Marco Lakes ASR Expansion Project ASR-5 Well Completion Report

December, 2004
Volume II

Prepared by:
Water Resource Solutions, Inc
428 Pine Island Road, S.W.
Cape Coral, FL 33991

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APPENDIX 1.1

FDEP WELL 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

CERTIFIED MAIL NO.: Z 252 620 872
RETURN RECEIPT REQUESTED

In the Matter of an
application for Permit by:

Mr. Rafael Terrero, P.E.
Florida Water Services Corporation
1000 Color Place
Apopka, Florida 32703
_____/

FDEP File No. 141218-001 thru 008-UC
Collier County - UIC
Marco Lakes Aquifer Storage and Recovery
(ASR) Class V Injection Wells

NOTICE OF PERMIT ISSUANCE

Enclosed are Permit Numbers 141218-001 thru 008-UC to construct a Class V injection well, 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

Margaret F. Highsmith
Director of
District Management

Continue...

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this PERMIT and all copies were mailed before the close of business on April 23, 1999 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.

Karen L. Mialy 4-23-99
Clerk Date

MFH/JBM/dj

cc: Lloyd Horvath P. E.
TAC

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

PERMIT

PERMITTEE

Florida Water Services
1000 Color Place
Apopka, Florida 32703

Permit/Certification
I. D. No: 5211P04979
Number: 141218-001 thru 008
Date of Issue: April 22, 1999
Expiration Date: April 21, 2004
County: Collier
Latitude: 26 04' 01" N
Longitude: 81 41' 34" W
Section/Town/Range: 34/50S 26E
Project: Marco Lakes Aquifer Storage and Recovery (ASR) Class V Injection Wells

This permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.) and rules 62-4, 62-520, 62-550 and 62-528 of the Florida Administrative Code. 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 eight (8) Class V Group Seven Aquifer Storage and Recovery (ASR) injection wells and two (2) monitoring wells as an expansion to an existing ASR system. The purpose is to store surplus partially treated water from the Marco Lakes in the lower Hawthorn and Suwanee aquifers for later recovery to meet peak seasonal water demands. The basic well design for the eight wells will consist of 16-inch diameter injection wells to a proposed total depth of approximately 790 feet and cased to 745 feet below land surface (bls) and two 6-inch monitoring wells that will monitor the storage zone and the mid-Hawthorn Zone II. This project is depicted on the ViroGroup, Inc. application and associated documents submitted in support of this project. The location for this project is approximately one-half mile SE of C.R. 951, Collier County, Florida.

Subject to General Conditions 1-16 and Specific Conditions 1-22.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5) F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by any order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credential or other documents as may be required by law, and at reasonable times, access to the premises where the permitted activity is located or conducted to:

(a) Have access to and copy any records that must be kept under the conditions of the permit;
(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules. Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of non-compliance, and
(b) The period of non-compliance, including dates and times, or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent

GENERAL CONDITIONS:

recurrence of the non-compliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Section 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-3.051, shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard.

11. This permit is transferable only upon Department approval in accordance with F.A.C. Rules 62-4.120 and 62-30.300, F.A.C. as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

(a) Determination of Best Available Control Technology (BACT)
(b) Determination of Prevention of Significant Deterioration (PSD)
(c) Certification of compliance with State Water Quality Standards (Section 401, PL 92-500)
(d) Compliance with New Source Performance Standards

14. The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically, unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. the date, exact place, and time of sampling or measurements;
2. the person responsible for performing the sampling or measurements;

GENERAL CONDITIONS:

3. the dates analyses were performed;
4. the person responsible for performing the analyses;
5. the analytical techniques or methods used;
6. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

16. In the case of an underground injection control permit, the following permit conditions also shall apply:

(a) All reports or information required by the Department shall be certified as being true, accurate and complete.

(b) Reports of compliance or noncompliance with, or any progress reports on, requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(c) Notification of any noncompliance which may endanger health or the environment shall be reported verbally to the Department within 24 hours and again within 72 hours, and a final written report provided within two weeks.

1 The verbal reports shall contain any monitoring or other information which indicate that any contaminant may endanger an underground source of drinking water and 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.

2. The written submission shall contain a description of and a discussion of the cause of the noncompliance and, if it has not been corrected, the anticipated time the noncompliance is expected to continue, the steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance and all information required by Rule 62-528.415(4)(b), F.A.C.

(d) The Department shall be notified at least 180 days before conversion or abandonment of an injection well, unless abandonment within a lesser period of time is necessary to protect waters of the State.

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.

1. General Criteria

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 or 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:

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 if such fluid movement may cause a violation of any primary drinking water standard or may otherwise adversely affect the health of persons.

l. 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 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.

m. The permittee shall retain all records concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment. 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.

2. Drawings, plans, documents or specifications submitted by the Permittee, not attached hereto, but retained on file at the South Florida District Office, are made a part hereof.

3. The injection and monitor wells at the site shall be abandoned when posing a potential threat to the quality of the waters of the State. In the event a well must be plugged or abandoned, the permittee shall obtain a permit from the Department as required by Chapter 62-528, F A.C. The permittee shall notify the Department and obtain approval prior to any well work or modification.

4. The permittee shall notify the Department in the event that any of the conditions of the permit cannot be met, including an emergency discharge, due to breakdown of equipment, power outages or damages by hazard of fires, wind or other causes in accordance with the following:

a. Notification shall be made in person or by telephone within 24 hours of the event.

b. A written report shall be submitted within 5 days which describes the nature and cause of the breakdown or malfunction, the steps being taken to correct the problem and prevent its recurrence, emergency procedures in use pending correction of the problem and the time when the facility will again be operating in compliance with permit conditions.

5. Prior to the commencement of any work, the name of the Florida-registered driller(s) supervising the drilling operations and the driller's registration number shall be submitted to the Department. The permittee or the engineer of record shall provide the Department with copies of all required federal, state or local permits prior to spudding the wells.

6. The permittee shall retain the engineer of record or obtain the services of any professional engineer registered in the State of Florida for the inspection of the construction of this project. Upon completion the engineer shall inspect for conformity to construction permit applications and associated documents. The Department shall be notified immediately of any change of engineer

7. The pumping of any fluids other than the Marco Lakes' treated water into the ASR injection well constitutes a violation of this permit and shall be cause for revocation.

8. Prior to commencement of operational testing of the injection well, the permittee shall obtain from the Department a Water Quality Exemption for Color pursuant to Rule 62-520.500, F.A.C

9. Prior to injection, the source water shall be treated with a minimum of 3ppm of sodium hypochlorite to reduce total coliform to 4 per 100 ml or less

10. The Water Treatment and Transmission Facilities - Phase I shall be implemented as depicted by the drawings, plans, and specifications submitted by the permittee on December 2, 1998. These facilities will provide filtration, pH adjustment and disinfection of surface water prior to injection for storage.

11. Injection into any aquifer shallower than the Lower Hawthorn will require a major modification to this permit pursuant to Rules 62-4.050 (4)(1)15. and 62-528.355, F.A.C., and public notice.

12. The first two ASR wells (001, 002) may be operationally (cycle) tested upon written authorization by the Department and the cycle test data submitted to the Department prior to the remaining ASR wells undergoing cycle testing. Prior to requesting operational testing approval from the Department for ASR wells 003 thru 008, the permittee shall submit to the Department all cycle test data for ASR wells 001 and 002.

13. **Operational Testing**

Prior to operational testing:

(a). The permittee shall submit the following information to each member of the TAC:
1). A draft well completion report
2). Geophysical logs
3). Injection test data
4). Confining zone data
5). Background water quality data for the injection and monitor zones
6). Injection fluid analysis
7). As-built well construction specifications
8). Other data obtained during well construction

(b). Written authorization shall be obtained from the Department. 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). Injection well monitoring requirements
4) Effluent monitoring requirements
5). Ground water sampling of monitor wells
6). Reporting requirements
7). An expiration date for the operational testing period

(c). Before authorizing operational testing the Department shall conduct an inspection of the facility to determine if the conditions of the permit have been met.

The injection system shall be monitored in accordance with Rule 62-528.615, F.A.C. The injection well performance and monitor zone data shall be recorded and reported 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 submit monthly to the Department the results of all injection well and monitor well data required by this permit no later than the fifteenth (15) 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.

14. This permit does not authorize the introduction of the water recovered from the ASR well into the public water system. A permit is required from this Department's Drinking Water Section prior to connection of an ASR system into a public water system.

15. This project will be monitored by the Department with the assistance of the U.S. Environmental Protection Agency (USEPA), Region 4, and the Technical Advisory Committee (TAC) which consists of representatives of the following agencies:

Department of Environmental Protection - Fort Myers
Department of Environmental Protection - Tallahassee
U.S. Geological Survey - Miami
South Florida Water Management District - West Palm Beach

16. The permittee shall provide copies of all correspondence relative to this permit to each member of the TAC and the USEPA. Such correspondence includes but is not limited to reports, schedules, analyses and geophysical logs required by the Department under the terms of this permit. The permittee is not required to provide specific correspondence to any TAC member who submits to the permittee a written request to be omitted as a recipient of specific correspondence.

17. During the construction period allowed by this permit, daily progress reports shall be submitted to the Department, the USEPA, and the Technical Advisory Committee each week. The reporting period shall run Friday through Thursday and reports shall be mailed on Friday of each week. The report shall include, but is not limited to the following:

a. Description of daily footage drilled by diameter of bit or size of hole opener or reamer being used;

b. Description of work during installation and cementing of casing, including amounts of casing and cement used;

c. Description of formation and depth encountered;

d. Lithological description of drill cuttings collected every ten feet or at every formation change;

e. Description of work and type of testing accomplished including geophysical logging and pumping tests;

f. Description of any construction problems that develop and their status;

g Copies of the driller's logs; and

h. Accurate records of the amount and type of any material used during construction to kill the flow of the wells.

18. No drilling operations shall begin without an approved disposal site for drill cuttings, fluids or waste. It shall be the Drilling Contractor's responsibility to obtain any necessary Department and local agency approval for disposal prior to the start of construction.

19. After completion of construction and testing, a final report shall be submitted to the Department and the TAC. The report shall include, but not be limited to, all information and data collected under Sections 62-528.605, 62-528.610, 62-528.615 and 62-528.620, F.A.C., with appropriate interpretations. Mill certificates for the casing(s) shall be included in this report.

20. 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 are 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.

21. The existing dual-zone monitoring well may be converted to an ASR zone monitor well under this permit. A plugging and abandonment plan for the Hawthorn zone I well shall be submitted and approved by the Department prior to this work.

22. A new mid-Hawthorn II monitor well shall be constructed and a minimum of three months of water quality data shall be submitted to the Department prior to plugging and abandonment of the Hawthorn zone well.

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 22ND day of April 1999.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Margaret F. Highsmith
Director of
District Management

MFH/JBM/dj

APPENDIX 1.2

COLLIER COUNTY PERMITAPPLICATION AND PERMIT FOR ASR-5

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

Permit No. 20040716.83
Florida Unique I.D. CC0716 4-U
Permit Stipulations Required (See attached)
62-524 well ☐
CUP/WUP Application No. _____

ABOVE THIS LINE FOR OFFICIAL USE ONLY

☐ Southwest
☐ Northwest
☐ St. Johns River
☒ South Florida
☐ Suwannee River

CHECK BOX FOR APPROPRIATE DISTRICT. ADDRESS ON BACK OF PERMIT FORM.

THIS FORM *MUST* BE FILLED OUT COMPLETELY.

The water well contractor is responsible for completing this form and forwarding the permit to the appropriate delegated county where applicable.

Fold at this line in order that address is visible through envelope window

1. City of Marco Island — 50 Bald Eagle Drive — Marco Island — 34145 — (239) 389-5000
   Owner, Legal Name of Entity if Corporation / Address / City / Zip / Telephone Number

2. Marco Lakes, 7130 Collier Boulevard, Naples, FL 10453
   Well Location Address, Road Name or Number, City

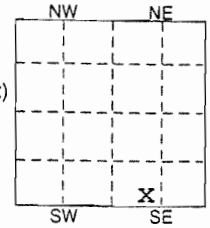
3. Southern Well Services, Inc. — 9037 — 26134 — (727) 531-7559
   Well Drilling Contractor / License No. / Telephone No.

   P.O. Box 8145
   Address

   Clearwater — FL — 33758-8145
   City / State / Zip

4. SW 1/4 of SE 1/4 of Section 34 (SW = smallest, SE = biggest)
   (Indicate Well on Chart)

5. Township 50s Range 26e



6. Collier
   County / Subdivision Name / Lot / Block / Unit

7. Number of proposed wells 1 · Check the use of well: (See back of permit for additional choices) _____ Domestic Monitor (type) _____
   _____ Irrigation (type) (See Back) Public Water Supply (type) ASR (See Back) List Other _____
   Distance from septic system _____ ft. Description of facility Wellfield Estimated start of construction date 7/12/04

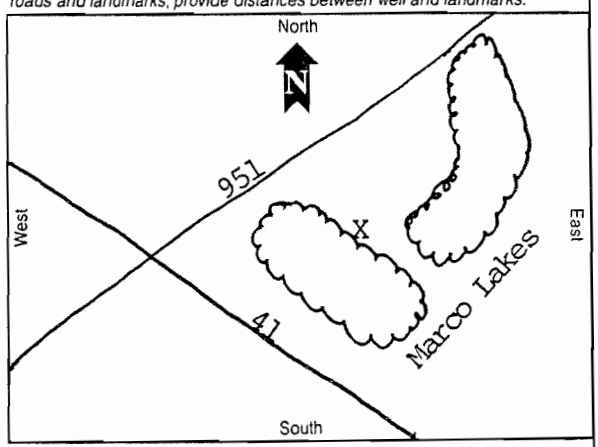
8. Application for: _____ New Construction _____ Repair/Modify _____ Abandonment _____ (Reason for Abandonment)

Date Stamp

9. Estimated: Well Depth 785' Casing Depth 740' Screen Interval from _____ to _____
   Casing Material: Blk-Steel / Gal / (PVC) Casing Diameter 16" Seal Material Neat Cement

   If applicable: Proposed Grouting Interval
   From 745' to LS Seal Material Neat Cement
   From _____ to _____ Seal Material _____
   From _____ to _____ Seal Material _____

Draw a map of well location and indicate well site with an "X". Identify known roads and landmarks; provide distances between well and landmarks.



11. Telescope Casing _____ or Liner _____ (check one) Diameter _____
    Blk-Steel / Galvanized / PVC Other (specify): _____

12. Method of Construction: X Rotary _____ Cable Tool _____ Combination
    _____ Auger _____ Other (specify:) _____)

13. Indicate total No. of wells on site 3. List number of unused wells on site 0.

14. Is this well or any other well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___No X Yes
    (If yes, complete the following) CUP/WUP No. 11-00080-W
    District well I.D. No. 5
    Latitude 260403 Longitude 814138
    Data obtained from GPS ____ or map ____ or survey ____ (*map datum NAD 27*___ *NAD 83*___)

15. I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided on this application is accurate and that I will obtain necessary approval from other federal, state, or local governments if applicable. I agree to provide a well completion report to the District within 30 days after drilling or the permit expiration, whichever occurs first.

Signature of Contractor — 9037 License No.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to personnel of the WMD or a representative access to the well site.

Owner's or Agent's Signature — 7/12/04 Date

DO NOT WRITE BELOW THIS LINE — FOR OFFICIAL USE ONLY

Approval Granted By: _____ Issue Date: _____ Hydrologist Approval _____ Initials

Owner Number: _____ Fee Received: $ _____ Receipt No.: _____ Check No.: _____

THIS PERMIT NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD. IT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL DRILLING OPERATIONS. ***This permit is valid for 90 days from date of issue.***

WHITE: ORIGINAL FILE
YELLOW: DRILLING CONTRACTOR
PINK: OWNER

INSPECTION JOB CARD - COLLIER COUNTY, FLORIDA
FOR INSPECTIONS PHONE 643-9757

PERMIT NBR **2004071683**

MASTER NBR ISSUED 7/16/2004

J\ DESC.: CC07164-N, ASR
JOB LOCATION: 7130 COLLIER BLVD
SUBDIVISION: 100 acreage LOT .000 BLOCK 006
CONTACT NAME: NOEMAN CONTACT PHONE: (727)531-7559
D.B.A. SOUTHERN WELL SERVICES, INC.
SETBACKS
FRONT: REAR: LEFT: RIGHT:
SPECIAL: FLOOD ZONE: AE-7

REQ	DESCRIPTION	REQ	DESCRIPTION
804	WELL		

NOISE ORDINANCE 90-17 - NOISE LIMITATIONS are in effect at all times. Work permitted: RESIDENTIAL Areas - 6:30AM to 7:00PM Monday thru Saturday
NON-RESIDENTIAL Areas (more than 500 feet from Residentail Area) 6:00AM to 8:00PM Monday thru Saturday. No Work on Sundays or Holidays.
RADIOS, LOADSPEAKERS, ETC. Must not disturb peace, quiet and comfort of neighboring inhabitants.
FREE CABLE LOCATIONS - Call 48 Hours prior to digging/FPL 434-1222/UTS 1-800-542-0088/PalmerCATV 783-0638 and all other applicable utilites.

WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT. FS 713.135

CDPR2022

COLLIER COUNTY
BOARD OF COUNTY COMMISSIONERS

PERMIT

ER. #: 2004071683 PERMIT TYPE: WELL VALID #: 683
SSUED: 07-16-04 APPLIED DATE: 07-16-04 APPROVAL DATE: 07-16-04
ASTER #: COA #:

OB ADDRESS: 7130 COLLIER BLVD
OB DESCRIPTION: CC07164-N, ASR JOB PHONE:

UBDIVISION #: 100 - acreage BLOCK: 006 LOT: .000
LOOD MAP: 0605 ZONE: AE-7 ELEVATION:
OLIO #: 0000000448000303 SECTION-TOWNSHIP-RANGE 34 50 26

WNER INFORMATION:
ITY OF MARCO ISLAND
CITY MANAGER CITY HALL
0 BALD EAGLE DR
ARCO ISLAND, FLR0080 341453528

CONTRACTOR INFORMATION:
SOUTHERN WELL SERVICES, INC.
P.O. BOX 8145
CLEARWATER,FL 33758-8145

CERTIFICATE #: 26134 PHONE: (727)531-7559

CC CODE: 800 - WELLS
ONSTRUCTION CODE: 10 / OTHER
OB VALUE: TOTAL SQFT:

ETBACKS FRONT: REAR: LEFT: RIGHT:
EW SEPTIC WATER: WELL
ON. P NAME: NOEMAN
ONTACT PHONE: (727)531-7559

Per Collier County Ordinance No. 2002-01, as it may be amended, all work must comply with all applicable laws, codes, ordinances, and any additional stipulations or conditions of this permit. This permit expires if work authorized by the permit is not commenced within six (6) months from the date of issuance of the permit. Additional fees for failing to obtain permits prior to the commencement of construction may be imposed. Permittee(s) further understands that any contractor that may be employed must be a licensed contractor and that the structure must not be used or occupied until a Certificate of Occupancy is issued.

OTICE: PRIOR TO THE REMOVAL OF ASBESTOS PRODUCTS OR THE DEMOLITION OF A STRUCTURE, FEDERAL ND STATE LAWS REQUIRE THE PERMITTEE (EITHER THE OWNER OR CONTRACTOR) TO SUBMIT A NOTICE OF HE INTENDED WORK TO THE STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP). FOR MORE NFORMATION, CONTACT DEP AT (239) 332-6975.

1 addition to the conditions of this permit, there may be additional restrictions applicable to this property that may be found in ie public records of this county, and there may be additional permits required from other governmental entities such as water anagement districts, state agencies, or federal agencies.

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APPENDIX 2.1

GEOPHYSICAL LOGS AND VIDEO SURVEY

ASR WELL 5 – PILOT HOLE

- Caliper Log
- Dual Induction
- Natural Gamma
- Sonic/VDL

ASR WELL 5 – CASED HOLE

- Merged Cement Top Logs

ASR WELL 5 – OPEN HOLE

- Caliper Log
- Natural Gamma
- Fluid Conductivity
- Flowmeter
- Sonic/VDL
- Video Survey

MV Geophysical

X-Y CALIPER GAMMA RAY LOG

Company	Water Resource Solutions
Well	ASR-5
Field	Marco Lakes ASR Exp.
County	Collier
State/Prv	Florida

Company: Water Resource Solutions
Well: ASR-5
Field: Marco Lakes ASR Expansion
County: Collier State/Prv: Florida
Location: Marco Lakes ASR Wellfield Expansion, Southern Well Services

Permanent Datum: G.L. Elevation
Log Measured From: G.L.
Drilling Measured From: G.L.
Elevation: K.B. / D.F. / G.L.
Other Services: DIL/SP BHC/VDL

Date	23-AUG-2004
Run Number	ONE
Depth Driller	745
Depth Logger	744
Bottom Logged Interval	744
Top Log Interval	SURFACE
Open Hole Size	12.5"
Type Fluid	MUD
Density / Viscosity	9.8/NA
Max. Recorded Temp.	na
Estimated Cement Top	na
Time Well Ready	13:30 8/23/04
Time Logger Bottom	13:30 8/23/04
Equipment Number	MV004
Location	Ft. Myers
Recorded By	S. Maas
Witnessed By	A. McThenia (WRS) J. Bair (SWS)

Borehole Record			
Run Number	Bit	From	To
ONE	12.5"	45'	745'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	26"	0.375" WT	SURFACE	45'
Prot. String				
Production String				
Liner				

Invoice No. 200421 P.O. # Job No. * FINAL PRINT *

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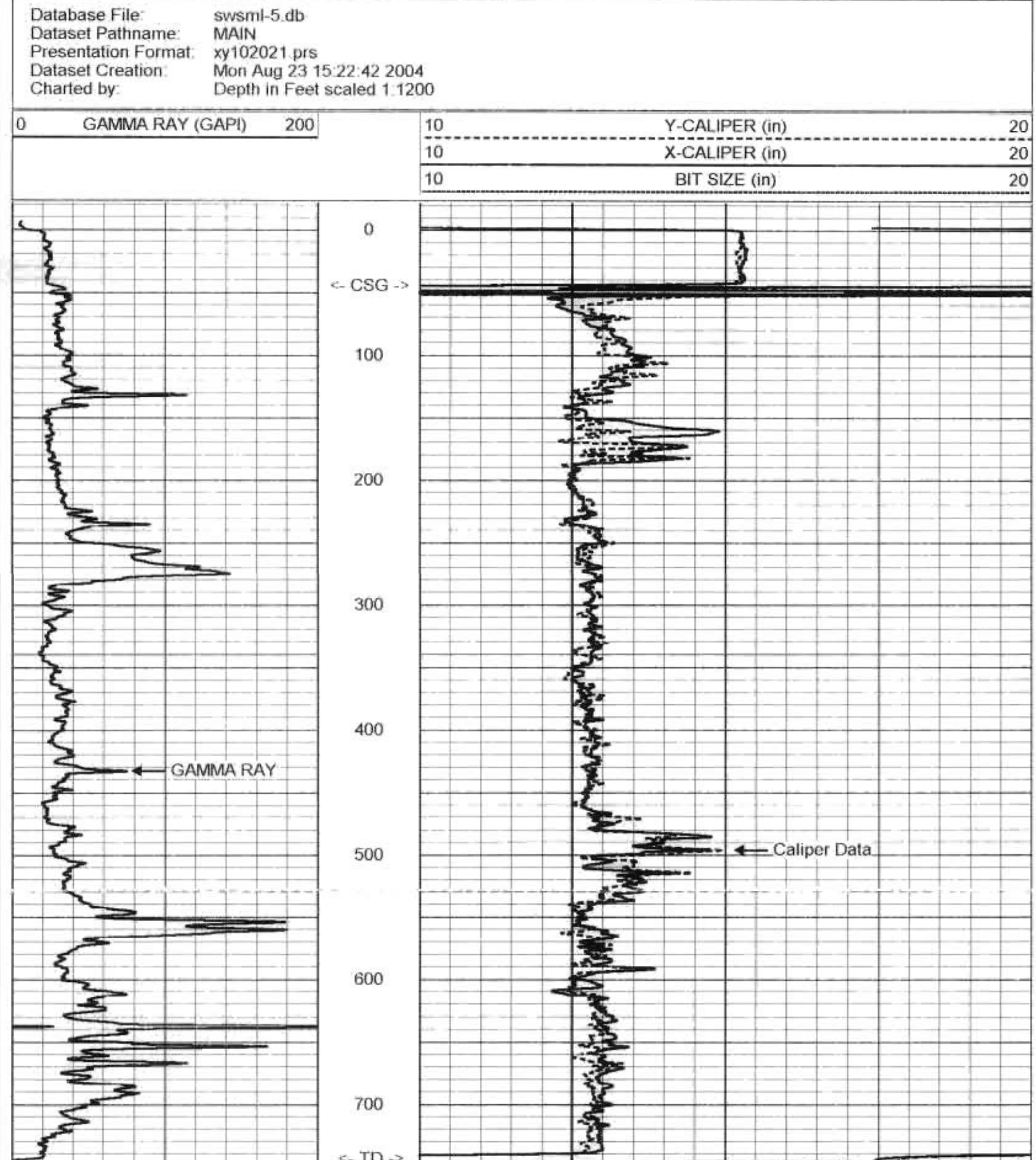
Comments

X-Y Caliper Arm Extensions: 33"

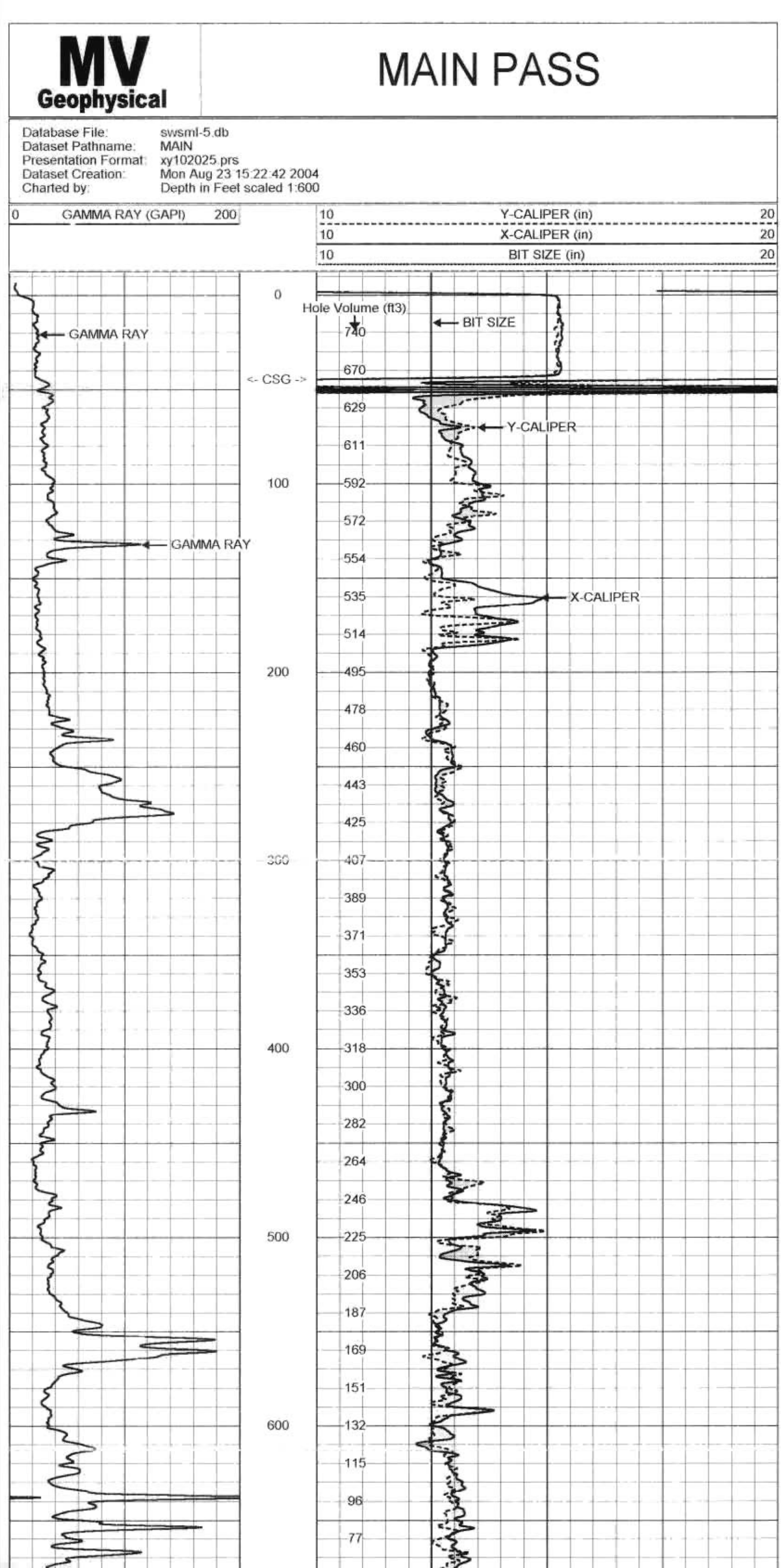
MAIN PASS

Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: xy102021.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:1200



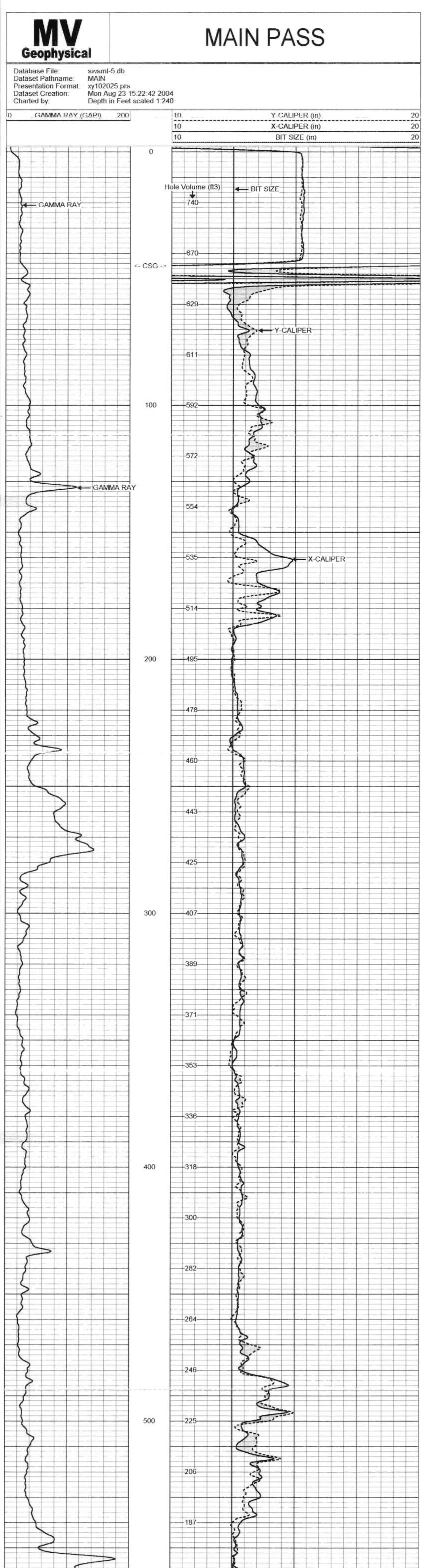
MAIN PASS

Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: xy102025.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:600



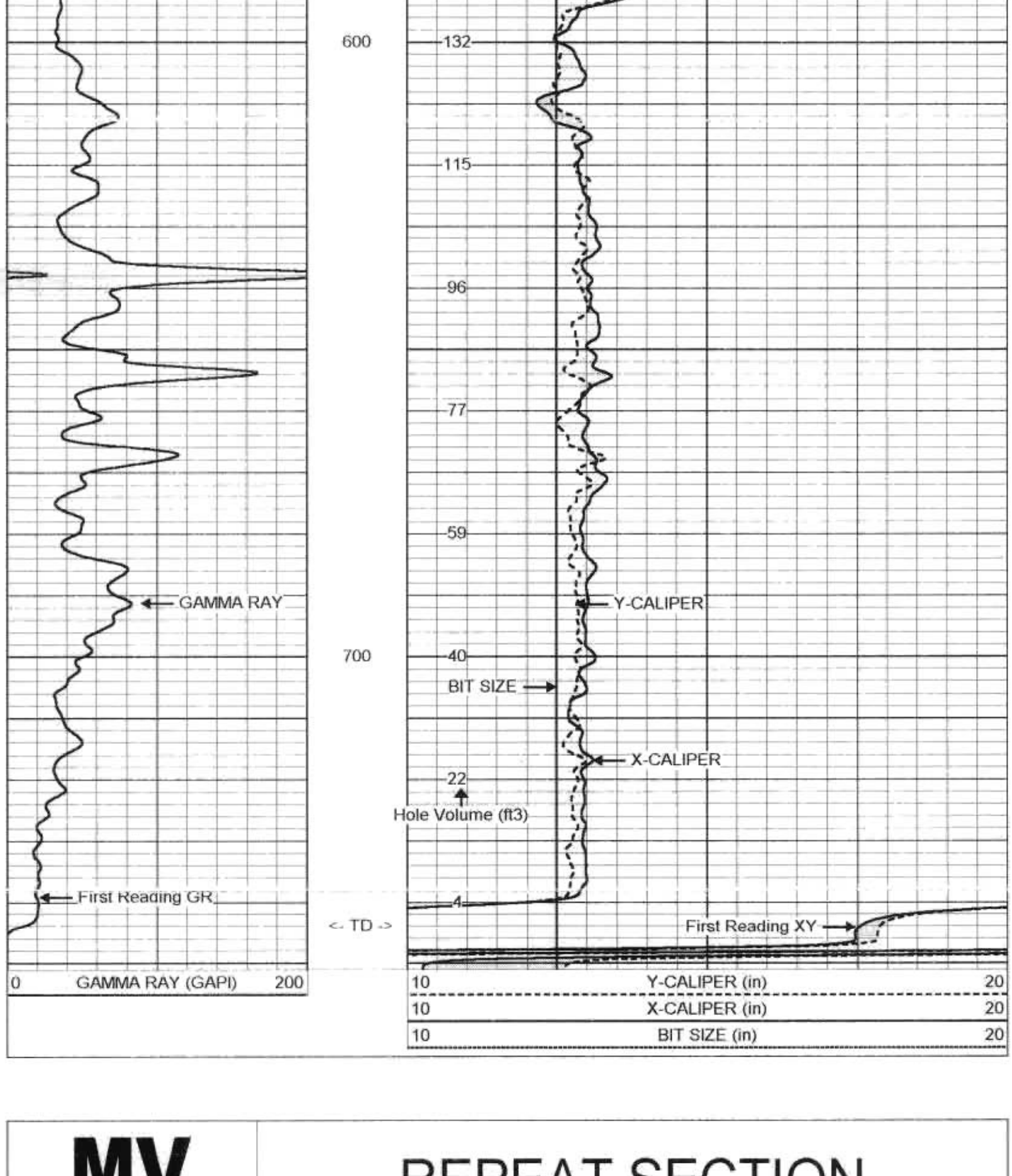
MAIN PASS

Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: xy102025.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:240



REPEAT SECTION

Database File: swsml-5.db
Dataset Pathname: REPEAT
Presentation Format: xy102025.prs
Dataset Creation: Mon Aug 23 14:30:24 2004
Charted by: Depth in Feet scaled 1:240

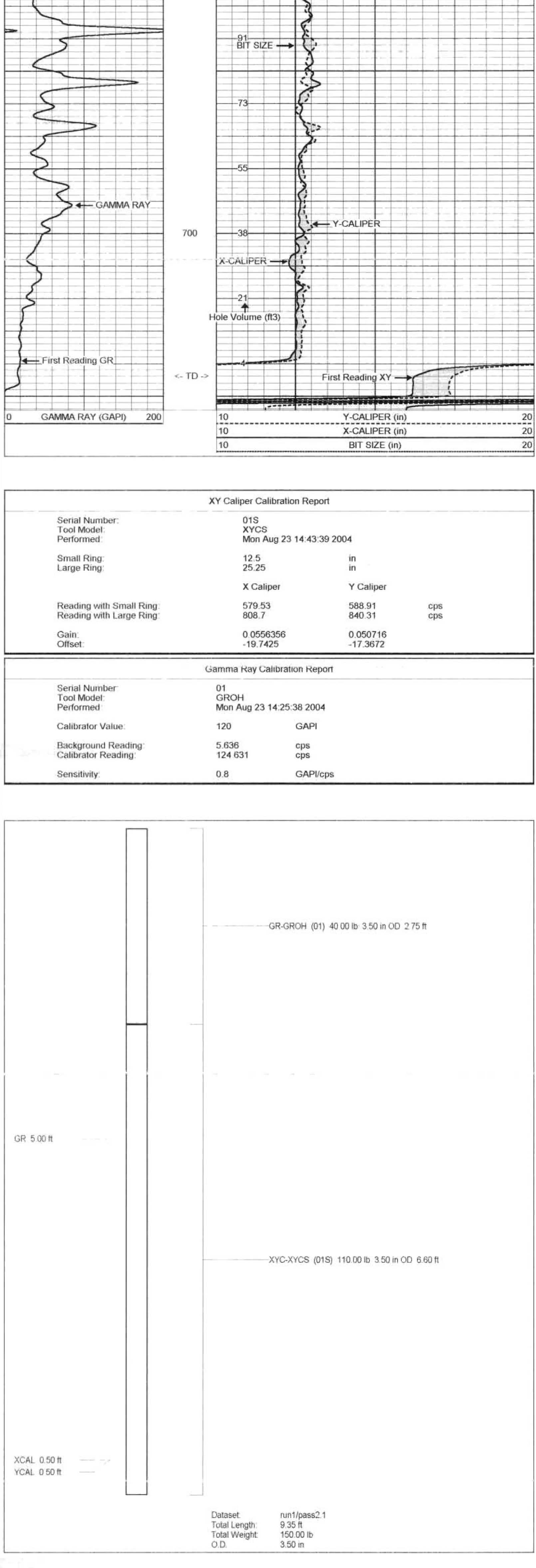


XY Caliper Calibration Report

Serial Number:	01S		
Tool Model:	XYCS		
Performed:	Mon Aug 23 14:43:39 2004		
Small Ring:	12.5		in
Large Ring:	25.25		in
	X Caliper	Y Caliper	
Reading with Small Ring:	579.53	588.91	cps
Reading with Large Ring:	808.7	840.31	cps
Gain:	0.0556356	0.050716	
Offset:	-19.7425	-17.3672	

Gamma Ray Calibration Report

Serial Number:	01	
Tool Model:	GROH	
Performed:	Mon Aug 23 14:25:38 2004	
Calibrator Value:	120	GAPI
Background Reading:	5.636	cps
Calibrator Reading:	124.631	cps
Sensitivity:	0.8	GAPI/cps



Dataset: run1/pass2.1
Total Length: 9.35 ft
Total Weight: 150.00 lb
O.D.: 3.50 in

MV Geophysical

DUAL INDUCTION LL3 / SP LOG

Company	Water Resource Solutions
Well	ASR-5
Field	Marco Lakes ASR Expansion
County	Collier
State/Prv	Florida
Location	Marco Lakes ASR Wellfield Expansion Southern Well Services
Other Services	XY/GR BHC/VDL
Permanent Datum	G L
Log Measured From	G L
Drilling Measured From	G L
Elevation	K B / D F / G L

Date	23-AUG-2004
Run Number	ONE
Depth Driller	742
Depth Logger	744
Bottom Logged Interval	742
Top Log Interval	47
Open Hole Size	12.5"
Type Fluid	MUD
Density / Viscosity	9.8MA
Max. Recorded Temp.	na
Estimated Cement Top	NA
Time Well Ready	13:30 8/23/04
Time Logger on Bottom	14:45 8/23/04
Equipment Number	MVGS-1
Location	Ft. Myers
Recorded By	S. Miller
Witnessed By	A. Mc Treiva (WRS) J. Barr (SWS)

Borehole Record				Tubing Record		
Run Number	Bit	From	To	Size	Weight	From	To
ONE	12.5"	40'	740'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	26"	0.375" WT	SURFACE	40'
Prot. String				
Production String				
Liner				

Invoice No.	2004121
P.O. #	
Job No.	

