



Engineering Well Completion Report
South Collier Regional WTP
8-mgd R.O. Expansion
Concentrate Disposal System

Prepared for
Collier County
County Project No. 70054

September 2003

Prepared by

Project No. 40226

Metcalf & Eddy

HAZEN AND SAWYER
Engineering, Architecture, & Construction

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Appendix A
FDEP Construction Permit



Department of Environmental Protection

COPY

Jeb Bush
Governor

South District
P.O. Box 2549
Fort Myers, Florida 33902-2549

David B. Struhs
Secretary

RECEIVED

HAZEN AND SAWYER, P.C.
Boca Raton, Florida

JUL 5 2001

CERTIFIED MAIL NO.: 7000 0600 0024 1470 3440
RETURN RECEIPT REQUESTED

In the Matter of an
Application for Permit by:

JOB No. 40226

Paul Mattausch, Water Director
Collier County
3301 Tamiami Trail East, Building D
Naples, Florida 34112-0000

Collier - UIC/IW
FDEP File No. 173528-001-UC and
173528-002-UC
South Collier County WTP Reverse Osmosis
IW-1 & IW-2 Class I Injection Wells

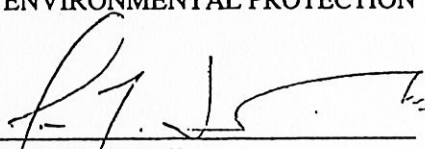
NOTICE OF PERMIT ISSUANCE

Enclosed are Permit Numbers 173528-001-UC and 173528-002-UC to construct two Class I Injection Wells (IW-1 and IW-2) and monitoring well system, issued pursuant to Section(s) 403.087, Florida Statutes.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Fort Myers, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION


Richard W. Cantrell
Director of
District Management

Paul Mattausch, Water Director
July 2, 2001

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this PERMIT and all copies were mailed by certified mail before the close of business on July 2, 2001 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to S.120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Janice L. Ingram 7-2-01
Clerk Date

RWC/JBM/cap

Enclosures

Copies furnished to:

- Charles Davault – FDEP Fort Myers
- Albert Muniz, P.E. – Hazen and Sawyer – Boca Raton ✓
- TAC



Department of Environmental Protection

Jeb Bush
Governor

South District
P.O. Box 2549
Fort Myers, Florida 33902-2549
PERMIT

David B. Struhs
Secretary

PERMITTEE:

Collier County
3301 Tamiami Trail East, Building D.
Naples, Florida 34112-0000

Permit/Certification

Number: 173528-001-UC and 173528-002-UC
Date of Issue: July 2, 2001
Expiration Date: July 1, 2006
County: Collier
Latitude: 26° 09' 52" N
Longitude: 81° 40' 58" W
Section/Town/Range: 35/49S/26E
Project: South County Regional WTP
IW-1 and IW-2 Class I Injection Wells

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Rules 62-4, 62-520, 62-528, 62-550, and 62-660. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the Department and made a part hereof and specifically described as follows:

Construct two nominal 20 inch diameter tubing and packer Class I injection wells (IW-1 and IW-2), with cemented 24" steel casing to approximately 2,500 feet below land surface (bls) and a total depth of approximately 3,200 feet bls. Injection is into the Oldsmar Formation for the primary means of disposal of non-hazardous, reverse osmosis concentrate from the South County Regional Water Treatment Plant (SCRWTP), for a maximum disposal of 12.73 million gallons per day (MGD) per well. The maximum injection rate for each well shall not exceed 8,840 gpm. The dual zone monitoring well (DZMW-1) will be completed from approximately 895 to 970 feet bls and from approximately 1550 to 1600 feet bls.

The Application to Construct/Operate/Abandon Class I, III, or V Injection well System, DEP Form 62-528.900(1), was received August 10, 2000, with supporting documents and additional information last received October 12, 2000. The Certificates of Demonstration of Financial Responsibility were approved November 1, 2000. Project is located at 3851 Utilities Drive, Naples, Florida.

Subject to Specific Conditions 1-13.

PERMITTEE:

Collier County

Permit/Cert. No.: 173528-001 & 173528-002-UC

Date of Issue: July 2, 2001

Expiration Date: July 1, 2006

SPECIFIC CONDITIONS:

1. GENERAL CRITERIA

- a. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
- b. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- c. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
- d. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures.
- e. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation or reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
- f. When requested by the Department, the permittee shall furnish, within the time specified, any information needed to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.
- g. Signatories and Certification Requirements
 1. All reports and other submittals required to comply with this permit shall be signed by a person authorized under Rules 62-528.340(1) or (2), F.A.C.
 2. In accordance with Rule 62-528.340(4), F.A.C., all reports shall contain the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
- h. The permittee shall notify the Department and obtain approval prior to any physical alterations or additions to the injection or monitor well, including removal of the well head.
- i. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity which may result in noncompliance with permit requirements.
- j. The permittee shall report any noncompliance which may endanger health or the environment, including:

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Date of Issue: July 2, 2001

Expiration Date: July 1, 2006

SPECIFIC CONDITIONS:

1. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
2. Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

- k. No underground injection is allowed that causes or allows movement of fluid into an underground source of drinking water.
- l. The permittee shall retain all records of all monitoring information concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under Rule 62-528.435, F.A.C. The permittee shall deliver the records to the Department office that issued the permit at the conclusion of the retention period unless the permittee elects to continue retention of the records.
- m. If injection is to continue beyond the expiration date of this permit the permittee shall apply for, and obtain an operation permit. If necessary to complete the two-year operational testing period, the permittee shall apply for renewal of the construction permit at least 60 days prior to the expiration date of this permit.

2. Site Requirements

- a. A drilling pad shall be provided to collect spillage of contaminants and to support the heaviest load that will be encountered during drilling.
- b. The disposal of drilling fluids, cuttings, formation water or waste shall be in a sound environmental manner that avoids violation of surface and ground water quality standards. The disposal method shall be approved by the Department prior to start of construction.
- c. Specific drilling pad dimensions and design details shall be provided to and approved by the Department prior to commencing construction (and shortly after selection of drilling contractor).
- d. The six water table monitoring wells surrounding the injection well pad shall be sampled and analyzed prior to drilling these injection wells and then weekly thereafter. Sampling shall include specific conductance, pH, chloride, temperature and water level.
- e. Pursuant to Rule 62-528.455(1)(c)6., F.A.C., a survey indicating the exact location in metes and bounds of all wells authorized by this permit shall be provided prior to issuance of an operating permit.

PERMITTEE:

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SPECIFIC CONDITIONS:

3. Construction and Testing Requirements

- a. The permittee shall contact the Technical Advisory Committee (TAC) chairman so that he may schedule progress review meetings at appropriate times with the TAC, the U.S. Environmental Protection Agency (USEPA), and permittee for the purpose of reviewing the results of tests, geophysical logging, surveys, drilling records and construction problems.
- b. All drilling shall be inside a blow out preventer upon penetration of the Floridan Aquifer.
- c. Mechanical integrity testing is a two-part demonstration which includes a pressure test to demonstrate that no leaks are present in the casing, tubing or packer and a temperature or noise log and radioactive tracer survey to demonstrate the absence of leaks behind the casing. Verification of pressure gauge calibration must be provided at the scheduled tests.
- d. Department approval and Technical Advisory Committee (TAC) and USEPA review pursuant to F.A.C. Rule 62-528 is required for the following stages of construction:
 - (1) Intermediate casing seat selection for injection and monitor wells.
 - (2) Final casing seat selection for injection and monitor wells.
 - (3) Prior to operational (long term) testing with effluent.

The permittee shall submit all necessary supporting documentation/data, with interpretation, to the TAC and USEPA for review.

- e. The cementing program, as required in Section 62-528.410(5), Florida Administrative Code, shall be submitted to the Department, the USEPA, and the Technical Advisory Committee for review. Cementing shall not commence prior to approval being granted.
- f. All temperature surveys (except for mechanical integrity demonstration) shall be run within 48 hours after cementing.
- g. TAC meetings are scheduled on the 1st Tuesday of each month subject to a 5 working day prior notice and timely receipt of critical data by all TAC members and the USEPA. Emergency meetings may be arranged when justified to avoid undue construction delay.
- h. The Permittee shall insure that safe internal pressures are maintained during the cementing of all casings.
- i. The background water quality of the injection zone and monitoring zones shall be established prior to commencement of any injection testing. Parameters to be measured are the primary and secondary drinking water standards (except asbestos). These parameters are contained in Section 5 in the July, 2000 application document.
- j. The injection and monitor well(s) at the site shall be abandoned when no longer usable for their intended purpose, or when posing potential threat to the quality of the waters of the State. Within 180 days of well abandonment, the permittee shall submit to the Department, the USEPA, and the TAC the proposed plugging method, pursuant to Rule 62-528.435, F.A.C.
- k. All salt used in well drilling shall be stored in an environmentally sound manner. Accurate records shall be kept on the amount of salt used.

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SPECIFIC CONDITIONS:

1. All dual induction, sonic and caliper geophysical logs run on the pilot holes of the injection well shall be submitted with scales of one inch equals one hundred feet (1"=100'), two inches equals one hundred feet (2"=100'), and five inches equals one hundred feet (5"=100').

4. Quality Assurance/Quality Control Requirements

a. This permit approval is based upon evaluation of the data contained in the application dated August 10, 2000, and the plans and/or specifications submitted in support of the application. Any proposed modifications to this permit shall be submitted in writing to the Underground Injection Control program manager, the TAC, and USEPA for review and clearance prior to implementation. Changes of negligible impact to the environment and staff time will be reviewed by the program manager, cleared when appropriate and incorporated into this permit. Changes or modifications other than those described above will require submission of a completed application and appropriate processing fee as per Rule 62-4.050, F.A.C.

b. A professional engineer registered pursuant to Chapter 471, Florida Statutes shall be retained throughout the construction period to be responsible for the construction operation and to certify the application, specifications, completion report and other related documents. The Department shall be notified immediately of any change of engineer.

c. Where required by Chapter 471 (P.E.) or Chapter 492 (P.G.) F.S., applicable portions of permit applications and supporting documents which are submitted to the Department for public record shall be signed and sealed by the professional(s) who approved or prepared them.

d. The Department shall be notified immediately of any problems that may seriously hinder compliance with this permit, construction progress, or good construction practice. The Department may require a detailed written report describing the problem, remedial measures taken to assure compliance and measures taken to prevent recurrence of the problem.

e. Issuance of a Class I Test/Injection well construction and testing permit does not obligate the Department to authorize operation of the injection well system, unless the wells qualify for an operation permit applied for by the permittee and issued by the Department.

