7.40	0.01	0	1,350
12/05/1995	24,349	13,800	38,000	0.74	0.51	7.40	0.01	0	1,350
01/02/1996	24,945	14,200	34,800	0.65	0.46	7.42	0.01	0	1,200
02/06/1996	24,730	13,600	37,000	0.79	0.41	7.44	0.01	0	1,350
03/05/1996	24,245	13,600	37,900	0.64	0.45	7.45	0.02	0	1,750
03/19/1996	23,653	13,600	37,300	0.64	0.44	7.43	0.01	0	1,350
04/02/1996	24,457	13,800	36,700	0.72	0.49	7.42	0.09	0	1,300
05/07/1996	24,994	13,500	37,500	0.66	0.50	7.50	<0.01	0	1,850
06/04/1996	24,609	15,200	37,400	0.55	0.45	7.49	<0.01	0	1,700
07/02/1996	24,609	14,200	37,800	0.64	0.27	7.53	0.02	0	1,350
08/06/1996	24,610	14,200	37,600	0.62	0.36	7.57	0.07	0	1,700
09/04/1996	24,390	14,400	37,600	0.57	0.38	7.38	0.01	0	NA
10/08/1996	25,100	14,000	38,600	0.53	0.45	7.61	0.02	0	1,450
10/15/1996	31,700	17,000	45,700	1.82	1.43	7.46	<0.01	0	2,250
11/05/1996	24,730	14,400	38,300	0.62	0.32	7.42	<0.01	0	1,400
12/02/1996	25,110	13,600	37,700	0.68	0.68	7.58	<0.01	0	1,350

City of Fort Lauderdale
RMW-1 Lower Monitor Zone

Date	1,500-1600 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
01/07/1997	25,876	14,400	39,400	0.47	0.39	7.41	0.01	0	1,400
02/04/1997	26,010	14,600	39,200	0.57	0.38	7.48	0.01	0	1,500
03/04/1997	25,547	14,200	39,900	0.53	0.39	7.45	0.01	0	1,650
04/08/1997	25,496	16,400	39,400	0.47	0.39	7.48	0.02	0	1,400
05/06/1997	25,086	16,200	38,800	0.59	0.38	7.57	0.06	0	1,450
06/03/1997	25,574	14,400	40,200	0.57	0.45	7.66	0.01	0	1,450
07/08/1997	25,260	15,600	37,900	0.44	0.34	7.47	<0.01	0	1,550
08/05/1997	25,506	14,400	39,400	0.48	0.40	7.31	<0.01	0	1,300
09/03/1997	25,111	15,400	38,800	0.52	0.50	7.53	<0.01	0	1,450
10/07/1997	25,557	14,000	40,500	0.49	0.40	7.44	<0.01	0	1,400
11/05/1997	24,750	14,000	39,200	0.55	0.38	7.52	<0.01	<1	1,400
12/02/1997	24,954	13,800	39,900	0.50	0.44	7.52	<0.01	<1	1,400
01/06/1998	26,990	14,800	44,000	0.65	0.49	7.53	<0.01	<1	1,500
02/03/1998	26,060	14,200	40,600	0.44	0.42	7.47	<0.01	<1	1,400
03/03/1998	25,201	12,600	40,600	0.52	0.33	7.35	<0.01	<1	1,400
05/05/1998	27,199	14,000	40,200	0.55	0.33	7.44	<0.01	<1	1,450
06/02/1998	26,250	15,400	39,500	0.65	0.41	7.54	<0.01	<1	1,500
07/07/1998	22,580	14,400	39,600	0.40	0.28	7.44	<0.01	<1	1,400
08/04/1998	25,444	15,200	40,000	0.66	0.35	7.38	<0.01	<1	1,600
09/01/1998	25,200	13,400	49,500	0.49	0.47	7.52	<0.05	<1	900
10/06/1998	25,526	14,200	38,600	0.67	0.43	7.45	<0.05	<1	1,600
12/08/1998	25,606	14,000	39,000	0.49	0.39	7.35	<0.05	<1	1,750
01/05/1999	26,813	13,400	39,900	0.51	0.37	7.50	<0.05	<1	1,600
02/02/1999	25,667	14,400	39,800	0.47	0.45	7.37	<0.05	<1	1,500
03/02/1999	25,370	14,200	39,800	0.68	0.46	7.52	<0.05	<1	1,450
04/06/1999	25,374	16,000	39,600	0.63	0.40	7.51	0.10	<1	1,650
05/04/1999	26,003	14,200	40,200	0.47	0.42	7.58	0.09	<1	1,850
06/08/1999	26,105	14,800	40,600	0.57	0.46	7.52	<0.05	<1	1,650
07/06/1999	25,511	13,800	40,000	0.57	0.43	7.45	0.10	<1	1,150
08/03/1999	25,120	13,600	39,700	0.56	0.43	7.63	0.11	<1	1,300
09/07/1999	27,080	14,600	41,000	0.55	0.40	7.60	<0.05	<1	1,300
10/05/1999	25,680	14,800	40,600	0.44	0.38	7.56	<0.05	<1	1,250
11/02/1999	26,070	14,800	40,300	0.42	0.42	7.56	<0.05	<1	1,260
12/07/1999	25,591	14,400	41,100	0.41	0.40	7.47	<0.05	<1	1,350
01/04/2000	27,119	14,400	40,700	0.48	0.43	7.36	<0.05	<1	1,150
02/01/2000	25,490	14,200	40,000	0.64	0.42	7.47	<0.05	<1	1,450
03/07/2000	25,950	15,200	41,400	0.56	0.38	7.40	<0.05	<1	1,700
04/04/2000	25,779	15,940	40,900	0.67	0.39	7.47	<0.05	<1	1,600
05/02/2000	25,260	13,820	39,600	0.54	0.41	7.68	<0.05	<1	1,300
06/06/2000	25,252	15,186	39,600	0.55	0.40	7.54	<0.05	<1	1,250
07/05/2000	22,858	16,075	36,400	0.61	0.43	7.73	<0.05	<1	2,000
08/01/2000	24,649	16,875	38,700	0.44	0.42	7.56	<0.05	<1	550
09/05/2000	24,750	15,660	39,500	0.61	0.44	7.67	<0.05	<1	1,200
10/03/2000	25,810	16,500	39,400	0.62	0.40	7.73	<0.05	<1	1,250
11/07/2000	25,340	16,300	39,300	0.50	0.40	7.66	<0.05	<1	1,300

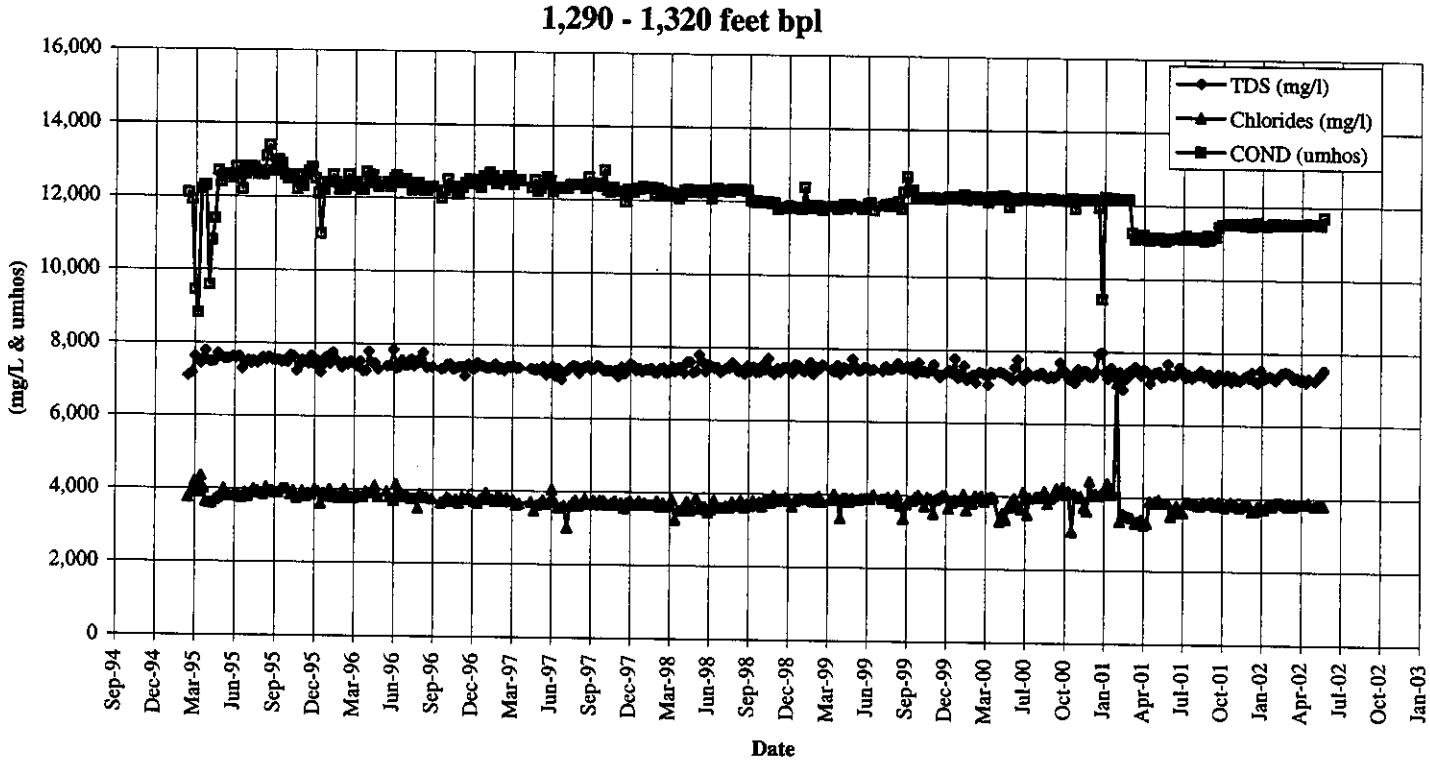
City of Fort Lauderdale RMW-1 Lower Monitor Zone									
Date	1,500-1600 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
12/05/2000	25,673	16,380	39,700	0.60	0.71	7.75	<0.05	<1	1,100
01/02/2001	25,120	16,760	40,300	0.64	0.39	7.90	<0.05	#N/A	1,550
02/06/2001	25,950	12,160	40,300	0.64	0.43	8.02	0.09	<1	1,400
03/06/2001	25,640	12,000	36,700	0.58	0.43	8.07	<0.05	<1	1,450
04/03/2001	26,860	12,200	37,300	0.58	0.39	8.10	<0.05	0	1,450
05/01/2001	25,391	14,800	36,400	0.56	0.32	8.02	<0.05	<1	1,100
06/05/2001	25,400	14,800	36,400	0.56	0.39	7.58	0.90	<1	1,500
07/10/2001	25,680	14,500	36,600	0.58	0.40	7.57	<0.05	<1	1,250
08/07/2001	26,170	15,000	37,600	0.69	0.38	7.64	<0.05	<1	1,450
09/04/2001	25,838	14,800	36,600		0.39	7.56	<0.05	<1	1,350
10/02/2001	26,070	15,000	38,600	1.03	0.38	7.59	<0.05	<1	1,350
01/08/2002	25,450	15,000	38,000	0.76	0.43	7.50	<0.05	<1	1,700
02/05/2002	25,717	15,000	38,400	0.86	0.43	7.64	0.08	<1	1,500
03/05/2002	26,314	15,000	38,900	0.74	0.38	7.63	<0.05	<1	1,550
04/02/2002	26,370	15,400	39,200	0.80	0.40	7.58	<0.05	<1	1,550
05/07/2002	25,667	15,400	38,500	0.67	0.41	7.50	<0.05	<1	1,450