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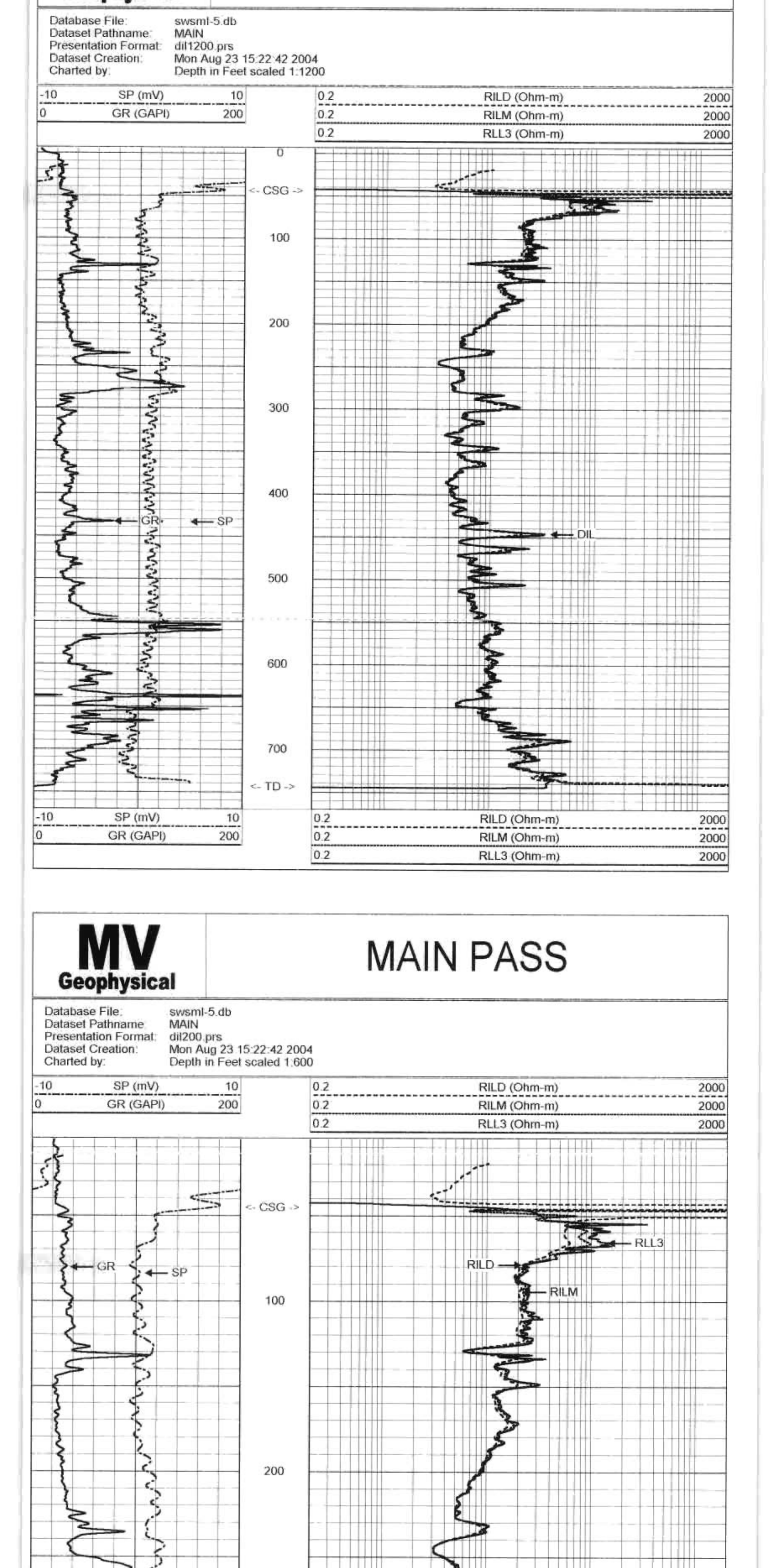
Comments

Rm=9.877 ohm @ 81.2 degF

MV Geophysical

MAIN PASS

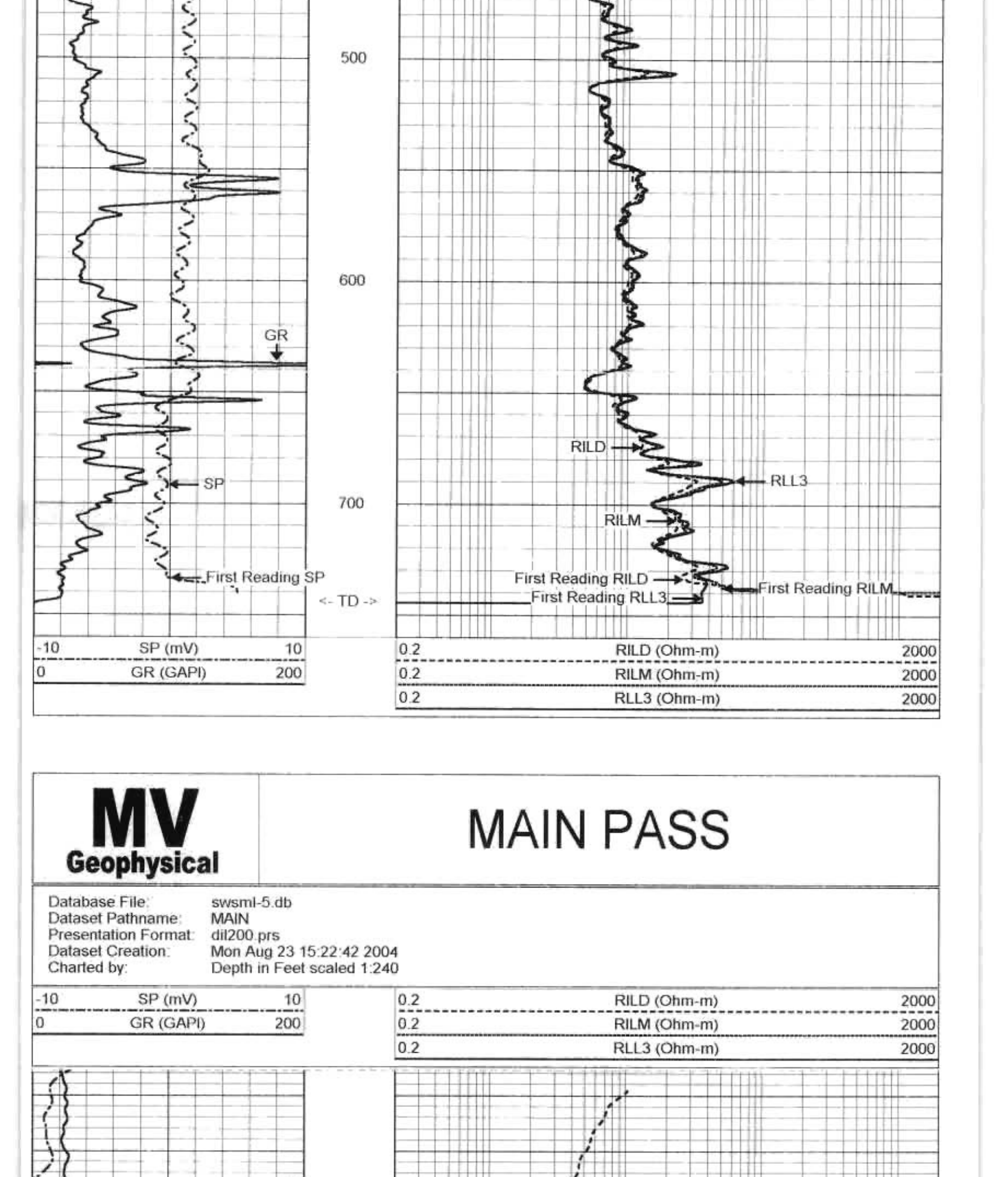
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: dil1200.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:1200



MV Geophysical

MAIN PASS

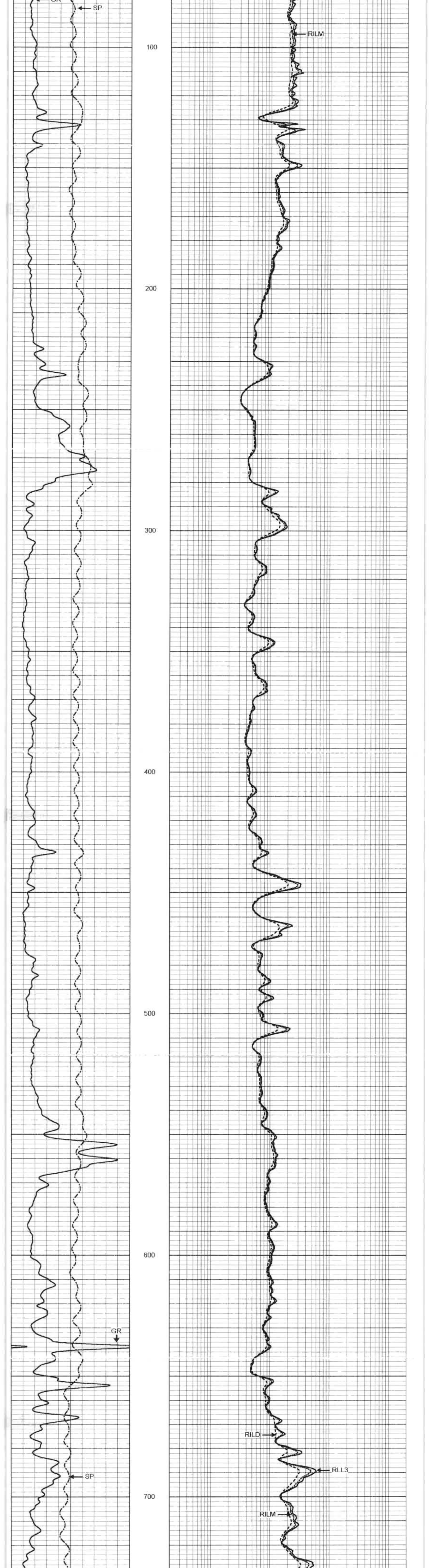
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: dil200.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:600



MV Geophysical

MAIN PASS

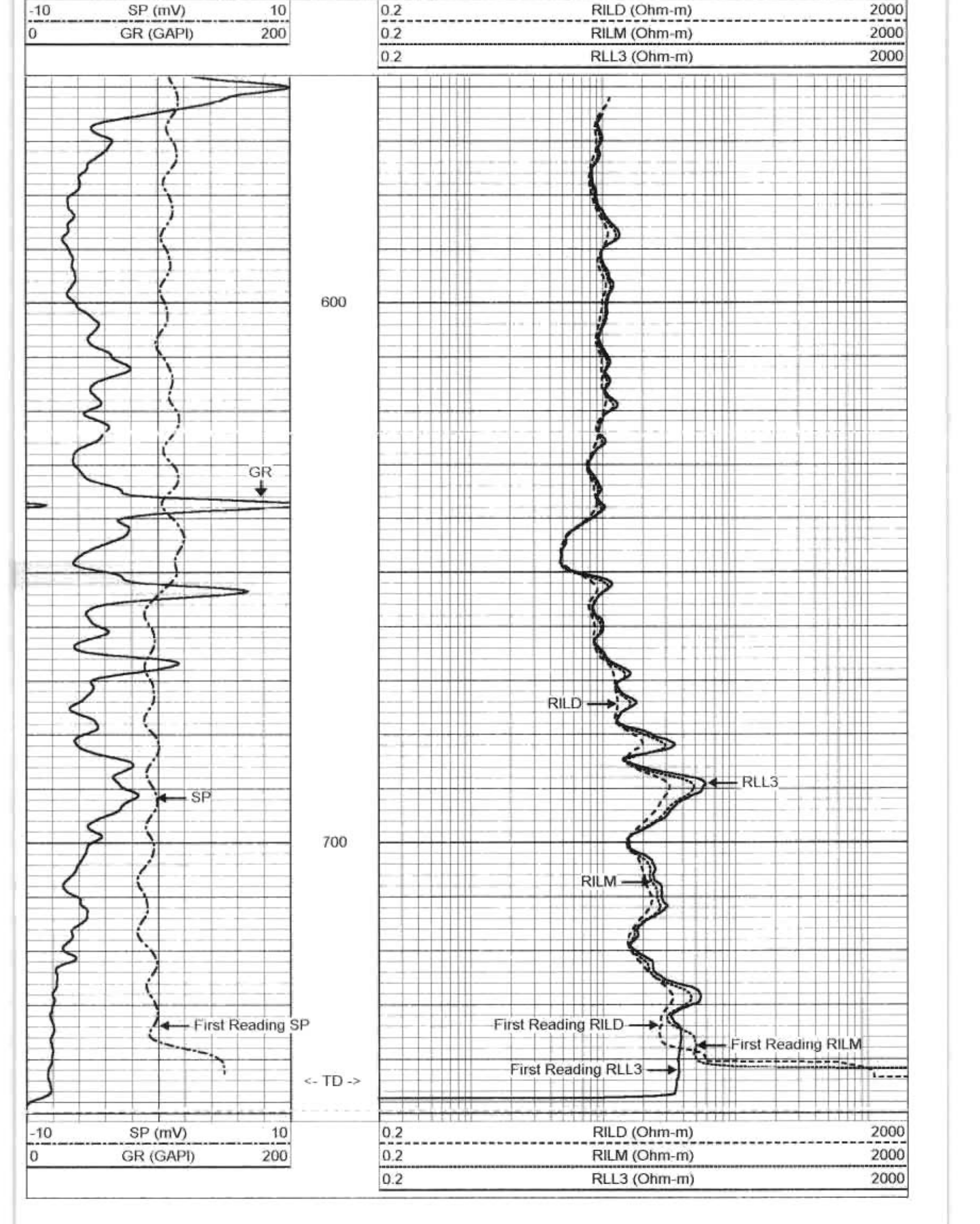
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: dil200.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:240



MV Geophysical

REPEAT SECTION

Database File: swsml-5.db
Dataset Pathname: REPEAT
Presentation Format: dil200.prs
Dataset Creation: Mon Aug 23 14:30:24 2004
Charted by: Depth in Feet scaled 1:240



Dual Induction Calibration Report

Serial-Model: 5390-R
Surface Cal Performed: Mon Feb 24 16:52:46 2003
Downhole Cal Performed: Mon Aug 23 14:58:48 2004
After Survey Verification Performed: Mon Aug 23 15:44:36 2004

Surface Calibration

Loop:	Readings Air	Readings Loop		References Air	References Loop		Results m	Results b
Deep	0.041	0.637	V	0.000	400.000	mmho-m	670.900	-27.223
Medium	-0.006	0.700	V	0.000	464.000	mmho-m	656.366	4.251

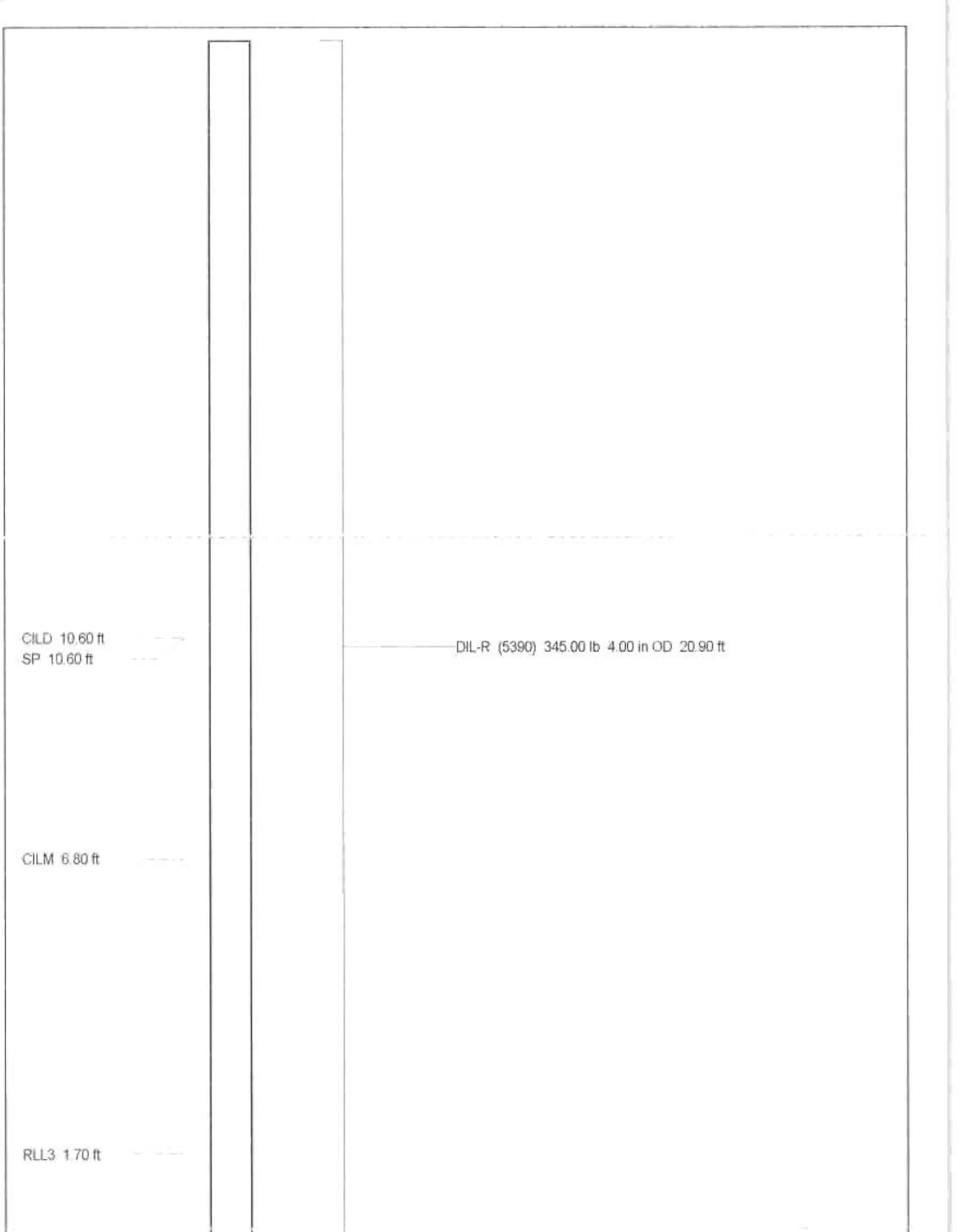
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.647	V	0.000	400.000	mmho-m	628.552	-6.783
Medium	-0.011	0.749	V	0.000	464.000	mmho-m	610.612	6.720

Downhole Calibration

Internal:	Readings Zero	Readings Cal		References Zero	References Cal		Results m	Results b
Deep	-20.098	398.093	mmho-m	-19.983	406.966	mmho-m	1.021	0.536
Medium	12.039	488.341	mmho-m	-2.972	495.796	mmho-m	1.047	-15.579
Shallow	2.501	0.022	V	494.500	2.000	Ohm-m	198.691	-2.400

After Survey Verification

Internal:	Readings Zero	Readings Cal		Targets Zero	Targets Cal		Results m'	Results b'
Deep	-18.980	399.903	mmho-m	-20.098	398.093	mmho-m	1.021	0.536
Medium	13.277	490.248	mmho-m	12.039	488.341	mmho-m	1.047	-15.579
Shallow	494.898	2.592	Ohm-m	494.500	2.000	Ohm-m	1.000	-0.593



Dataset: run1/pass6
Total Length: 20.90 ft
Total Weight: 345.00 lb
O.D.: 4.00 in

MV Geophysical

BOREHOLE COMPENSATED SONIC w/ VARIABLE DENSITY LOG

Company: Water Resource Solutions
Well: ASR-5
Field: Marco Lakes ASR Expansion
County: Collier
State/Prv: Florida

Location: Marco Lakes ASR Wellfield Expansion, Southern Well Services

Permanent Datum: G.L.
Log Measured From: G.L.
Drilling Measured From: G.L.

Elevation: K.B. / G.L.

Other Services: XYGR, DEGP

Date	23-AUG-2004
Run Number	ONE
Depth Driller	740'
Depth Logger	736'
Bottom Logged Interval	736'
Top Log Interval	0'
Open Hole Size	12.0"
Type Fluid	N/A
Density / Viscosity	N/A
Max. Recorded Temp.	N/A
Estimated Cement Top	N/A
Time Well Ready	13:00 8/23/04
Time Logger on Bottom	15:22 8/23/04
Equipment Number	SLT-GO
Location	ASR-5
Recorded By	A. McThenia (MVG)
Witnessed By	J. Baker (WRS)

Run Number	Bore-Hole Record Bit	From	To	Casing Record Size	Weight	From	To
ONE	12.0"	60'	740'	18"		SURFACE	60'

Surface String: | Prot. String: | Production String: 24" STEEL | Liner:

Invoice No.: 2004-121 | P.O. #: | Job No.: | *** FINAL PRINT ***

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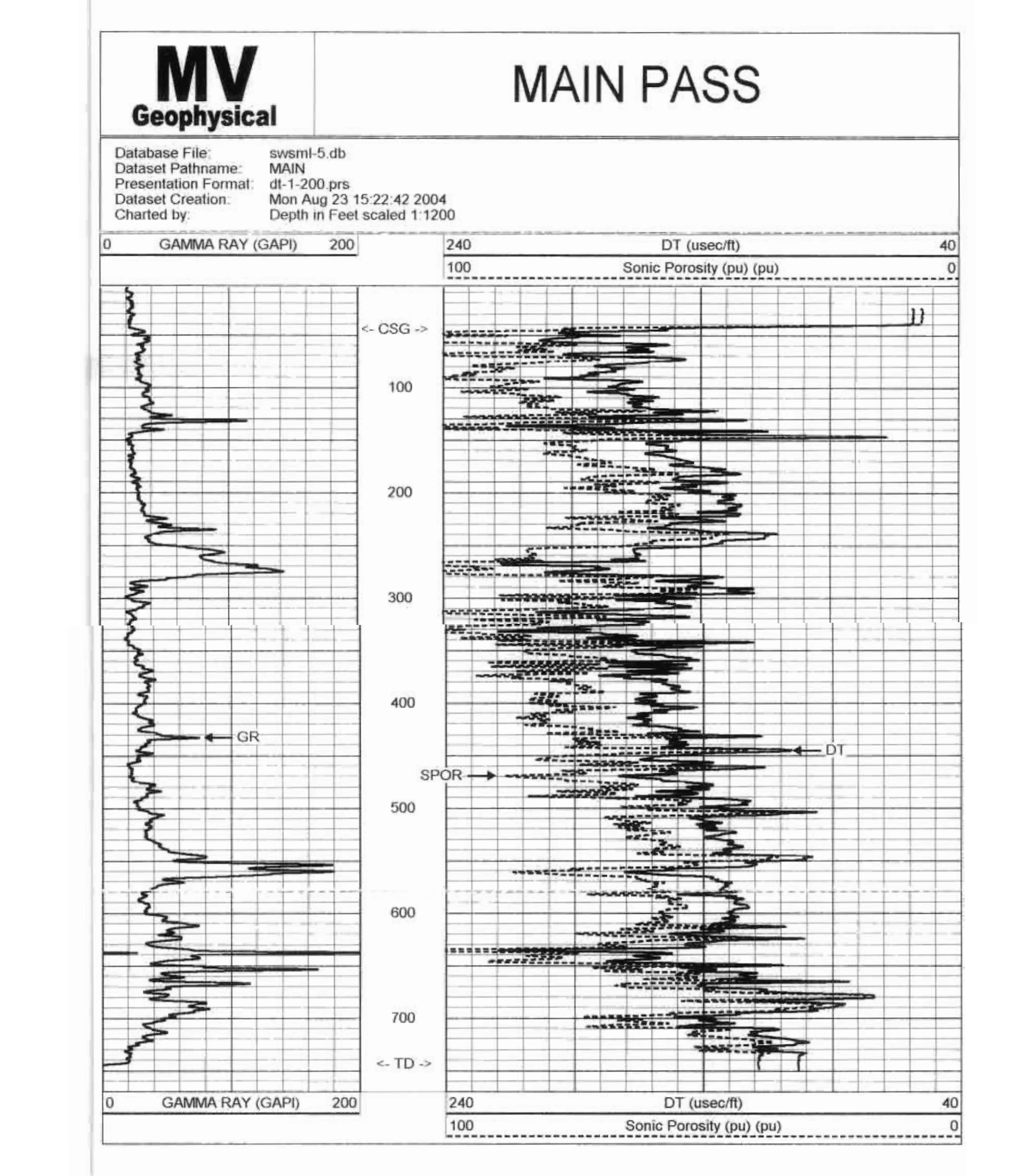
Comments

Sonic Porosity was run on a Limestone Matrix (=47.5)

MV Geophysical

MAIN PASS

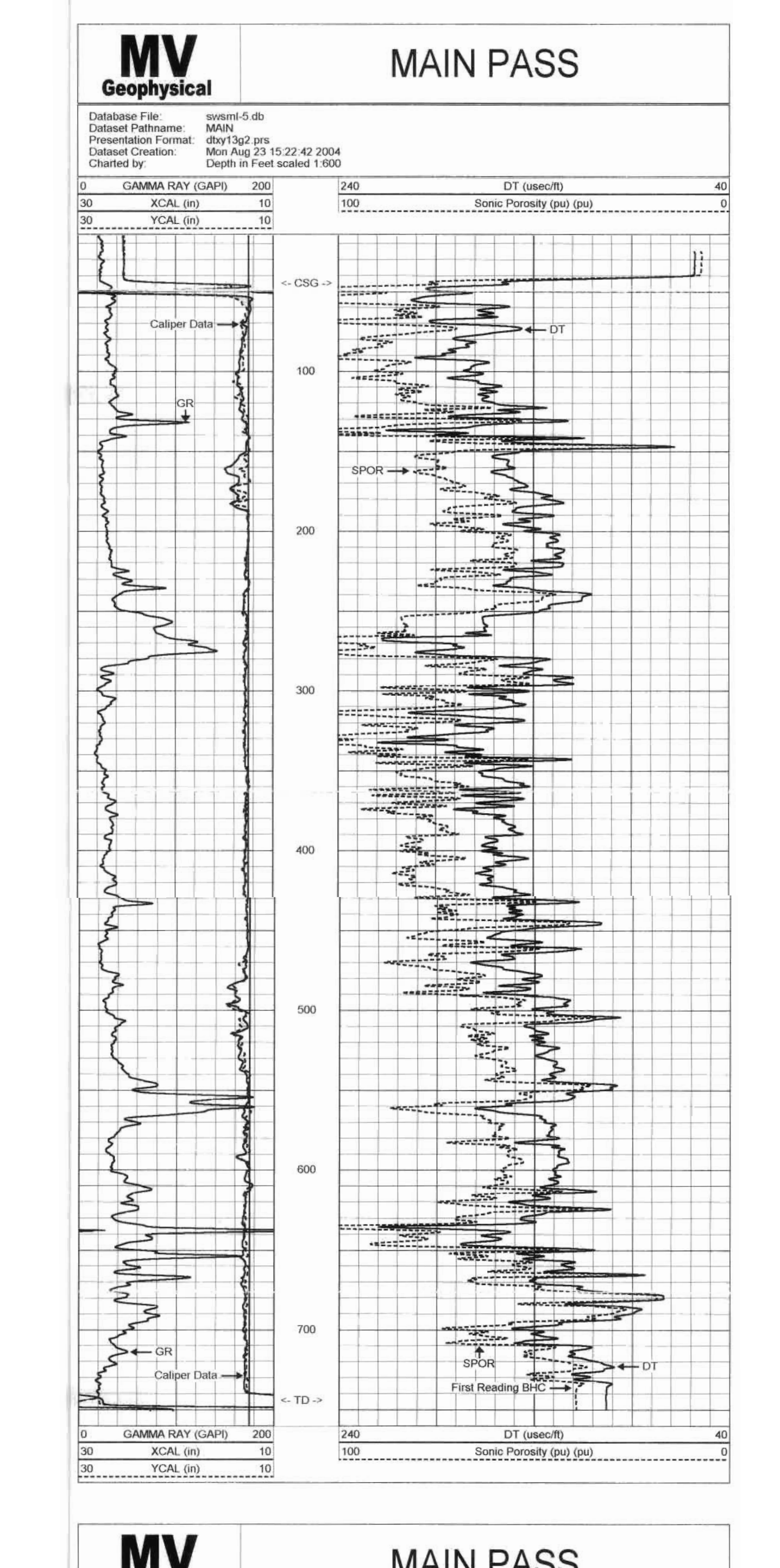
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: dt-1-200.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:1200



MV Geophysical

MAIN PASS

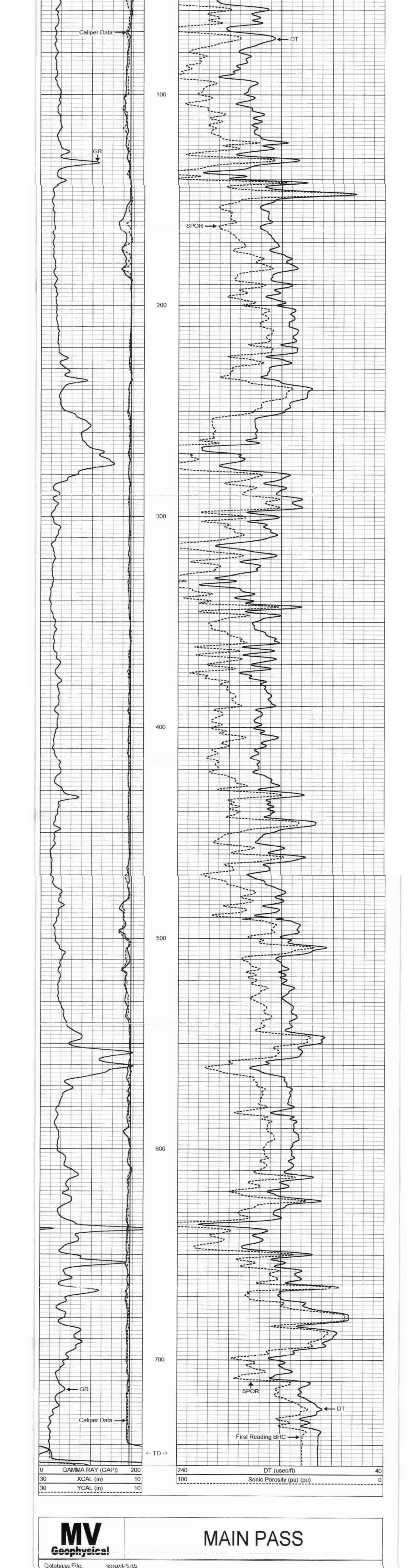
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: dbxy13g2.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:600



MV Geophysical

MAIN PASS

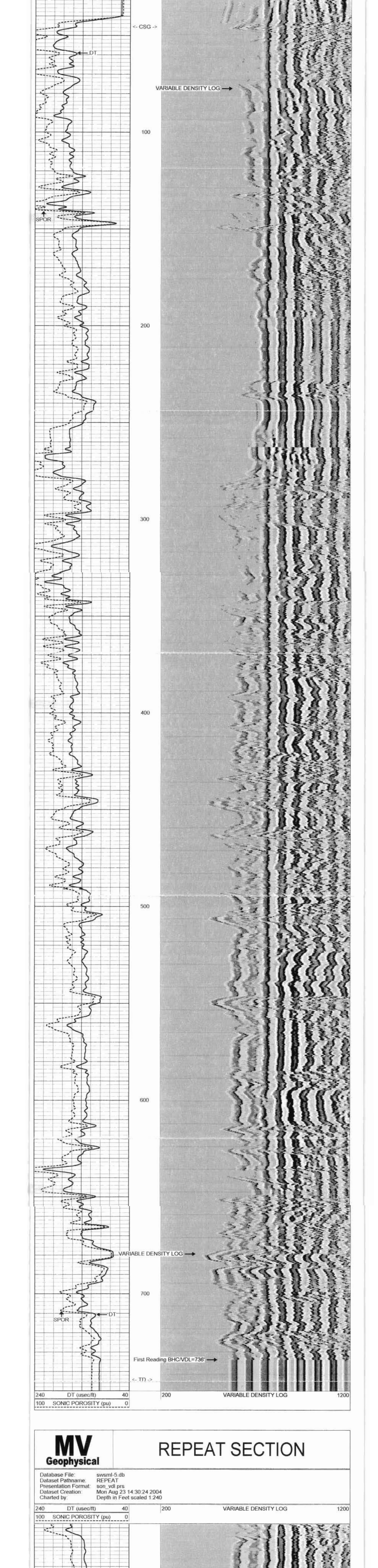
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: dbxy13g2.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:240



MV Geophysical

MAIN PASS

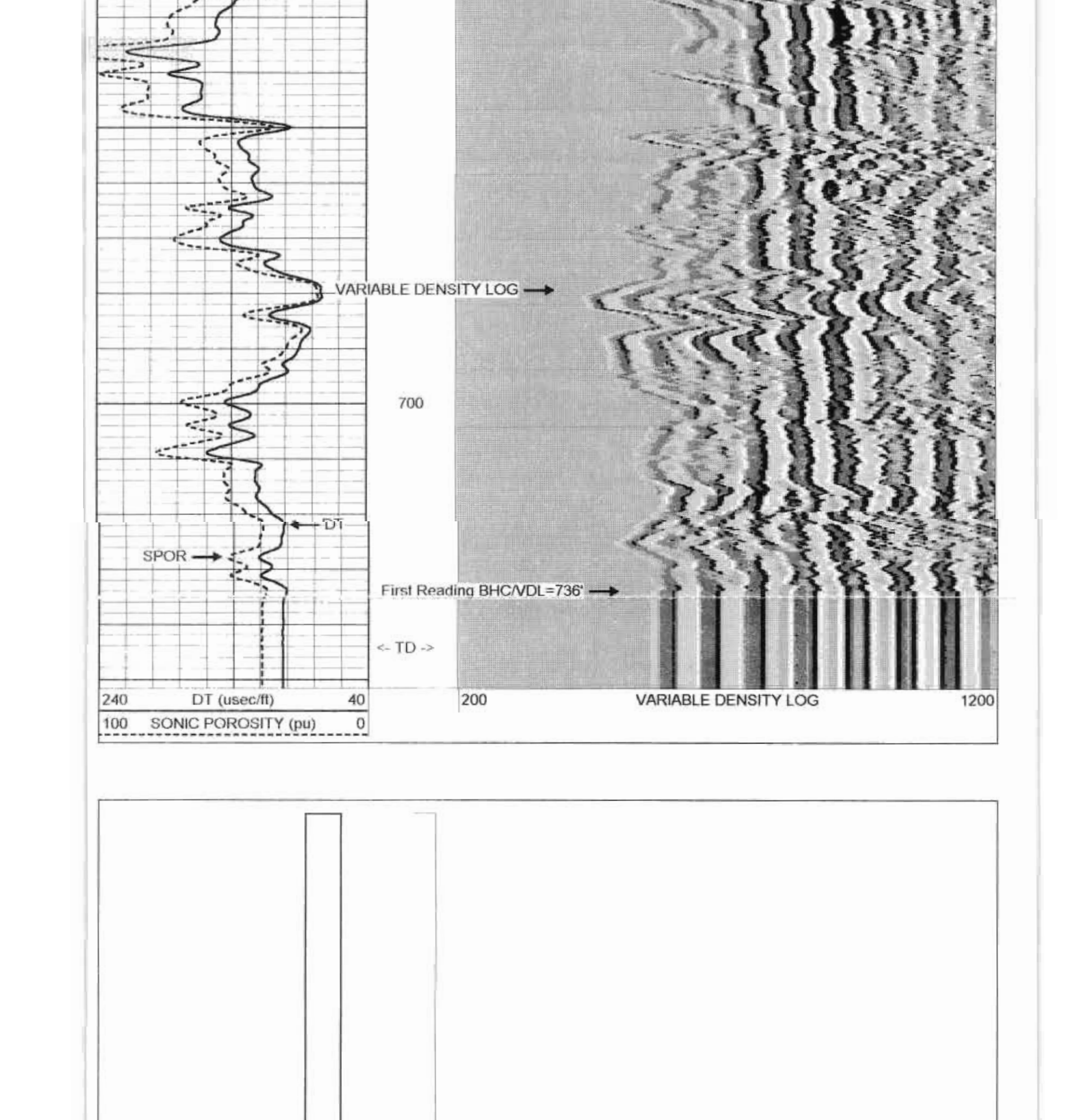
Database File: swsml-5.db
Dataset Pathname: MAIN
Presentation Format: son_vdl.prs
Dataset Creation: Mon Aug 23 15:22:42 2004
Charted by: Depth in Feet scaled 1:240

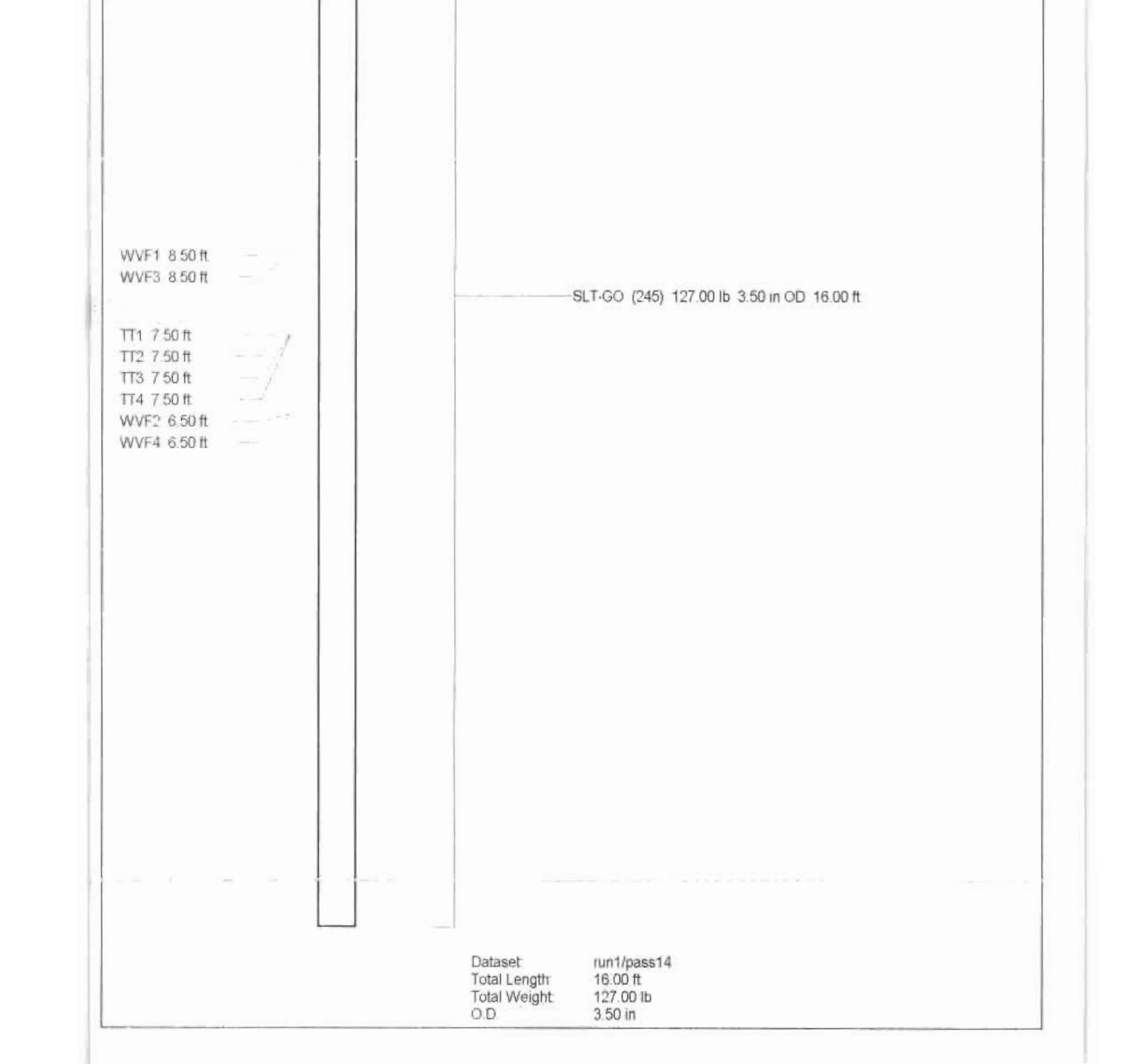


MV Geophysical

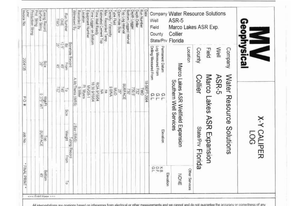
REPEAT SECTION

Database File: swsml-5.db
Dataset Pathname: REPEAT
Presentation Format: son_vdl.prs
Dataset Creation: Mon Aug 23 14:30:24 2004
Charted by: Depth in Feet scaled 1:240





Dataset: run1/pass14
Total Length: 16.00 ft
Total Weight: 127.00 lb
O.D.: 3.50 in



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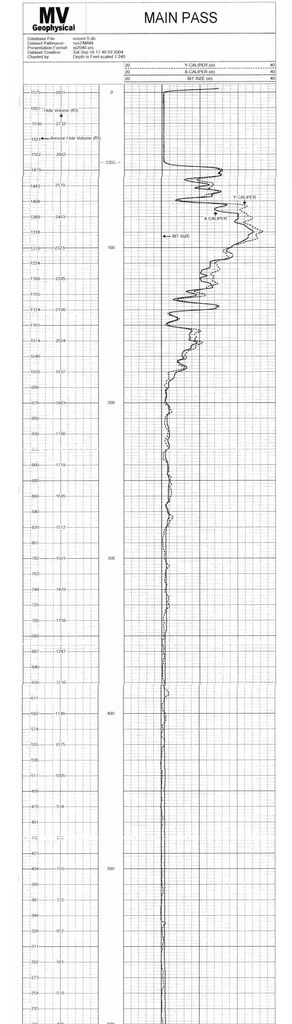
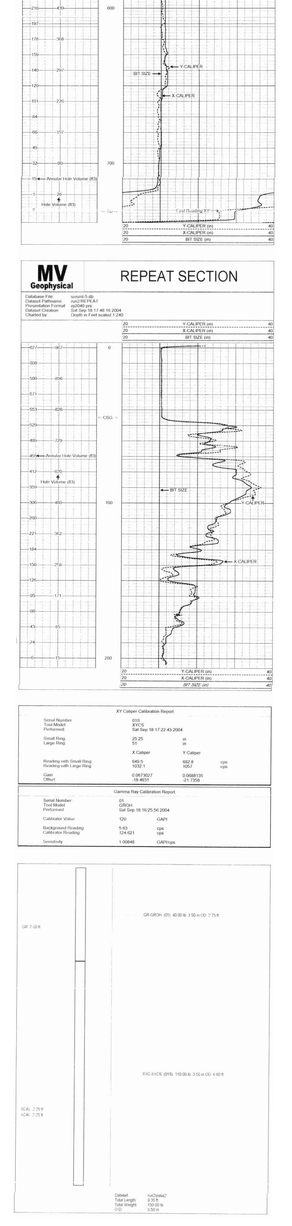
Comments

X-Y Caliper Arm Extensions: 51"

FUTURE CASING SIZE: 17.4"





XY Caliper Calibration Report

Sonut Number	0101		
Tool Model	XYCS-2		
Performed	Sat Sep 18 17:22:43 2004		
Small Ring	25.25	in	
Large Ring	51	in	
	X Caliper	Y Caliper	
Rovoking with Small Ring	6463	6828	cps
Rovoking with Large Ring	1032.1	1067	cps
Gain	0.0872837	0.0988135	
Offset	-16.4031	-21.7256	

Gamma Ray Calibration Report

Serial Number	01	
Tool Model	GR(H)	
Performed	Sat Sep 18 16:25:50 2004	
Calibrator Value	120	GAPI
Background Rovoking	5.92	cps
Calibrator Rovoking	124.021	cps
Sensitivity	1.09648	GAPI/cps

MV Geophysical

CEMENT TOP LOG
HIGH RESOLUTION
TEMPERATURE
GAMMA RAY

Company Water Resource Solutions
Well ASR-5
Field Marco Lakes ASR Exp.
County Collier
State/Prv Florida

Company Water Resource Solutions
Well ASR-5
Field Marco Lakes ASR Expansion
County Collier State/Prv Florida

Location
Marco Lakes ASR Wellfield Expansion
Southern Well Services

Other Services
NONE

		Elevation	
Permanent Datum	G.L.		K.B.
Log Measured From	G.L.		D.F
Drilling Measured From	G.L.		G.L.