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Collier County

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Expiration Date: July 1, 2006

SPECIFIC CONDITIONS:

5. Reporting Requirements

a. All reports and surveys required by this permit must be submitted concurrently to all the members of the TAC and the USEPA. The TAC and USEPA consists of representatives from these agencies:

Florida Department of Environmental Protection
South District
P.O. Box 2549
Fort Myers, FL 33902-2549

Florida Department of Environmental Protection
Bureau of Water Facilities Regulation
UIC Program, MS 3530
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

South Florida Water Management District
P.O. Box 24860
West Palm Beach, FL 33416-4860

United States Environmental Protection Agency, Region IV
UIC Section
61 Forsythe Street, SW
Atlanta, Georgia 30303-8909

United States Geological Survey
9100 NW 36th Street, Suite 107
Miami, FL 33178

b. Members of the TAC and the USEPA shall receive a weekly summary of the daily log kept by the contractor. The weekly reporting period shall run Friday through Thursday and reports shall be mailed each Friday. The report shall include but is not limited to the following:

- (1) Description of daily footage drilled by diameter of bit or size of hole opener or reamer being used;
- (2) Description of formation and depth encountered; and specific conductance of water samples collected during drilling. Description of work during installation and cementing of casings; include amounts of casing and actual cement used versus calculated volume required.
- (3) Lithological description of drill cuttings collected every ten (10) feet or at every change in formation. Description of work and type of testing accomplished, geophysical logging, pumping tests, and coring results.
- (4) Description of any construction problems that develop and their status to include a description of what is being done or has been done to correct the problem.
- (5) Description of the amount of salt used.
- (6) Results of any water quality analyses performed as required by this permit, including pad monitor wells
- (7) Copies of the driller's log are to be submitted with the weekly summary.

c. The Department must be notified seventy-two (72) hours prior to all testing for mechanical integrity on the injection well. Testing should begin during daylight hours Monday through Friday.

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SPECIFIC CONDITIONS:

- d. Annotated copies of geophysical logs, lithologic descriptions and logs and water quality data (from drilling and packer tests) must be submitted to TAC and the USEPA, with interpretation, for intermediate and final casing seat selection approvals by the Department.
 - e. An interpretation of all test results must be submitted with all test data and geophysical logs.
 - f. After completion of construction and testing, a final report shall be submitted to the Department, the TAC, and the USEPA. The report shall include, but not be limited to, all information and data collected under Rule 62-528.450(2) and Rule 62-528.450(3), F.A.C., with appropriate interpretations. Mill certificates for the casing(s) shall be included in this report. To the extent possible, the transmissivity of the injection zone and maximum injection rate within safe pressure limits shall be estimated.
6. The construction permit includes a period of temporary injection operation for the purposes of long term testing. Prior to commencement of operational testing:
- a. Construction of the injection well shall be complete and the permittee shall submit a notice of completion of construction to the Department.
 - b. Each well shall first be tested for integrity of construction, and shall be followed by a short-term injection test of such duration to allow for the prediction of the operating pressure.
 - c. The permittee shall submit the following information to each member of the Technical Advisory Committee:
 - 1) A copy of the borehole television survey(s),
 - 2) Geophysical logs,
 - 3) Mechanical integrity test data,
 - 4) Data obtained during the short term injection testing conducted pursuant to Rules 62-528.405(3)(a) and 62-528.410(7)(e), and 62-528.450(3)(a)2., F.A.C., above,
 - 5) Confining zone data,
 - 6) Background water quality data for the injection and monitor zones,
 - 7) Wastestream analysis,
 - 8) As-built well construction specifications,
 - 9) Draft operation and maintenance manual with emergency procedures, and
 - 10) Other data obtained during well construction needed by the Department to evaluate whether the well will operate in compliance with Department rules.
 - d. The emergency discharge method shall be fully operational and no emergency discharge shall occur until the permittee has obtained all necessary permits.
 - e. Any corrective action required under Rule 62-528.300(5)(c)2., F.A.C., has been completed.
 - f. Written authorization shall be obtained from the Department. Authorization shall be for up to two years or the expiration date of the construction permit, whichever is less, and is nonrenewable. The authorization shall specify the conditions under which operational testing is approved. The authorization shall include:
 - 1) Injection pressure limitation,
 - 2) Injection flow rate limitation,
 - 3) Monthly specific injectivity testing,
 - 4) Reporting requirements, and
 - 5) An expiration date for the operational testing period not to exceed two years.
 - g. Before authorizing operational testing the Department shall conduct an inspection of the facility to determine if the conditions of the permit have been met.

7. Operational Testing Requirements

- (a). Operational Testing Conditions - Injection Well System

PERMITTEE:

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Expiration Date: July 1, 2006

SPECIFIC CONDITIONS:

The injection system shall be monitored in accordance with rule 62-528.425(1)(g) and 62-528.430(2), F.A.C.

The following injection well performance data shall be recorded and reported at the frequency indicated from the injection well instrumentation in the Monthly Operating Report as indicated below. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall use continuous indicating and recording devices to monitor injection flow rate and injection pressure and annular pressure. In the case of operational failure of any of these instruments for a period of more than 48 hours, the permittee shall report to the Department in writing the remedial action to be taken and the date when the failure will be corrected.

INJECTION WELLS IW-1 & IW-2

The proposed specifications for the injection wells are as follows:

<u>Casing Diameter (OD)</u>	<u>Depth (bls) Cased</u>	<u>Open Hole (bls)</u>
52" Steel	50'	
42" Steel	330'	
34" Steel	1300'	
24" Steel	2500'	
20" Steel Tbg	2480'	2500-3200'

Parameters

Reporting Frequency

Injection Pressure (p.s.i)	Daily/Monthly
Maximum Injection Pressure	Daily/Monthly
Minimum Injection Pressure	Daily/Monthly
Average Injection Pressure	Daily/Monthly
Flow Rate (g.p.m.)	Daily/Monthly
Maximum Flow Rate	Daily/Monthly
Average Flow Rate	Daily/Monthly
Minimum Flow Rate	Daily/Monthly
Annular Pressure (p.s.i.)	Daily/Monthly
Maximum Annular Pressure	Daily/Monthly
Minimum Annular Pressure	Daily/Monthly
Average Annular Pressure	Daily/Monthly
Annular Fluid added/removed (gallons)	Daily/Monthly
Annular Pressure added/removed (p.s.i.)	Daily/Monthly
Total Volume WTP Concentrate Injected (gallons)	Daily
Total Volume WTP Concentrate Injected (gallons)	Monthly

PERMITTEE:

Collier County

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SPECIFIC CONDITIONS:

WTP Concentrate Water Quality

TKN (mg/L)	Monthly
pH (std. units)	Monthly
Specific Conductivity (µmhos/cm)	Monthly
Chloride (mg/L)	Monthly
Sulfate (mg/L)	Monthly
Field Temperature (deg. C)	Monthly
Total Dissolved Solids (mg/L)	Monthly
Sodium (mg/L)	Monthly
Calcium (mg/L)	Monthly
Potassium (mg/L)	Monthly
Magnesium (mg/L)	Monthly
Iron (mg/L)	Monthly
Carbonate (mg/L)	Monthly
Bicarbonate (mg/L)	Monthly
Gross Alpha	Monthly
Radium 226	Monthly
Radium 228	Monthly

(b). Operational Testing Conditions - Monitor Well System

The monitor well system will consist of one Dual Zone Monitor Well as described below:

<u>Well Number</u>	<u>Casing Dia. (OD)</u>	<u>Depth (bls) Cased</u>	<u>Open Hole</u>
DZMW-1	34" Steel	50'	
	24" Steel	330'	
	16" Steel	895'	895-970'
	6 5/8" Steel	1550'	1550-1600'

All monitor wells shall be monitored in accordance with rule 62-528.615, F.A.C. The following monitor well performance data shall be recorded and reported at the frequency indicated from the monitor well instrumentation in the Monthly Operating Report as indicated below. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall use continuous indicating and recording devices to monitor the monitor zone pressures or water levels. In the case of operational failure of any of these instruments for a period of more than 48 hours, the permittee shall report to the Department in writing the remedial action to be taken and the date when the failure will be corrected.

PERMITTEE:

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SPECIFIC CONDITIONS:

DZMW-1
Parameters

Reporting
Frequency

Maximum Water Level/Pressure
Minimum Water Level/Pressure
Average Water Level/Pressure

Daily/Weekly
Daily/Weekly
Daily/Weekly

Water Quality

TKN (mg/L)
Specific Conductivity (μ mhos/cm)
Total Dissolved Solids (mg/L)
pH (std. units)
Chloride (mg/L)
Sulfate (mg/L)
Field Temperature ($^{\circ}$ C)
Sodium (mg/L)
Calcium (mg/L)
Potassium (mg/L)
Magnesium (mg/L)
Iron (mg/L)
Carbonate (mg/L)
Bicarbonate (mg/L)
Gross Alpha
Radium 226
Radium 228

Weekly
Weekly
Weekly
Weekly
Weekly
Weekly
Weekly
Monthly
Monthly
Monthly
Monthly
Monthly
Monthly
Monthly
Monthly
Monthly (deep monitor zone only)
Monthly (deep monitor zone only)
Monthly (deep monitor zone only)

Water quality data may be reduced to monthly analyses after a minimum six months of data if the conditions of Rule 62-528.450(3)(d), F.A.C., have been met and with Department approval.

- (c). The permittee shall calibrate all pressure gauge(s), flow meter(s), chart recorder(s), and other related equipment associated with the injection well system on a semi-annual basis. The permittee shall maintain all monitoring equipment and shall ensure that the monitoring equipment is calibrated and in proper operating condition at all times. Laboratory equipment, methods, and quality control will follow EPA guidelines as expressed in Standard Methods for the Examination of Water and Wastewater. The pressure gauge(s), flow meter(s), and chart recorder(s) shall be calibrated using standard engineering methods.
- (d). The permittee shall submit monthly to the Department the results of all injection well and monitor well data required by this permit no later than the last day of the month immediately following the month of record. The results shall be sent to the Department of Environmental Protection, P.O. Box 2549, Fort Myers, Florida 33902-2549. A copy of this report shall also be sent to the Department of Environmental Protection, Underground Injection Control Program, MS 3530, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.
- (e). The Engineer of Record or designated qualified representative must be present for the start-up operations and the Department must be notified in writing of the date operational testing commenced for the well.

PERMITTEE:

Collier County

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Date of Issue: July 2, 2001

Expiration Date: July 1, 2006

SPECIFIC CONDITIONS:

8. Abnormal Events

a. In the event the permittee is temporarily unable to comply with any conditions of this permit due to breakdown of equipment, power outages, destruction by hazard of fire, wind, or by other cause, the permittee shall notify the Department. Notification shall be made in person, by telephone or by telegraph within 24 hours of breakdown or malfunction to the UIC Program staff, South District office.

b. A written report of any noncompliance referenced in 1) above shall be submitted to the South District office within five days after its occurrence. The report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem, and the time when the facility will again be operating in accordance with permit conditions.

9. Emergency Disposal

a. All applicable federal, state and local permits must be in place to allow for any alternate discharges due to emergency or planned outage conditions.

b. Any changes in emergency disposal methods must be submitted for Technical Advisory Committee (TAC) and USEPA review and Department approval.

c. The permittee shall notify the Department within 24 hours whenever an emergency discharge has occurred (Rule 62-528.415(4)(c)1., F.A.C.). Written notification shall be provided to the Department within 5 days after each occurrence. The Permittee shall indicate the location and duration of the discharge and the volume of fluid discharged.

