City of Hollywood

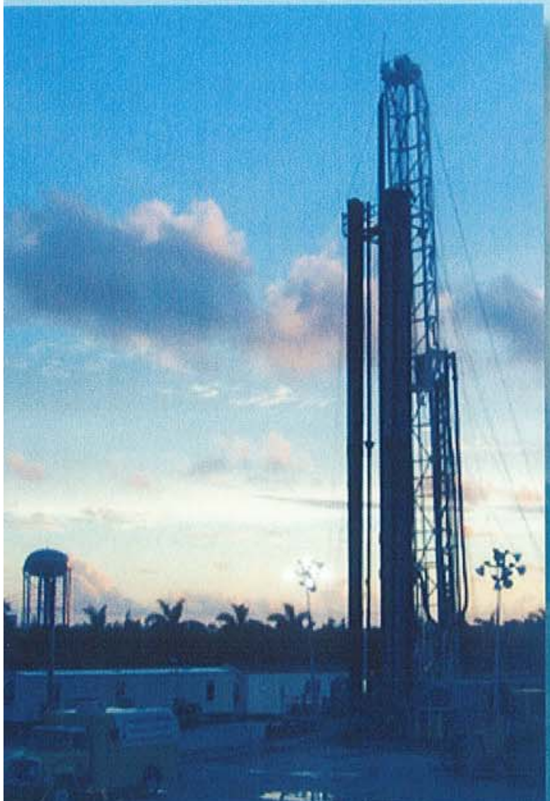
Engineering Well Completion Report City of Hollywood Southern Regional WWTP Injection Well Effluent Disposal System

Prepared for
City of Hollywood
City Project No. 95-9713

Prepared by:
HAZEN AND SAWYER
Environmental Engineers & Scientists

In Association with
Water Technologies Associates, Inc.
Project No. 4304

August 2003



Appendix A

FDEP Construction Permit

PERMITTEE:
Whitfield Van Cott, PE
Utilities Director
City of Hollywood Southern Regional WWTP

PERMIT/CERTIFICATION NO. 156419-001-UC
DATE OF ISSUE: APR 15 2002
EXPIRATION DATE: APR 14 2004
PROJECT: IW-1, IW-2 and MW-1

GENERAL CONDITIONS:

The following General Conditions are referenced in Florida Administrative Code Rule 62-528.307.

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit are "permit conditions" and are binding and enforceable pursuant to Section 403.141, F.S.

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.

3. As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor 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 this permit.

4. This permit conveys no title to land, 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 to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefrom; 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.

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, or are 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 credentials 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 conditions of this 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 will 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 noncompliance; and
   b. The period of noncompliance, including dates and times; or, if not corrected the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent the recurrence of the noncompliance. 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 for 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 proscribed by Sections 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.

11. This permit is transferable only upon Department approval in accordance with rules 62-4.120 and 62-528.350, F.A.C. 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. 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 shall be extended automatically unless the Department determines that the records are no longer required.

    b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including 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;
        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.

    d. The permittee shall furnish to the Department, within the time requested in writing, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.

    e. If the permittee becomes aware that 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.

14. All applications, reports, or information required by the Department shall be certified as being true, accurate, and complete.

15. 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 scheduled date.

16. 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.

17. 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.

18. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

19. This permit may be modified, revoked and reissued, or terminated for cause, as provided in 40 CFR Sections 144.39(a), 144.40(a), and 144.41 (1998). 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.

20. The permittee shall retain all records of all monitoring information concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under Rule 62-528.435, F.A.C. The permittee shall deliver the records to the Department office that issued the permit at the conclusion of the retention period unless the permittee elects to continue retention of the records.

21. 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. All reports shall contain the certification required in Rule 62-528.340(4), F.A.C.

22. The permittee shall notify the Department as soon as possible of any planned physical alterations or additions to the permitted facility. In addition, prior approval is required for activities described in Rule 62-528.410(1)(h), F.A.C.

23. 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.