Date	21-SEPT-2004		22-SEPT-2004
Run Number	THREE-2	THREE-2	THREE-3
Depth Driller	732'		
Depth Logger	730.5'	730.5'	
Bottom Logged Interval	730'		
Top Log Interval	SURFACE		
Open Hole Size	25"		
Type Fluid	MUD		
Density / Viscosity	10.2/35		
Max. Recorded Temp.	na		
Estimated Cement Top	414'	212'	141'
Time Well Ready	04:00 9/21/04	18:00 9/21/04	21:00 9/22/04
Time Logger on Bottom	04:30 9/21/04	18:00 9/21/04	21:00 9/22/04
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller		
Witnessed By	A.McThenia (WRS)	J.Bair (SWS)	

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	12.5"	45'	745'				
TWO	25"	45'	732'				
THREE	15"						

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	26"	0.375" WT	SURFACE	45'
Prot. String	17.4" PVC	15.25" ID	SURFACE	730'
Production String				
Liner				
Invoice No.	2004136	P.O. #	Job No.	* FINAL PRINT *

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Comments

Cement Tops

Stage	CTL	TAG
1	Not Logged	635'
2	414'	375'
3	212'	219'
4	141'	'

TEMPERATURE CALIBRATION REPORT
(Performed: 6-SEPT-04 13:45)

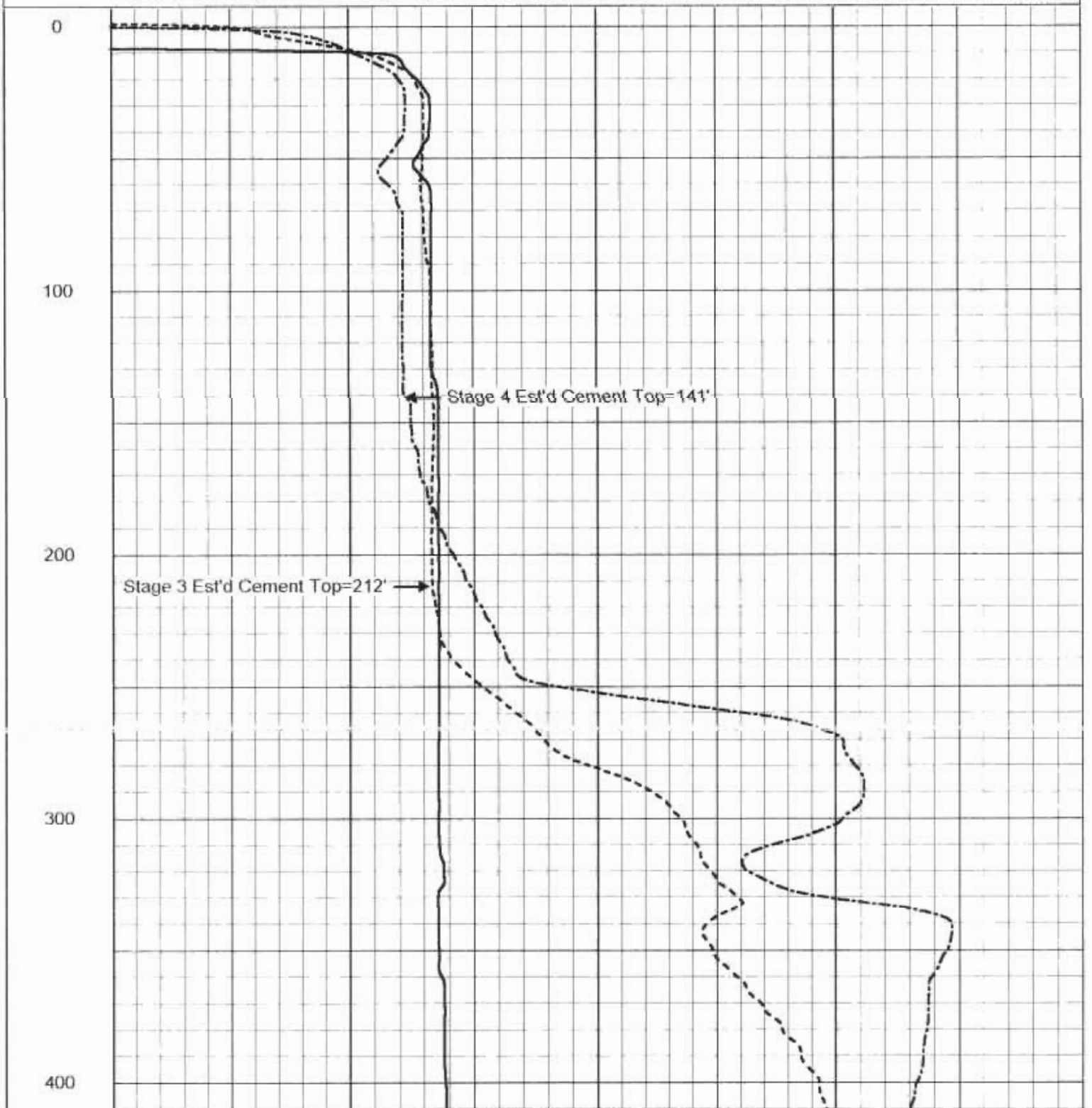
DEG-F	CPS
38.5	148.856
148.0	2690.25

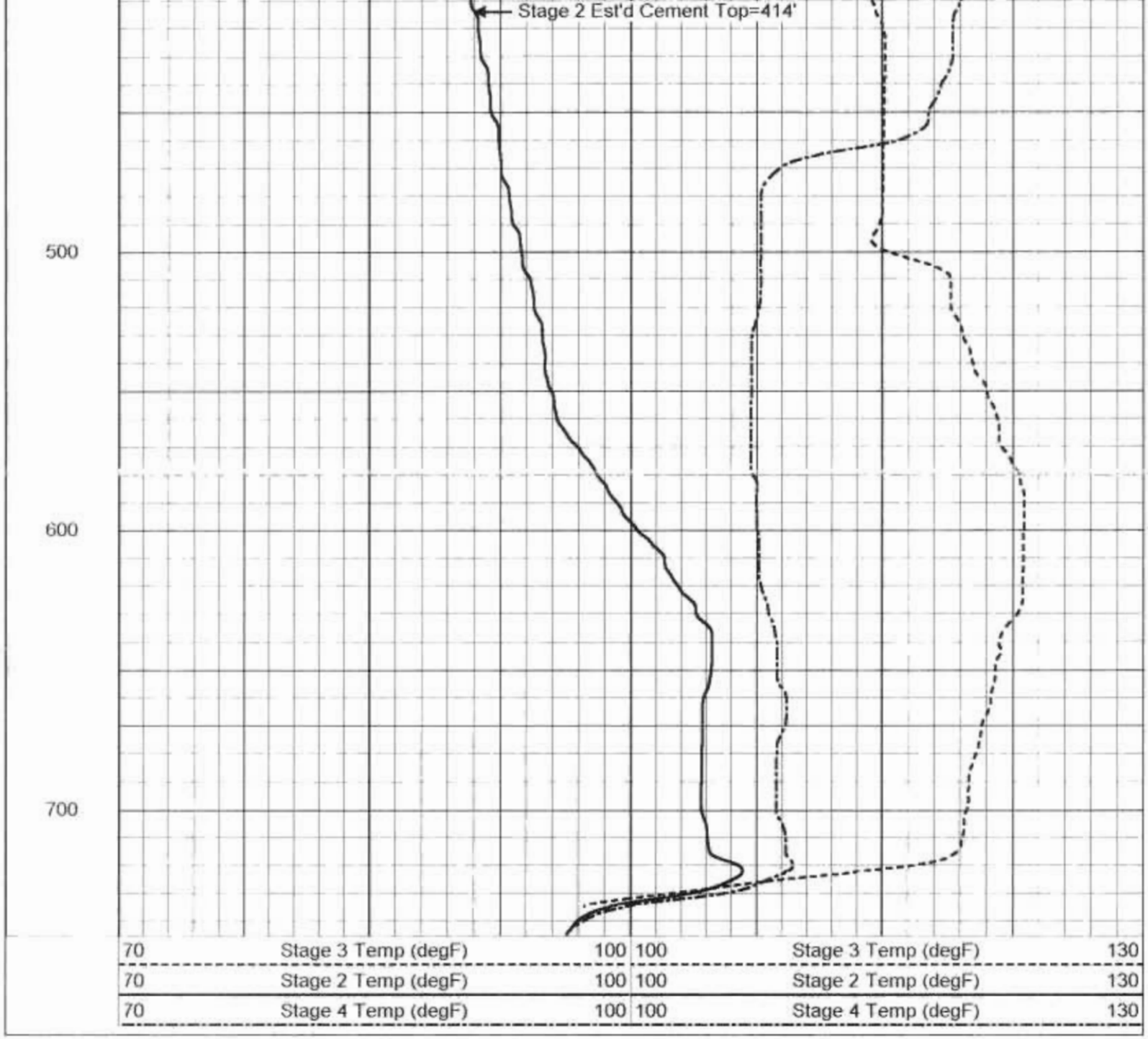
MV Geophysical

Merged Cement Tops

Database File: swsml-5.db
Dataset Pathname: run3/ctlmerge
Presentation Format: ctlmrg4.prs
Dataset Creation: Sat Nov 13 12:25:14 2004
Charted by: Depth in Feet scaled 1:600

70	Stage 3 Temp (degF)	100	100	Stage 3 Temp (degF)	130
70	Stage 2 Temp (degF)	100	100	Stage 2 Temp (degF)	130
70	Stage 4 Temp (degF)	100	100	Stage 4 Temp (degF)	130



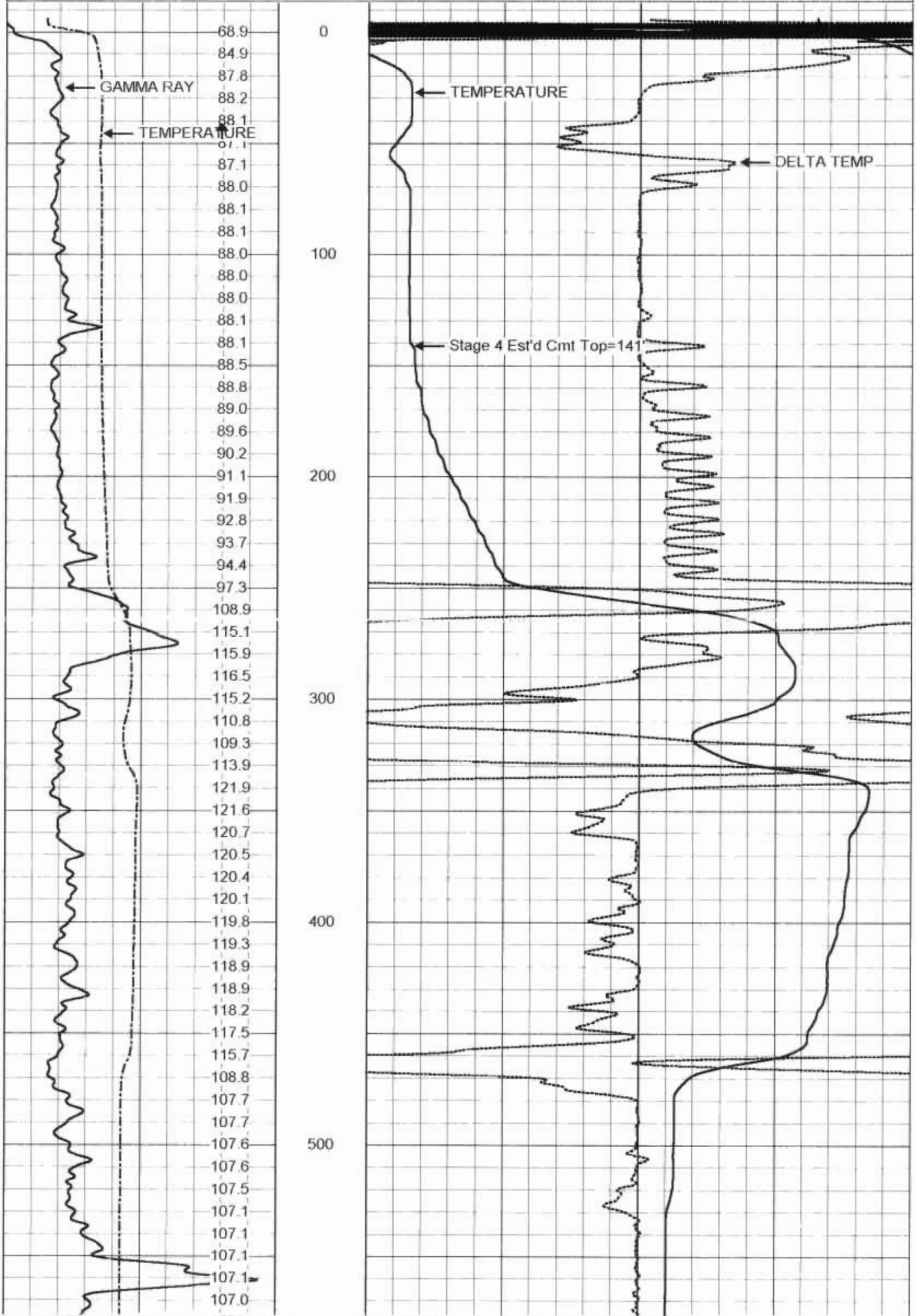


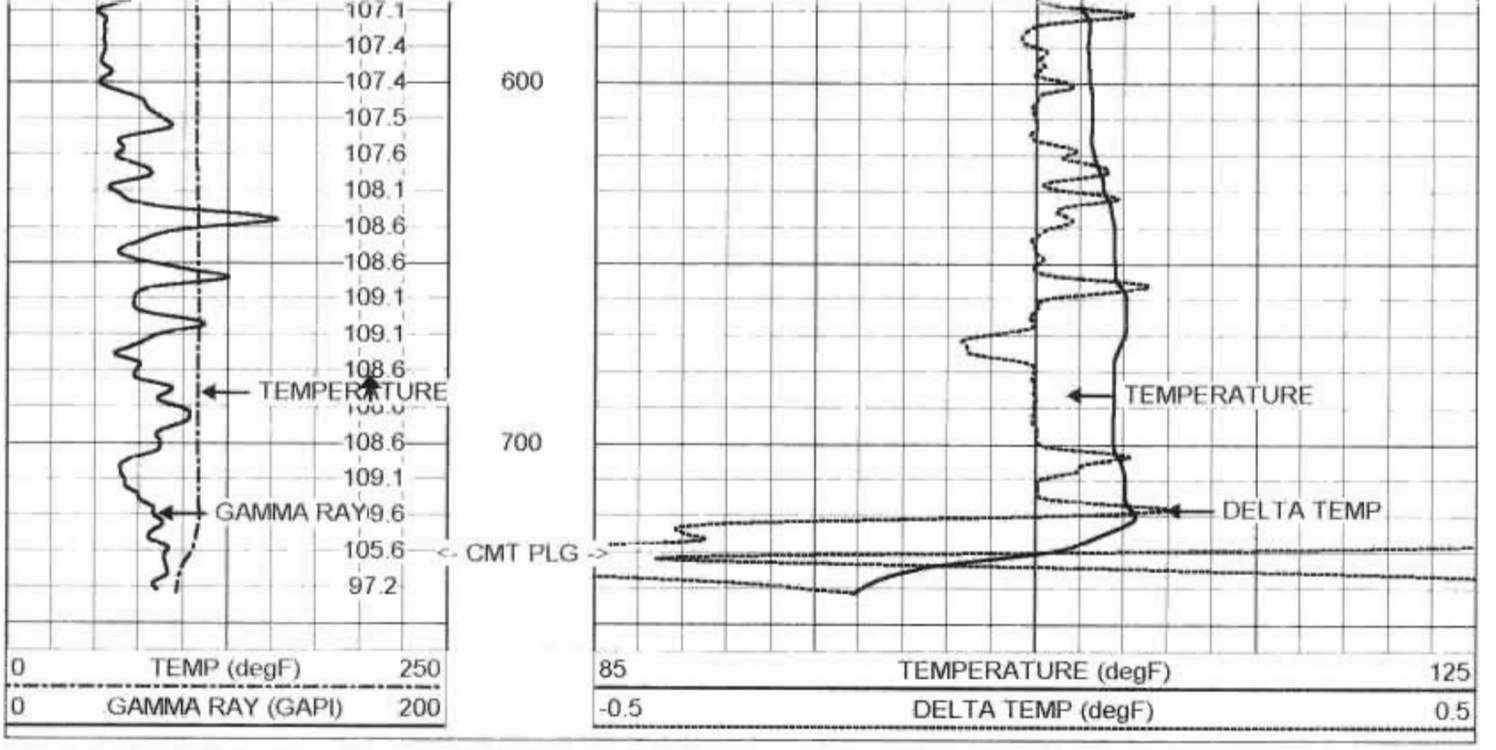
MV Geophysical

Stage 4: 141'

Database File:	swsml-5.db
Dataset Pathname:	run3/pass5
Presentation Format:	rtstemp.prs
Dataset Creation:	Wed Sep 22 21:07:49 2004 by Log VER_5.3
Charted by:	Depth in Feet scaled 1:600

0	TEMP (degF)	250	85	TEMPERATURE (degF)	125
0	GAMMA RAY (GAPI)	200	-0.5	DELTA TEMP (degF)	0.5

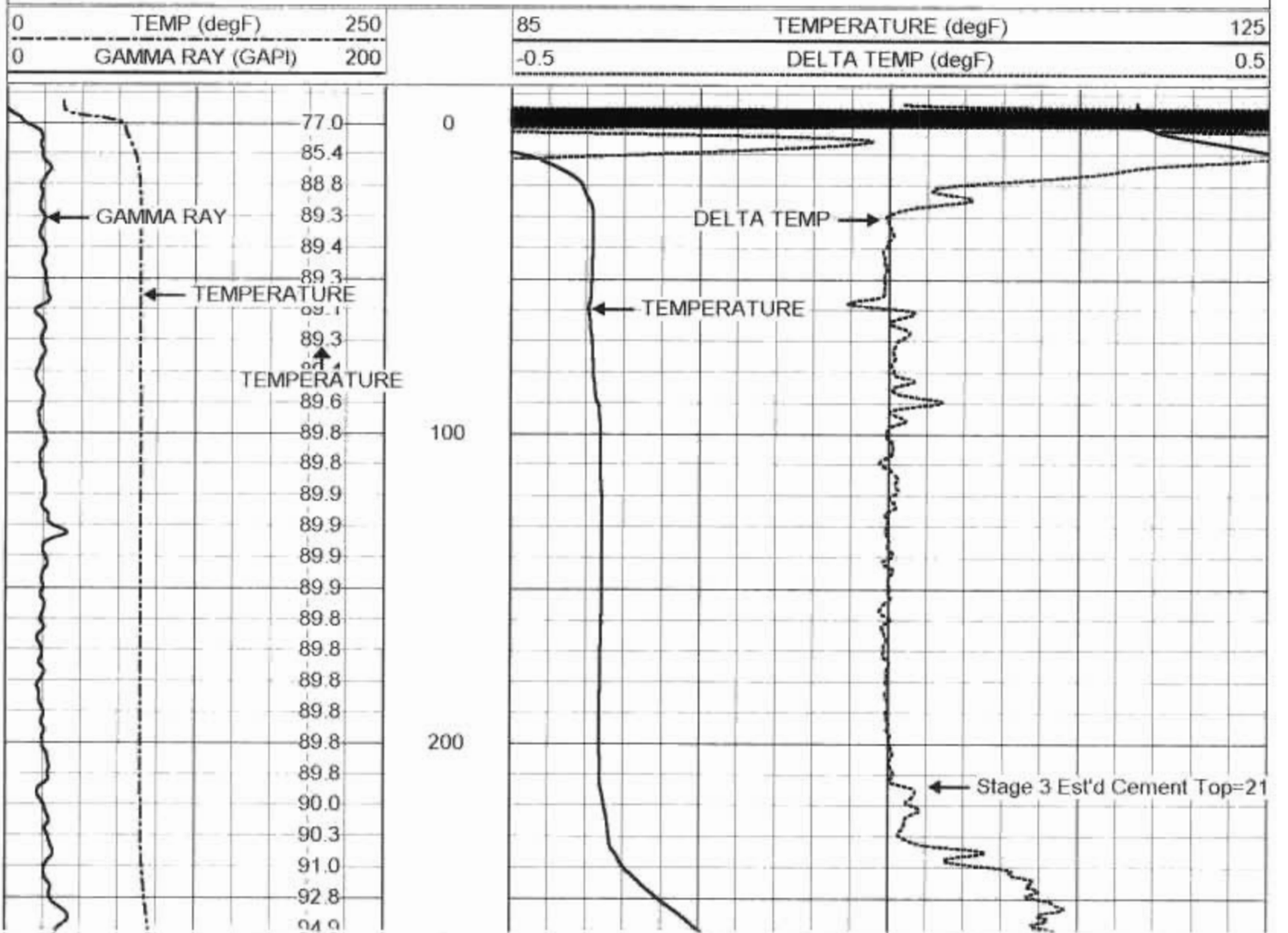

GAMMA RAY
TEMPERATURE
TEMPERATURE
DELTA TEMP
Stage 4 Est'd Cmt Top=141'
68.9
84.9
87.8
88.2
88.1
87.1
88.0
88.1
88.1
88.0
88.0
88.0
88.1
88.1
88.5
88.8
89.0
89.6
90.2
91.1
91.9
92.8
93.7
94.4
97.3
108.9
115.1
115.9
116.5
115.2
110.8
109.3
113.9
121.9
121.6
120.7
120.5
120.4
120.1
119.8
119.3
118.9
118.9
118.2
117.5
115.7
108.8
107.7
107.7
107.6
107.6
107.5
107.1
107.1
107.1
107.1
107.0
0
100
200
300
400
500

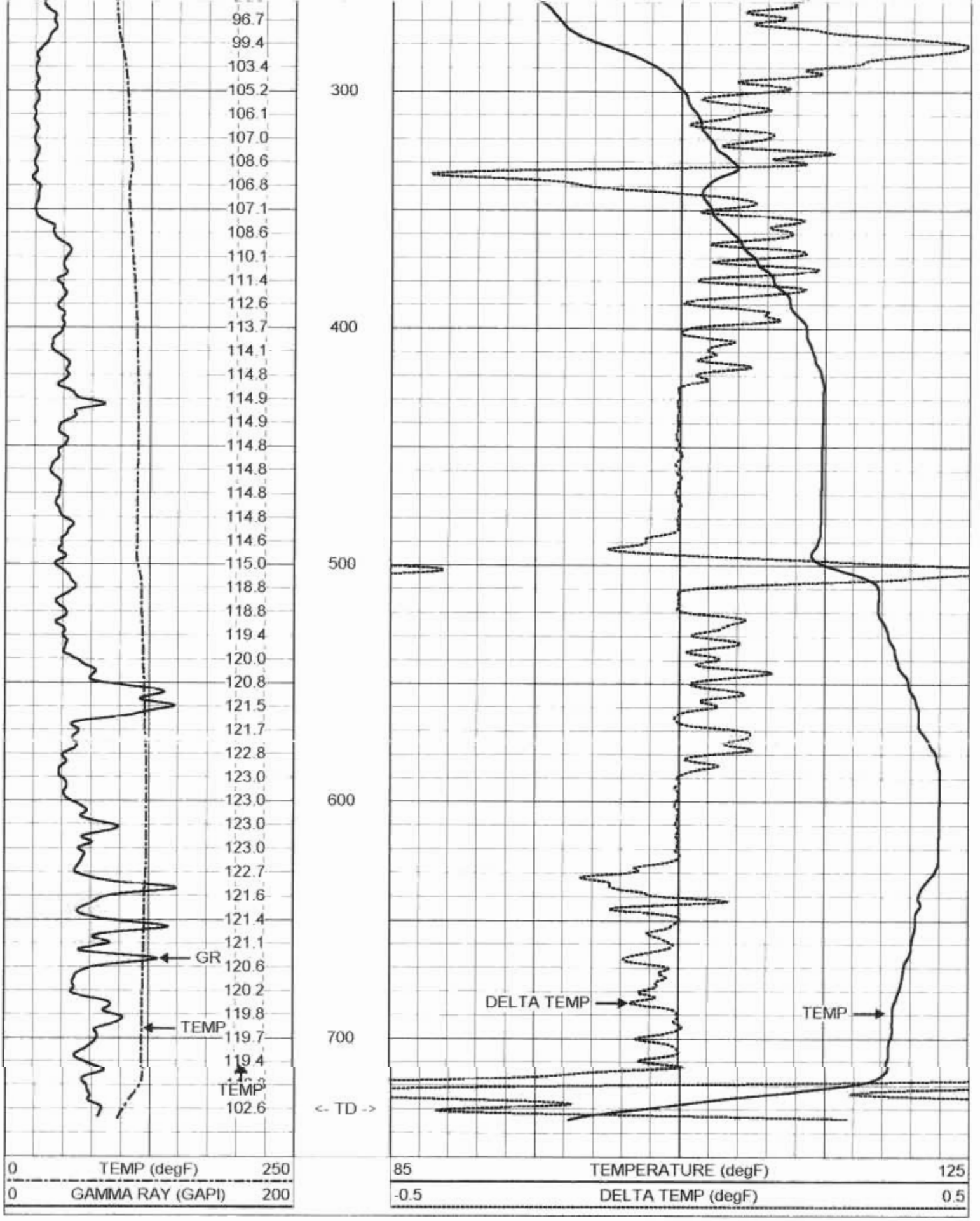


MV Geophysical

Stage 3: 212'

Database File: swsml-5.db
Dataset Pathname: run3/pass3
Presentation Format: rtstemp.prs
Dataset Creation: Tue Sep 21 07:05:39 2004 by Log VER_5.3
Charted by: Depth in Feet scaled 1:600

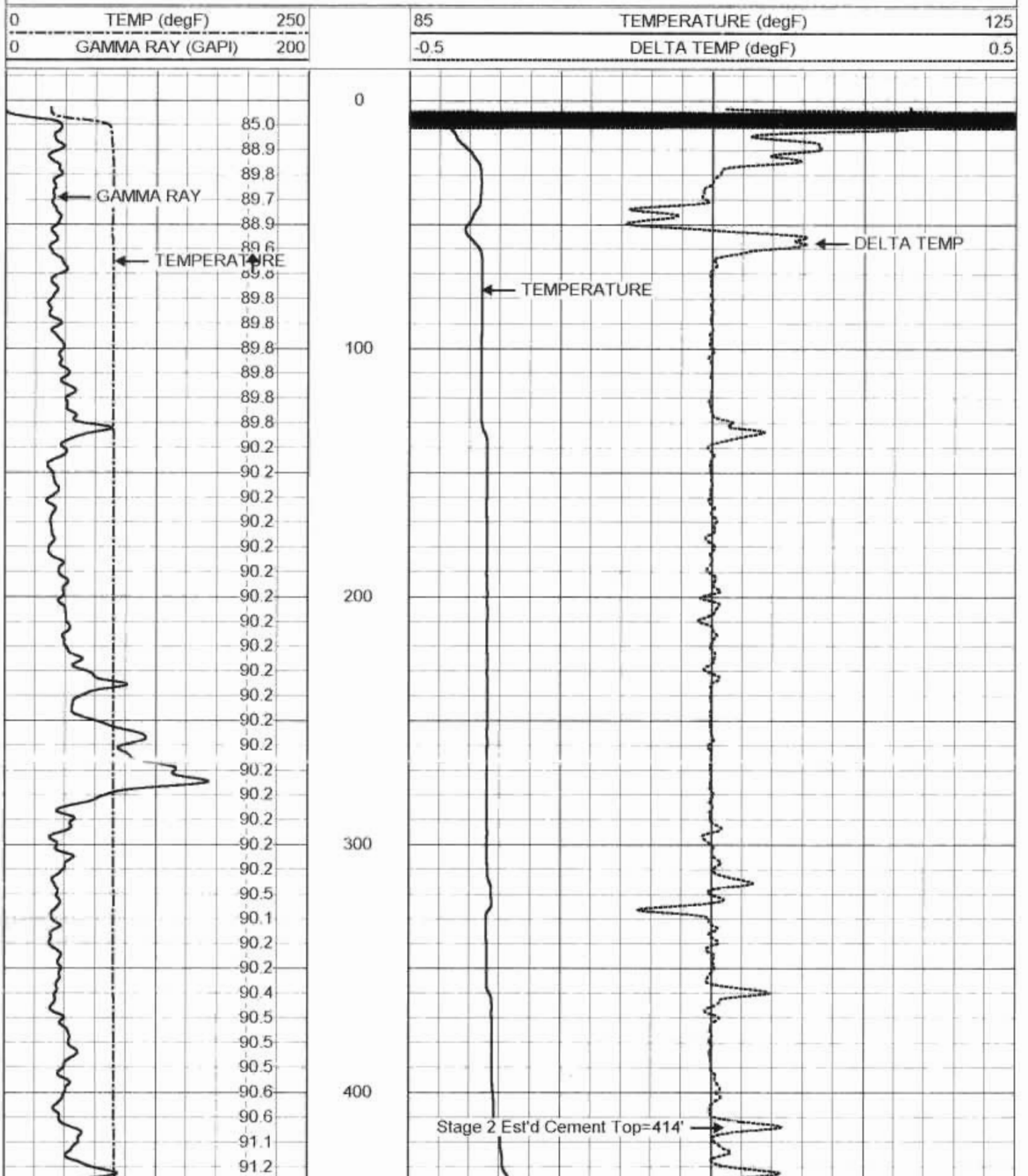


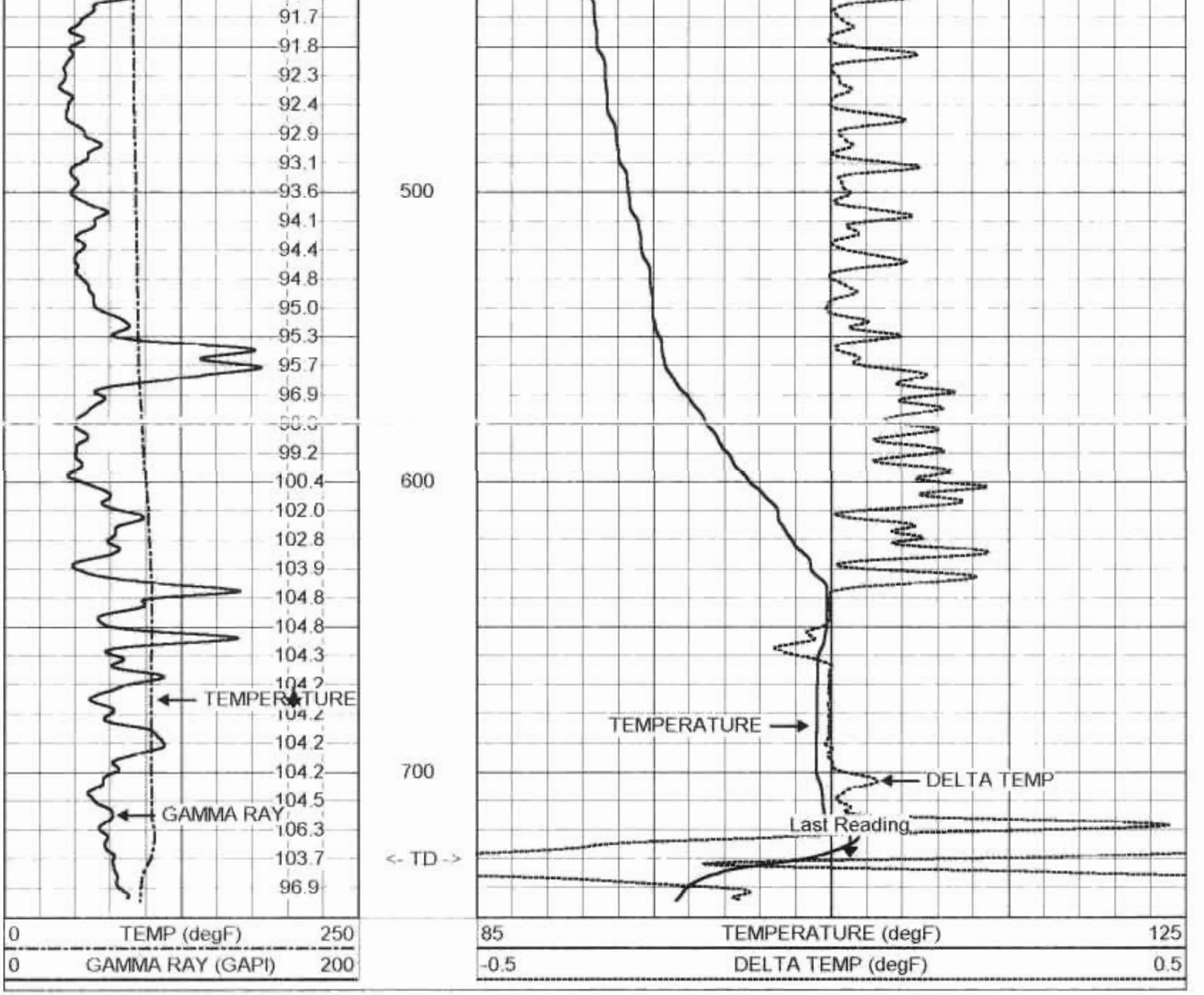

96.7
99.4
103.4
105.2
106.1
107.0
108.6
106.8
107.1
108.6
110.1
111.4
112.6
113.7
114.1
114.8
114.9
114.9
114.8
114.8
114.8
114.8
114.6
115.0
118.8
118.8
119.4
120.0
120.8
121.5
121.7
122.8
123.0
123.0
123.0
123.0
122.7
121.6
121.4
121.1
GR
120.6
120.2
119.8
TEMP
119.7
119.4
TEMP
102.6
300
400
500
600
700
<- TD ->
0
TEMP (degF)
250
0
GAMMA RAY (GAPI)
200
DELTA TEMP
TEMP
85
TEMPERATURE (degF)
125
-0.5
DELTA TEMP (degF)
0.5

MV Geophysical

Stage1: 414'

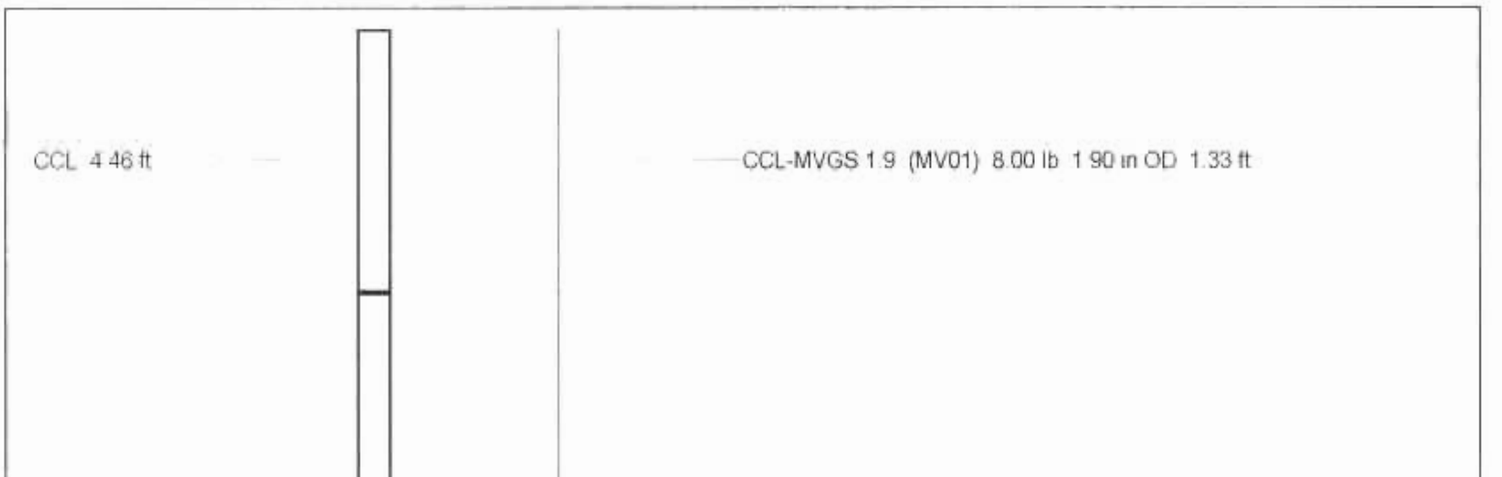
Database File:	swsml-5.db
Dataset Pathname:	run3/pass2
Presentation Format:	rtstemp.prs
Dataset Creation:	Sun Sep 19 04:02:12 2004 by Log VER_5.3
Charted by:	Depth in Feet scaled 1:600

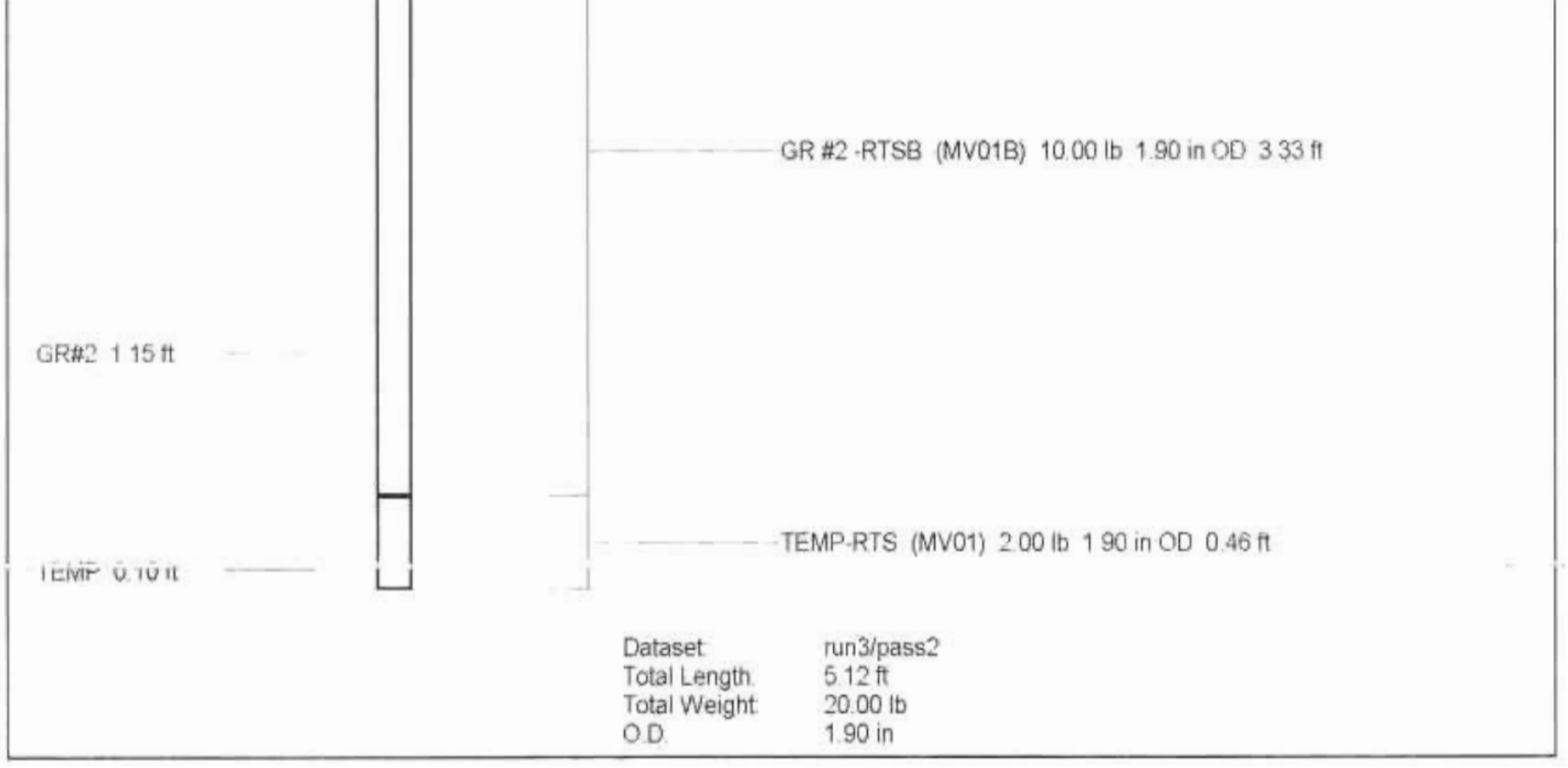


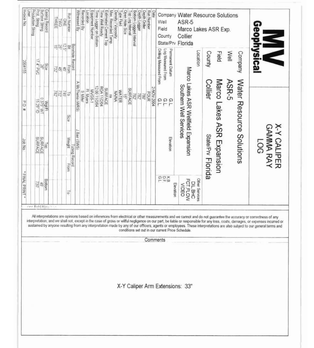


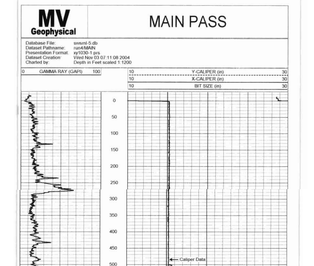
Gamma Ray Calibration Report

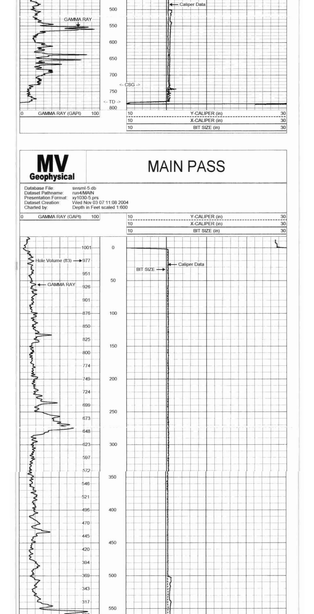
Serial Number:	MV01B	
Tool Model:	RTSB	
Performed:	Wed Aug 11 17:27:36 2004	
Calibrator Value:	120	GAPI
Background Reading:	14.7819	cps
Calibrator Reading:	120.521	cps
Sensitivity	1.13487	GAPI/cps