10. Financial Responsibility

a. The permittee shall maintain the resources necessary to close, plug and abandon the injection and associated monitor wells, at all times (Rule 62-528.435(9), F.A.C.).

b. The permittee shall review annually the plugging and abandonment cost estimates. The permittee shall resubmit documentation necessary to demonstrate financial responsibility using the revised cost estimates on or before March 31 of each year.

c. In the event that the mechanism used to demonstrate financial responsibility should become invalid for any reason, the permittee shall notify the Department of Environmental Protection in writing within 14 days of such invalidation. The permittee shall, within 30 days of said notification, submit to the Department for approval, new financial documentation in order to comply with Rule 62-528.435(9), F.A.C., and the conditions of this permit.

PERMITTEE:

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SPECIFIC CONDITIONS:

11. Mechanical Integrity

- a. Injection is prohibited until the permittee affirmatively demonstrates that the well has mechanical integrity. Prior to operational testing the permittee shall establish, and thereafter maintain, mechanical integrity of the well at all times.
- b. If the Department determines that the injection well lacks mechanical integrity, written notice shall be given to the permittee.
- c. Unless the Department requires the immediate cessation of injection, within 48 hours of receiving written notice from the department that the well lacks mechanical integrity the permittee shall cease injection into the well unless the Department allows continued injection pursuant to (d) below.
- d. The Department may allow the permittee to continue operation of a well that lacks mechanical integrity if the permittee demonstrates that fluid movement into or between underground sources of drinking water is not occurring.

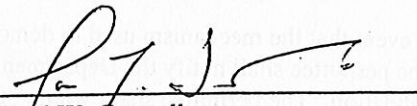
12. The permittee is reminded of the necessity to comply with the pertinent regulations of any other regulatory agency, as well as any county, municipal, and federal regulations applicable to the project. These regulations may include, but not limited to, those of the Federal Emergency Management Agency in implementing flood control measures. This permit should not be construed to imply compliance with the rules and regulations of other regulatory agencies.

13. The permittee shall be aware of and operate under the general conditions in Rule 62-528.307(1)(a) through (x) and Rule 62-528.307(2)(a) through (f), F.A.C. These general conditions are binding upon the permittee and enforceable pursuant to Chapter 403 of the Florida Statutes.

Note: In the event of an emergency the permittee shall contact the Department by calling (850)413-9911. During normal business hours, the permittee shall call (941) 332-6975.

Issued this 2nd day of July, 2001.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION


Richard W. Cantrell
Director of
District Management

RWC/JBM/cap

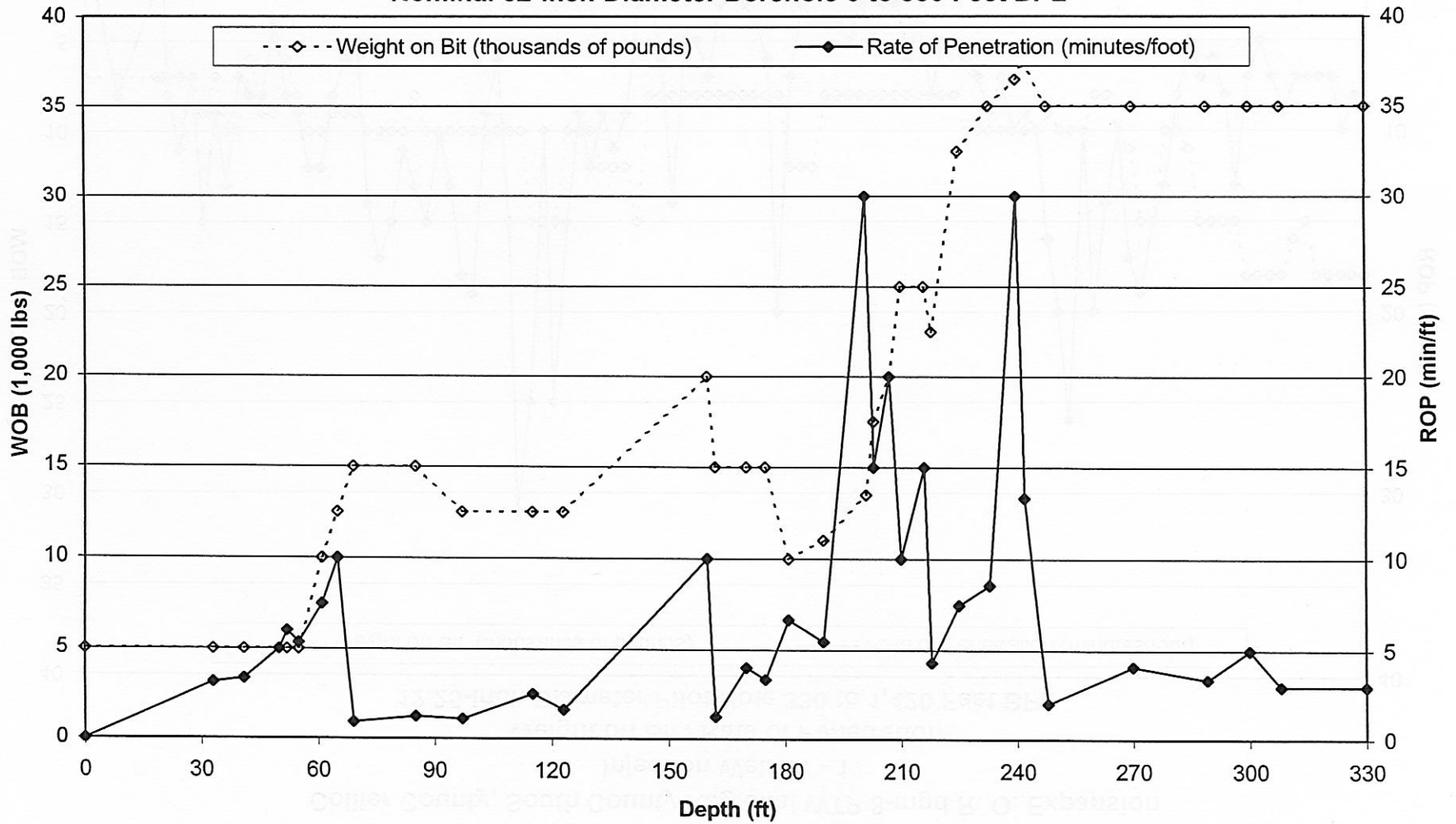
Appendix B

Weight on Bit / Rate of Penetration Graphs

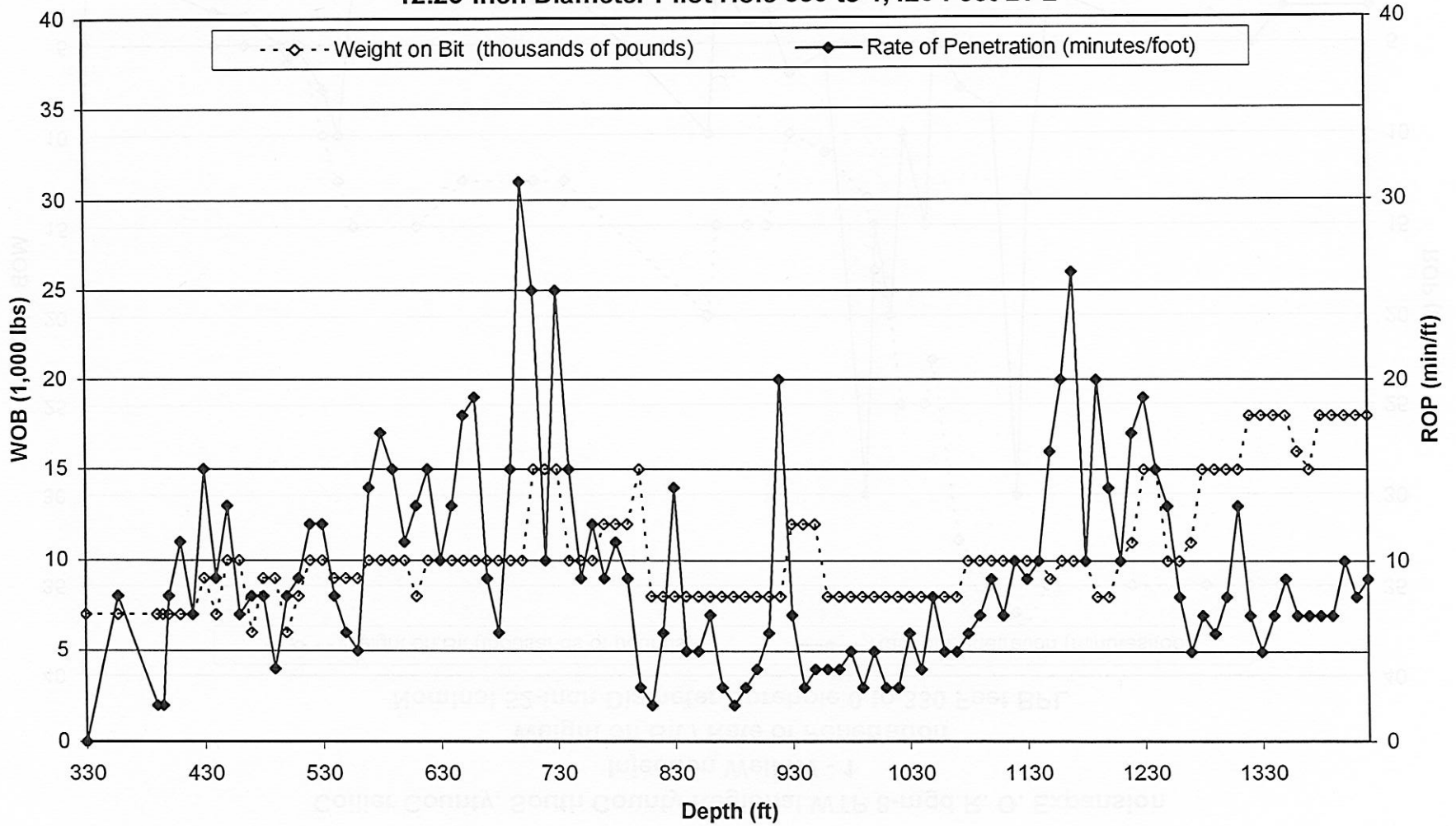
Injection Well No. 1 (IW-1) – Drilling Data
Weight on Bit / Rate of Penetration

Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 1

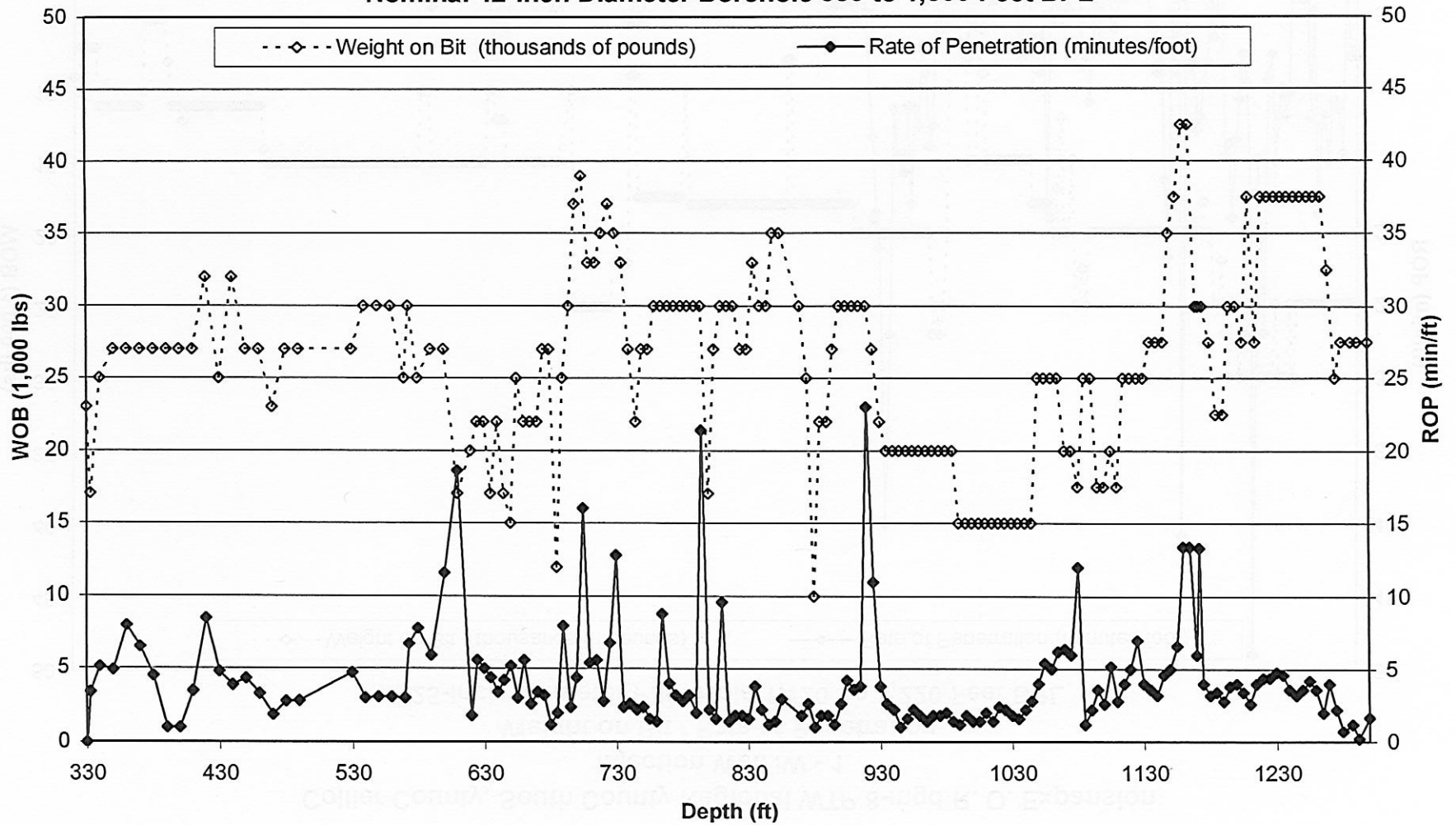
Weight on Bit / Rate of Penetration
Nominal 52-inch Diameter Borehole 0 to 330 Feet BPL



**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 1
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 330 to 1,420 Feet BPL**