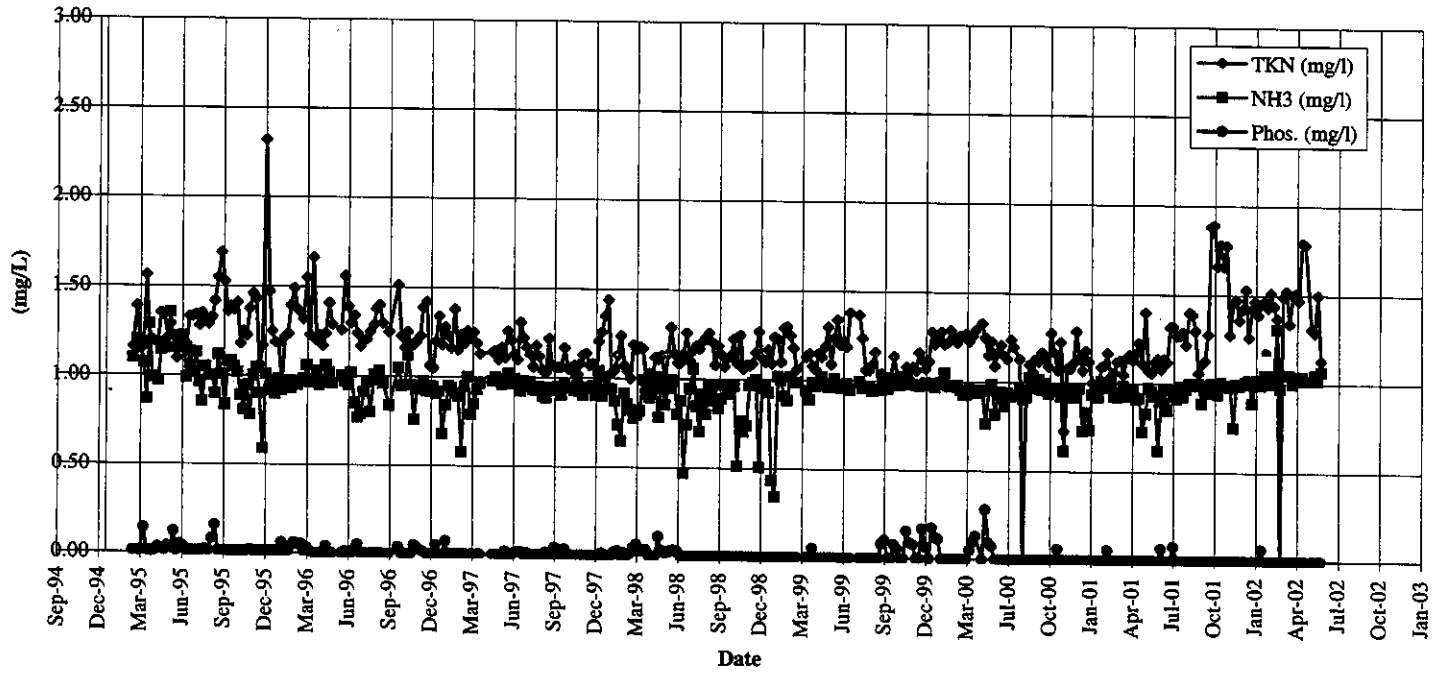
City of Fort Lauderdale
RMW-1 Upper Monitor Zone

Date	1,300-1,350 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
03/31/1995	5,839	2,900	9,620	0.84	0.73	8.04	0.64	0.00	800
04/07/1995	5,777	2,900	9,680	1.03	1.16	8.12	0.01	0.00	825
04/11/1995	5,994	2,950	9,680	0.97	0.68	7.83	0.03	0.00	800
04/19/1995	5,942	2,650	7,440	0.92	0.70	7.86	0.06	0.00	700
04/25/1995	5,857	2,700	8,720	0.98	0.79	7.86	0.03	0.00	825
05/02/1995	5,886	2,800	9,200	0.96	0.87	7.64	0.02	0.00	725
05/09/1995	5,878	2,800	10,000	0.73	0.55	8.05	0.01	0.00	825
05/16/1995	6,009	2,750	9,680	0.99	1.28	7.76	0.03	0.00	800
05/23/1995	5,856	2,750	10,000	1.23	0.82	8.08	0.12	0.00	775
05/30/1995	5,880	2,750	9,690	0.95	1.06	7.69	0.01	0.00	775
06/05/1995	5,890	2,850	9,900	0.96	0.88	8.08	0.01	0.00	775
06/13/1995	5,838	2,800	9,480	1.07	1.13	7.86	0.08	0.00	850
06/20/1995	5,978	2,800	9,800	0.98	0.76	7.83	0.01	0.00	775
06/27/1995	5,950	2,800	9,620	1.10	0.78	7.74	0.01	0.00	900
07/04/1995	5,890	2,900	9,900	1.17	0.82	7.69	0.01	0.00	650
07/11/1995	6,508	2,900	9,900	1.23	0.81	7.71	0.02	0.00	625
07/18/1995	5,760	2,850	10,000	1.17	0.85	7.78	0.08	0.00	825
07/25/1995	5,909	3,000	9,960	1.14	0.78	7.66	0.01	0.00	675
07/31/1995	5,703	2,900	9,680	1.08	0.52	8.15	0.01	0.00	975
08/08/1995	5,936	2,950	9,950	1.03	0.82	7.73	0.01	0.00	675
08/15/1995	5,876	2,900	9,860	0.93	0.79	7.93	0.01	0.00	750
08/22/1995	5,955	2,850	9,800	1.01	0.80	7.89	0.01	0.00	725
08/29/1995	5,875	2,900	10,200	1.11	0.71	7.88	0.01	0.00	750
09/05/1995	5,964	2,950	10,300	0.80	0.80	7.94	0.01	0.00	700
09/12/1995	5,905	2,900	9,720	1.20	0.74	7.84	0.01	0.00	700
09/19/1995	5,900	2,900	9,800	1.01	0.67	7.79	0.01	0.00	675
09/26/1995	5,895	3,000	10,100	0.92	0.81	7.80	0.01	0.00	900
10/03/1995	5,891	3,000	9,820	1.10	0.73	7.85	0.01	0.00	750
10/10/1995	5,840	3,000	10,000	1.11	0.81	7.76	0.01	0.00	700
11/07/1995	5,883	2,800	9,520	1.10	0.78	7.64	0.01	0.00	700
12/05/1995	5,872	2,850	9,900	1.05	0.70	7.87	0.01	0.00	750
01/02/1996	5,830	2,900	8,600	0.87	0.72	7.84	0.01	0.00	600
02/06/1996	5,910	2,900	9,420	1.03	0.77	7.98	0.01	0.00	675
03/05/1996	5,834	2,900	9,660	1.25	0.77	7.98	0.09	0.00	750
03/19/1996	5,666	2,900	9,580	1.21	0.89	7.98	0.01	0.00	625
04/02/1996	5,840	2,900	9,330	1.30	0.81	7.96	0.05	0.00	700
05/07/1996	5,857	3,750	9,510	1.03	1.03	7.87	<0.01	0.00	725
06/04/1996	5,889	2,950	9,500	1.05	0.81	7.92	<0.01	0.00	725
07/02/1996	6,042	2,750	9,600	1.14	0.62	7.89	<0.01	0.00	700
08/06/1996	5,775	2,850	9,700	1.24	0.18	7.97	<0.01	0.00	800
09/04/1996	5,790	2,850	9,400	1.04	0.77	7.84			
10/08/1996	5,773	2,800	9,680	1.20	0.81	8.04	<0.01	0.00	725
10/15/1996	7,310	3,700	12,000	1.11	0.97	8.04	<.0.01	0.00	800
11/05/1996	5,750	2,800	9,640	1.30	0.77	8.04	<0.01	0.00	900
12/02/1996	5,810	2,850	9,420	1.07	0.76	8.08	<0.01	0.00	900

City of Fort Lauderdale RMW-1 Upper Monitor Zone									
Date	1,300-1,350 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
01/07/1997	5,728	2,800	9,430	0.85	0.72	8.14	<0.01	0.00	800
02/04/1997	5,790	2,900	9,580	0.99	0.74	8.14	0.01	0.00	900
03/04/1997	5,767	2,800	9,570	0.95	0.74	8.04	<0.01	0.00	1,000
04/08/1997	5,719	2,600	9,700	0.93	0.72	8.04	<0.01	0.00	850
05/06/1997	5,709	3,200	9,700	0.94	0.74	7.96	<0.01	0.00	900
06/03/1997	5,640	2,800	9,650	0.89	0.76	8.21	<0.01	0.00	900
07/08/1997	5,665	2,950	9,400	0.99	0.70	8.05	<0.01	0.00	800
08/05/1997	5,751	2,800	9,700	0.86	0.73	7.87	<0.01	0.00	800
09/03/1997	5,791	2,850	9,460	0.89	0.75	8.09	<0.01	0.00	850
10/07/1997	5,789	2,800	9,720	0.84	0.73	7.95	<0.01	0.00	900
11/05/1997	5,747	2,800	9,560	0.96	0.81	7.95	<0.01	<1	900
12/02/1997	5,646	2,750	9,540	0.90	0.71	8.09	<0.01	<1	850
01/06/1998	5,770	2,750	9,600	1.01	0.79	7.96	<0.01	<1	900
02/03/1998	5,770	2,750	9,610	1.35	0.74	8.03	<0.01	<1	800
03/03/1998	5,599	1,800	9,560	0.83	0.63	7.99	<0.01	<1	600
05/05/1998	5,777	2,600	9,430	1.05	0.60	8.12	<0.01	<1	800
06/02/1998	5,990	2,150	9,690	1.09	0.76	7.95	<0.01	<1	900
07/07/1998	5,570	2,800	9,290	0.82	0.39	0.81	<0.01	<1	750
08/04/1998	5,680	2,750	9,590	0.98	0.68	7.94	<0.01	<1	900
09/01/1998	5,775	2,800	9,600	0.99	0.80	8.07	<0.05	<1	900
10/06/1998	5,841	2,800	9,380	0.94	0.76	7.98	<0.05	<1	950
12/08/1998	5,620	2,750	9,090	0.88	0.73	8.04	<0.05	<1	1,000
01/05/1999	5,857	2,650	9,150	1.08	0.73	8.16	<0.05	<1	900
02/02/1999	5,802	2,900	9,650	0.87	0.80	8.12	<0.05	<1	900
03/02/1999	5,760	2,950	9,290	0.99	0.81	8.03	<0.05	<1	900
04/06/1999	5,755	2,950	9,240	0.92	0.74	8.06	<0.05	<1	850
05/04/1999	5,794	2,900	9,220	0.82	0.78	8.18	<0.05	<1	1,100
06/08/1999	5,826	2,900	9,170	1.05	0.76	8.11	<0.05	<1	850
07/06/1999	5,841	2,450	9,320	1.03	0.82	8.08	<0.05	<1	700
08/03/1999	5,810	2,950	9,270	1.02	0.80	8.24	0.05	<1	750
09/07/1999	5,870	2,950	9,390	0.97	0.74	8.21	<0.05	<1	750
10/05/1999	5,650	2,950	9,540	0.83	0.73	8.22	<0.05	<1	800
11/02/1999	5,790	2,900	9,460	0.83	0.77	8.12	<0.05	<1	750
12/07/1999	5,651	2,900	9,320	0.83	0.75	8.09	<0.05	<1	750
01/04/2000	5,922	2,700	9,480	0.95	0.76	7.99	<0.05	<1	750
02/01/2000	5,710	2,900	9,320	1.03	0.76	8.14	<0.05	<1	700
03/07/2000	5,520	2,850	9,320	0.95	0.70	7.80	<0.05	<1	850
04/04/2000	6,463	3,440	9,850	1.11	0.74	8.13	<0.05	<1	900
05/02/2000	5,645	2,840	9,480	1.20	0.74	8.09	<0.05	<1	800
06/06/2000	5,826	3,570	9,470	1.04	0.73	8.06	<0.05	<1	650
07/05/2000	5,878	3,105	9,600	0.95	0.71	8.17	<0.05	<1	550
08/01/2000	5,759	3,200	9,490	0.93	0.70	8.03	<0.05	<1	550
09/05/2000	5,640	3,100	9,470	0.97	0.78	8.08	<0.05	<1	750
10/03/2000	5,713	3,715	9,460	0.91	0.69	8.29	<0.05	<1	900
11/07/2000	5,750	3,700	9,560	0.84	0.75	8.20	<0.05	<1	700