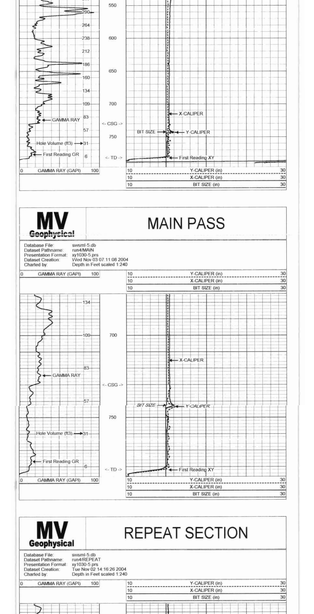


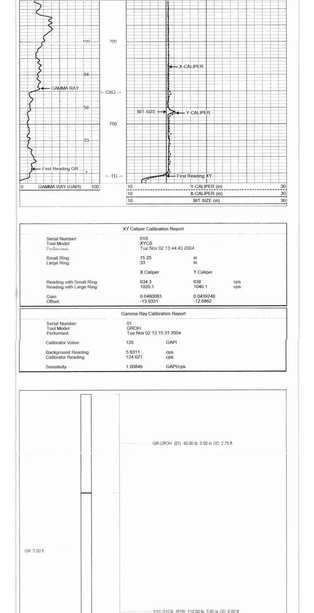

GR #2 -RTSB (MV01B) 10.00 lb 1.90 in OD 3.33 ft
GR#2 1.15 ft
TEMP-RTS (MV01) 2.00 lb 1.90 in OD 0.46 ft
TEMP 0.10 ft
Dataset: run3/pass2
Total Length: 5.12 ft
Total Weight: 20.00 lb
O.D. 1.90 in









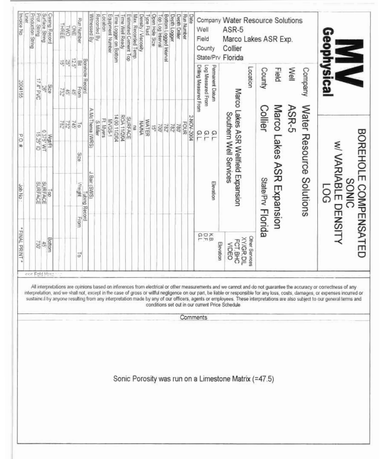


XY Caliper Calibration Report

Serial Number:	0105	
Test Method:	Ring	
Performed:	Tue Nov 02 13:44:43 2004	
Small Ring	15.25	in
Large Ring	33	in
	X Caliper	Y Caliper
Reading with Small Ring	634.3	636 cps
Reading with Large Ring	1020.1	1040.1 cps
Gain:	0.6460083	0.6430246
Offset:	-13.9301	-12.6962

Gamma Ray Calibration Report

Serial Number:	05	
Test Method:	Counting	
Performed:	Tue Nov 02 13:15:31 2004	
Calibrator Value:	120	GAPI
Background Reading:	5.8311	cps
Calibrator Reading:	124.621	cps
Sensitivity	1.00849	GAPI/cps



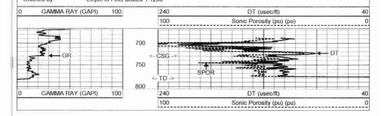
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Sonic Porosity was run on a Limestone Matrix (=47.5)

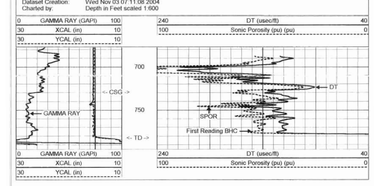
MAIN PASS

Database File: svsnml-5.db
Dataset Pathname: run4/MAIN
Presentation Format: dtg-11.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:1200



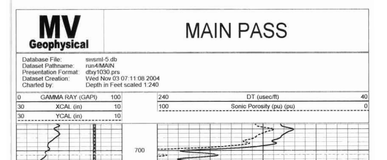
MAIN PASS

Database File: svsnml-5.db
Dataset Pathname: run4/MAIN
Presentation Format: dtsy1030.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:600



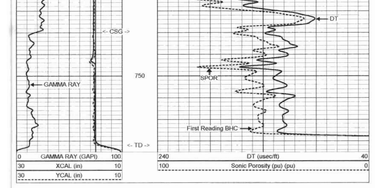
MAIN PASS

Database File: svsnml-5.db
Dataset Pathname: run4/MAIN
Presentation Format: dtsy1030.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:240



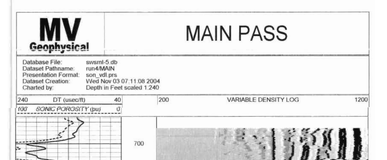
MAIN PASS

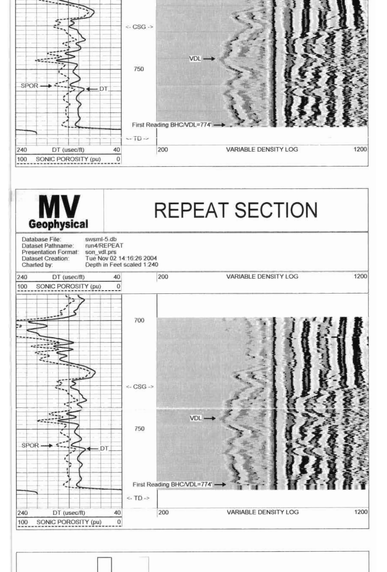
Database File: svsnml-5.db
Dataset Pathname: run4/MAIN
Presentation Format: son_vdl.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:240

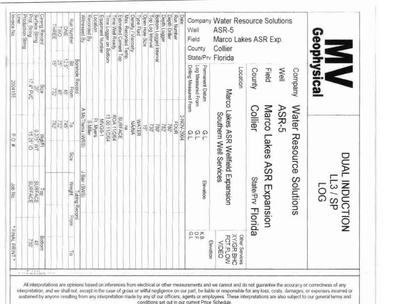


REPEAT SECTION

Database File: svsnml-5.db
Dataset Pathname: run4/REPEAT
Presentation Format: son_vdl.prs
Dataset Creation: Tue Nov 02 14:16:26 2004
Charted by: Depth in Feet scaled 1:240







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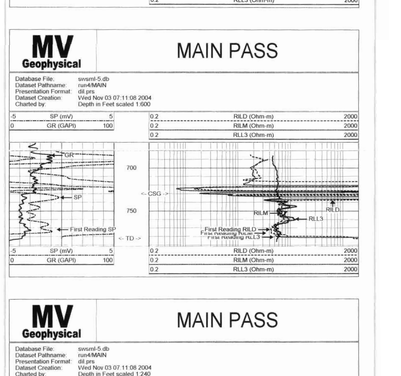
Comments

Rw=8.368 ohm-m @ 80.9 degF

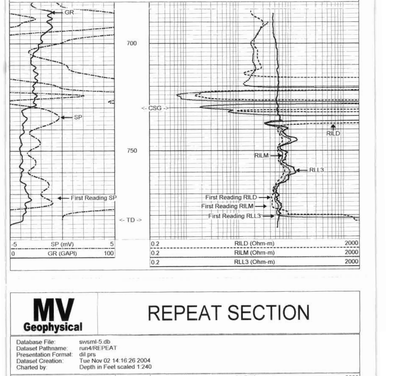
MV Geophysical — MAIN PASS

Database File: svsvnl-5.db
Dataset Pathname: run4/MAIN
Presentation Format: dil.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:200



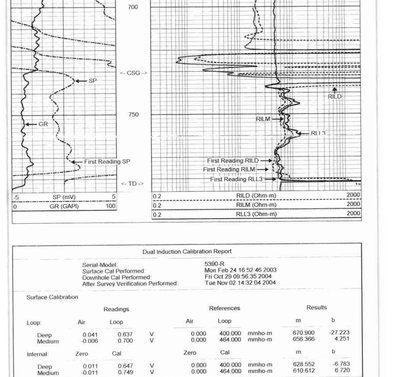
MV Geophysical — MAIN PASS

Database File: svsvnl-5.db
Dataset Pathname: run4/MAIN
Presentation Format: dil.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:600



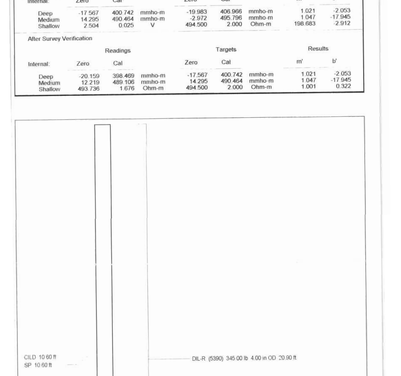
MV Geophysical — MAIN PASS

Database File: svsvnl-5.db
Dataset Pathname: run4/MAIN
Presentation Format: dil.prs
Dataset Creation: Wed Nov 03 07:11:08 2004
Charted by: Depth in Feet scaled 1:240



MV Geophysical — REPEAT SECTION

Database File: svsvnl-5.db
Dataset Pathname: run4/REPEAT
Presentation Format: dil.prs
Dataset Creation: Tue Nov 02 14:16:26 2004
Charted by: Depth in Feet scaled 1:240



Dual Induction Calibration Report

Serial-Model: 5390-R
Surface Cal Performed: Mon Feb 24 16:52:46 2003
Downhole Cal Performed: Fri Oct 29 09:56:35 2004
After Survey Verification Performed: Tue Nov 02 14:32:04 2004

Surface Calibration

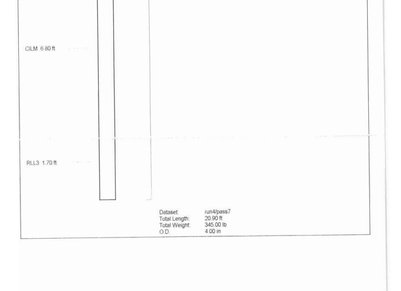
Loop:	Readings Air	Loop		References Air	Loop		Results m	b
Deep	0.041	0.837	V	0.000	400.000	mmho-m	670.900	-27.223
Medium	-0.006	0.700	V	0.000	464.000	mmho-m	656.366	4.251
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.011	0.647	V	0.000	400.000	mmho-m	628.552	-6.783
Medium	-0.011	0.749	V	0.000	464.000	mmho-m	610.612	6.720

Downhole Calibration

Internal:	Readings Zero	Cal		References Zero	Cal		Results m	b
Deep	-17.567	400.742	mmho-m	-19.983	406.966	mmho-m	1.021	2.053
Medium	14.295	490.464	mmho-m	2.972	495.196	mmho-m	1.047	-17.945
Shallow	2.504	0.025	V	494.500	2.000	Ohm-m	198.683	3.912

After Survey Verification

	Readings			Targets			Results	
Internal:	Zero	Cal		Zero	Cal		m'	b'
Deep	-20.159	398.469	mmho-m	-17.567	400.742	mmho-m	1.021	2.053
Medium	12.219	489.106	mmho-m	14.295	490.464	mmho-m	1.047	-17.945
Shallow	493.736	1.676	Ohm-m	494.500	2.000	Ohm-m	1.001	0.322



MV Geophysical

FLOWMETER LOG

Company	Water Resource Solutions
Well	ASR-5
Field	Marco Lakes ASR Exp.
County	Collier
State/Prv	Florida

Company: Water Resource Solutions
Well: ASR-5
Field: Marco Lakes ASR Expansion
County: Collier State/Prv: Florida
Location: Marco Lakes ASR Wellfield Expansion, Southern Well Services
Other Services: XY/GR,DIL, FCT,BHC, VIDEO

		Elevation	
Permanent Datum	G.L.		K.B.
Log Measured From	G.L.		D.F.
Drilling Measured From	G.L.		G.L.

Date	2-NOV-2004
Run Number	FOUR
Depth Driller	780'
Depth Logger	782'
Bottom Logged Interval	782'
Top Log Interval	700'
Open Hole Size	15"
Type Fluid	WATER
Density / Viscosity	NA/NA
Max. Recorded Temp.	na
Estimated Cement Top	SURFACE
Time Well Ready	ROA 11/2/04
Time Logger on Bottom	15:00 11/2/04
Equipment Number	MVGS-1
Location	Ft. Myers
Recorded By	S.Miller
Witnessed By	A.McThenia (WRS) J.Bair (SWS)

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	12.5"	45'	745'				
TWO	25"	45'	732'				
THREE	15"	732'	782'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	26"	0.375" WT	SURFACE	45'
Prot. String	17.4" PVC	15.25" ID	SURFACE	730'
Production String				
Liner				

Invoice No. 2004155   P.O.#   Job No.   * FINAL PRINT *

Comments

A DYNAMIC down pass was made at 50 fpm.

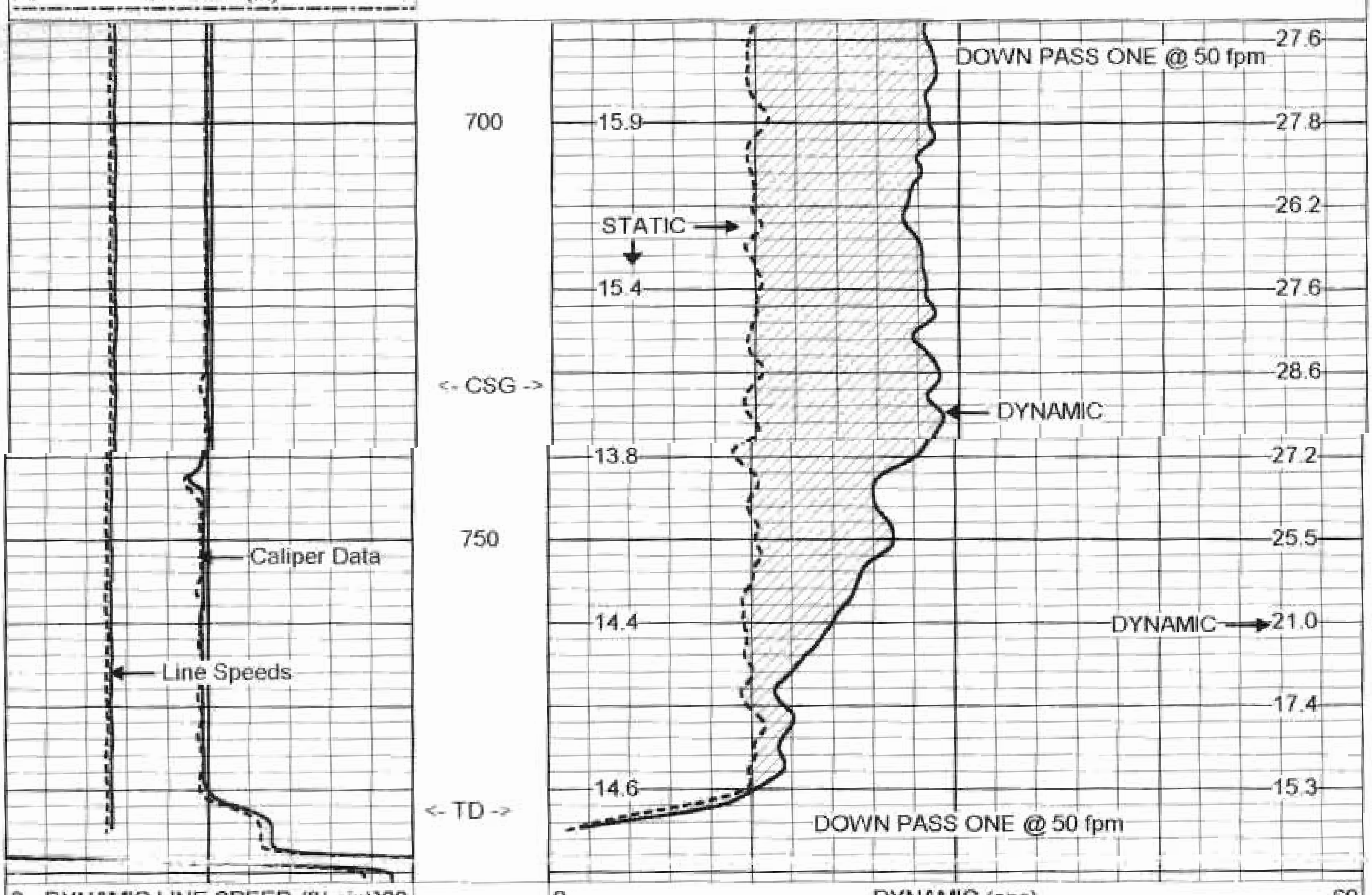
1 Stations were performed.

Q =375 gpm

MV Geophysical — S/D DOWN @ 50 fpm

Database File: swsml-5.db
Dataset Pathname: run4/SD50
Presentation Format: q-60.prs
Dataset Creation: Wed Nov 03 08:35:36 2004
Charted by: Depth in Feet scaled 1:240

0 DYNAMIC LINE SPEED (ft/min) 200	0 DYNAMIC (cps) 60
0 STATIC LINE SPEED (ft/min) -200	0 STATIC (cps) 60
25 X-CALIPER (in) 5	
25 Y CALIPER (in) 5	
25 BIT SIZE (in) 5	

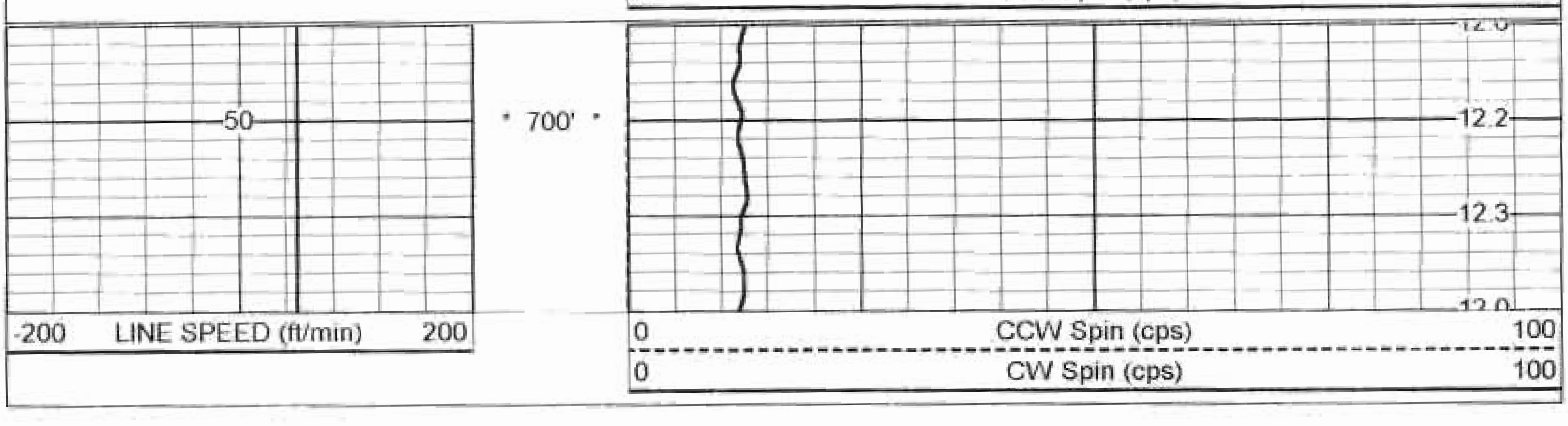


0 DYNAMIC LINE SPEED (ft/min) 200	0 DYNAMIC (cps) 60
0 STATIC LINE SPEED (ft/min) -200	0 STATIC (cps) 60
25 X-CALIPER (in) 5	
25 Y CALIPER (in) 5	
25 BIT SIZE (in) 5	

MV Geophysical — Station #1: 700'

Database File: swsml-5.db
Dataset Pathname: run4/pass11
Presentation Format: flow.prs
Dataset Creation: Tue Nov 02 15:40:53 2004 by Log VER_5.3
Charted by: Depth in Feet scaled 1:240

-200 LINE SPEED (ft/min) 200	0 CCW Spin (cps) 100
	0 CW Spin (cps) 100

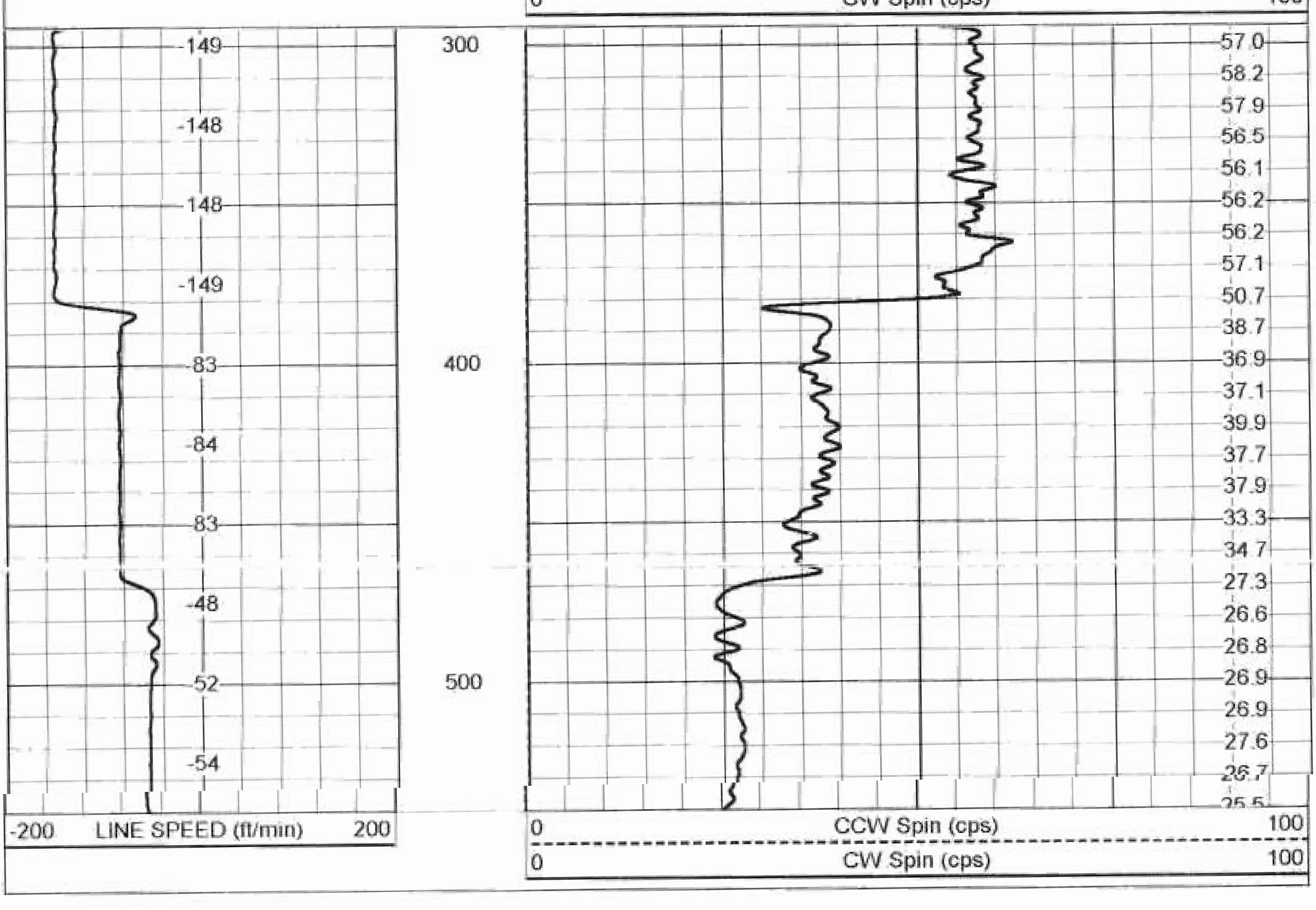


-200 LINE SPEED (ft/min) 200	0 CCW Spin (cps) 100
	0 CW Spin (cps) 100

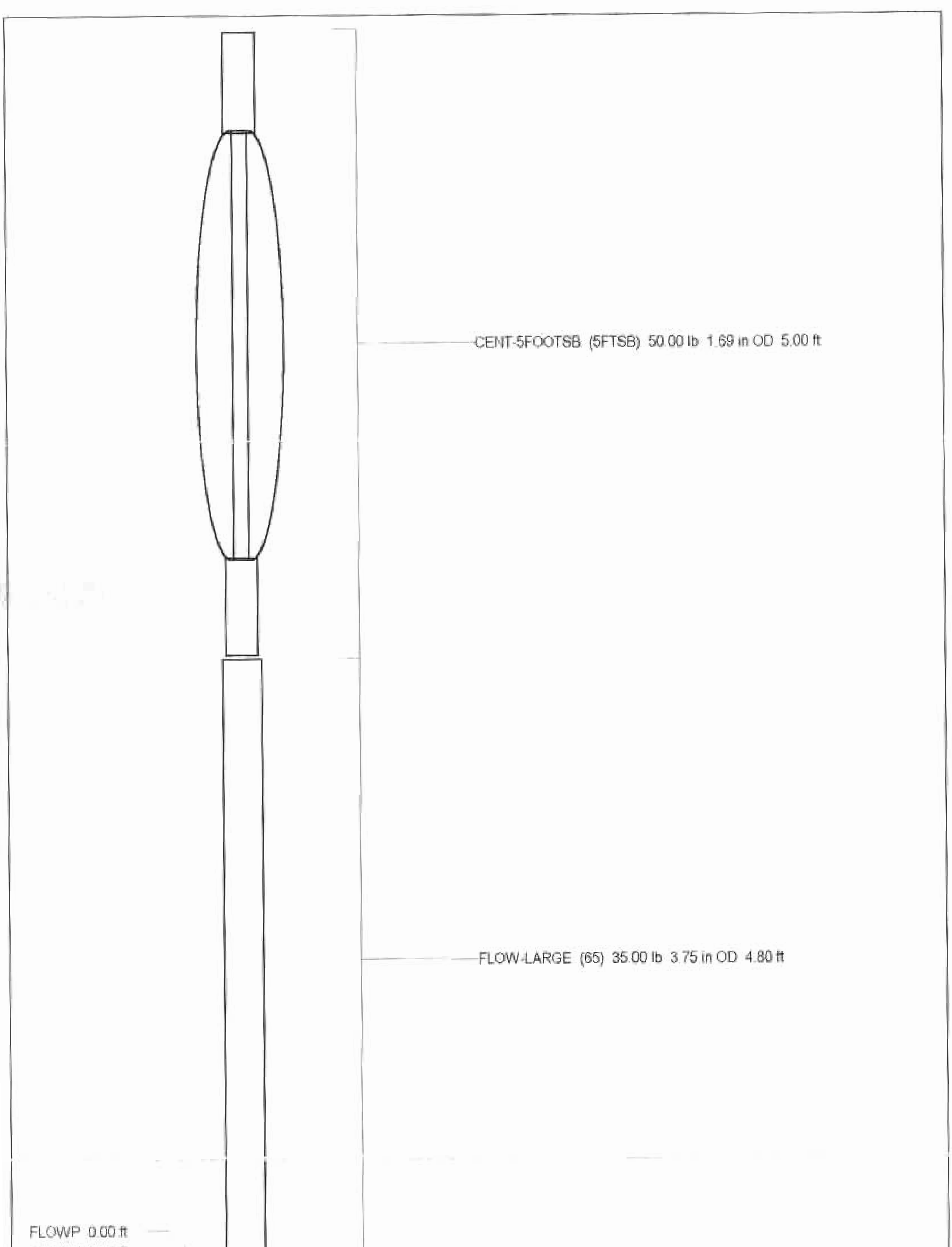
MV Geophysical — Q Calibration Down

Database File: swsml-5.db
Dataset Pathname: run4/pass10
Presentation Format: flow.prs
Dataset Creation: Tue Nov 02 15:31:22 2004 by Log VER_5.3
Charted by: Depth in Feet scaled 1:600

-200 LINE SPEED (ft/min) 200	0 CCW Spin (cps) 100
	0 CW Spin (cps) 100



-200 LINE SPEED (ft/min) 200	0 CCW Spin (cps) 100
	0 CW Spin (cps) 100



Dataset: run4/pass11
Total Length: 9.80 ft
Total Weight: 85.00 lb
O.D.: 3.75 in

MV Geophysical

FLOWMETER INTERPRETATION

Company	Water Resource Solutions
Well	ASR-5
Field	Marco Lakes ASR Exp.
County	Collier
State/Prv	Florida

Company Water Resource Solutions
Well ASR-5
Field Marco Lakes ASR Expansion
County Collier State/Prv Florida

Location: Marco Lakes ASR Wellfield Expansion, Southern Well Services

Other Services: XY/GR,DIL FCT,BHC FLO,VIDEO

		Elevation
Permanent Datum	G.L.	
Log Measured From	G.L.	
Drilling Measured From	G.L.	

Elevation: K.B. / D.F. / G.L.

Date	2-NOV-2004
Run Number	FOUR
Depth Driller	780'
Depth Logger	782'
Bottom Logged Interval	782'
Top Log Interval	688'
Open Hole Size	15"
Type Fluid	WATER
Density / Viscosity	NA/NA
Max. Recorded Temp.	na
Estimated Cement Top	SURFACE
Time Well Ready	ROA 11/2004
Time Logger on Bottom	15:00 11/2004
Equipment Number	MVGS-1
Location	Ft. Myers
Recorded By	S.Miller
Witnessed By	A.Mc Thena (WRS) J.Bair (SWS)

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	12.5"	45'	745'				
TWO	25"	45'	732'				
THREE	15"	732'	782'				

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	26"	0.375" WT	SURFACE	45'
Prot. String	17.4" PVC	15.25" ID	SURFACE	730'
Production String				
Liner				

Invoice No. 2004155 P.O. # Job No. * FINAL PRINT *

<<< Fold Here >>>

Comments

Q, %Q & Fluid Velocity presentations include a regular Line Speed and Caliper corrected only format, and an interpretative "LOGICAL" format.
"LOGICAL" Q, %Q & Fluid Velocity passes assume no thief zones (Q & %Q can only increase).

A DYNAMIC down pass was made at 50 fpm.

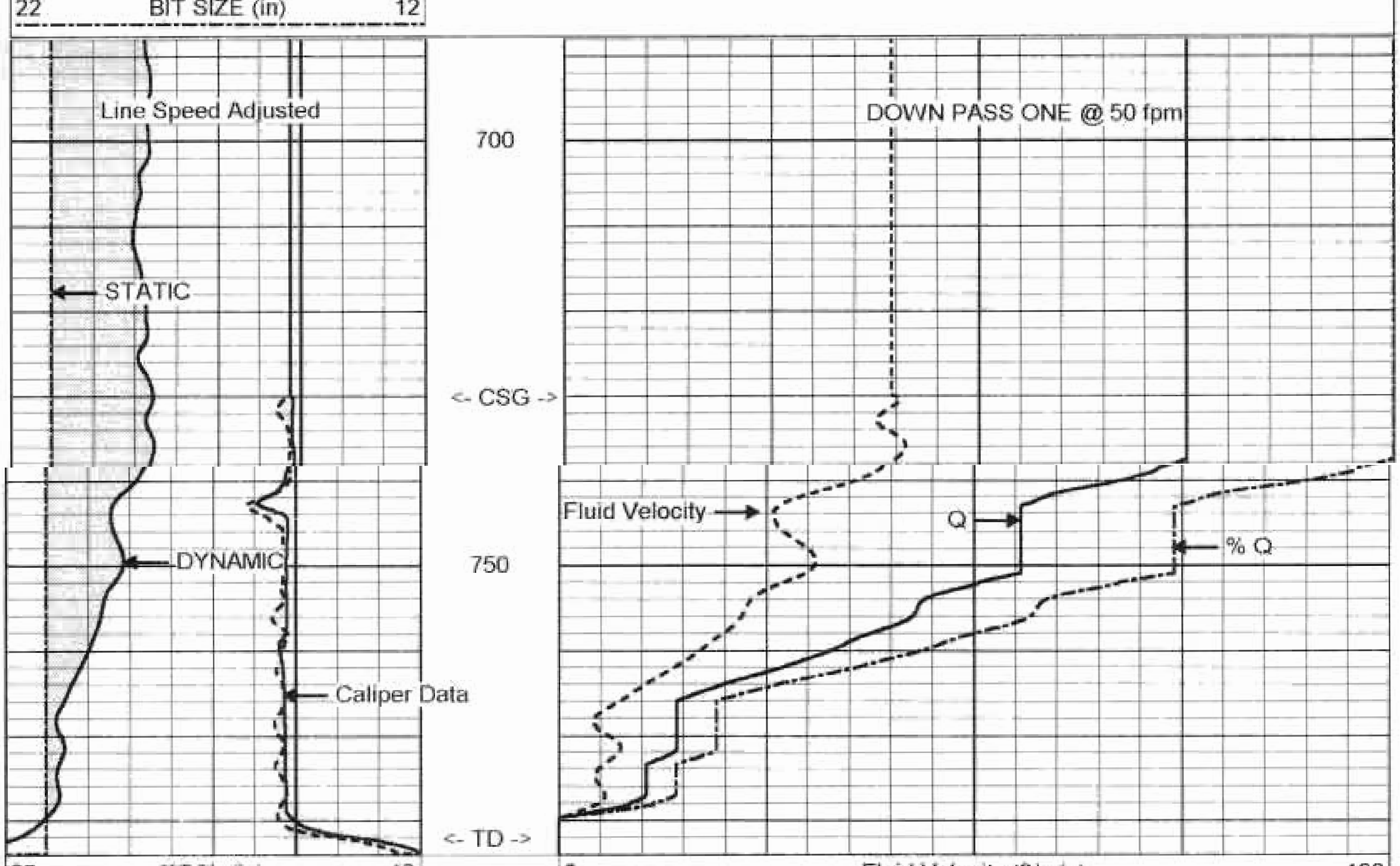
1 Stations were performed.

Q =375 gpm

MV Geophysical — "Logical" Q, %Q & F.Vel.

Database File:	swsml-5.db
Dataset Pathname:	run4/lq50
Presentation Format:	lpvqml.prs
Dataset Creation:	Sat Nov 13 14:05:20 2004
Charted by:	Depth in Feet scaled 1:240

22	XCAL (in)	12	0	Fluid Velocity (ft/min)	100
22	YCAL (in)	12	0	Flowrate, gpm	500
10	STATIC (cps)	60	0	% Q	100
10	DYNAMIC (cps)	60			
22	BIT SIZE (in)	12			

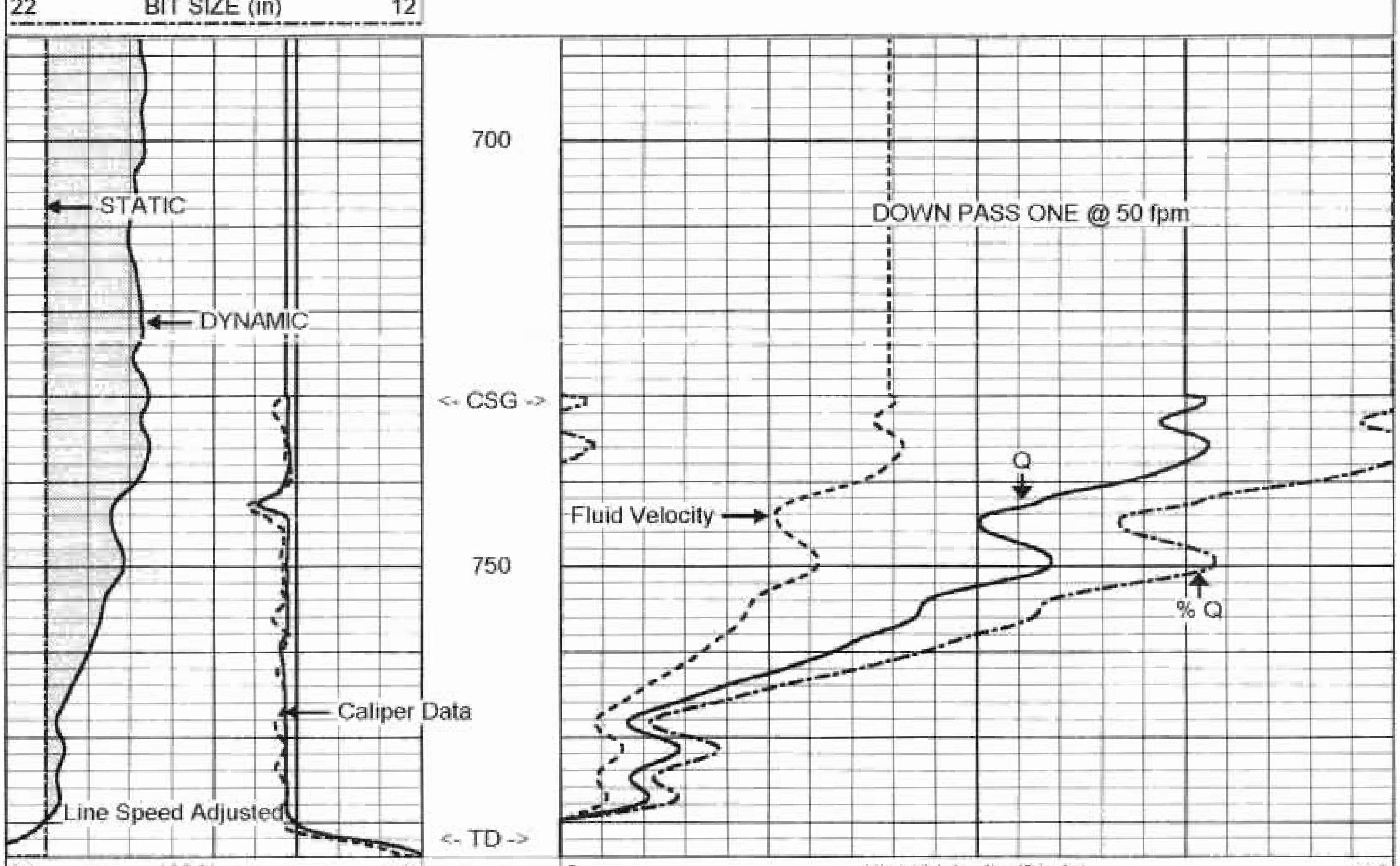


22	XCAL (in)	12	0	Fluid Velocity (ft/min)	100
22	YCAL (in)	12	0	Flowrate, gpm	500
10	STATIC (cps)	60	0	% Q	100
10	DYNAMIC (cps)	60			
22	BIT SIZE (in)	12			

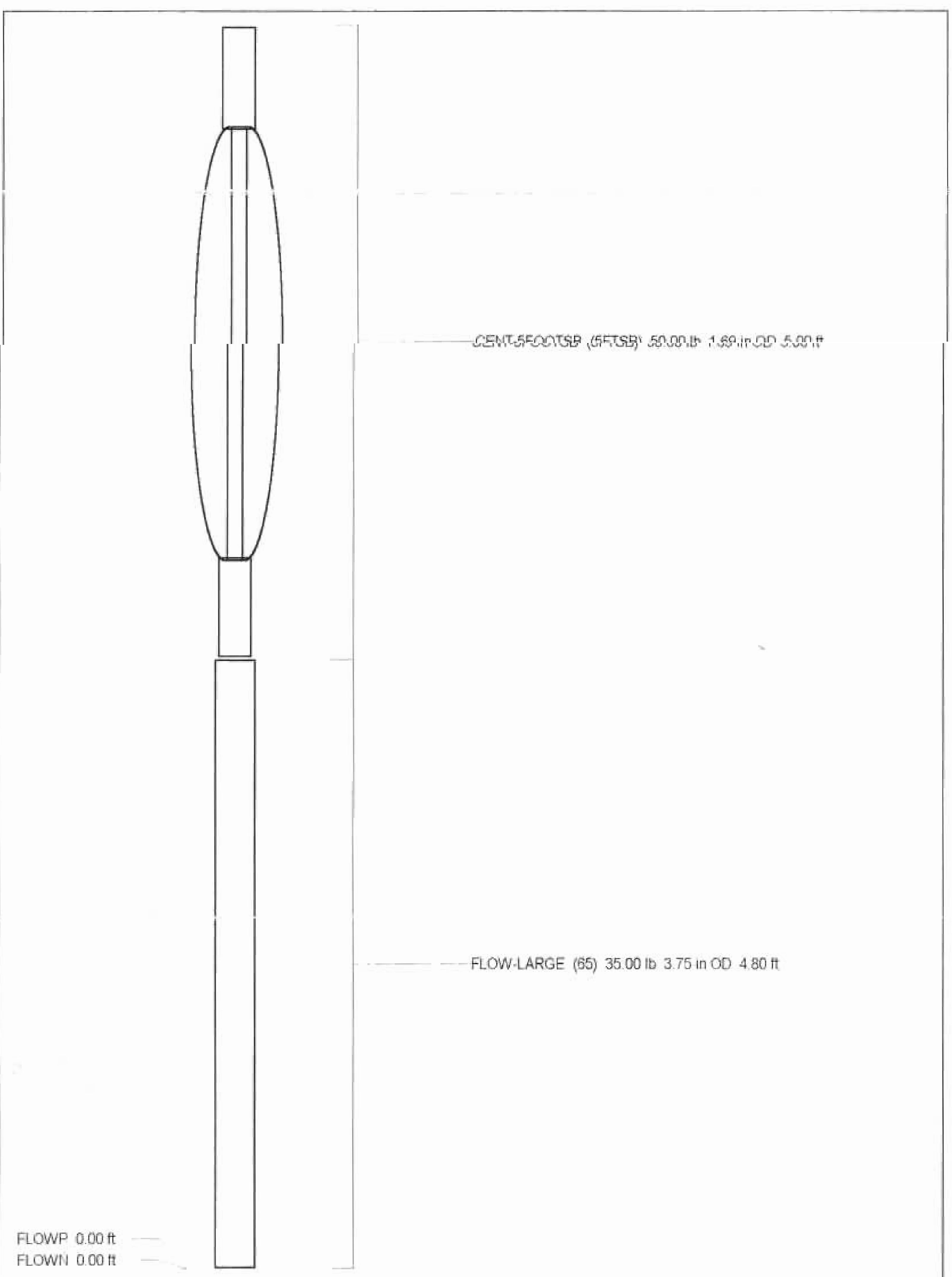
MV Geophysical — "Raw" Q, %Q & F.Vel.