24. The permittee shall report any noncompliance which may endanger health or the environment including:

    a. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
    b. 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.

1. GENERAL REQUIREMENTS

a) This permit is to construct and operationally test the City of Hollywood Southern Regional WWTP Class I injection wells, IW-1, IW-2 and an associated dual zone Floridan Aquifer monitor well, MW-1. This permit does not authorize the construction or testing of any other well or wells associated with the City of Hollywood Southern Regional WWTP, except as specified in this permit.

b) If injection is to continue beyond the expiration date of this permit the permittee shall apply for, and obtain an operation permit. If necessary to complete the two-year operational testing period, the permittee shall apply for renewal of the construction permit at least 60 days prior to the expiration date of this permit.

c) 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.

d) 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.

e) Pursuant to Rule 62-4.080(3), F.A.C., a permittee may request that a permit be extended as a modification of an existing permit. A request for an extension is the responsibility of the permittee and shall be submitted to the Department before the expiration of the permit. In accordance with Rule 62-4.070(4), F.A.C., a permit cannot be extended beyond the maximum 5 year statutory limit. Should operational testing need to continue beyond 5 year limit of this permit, the permittee must renew this construction permit.

2. SITE REQUIREMENTS

a) The measurement points for drilling and logging construction shall be surveyed and referenced to the National Geodetic Vertical Datum (NGVD) of 1983 prior to the onset of drilling activities for this injection well system.

b) The injection wells shall be surveyed by a Florida registered land surveyor for latitude and longitude and submitted on a site plan prior to commencement of construction activities.

c) A drilling and system construction schedule shall be submitted to the Department, the Underground Injection Control - Technical Advisory Committee (UIC-TAC) and the United States Environmental Protection Agency (USEPA), Region IV, Atlanta (special advisor to the UIC-TAC) prior to site preparation for the injection well system.

d) Four permanent surficial aquifer monitor wells, identified as Pad Monitor Wells (PMWs), shall be located at the corners of the injection well drilling pad(s) and identified by location number and pad location, i.e. NW, NE, SW, and SE. If located in a traffic area, the well head(s) must be protected by a traffic bearing enclosure and cover. Individual cover(s) must lock and be specifically marked to identify the well and its purpose.

i) These wells shall be sampled and analyzed prior to the onset of drilling for chlorides (mg/L), conductivity (μmhos/cm), temperature, and water level (relative to NGVD). Initial analyses must be submitted prior to the initiation of work.

ii) These wells are to be retained in service, sampled weekly for the above parameters during the construction phase and quarterly thereafter.

iii) These wells shall also be sampled 48 hours prior to any maintenance, testing or repairs to the system which represent an increased potential for accidental discharge to the surficial aquifer.

iv) The results of these analyses shall be submitted to the Department within 30 days of the completion of the activity.

A copy of the FDEP Southeast District Summary Sheet is attached for your use when reporting the above information.

3. CONSTRUCTION AND TESTING REQUIREMENTS

a) The Department shall be notified within 48 hours after work has commenced.

b) A revised set of contract documents that includes this permit and approved specification changes documented in all responses to requests for information (RFIs) shall be submitted to the Department, the UIC-TAC and the USEPA prior to construction.

c) Blow-out preventers or equal shall be installed on the wells prior to penetration of the Floridan Aquifer System.

d) Monitor Well MW-1 shall not be drilled below the base of the Hawthorn Group, until testing to determine the lower limit of the Underground Source of Drinking Water (USDW) in the injection well pilot hole is completed and the results are submitted to the Department for approval.

e) Hurricane Preparedness - Upon the issuance of a "Hurricane Watch" by the National Weather Service, the preparations to be made shall include but are not limited to the following:

i) Secure all on-site chemicals, and other stockpiled additive materials to prevent surface and/or groundwater contamination.

ii) Properly secure drilling equipment and rig(s) to prevent damage to well(s) and on-site treatment process equipment as well as public property.