City of Fort Lauderdale RMW-1 Upper Monitor Zone									
Date	1,300-1,350 feet bpl								
	TDS (mg/l)	Chlorides (mg/l)	COND (umhos)	TKN (mg/l)	NH3 (mg/l)	pH (units)	Phos. (mg/l)	Fecal Coliform	Sulfate (mg/l)
12/05/2000	5,695	3,630	9,620	1.31	0.71	8.29	<0.05	<1	600
01/02/2001	5,690	3,690	9,480	0.93	0.74	8.28	<0.05	#N/A	500
02/06/2001	5,870	2,740	9,520	0.93	0.77	8.30	<0.05	<1	750
03/06/2001	5,740	2,190	8,860	0.92	0.74	8.45	<0.05	<1	750
04/03/2001	5,990	2,210	8,820	0.99	0.73	8.64	<0.05	0.00	700
05/01/2001	5,710	2,900	8,730	0.92	0.58	8.52	<0.05	<1	600
06/05/2001	5,600	2,900	8,680	0.95	0.68	8.09	0.90	<1	700
07/10/2001	5,660	2,900	8,750	1.08	0.74	8.10	<0.05	<1	600
08/07/2001	5,610	2,850	8,600	1.02	0.74	8.22	<0.05	<1	750
09/04/2001	5,681	2,900	8,740	1.02	0.68	8.18	<0.05	<1	700
10/02/2001	5,620	2,850	9,070	1.55	0.75	8.32	<0.05	<1	600
01/08/2002	5,600	3,000	9,060	1.20	0.77	8.13	<0.05	<1	650
02/05/2002	5,528	2,900	8,980	1.26	0.78	8.13	0.11	<1	650
03/05/2002	5,722	2,950	8,980	1.24	0.76	8.15	<0.05	<1	850
04/02/2002	5,550	2,850	8,850	1.22	0.75	8.17	<0.05	<1	800





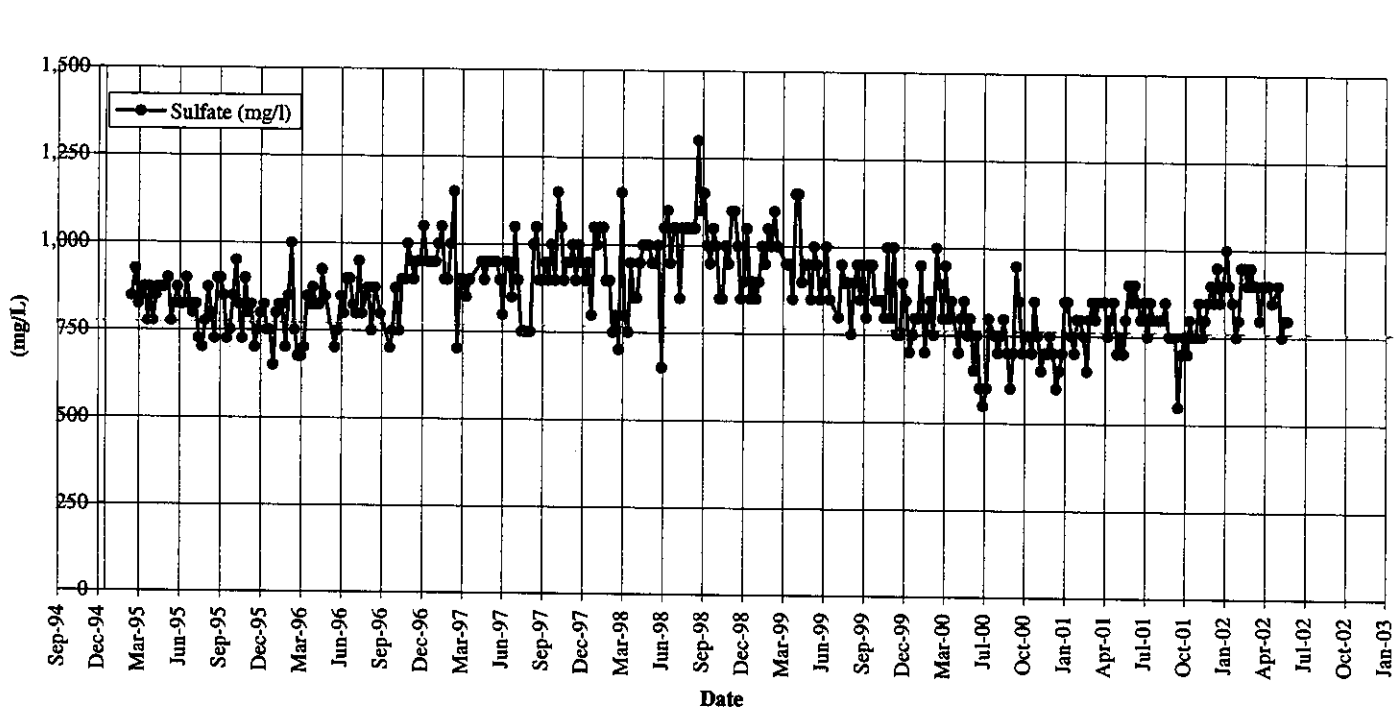
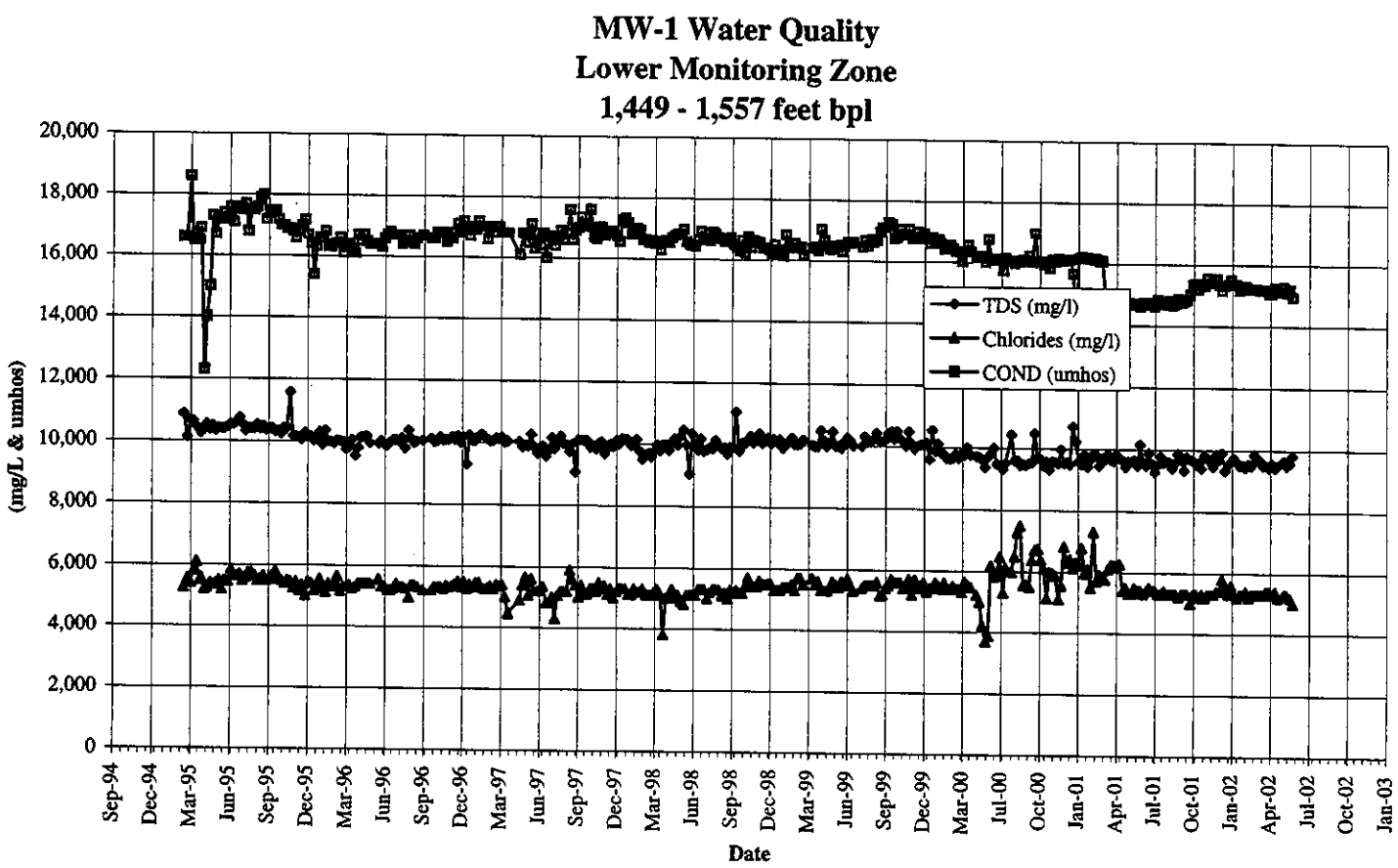
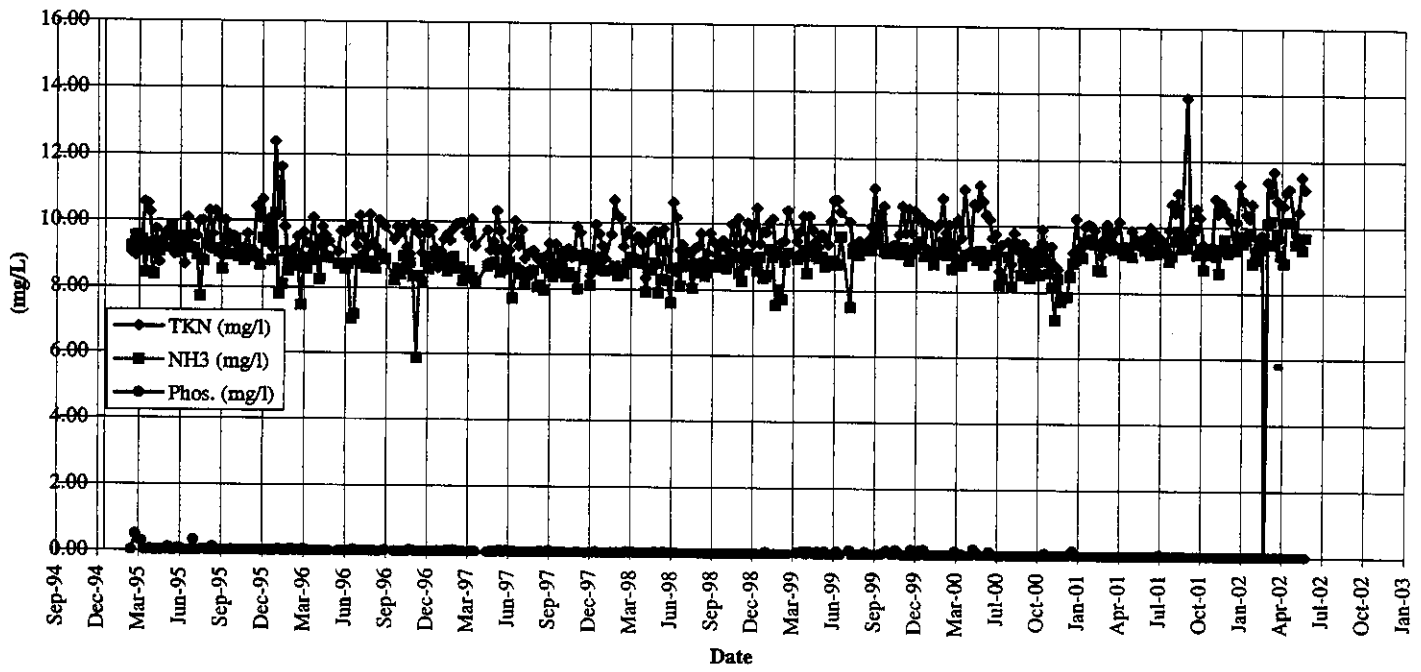