**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 42-inch Diameter Borehole 330 to 1,300 Feet BPL**

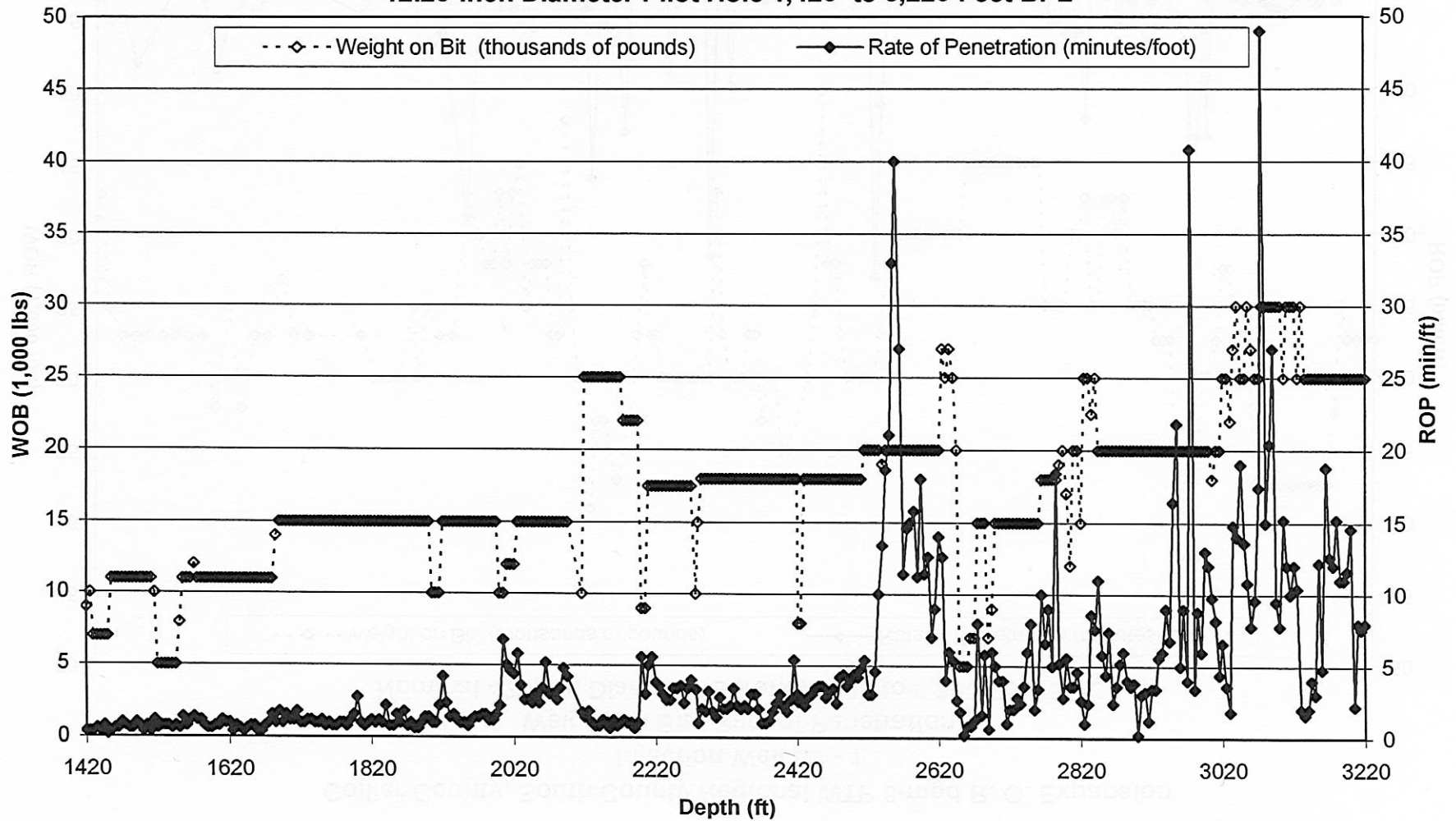


Collier County, South County Regional WTP 8-mgd R. O. Expansion

Injection Well IW - 1

Weight on Bit / Rate of Penetration

12.25-inch Diameter Pilot Hole 1,420 to 3,220 Feet BPL

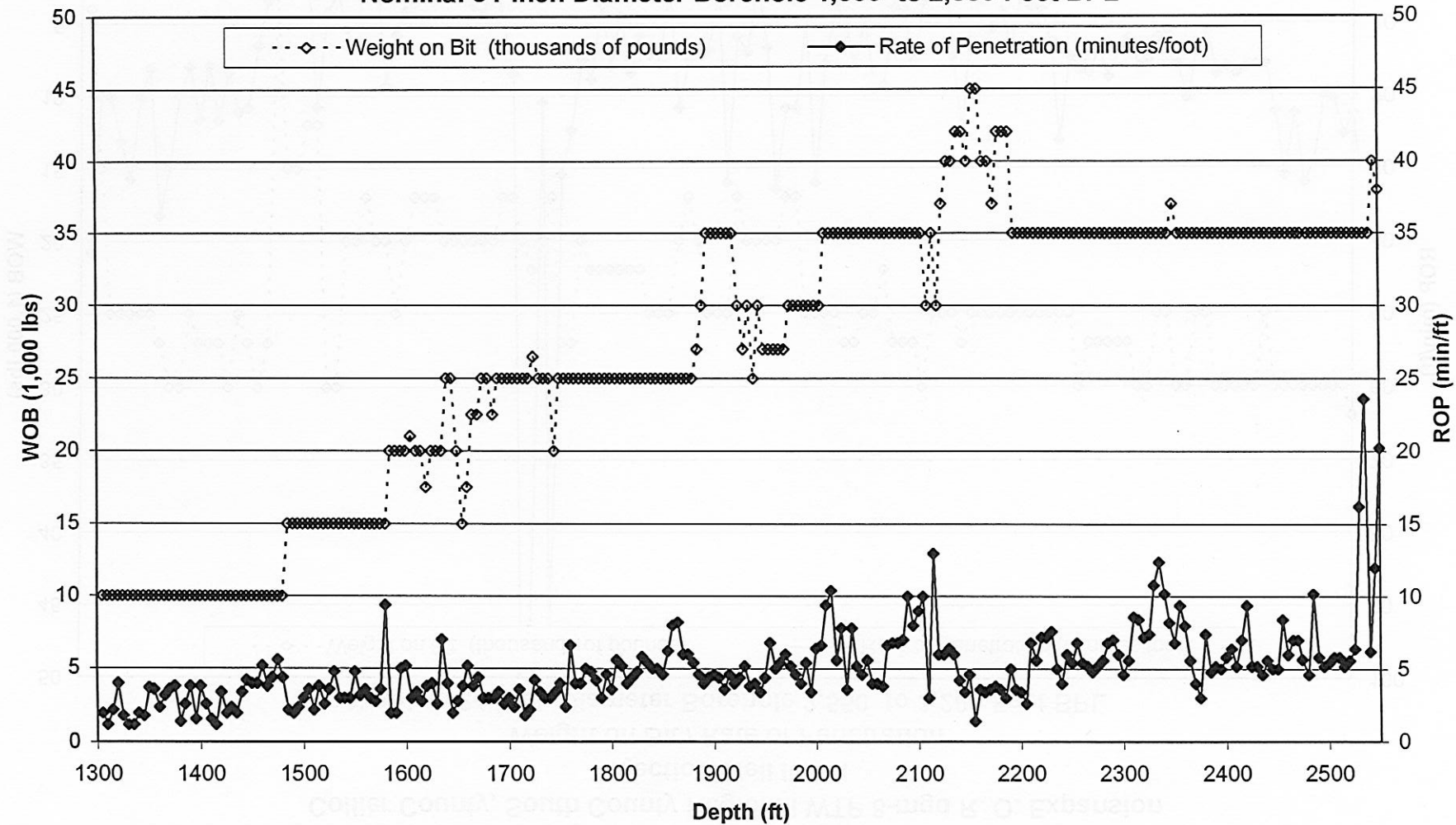


Collier County, South County Regional WTP 8-mgd R. O. Expansion

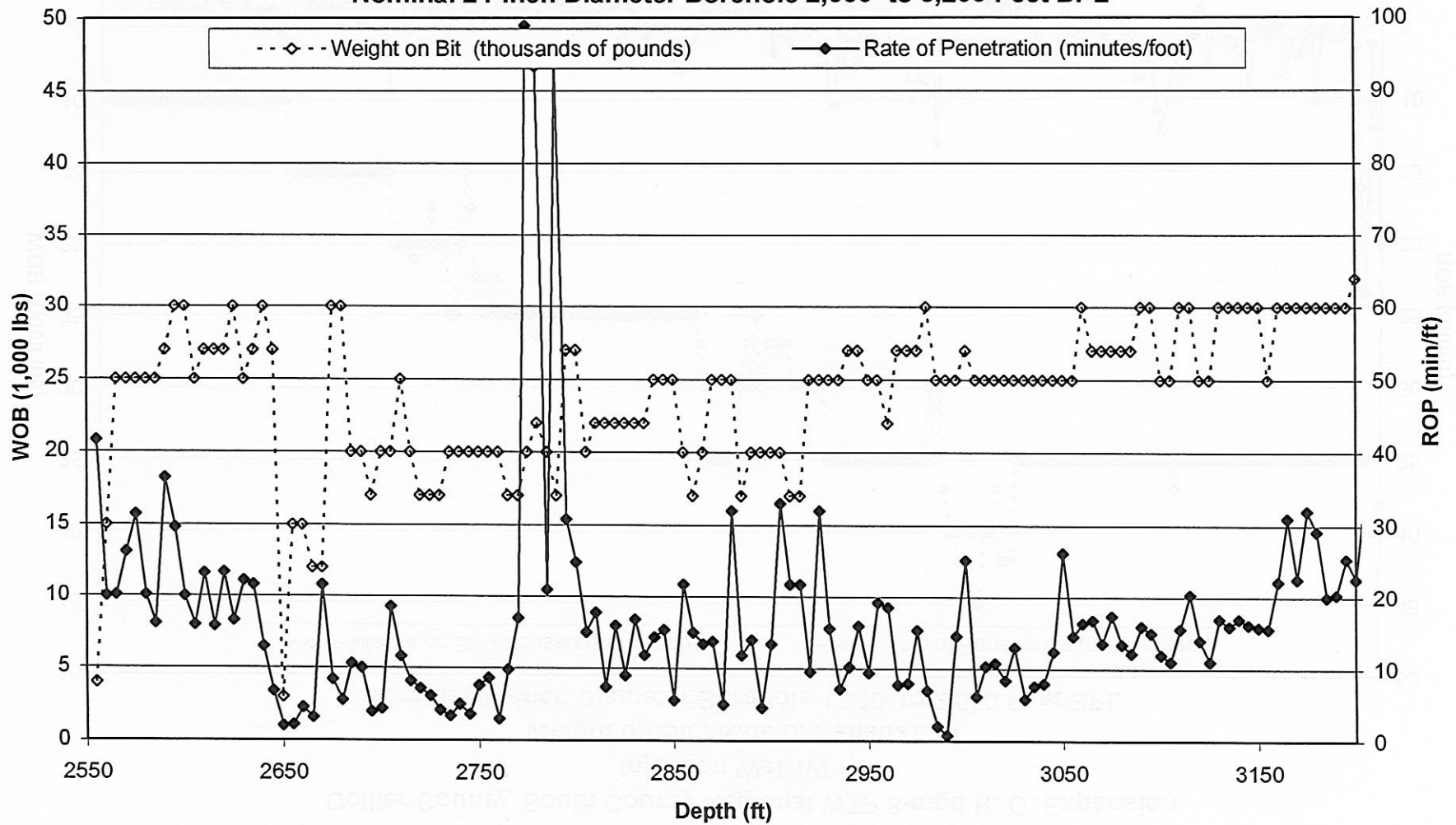
Injection Well IW - 1

Weight on Bit / Rate of Penetration

Nominal 34-inch Diameter Borehole 1,300 to 2,550 Feet BPL

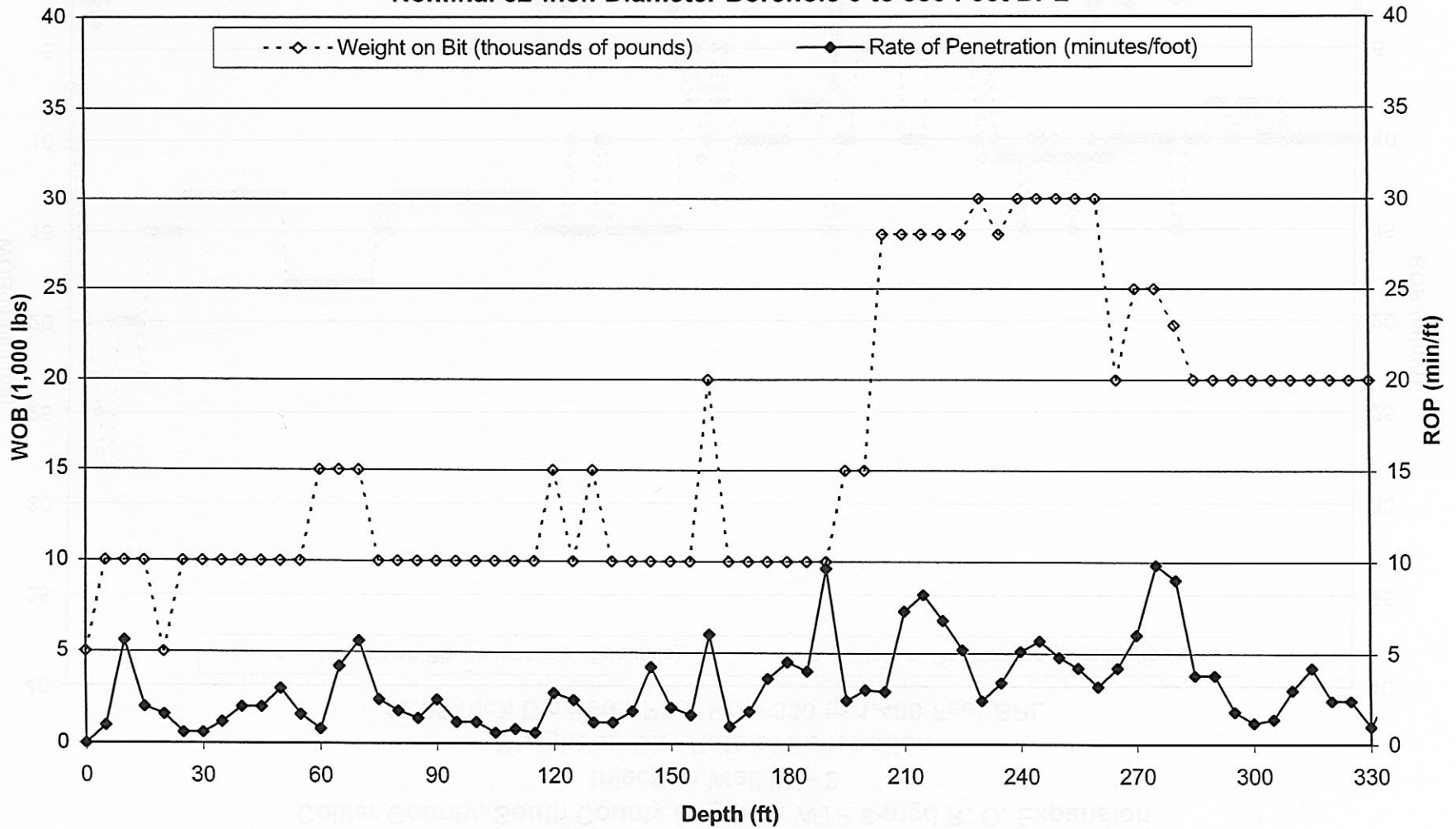