Database File:	swsml-5.db
Dataset Pathname:	run4/mlq50
Presentation Format:	pvqml.prs
Dataset Creation:	Mon Nov 15 20:09:58 2004
Charted by:	Depth in Feet scaled 1:240

22	XCAL (in)	12	0	Fluid Velocity (ft/min)	100
22	YCAL (in)	12	0	Q, gpm	500
10	STATIC (cps)	60	0	% Q	100
10	DYNAMIC (cps)	60			
22	BIT SIZE (in)	12			



22	XCAL (in)	12	0	Fluid Velocity (ft/min)	100
22	YCAL (in)	12	0	Q, gpm	500
10	STATIC (cps)	60	0	% Q	100
10	DYNAMIC (cps)	60			
22	BIT SIZE (in)	12			



Dataset:	run4/pass11
Total Length:	9.80 ft
Total Weight:	85.00 lb
O.D.	3.75 in

MV Geophysical

FLUID CONDUCTIVITY TEMPERATURE LOG

Company Water Resource Solutions
Well ASR-5
Field Marco Lakes ASR Exp.
County Collier
State/Prv Florida

Company Water Resource Solutions
Well ASR-5
Field Marco Lakes ASR Expansion
County Collier State/Prv Florida

Location
Marco Lakes ASR Wellfield Expansion
Southern Well Services

Other Services
DIL,XY/GR
BHC,FLOW
VIDEO

Date	2-NOV-2004		
Run Number	FOUR	Permanent Datum	G.L.
Depth Driller	780'	Log Measured From	G.L.
Depth Logger	782'	Drilling Measured From	G.L.
Bottom Logged Interval	782'		
Top Log Interval	695'		
Open Hole Size	15"		
Type Fluid	WATER		
Density / Viscosity	NA/NA		
Max. Recorded Temp.	na		
Estimated Cement Top	SURFACE		
Time Well Ready	ROA 11/2/04		
Time Logger on Bottom	11:00 11/2/04		
Equipment Number	MVGS-1		
Location	Ft. Myers		
Recorded By	S.Miller		
Witnessed By	A.McTheria (WRS)	J.Barr (SWS)	

Elevation
K.B.
D.F.
G.L.

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
ONE	12.5"	45'	745'				
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Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	26"	0.375" WT	SURFACE	45'
Prot. String	17.4" PVC	15.25" ID	SURFACE	730'
Production String				
Liner				
Invoice No.	2004155	P.O. #	Job No.:	* FINAL PRINT *

All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

A DYNAMIC DOWN pass was performed.
Cw=1195 uS/cm @ 80.9 degF (Dynamic Sample). Q =~250 gpm.
FLUID RESISTIVITY CALIBRATION REPORT (Performed: 16-AUG-04 13:00)

OHM-M	CPS
335.0	4565.33
820.1	4400.12
1525.1	3890.11

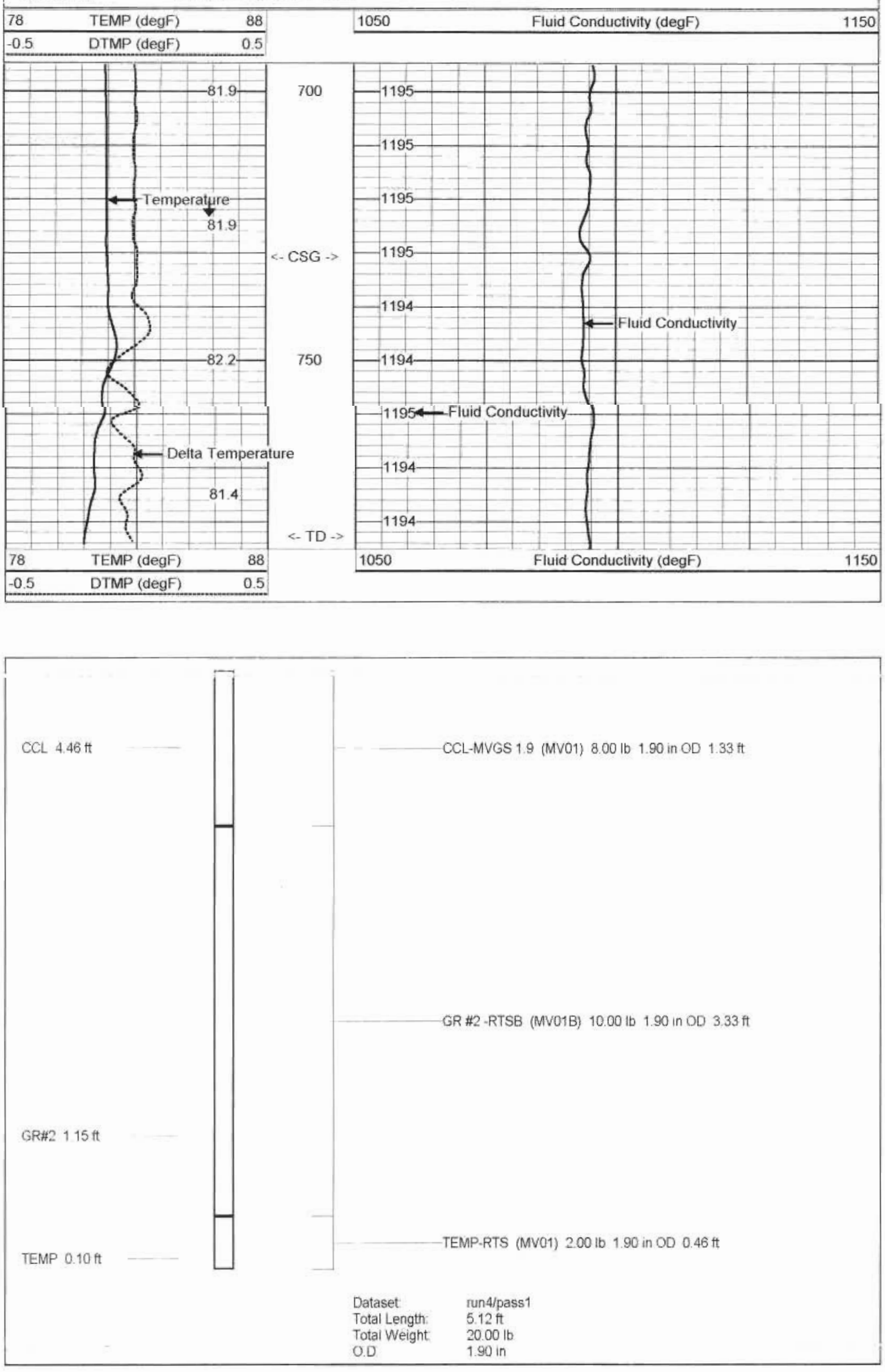
TEMPERATURE CALIBRATION REPORT (Performed: 16-AUG-04 13:45)

DEG-F	CPS
34.6	2346.14
144.6	6955.44

MV Geophysical

Dynamic FCT Down

Database File: swsml-5.db
Dataset Pathname: run4/DFCT
Presentation Format: fct6.prs
Dataset Creation: Fri Oct 29 16:51:06 2004
Charted by: Depth in Feet scaled 1:240



Dataset: run4/pass1
Total Length: 5.12 ft
Total Weight: 20.00 lb
O.D: 1.90 in

APPENDIX 2.2

LITHOLOGIC LOG

ASR-5

WATER RESOURCE SOLUTIONS, INC.

MARCO LAKES ASR WELL NO. 5
GEOLOGIST'S LOG

Marco Island Utilities
Marco Lakes ASR Expansion Project **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/21/04**

Depth	Lithology
0-1	Sand, moderate olive brown, (5Y 4/4), abundant quartz, angular to sub-rounded, fine to coarse grained, poorly indurated, abundant organics, abundant limestone fragments, common clay, good intergranular porosity and good apparent permeabilty.
1-4	Sand, light brown, (5YR 6/4), predominantly quartz, angular to sub-rounded, iron stained, fine to coarse grained, friable, abundant limestone fragments, excellent intergranular porosity and excellent apparent permeability.
4-7	Sand, dark yellowish orange, (10YR 6/6), predominantly quartz, clay to medium grained sand, angular to sub rounded, iron stained, abundant clay, stiff, fair intergranular porosity, fair apparent permeability.
7-12	Limestone, dark yellowish orange (10YR 6/6) to dusky yellow (5Y 6/2), packstone to grainstone, well indurated, recrystallized calcite common, abundant bivalve shells and quartz sand, fair vuggy porosity, fair apparent permeabilty.
12-20	Limestone, light gray (N7) to yellowish gray (5Y 8/1), wackestone, friable to poorly indurated, abundant shell fragments, abundant recrystallized calcite, common quartz sand, good vuggy porosity, good apparent permeability.
20-35	Limestone, yellowish gray, (5Y 8/1), wackestone to packstone, poor to moderate induration, abundant shell casts, abundant shell fragments, common quartz sand, excellent intergranular porosity and excellent apparent permeability.
35-38	Same as above except abundant (30 %) medium, sub-rounded to rounded, quartz sand.
38 -52	Limestone, yellowish gray (5Y 7/2) to yellowish gray (5Y 8/1), wackestone, friable to moderately indurated, abundant shell fragments, common quartz sand, common lime mud, fair intergranular porosity and fair apparent permeability.
50-58	Limestone, yellowish gray, (5Y 8/1) to very light gray (N8), wackestone to packstone, moderately indurated, abundant fossil casts, abundant shell fragments, occasional quartz sand, good moldic porosity and good apparent permeability.

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Prepared by: Andy McThenia **Date: 10/21/04**

58-77	Limestone, yellowish gray, (5Y 8/1), packstone, moderately to well indurated, abundant gastropod molds and casts, common fine quartz sand, occasional fine phosphate, fair moldic porosity and fair apparent permeability.
77-86	Limestone, same as above except abundant fine quartz sand and common fine phosphate.
86-101	Limestone, yellowish gray (5Y 7/2), packstone, friable, abundant fine quartz sand matrix, abundant fine phosphate, common shell fragments, excellent intergranular porosity and excellent apparent permeability.
101-110	Limestone, yellowish gray, (5Y 7/2), packstone, friable, trace fine phosphate, trace fine quartz sand, fair intergranular porosity and apparent permeability
110-120	Same as above except occasional wood fragments
120-125	Limestone, same as above except trace clay, dark yellowish orange, (10YR 6/6)
125-128	Limestone, yellowish gray (5Y 7/2), packstone, friable, common coarse grained phosphatic sand, fair intergranular porosity and apparent permeability
128-130	Clay, pale olive (10Y 6/2) – pale greenish yellow (10Y 8/2) to dusky yellow green (5GY 5/2), mottled, soft, sticky, sandy, abundant limestone clasts
130-140	Clay, dusky yellow green, (5GY 5/2) soft, sticky, abundant fine to coarse phosphatic sand, abundant limestone, yellowish gray (5Y 7/2), packstone, poor porosity and apparent permeability
140-145	Sand, pale yellowish brown, (10YR 6/2) fine-medium grained, predominately calcareous mudstone grains, common fine to medium grained phosphate, common fine quartz sand, fair to good intergranular porosity and apparent permeability
145 -185	Sand, pale olive (10Y 6/2), predominantly opaque quartz, unconsolidated to loose, angular to sub-rounded, increasing amount of lime mud with depth, common limestone and shell grains, unconsolidated to loose, poor to fair intergranular porosity and apparent permeability

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Prepared by: Andy McThenia **Date: 10/21/04**

185-190	Clay, pale greenish yellow (10Y 8/2) to pale olive (10Y 6/2), soft, sticky, abundant fine to medium, opaque, rounded to well rounded quartz sand, common limestone fragments, common phosphatic sand, poor porosity and apparent permeability
190-237	Clay, greenish gray (5GY 6/1) to dusky yellow green (5GY 5/2), soft, sticky, abundant very fine phosphatic sand, occasional flat, smooth quartz gravel, trace limestone, poor porosity and apparent permeability
237-250	Clay, greenish gray (5GY 6/1) to dusky yellow green (5GY 5/2), soft, sticky, abundant very fine phosphatic sand, abundant limestone, increasing amount of lime mud with depth, , occasional flat, smooth quartz gravel, poor porosity and apparent permeability
250-287	Clay, greenish gray (5GY 6/1) to dusky yellow green (5GY 5/2), soft, sticky, abundant very fine phosphatic sand, occasional rounded fine quartz sand, poor porosity and apparent permeability
287-290	Limestone, yellowish gray, (5Y 8/1) packstone, poor to moderate induration, abundant casts and molds, abundant fine grained phosphate, good moldic porosity and apparent porosity
290-295	Clay, greenish gray (5GY 6/1), soft, sticky, abundant limestone clasts, yellowish gray, (5Y 8/1) packstone, friable, abundant very fine phosphatic sand, poor porosity and apparent permeability
295-310	Limestone, yellowish gray, (5Y 8/1), packstone to wackestone, poor to moderate induration, abundant casts and molds, abundant fine grained phosphate, good moldic porosity and apparent porosity
310-324	Clay, greenish gray (5GY 6/1), soft, sticky, abundant limestone clasts, yellowish gray, (5Y 8/1) packstone, friable, abundant very fine phosphatic sand, poor porosity and apparent permeability
324-326	Limestone, pale greenish yellow, (10Y 8/2), packstone, well indurated, shell fragments common, molds and casts common, fair moldic porosity and apparent permeability.
326-344	Limestone, light greenish gray (5GY 8/1) to white (N9), packstone to wackestone, friable to moderate induration, abundant shell fragments, abundant fine phosphate, occasional fine quartz sand, good to excellent moldic porosity and apparent permeability

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344-350	Limestone, light greenish gray (5GY 8/1) to yellowish gray (5Y 8/1), packstone, well indurated, abundant shell fragments, abundant molds and casts, common fine phosphate, occasional clay, greenish gray (5GY 6/1), trace orange clay, poor porosity and apparent permeability
350-355	Limestone, yellowish gray (5Y 8/1), packstone to wackestone, moderate induration, abundant molds and casts, common fine phosphate, occasional marl, white (N9), fair moldic porosity and apparent permeability
355-360	Limestone, yellowish gray (5Y 8/1), packstone to wackestone, moderate induration, abundant molds and casts, common fine phosphate, occasional clay, greenish gray (5GY 6/1), soft, sticky, fair moldic porosity and apparent permeability
360-365	Limestone, yellowish gray (5Y 8/1), packstone to wackestone, well indurated, abundant molds and casts, common fine phosphate, occasional marl, white (N9), good to excellent moldic porosity, and apparent permeability
365-380	Limestone, yellowish gray, (5Y 8/1) grainstone to packstone, friable to soft, unconsolidated, abundant molds and casts, abundant fine phosphate, occasional clay, greenish gray (5GY 6/1), soft, sticky, occasional marl, white (N9), good to excellent moldic porosity and apparent permeability.
380-425	Limestone, yellowish gray, (5Y 8/1) packstone, friable, abundant molds and casts, abundant fine phosphatics, occasional marl, white (N9), fair moldic and intergranular porosity, fair apparent permeability.
425-432	Limestone, yellowish gray, (5Y 8/1) packstone to wackestone, moderate induration, abundant molds and casts, abundant clay, ~40% common fine phosphate, occasional marl, white (N9), fair moldic and intergranular porosity, fair apparent permeability
432-440	Limestone, yellowish gray, (5Y 8/1) to very pale orange, packstone, well indurated, abundant molds and casts, abundant fine phosphate, occasional fair moldic porosity, fair apparent permeability

WATER RESOURCE SOLUTIONS, INC.

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GEOLOGIST'S LOG

Marco Island Utilities
Marco Lakes ASR Expansion Project **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/21/04**

440-450	Clay, pale olive (10Y 6/2), soft, sticky, abundant ~40% limestone clasts, yellowish gray, (5Y 8/1), common fine phosphate, trace dolostone, moderate olive brown (5Y 4/4), poor porosity and apparent permeability
450-470	Same as above except less limestone clasts, ~ 20%
470-485	Limestone, pale greenish yellow (10Y 8/2) to very pale orange (10YR 8/2), packstone to wackestone, marly, soft, abundant molds and casts, abundant (~30%) greenish gray clay (5G 6/1) common fine phosphate, poor porosity and apparent permeability
485-490	Same as above except for trace phosphate
490-506	Limestone, pale greenish yellow (10Y 8/2) to very pale orange (10YR 8/2), packstone to wackestone, marly, moderate induration, abundant molds and casts, common gastropod casts, common fine phosphate, fair porosity and apparent permeability
506-510	Limestone, pale greenish yellow (10Y 8/2) to white (N9), packstone to wackestone, marly, friable to soft, abundant molds and casts, common greenish gray clay (5G 6/1) common fine phosphate, good, moldic porosity and apparent permeability
512-521	Limestone, pale greenish yellow (10Y 8/2) wackestone, marly, soft to friable, abundant molds and casts, abundant (~30%) light olive gray clay (5Y 6/1) common fine phosphate, poor porosity and apparent permeability
520-530	Limestone, pale greenish yellow (10Y 8/2) wackestone, marly, friable, abundant molds and casts, abundant (~40%) light olive gray clay (5Y 6/1) common fine phosphate, poor porosity and apparent permeability
530-540	Limestone, pale greenish yellow (10Y 8/2) packstone to wackestone, marly, friable, abundant molds and casts, abundant (~20%) light olive gray clay (5Y 6/1) common fine phosphate, poor porosity and apparent permeability
540-550	Dolosilt, yellowish gray (5Y 7/2), soft, sticky, abundant (~30%) limestone clasts, yellowish gray (5Y 7/2) to white (N9), packstone to grainstone, common coarse to very fine phosphatic sand, poor porosity and apparent permeability

WATER RESOURCE SOLUTIONS, INC.

MARCO LAKES ASR WELL NO. 5
GEOLOGIST'S LOG

Marco Island Utilities
Marco Lakes ASR Expansion Project **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/21/04**

550 -563	Dolosilt, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), soft, sticky, abundant (~10%) phosphatic sand, common limestone, yellowish gray (5Y 7/2) packstone, poor porosity and apparent permeability
563-570	Dolosilt, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), soft, sticky, abundant (~30 %) limestone clasts, yellowish gray (5Y 7/2) packstone, common phosphatic sand, poor porosity and apparent permeability
570-605	Limestone, yellowish gray (5Y 7/2) wackestone, marly, friable, abundant molds and casts, abundant (~40%) dolomitic clay (5Y 6/1) common fine phosphate, poor porosity and apparent permeability
605-619	Dolosilt, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), soft, sticky, abundant (~30 %) limestone clasts, yellowish gray (5Y 7/2) packstone, common phosphatic sand, poor porosity and apparent permeability
619-625	Limestone, yellowish gray (5Y 7/2) wackestone, marly, friable, abundant molds and casts, abundant (~40%) dolomitic clay (5Y 6/1) common fine phosphate, poor porosity and apparent permeability
625-650	Clay, yellowish gray (5Y 8/1) to light greenish gray (5GY 8/1), hard, stiff, sticky, occasional fine gravel to very fine phosphatic grains, black (N8), rounded to well rounded, occasional limestone clasts (packstone to grainstone, yellowish gray (5Y 7/2) to white (N7), poor porosity and apparent permeability
650-657	Clay, light greenish gray (5GY 8/1), hard, stiff, sticky, lumpy, occasional fine gravel to very fine phosphatic grains, black (N8), rounded to well rounded, poor porosity and apparent permeability.
657-665	Limestone, yellowish gray (5Y 7/2) to white (N7), wackestone, marly, friable, abundant molds and casts, abundant (~40%) dolomitic clay, light olive gray, (5Y 6/1), common fine phosphate, poor porosity and apparent permeability
665-668	Clay, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), soft, sticky, poor porosity and apparent permeability, abundant (~30 %) limestone clasts, yellowish gray (5Y 7/2), packstone to wackestone, well indurated, common phosphatic sand, good moldic porosity and apparent permeability

WATER RESOURCE SOLUTIONS, INC.

MARCO LAKES ASR WELL NO. 5
GEOLOGIST'S LOG

Marco Island Utilities
Marco Lakes ASR Expansion Project **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/21/04**

668-695	Limestone, yellowish gray (5Y 7/2), packstone to wackestone, friable, abundant molds and casts, common fine phosphatic sand, excellent moldic porosity and excellent apparent permeability, abundant (~30%) marl, white, (N7), poor porosity and apparent permeability
695-710	Marl, white (N5) to very light gray (N8), soft, sticky, low porosity and apparent permeability, common very fine phosphatic sand, abundant (~20%) clasts of limestone, yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), packstone, fair moldic porosity
710 718	Limestone, yellowish gray (5Y 8/1), packstone to wackestone, fair to good induration, trace fine phosphatic sand, good moldic porosity, good apparent permeability, occasional (~10%) marl, white (N7) soft, sticky, poor porosity and apparent permeability, common clasts of dolostone, light olive gray, (5Y 5/2), microcrystaline, well indurated, poor porosity and apparent permeability
718-730	Limestone, very pale orange, (10YR 8/2), wackestone, fair to good induration, trace fine phosphatic sand, abundant bivalve and gastropod molds, excellent moldic porosity and excellent apparent permeability, occasional marl, white (N7) soft sticky, low porosity and apparent permeability
730-740	Limestone, grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2) packstone, fair to good induration, abundant molds and casts, casts predominantly gastrpods (turitella), occasional recrystalized calcite molds and casts, trace fine phosphatic sand, good to excellent moldic porosity, good to excellent apparent permeability
740-745	Limestone, very pale orange (10YR 8/2) to yellowish gray (5Y 8/10) packstone to wackestone, moderate to good induration, common molds and casts, abundant bivalve casts, abundant cement, good moldic porosity and good apparent permeability.
745-750	Limestone, very pale orange (10YR 8/2), packstone, well indurated, abundant molds and casts, common recrystalized calcite molds, occasional phosphatic limestone, light olive gray (5Y 5/2), trace clay, pale olive (10Y 6/2) with abundant fine phosphatic grains, good to excellent moldic and intergranular porosity and apparent permeability.

WATER RESOURCE SOLUTIONS, INC.

MARCO LAKES ASR WELL NO. 5
GEOLOGIST'S LOG

Marco Island Utilities
Marco Lakes ASR Expansion Project **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/21/04**

750-755	Limestone, very pale orange (5Y 8/1) to yellowish gray (5Y 8/1), packstone, well indurated, abundant molds and casts, abundant recrystalized calcite molds, trace pyrite, occasional flakes of black pyrite rich magnetic material, good to excellent moldic and intergranular porosity and good to excellent apparent permeability.
755-760	Limestone, very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), packstone, friable to moderate induration, abundant molds and casts, occasional moderate yellowish green (10GY 6/4) staining on surfaces, abundant vugs and molds, excellent vuggy and moldic porosity, excellent apparent permeability.
760-765	Limestone, very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), packstone, moderate induration, abundant molds and casts, occasional oolitic texture, good to excellent intergranular and moldic porosity and good to excellent apparent permeability.
765-770	Limestone, yellowish gray, (5Y 8/1), packstone, friable, occasional to common molds and casts, grains adjacent to molds are weathered, fair to good intergranular and moldic porosity and permeability.
770-775	Limestone, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), packstone, well indurated, common molds and casts, trace moderate yellowish green (10GY 6/4) staining on surfaces, trace marl, yellowish gray (5Y 8/1), sticky, fair to good intergranular and moldic porosity, fair to good apparent permeability.
775-780	Limestone, very pale orange (10YR 8/2) to grayish orange (10YR 7/4), packstone, friable, intergranular weathering apparent, grains have clay rims, common noncohesive lime mud, poor intergranular porosity, poor to fair moldic porosity, poor to fair apparent permeability.

APPENDIX 2.3

ANALYSIS OF FORMATION WATER BASED ON DRINKING WATER STANDARDS

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Safe Drinking Water Program Laboratory Report

Southern Well Services Inc.
Marco Lakes

PUBLIC WATER SYSTEM INFORMATION

PWS I.D. #:

System Name:

System Type: ☐ Community ☐ Nontransient Noncommunity ☐ Transient Noncommunity

Address:

City: State:

Phone #: ZIP Code:

E-Mail Address: Fax #:

SAMPLE INFORMATION

Sample Number: 46325.01 Location Code (if known):

Sample Date: 10/28/04 Sample Time: 17:00

Sample Location: ASR#5 Field pH:

Disinfectant Residual: mg/L

Sample Type (Check Only One)

- ☐ Distribution
- ☐ Entry Point (to Distribution)
- ☐ Plant Tap (not 62-550 compliance)
- ☐ Raw (at well or intake)
- ☐ Max Residence Time
- ☐ Ave Residence Time
- ☐ Near First Customer

Reason(s) for Sample (Check all that apply)

- ☐ Routine Compliance (with 62-550)
- ☐ Confirmation of MCL Exceedance*
- ☐ Composite of Multiple Sites**
- ☐ Clearance (permitting)
- ☐ Quarterly (Which Quarter?)
- ☐ Special (not for compliance with 62-550)
- ☐ Violation Resolution
- ☐ Replacement (of Invalidated Sample)

Other: _____

Sampling Procedure Used or Other Comments: _____

Sampler's Name:

Sampler's Phone #: Sampler's Fax #:

Sampler's E-Mail Address:

CERTIFICATION (to be completed by sampler)

I, _____ (Name), _____ (Title)

do HEREBY CERTIFY that the above public water system and sample collection information is complete and correct.

Signature: _____ Date: _____

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Safe Drinking Water Program Laboratory Report

Southern Well Services Inc.
Marco Lakes

LABORATORY CERTIFICATION INFORMATION

Lab Name: Southern Analytical Laboratories, Inc.
Address: 110 Bayview Blvd., Oldsmar, FL 34677
Phone: (813) 855-1844

Florida Certification #: E84129
Certification Expires: 06/30/05

ANALYSIS INFORMATION (to be completed by lab)
PWS I.D. #:
Lab Assigned Report Number: 46325.01

Date Sample(s) Rec'd: 10/29/04

Group(s) Analyzed & Results attached for compliance with Chapter 62-550, F.A.C. (Check all that apply):

Inorganics	Synthetic Organics	Volatile Organics	Disinfection Byproducts
☐ All 17	☐ All 30	☑ All 21	☑ Trihalomethanes
☑ Partial	☑ All Except Dioxin	☐ Partial	☐ Haloacetic Acids
☐ Nitrate	☐ Partial		☐ Bromate
☐ Nitrite			☐ Chlorite

Radionuclides	Secondaries
☑ Single Sample	☑ All 14
☐ Qtrly Composite**	☐ Partial

Were any analyses subcontracted? ☐ Yes ☑ No
If yes, please provide DOH certification numbers: _____

CERTIFICATION

I, Francis I. Daniels, Laboratory Director (or Leslie C. Boardman, QA Manager),
do HEREBY CERTIFY that all attached analytical data are correct and unless noted meet all requirements of the National Environmental Laboratory Accreditation Conference (NELAC).

Signature: _____ Date: 11/18/04

** Provide radiological sample dates & locations for each quarter

COMPLIANCE DETERMINATION (to be completed by DEP or DOH)

Sample Collection Info Satisfactory: ☐ Yes ☐ No Sample Analysis Info Satisfactory: ☐ Yes ☐ No
☐ Replacement Sample(s) Requested (circle or highlight group(s) above) ☐ Revised Report Requested (circle or highlight group(s) above)
☐ Additional Monitoring Required (circle or highlight group(s) above)

Reason(s): ☐ MCL(s) Exceeded ☐ Detection(s) ☐ Incomplete Report
☐ Missing Analyte Sheet(s) ☐ Location Unsatisfactory ☐ Analysis Unsatisfactory
☐ Other: _____

Person Notified: _____ Date Notified: _____
Comments: _____
Date Reviewed: _____ DEP/DOH Reviewing Official: _____

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample No.: 46325.01
PWS ID:

Inorganic Contaminants
62-550.310(1)

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Analysis Date	Analysis Time	DOH Lab Certification #
1040	Nitrate (as N)	10	mg/L	0.002	U	EPA 300.0	0.002	10/29/04	18:50	E84129
1041	Nitrite (as N)	1	mg/L	0.005	U	EPA 300.0	0.005	10/29/04	18:50	E84129
1005	Arsenic	0.05	mg/L	0.0050		SM 3113 B	0.001	11/02/04	09:20	E84129
1010	Barium	2	mg/L	0.011		EPA 200.7	0.01	10/29/04	10:50	E84129
1015	Cadmium	0.005	mg/L	0.001	U	EPA 200.7	0.001	10/29/04	10:50	E84129
1020	Chromium	0.1	mg/L	0.01	U	EPA 200.7	0.01	10/29/04	10:50	E84129
1024	Cyanide	0.2	mg/L	0.006		SM 4500 CN E	0.005	11/02/04	16:38	E84129
1025	Fluoride	4	mg/L	0.71		EPA 300.0	0.003	10/29/04	18:50	E84129
1030	Lead	0.015	mg/L	0.001	U	SM 3113 B	0.001	11/04/04	15:10	E84129
1035	Mercury	0.002	mg/L	0.0001	U	EPA 245.1	0.0001	11/04/04	13:15	E84129
1036	Nickel	0.1	mg/L	0.02	U	EPA 200.7	0.02	10/29/04	10:50	E84129
1045	Selenium	0.05	mg/L	0.001	U	SM 3113 B	0.001	10/29/04	14:55	E84129
1052	Sodium	160	mg/L	71		EPA 200.7	0.1	11/04/04	12:30	E84129
1074	Antimony	0.006	mg/L	0.001	U	SM 3113 B	0.001	11/01/04	13:45	E84129
1075	Beryllium	0.004	mg/L	0.002	U	EPA 200.7	0.002	10/29/04	10:50	E84129
1085	Thallium	0.002	mg/L	0.001	U	EPA 200.9	0.001	10/29/04	13:20	E84129

*** Qualifiers:**

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

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample No.: 46325.01
PWS ID:

Secondary Contaminants
62-550.320

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Analysis Date	Analysis Time	DOH Lab Certification #
1002	Aluminum	0.2	mg/L	0.1	U	EPA 200.7	0.1	10/29/04	10:50	E84129
1017	Chloride	250	mg/L	120		EPA 300.0	0.1	11/01/04	18:19	E84129
1022	Copper	1	mg/L	0.005	U	EPA 200.7	0.005	10/29/04	10:50	E84129
1025	Fluoride	2	mg/L	0.71		EPA 300.0	0.003	10/29/04	18:50	E84129
1028	Iron	0.3	mg/L	0.02	U	EPA 200.7	0.02	10/29/04	10:50	E84129
1032	Manganese	0.05	mg/L	0.01	U	EPA 200.7	0.01	10/29/04	10:50	E84129
1050	Silver	0.1	mg/L	0.01	U	EPA 200.7	0.01	10/29/04	10:50	E84129
1055	Sulfate	250	mg/L	96		EPA 300.0	0.1	11/01/04	18:36	E84129
1095	Zinc	5	mg/L	0.0099		EPA 200.7	0.005	10/29/04	10:50	E84129
1905	Color	15	CU	5	U	SM 2120 B	5	10/29/04	17:57	E84129
1920	Odor	3	TON	100		SM 2150 B	1	10/29/04	10:04	E84129
1930	Total Dissolved Solids	500	mg/L	610		SM 2540 C	10	11/01/04	15:35	E84129
2905	Foaming Agents	0.5	mg/L	0.05	U	SM 5540 C	0.05	10/29/04	14:22	E84129

*** Qualifiers:**

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

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample No.: 46325.01
PWS ID:
Disinfectant Residual (mg/L):

Disinfection Byproducts
62-550.310(3)

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Analysis Date	Analysis Time	DOH Lab Certification #
2941	Chloroform	N/A	µg/L	0.2	U	EPA 502.2	0.2	11/02/04	04:05	E84129
2942	Bromoform	N/A	µg/L	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2943	Bromodichloromethane	N/A	µg/L	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2944	Dibromochloromethane	N/A	µg/L	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2950	Total Trihalomethanes	80	µg/L	0.2	U	EPA 502.2	0.2	11/02/04	04:05	E84129

*** Qualifiers:**

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

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample No.: 46325.01
PWS ID:

Radionuclides
62-550.310(6)

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier	Analytical Method	Lab MDL	RDL **	Analysis Error	Analysis Date	Analysis Time	DOH Lab Certification #
4000	Gross Alpha (Incl. Uranium)	***	pCi/L	6.4		EPA 900.0	4.5	3	1.9	11/06/04	13:56	E84129
4020	Radium-226	5*	pCi/L	0.9		EPA 903.1	0.2	1	0.08	11/10/04	11:30	E84129
4030	Radium-228	5*	pCi/L	1.0	U1	EPA RA-05	1.0	1	0.3	11/17/04	11:15	E84129

* Combined Limit
*** If the results exceed 5 pCi/L, a measurement for radium-226 is required.
If the results exceed 15 pCi/L, measurements for radium-226 and uranium are required.

*** Qualifiers:**

** Non-detects with a reported lab MDL <50% of the MCL are acceptable for compliance with 62-550.310(4)(b).

U1 Analyte was not detected; indicated concentration is method detection limit. Radiochemistry MDL is sample specific and matrix dependent.

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample No.: 46325.01
PWS ID:

Volatile Organics
62-550.310(4)(a)

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	RDL **	Analysis Date	Analysis Time	DOH Lab Certification #
2378	1,2,4 Trichlorobenzene	70	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2380	cis-1,2-Dichloroethylene	70	µg/L	0.2	U	EPA 502.2	0.2	0.5	11/02/04	04:05	E84129
2955	Xylenes (total)	10,000	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2964	Dichloromethane	5	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2968	o-Dichlorobenzene	600	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2969	para-Dichlorobenzene	75	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2976	Vinyl Chloride	1	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2977	1,1-Dichloroethylene	7	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2979	trans-1,2-Dichloroethylene	100	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2980	1,2-Dichloroethane	3	µg/L	0.2	U	EPA 502.2	0.2	0.5	11/02/04	04:05	E84129
2981	1,1,1-Trichloroethane	200	µg/L	0.3	U	EPA 502.2	0.3	0.5	11/02/04	04:05	E84129
2982	Carbon tetrachloride	3	µg/L	0.3	U	EPA 502.2	0.3	0.5	11/02/04	04:05	E84129
2983	1,2-Dichloropropane	5	µg/L	0.3	U	EPA 502.2	0.3	0.5	11/02/04	04:05	E84129
2984	Trichloroethylene	3	µg/L	0.2	U	EPA 502.2	0.2	0.5	11/02/04	04:05	E84129
2985	1,1,2-Trichloroethane	5	µg/L	0.3	U	EPA 502.2	0.3	0.5	11/02/04	04:05	E84129
2987	Tetrachloroethylene	3	µg/L	0.2	U	EPA 502.2	0.2	0.5	11/02/04	04:05	E84129
2989	Monochlorobenzene	100	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2990	Benzene	1	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2991	Toluene	1,000	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2992	Ethylbenzene	700	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129
2996	Styrene	100	µg/L	0.5	U	EPA 502.2	0.5	0.5	11/02/04	04:05	E84129

*** Qualifiers:**

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

** Non-detects with a reported lab MDL <50% of the MCL are acceptable for compliance with 62-550.310(4)(b).

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample No.: 46325.01
PWS ID:

Synthetic Organics
62-550.310(4)(b)

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	RDL **	Extraction Date	Analysis Date	Analysis Time	DOH Lab Certification #
2005	Endrin	2	µg/L	0.1	U	EPA 525.2	0.1	0.01	11/01/04	11/03/04	10:22	E84129
2010	Lindane	0.2	µg/L	0.06	U	EPA 525.2	0.06	0.02	11/01/04	11/03/04	10:22	E84129
2015	Methoxychlor	40	µg/L	0.05	U	EPA 525.2	0.05	0.1	11/01/04	11/03/04	10:22	E84129
2020	Toxaphene	3	µg/L	0.5	U	EPA 508.1	0.5	1	11/01/04	11/03/04	09:44	E84129
2031	Dalapon	200	µg/L	1	U	EPA 515.3	1	1	11/04/04	11/04/04	21:54	E84129
2032	Diquat	20	µg/L	1	U	EPA 549.2	1	0.4	10/29/04	11/02/04	18:43	E84129
2033	Endothall	100	µg/L	20	U	EPA 548.1	20	9	11/02/04	11/05/04	16:34	E84129
2034	Glyphosate	700	µg/L	10	U	EPA 547	10	6		10/29/04	21:27	E84129
2035	Di(2-ethylhexyl)adipate	400	µg/L	0.3	U	EPA 525.2	0.3	0.6	11/01/04	11/03/04	10:22	E84129
2036	Oxamyl (Vydate)	200	µg/L	0.5	U	EPA 531.1	0.5	2		11/02/04	19:49	E84129
2037	Simazine	4	µg/L	0.07	U	EPA 525.2	0.07	0.07	11/01/04	11/03/04	10:22	E84129
2039	Di(2-ethylhexyl)phthalate	6	µg/L	1.0	U	EPA 525.2	1.0	0.6	11/01/04	11/03/04	10:22	E84129
2040	Picloram	500	µg/L	0.75	U	EPA 515.3	0.75	0.1	11/04/04	11/04/04	21:54	E84129
2041	Dinoseb	7	µg/L	0.5	U	EPA 515.3	0.5	0.2	11/04/04	11/04/04	21:54	E84129
2042	Hexachlorocyclopentadiene	50	µg/L	0.2	U	EPA 525.2	0.2	0.1	11/01/04	11/03/04	10:22	E84129
2046	Carbofuran	40	µg/L	0.5	U	EPA 531.1	0.5	0.9		11/02/04	19:49	E84129
2050	Atrazine	3	µg/L	0.06	U	EPA 525.2	0.06	0.1	11/01/04	11/03/04	10:22	E84129
2051	Alachlor	2	µg/L	0.2	U	EPA 525.2	0.2	0.2	11/01/04	11/03/04	10:22	E84129
2065	Heptachlor	0.4	µg/L	0.08	U	EPA 525.2	0.08	0.04	11/01/04	11/03/04	10:22	E84129
2067	Heptachlor Epoxide	0.2	µg/L	0.1	U	EPA 525.2	0.1	0.02	11/01/04	11/03/04	10:22	E84129
2105	2,4-D	70	µg/L	1	U	EPA 515.3	1	0.1	11/04/04	11/04/04	21:54	E84129
2110	2,4,5-TP (Silvex)	50	µg/L	0.25	U	EPA 515.3	0.25	0.2	11/04/04	11/04/04	21:54	E84129
2274	Hexachlorobenzene	1	µg/L	0.05	U	EPA 525.2	0.05	0.1	11/01/04	11/03/04	10:22	E84129
2306	Benzo(a)pyrene	0.2	µg/L	0.1	U	EPA 525.2	0.1	0.02	11/01/04	11/03/04	10:22	E84129
2326	Pentachlorophenol	1	µg/L	0.1	U	EPA 515.3	0.1	0.04	11/04/04	11/04/04	21:54	E84129
2383	(PCBs)	0.5	µg/L	0.2	U	EPA 508.1	0.2	0.1	11/01/04	11/03/04	09:44	E84129
2931	Dibromochloropropane	0.2	µg/L	0.005	U	EPA 504.1	0.005	0.02	11/03/04	11/04/04	18:26	E84129
2946	Ethylene Dibromide (EDB)	0.02	µg/L	0.005	U	EPA 504.1	0.005	0.01	11/03/04	11/04/04	18:26	E84129
2959	Chlordane	2	µg/L	0.05	U	EPA 508.1	0.05	0.2	11/01/04	11/03/04	09:44	E84129

*** Qualifiers:**

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

** Non-detects with a reported lab MDL <50% of the MCL are acceptable for compliance with 62-550.310(4)(b).

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample: 46325.01
PWS ID:

Other Contaminants

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Analysis Date	Analysis Time	DOH Lab Certification #
	pH		units	7.03	D1	EPA 150.1				E84129
	Turbidity		NTU	0.14		EPA 180.1	0.05	10/29/04	18:02	E84129
	Iron, Dissolved		mg/l	0.02	U	EPA 200.7	0.02	11/03/04	09:10	E84129
	Dissolved Oxygen		mg/l	0.7	Q5	EPA 360.1	0.1	11/02/04	15:06	E84129
	Hydrogen Sulfide (Unionized)		mg/l	0.1	U	EPA 376.1	0.1	11/03/04	13:30	E84129
	Sulfide		mg/l	0.1	U	EPA 376.1	0.1	11/03/04	13:30	E84129
2986	1,1,1,2-Tetrachloroethane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2988	1,1,2,2-Tetrachloroethane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2978	1,1-Dichloroethane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2410	1,1-Dichloropropene		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2414	1,2,3-Trichloropropane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2412	1,3-Dichloropropane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2413	1,3-Dichloropropene, Total		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2416	2,2-Dichloropropane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129

*** Qualifiers:**

D1	Measurement was made in the field. Data supplied by client.
U	Analyte was not detected; indicated concentration is method detection limit.
Q5	Analysis should be performed "immediately" in the field. Lab analysis was performed at a later time.