FIGURE 1
MW-1 Water Quality - Upper Monitoring Zone
Fort Lauderdale George T. Lohmeyer Injection System

CH2MHILL

MW1.XLS 06/25/2002





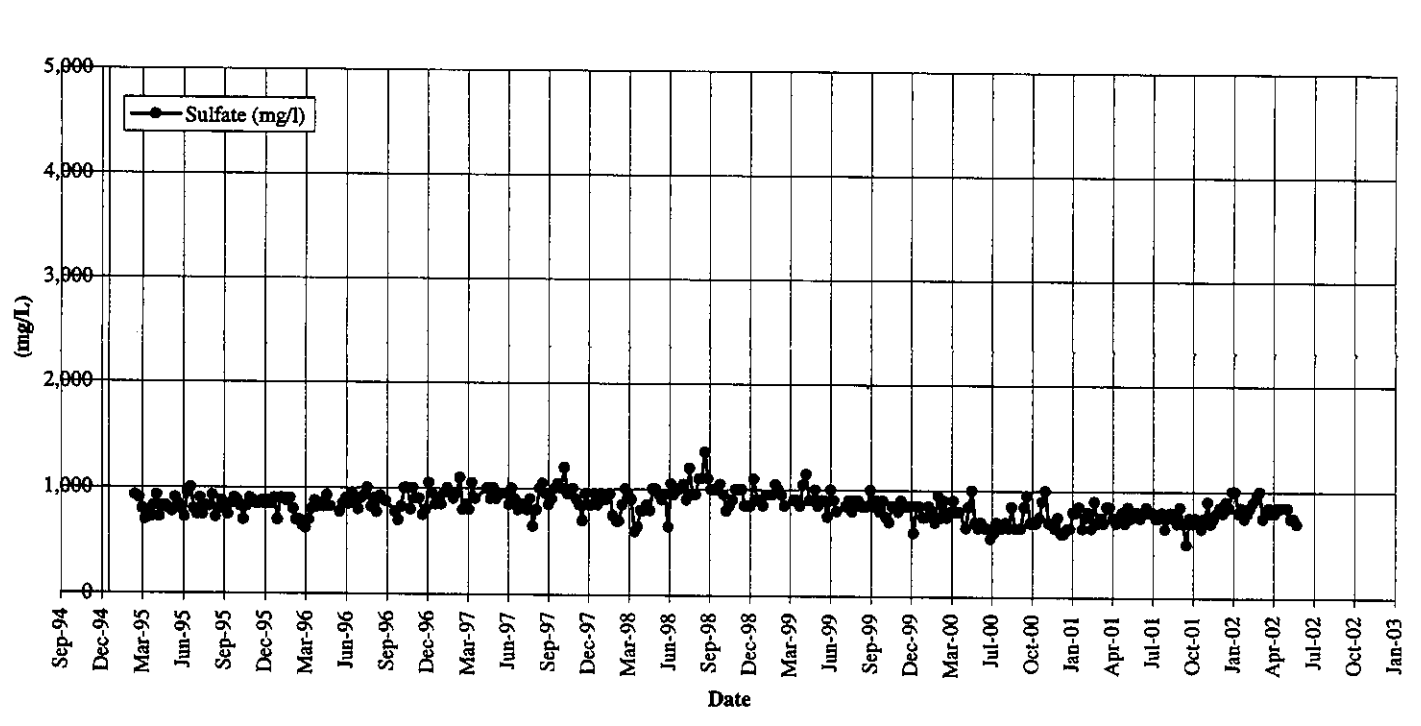
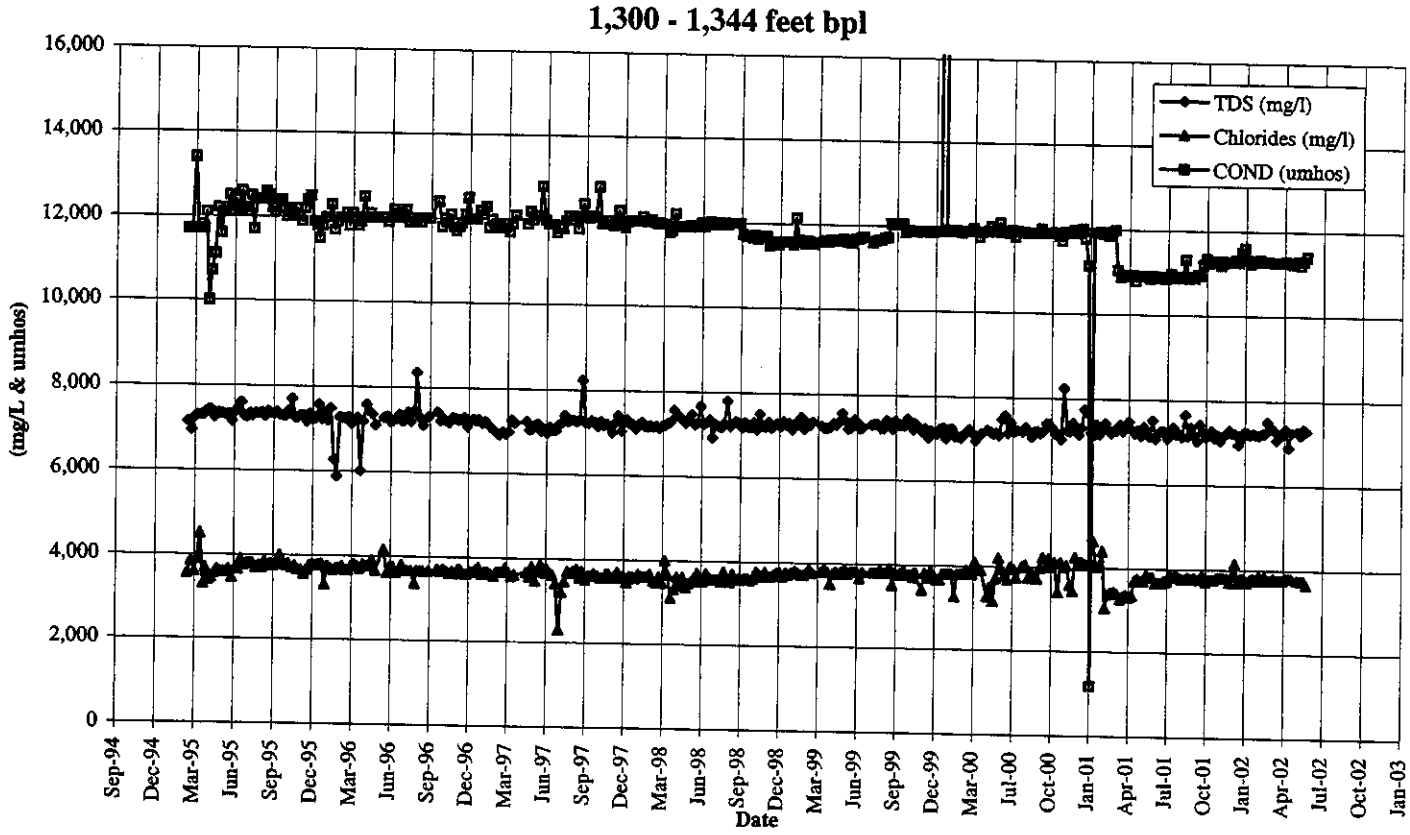
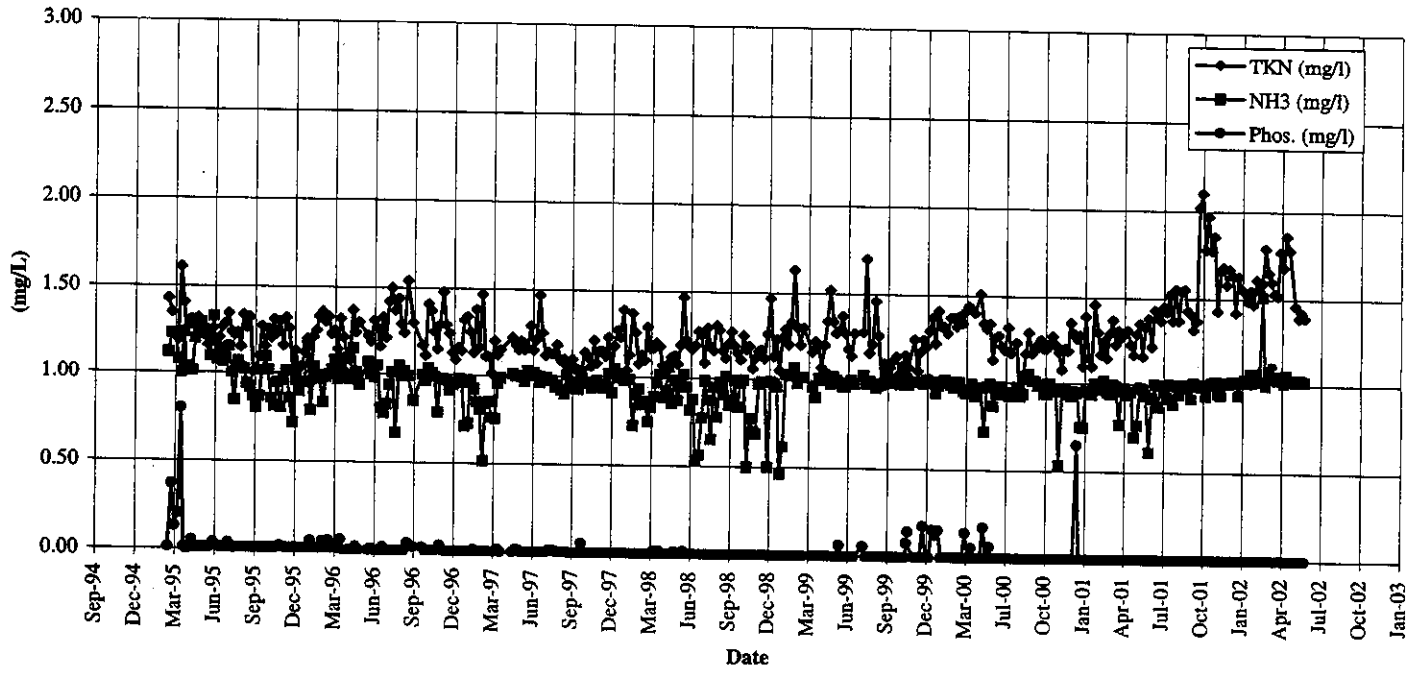


FIGURE 2
MW-1 Water Quality - Lower Monitoring Zone
Fort Lauderdale George T. Lohmeyer Injection System