**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 24-inch Diameter Borehole 2,550 to 3,200 Feet BPL**

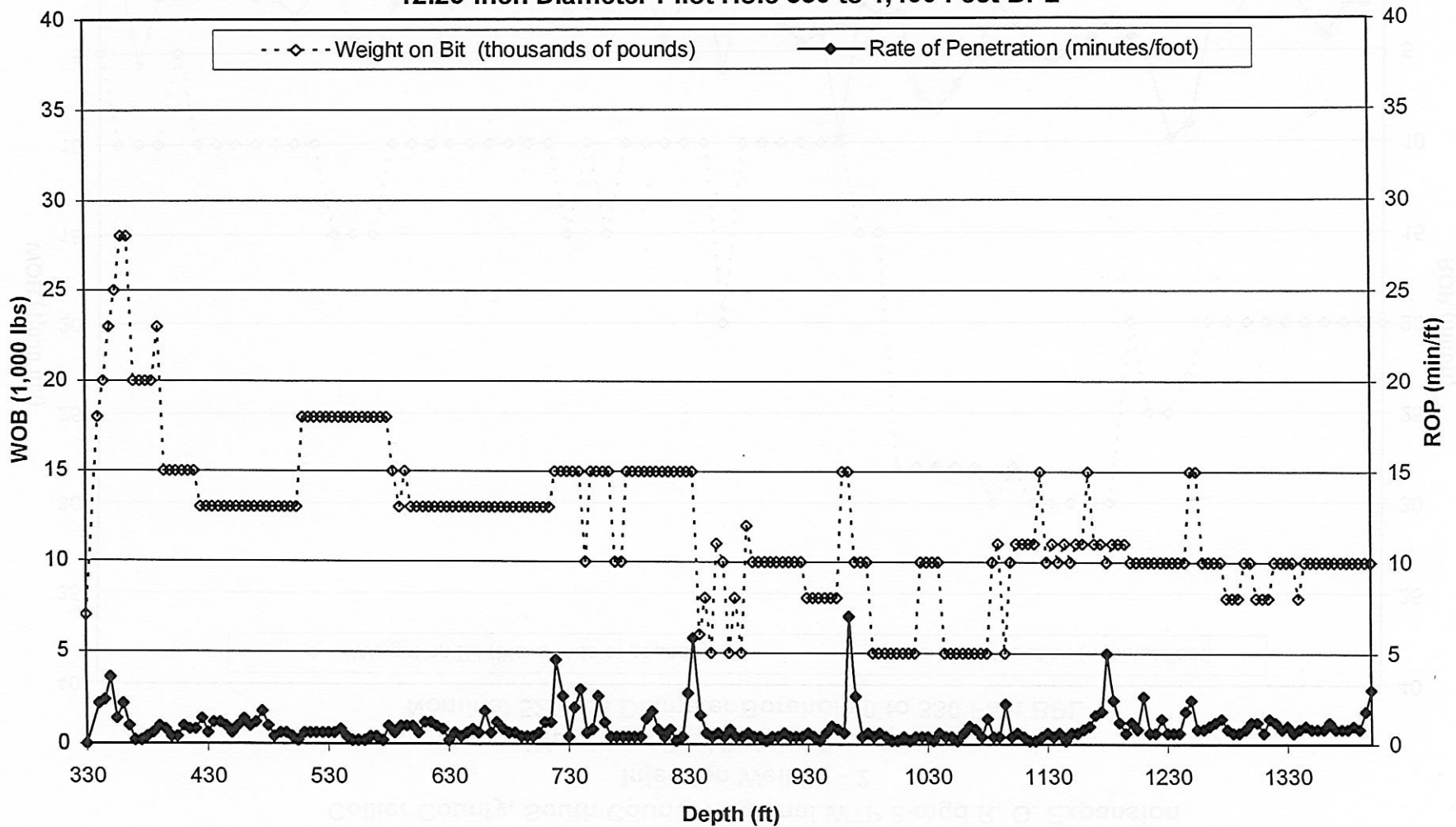


Injection Well No. 2 (IW-2) – Drilling Data
Weight on Bit / Rate of Penetration

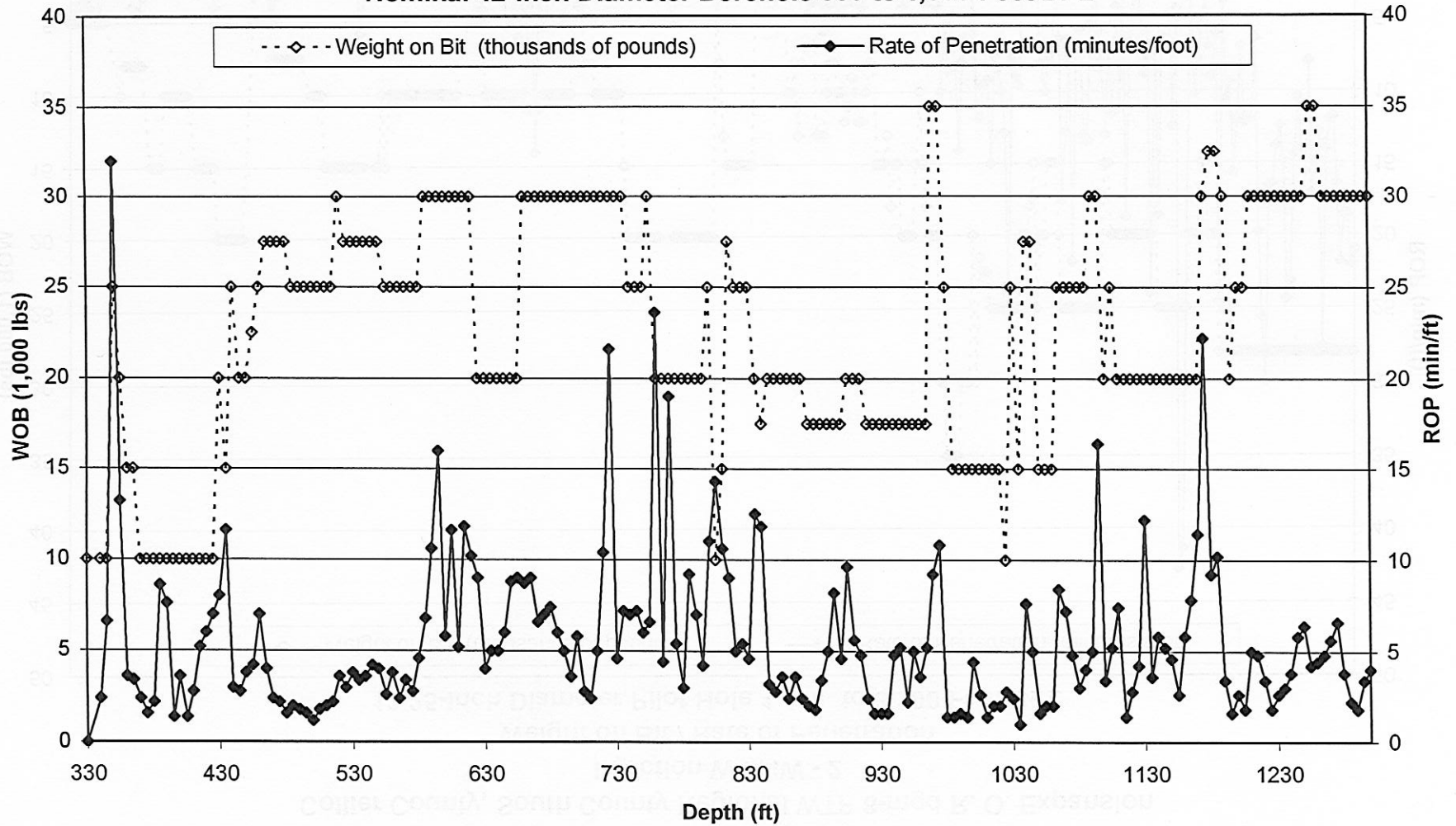
**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 52-inch Diameter Borehole 0 to 330 Feet BPL**



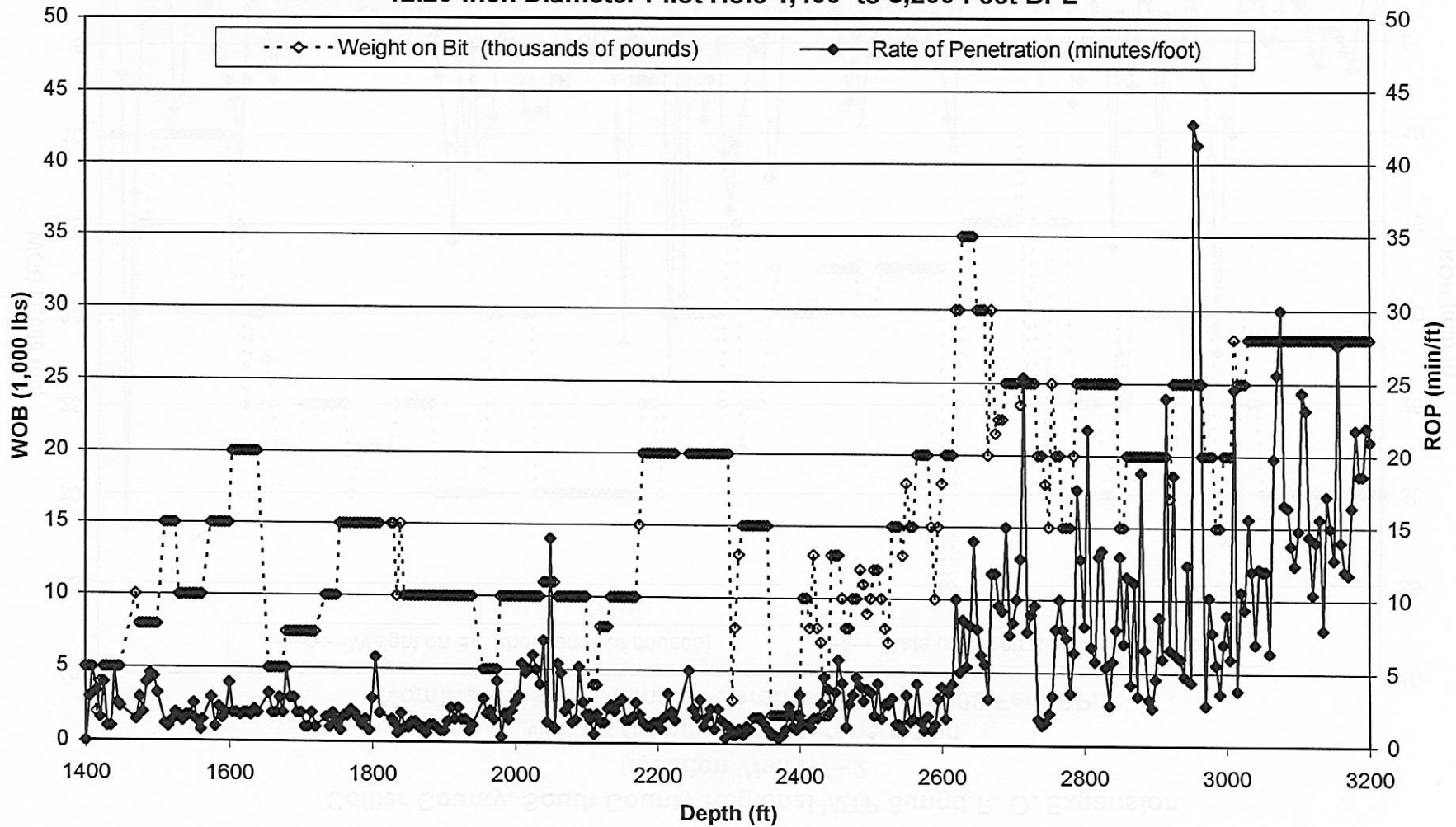
**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 2
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 330 to 1,400 Feet BPL**



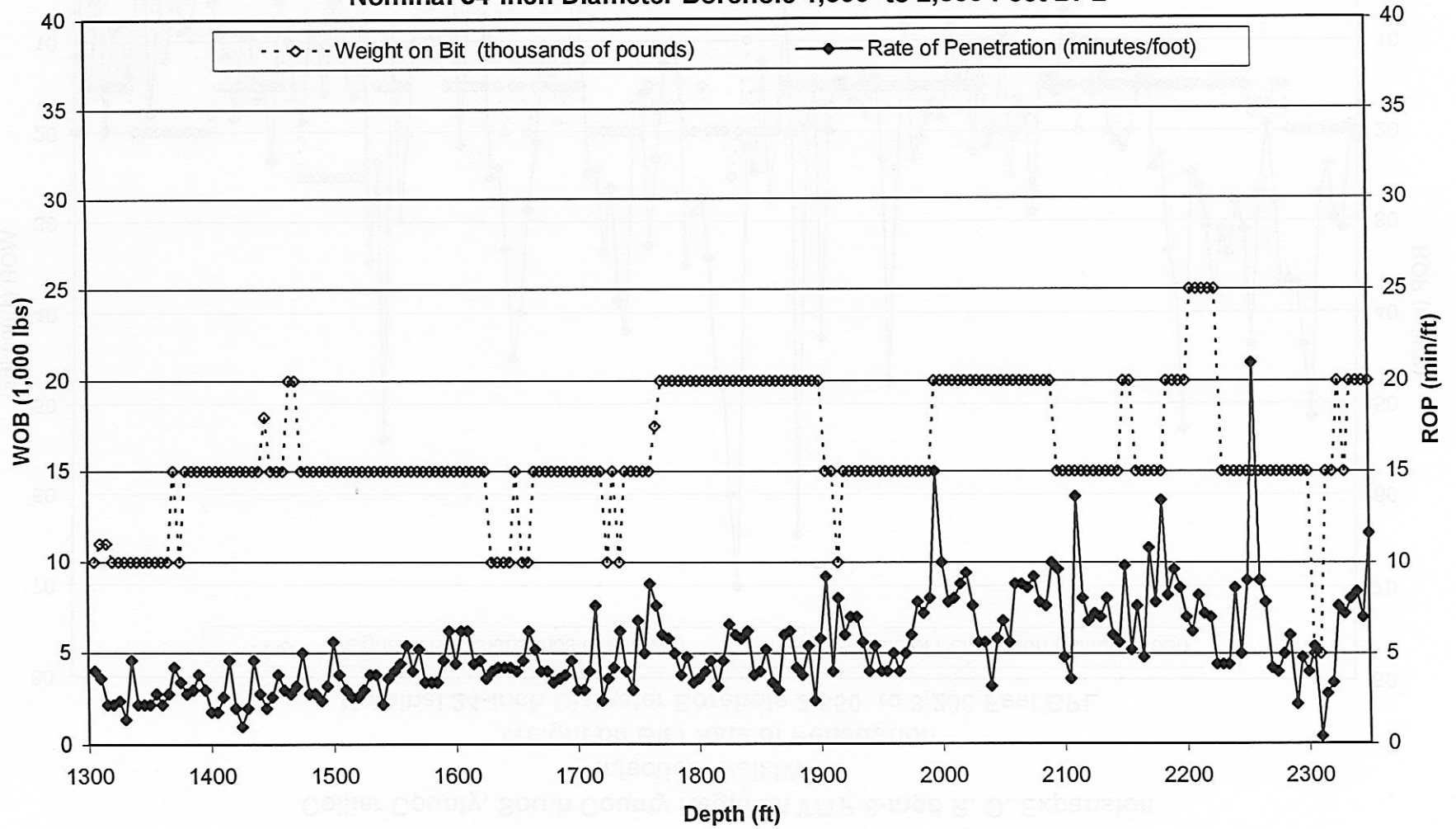
**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 42-inch Diameter Borehole 330 to 1,300 Feet BPL**