SOUTHERN ANALYTICAL LABORATORIES, INC.

110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 FAX 813-855-2218

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample: 46325.01
PWS ID:

Other Contaminants

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Analysis Date	Analysis Time	DOH Lab Certification #
2993	Bromobenzene		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2943	Bromodichloromethane		ug/l	0.3	U	EPA 502.2	0.3	11/02/04	04:05	E84129
2942	Bromoform		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2214	Bromomethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2216	Chloroethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2941	Chloroform		ug/l	0.2	U	EPA 502.2	0.2	11/02/04	04:05	E84129
2210	Chloromethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2944	Dibromochloromethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2408	Dibromomethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2212	Dichlorodifluoromethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2967	m-Dichlorobenzene		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2251	Methyl-tert-butyl-ether		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2965	o-Chlorotoluene		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2966	p-Chlorotoluene		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2218	Trichlorofluoromethane		ug/l	0.5	U	EPA 502.2	0.5	11/02/04	04:05	E84129
2440	Dicamba		ug/l	0.25	U	EPA 515.3	0.25	11/04/04	21:54	E84129

*** Qualifiers:**

D1	Measurement was made in the field. Data supplied by client.
U	Analyte was not detected; indicated concentration is method detection limit.
Q5	Analysis should be performed "immediately" in the field. Lab analysis was performed at a later time.

SOUTHERN ANALYTICAL LABORATORIES, INC.
110 BAYVIEW BOULEVARD, OLDSMAR, FL 34677 813-855-1844 fax 813-855-2218

Southern Well Services Inc.
Marco Lakes
Sample ID: ASR#5

November 18, 2004
Sample: 46325.01
PWS ID:

Other Contaminants

Contaminant ID	Contaminant Name	MCL	Units	Analysis Result	Qualifier*	Analytical Method	Lab MDL	Analysis Date	Analysis Time	DOH Lab Certification #
2356	Aldrin		ug/l	0.08	U	EPA 525.2	0.08	11/03/04	10:22	E84129
2076	Butachlor		ug/l	0.06	U	EPA 525.2	0.06	11/03/04	10:22	E84129
2364	Dieldrin		ug/l	0.06	U	EPA 525.2	0.06	11/03/04	10:22	E84129
2045	Metolachlor		ug/l	0.05	U	EPA 525.2	0.05	11/03/04	10:22	E84129
2595	Metribuzin		ug/l	0.1	U	EPA 525.2	0.1	11/03/04	10:22	E84129
2077	Propachlor		ug/l	0.07	U	EPA 525.2	0.07	11/03/04	10:22	E84129
2066	3-Hydroxycarbofuran		ug/l	0.5	U	EPA 531.1	0.5	11/02/04	19:49	E84129
2047	Aldicarb		ug/l	0.5	U	EPA 531.1	0.5	11/02/04	19:49	E84129
2044	Aldicarb sulfone		ug/l	0.5	U	EPA 531.1	0.5	11/02/04	19:49	E84129
2043	Aldicarb sulfoxide		ug/l	0.5	U	EPA 531.1	0.5	11/02/04	19:49	E84129
2021	Carbaryl		ug/l	0.5	U	EPA 531.1	0.5	11/02/04	19:49	E84129
2022	Methomyl		ug/l	0.5	U	EPA 531.1	0.5	11/02/04	19:49	E84129

*** Qualifiers:**

D1	Measurement was made in the field. Data supplied by client.
U	Analyte was not detected; indicated concentration is method detection limit.
Q5	Analysis should be performed "immediately" in the field. Lab analysis was performed at a later time.

SOUTHERN ANALYTICAL LABORATORIES, INC.

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

SAL Project No. H0325

Client Name	Contact / Phone.
Southern Well Services	Susan 727/531-7559
Project Name / Location: Marco Lakes	Turn Around Time Requested (*Surcharges may apply): 24 Hour* ☐ 48 Hour* ☐ 5 Bus. Days* ☐ 10 Bus Days ☑
Samplers (Signature): Jeff Bair / Andy McElvini	

Matrix Codes: DW-Drinking Water WW-Wastewater SW-SurfaceWater SL-Sludge SO-Soil GW-Groundwater SA-Saline Water O-Other R-Reagent Water

SAL Use Only Sample No	Sample Description	Date	Time	Matrix	Composite	Grab	1LP, Cool 4°C Misc. Inorganics, Turbidity	250ml P, H_2SO_4 Nutrients, TKN	250ml P, HNO_3 Metals	250 ml P, NaOH Cyanide	1LG, Cool 4°C Odor	40ml V, HCl 502.2, TTHM, Group II	1LG, HCl 508.1, 525.2	1LP, H_2SO_4 549.2	40ml V, HCl 504.1	40ml V, MCAA 531.1, Group I	40ml V, Cool 4°C 547, 548.1	1LP, HNO_3 Radiochemistry (Conditional)	1LP, NaOH / Zn Acetate Hydrogen Sulfide	40 mL V, Cool 4°C 515.3	250ml P, Cool 4°C Dissolved Iron	See BR, Manual, AIK, Iodide Dissolved Oxygen
01	ASR #5	10-24-04	1700	GW		X	1	1	1	1	1	2	4	1	3	1	2	2	1	3	1	1
02	Trip Blank	10/25/04	1330	R		X						1										

SAL Report Page ___ of ___

Containers Prepared/ Relinquished:	Date/Time: 10/25/04 1300	Received:	Date/Time: 10/26/04 0825
Relinquished:	Date/Time: 10/28/04 17:00	Received:	Date/Time: 10-25-04
Relinquished:	Date/Time: 10-29-04 0800	Received:	Date/Time: 10-29-04 0800
Relinquished:	Date/Time:	Received:	Date/Time:
Relinquished	Date/Time	Received	Date/Time

Seal intact?	Y N (N/A)
Samples intact upon arrival?	(Y) N N/A
Received on ice? Temp 1.7°	(Y) N N/A
Proper preservatives indicated?	(Y) N N/A
Rec'd within holding time?	(Y) N N/A
Volatiles rec'd w/out headspace?	(Y) N N/A
Proper containers used?	(Y) N N/A

Instructions / Remarks.

Primary & Secondary DW Standards
Group I & II Unregulated
Conditional Radiochemistry

No Dioxin, Asbestos, Total Coliforms, or Group III

Refer to SAL Project # 41151

APPENDIX 3.1

WEEKLY CONSTRUCTION SUMMARY REPORTS

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 7/23/04** **Week # 1**

Date	Description of Activities
Friday 7/16/04	The drillers continued setting up the rig and preparing the site.
Saturday 7/17/04	No site activity
Sunday 7/18/04	No site activity
Monday 7/19/04	No site activity
Tuesday 7/20/04	The subcontracted driller, Custom Well Drilling, mobilized a drill rig to the site and attempted to drill pad monitor wells using hollow stem augers. This method was unsuccessful as the augers were unable to penetrate the hard caprock encountered at 7 feet below ground level. No monitor wells were installed.
Wednesday 7/21/04	The contractor wired the mud separation system and sump pump. Two pallets of gel were brought to the site.
Thursday 7/22/04	Three 50-foot lengths of 26-Inch steel casing were delivered to the jobsite. The subcontracted driller mobilized a drill rig with mud rotary capability and installed two pad monitor wells adjacent to the NW and SE corners of the containment pad. The pad monitor wells are designated as MW-1 (NW) and MW-2 (SE). The wells were completed inside 12" manholes and concrete pads measuring 2' X 2' were constructed around the wells. The wells were developed by pumping. After water levels had stabilized, the wells were purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 7/30/04** **Week # 2**

Date	Description of Activities
Friday 7/23/04	No site activity
Saturday 7/24/04	No site activity
Sunday 7/25/04	No site activity
Monday 7/26/04	The contractor drilled a 12-inch pilot hole to 38 feet bpl. The vendors of the mud solids separation unit were onsite to go through start up procedures on this new piece of equipment.
Tuesday 7/27/04	The contractor brought a cementing truck to the jobsite. The contractor began reaming the 12-inch pilot hole using a 35-inch bit with a 14-inch lead bit. The 35-inch hole was advanced to 20 feet bpl.
Wednesday 7/28/04	The contractor advanced the 35-inch borehole to 52 feet bpl and set a single 49.2 foot length of 26-inch, spiral welded, pit casing to 45.2 feet bpl. A cementing header had previously been welded to the end of the casing to facilitate grouting and sealing. The casing was pressure grouted using 150 sacks of neat cement.
Thursday 7/29/04	The contractor tagged the annular cement depth at 4 feet bpl. Fifteen sacks of neat cement were mixed and pumped into the annular space. The contractor cut the well header from the top of the casing leaving 1.8 feet of open-ended 26-inch casing remaining above ground level. A vacuum truck service removed 3000 gallons of drilling fluid from the mud system tank. The static water levels were measured in pad monitor wells MW-1 and MW-2, and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/6/04** **Week # 3**

Date	Description of Activities
Friday 7/30/04	No site activity
Saturday 7/31/04	No site activity
Sunday 8/01/04	No site activity
Monday 8/02/04	No site activity
Tuesday 8/03/04	The contractor reconfigured the discharge system from the wellhead. A 5-foot long of 36-inch diameter pipe was used as a sump. The pipe was buried vertically adjacent to the drilling platform within the pad area. The same type of plastic used as the pad liner was installed around the bottom end of the sump before it was buried. A 10-inch discharge pipe was welded to a port cut into the base of the 26-inch pit casing. This line is equipped with a butterfly valve and discharges into the sump. A 2-inch port was similarly cut into the pit casing and was equipped with a 2-inch ball valve. A 36-inch flange ring was welded around the top of the casing as a part of the casing shut-in system.
Wednesday 08/04/04	The contractor continued to fabricate a wellhead casing shut-in system by cutting, drilling, and welding flanges to fit a drill through rubber. The contractor used a 23-inch reaming bit with a 12 ½-inch lead bit to drill through the cement plug at the base of the pit casing. This assembly was advanced to a depth of 50-feet below pad level to create a centered hole for the ensuing pilot hole drilling. The cement plug was tagged with the bit at a depth of 42.5 feet bpl.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/6/04** **Week # 3**

Date	Description of Activities
Thursday 08/05/04	The pilot hole was drilled from a depth of 50 feet bpl to 101.1 feet bpl using a 12 ½-inch carbide button studded tricone roller bit. An inclination survey was conducted at a depth of 90 feet bpl. A deviation of 0.75 degrees from the vertical was recorded. The contractor installed a drill through rubber mounted on a flange. The drill through rubber and flange were then bolted onto the flange ring previously welded to the wellhead. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/16/04** **Week # 4**

Date	Description of Activities
Friday 8/06/04	The contractor mixed drilling mud in preparation for drilling but could not maintain constant capacity operation of the rig mud pump due to mechanical problems with a clutch. The contractor discovered that the drill-through rubber was damaged. The rubber was deemed to be semi-operable and the well was shut in for the weekend
Saturday 8/07/04	No site activity
Sunday 8/08/04	No site activity
Monday 8/09/04	The contractor removed the drill-through rubber seal assembly from the wellhead to replace the rubber that had been damaged. A flatbed load of drill collars, drill pipe, and assorted other pipe was brought to the job site.
Tuesday 8/10/04	A rental tanker trailer with a capacity to hold 21,000 gallons of fluid was delivered to the site. Approximately 2,800 gallons of drilling mud was transferred from the solids separation system to the rental tank. The contractor added fresh water to the mud system, adjusted the pH to 9.4 using soda ash or sodium carbonate, and began mixing pure bentonite to the drilling mud. Drilling mud that had been in the borehole was flushed into the rental tanker unit and was displaced by the newly mixed mud.
Wednesday 08/11/04	The contractor began mixing mud and circulating it downhole in preparation for drilling. The contractor attempted to fix a leak that had developed in the gooseneck connection at the top of the kelly standpipe. After in-situ welding on the fitting proved unsuccessful, the contractor decided to stop operations and lower the derrick to remove the fitting for repair. Concerns over the impending Tropical Storm Charlie were also factored into the decision to postpone drilling.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/16/04** **Week # 4**

Date	Description of Activities
Thursday 08/12/04	The contractor lowered the derrick and removed the fitting to be repaired. The contractor secured the fuel tank on a raised platform in preparation for possible flooding from Hurricane Charlie. The contractor pumped down the fluid level in the open topped mud system to allow for upwards of 2 feet of precipitation. All other equipment was secured for the approaching storm and the contractors left the site for the week. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/20/04** **Week # 5**

Date	Description of Activities
Friday 8/13/04	No site activity. Hurricane Charley passes within 50 miles of the site. No damage occurs to equipment on site.
Saturday 8/14/04	No site activity
Sunday 8/15/04	No site activity
Monday 8/16/04	The contractor replaced a previously leaking gooseneck fitting on the kelly standpipe and raised the derrick on the rig. Equipment and materials on the site were returned to the pre-storm arrangement. Water that had ponded on the site was drained from the immediate work area by constructing a swale using a backhoe.
Tuesday 8/17/04	Drill pipe was tripped to the bottom of the pilot borehole at 101 feet bpl. After the bottom of the borehole was tagged at 101 feet bpl, an inclination survey was performed at a depth of 90 feet bpl. The result of this survey is a deviation angle of 0.75 degrees from the vertical. Initial mud weight before drilling was measured at 9.1 pounds per gallon. Pilot-hole drilling using a 12 ½-inch bit began at 101 feet bpl and continued to a depth of 250.5 feet bpl. A deviation of 0.0 degrees from the vertical was measured at 180 feet bpl. After all drilling and circulation had ceased, mud weight was measured at 9.1 lbs/gal. Two drill rods were tripped from the borehole leaving five drill collars and the bit assembly suspended with the third from bottom drill collar at the wellhead. The drill through rubber formed a tight seal around this drill collar. The butterfly valve on the 10-inch discharge line from the wellhead was closed and the well was shut in for the night.
Wednesday 08/18/04	The contractor began drilling at 250.5 feet bpl and advanced the 12 ½-inch borehole to a depth of 469.75 feet bpl. Inclination surveys were performed at depths of 270 and 360 feet below pad level; the results were 0.75 and 0.5 degrees respectively. Mud weights measured throughout the day ranged from 9.1 – 9.4 lbs. per gallon.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/20/04** **Week # 5**

Date	Description of Activities
Wednesday 08/18/04 (cont.)	Mud viscosity measurements ranged from 63 to 80 seconds per quart using the Marsh funnel method. At the completion of drilling, the well was shut in for the night.
Thursday 08/19/04	The contractor began drilling at 469.75 feet bpl and advanced the 12 ½-inch borehole to a depth of feet 656.85 feet bpl. Inclination surveys were performed at depths of 450 and 540 feet bpl; the results were 0.0 and 0.5 degrees respectively. Mud weights measured throughout the day ranged from 9.0 – 9.5 lbs. per gallon. Mud viscosity measurements ranged from 55 to 80 seconds per quart using the Marsh funnel method. At the completion of drilling, the well was shut in for the night. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/27/04** **Week # 6**

Date	Description of Activities
Friday 8/20/04	The contractor began drilling at a depth of 656.85 feet bpl and advanced the 12 ½-inch borehole to the total depth of 745 feet bpl. Inclination surveys were performed at depths of 630 and 720 feet bpl; the results were 0.25 and 0.5 degrees respectively. Baroid Drilling Fluids Field Representative, James Mabrey, visited the site to evaluate and discuss the mud program. The drilling fluid weight was measured on two separate occasions at 10 lbs. per gallons. Mud viscosity was measured at 83 seconds. After reaching depth of 745 feet bpl, and circulating the drilling fluid until it was free of cuttings, the drill string was tripped up to 373 feet bpl. The well was then shut in for the night.
Saturday 8/21/04	No site activity
Sunday 8/22/04	No site activity
Monday 8/23/04	The contractor tripped the drill string back into the borehole to a depth of 745 feet bpl and encountered no fill in the borehole. After circulating for 30 minutes, the contractor tripped the entire drill string from the borehole. MV Geophysical Surveys arrived onsite and performed geophysical logging. The XY Caliper/Gamma Ray, Dual Induction/SP, and Sonic/VDL logs were conducted. The well was shut in for the night by connecting the drill-through rubber on the wellhead and suspending a capped drill collar in the well.
Tuesday 8/24/04	The contractor rigged up the reaming assembly. The assembly was tripped in the well and the well was shut in for the night.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 8/27/04** **Week # 6**

Date	Description of Activities
Wednesday 08/25/04	The contractor began reaming the pilot hole to a diameter of 25 inches starting at a depth of 42.5 feet. After drilling through the cement, and re-conditioning the mud, the mud weight was measured at 9.1 lbs./gallon and viscosity was measured at 31 seconds using a Marsh funnel. Once circulation was restored, the pilot hole was reamed to a depth of 117.75 feet bpl. The top end of the drill string was capped and the well was shut in for the night.
Thursday 08/26/04	An inclination survey was performed at a depth of 90 feet bpl with a result of 0.25 degrees of inclination from the vertical. The contractor reamed the pilot hole to a depth of 179.45 feet below pad level The contractor excavated a runoff swale to remedy nuisance ponding of rainwater on the site. The well was shut in for the night with the drill string left suspended in the well.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 9/03/04** **Week # 7**

Date	Description of Activities
Friday 8/27/04	The contractor began reaming at a depth of 179.45 feet bpl and advanced the 25-inch borehole to the total depth of 269.85 feet bpl. A single inclination survey was performed at a depth of 180 feet bpl with a result of 0.5 degrees of deviation from the vertical. Drilling fluid weight was measured at 9.5 and 9.2 lbs per gallon. Viscosity was measured using a Marsh funnel at 47 seconds and then at 41 seconds after the addition of a mud thinning agent. The drill string was partially tripped from the borehole and the well was shut in for the weekend.
Saturday 8/28/04	No site activity
Sunday 8/29/04	No site activity
Monday 8/30/04	The contractor reamed the borehole from a depth of 269.85 feet to 364.75 feet bpl using the 25-inch reaming bit assembly. A single inclination survey was performed at a depth of 270 feet bpl with a result of 0.25 degrees of deviation from the vertical. Drilling fluid weight was measured at 9.6 and 9.8 lbs per gallon. Viscosity was measured using a Marsh funnel at 40 and 46 seconds. The drill string was partially tripped from the borehole and the well was shut in for the night.
Tuesday 8/31/04	The contractor reamed the borehole to a diameter of 25 inches from a depth of 364.75 feet bpl to 490.05. A single inclination survey was performed at a depth of 360 feet bpl with a result of 0.5 degrees of deviation from the vertical. Drilling fluid weight was measured at 9.8, 9.5, and 9.7 lbs. per gallon. Viscosity was measured using a Marsh funnel at 94, 46, and 47 seconds. The well was shut in for the night.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 9/03/04** **Week # 7**

Date	Description of Activities
Wednesday 09/01/04	The contractor reamed the borehole to a diameter of 25 inches from a depth of 490.05 feet to 646.35 feet below pad level. Drilling fluid weights ranged from 9.6 to 10 pounds per gallon in four separate measurements. Viscosity measurements ranged from 35 to 50 seconds. Inclination surveys were performed at 450 and 540 feet bpl, with results of 0.5 and 0.6 degrees of deviation from the vertical. The well was shut in for the night.
Thursday 09/02/04	The contractor secured the site for the approaching Hurricane Frances. The contractor tripped the entire drill string from the well and sealed the wellhead with a blind flange. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 9/10/04** **Week # 8**

Date	Description of Activities
Friday 9/03/04	No site activity
Saturday 9/04/04	No site activity
Sunday 9/05/04	No site activity
Monday 9/06/04	No site activity
Tuesday 09/07/04	The contractor raised the derrick on the drill rig and removed the blind flange seal from the wellhead. Early afternoon thundershowers curtailed site activity and the well was shut in for the night.
Wednesday 09/08/04	The contractor removed the 17-inch diameter bit section from the reaming assembly. The 17-inch bit was removed to minimize the depth of penetration below the 25-inch diameter section of the borehole. The contractor tripped the drill string into the borehole and reamed from a depth of 646.35 feet to 705.5 feet below pad level. Drilling fluid weight was measured at 9.6 and 10 pounds per gallon. Viscosity was measured at 45 and 50 seconds. An inclination survey was performed at 630 feet bpl, with a result of 0.5 degrees of deviation from the vertical. The well was shut in for the night.
Thursday 09/09/04	The contractor finished reaming the borehole to a diameter of 25 inches from a depth of 705.5 feet to a total depth of 731.6 feet bpl. The site was secured for the approaching Hurricane Ivan. The contractor tripped the entire drill string from the well and sealed the wellhead with a blind flange. The drill rig mast was lowered and the onsite fuel tank was secured in an elevated position. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 9/17/04** **Week # 9**

Date	Description of Activities
Friday 9/10/04	No site activity
Saturday 9/11/04	No site activity
Sunday 9/12/04	No site activity
Monday 9/13/04	No site activity
Tuesday 09/14/04	No site activity
Wednesday 09/15/04	The contractor raised the derrick on the drill rig and readied the site to resume drilling operations. When the blind flange was removed from the wellhead, the drilling fluid level in the well was measured at 2.35 feet below pad level.
Thursday 09/16/04	The contractor staged thirty-six 20-foot lengths of PVC Certa-Lok casing adjacent to the wellsite. The couplings had previously been attached to the casing joints. A 10-foot length of casing was cut to serve as the bottom joint in the casing string. A cement basket was attached around the base of the bottom joint. The drilling mud in the treatment system tank was conditioned with a thinning agent. The drilling fluid begun to flow from the wellhead. The contractor tripped the drill string and bit assembly to the bottom of the 25-inch borehole after attaching the drill through rubber to seal the wellhead. The drilling fluid was thoroughly circulated and the well was shut in for the night using the drill through rubber assembly as the seal. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 9/24/04** **Week #10**

Date	Description of Activities
Friday 9/17/04	The drill string was tripped from the borehole and geophysical logging was performed by Hausinger and Associates. A 3-arm caliper and log and a gamma log were run. The caliper log showed that a portion of the borehole was under-guage. The contractor then re-reamed the borehole from the bottom of the surface casing to a depth of 350 feet and shut the well in for the night.
Saturday 9/18/04	The contractor reamed the borehole from 350 feet to the bottom of the 25-inch borehole at 731.6 feet bpl. The drilling fluid was circulated and conditioned and the drill string was tripped from the borehole. A 4-arm caliper log was performed by MV Geophysical Surveys and the well was shut in for the night.
Sunday 9/19/04	The contractor installed 730 feet of 17.4-inch OD Certa-Lok casing. A cement basket was installed on the base of the casing. Prior to casing installation, the cement basket was expanded to 25 inches and filled with ¾-inch bentonite pellets. At the completion of casing installation, a steel header was coupled, via a Certa-Lok type spline and groove system, to the top of the PVC casing. A flanged ring plate was fit and welded around the header and then bolted to the flange ring on the surface casing. Two threaded 3-inch annular access ports were installed in the plate. The contractor pumped 100 sacks of neat cement into the annulus through 730 feet of 1 ¼-inch diameter tremie pipe. Cement weights of 13.8, 14.8, 15, and 15.4 lbs. per gallon were measured during this cementing stage. The tremie pipe was tripped up in the annulus above the cement and flushed with fresh water. A 3-inch by 1 ¼-inch well seal was installed in the annular access port to seal and support the tremie pipe. The well was then shut in for the night.
Monday 9/20/04	The contractor tripped in the tremie pipe and tagged the cement top at 635 feet bpl. Cement pumping was delayed due to clogged tremie pipe. After several hours of delay, the contractor re-tagged the cement top at 623 feet bpl. The contractor then pumped the second cement stage. The volume pumped during the second stage was 200 sacks of neat cement. Cement weights of 14.7, 15.2, 15, 15.2, 15.3,

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 9/24/04** **Week #10**

Date	Description of Activities
Monday 9/20/04 (cont.)	and 15.4 lbs. per gallon were measured during this event. The tremie was tripped up in the annulus and flushed. The well was shut in for the night.
Tuesday 09/21/04	A high-resolution temperature log was performed following the second cement stage. The contractor then tripped in the tremie pipe and tagged the top of the second stage cement at 375 feet bpl. The contractor then pumped 200 sacks of neat cement grout into the annulus. Cement weights of 15.3, 15.4, 15.2, 15.2, and 15.3 lbs. per gallon were measured during this event. A temperature log was performed approximately seven hours after pumping the third cement stage.
Wednesday 09/22/04	The contractor tripped in the tremie pipe and tagged the top of the previous cement stage at 219 feet bpl. The contractor pressurized the interior of the PVC casing to 30 psi prior to pumping the fourth cement stage. The contractor pumped 200 sacks of cement with 2.5% (by weight) bentonite. Cement weights of 13.7, 13.8, 14.2, 13.8, 12.6, 11.8, and 11.8 lbs. per gallon were measured during this cement stage. A temperature log of the well was performed approximately 8 hours after pumping the fourth stage.
Thursday 09/23/04	The contractor tagged the top of the previous stage cement at 95.5 feet bpl. The contractor pressurized the PVC casing to 40 psi before pumping the fifth cement stage. The contractor pumped 165 sacks of cement with 1.56% bentonite. Cement weights of 13.3, 12.8, 12.3, and 11.7 lbs. per gallon were measured during this event The contractor pumped until cement returns were observed at the surface. The tremie pipe was tripped from the annulus and the well casing was left sealed under pressure. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/1/04** **Week #11**

Date	Description of Activities
Friday 9/24/04	The contractor lowered the derrick and secured the site in preparation for the approaching Hurricane Jeanne.
Saturday 9/25/04	No site activity
Sunday 9/26/04	No site activity
Monday 9/27/04	No site activity
Tuesday 09/28/04	The contractor delivered 40 joints of 2-inch work pipe and two inflatable packers. The packers were prepared for connection to the 2-inch pipe. The contractor cut the top from the steel well casing header and observed that the casing fluid level was 1.3 feet above pad level. The casing was temporarily re-sealed and the well was shut in for the night.
Wednesday 09/29/04	The contractor delivered three finished wellhead assemblies. The drilling fluid disposal subcontractor removed 2 tanker loads (9300 gallons) from the jobsite. The contractor tripped in 23 lengths of drill pipe totaling 713 feet and installed 315 feet of 1-inch PVC airline inside the drill string for drilling fluid removal. The contractor decided on a new plan and tripped the drill sting and airline from the well. The well was shut in for the night.
Thursday 09/30/04	The contractor installed 2-inch tremie pipe to 712 ft bpl and proceeded to flush water down the tremie to displace the drilling fluid. After flushing was completed, the header on the casing was sealed and pressure began to rise in the casing. Casing pressure reached a maximum of 10 psi. The contractor mixed and pumped sodium chloride solution down the 2-inch pipe. After 4900 lbs of salt had been mixed and pumped, there was no pressure at the surface. After the 2-inch pipe had been tripped from the well, 500 lbs of salt was introduced at the top of casing. The well was shut in for the night.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/8/04** **Week #12**

Date	Description of Activities
Friday 10/01/04	The contractor cut the header from the wellhead and installed an inflatable packer to a depth of 718 feet bpl. The contractor sealed the wellhead and inflated the packer using nitrogen gas. After filling the casing with water, the contractor pressured the casing by injecting water at the surface. Several pinhole leaks in the wellhead were detected and were sealed. The contractor did not achieve an effective seal at the wellhead or at the packer and the casing did not hold the applied pressure of 130 psi. The well was shut in for the weekend.
Saturday 10/02/04	No site activity
Sunday 10/03/04	No site activity
Monday 10/04/04	No site activity
Tuesday 10/05/04	The contractor was able to seal the casing by inflating the packer to 500 psi and welding pinhole leaks at the wellhead. A one-hour pressure test of the casing was conducted with an initial pressure of 131 psi and a final pressure of 130 psi. The pressure inside the casing was recorded at 5-minute intervals and the official record was signed and witnessed by WRS and Southern Well Services. The volume of water released from the casing at the end of the test was 7.1 gallons. The well was shut in for the night.
Wednesday 10/06/04	The contractor made measurements of discharge piping at monitor wells and unloaded a pump. No work was performed on the well.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/8/04** **Week #12**

Date	Description of Activities
Thursday 10/07/04	The contractor tripped the packer from the well. The contractor removed the well header and installed a blind flange. The well was shut in for the night. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/14/04** **Week #13**

Date	Description of Activities
Friday 10/08/04	The contractor removed the blind flange from the wellhead. The well had been killed with salt on Thursday and the water level in the well was still below the top of the casing. A 15-inch bit assembly, three drill collars, and two lengths of drill pipe were tripped in the well. The drill through rubber assembly was installed and the well was shut in for the weekend.
Saturday 10/09/04	No site activity
Sunday 10/10/04	No site activity
Monday 10/11/04	The contractor ran a 10-inch PVC discharge pipeline from the ASR 5 wellhead for connection to the Henderson Creek discharge line at monitor well SZ-2. A valve on the ASR 5 wellhead was opened and showed that the well remained suppressed. The well was shut in for the night.
Tuesday 10/12/04	The contractor continued to assemble the 10-inch discharge line. The drill string was tripped and the bottom of the well was tagged at 730 feet bpl. The drill string was then pulled up and capped so that the top of the last collar was at the top of the derrick. The well was shut in for the night.
Wednesday 10/13/04	No site activity.
Thursday 10/14/04	Consolidated Power Services delivered a 12-inch butterfly valve for the ASR-5 wellhead. Southern Sanitation hauled approximately 15,000 gallons of drilling fluid from the site for disposal. The contractor continued working on the 10-inch line from the well for discharge to the existing 8-inch discharge line to Henderson Creek.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/14/04** **Week #13**

Date	Description of Activities
Thursday 10/14/04 (cont.)	The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/22/04** **Week #14**

Date	Description of Activities
Friday 10/15/04	The contractor isolated the ASR-5 discharge line to Henderson Creek from the existing wellfield discharge piping. The piping was isolated with blind flanges to prevent back-flow to the wells. The contractor pumped water from Marco Lakes through the discharge line at a rate of approximately 250 gpm to Henderson Creek to test the system. Flow through the line was confirmed by visual inspection at the weir on US 41. Approximately 6000 gallons of drilling fluid was hauled from the site for disposal. The contractor applied water pressure to the wellhead up to 40 psi to test the integrity of the drill through rubber system and observed no fluid leakage at the wellhead. The well remained suppressed with a salt plug and was left shut in for the weekend.
Saturday 10/16/04	No site activity
Sunday 10/17/04	No site activity
Monday 10/18/04	The contractor mounted a manifold on the solids separation unit. The reverse air discharge from the drill rig was then connected to this manifold. The contractor installed 315 feet of 1-inch PVC airline inside the drill string and then airlifted the well for approximately five minutes to test the manifold system. The well was shut in for the night.
Tuesday 10/19/04	The contractor drilled the 15-inch diameter open hole by the reverse-air method. The borehole was drilled from the base of the casing at 730 feet bpl to the total depth of the well at 780 feet bpl. All cuttings and fluid that returned through the drill stem were routed through the solids separation unit and into a 6000-gallon storage tank. The fluid was then pumped to a 21,000 gallon holding tank for further settling. The well was allowed to flow to Henderson Creek during drill pipe connection and during development. The specific conductance and general appearance of the discharged water was periodically

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/22/04** **Week #14**

Date	Description of Activities
Tuesday 10/19/04 (Cont.)	monitored at the Henderson Creek weir. Approximately 7,000 gallons of water from the settling tank was blended with the artesian flow from the well and discharged through the pipeline. The remaining fluid was left in the tank for further settling. The drill stem was capped and raised into the derrick and the well was shut in until next week. After the well was shut in, the formation pressure at the wellhead was 20 psi.
Wednesday 10/20/04	No site activity. The well remained sealed.
Thursday 10/21/04	The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration. The well remained sealed.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/28/04** **Week #15**

Date	Description of Activities
Friday 10/22/04	No site activity
Saturday 10/23/04	No site activity
Sunday 10/24/04	No site activity
Monday 10/25/04	The contractor injected approximately 2000 gallons of water containing 5430 lbs. of salt to kill the well. The initial pressure of 20 psi at the wellhead dropped to zero after the injection of the kill fluid. Tranducers were installed; one each above the pad levels at DZ-2 and ASR-2 for the pump test. ASR-5 was shut in for the night.
Tuesday 10/26/04	The contractor tripped the drill string from the well and installed a Goulds Model 9RCLC single-stage submersible pump at a depth of 140 feet bpl. A pressure transducer was installed to a depth of 78 feet bpl in ASR-5. Data collection was initiated at one-minute intervals The well was shut in for the night.
Wednesday 10/27/04	The contractor pumped approximately 4500 gallons of salt solution from the well an onsite storage tank. The well was then allowed to flow through the pump under artesian pressure. A calibration was performed on the contractor's water meter by Richard Prince of the Avanti Co.. A low and a high flow rate were measured with the contractor's 8-inch Hersey meter and compared with simultaneous measurements using Avanti's ultrasonic flowmeter. Artesian flow of approximately 300 gpm was used for the low calibration point. Next, a pumping rate of 1042 was measured for the high point. The comparison showed that the contractor's meter registered flow 8.9% higher than actual at both the low and high rates. The well was further flushed by artesian flow while conductivity was monitored at the wellsite and at the Henderson Creek discharge. The well was shut in for the night.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 10/28/04** **Week #15**

Date	Description of Activities
Thursday 10/28/04	A four-stage step drawdown test was conducted at hour-long intervals using rates of 162, 297, 573, and 784 gallons per minute. Specific capacities were calculated using the average flow during each step versus drawdown from static at the end of each interval. From low to high flow rates the specific capacities were as follows; 101, 48, 44, and 32 gpm/foot. Water samples were collected for primary and secondary drinking water standards. The well was shut in for a period of two hours for collection of recovery data. An attempt was made to also perform a mini-APT test. However, the pump shorted out and pumping operations were discontinued. The well was shut in for the weekend. The static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 11/05/04** **Week #16**

Date	Description of Activities
Friday 10/29/04	No site activity
Saturday 10/30/04	No site activity
Sunday 10/31/04	No site activity
Monday 11/01/04	Water samples from the well discharge were collected. The samples were collected from the artesian flow and were sent for NPDES permit compliance analyses. The contractor injected a solution of previously recovered saline fluid mixed with an additional 6820 lbs of salt to kill the well. The submersible pump was removed from the well. Pressure transducers were removed from the ASR-5, and DZ-2; the transducer at ASR-2 had previously been removed. The contractor installed a 6-inch gate valve and a 25-foot by 6-inch PVC riser pipe on the wellhead in preparation for geophysical logging. The well was shut in for the night.
Tuesday 11/02/04	The contractor recovered approximately 1000 gallons of kill fluid before artesian flow was restored and the well was allowed to flow to discharge. MV Geophysical Surveys, Inc. performed a video survey and caliper/gamma log of the entire well and also the following open hole logs; flowmeter, fluid resistivity/temperature, dual induction, borehole compensated sonic/variable density log. The well was flowing throughout the geophysical logging and video surveys. Flow rate was estimated at between 367 and 385 gpm using the flowmeter log. The contractor began site clearing and grading in preparation for construction of ASR-8. ASR-5 was shut in for the night.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 11/05/04** **Week #16**

Date	Description of Activities
Wednesday 11/03/04	The contractor injected a solution of previously recovered saline fluid mixed with an additional 8900 lbs of salt to kill the well. The contractor continued site preparation for ASR-8. The contractor lowered the derrick on the drill rig and moved the rig away from ASR-5. The well pad berm was partially removed to allow the rig to leave the site. The mud separation trailer was also moved from the site of ASR-5. The well was shut in for the night.
Thursday 11/04/04	The contractor cut the 26-inch surface casing off at ground level. The well remained suppressed. Static water levels were measured in pad monitor wells MW-1 and MW-2 and the wells were purged and sampled. Approximately 2000 gallons of water was pumped at a rate of 10 gpm from pad well MW-2 in order to lower chloride levels from 264 mg/l. Salt solution mixing operations had been conducted adjacent to MW-2. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration. The contractor continued to move equipment and perform site preparation for ASR-8. ASR-5 was shut in for the night using a steel Certa-Lok style well header. The temporary discharge line from ASR-5 was disconnected from the existing 8-inch piping to Henderson Creek and a blind flange was installed on the existing piping.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 11/12/04** **Week #17**

Date	Description of Activities
Friday 11/05/04	The contractor constructed a 60 foot long by 20 foot wide by 2 foot high earthen berm around the drill pad site at ASR-8. The contractor lined the pad with 10 millimeter polyethylene sheeting and extended the liner outside the berm. The contractor spread a layer of sand and gravel over the liner inside the berm. ASR-5 was left shut in and remained suppressed.
Saturday 11/06/04	No site activity
Sunday 11/07/04	No site activity
Monday 11/08/04	The contractor continued to prepare the site at ASR-8 for drilling. The contractor cleared a road from ASR-5 to the future site of ASR-6. The contractor graded around ASR-5. ASR-5 remained shut in and suppressed.
Tuesday 11/09/04	The contractor cleared an area approximately 200 feet by 300 feet around the future site of ASR-6. ASR 5 was left shut in.
Wednesday 11/10/04	The contractor purged approximately 4000 gallons of water from pad well MW-2. A chloride level of 210 mg/l was measured after approximately 3000 gallons of water had been pumped. The contractor installed a new coupling at the top of the casing on ASR-5. The fluid level in the ASR-5 was approximately 20 feet below ground. The well remained suppressed and was shut in for the night.
Thursday 11/11/04	Metron, Inc. of Ft. Myers surveyed the site. Pad monitor well top-of-casing elevations of 6.17 and 6.37 feet NGVD were measured at MW-1 and MW-2 respectively. The contractor installed the permanent wellhead on ASR-5 with the bottom of the lower flange set at 8 feet NGVD. The contractor installed a 12-inch butterfly valve on the wellhead. ASR-5 remained suppressed and was shut in for the night. MW-1 was sampled after having been purged of approximately 4000 gallons of water. MW-2 was sampled after having been purged of approximately 100 gallons of water. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration. Static water levels were measured ½ hour after all purging had ceased.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5 AND 8

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit No. 141218-004 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 11/18/04** **Week #18**

Date	Description of Activities
Friday 11/12/04	The contractor spotted the rig on the site of ASR-8. ASR-5 remained shut in and suppressed.
Saturday 11/13/04	No site activity
Sunday 11/14/04	No site activity
Monday 11/15/04	The contractor ran a water line and finished rigging up in preparation for drilling ASR-8. ASR-5 remained shut in and suppressed.
Tuesday 11/16/04	The contractor raised the 35-inch bit above the well spot and prepared the 26-inch surface casing for installation. The contractor replaced the packing in the pumps on the mud system and on the drill rig. ASR 5 was left shut in.
Wednesday 11/17/04	The contractor drilled a 36-inch borehole at ASR-8 from the surface to 5 feet bpl but stopped due to a mud leak at the top of the kelly. ASR 5 was left shut in. The static water levels were measured in ASR-5 pad monitor wells MW-1 and MW-2. The wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.
Thursday 11/18/04	The contractor lowered the derrick on the drilling rig to work on the leaking mud line. The fluid level in ASR-5 was measured at approximately 10 feet bpl. The contractor removed the wellhead at ASR-5 and made adjustments. ASR-5 remained suppressed throughout these operations and was shut in for the night.

WATER RESOURCE SOLUTIONS, INC.