MW-2 Water Quality
Upper Monitoring Zone
1,300 - 1,344 feet bpl





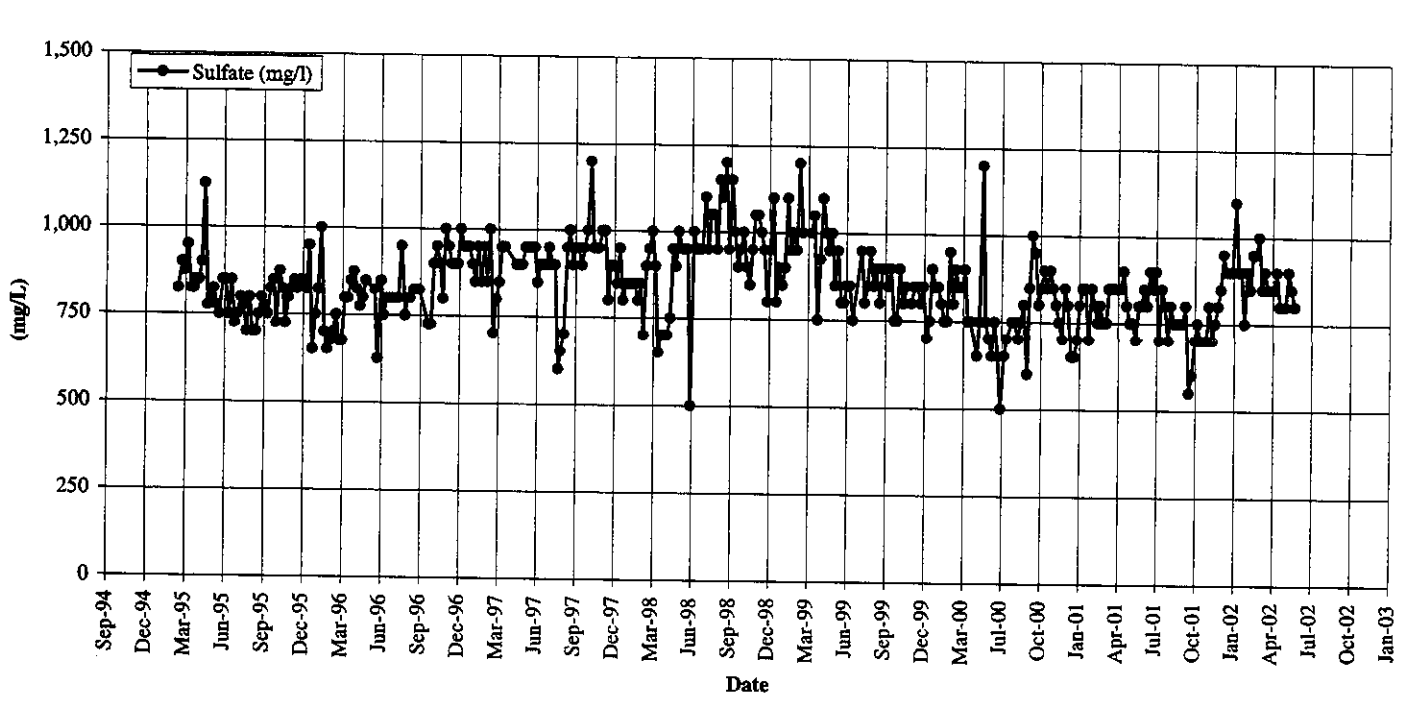


FIGURE 3
MW-2 Water Quality - Upper Monitoring Zone
Fort Lauderdale George T. Lohmeyer Injection System

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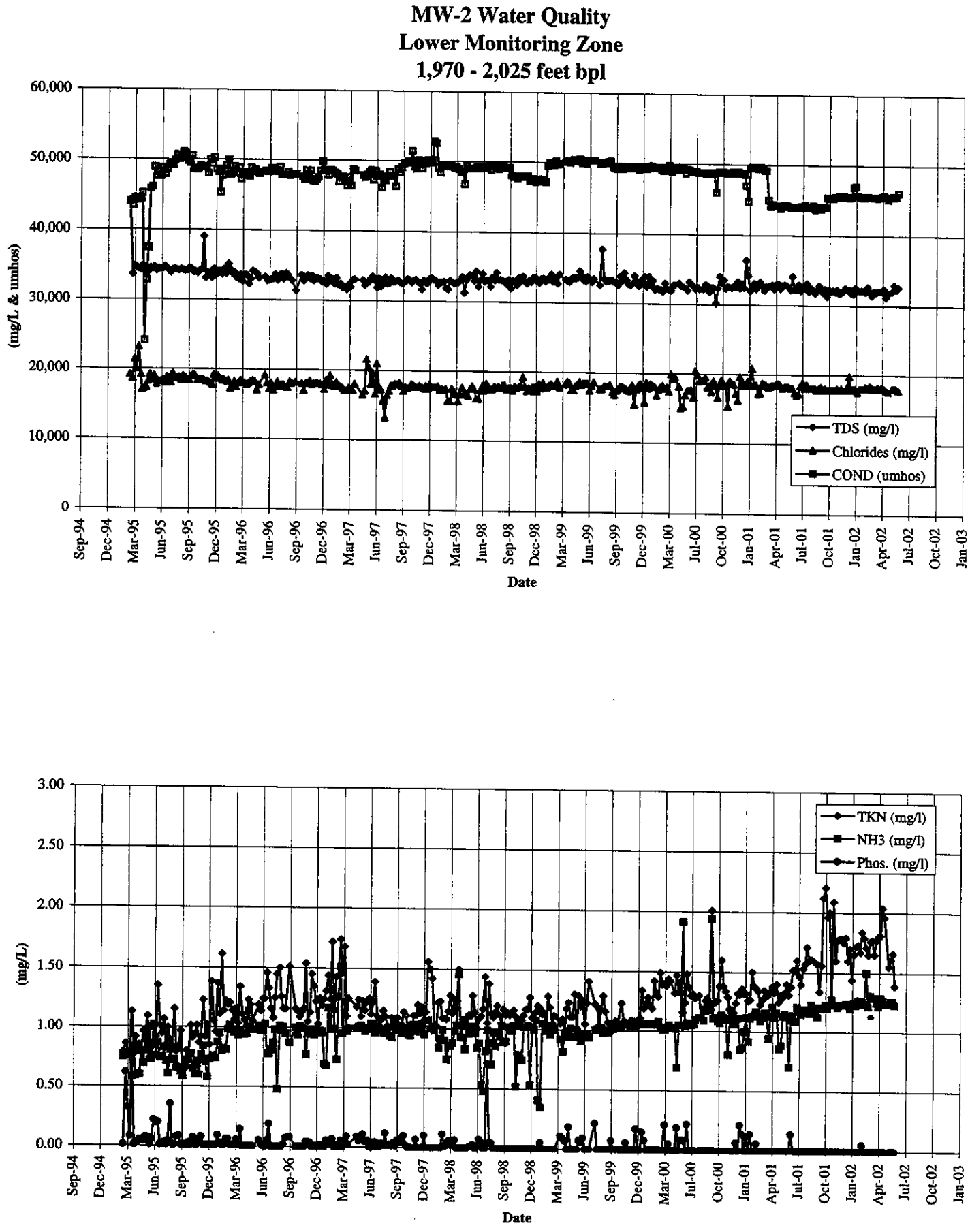
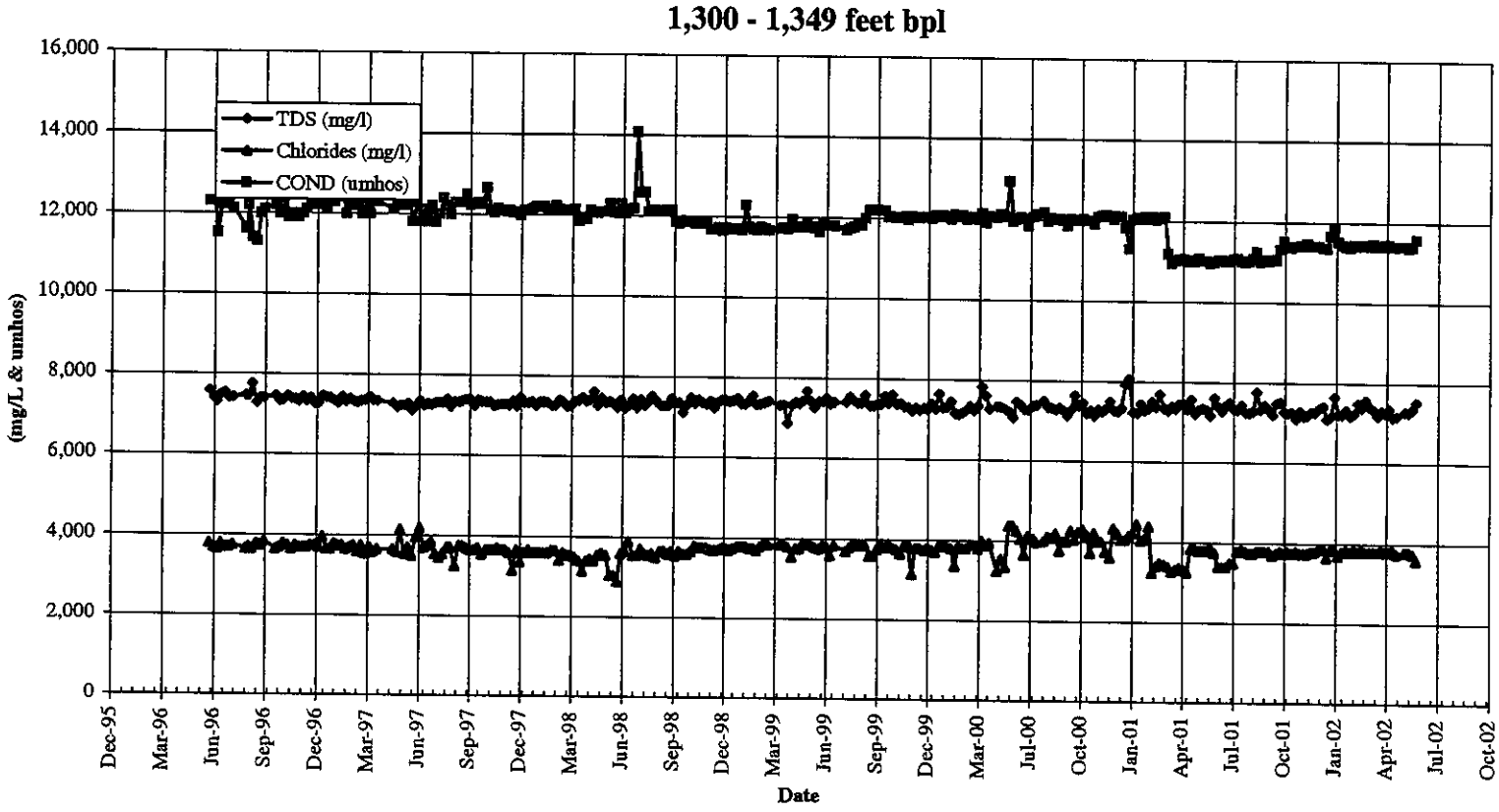
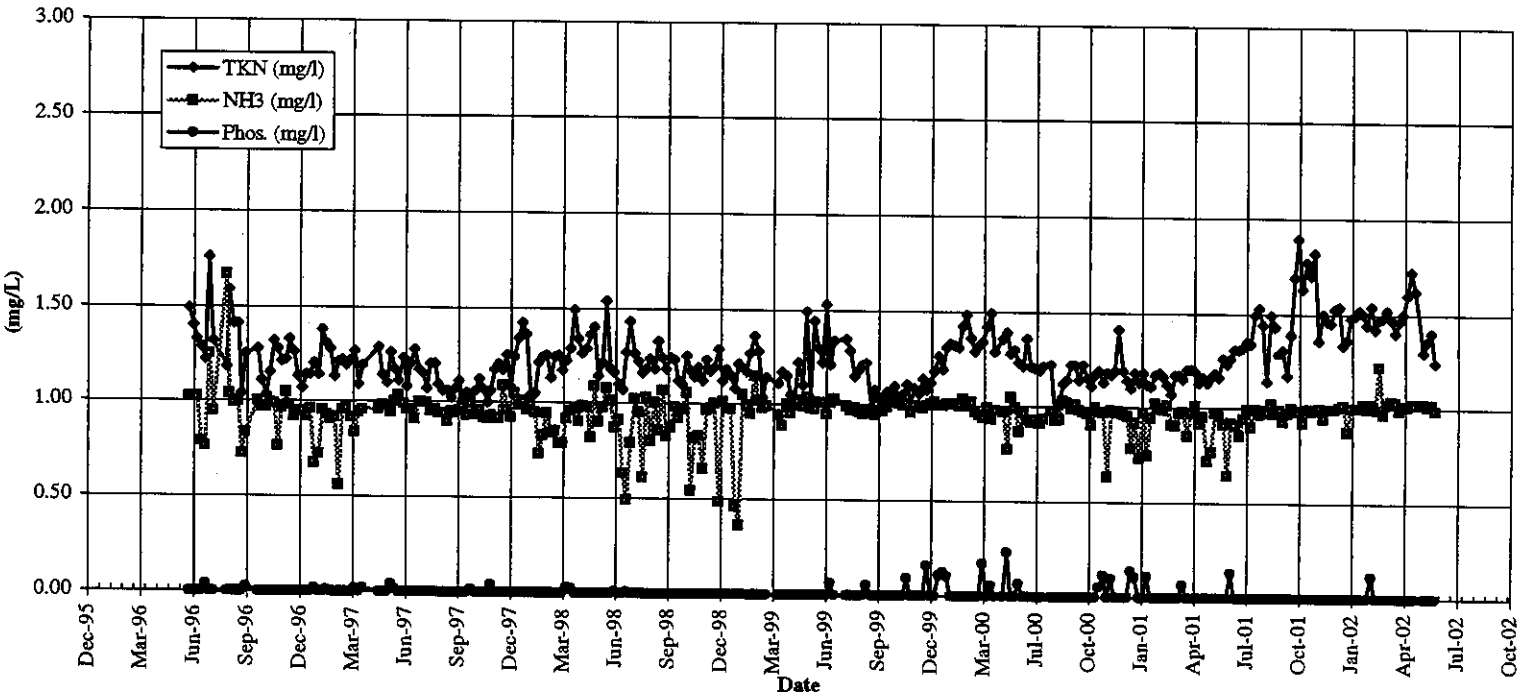