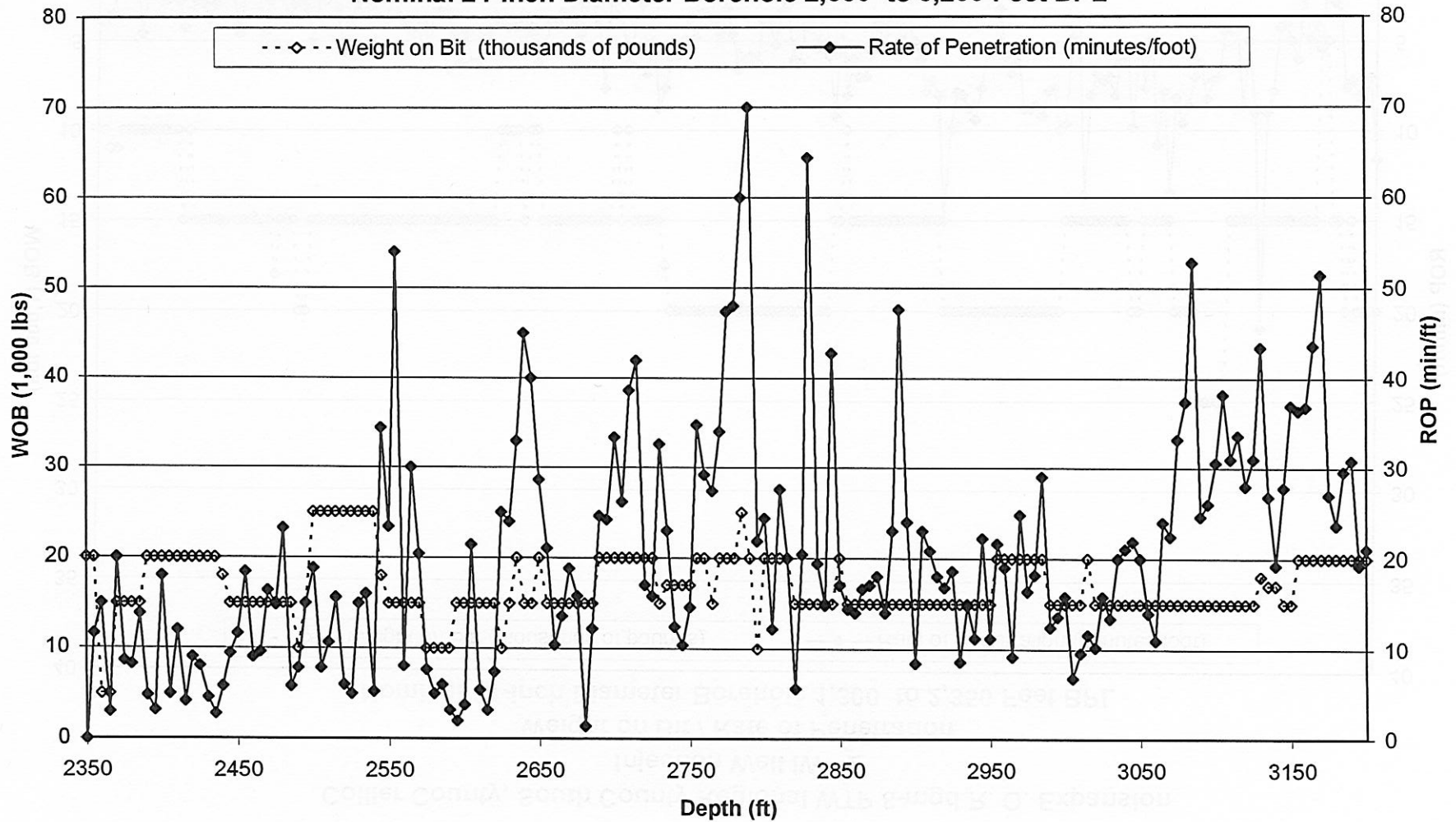
Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 2
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 1,400 to 3,200 Feet BPL



**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 34-inch Diameter Borehole 1,300 to 2,350 Feet BPL**

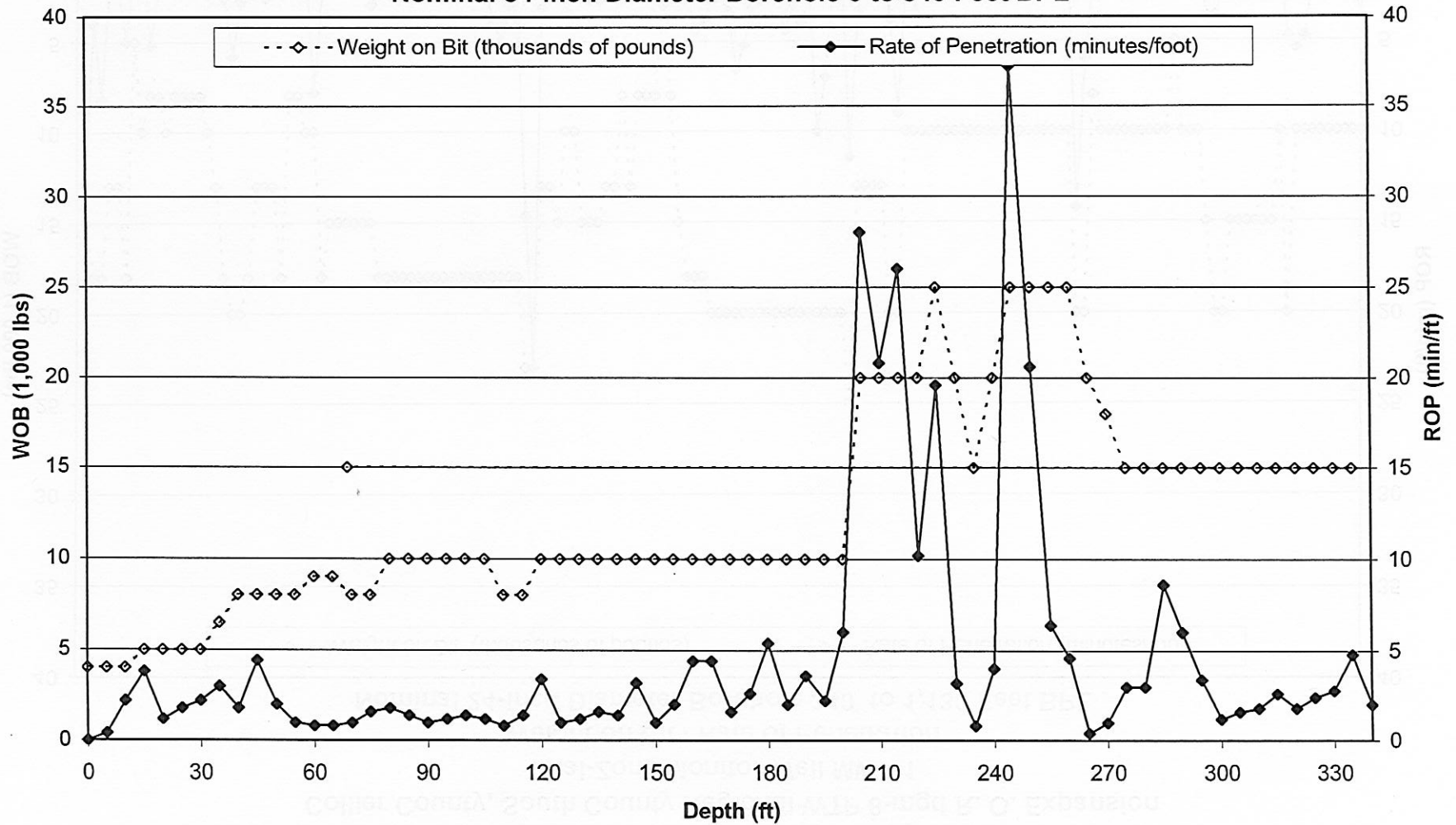


**Collier County, South County Regional WTP 8-mgd R. O. Expansion
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 24-inch Diameter Borehole 2,350 to 3,200 Feet BPL**