f) UIC-TAC and USEPA review and Department approval are required for the following stages of construction and testing, pursuant to Chapter 62-528, F.A.C.

i) Final updated contract documents, and project startup date

ii) Pre-construction monitoring data, results and interpretation of the shallow pad monitoring wells

ii) Intermediate injection well casing seat(s)

iii) Monitor zone selection and casing seat(s)

iii) Final injection well casing seat(s)

iv) Proposed cementing procedures (including cement volumes, number of stages) for the intermediate and final casing must be submitted with the caliper logs (reamed sections)

v) Short term injection testing

vi) Operational testing.

g) The formation evaluation program shall consist of the construction and geophysical logging program, the formation core sampling program and the packer testing program.

h) The construction and geophysical logging program shall be implemented in accordance with this permit and as proposed in the submittals dated January 2001 "Construction Permit Application - Southern Regional Wastewater Treatment Plant Deep Well Injection System for the City of Hollywood, Florida" and the "Response to RFI on IW-1 and IW-2 Permit Application Hollywood Southern Regional WWTP" dated September 13, 2001. All depths specified are approximate. Exact depths will be determined based on field conditions and are subject to the conditions of this permit. The program shall, at a minimum, include:

<u>Injection Wells IW-1 and IW-2</u>

58-inch hole (0-200 feet bpl):
caliper, gamma ray, temperature

Cement 50-inch casing (0-200 feet bpl):
temperature (after each cement stage)

50-inch borehole (160-1000 feet bpl):
caliper, gamma ray, temperature

Cement 42-inch casing (0-1000 feet bpl):
temperature (after each cement stage)

12-inch pilot hole (1000-2000 feet bpl):
caliper, gamma ray, dual induction, borehole compensated w/VDL, temperature-static and dynamic, fluid resistance-static and pumping, flowmeter-static and pumping, video survey (downhole and radial color TV survey with rotating lens), borehole televiewer

42-inch borehole (1000-2000 feet bpl):
caliper, gamma ray, temperature

Cement 34-inch casing (0-2000 feet bpl):
temperature-static, after each cement stage

12-inch pilot hole (2000-3000 feet bpl):
caliper, gamma ray, dual induction, borehole compensated w/VDL, temperature-static and dynamic, fluid resistivity-static and pumping, flowmeter-static and pumping, video survey (downhole and radial color TV survey with rotating lens), borehole televiewer

Ream 34-inch hole (2000-3000 feet bpl):
caliper, gamma ray, temperature

Cement 24-inch casing (0-3000 feet bpl):
temperature-static, after each cement stage, cement bond log with variable density display before cementing and after cementing

Complete well (3000 to 3500 feet bpl):
caliper, gamma ray, dual induction, borehole compensated w/VDL, temperature-static, fluid resistivity-static, video survey (downhole and radial color TV survey with rotating lens)

Monitor Well MW-1

32-inch borehole (0-200 feet bpl):
caliper, gamma ray, temperature

Cement 24-inch casing (0-200 feet bpl):
temperature-static, after each cement stage

24-inch borehole (160-1450 feet bpl):
caliper, gamma ray, dual induction, borehole compensated w/VDL

Cement 16-inch casing (0-1400 feet bpl) for upper monitoring zone:
temperature-static, after each cement stage, cement bond log with variable density display before cementing and after cementing

16-inch borehole (1400-1700 feet bpl):
caliper, gamma ray, dual induction, borehole compensated w/VDL, temperature-static and dynamic, fluid resistivity-static and pumping, flowmeter-static and pumping, video survey (downhole and radial color TV survey with rotating lens), borehole televiewer

Cement 6-inch casing (0-1650 feet bpl) for lower monitoring zone:
temperature-static, after each cement stage, cement bond log with variable density display before cementing and after cementing

The pumping logs for IW-1, IW-2 and MW-1 shall be run while pumping the borehole at a rate that adequately stresses the confining units, as shown by head loss across the beds, and allows the log interpreter to clearly identify the confining beds.