FIGURE 4
MW-2 Water Quality - Lower Monitoring Zone
Fort Lauderdale George T. Lohmeyer Injection System





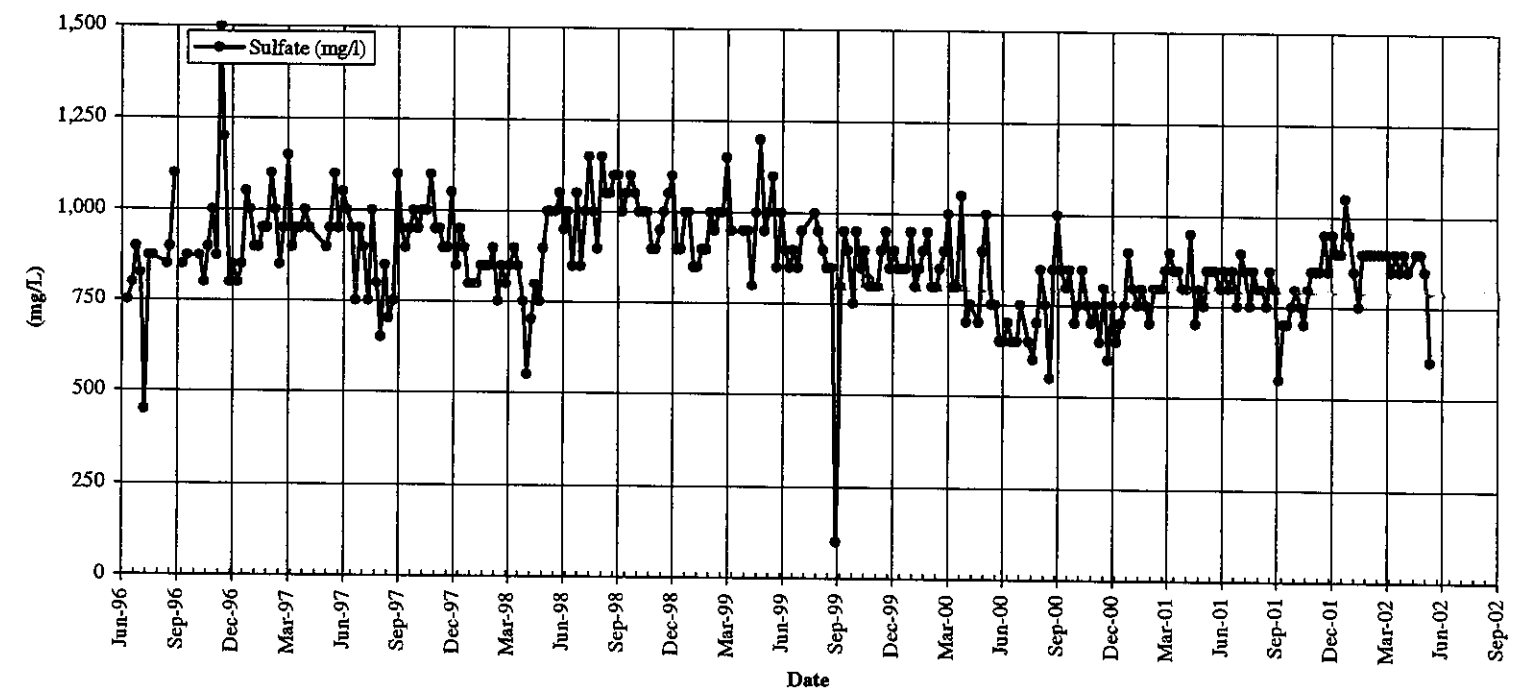


FIGURE 5
MW-3 Water Quality - Upper Monitoring Zone
Fort Lauderdale George T. Lohmeyer Injection System

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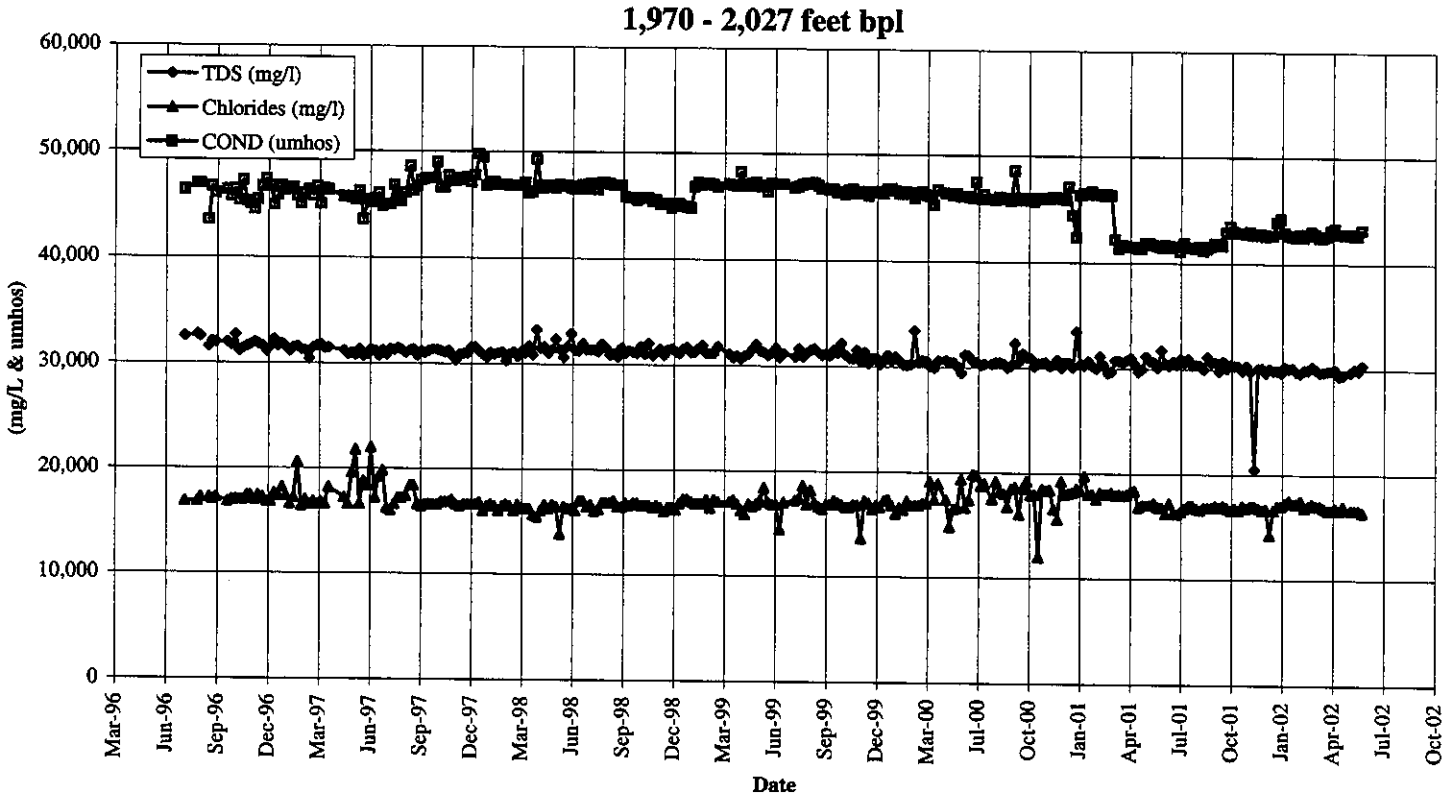
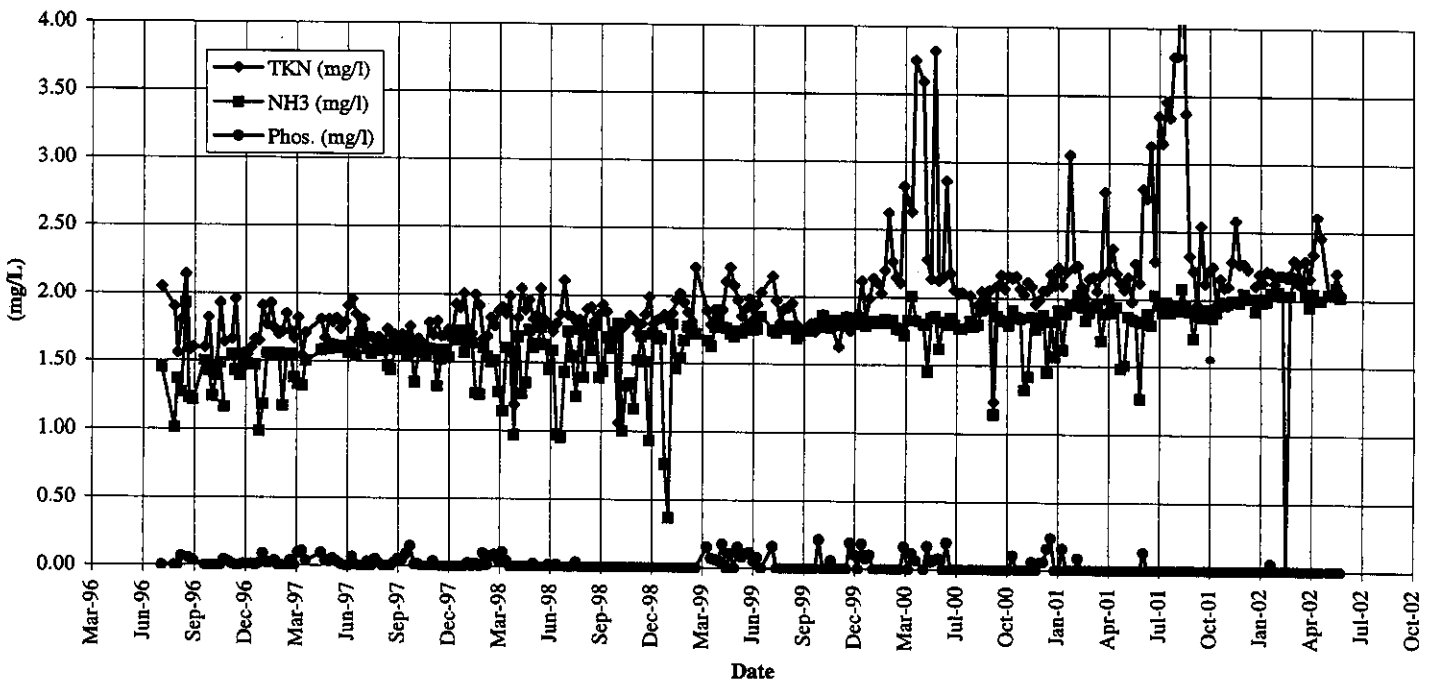