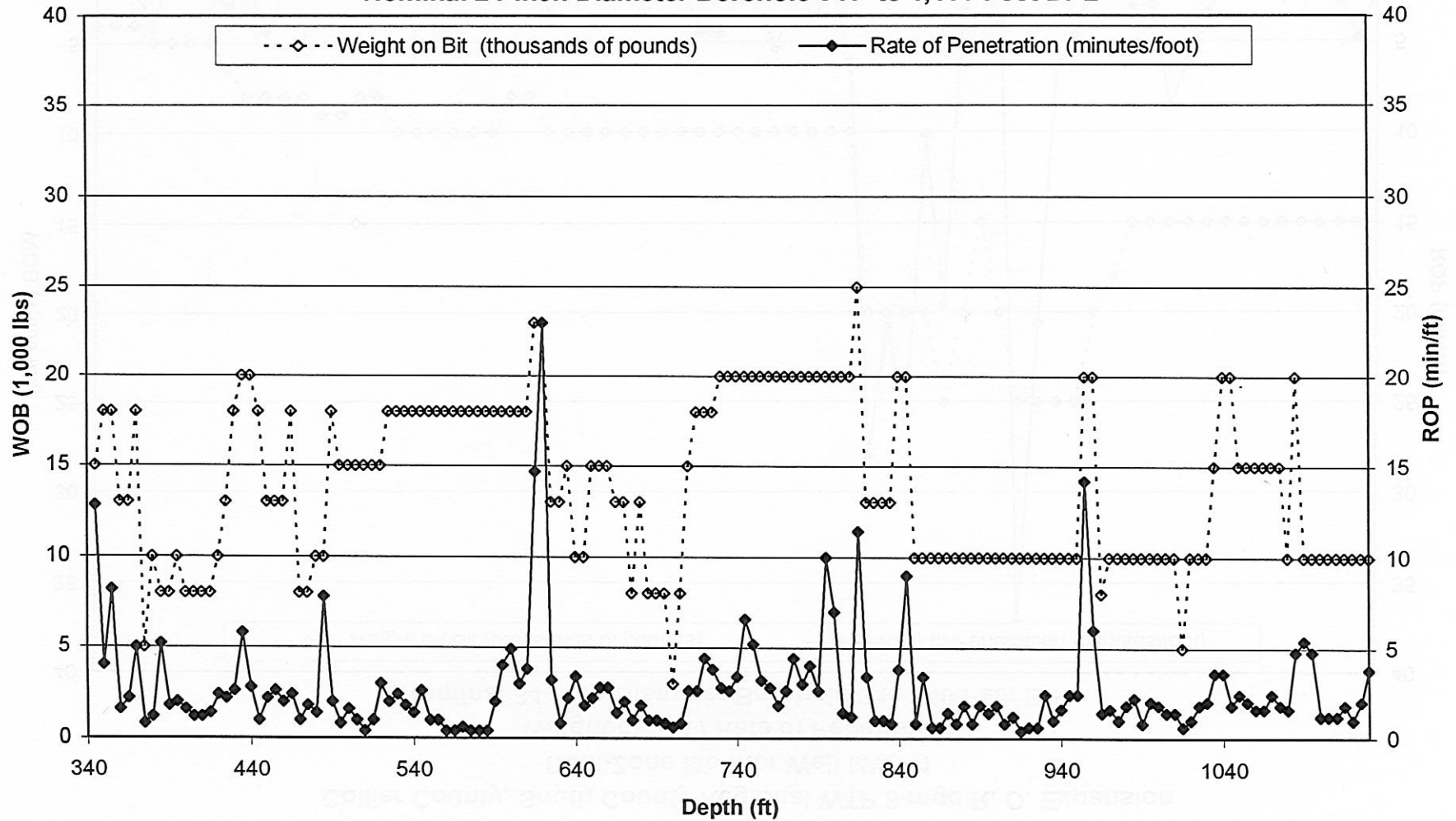


Monitor Well No. 1 (MW-1) – Drilling Data
Weight on Bit / Rate of Penetration

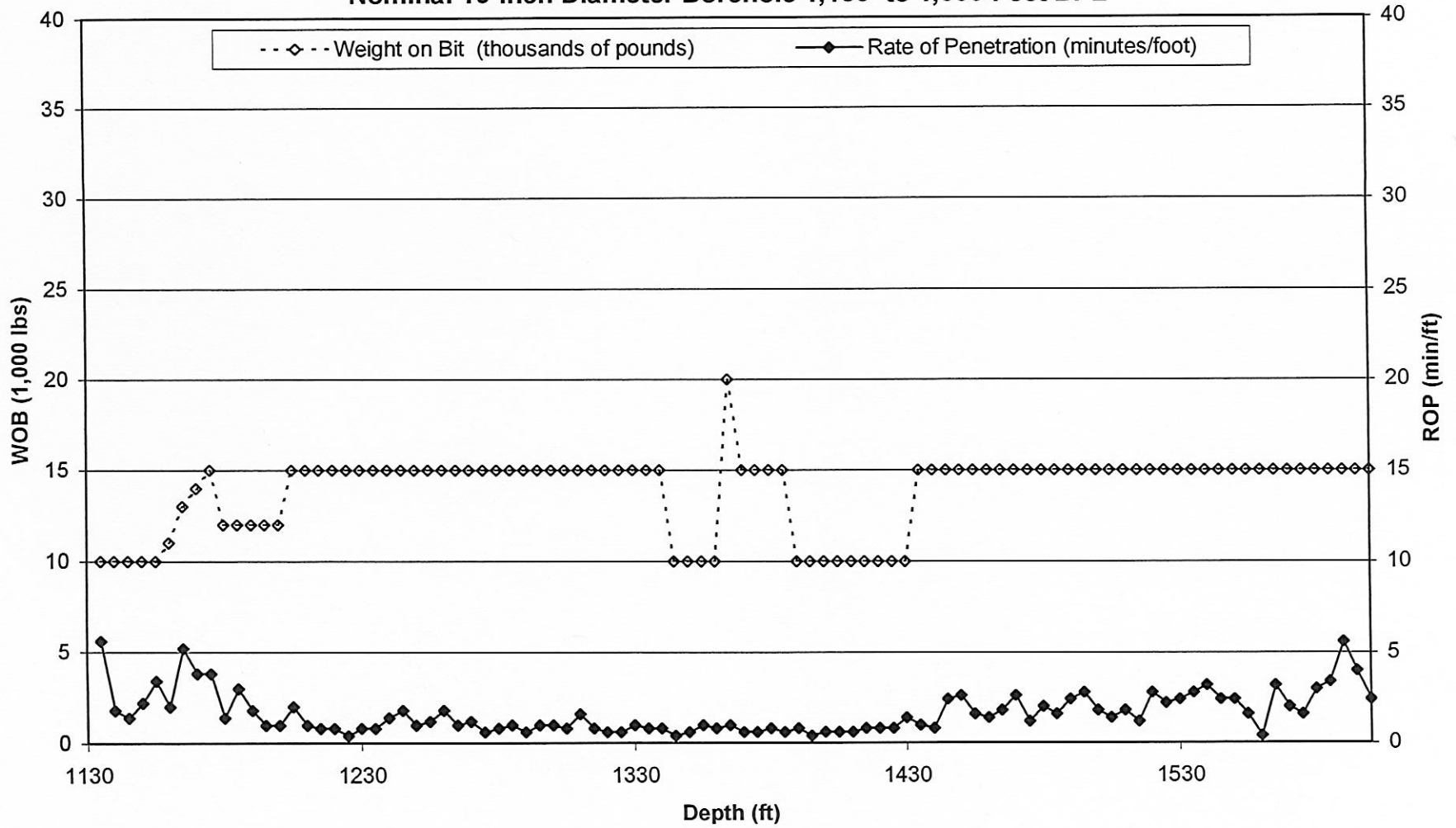
**Collier County, South County Regional WTP 8-mgd R. O. Expansion
 Dual-Zone Monitor Well MW - 1
 Weight on Bit / Rate of Penetration
 Nominal 34-inch Diameter Borehole 0 to 340 Feet BPL**



Collier County, South County Regional WTP 8-mgd R. O. Expansion
Dual-Zone Monitor Well MW - 1
Weight on Bit / Rate of Penetration
Nominal 24-inch Diameter Borehole 340 to 1,130 Feet BPL



Collier County, South County Regional WTP 8-mgd R. O. Expansion
Dual-Zone Monitor Well MW - 1
Weight on Bit / Rate of Penetration
Nominal 16-inch Diameter Borehole 1,130 to 1,600 Feet BPL



Appendix C
Inclination Surveys

Injection Well No. 1 (IW-1) – Drilling Data
Inclination Surveys

APPENDIX C
INCLINATION SURVEYS
 CONCENTRATE DISPOSAL WELL IW-1
 SOUTH COLLIER COUNTY WTP

CONCENTRATE DISPOSAL WELL IW-1		
Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
120	0.40	50.5
240	0.40	50.5
335	0.30	50.5
360	0.25	12.25
450	0.30	12.25
540	0.40	12.25
630	0.50	12.25
720	0.30	12.25
810	0.25	12.25
900	0.40	12.25
990	0.50	12.25
1080	0.50	12.25
1170	0.35	12.25
1260	0.25	12.25
90	0.50	40.5
180	0.38	40.5
270	0.50	40.5
360	0.30	40.5
450	0.50	40.5
540	0.25	40.5
630	0.25	40.5
720	0.30	40.5

CONCENTRATE DISPOSAL WELL IW-1

Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
810	0.40	40.5
900	0.50	40.5
990	0.50	40.5
1080	0.50	40.5
1170	0.35	40.5
1260	0.40	40.5
1390	0.25	12.25
1480	0.25	12.25
1570	0.40	12.25
1660	0.25	12.25
1750	0.25	12.25
1840	0.20	12.25
1930	0.15	12.25
2020	0.20	12.25
2110	0.25	12.25
2200	0.25	12.25
2290	0.25	12.25
2380	0.25	12.25
2470	0.10	12.25
2560	0.30	12.25
2650	0.30	12.25
2740	0.45	12.25
2830	0.25	12.25
2920	0.45	12.25
3010	0.45	12.25
3100	0.20	12.25

CONCENTRATE DISPOSAL WELL IW-1

Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
1390	0.30	32.5
1480	0.20	32.5
1570	0.30	32.5
1660	0.30	32.5
1750	0.30	32.5
1840	0.40	32.5
1930	0.40	32.5
2020	0.30	32.5
2110	0.28	32.5
2200	0.40	32.5
2290	0.26	32.5
2380	0.37	32.5
2470	0.40	32.5
2555	0.35	32.5
2645	0.25	22.5
2735	0.40	22.5
2825	0.30	22.5
2915	0.30	22.5
3005	0.30	22.5
3095	0.35	22.5
3185	0.25	22.5

Injection Well No. 2 (IW-2) – Drilling Data
Inclination Surveys

APPENDIX C
INCLINATION SURVEYS
 CONCENTRATE DISPOSAL WELL IW-2
 SOUTH COLLIER COUNTY WTP

CONCENTRATE DISPOSAL WELL IW-2		
Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
90	0.30	50.5
180	0.30	50.5
270	0.50	50.5
360	0.25	12.25
450	0.20	12.25
540	0.20	12.25
630	0.25	12.25
720	0.25	12.25
810	0.30	12.25
900	0.30	12.25
990	0.25	12.25
1080	0.25	12.25
1170	0.30	12.25
1260	0.25	12.25
1350	0.30	12.25
420	0.40	40.5
510	0.30	40.5
600	0.25	40.5
690	0.30	40.5
780	0.40	40.5
870	0.30	40.5
960	0.35	40.5

CONCENTRATE DISPOSAL WELL IW-2

Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
1050	0.25	40.5
1140	0.25	40.5
1230	0.30	40.5
1440	0.25	12.25
1530	0.25	12.25
1620	0.25	12.25
1710	0.40	12.25
1800	0.25	12.25
1890	0.25	12.25
1980	0.20	12.25
2070	0.40	12.25
2160	0.25	12.25
2250	0.25	12.25
2340	0.25	12.25
2430	0.25	12.25
2520	0.25	12.25
2610	0.25	12.25
2700	0.25	12.25
2790	0.30	12.25
2880	0.25	12.25
2970	0.35	12.25
3060	0.25	12.25
3150	0.30	12.25
1350	0.20	32.5
1440	0.18	32.5
1530	0.25	32.5

CONCENTRATE DISPOSAL WELL IW-2

Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
1620	0.18	32.5
1710	0.25	32.5
1800	0.23	32.5
1890	0.30	32.5
1980	0.25	32.5
2070	0.30	32.5
2160	0.25	32.5
2250	0.25	32.5
2340	0.25	32.5
2430	0.25	22.5
2520	0.25	22.5
2610	0.25	22.5
2700	0.23	22.5
2790	0.20	22.5
2880	0.20	22.5
2970	0.25	22.5
3060	0.15	22.5
3150	0.25	22.5

Monitor Well No. 1 (MW-1) – Drilling Data
Inclination Surveys

APPENDIX C
INCLINATION SURVEYS
 DUAL-ZONE MONITOR MW-1
 SOUTH COLLIER COUNTY WTP

DUAL-ZONE MONITOR WELL MW-1		
Depth (feet bpl)	Inclination (degrees)	Bit Diameter (inches)
90	0.25	34.5
180	0.30	34.5
270	0.25	34.5
360	0.50	22.5
450	0.50	22.5
540	0.75	22.5
630	0.75	22.5
720	0.75	22.5
810	0.75	22.5
900	0.10	22.5
990	0.20	22.5
1080	0.20	22.5
1200	0.25	14.75
1290	0.25	14.75
1380	0.35	14.75
1470	0.40	14.75
1560	0.25	14.75