WEEKLY REPORT
MARCO LAKES ASR
EXPANSION PROJECT
ASR WELL 5 AND ASR WELL 8

Marco Island Utilities
Marco Lakes ASR Expansion **Project No. 01-04773.HO**

FDEP Permit Nos. 141218-004 and -007 UC **Contractor: Southern Well Services**

Prepared by: Andy McThenia **Date: 11/29/04** **Week #19**

Date	Description of Activities
Friday 11/19/04	No site activity
Saturday 11/20/04	The contractor made final adjustments to the wellhead at ASR-5. ASR-5 remained suppressed and was shut in.
Sunday 11/21/04	No site activity
Monday 11/22/04	The fluid level in ASR-5 was measured at 1.14 feet NGVD. The PVC blind flange on the wellhead was removed and a 4-foot level was used to confirm that the wellhead was level. The well remained suppressed and was shut in. The contractor replaced a gooseneck fitting at the top of the kelly that had previously been removed to fix a leak.
Tuesday 11/23/04	The contractor advanced the 35-inch borehole from 5 to 50 feet bpl and set a single 49.2 foot length of 26-inch, spiral welded, pit casing to 49 feet bpl. A cementing header had previously been welded to the end of the casing to facilitate grouting and sealing. The casing was pressure grouted using 7 yards of neat cement.
Wednesday 11/24/04	There was no site activity by the drilling contractor. The fluid level in ASR-5 was measured at 1.83 feet NGVD. ASR-5 remained suppressed and was shut in. The static water levels were measured in pad monitor wells MW-1 and MW-2 at ASR-5. The wells were then purged and sampled. Field water quality analyses were performed for the following parameters: pH, temperature, conductivity, and chloride concentration.
Thursday 11/25/04	No site activity.

APPENDIX 3.2

NPDES PERMIT

Department of Environmental Protection

Jeb Bush
Governor

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

Colleen M. Castille
Secretary

September 16, 2004

CERTIFIED MAIL NO.: 7004 0750 0003 9120 7005
RETURN RECEIPT REQUESTED

Mr. Bruce Weinstein,
Marco Island Utilities
City of Marco Island
960 North Collier Blvd.
Marco Island, Florida, 34145

Re: Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site
Marco Island Utilities, Marco Lakes ASR Well Field Expansion

Facility ID: FLG070154-001-IWF
FLG070154-002-IWF
FLG070154-003-IWF

Marco Island Utilities
Intersection of U.S. 41 and S.R. 951
Collier County
Permit Expiration: September 15, 2009

Dear Mr. Weinstein:

In response to your request for coverage under the Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity, dated August 27, 2004, the Department of Environmental Protection hereby grants your request effective on the date of this letter. Please note that this permit is for a temporary discharge only.

Enclosed is a copy of the final permit and a copy of 62-621, Florida Administrative Code (F.A.C.). You should become familiar with the permit and any reporting requirements for which you may be responsible.

Please see "Attachment A" regarding procedures for reporting unauthorized discharges under rules 62-620.610(20) and 62-621.250(14), F.A.C.

If you have any questions or comments, please contact Elvis Pemberton at 239-332-6975 ext. 125.

Sincerely,

Abdul B. Ahmadi, Ph.D., P.E.
Water Facilities Administrator

CERTIFICATE OF SERVICE

The undersigned hereby certifies that this NOTICE OF PERMIT and all copies were mailed before the close of business on September 16, 2004 to the listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, under section 120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Janice L. Dyer 9-16-04

Clerk Date

Enclosures: Rule 62-621, F.A.C.
Generic Permit for The Discharge of Produced Ground from Any Non-Contaminated Sites Activity
Attachment A

cc: Mark S. Pearce, Ph.D. Senior Scientist, Water Resource Solutions.

ABA/EJP/dmm

ATTACHMENT A

The permittee shall report to the Department any noncompliance, which may endanger health or the environment. 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 five 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 time, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

a. The following shall be included as information which must be reported within 24 hours under this condition:
    1. Any unanticipated bypass which causes any reclaimed water or effluent to exceed any permit limitation or results in an unpermitted discharge,
    2. Any upset which causes any reclaimed water or the effluent to exceed any limitation in the permit,
    3. Violation of a maximum daily discharge limitation for any of the pollutants specifically listed in the permit for such notice, and
    4. Any unauthorized discharge to surface or ground waters.

b. Oral reports as required by this subsection shall be provided as follows:

1. For unauthorized releases or spills of untreated or treated wastewater reported pursuant to subparagraph a.4 that are in excess of 1,000 gallons per incident, or where information indicates that public health or the environment will be endangered, oral reports shall be provided to the Department by calling the STATE WARNING POINT TOLL FREE NUMBER (800) 320-0519, as soon as practical, but no later than 24 hours from the time the permittee becomes aware of the discharge. The permittee, to the extent known, shall provide the following information to the State Warning Point:
    (a) Name, address, and telephone number of person reporting;
    (b) Name, address, and telephone number of permittee or responsible person for the discharge;
    (c) Date and time of the discharge and status of discharge (ongoing or ceased);
    (d) Characteristics of the wastewater spilled or released (untreated or treated, industrial or domestic wastewater);
    (e) Estimated amount of the discharge;
    (f) Location or address of the discharge;
    (g) Source and cause of the discharge;
    (h) Whether the discharge was contained on-site, and cleanup actions taken to date;
    (i) Description of area affected by the discharge, including name of water body affected, if any; and
    (j) Other persons or agencies contacted.
2. Oral reports, not otherwise required to be provided pursuant to subparagraph b.1 above, shall be provided to the Department's South District Office within 24 hours from the time the permittee becomes aware of the circumstances.

c. If the oral report has been received within 24 hours, the noncompliance has been corrected, and the noncompliance did not endanger health or the environment, the Department's South District Office shall waive the written report.

CHAPTER 62-621
GENERIC PERMITS

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62-621.100 Scope/Applicability.

This Chapter sets forth the procedures to obtain generic permits authorized under Section 403.0885, Florida Statutes, and Chapter 62-620, Florida Administrative Code (F.A.C.). For the purpose of this Chapter "Generic Permit" means a general permit issued under the authority of Section 403.0885, F.S. As an alternative to individual permits, the Department may promulgate by rule a generic permit to regulate a category of wastewater facilities or activities. The Department shall issue a generic permit to regulate such a category of wastewater facilities or activities only if they all: involve the same or substantially similar types of operations; discharge the same types of wastes or engage in the same types of residuals or industrial sludge use or disposal practices; require the same effluent limitations, operating conditions, or standards for residuals or industrial sludge use or disposal; require the same or similar monitoring; and the permit is approved by the EPA pursuant to Rule 62-620.710(3), F.A.C.

(1) The generic permits issued under this Chapter are subject to the procedural requirements of Chapter 62-620, F.A.C., unless otherwise specified.

(2) For wastewater facilities covered under the Federal NPDES "General Permit for Dewatering and Petroleum Fuel Contaminated Ground/Storm Waters in the State of Florida", the Department shall, after receiving authorization to administer the NPDES program, notify users that their coverage has been transferred to the State permit by issuing a letter to the permittee.

(3) For activities covered under the existing Federal NPDES "General Permit for Storm Water Discharges from Construction Activities," the Department shall, after receiving authorization to administer this component of the NPDES program, notify users that they must apply for coverage under the State Generic Permit for Stormwater Discharge from Construction Activities that Disturb Five or More Acres of Land in accordance with Rule 62-621.300(4), F.A.C. Application for coverage under the State generic permit shall be made within 30 days of the permittee's receipt of notification.

(4) For facilities or activities covered under the existing Federal NPDES "Storm Water Multi-Sector General Permit for Industrial Activities," the Department shall, after receiving authorization to administer this component of the NPDES program, notify users that they must apply for coverage under the State Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity in accordance with Rule 62-621.300(5), F.A.C. Application for coverage under the State generic permit shall be made within 30 days of the permittee's receipt of notification.

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
History -- New 8-22-95, Amended 12-24-96, 5-1-97, 10-22-00.

62-621.105 Applicability. (Repealed)

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.

History -- New 8-22-95, Repealed 12-24-96.

62-621.200 Definitions. (Repealed)
Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
Law Implemented: 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
History -- New 8-2-95, Repealed 12-24-96.

62-621.250 General Conditions.

Notwithstanding Rule 62-620.610, F.A.C., and unless stated otherwise in this Chapter, the following conditions apply to all permits listed in this Chapter:

(1) The terms, conditions, requirements, limitations and restrictions set forth in this permit are binding and enforceable pursuant to Chapter 403, Florida Statutes. Any permit noncompliance constitutes a violation of Chapter 403, Florida Statutes, and is grounds for enforcement action, permit termination, or permit revocation and reissuance, or a combination of the three.

(2) As provided in subsection 403.087(6), F.S., the issuance of coverage under this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor authorize any infringement of federal, state, or local laws or regulations. Coverage under this permit is not a waiver or approval of any other Department permit or authorization that may be required for other aspects of the total project which are not addressed in this permit.

(3) Coverage issued under this permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Board of Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

(4) Coverage under this permit does not relieve the permittee from liability and penalties for harm or injury to human health or welfare, animal or plant life, or property caused by the construction or operation of this permitted source; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. The permittee shall take all reasonable steps to minimize or prevent any discharge, reuse of reclaimed water, or residuals use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. 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.

(5) The permittee shall at all times properly operate and maintain the facility and systems of treatment and control, and related appurtenances, that are installed and used by the permittee to achieve compliance with the conditions of this permit. This

provision includes the operation of backup or auxiliary facilities or similar systems when necessary to maintain or achieve compliance with the conditions of the permit.

(6) This permit may be modified, revoked and reissued, or terminated for cause as defined in Rules 62-620.325(2) and 62-620.345(1), F.A.C. The filing of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

(7) The permittee, by accepting coverage under this permit, specifically agrees to allow authorized Department personnel, including an authorized representative of the Department and authorized EPA personnel, when applicable, upon presentation of credentials or other documents as may be required by law, and at reasonable times, depending upon the nature of the concern being investigated, to:

(a) Enter upon the permittee's premises where a regulated facility, system, or activity is located or conducted, or where records shall be kept under the conditions of this permit;

(b) Have access to and copy any records that shall be kept under the conditions of this permit;

(c) Inspect the facilities, equipment, practices, or operations regulated or required under this permit; and

(d) Sample or monitor any substances or parameters at any location necessary to assure compliance with this permit or Department rules.

(8) In accepting coverage under this permit, the permittee understands and agrees that all records, notes, monitoring data, and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except as such use is proscribed by section 403.111, Florida Statutes, or Rule 62-620.302, Florida Administrative Code. Such evidence shall only be used to the extent that it is consistent with the Florida Rules of Civil Procedure and applicable evidentiary rules.

(9) When requested by the Department, the permittee shall provide any information required by law which is needed to determine whether there is cause for revising, revoking and reissuing, or terminating coverage under this permit, or to determine compliance with the permit. The permittee shall also provide to the Department upon request copies of records required by this permit to be kept. If the permittee becomes aware of relevant facts that were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrections reported to the Department within 10 days of discovery.

(10) The permittee, in accepting coverage under this permit, agrees to pay the applicable regulatory program and surveillance fee in accordance with Rule 62-4.052, F.A.C.

(11) Coverage under this permit is transferable only in accordance with Rule 62-620.340, F.A.C. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

(12) The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. The permittee shall be responsible for any and all damages which may result from the changes and may be subject to enforcement action by the Department for penalties or revocation of this permit. The notice shall include the following information:

(a) A description of the anticipated noncompliance;

(b) The period of the anticipated noncompliance, including dates and times; and,

(c) Steps being taken to prevent future occurrence of the noncompliance.

(13) Sampling and monitoring data shall be collected and analyzed in accordance with Rule 62-4.246, F.A.C., Chapter 62-160, F.A.C., and 40 CFR 136, which is hereby incorporated by reference, as appropriate.

(a) Monitoring results shall be reported at the intervals specified elsewhere in this permit and shall be reported on a Discharge Monitoring Report (DMR), DEP Form 62-620.910(10).

(b) If the permittee monitors any contaminant more frequently than required by the permit, using Department-approved test procedures, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(c) Calculations for all limitations which require averaging of measurements shall use an arithmetic mean unless otherwise specified in this permit.

(d) Under Chapter 62-160, F.A.C., sample collection shall be performed by following the protocols outlined in "DER Standard Operating Procedures for Laboratory Operations and Sample Collection Activities" (DER-QA-001/92). Alternatively, sample collection may be performed by an organization which has an approved Comprehensive Quality Assurance Plan (CompQAP) approved pursuant to Chapter 62-160, F.A.C., on file with the Department. This CompQAP shall be approved for collection of samples from the required matrices and for the required tests.

(14) The permittee shall report to the Department any noncompliance which may endanger health or the environment. 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 five 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 time, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(a) The following shall be included as information which must be reported within 24 hours under this condition:

1. Any unanticipated bypass which causes any reclaimed water or the effluent to exceed any permit limitation or results in an unpermitted discharge,

2. Any upset which causes any reclaimed water or the effluent to exceed any limitation in the permit,

3. Violation of a maximum daily discharge limitation for any of the pollutants specifically listed in the permit for such notice, and

4. Any unauthorized discharge to surface or ground waters.

(b) If the oral report has been received within 24 hours, the noncompliance has been corrected, and the noncompliance did not endanger health or the environment, the Department shall waive the written report.

(15) The permittee shall report all instances of noncompliance not reported under condition (12) of this permit at the time monitoring reports are submitted. This report shall contain the same information required by condition (14) of this permit.

(16) Bypass Provisions.

(a) Bypass is prohibited, and the permittee is subject to enforcement action for bypass, unless the permittee affirmatively demonstrates that:

1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if back-up equipment should have been installed in accordance with generally accepted engineering principles to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

3. The permittee submitted notices as required under condition (16)(b) of this permit.

(b) If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least 10 days before the date of the bypass. The permittee shall submit notice of an unanticipated bypass within 24 hours of learning about the bypass as required in condition (14) of this permit. A notice shall include a description of the bypass and its cause; the period of the bypass, including exact dates and times; if the bypass has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.

(c) The Department shall approve an anticipated bypass, after considering its adverse effect, if the permittee demonstrates that it will meet the conditions listed in condition (16)(a)1. through 3. of this permit.

(d) A permittee may allow any bypass to occur which does not cause reclaimed water or effluent limitations to be exceeded if it is for essential maintenance

to assure efficient operation. These bypasses are not subject to the provision of conditions (16)(a) through (c) of this permit.

(17) Upset Provisions.

(a) A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and the permittee can identify the cause(s) of the upset;

2. The permitted facility was at the time being properly operated;

3. The permittee submitted notice of the upset as required in condition (14) of this permit; and

4. The permittee complied with any remedial measures required under condition (4) of this permit.

(b) In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

(c) Before an enforcement proceeding is instituted, no representation made during the Department review of a claim that noncompliance was caused by an upset is final agency action subject to judicial review.

(18) Generic permits are valid only for the specific activities indicated. Any deviation from the specified activities and the conditions for undertaking those activities shall constitute a violation of the permit.

(19) The use of generic permits issued under this Chapter is limited to a term not to exceed five years. Terms and conditions of the permit are automatically continued in accordance with 40 CFR 122.6, which is hereby incorporated by reference, only where the permittee has submitted a timely and complete Notice of Intent 180 days prior to expiration of permit coverage or as otherwise specified in the generic permit. The requirements for submittal of Notice of Intent are located in each specific generic permit.

(20) Coverage under this generic permit may be modified in accordance with Chapter 120, F.S., or suspended or revoked in accordance with Rule 62-620.710(4), F.A.C., if the Secretary determines that there has been a violation of any of the terms or conditions of the permit, there has been a violation of state water quality standards or the permittee has submitted false, incomplete or inaccurate data or information.

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
History -- New 8-22-95, Amended 5-1-97, 2-14-00, 10-22-00.

62-621.300 Permits.

(1) Generic Permit for Discharges From Petroleum Contaminated Sites.

(a) The document "Generic Permit for Discharges From Petroleum Contaminated Sites," document number 62-621.300(1), issued by the Department and effective February 14, 2000, is hereby incorporated by reference and made part of this

Chapter. This document may be obtained by contacting either the local Department District Office or by writing the Department of Environmental Protection, Industrial Wastewater Section, Mail Station #3545, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(b) The document referenced in rule 62-621.300(1)(a) contains the specific discharge limits, operating requirements, and application requirements for discharges from petroleum contaminated sites.

(2) Generic Permit for Discharge of Produced Ground Water From any Non-contaminated Site Activity.

(a) The document "Generic Permit for the Discharge of Produced Ground Water From Any Non-Contaminated Site Activity," document number 62-621.300(2), issued by the Department and effective February 14, 2000, is hereby incorporated by reference and made part of this Chapter. This document may be obtained by contacting either the local Department District Office or by writing the Department of Environmental Protection, Industrial Wastewater Section, Mail Station #3545, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(b) The document referenced in rule 62-621.300(2)(a) contains the specific discharge limits and operating requirements for discharges of produced ground water from any site activity.

(3) Generic Permit for Discharges from Concrete Batch Plants

(a) The document "Generic Permit for Discharges from Concrete Batch Plants," document number 62-621.300(3)(a), issued by the Department and dated March 10, 1997, is hereby incorporated by reference and made part of this Chapter. This document may be obtained by contacting either the local Department District Office or by writing the Department of Environmental Protection, Industrial Wastewater Section, Mail Station #3545, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(b) Form number 62-621.300(3)(b), Notice of Intent to Use Generic Permit for Discharges from Concrete Batch Plants, effective May 1, 1997, is hereby incorporated by reference and made part of this Chapter. This form may be obtained by contacting either the local Department District Office or by writing the Department of Environmental Protection, Industrial Wastewater Section, Mail Station #3545, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(c) Document number 62-621.300(3)(a) referenced in item (a) of this section contains specific design and operating requirements for discharges from wastewater and stormwater management systems at concrete batch plants.

(4) Generic Permit for Stormwater Discharge from Construction Activities that Disturb Five or More Acres of Land.

(a) The document "Generic Permit for Stormwater Discharge from Construction Activities that Disturb Five or More Acres of Land," document number 62-621.300(4)(a), issued by the Department and effective October 22, 2000 is hereby incorporated by reference and made a part of this Chapter.

(b) Form number 62-621.300(4)(b), Notice of Intent to Use Generic Permit for Stormwater Discharge from Construction Activities that Disturb Five or More Acres of Land, effective October 22, 2000, is hereby incorporated by reference and made part of this Chapter. This form may be obtained by writing the Department of Environmental Protection, NPDES Stormwater Notices Center, Mail Station #2510, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(c) The document referenced in Rule 62-621.300(4)(a), F.A.C., contains specific requirements for stormwater discharges from construction activities that disturb five or more acres of land.

(5) Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity.

(a) The Department hereby adopts and incorporates by reference Federal Register, Volume 60, Number 189, pages 50804-51319, published on September 29, 1995; Federal Register, Volume 61, Number 28, pages 5248-5254, published on February 9, 1996; Federal Register, Volume 61, Number 34, page 6412, published on February 20, 1996; Federal Register, Volume 63, Number 152, pages 42534-42548, published on August 7, 1998; Federal Register, Volume 63, Number 189, pages 52430-52577, published on September 30, 1998; and, Federal Register, Volume 64, Number 11, pages 2898-2900, published on January 19, 1999, which shall hereinafter be referred to as the "Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity." When used in the Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity, the following shall mean:

1. EPA shall mean the Department of Environmental Protection.

2. Regional Administrator, Director, or State Director, shall mean the Secretary of the Department of Environmental Protection or the Secretary's designee where appropriate.

(b) Form number 62-621.300(5)(b), Notice of Intent to Use Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity, effective October 22, 2000, is hereby incorporated by reference and made part of this Chapter. This form may be obtained by writing the Department of Environmental Protection, NPDES Stormwater Notices Center, Mail Station #2510, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(c) Facilities or activities seeking coverage under this generic permit shall apply to the Department on the form referenced in Rule 62-621.300(5)(b), F.A.C., and in accordance with the Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity, and shall include the appropriate processing fee as required by Rule 62-4.050, F.A.C.

(d) All notices, certifications, reports, or any other information required to be submitted under the Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity, excluding discharge monitoring reports, shall be submitted to Department of Environmental Protection, NPDES Stormwater Notices Center, Mail Station #2510, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(e) Discharge monitoring reports (DMRs) required to be submitted under the Multi-Sector Generic Permit for Stormwater Discharge Associated with Industrial Activity shall be sent to Department of Environmental Protection, NPDES Stormwater MSGP DMR, Mail Station #2511, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(f) The effective date of coverage under this generic permit shall be two (2) days after the Notice of Intent submitted in accordance with Rule 62-621.300(5)(c), F.A.C., is postmarked, unless notified to the contrary by the Department.

(g) Coverage under this generic permit is limited to a term not to exceed five years from the effective date of coverage. Permittees may request continued coverage under this generic permit in accordance with the requirements of Rule 62-621.300(5)(c), F.A.C. Request for continued coverage shall be made at least two (2) days before expiration of the current coverage.

(6) Form number 62-621.300(6), Notice of Termination of Generic Permit Coverage, October 22, 2000, is hereby incorporated by reference and made a part of this Chapter. Facilities or activities seeking to terminate coverage under the generic permits in Rules 62-621.300(4) and (5), F.A.C., shall file a Notice of Termination of Generic Permit Coverage with the Department in accordance with the provisions of the applicable generic permit. This form may be obtained by writing the Department of Environmental Protection, NPDES Stormwater Notices Center, Mail Station #2510, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Specific Authority 373.043, 373.1131, 373.413, 373.414, 373.416, 403.061, 403.087, 403.0877, FS.

Law Implemented 373.043, 373.1131, 373.413, 373.414, 373.416, 403.061, 403.087, 403.0877, 403.088, 403.0885, 403.08851 FS.

History-New - 12-24-96, Amended 5-1-97, 2-14-00, 10-22-00.

62-621.301 Generic Permit for Discharges From Petroleum Contaminated Sites. (Repealed)

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.

Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.

History -- New 8-22-95, Repealed 12-24-96.

62-621.302 Generic Permit for Discharge of Produced Ground Water From any Non-Contaminated Site Activity.

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.

Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.

History -- New 8-22-95, Repealed 12-24-96.

62.621.700 Best Management Practices (BMP) Plan.

When a BMP plan is required by a generic permit listed in this Chapter, the permittee shall prepare the plan in accordance with the following procedures:

(1) The permittee shall maintain the BMP plan at the facility and shall make the plan available to the Department upon request.

(2) The permittee shall develop and implement a BMP plan which prevents, or minimizes the potential for, the release of pollutants from ancillary activities, including:

a. material storage areas;
b. plant site runoff;
c. in-plant transfer, process and material handling areas;
d. loading and unloading operations; and
e. sludge and waste disposal areas,

to the waters of the United States through plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. The term "pollutants" refers to any substance listed as toxic under Section 307(a)(1) of the Clean Water Act (Act); oil, as defined in Section 311(a)(1) of the Act; and substances listed as hazardous under Section 311 of the Act.

(3) The publication "Guidance Manual for Developing Best Management Practices (BMP)," document number EPA 833-B-93-004, can be used as a reference which contains technical information on BMPs and the elements of the BMP program. Copies of this publication can be obtained by submitting written requests to: Department of Environmental Protection, Bureau of Water Facilities Regulation, Industrial Wastewater Section, Mail Station #3545, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400 or Director, Water Management Division, U.S. EPA Region IV, 61 Forsyth Street, Atlanta, Georgia 30303.

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
History -- New 8-22-95, Amended 5-1-97, 2-14-00.

62-621.800 Toxicity Testing Requirements.

When specifically required by the generic permit, the toxicity standards and procedures set forth in rules 62-4.244(3), 62-4.246, 62-301.200, 62-302.200 and 62-302.500(1)(d), F.A.C., shall apply.

Specific Authority 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
Law Implemented 403.061, 403.087, 403.088, 403.0885, 403.08851 FS.
History -- New 8-22-95.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERIC PERMIT

FOR THE

DISCHARGE OF PRODUCED GROUND WATER

FROM ANY NON-CONTAMINATED SITE ACTIVITY

Document number 62-621.300(2)
Effective Date: February 14, 2000

Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity

(1) The facility is authorized to discharge produced ground water from any non-contaminated site activity which discharges by a point source to surface waters of the State, as defined in Chapter 62-620, F.A.C., only if the reported values for the parameters listed in Table 1 do not exceed any of the listed screening values. Before discharge of produced ground water can occur from such sites, analytical tests on samples of the proposed untreated discharge water shall be performed to determine if contamination exists.

(2) Minimum reporting requirements for all produced ground water dischargers. The effluent shall be sampled before the commencement of discharge, again within thirty (30) days after commencement of discharge, and then once every six (6) months for the life of the project to maintain continued coverage under this generic permit. Samples taken in compliance with the provisions of this permit shall be taken prior to actual discharge or mixing with the receiving waters. The effluent shall be sampled for the parameters listed in Table 1.

Table 1

	Screening Values for Discharges into:	
Parameter	Fresh Waters	Coastal Waters
Total Organic Carbon (TOC)	10.0 mg/l	10.0 mg/l
pH, standard units	6.0-8.5	6.5-8.5
Total Recoverable Mercury	0.012 µg/l	0.025 µg/l
Total Recoverable Cadmium	9.3 µg/l	9.3 µg/l
Total Recoverable Copper	2.9 µg/l	2.9 µg/l
Total Recoverable Lead	0.03 mg/l	5.6 µg/l
Total Recoverable Zinc	86.0 µg/l	86.0 µg/l
Total Recoverable Chromium (Hex.)	11.0 µg/l	50.0 µg/l
Benzene	1.0 µg/l	1.0 µg/l
Naphthalene	100.0 µg/l	100.0 µg/l

(3) If any of the analytical test results exceed the screening values listed in Table 1, except TOC, the discharge is not authorized by this permit.

(a) For initial TOC values that exceed the screening values listed in Table 1, which may be caused by naturally-occurring, high molecular weight organic compounds, the permittee may request to be exempted from the TOC requirement. To request this exemption, the permittee shall submit additional information with a Notice of Intent (NOI), described below, which describes the method used to determine that these compounds are naturally occurring. The Department shall grant the exemption if the permittee affirmatively demonstrates that the TOC values are caused by naturally-occurring, high molecular weight organic compounds.

(b) The NOI shall be submitted to the appropriate Department district office thirty (30) days prior to discharge, and contain the following information:

1. the name and address of the person that the permit coverage will be issued to;

2. the name and address of the facility, including county location;

3. any applicable individual wastewater permit number(s);

4. a map showing the facility and discharge location (including latitude and longitude);

5. the name of the receiving water; and

6. the additional information required by paragraph (3)(a) of this permit.

(c) Discharge shall not commence until notification of coverage is received from the Department.

(4) For fresh waters and coastal waters, the pH of the effluent shall not be lowered to less than 6.0 units for fresh waters, or less than 6.5 units for coastal waters, or raised above 8.5 units, unless the permittee submits natural background data confirming a natural background pH outside of this range. If natural background of the receiving water is determined to be less than 6.0 units for fresh waters, or less than 6.5 units in coastal waters, the pH shall not vary below natural background or vary more than one (1) unit above natural background for fresh and coastal waters. If natural background of the receiving water is determined to be higher than 8.5 units, the pH shall not vary above natural background or vary more than one (1) unit below natural background of fresh and coastal waters. The permittee shall include the natural background pH of the receiving waters with the results of the analyses required under paragraph (2) of this permit. For

APPENDIX 3.3

COLLIER COUNTY WELL PERMIT APPLICATION AND PERMIT FOR PAD MONITOR WELLS

STATE OF FLORIDA PERMIT APPLICATION TO CONSTRUCT, REPAIR, MODIFY, OR ABANDON A WELL

Permit No. 2004071681
Florida Unique I.D. CCO7164-M
Permit Stipulations Required (See attached)
62-524 well ☐
CUP/WUP Application No. _____

ABOVE THIS LINE FOR OFFICIAL USE ONLY

☐ Southwest
☐ Northwest
☐ St. Johns River
☐ South Florida
☐ Suwannee River

CHECK BOX FOR APPROPRIATE DISTRICT. ADDRESS ON BACK OF PERMIT FORM.

THIS FORM *MUST* BE FILLED OUT COMPLETELY.

The water well contractor is responsible for completing this form and forwarding the permit to the appropriate delegated county where applicable.

Fold at this line in order that address is visible through envelope window

1. City of Marco Island (Owner, Legal Name of Entity if Corporation) | 50 Bald Eagle Drive (Address) | Marco Island (City) | 34145 (Zip) | (239) 389-5000 (Telephone Number)

2. Marco Island, 7130 Collier Boulevard, Naples, FL 10453
Well Location Address, Road Name or Number, City

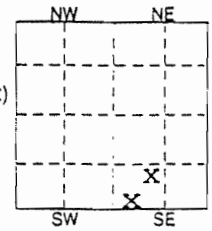
3. Southern Well Services, Inc. (Well Drilling Contractor) | 9037 (License No.) 26134 | (727) 531-7559 (Telephone No.)

P.O. Box 8145
Address

Clearwater (City) | FL (State) | 33758-8145 (Zip)

4. SW (smallest) 1/4 of SE (biggest) 1/4 of Section 34

(Indicate Well on Chart)



5. Township 50s Range 26e

6. Collier (County) | _____ (Subdivision Name) | _____ (Lot) | _____ (Block) | _____ (Unit)

7. Number of proposed wells 2. Check the use of well: (See back of permit for additional choices) _____ Domestic Monitor (type) ASR Zone & Zone II

_____ Irrigation (type) (See back) Public Water Supply (type) _____ (See Back) List Other _____

Distance from septic system _____ ft. Description of facility Wellfield Estimated start of construction date 7/12/04

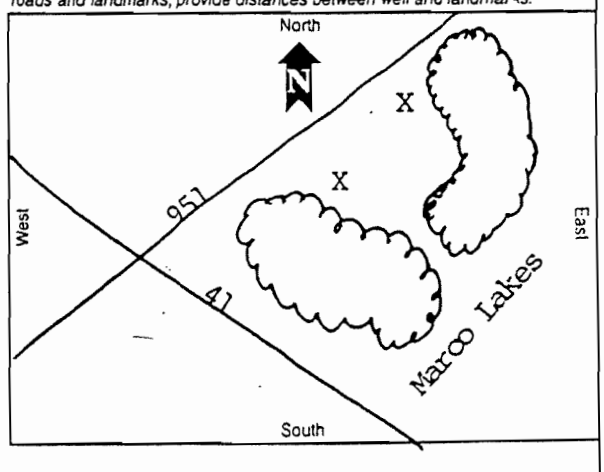
8. Application for: X New Construction _____ Repair/Modify _____ Abandonment _____ (Reason for Abandonment)

Date Stamp

9. Estimated: Well Depth 20' Casing Depth 10' Screen Interval from 10' to 15'
Casing Material: Blk-Steel / Gal / PVC Casing Diameter 4" Seal Material Neat Cement

If applicable: Proposed Grouting Interval From 20' to LS Seal Material Neat Cement
From _____ to _____ Seal Material _____
From _____ to _____ Seal Material _____

Draw a map of well location and indicate well site with an "X". Identify known roads and landmarks; provide distances between well and landmarks.



11. Telescope Casing _____ or Liner _____ (check one) Diameter _____
Blk-Steel / Galvanized / PVC Other (specify: _____

12. Method of Construction: X Rotary _____ Cable Tool _____ Combination
_____ Auger _____ Other (specify:) _____

13. Indicate total No. of wells on site 3. List number of unused wells on site 0.

14. Is this well or any other well or water withdrawal on the owner's contiguous property covered under a Consumptive/Water Use Permit (CUP/WUP) or CUP/WUP Application? ___No X Yes
(If yes, complete the following) CUP/WUP No. 11-00080-W
District well I.D. No. _____
Latitude _____ Longitude _____
Data obtained from GPS ___ or map ___ or survey ___ (*map datum NAD 27*___ *NAD 83*___)

15. I hereby certify that I will comply with the applicable rules of Title 40, Florida Administrative Code, and that a water use permit or artificial recharge permit, if needed, has been or will be obtained prior to commencement of well construction. I further certify that all information provided on this application is accurate and that I will obtain necessary approval from other federal, state, or local governments, if applicable. I agree to provide a well completion report to the District within 30 days after drilling or the permit expiration, whichever occurs first.

Signature of Contractor — 9037 License No.

I certify that I am the owner of the property, that the information provided is accurate, and that I am aware of my responsibilities under Chapter 373, Florida Statutes, to maintain or properly abandon this well; or, I certify that I am the agent for the owner, that the information provided is accurate, and that I have informed the owner of his responsibilities as stated above. Owner consents to personnel of the WMD or a representative access to the well site.

Owner's or Agent's Signature — Date 7/12/04

DO NOT WRITE BELOW THIS LINE — FOR OFFICIAL USE ONLY

Approval Granted By: _____ Issue Date: _____ Hydrologist Approval _____ Initials

Owner Number: _____ Fee Received: $ _____ Receipt No.: _____ Check No.: _____

THIS PERMIT NOT VALID UNTIL PROPERLY SIGNED BY AN AUTHORIZED OFFICER OR REPRESENTATIVE OF THE WMD. IT SHALL BE AVAILABLE AT THE WELL SITE DURING ALL DRILLING OPERATIONS. ***This permit is valid for 90 days from date of issue.***

WHITE: ORIGINAL FILE
YELLOW: DRILLING CONTRACTOR
PINK: OWNER

FORM 41.10 — 410 (1) REV. 4/95

INSPECTION JOB CARD - COLLIER COUNTY, FLORIDA
FOR INSPECTIONS PHONE 643-9757

PERMIT NBR **2004071681**

MASTER NBR 2004071681 ISSUED 7/16/2004

DESC.: CC07164-M, 2 MON WELLA
LOCATION: 7130 COLLIER BLVD
SUBDIVISION: 100 acreage LOT .000 BLOCK 006
CONTACT NAME: NOEMAN CONTACT PHONE: (727)531-7559
D.B.A. SOUTHERN WELL SERVICES, INC.
SETBACKS
FRONT: REAR: LEFT: RIGHT:
SPECIAL: FLOOD ZONE: AE-7

REQ	DESCRIPTION	REQ	DESCRIPTION
804	WELL		

NOISE ORDINANCE 90-17 - NOISE LIMITATIONS are in effect at all times. Work permitted: RESIDENTIAL Areas - 6:30AM to 7:00PM Monday thru Saturday
NON-RESIDENTIAL Areas (more than 500 feet from Residentail Area) 6:00AM to 8:00PM Monday thru Saturday. No Work on Sundays or Holidays.
RADIOS, LOADSPEAKERS, ETC. - Must not disturb peace, quiet and comfort of neighboring inhabitants.
FREE CABLE LOCATIONS - Call 48 Hours prior to digging/FPL 434-1222/UTS 1-800-542-0088/PalmerCATV 783-0638 and all other applicable utilites.

WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT. FS 713.135

CDPR2022

COLLIER COUNTY
BOARD OF COUNTY COMMISSIONERS

PERMIT

PERMIT #: 2004071681 PERMIT TYPE: WELL VALID #: 681
I: D: 07-16-04 APPLIED DATE: 07-16-04 APPROVAL DATE: 07-16-04
MASTER #: 2004071681 COA #:

JOB ADDRESS: 7130 COLLIER BLVD
JOB DESCRIPTION: CC07164-M, 2 MON WELLA JOB PHONE:

SUBDIVISION #: 100 - acreage BLOCK: 006 LOT: .000
FLOOD MAP: 0605 ZONE: AE-7 ELEVATION:
FOLIO #: 0000000448000303 SECTION-TOWNSHIP-RANGE 34 50 26

OWNER INFORMATION:
CITY OF MARCO ISLAND
& CITY MANAGER CITY HALL
50 BALD EAGLE DR
MARCO ISLAND, FLR0080 341453528

CONTRACTOR INFORMATION:
SOUTHERN WELL SERVICES, INC.
P.O. BOX 8145
CLEARWATER,FL 33758-8145

CERTIFICATE #: 26134 PHONE: (727)531-7559

FCC CODE: 800 - WELLS
CONSTRUCTION CODE: 10 / OTHER
JOB VALUE: TOTAL SQFT:

SETBACKS FRONT: REAR: LEFT: RIGHT:
SEWER: SEPTIC WATER: WELL
CONTACT NAME: NOEMAN
CO. CT PHONE: (727)531-7559

Per Collier County Ordinance No. 2002-01, as it may be amended, all work must comply with all applicable laws, codes, ordinances, and any additional stipulations or conditions of this permit. This permit expires if work authorized by the permit is not commenced within six (6) months from the date of issuance of the permit. Additional fees for failing to obtain permits prior to the commencement of construction may be imposed. Permittee(s) further understands that any contractor that may be employed must be a licensed contractor and that the structure must not be used or occupied until a Certificate of Occupancy is issued.

NOTICE: PRIOR TO THE REMOVAL OF ASBESTOS PRODUCTS OR THE DEMOLITION OF A STRUCTURE, FEDERAL AND STATE LAWS REQUIRE THE PERMITTEE (EITHER THE OWNER OR CONTRACTOR) TO SUBMIT A NOTICE OF THE INTENDED WORK TO THE STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP). FOR MORE INFORMATION, CONTACT DEP AT (239) 332-6975.

In addition to the conditions of this permit, there may be additional restrictions applicable to this property that may be found in the public records of this county, and there may be additional permits required from other governmental entities such as water management districts, state agencies, or federal agencies.

WARNING TO OWNER: YOUR FAILURE TO RECORD A NOTICE OF COMMENCEMENT MAY RESULT IN YOUR PAYING TWICE FOR IMPROVEMENTS TO YOUR PROPERTY. IF YOU INTEND TO OBTAIN FINANCING, CONSULT WITH YOUR LENDER OR AN ATTORNEY BEFORE RECORDING YOUR NOTICE OF COMMENCEMENT.

APPENDIX 3.4

26-INCH SURFACE CASING MILL CERTIFICATE

Bodycote MATERIALS TESTING • METALLON LABORATORY
METAL TECHNOLOGY
BODYCOTE OMNITEST, INC. • 2524 SUTHERLAND • HOUSTON, TEXAS 77023 • TEL 713/923-7761 • FAX 713/923-1679

DATE : 10/12/98
REPORT NO: 122712.0
CUST ACCT: 16140

MECHANICAL TEST REPORT

CUSTOMER JOB: PPLC-26.375
MATERIAL : 26" OD x .375" Wall Pipe
IDENT. :

TENSILE TEST RESULTS

NO	SIZE [IN]	YIELD [PSI]	TENSILE [PSI]	ELONG. [%]	R OF A [%]	HARDNESS
1	1.507x.350	61,200	76,400	38.00		
0	.5% Total Ext					

Unless otherwise stated, yield stress is .2% offset. Gage length is 2 in. for 1/2 in. bars, 1.4 in. for 3/8 in. bars, or 1 in. for 1/4 in. bars.

CHEMICAL TEST RESULTS

1. C:0.05 MN:0.82 P:0.009 S:0.004 SI:0.04 CR:0.02 MO:<.010
NI:0.03 CU:0.08 NB:<.005 V:0.027 AL:0.038 TI:<.001

Chemical results are reported in percent by weight.

COMMENTS: Transverse tensile specimen tested per ASTM A370.
Analysis by Argon Discharge Optical Emission Vacuum Spectroscopy.

Respectfully submitted,

BY: James M Mason

Bodycote Omnitest Inc.

APPENDIX 3.5

17.4-INCH CERTAINTEED WELL CASING SPECIFICATONS

ENGINEERING SPECIFICATION

RESTRAINED JOINT PVC WELL CASING

1.0 SCOPE

This specification covers Poly-Vinyl Chloride (PVC) Well Casing pipe and couplings which are assembled and installed as a completely non-metallic restrained joint system. Pipe is produced in nominal sizes 4"–16", and is available in both solid and slotted configurations.

2.0 REFERENCE DOCUMENTS

American Society for Testing and Materials (ASTM):
ASTM D1784 – Standard Specification for Rigid PVC Compounds and Chlorinated PVC Compounds.

ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.

ASTM F480 – Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80.

National Sanitation Foundation (NSF):
NSF14 – Plastic Piping System Components and Related Materials

NSF61 – Drinking Water System Components – Health Effects

3.0 REQUIREMENTS

3.1 Materials: Pipe and couplings shall be made from unplasticized PVC compounds having a minimum cell classification of 12454-B, as defined in ASTM D1784. The compound shall qualify for a Hydrostatic Design Basis (HDB) of 4000psi for water at 73.4° F, in accordance with the requirements of ASTM D2837. White pipe shall be supplied, unless otherwise agreed upon at time of purchase.

3.2 Approvals: Products intended for contact with potable water shall be evaluated, tested, and certified for conformance with NSF61, or the health effects portion of NSF14, by an acceptable certifying organization, when required by the regulatory authority having jurisdiction.

3.3 Physical Requirements: Product dimensions, weights, and performance data are summarized in the table on the reverse side of this page. Standard pipe length is 20'. Nominal casing size should be selected by the Design Engineer based on required flow performance, pump diameter, and local installation conditions under which the well will be constructed.

3.4 Performance: All pipe supplied to this specification shall meet the stiffness (crush resistance), flattening, impact, and puncture test requirements of ASTM F480.

3.5 Joints: Pipe shall be joined using non-metallic couplings which, together, have been designed as an integral system for maximum reliability and interchangeability. High-strength flexible thermoplastic splines shall be inserted into mating precision-machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading. No external pipe-to-pipe restraining devices which clamp onto or otherwise damage the pipe surface as a result of point-loading shall be permitted. Couplings shall incorporate twin elastomeric sealing gaskets. Consult the manufacturer for availability of joint accessories and fittings. Note that this specification does not cover integral bell pipe with solvent-cement joints.