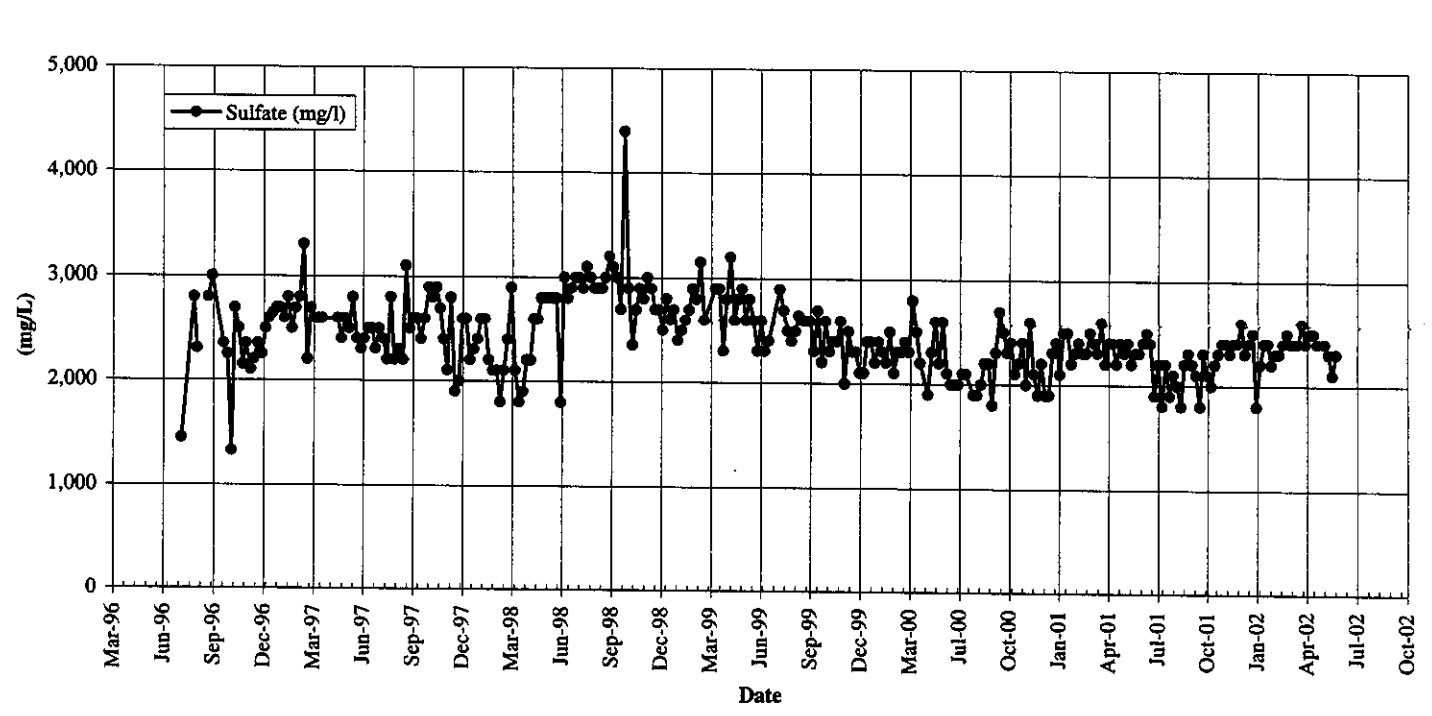
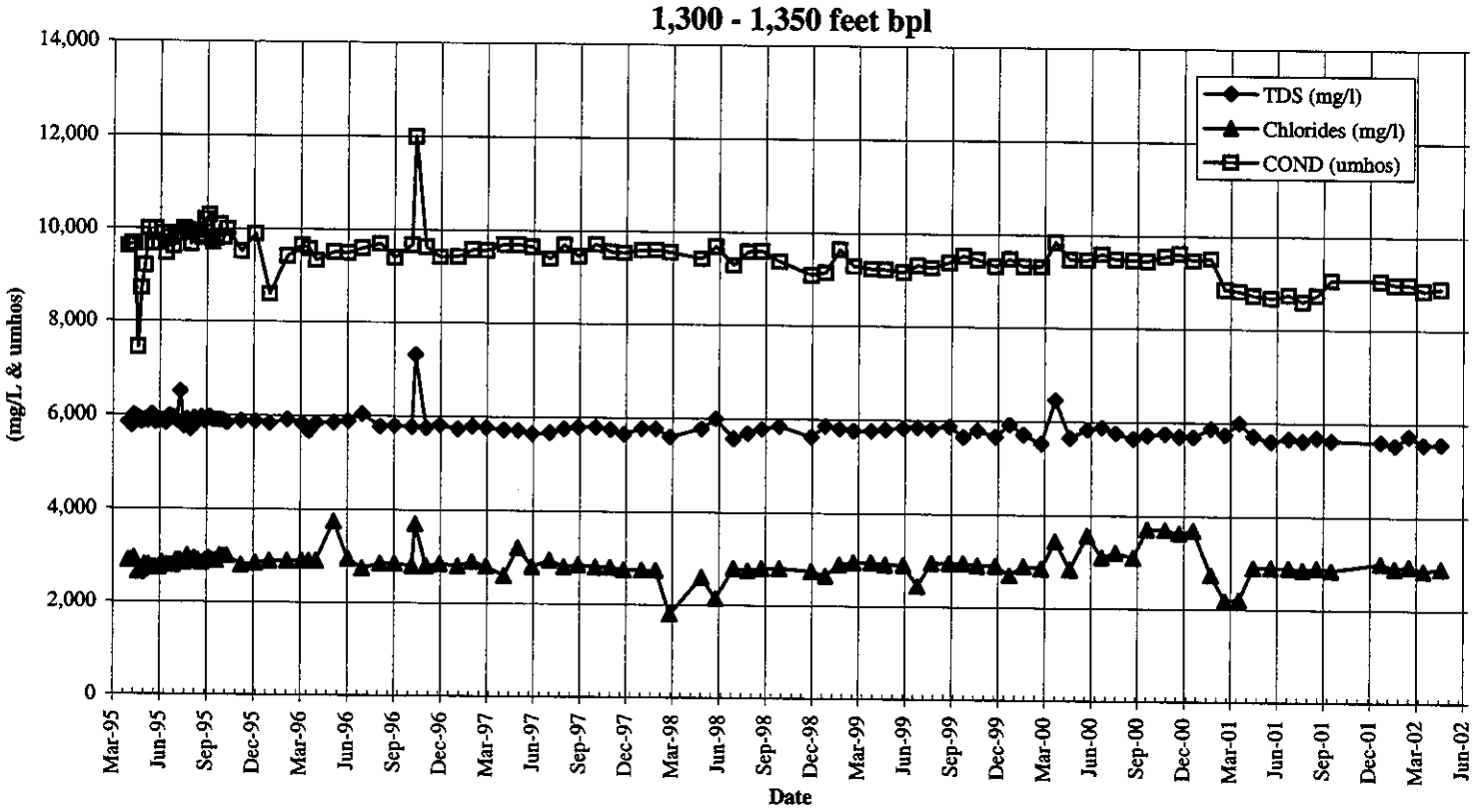
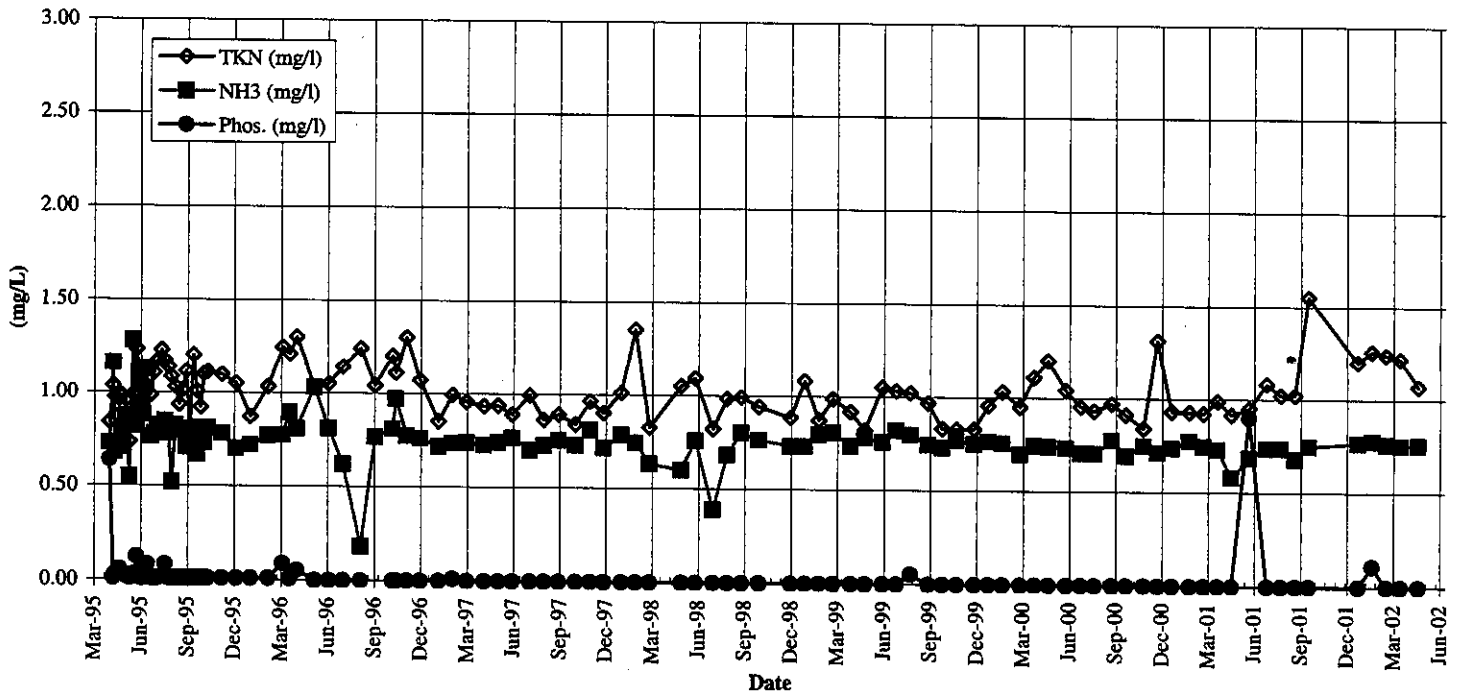


FIGURE 6
MW-3 Water Quality - Lower Monitoring Zone
Fort Lauderdale George T. Lohmeyer Injection System





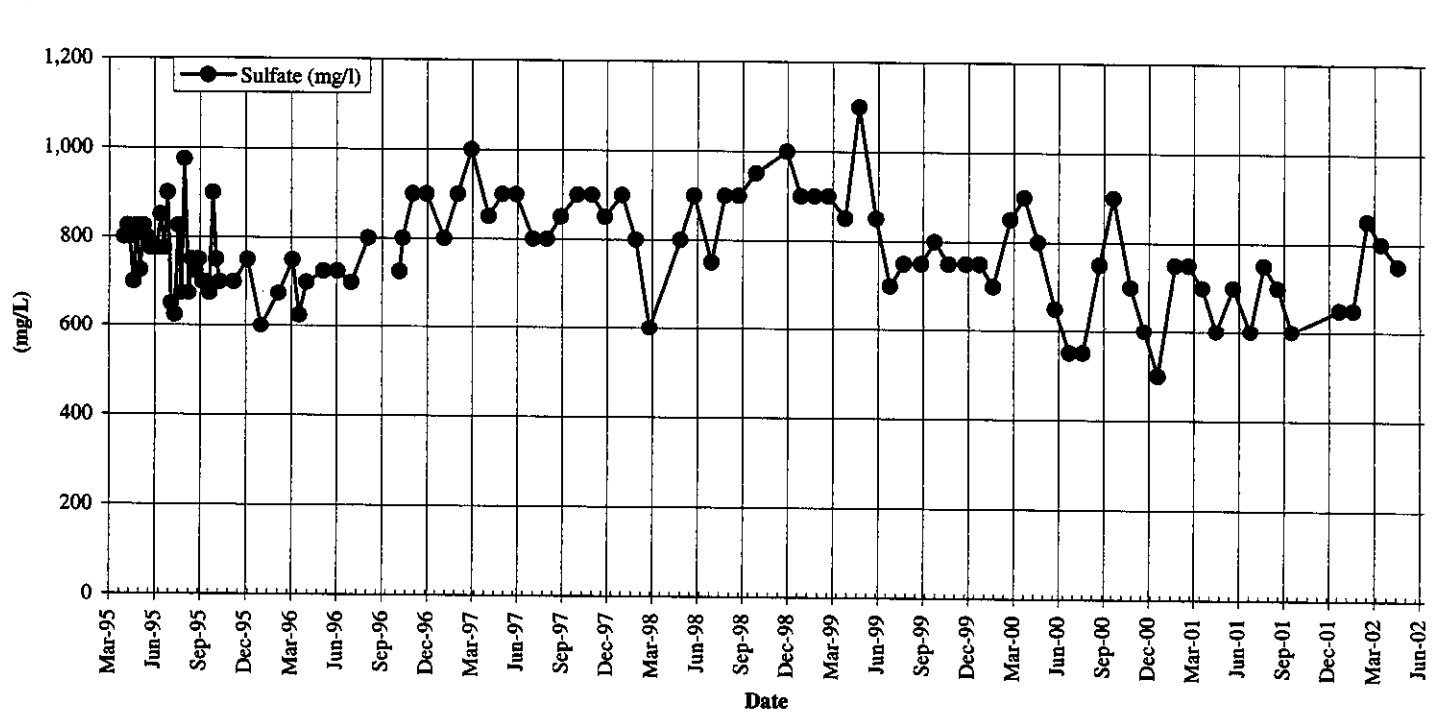
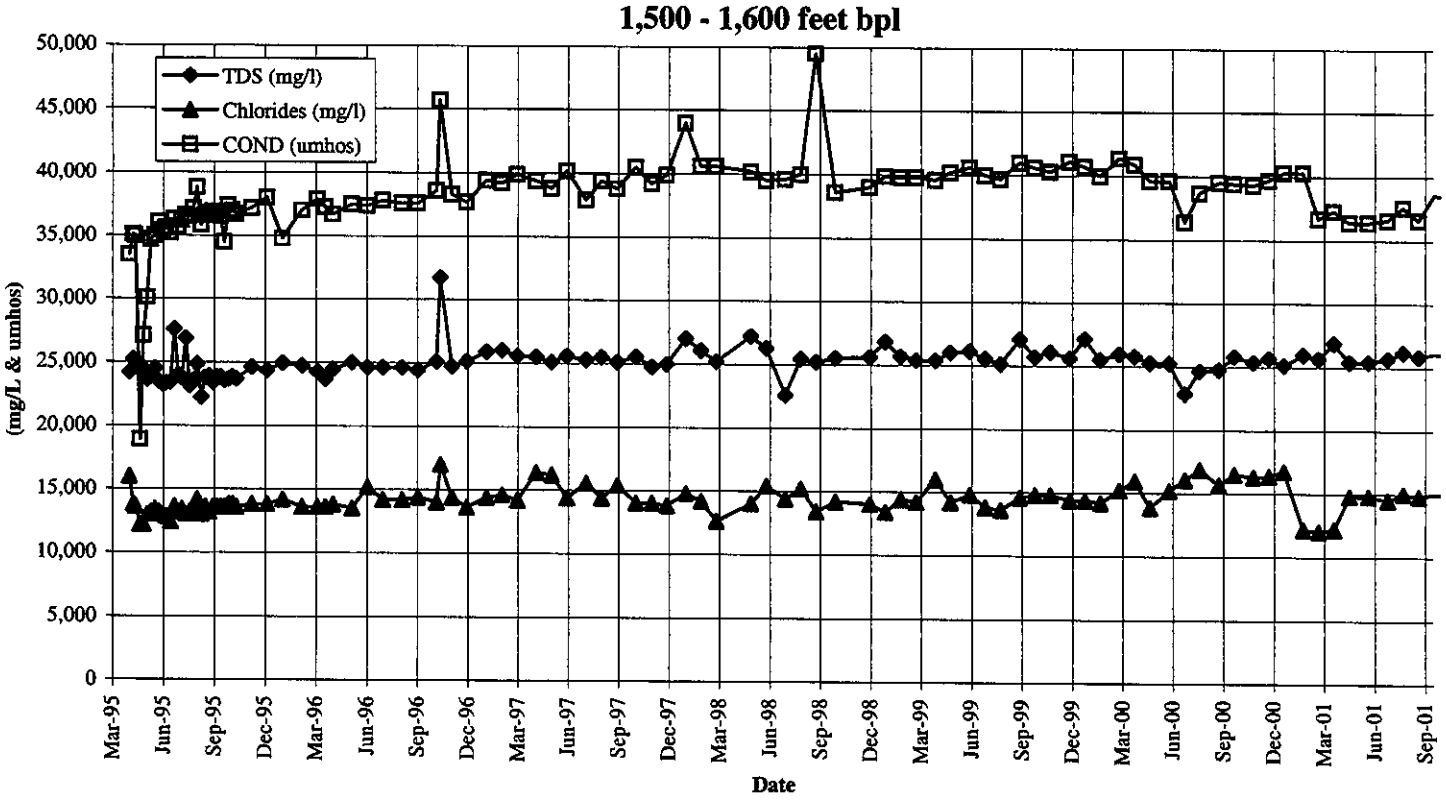
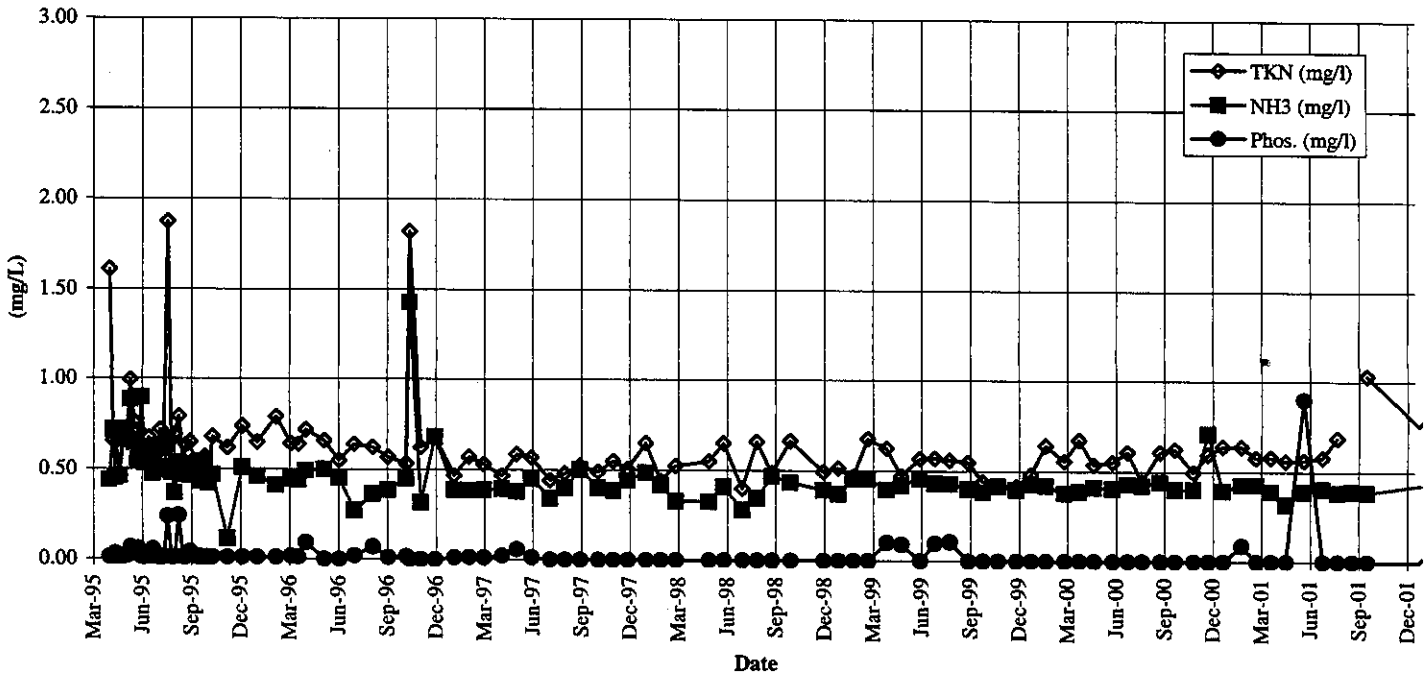


FIGURE 11
RMW Water Quality - Upper Monitoring Zone
Fort Lauderdale George T. Lohmeyer Wastewater Treatment Plant





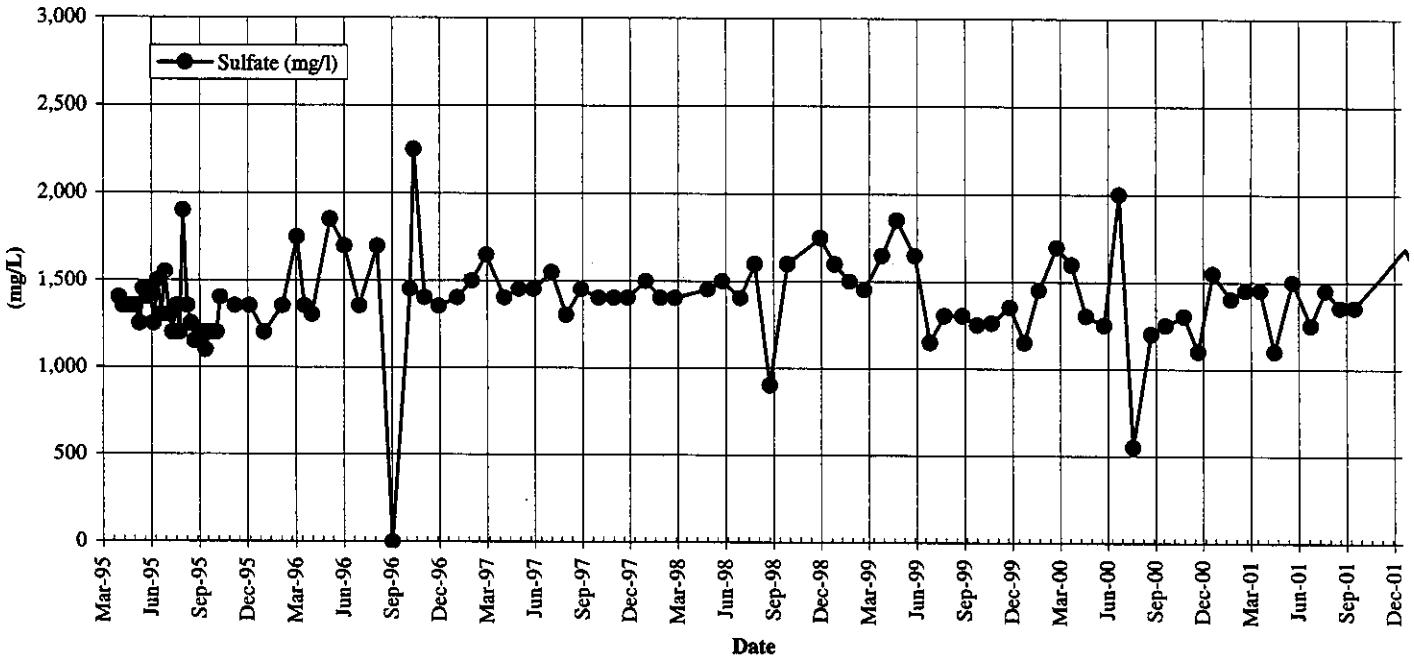


FIGURE 12
RMW Water Quality - Lower Monitoring Zone
Fort Lauderdale George T. Lohmeyer Wastewater Treatment Plant