3.6 Marking: Well Casing pipe shall be legibly and permanently marked in ink with the following information:

- Manufacturer and Trade Name
- Nominal Size & SDR or SCH Rating
- Manufacturing Date Code
- Cell Classification
- ASTM F480-94 SE
- (NSF-61)

3.7 Workmanship: Pipe and couplings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions, blisters and dents, interior roughness, and other injurious defects that may affect wall integrity. The pipe and couplings shall be as uniform as commercially practicable in color, opacity, density, and other physical characteristics.

4.0 SLOTTING

Pipe can be supplied with multiple rows of machined circumferential slots, to allow for water entry into the casing. Slot patterns should be specified to provide the required open areas and flow rates (taking into account the surrounding embedment material), while maintaining structural integrity of the installed system. Consult the manufacturer for design data and product availability. The following slotting parameters must be specified:

- Slot Width
- Slot Spacing
- Number of Rows
- Row Length
- Slot O.D. Length

5.0 SUGGESTED SOURCE OF SUPPLY

Certa-Lok PVC Well Casing as supplied by:

CertainTeed Corporation
Pipe & Plastics Group
P.O. Box 860
Valley Forge, PA 19482

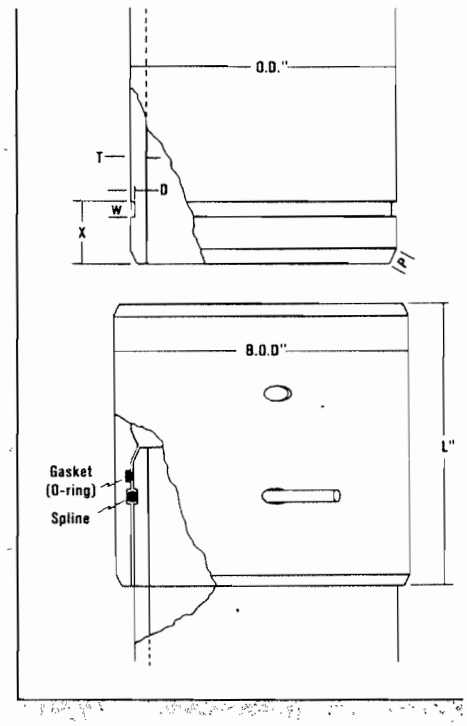
Code No: 40-37-51A
Date: 5/96

Printed in U.S.A.
5950

CERTA-LOK™ PVC WELL CASING

DIMENSIONS, WEIGHTS AND PERFORMANCE DATA

O.D. SIZE	SDR	X	W	D MIN.	D MAX.	P	L	COUPLING B.O.D.
4.500"	19	1.313	.375	.125	.130	.25	6.00	4.950
4.950"	20	1.313	.375	.125	.130	.25	6.00	5.563
	17	1.313	.375	.125	.130	.25	6.00	5.563
5.563"	21	1.313	.375	.125	.130	.25	6.00	6.180
	17	1.313	.375	.125	.130	.25	6.00	6.180
6.625"	24	1.313	.375	.125	.130	.25	6.00	7.600
	21	1.313	.375	.125	.130	.25	6.00	7.600
	17	1.313	.375	.125	.130	.25	6.00	7.600
6.900"	17	3.000	.375	.125	.130	.25	8.25	7.840
8.625"	21	3.163	.500	.135	.140	.68	10.00	9.854
9.050"	17	3.163	.500	.205	.215	.68	10.00	10.190
10.750"	17	3.500	.500	.205	.215	.68	12.00	12.438
12.750"	17	3.500	.500	.205	.215	.68	12.00	14.000
14.000"	17	3.500	.500	.205	.215	.68	12.00	15.300
16.000"	26	3.500	.500	.205	.215	.68	12.00	17.400
	21	3.500	.500	.205	.215	.68	12.00	17.400
	17	3.500	.500	.205	.215	.68	12.00	17.400
17.400"	17	3.500	.500	.205	.215	.68	12.00	18.701



Note: All dimensions are in inches.

NOMINAL SIZE DESIGNATION	O.D.① SIZE (INCHES)	SDR	T MIN. WALL (INCHES)	I.D.② (INCHES) MIN.	I.D.② (INCHES) MAX.	R.H.C.P.③ (PSI)	MAX.④ TENSILE PULL (LBS.)	MAX.⑤ INTERNAL PRESSURE (LBS.)	APPROX. WEIGHT PER FOOT (LBS.)	PART NO.
4"	4.500	19⑥	.237	3.968	4.026	158	2,900	65	2.05	65015
4½"	4.950	20⑥	.248	4.364	4.454	134	7,400	160	2.39	65115
		17	.291	4.273	4.368	224	7,400	160	2.77	65655
5"	5.563	21	.265	4.941	5.033	115	7,600	150	2.86	65425
		17	.327	4.810	4.909	224	7,600	150	3.46	65665
6"	6.625	24⑥	.280	5.961	6.065	79	12,000	280	3.92	65025
		21	.316	5.885	5.993	115	12,000	280	4.33	65435
		17	.390	5.728	5.845	224	12,000	280	5.22	65675
6"CI⑦	6.900	17	.405	5.970	6.090	224	14,850	210	5.48	65685
8"	8.625	21	.410	7.666	7.805	115	22,440	210	7.17	65745
8"CI⑦	9.050	17	.532	7.848	7.986	224	22,440	185	9.61	65695
10"	10.750	17	.632	9.334	9.486	224	26,000	300	13.70	65405
12"	12.750	17	.750	11.070	11.250	224	30,800	150	18.84	65705
14"	14.000	17	.823	12.156	12.354	224	36,440	150	22.57	65715
16"	16.000	26	.616	14.544	14.768	59	41,000	150	20.51	65285
		21	.762	14.235	14.476	115	41,000	150	24.66	65485
		17	.941	13.894	14.118	224	41,000	150	31.66	65475
16"CI⑦	17.400	17	1.024	15.106	15.352	224	37,000	125	35.05	65725

① O.D. - Outside Diameter
② I.D. - Inside Diameter
③ RHCP - Resistance to Hydrostatic Collapse Pressure
④ 66% of Ultimate Tensile Strength
⑤ 66% of Ultimate Pressure
⑥ Schedule 40
⑦ Cast Iron O.D.

Note: All dimensions and weights are subject to manufacturing tolerances.

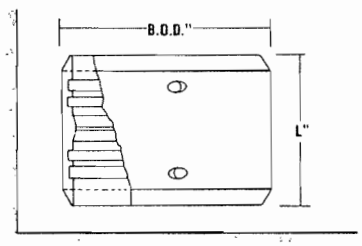
CertainTeed

ACCESSORIES

COUPLING

INCLUDES GASKETS AND SPLINES

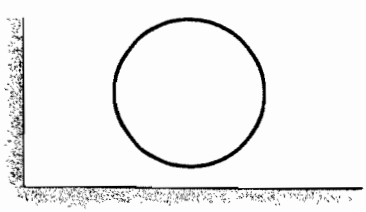
O.D. SIZE	PART NUMBER	L"	B.O.D."
4.500"	70703	6.00	4.950
4.950"	70704	6.00	5.563
5.563"	70705	6.00	6.180
6.625"	70706	6.00	7.600
6.900"	70707	8.25	7.840
8.625"	70708	10.00	9.854
9.050"	70716	10.00	10.190
10.750"	70712	12.00	12.438
12.750"	70709	12.00	14.000
14.000"	70710	12.00	15.300
16.000"	70711	12.00	17.400
17.400"	70719	12.00	18.700



O-RING (GASKET)

O.D. SIZE	PART NUMBER	C/S	DASH NO.
4.500"	86123	.210"	-349
4.950"	86260	.210"	-353
5.563"	86124	.210"	-358
6.625"	86125	.210"	-364
6.900"	86174	.275"	-441
8.625"	86168	.350"	-
9.050"	86175	.350"	-
10.750"	86196	.365"	-
12.750"	86178	.365"	-
14.000"	86171	.365"	-
16.000"	86172	.365"	-
17.400"	86173	.365"	-

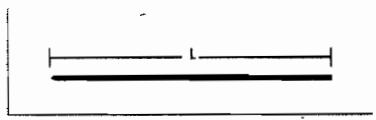
O-Ring Material: 4.500-6.900 NBR
8.625-Larger Poly Isoprene



SPLINE

O.D. SIZE	PART NUMBER	L"	SIZE
4.500"	86462	18	.250"①
4.950"	86462	18	.250"①
5.563"	86484	19	.250"①
6.625"	86463	24	.250"①
6.900"	86463	24	.250"①
8.625"	86464	32	.313"②
9.050"	86493	32	.375②
10.750"	86465	39	.375②
12.750"	86466	46	.375②
14.000"	86490	48	.375②
16.000"	86491	53	.375②
17.400"	86492	60	.375②

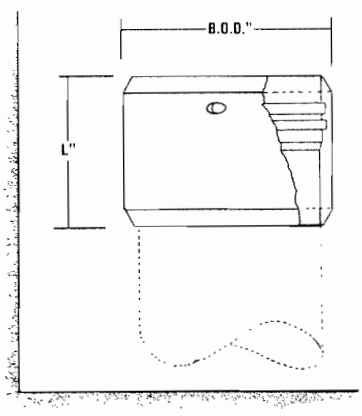
① Round Spline
② Square Spline



COUPLING

CERTA-LOK BELL BY SOLVENT WELD BELL

O.D. SIZE	PART NUMBER	L"	B.O.D."
4.500"	71703	6.00	4.950
4.950"	71704	6.00	5.563
5.563"	71705	6.13	6.180
6.625"	71706	6.63	7.600
6.900"	71708	8.25	7.840
8.625"	71707	10.00	9.854
9.050"	71709	10.00	10.190
10.750"	71710	12.00	12.438
12.750"	71711	12.00	14.000



APPENDIX 3.6

CASING PRESSURE TEST RECORD

WATER RESOURCE SOLUTIONS, INC.

MARCO LAKES ASR 5

Well No.: ASR 5

Starting Date/Time: 10/05/04 15:18 **Starting Pressure:** 131 **psi**

Casing Diameter: 24-inches **Ending Pressure:** 130 **psi**

Elapsed Time (minutes)	Pressure (psi)	Pressure Change (psi)	Percent Change
0	131		
5	131		
10	131		
15	131		
20	131		
25	130	1 psi	0.77
30	130		
35	130		
40	130		
45	130		
50	130		
55	130		
60	130		

Witnessed by:

Signature

Southern well Services
Firm/Organization

Signature

Southern well services
Firm/Organization

Signature

Water Resource Solutions
Firm/Organization

APPENDIX 3.7

PRESSURE GUAGE TEST REPORT

Epperson & Company

5202 Shadowlawn
P.O. Box 11535
Tampa, FL 33680

Tampa 813-626-6125
Polk Co. 813-682-1258
Wats 1-800-886-6125
Fax # 813-626-8806

CERTIFIED CALIBRATION CHART

CUSTOMER Southern Well Services

CUSTOMER ORDER NO. 453395 DATE 9/21/01 GAUGE NO. Test #

GAUGE DESCRIPTION 25-1009SW-02L 300#

TRUE VALUE	INDICATED VALUE
0	0
50	50
100	100
150	150
200	200
250	250
300	300

CALIBRATION STANDARD Dead Weight Tester SERIAL NO. 1HA38443

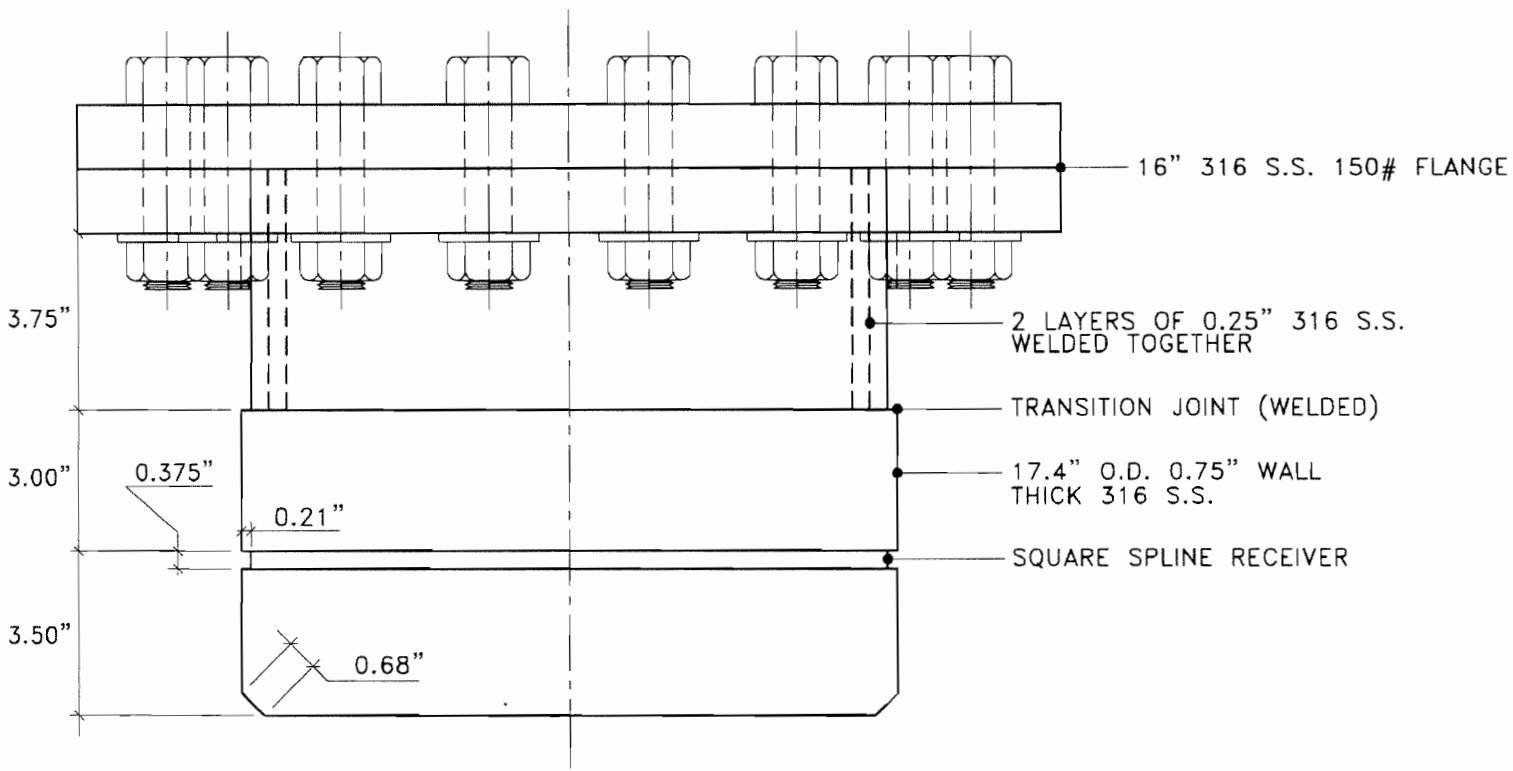
TESTED BY R. T. Rodgers DATE 9/21/04

THIS IS TO CERTIFY THAT THIS GAUGE HAS BEEN INSPECTED AND TESTED AGAINST PRESSURE STANDARD DEADWEIGHT TESTER TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY. ACCURACY TEST REFERENCE NO. 821/257176-96 & 38126 COMPENSATED TO LOCAL ACCELERATION DUE TO GRAVITY.

APPENDIX 3.8

STAINLESS STEEL FLANGE TO CERTALOK ADAPTER

CHANGE OVER ADAPTER FROM 17,4" CERTA-LOK TO 16" 150# FLANGE



Water Resource Solutions	PROJECT NAME: MARCO ISLAND UTILITIES	DWG. NUMBER: A-014773E3
	PROJECT NUMBER: 01-04773.02	DATE: 12/20/04

APPENDIX 3.8 SCHEMATICS OF THE CHANGE OVER ADAPTER.

APPENDIX 4.1

TOTALIZING FLOWMETER CALIBRATION REPORT

The Avanti Company

METERS * VALVES * INSTRUMENTS

22 South Lake Avenue
Avon Park, FL 33825-3902
www.avanticompany.com

800-284-5231
FAX: 863-453-0085
E-Mail: info@avanticompany.com

Certified Flow Meter Test Record

Customer: SOUTHERN WELL SERVICES, INC.

Consumptive Use Permit #: N/A

Test Site: MARCO LAKES ASR-5

Lat: 0 N Long: 0 W

Contact: JEFF BAIR

Meter Model: 8" HERSEY Meter Serial Number: 10828

Meter Accessories: 0

Pipe info at test site, Material: PVC

Outside Diameter: 6.65 " O.D. Pipe Thickness: 0.309 WT

Transducer Spacing: 5.704 " / 144.885 mm

Test information using a Panametrics Ultrasonic Flow Meter Transport Model PT878

Test Performed @: 1042 GPM

Initial meter reading at start of calibration: 69796 X 000

Final meter reading at end of calibration: 69799 X 000

Reading on equipment used for calibration: Start: 0 End: 2753

Meter tested at: **108.9 % Accuracy**

Last Meter Test:

Last Accuracy: N/A

Comments: 0

Test Performed By: RICHARD PRINCE

Signature: Richard Prince Date: 10/27/2004

APPENDIX 4.2

SUMMARY OF AQUIFER TET DATA

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
8:00	**0**	0.000	0.000	0.000	**69842000**	
8:01	1	2.958	0.072	0.005		
8:02	2	2.718	0.219	0.002		210
8:03	3	2.489	0.311	0.007		
8:04	4	2.254	0.381	0.016		
8:05	5	2.051	0.431	0.030	69843000	
8:06	6	1.573	0.475	0.042		
8:07	7	1.555	0.503	0.058		
8:08	8	1.516	0.538	0.069		
8:09	9	1.433	0.572	0.085		
8:10	10	1.400	0.602	0.097		
8:11	11	1.363	0.634	0.113		160
8:12	12	1.345	0.669	0.125		
8:13	13	1.359	0.701	0.138		
8:14	14	1.333	0.729	0.150		
8:15	15	1.370	0.750	0.161		
8:16	16	1.377	0.777	0.173		
8:17	17	1.375	0.805	0.185		
8:18	18	1.400	0.833	0.196		
8:19	19	1.410	0.861	0.208		
8:20	20	1.377	0.891	0.219		
8:21	21	1.421	0.911	0.228		
8:22	22	1.435	0.932	0.238		
8:23	23	1.414	0.948	0.249		
8:24	24	1.440	0.971	0.258		
8:25	25	1.453	0.997	0.268		
8:26	26	1.446	0.983	0.275		
8:27	27	1.465	0.994	0.286		
8:28	28	1.490	1.008	0.293		
8:29	29	1.493	1.017	0.302		
8:30	30	1.493	1.029	0.311		
8:31	31	1.518	1.038	0.321		
8:32	32	1.513	1.047	0.328		
8:33	33	1.518	1.059	0.337		
8:34	34	1.513	1.066	0.344	69848000	176.5
8:35	35	1.543	1.082	0.353		
8:36	36	1.550	1.084	0.360		
8:37	37	1.569	1.091	0.367		
8:38	38	1.564	1.091	0.374		
8:39	39	1.525	1.094	0.383		
8:40	40	1.550	1.094	0.390		181.8
8:41	41	1.550	1.103	0.394		
8:42	42	1.564	1.100	0.404		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
8:43	43	1.557	1.112	0.411		
8:44	44	1.539	1.117	0.418		
8:45	45	1.564	1.114	0.422		
8:46	46	1.571	1.128	0.429		
8:47	47	1.578	1.130	0.434		
8:48	48	1.557	1.140	0.441		
8:49	49	1.596	1.147	0.448		
8:50	50	1.585	1.154	0.454		
8:51	51	1.596	1.156	0.459		
8:52	52	1.571	1.163	0.466		
8:53	53	1.592	1.151	0.473		
8:54	54	1.603	1.158	0.475		
8:55	55	1.578	1.163	0.482	69852000	182.7
8:56	56	1.603	1.170	0.487		
8:57	57	1.585	1.170	0.491		
8:58	58	1.592	1.186	0.498		
8:59	59	1.610	1.186	0.503		
9:00	**60**	5.551	1.195	0.510	**69852700**	
9:01	61	5.117	1.336	0.514		
9:02	62	5.415	1.451	0.521		335
9:03	63	5.491	1.527	0.531		
9:04	64	5.523	1.410	0.547	69854000	
9:05	65	5.555	1.456	0.561		
9:06	66	5.599	1.497	0.579		
9:07	67	5.613	1.530	0.598		
9:08	68	5.643	1.560	0.616		
9:09	69	5.678	1.590	0.632		
9:10	70	5.675	1.615	0.651	69856000	328
9:11	71	5.678	1.640	0.669		
9:12	72	5.696	1.663	0.685		
9:13	73	5.714	1.684	0.701		
9:14	74	5.721	1.705	0.715		
9:15	75	5.728	1.721	0.731		
9:16	76	5.733	1.739	0.747		
9:17	77	5.726	1.756	0.759		
9:18	78	5.758	1.772	0.775		
9:19	79	5.786	1.788	0.789		
9:20	80	5.772	1.802	0.801	69859000	322.6
9:21	81	5.797	1.818	0.814		
9:22	82	5.797	1.832	0.826		
9:23	83	5.791	1.846	0.837		
9:24	84	5.809	1.859	0.851		
9:25	85	5.823	1.871	0.863		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
9:26	86	5.841	1.885	0.872		
9:27	87	5.823	1.896	0.884		
9:28	88	5.848	1.908	0.895		
9:29	89	5.841	1.922	0.907		
9:30	90	5.867	1.933	0.916	69862500	
9:31	91	5.878	1.942	0.925	69863000	
9:32	92	5.874	1.954	0.937		
9:33	93	5.874	1.963	0.944		
9:34	94	5.860	1.975	0.953	69864000	
9:35	95	5.878	1.984	0.962		
9:36	96	5.874	1.991	0.974		
9:37	97	5.862	2.000	0.980		
9:38	98	5.917	2.012	0.990		
9:39	99	5.874	2.021	0.997		
9:40	100	5.904	2.030	1.006		
9:41	101	5.911	2.039	1.015	69866000	
9:42	102	5.906	2.049	1.024		
9:43	103	5.913	2.056	1.029		
9:44	104	5.924	2.062	1.038	69867000	321.7
9:45	105	5.929	2.072	1.047		
9:46	106	5.917	2.081	1.052		
9:47	107	5.943	2.088	1.061		
9:48	108	5.950	2.095	1.068		
9:49	109	5.936	2.102	1.073		
9:50	110	5.943	2.109	1.082		
9:51	111	5.943	2.116	1.089		
9:52	112	5.936	2.122	1.096		
9:53	113	5.975	2.129	1.100		
9:54	114	5.950	2.136	1.107		
9:55	115	5.968	2.143	1.112		
9:56	116	5.961	2.150	1.119		
9:57	117	5.987	2.159	1.126		
9:58	118	6.077	2.166	1.133	69871500	
9:59	119	6.240	2.180	1.137		
10:00	**120**	6.418	2.196	1.144	**69872250**	
10:01	121	18.433	2.713	1.151		
10:02	122	12.026	2.789	1.160	69874000	562
10:03	123	12.294	2.821	1.181		
10:04	124	12.356	2.877	1.204		
10:05	125	12.407	2.925	1.232		
10:06	126	12.451	2.969	1.260	69876200	
10:07	127	12.439	3.013	1.287		
10:08	128	12.541	3.052	1.313		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
10:09	129	12.548	3.089	1.336		
10:10	130	12.603	3.121	1.361		
10:11	131	12.629	3.154	1.384		
10:12	132	12.647	3.184	1.407		
10:13	133	12.686	3.211	1.428		
10:14	134	12.624	3.237	1.449	69880200	561
10:15	135	12.751	3.264	1.470	6.99E+08	558.6
10:16	136	12.679	3.285	1.490		
10:17	137	12.661	3.306	1.511		
10:18	138	12.668	3.327	1.530		
10:19	139	12.700	3.347	1.548		
10:20	140	12.679	3.366	1.569		
10:21	141	12.718	3.387	1.585		
10:22	142	12.730	3.405	1.601		
10:23	143	12.751	3.424	1.615		
10:24	144	12.765	3.442	1.633		
10:25	145	12.744	3.458	1.650		
10:26	146	12.790	3.477	1.661		
10:27	147	12.739	3.490	1.677		
10:28	148	12.815	3.507	1.691	69888000	
10:29	149	12.852	3.520	1.705	69889000	554
10:30	150	12.808	3.537	1.716		
10:31	151	12.859	3.550	1.733	69890000	
10:32	152	12.815	3.564	1.744		
10:33	153	12.834	3.576	1.758		
10:34	154	12.841	3.587	1.774		
10:35	155	12.772	3.601	1.783	69892000	552.74
10:36	156	12.765	3.613	1.795	69893000	
10:37	157	12.829	3.624	1.806		
10:38	158	12.815	3.638	1.818		
10:39	159	12.859	3.650	1.829		
10:40	160	12.822	3.661	1.841	69894700	553.7
10:41	161	12.898	3.675	1.853		
10:42	162	12.880	3.687	1.862		
10:43	163	12.885	3.698	1.871		
10:44	164	12.855	3.707	1.883		
10:45	165	12.843	3.719	1.892		
10:46	166	12.924	3.730	1.903		
10:47	167	12.898	3.742	1.913		
10:48	168	12.880	3.751	1.922		
10:49	169	12.931	3.763	1.933		
10:50	170	12.924	3.770	1.940		
10:51	171	12.949	3.781	1.952		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
10:52	172	12.949	3.790	1.961		
10:53	173	12.956	3.800	1.970		
10:54	174	12.949	3.809	1.979		
10:55	175	12.898	3.818	1.989		
10:56	176	12.938	3.825	1.998		
10:57	177	12.919	3.832	2.005		
10:58	178	13.002	3.841	2.012	69904650	
10:59	179	12.901	3.853	2.021		
11:00	**180**	16.823	3.860	2.028	**69906100**	
11:01	181	18.874	4.095	2.037		
11:02	182	19.167	4.254	2.046		
11:03	183	19.326	4.365	2.060		760
11:04	184	21.464	4.446	2.079	69909000	
11:05	185	10.716	4.441	2.102		
11:06	186	17.815	4.464	2.127		780
11:07	187	18.112	4.531	2.150		790
11:08	188	19.580	4.632	2.173		780
11:09	189	20.424	4.734	2.194		
11:10	190	20.412	4.785	2.219		
11:11	191	23.458	4.930	2.245		890
11:12	192	23.624	5.052	2.270		
11:13	193	23.631	5.142	2.300	69916000	
11:14	194	23.674	5.216	2.330		
11:15	195	23.815	5.281	2.362		
11:16	196	23.834	5.336	2.392		
11:17	197	23.891	5.389	2.425		
11:18	198	23.587	5.419	2.457		
11:19	199	23.871	5.463	2.487		
11:20	200	24.087	5.507	2.517		
11:21	201	24.094	5.551	2.547		
11:22	202	24.150	5.590	2.575		
11:23	203	24.170	5.629	2.602		
11:24	204	24.196	5.664	2.630		
11:25	205	24.138	5.696	2.655		
11:26	206	24.258	5.726	2.681		
11:27	207	24.200	5.758	2.706		
11:28	208	24.251	5.786	2.729	69929000	886
11:29	209	24.302	5.816	2.755		
11:30	210	24.304	5.844	2.775	69930900	
11:31	211	24.341	5.867	2.801		
11:32	212	24.348	5.892	2.821		
11:33	213	24.367	5.917	2.842		
11:34	214	24.417	5.941	2.863		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
11:35	215	24.431	5.964	2.881		
11:36	216	24.373	5.987	2.902		
11:37	217	24.468	6.007	2.921		
11:38	218	24.406	6.030	2.939		
11:39	219	24.438	6.049	2.958		
11:40	220	24.450	6.067	2.976	69939700	880
11:41	221	24.463	6.086	2.994		
11:42	222	24.489	6.104	3.011		
11:43	223	24.457	6.123	3.027		
11:44	224	24.533	6.141	3.045	69944000	889.7
11:45	225	24.496	6.160	3.059		
11:46	226	24.503	6.176	3.078		
11:47	227	24.533	6.192	3.094	69946000	
11:48	228	24.546	6.208	3.110		
11:49	229	24.553	6.227	3.126		
11:50	230	24.510	6.240	3.140		
11:51	231	24.611	6.257	3.154		
11:52	232	24.655	6.270	3.165		
11:53	233	24.542	6.287	3.179	69952000	879.3
11:54	234	24.618	6.300	3.193		
11:55	235	24.650	6.314	3.209	69953000	
11:56	236	24.574	6.326	3.223		
11:57	237	24.604	6.340	3.234	69954000	881
11:58	238	24.687	6.351	3.246	69956000	
11:59	239	24.643	6.365	3.257	69957000	869.5
12:00	**240**	19.483	6.377	3.269	**69957340**	**0**
12:01	241	2.821	5.498	3.281		**0**
12:02	242	2.053	4.893	3.287		**0**
12:03	243	1.603	4.508	3.276		**0**
12:04	244	1.197	4.222	3.241		**0**
12:05	245	0.944	3.991	3.191		**0**
12:06	246	0.747	3.804	3.135		**0**
12:07	247	0.574	3.643	3.071		**0**
12:08	248	0.429	3.502	3.004		**0**
12:09	249	0.309	3.377	2.939		**0**
12:10	250	0.187	3.264	2.875		**0**
12:11	251	0.085	3.161	2.810		**0**
12:12	252	-0.016	3.068	2.750		**0**
12:13	253	-0.104	2.978	2.690		**0**
12:14	254	-0.182	2.898	2.632		**0**
12:15	255	-0.256	2.821	2.579		**0**
12:16	256	-0.332	2.750	2.528		**0**
12:17	257	-0.397	2.681	2.478		**0**

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
12:18	258	-0.459	2.618	2.427		0
12:19	259	-0.517	2.556	2.381		0
12:20	260	-0.568	2.498	2.337		0
12:21	261	-0.625	2.443	2.293		0
12:22	262	-0.676	2.392	2.252		0
12:23	263	-0.727	2.344	2.212		0
12:24	264	-0.771	2.295	2.176		0
12:25	265	-0.821	2.252	2.136		0
12:26	266	-0.861	2.205	2.099		0
12:27	267	-0.904	2.164	2.067		0
12:28	268	-0.937	2.125	2.032		0
12:29	269	-0.980	2.083	2.000		0
12:30	270	-1.013	2.046	1.966		0
12:31	271	-1.045	2.009	1.936		0
12:32	272	-1.082	1.975	1.908		0
12:33	273	-1.114	1.942	1.880		0
12:34	274	-1.147	1.910	1.853		0
12:35	275	-1.172	1.876	1.825		0
12:36	276	-1.204	1.848	1.799		0
12:37	277	-1.220	1.816	1.772		0
12:38	278	-1.246	1.788	1.749		0
12:39	279	-1.278	1.760	1.723		0
12:40	280	-1.303	1.733	1.700		0
12:41	281	-1.333	1.707	1.675		0
12:42	282	-1.354	1.679	1.654		0
12:43	283	-1.380	1.652	1.633		0
12:44	284	-1.405	1.629	1.610		0
12:45	285	-1.423	1.606	1.587		0
12:46	286	-1.444	1.580	1.569		0
12:47	287	-1.463	1.557	1.550		0
12:48	288	-1.481	1.536	1.530		0
12:49	289	-1.500	1.513	1.509		0
12:50	290	-1.520	1.493	1.490		0
12:51	291	-1.546	1.472	1.472		0
12:52	292	-1.557	1.451	1.453		0
12:53	293	-1.576	1.430	1.435		0
12:54	294	-1.594	1.410	1.419		0
12:55	295	-1.615	1.393	1.403		0
12:56	296	-1.626	1.375	1.387		0
12:57	297	-1.645	1.359	1.370		0
12:58	298	-1.659	1.340	1.354		0
12:59	299	-1.677	1.324	1.338		0
13:00	300	-1.691	1.306	1.322		0

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
13:01	301	-1.703	1.290	1.306		0
13:02	302	-1.721	1.273	1.294		0
13:03	303	-1.735	1.257	1.276		0
13:04	304	-1.739	1.241	1.264		0
13:05	305	-1.760	1.227	1.248		0
13:06	306	-1.772	1.211	1.237		0
13:07	307	-1.786	1.197	1.220		0
13:08	308	-1.797	1.181	1.209		0
13:09	309	-1.816	1.170	1.195		0
13:10	310	-1.823	1.154	1.181		0
13:11	311	-1.841	1.140	1.167		0
13:12	312	-1.848	1.126	1.156		0
13:13	313	-1.862	1.112	1.142		0
13:14	314	-1.873	1.100	1.128		0
13:15	315	-1.885	1.087	1.117		0
13:16	316	-1.899	1.073	1.107		0
13:17	317	-1.910	1.061	1.096		0
13:18	318	-1.924	1.050	1.084		0
13:19	319	-1.931	1.038	1.073		0
13:20	320	-1.942	1.024	1.064		0
13:21	321	-1.949	1.013	1.050		0
13:22	322	-1.961	1.001	1.040		0
13:23	323	-1.968	0.990	1.029		0
13:24	324	-1.979	0.978	1.022		0
13:25	325	-1.986	0.967	1.008		0
13:26	326	-2.000	0.955	0.999		0
13:27	327	-2.005	0.946	0.990		0
13:28	328	-2.019	0.934	0.978		0
13:29	329	-2.026	0.925	0.969		0
13:30	330	-2.037	0.916	0.957		0
13:31	331	-2.044	0.904	0.950		0
13:32	332	-2.051	0.893	0.939		0
13:33	333	-2.062	0.881	0.930		0
13:34	334	-2.069	0.874	0.918		0
13:35	335	-2.074	0.863	0.909		0
13:36	336	-2.088	0.854	0.900		0
13:37	337	-2.095	0.844	0.893		0
13:38	338	-2.099	0.835	0.886		0
13:39	339	-2.113	0.828	0.874		0
13:40	340	-2.113	0.819	0.867		0
13:41	341	-2.125	0.807	0.861		0
13:42	342	-2.125	0.801	0.851		0
13:43	343	-2.139	0.789	0.842		0

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
13:44	344	-2.146	0.782	0.835		**0**
13:45	345	-2.157	0.773	0.826		**0**
13:46	346	-2.157	0.764	0.819		**0**
13:47	347	-2.164	0.754	0.812		**0**
13:48	348	-2.171	0.745	0.805		**0**
13:49	349	-2.176	0.738	0.796		**0**
13:50	350	-2.182	0.729	0.789		**0**
13:51	351	-2.187	0.724	0.782		**0**
13:52	352	-2.194	0.715	0.773		**0**
13:53	353	-2.201	0.708	0.766		**0**
13:54	354	-2.208	0.701	0.759		**0**
13:55	355	-2.212	0.692	0.752		**0**
13:56	356	-2.226	0.687	0.745		**0**
13:57	357	-2.226	0.678	0.736		**0**
13:58	358	-2.233	0.671	0.731		**0**
13:59	359	-2.238	0.664	0.724		**0**
14:00	360	-2.238	0.657	0.717	69957340	
14:01	361	7.364	1.008	0.711		
14:02	362	10.654	1.400	0.706		
14:03	363	16.075	1.774	0.715		
14:04	364	17.307	2.162	0.738		
14:05	365	20.495	2.485	0.773		
14:06	366	18.412	2.787	0.817		
14:07	367	22.837	2.935	0.872		
14:08	368	22.539	3.227	0.932		
14:09	369	22.710	3.442	0.994	69972000	
14:10	370	22.920	3.615	1.057		
14:11	371	23.047	3.765	1.124	69966000	930
14:12	372	23.181	3.892	1.190		
14:13	373	23.340	4.010	1.257		
14:14	374	23.326	4.113	1.322		
14:15	375	23.423	4.213	1.384		
14:16	376	23.492	4.303	1.446		
14:17	377	23.582	4.386	1.504	69972000	924
14:18	378	23.677	4.464	1.562		
14:19	379	23.709	4.540	1.615		
14:20	380	23.688	4.609	1.668		
14:21	381	23.753	4.674	1.719		
14:22	382	23.799	4.736	1.767		
14:23	383	23.811	4.794	1.816		
14:24	384	23.861	4.847	1.862		
14:25	385	23.430	4.900	1.903		
14:26	386	23.513	4.935	1.947		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
14:27	387	23.437	4.972	1.989		
14:28	388	23.405	5.008	2.028		
14:29	389	23.368	5.048	2.065		
14:30	390	23.405	5.085	2.099		
14:31	391	23.411	5.122	2.136		
14:32	392	23.451	5.156	2.166	69985000	
14:33	393	23.506	5.191	2.199	69986000	924
14:34	394	23.527	5.223	2.231		
14:35	395	23.490	5.258	2.261		
14:36	396	23.469	5.288	2.293		
14:37	397	23.476	5.320	2.321		
14:38	398	23.552	5.350	2.351		
14:39	399	23.508	5.378	2.379		
14:40	400	23.541	5.410	2.404		
14:41	401	23.631	5.440	2.429		
14:42	402	23.566	5.468	2.455		
14:43	403	23.605	5.495	2.480	69995000	885
14:44	404	23.732	5.521	2.503		
14:45	405	23.700	5.546	2.526		
14:46	406	23.642	5.571	2.549		
14:47	407	23.566	5.592	2.572		
14:48	408	23.594	5.613	2.595		
14:49	409	23.612	5.636	2.616		
14:50	410	16.338	5.657	2.637	**70001000**	0
14:51	411	7.373	5.066	2.658		
14:52	412	1.601	4.499	2.674		
14:53	413	0.978	4.005	2.678		
14:54	414	0.616	3.677	2.658		
14:55	415	0.344	3.435	2.625		
14:56	416	0.141	3.239	2.579		
14:57	417	-0.030	3.075	2.522		
14:58	418	-0.178	2.939	2.466		
14:59	419	-0.309	2.815	2.406		
15:00	420	-0.418	2.706	2.349		
15:01	421	-0.519	2.607	2.291		
15:02	422	-0.616	2.517	2.238		
15:03	423	-0.697	2.434	2.185		
15:04	424	-0.773	2.358	2.132		
15:05	425	-0.849	2.289	2.083		
15:06	426	-0.914	2.219	2.037		
15:07	427	-0.976	2.159	1.993		
15:08	428	-1.036	2.102	1.949		
15:09	429	-1.084	2.046	1.908		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
15:10	430	-1.137	1.996	1.869		
15:11	431	-1.188	1.947	1.829		
15:12	432	-1.232	1.901	1.793		
15:13	433	-1.276	1.855	1.758		
15:14	434	-1.313	1.813	1.726		
15:15	435	-1.359	1.774	1.693		
15:16	436	-1.389	1.735	1.663		
15:17	437	-1.428	1.698	1.633		
15:18	438	-1.460	1.663	1.601		
15:19	439	-1.490	1.629	1.573		
15:20	440	-1.530	1.596	1.548		
15:21	441	-1.562	1.566	1.518		
15:22	442	-1.587	1.536	1.495		
15:23	443	-1.613	1.506	1.470		
15:24	444	-1.638	1.479	1.446		
15:25	445	-1.663	1.451	1.423		
15:26	446	-1.696	1.426	1.400		
15:27	447	-1.714	1.400	1.377		
15:28	448	-1.739	1.373	1.359		
15:29	449	-1.758	1.350	1.338		
15:30	450	-1.790	1.327	1.317		
15:31	451	-1.802	1.303	1.297		
15:32	452	-1.823	1.283	1.278		
15:33	453	-1.841	1.262	1.260		
15:34	454	-1.859	1.241	1.243		
15:35	455	-1.878	1.220	1.225		
15:36	456	-1.899	1.202	1.207		
15:37	457	-1.917	1.181	1.190		
15:38	458	-1.929	1.163	1.174		
15:39	459	-1.954	1.144	1.158		
15:40	460	-1.975	1.126	1.142		
15:41	461	-1.986	1.110	1.128		
15:42	462	-2.000	1.091	1.112		
15:43	463	-2.012	1.075	1.098		
15:44	464	-2.026	1.061	1.084		
15:45	465	-2.044	1.045	1.068		
15:46	466	-2.058	1.029	1.057		
15:47	467	-2.069	1.015	1.043		
15:48	468	-2.088	1.001	1.029		
15:49	469	-2.099	0.985	1.017		
15:50	470	-2.106	0.974	1.004		
15:51	471	-2.120	0.957	0.990		
15:52	472	-2.139	0.946	0.980		

Appendix 4-2

Summary of Aquifer Test Data

Time	Elapsed Time since pumping started (min.)	ASR-5 Drawdown (ft.)	ASR-2 Drawdown (ft.)	DZ-2 Drawdown (ft.)	Totalizer in Gallons	Measured flow Rate (gpm)
15:53	473	-2.150	0.932	0.969		
15:54	474	-2.164	0.920	0.957		
15:55	475	-2.171	0.909	0.944		
15:56	476	-2.176	0.897	0.932		
15:57	477	-2.189	0.884	0.923		
15:58	478	-2.201	0.872	0.911		
15:59	479	-2.215	0.861	0.900		
16:00	480	-2.226	0.849	0.891		
16:01	481	-2.233	0.837	0.879		
16:02	482	-2.247	0.826	0.870		
16:03	483	-2.252	0.814	0.858		
16:04	484	-2.265	0.803	0.849		
16:05	485	-2.277	0.794	0.840		
16:06	486	-2.284	0.784	0.828		
16:07	487	-2.291	0.775	0.819		