i) The formation core sampling program shall be implemented in accordance with this permit and as proposed in the submittals dated January 2001 "Construction Permit Application - Southern Regional Wastewater Treatment Plant Deep Well Injection System for the City of Hollywood, Florida" and the "Response to RFI on IW-1 and IW-2 Permit Application Hollywood Southern Regional WWTP" dated September 13, 2001. Exact depths will be determined based on field conditions and are subject to the conditions of this permit. The program shall, at a minimum, include five cores per injection well, taken from the base of the USDW to the top of the injection interval, at intervals which are to be field determined.

j) The packer testing program shall be implemented in accordance with this permit and as proposed in the submittals dated January 2001 "Construction Permit Application - Southern Regional Wastewater Treatment Plant Deep Well Injection System for the City of Hollywood, Florida" and the "Response to RFI on IW-1 and IW-2 Permit Application Hollywood Southern Regional WWTP" dated September 13, 2001. The program shall, at a minimum, include eight packer tests per injection well, at intervals which are to be field determined:

i) At least one straddle packer test conducted in each prospective monitor zone.

ii) At least 4 straddle packer tests conducted from the lowermost zone of the USDW to the top of the proposed injection horizon. These packer tests shall be used for the demonstration of confinement. For this reason the packer tests will be performed in the anticipated confining zones, from the base of the USDW to the top of the injection interval.

iii) Water samples shall be collected from each packer test, and analyzed for total dissolved solids, chlorides, conductivity, total nitrogen, nitrate, nitrite, organic nitrogen, ammonia, total Kjeldahl nitrogen and sulfate. A 5 gallon water sample from intervals where sufficient water is available, shall be collected at the end of the packer test. These samples shall be shipped to the Underground Injection Control Section of the Department of Environmental Protection, in Tallahassee.

k) The depth of the USDW and the background water quality of the monitor zones shall be determined during drilling and testing. Determination of the depth of the USDW, as a minimum, shall include:

i) Water samples from packer tests with analysis and interpretation

ii) Geophysical logging upon reaching the total depth of the appropriate pilot hole interval using the following logs: caliper, gamma, dual induction, borehole compensated sonic, pumping flow meter, temperature, and fluid resistivity.

iii) Plots of sonic porosity and apparent formation fluid resistivity (RWA). Interpretation will include the calculation of sonic porosity and RWA, and the input parameters used will be provided.

l) The confinement of the injection zone in the injection well system from overlying aquifers shall be monitored by the dual zone monitor well and a regular monitoring program. The lower interval is to be ideally positioned in a transmissive interval below the lowermost USDW, (i.e., where ground water has greater than 10,000 mg/L total dissolved solids, at an appropriate point above the injection interval and major confining units) to monitor for reasonable assurance of vertical confinement of injected fluids and external mechanical integrity of the injection wells. The upper interval shall ideally be positioned in a transmissive interval immediately above the base of the lowermost USDW, (i.e., where ground water has less than 10,000 mg/L total dissolved solids). If a sufficiently transmissive zone is not present below the lowermost 10,000 mg/L TDS interface and above the top of the injection horizon, as defined by testing during drilling, a sufficiently transmissive zone above the base of the lowermost USDW shall be utilized as the lower monitor zone and the upper monitor zone shall be established in lowermost interval within the USDW. The data and analysis supporting the selection of these monitoring intervals must be submitted to the Department, the UIC-TAC and the USEPA, Region IV, Atlanta after the collection, interpretation and analysis of all pertinent cores, geophysical logs and analysis of fluid samples. The hydrogeologic evaluation of the proposed monitoring zone will be submitted only after the collection, interpretation and analysis of all pertinent cores, packer tests, geophysical logs and analysis of fluid samples. The final selection of the specific upper and lower monitoring intervals shall be approved by the Department.

m) To identify the upper and lower monitoring zones, as a minimum, the following information from the injection well shall be analyzed, interpreted and submitted: borehole televiewer, the permeability of the transition zone in the vicinity of the USDW, packer test data including water quality (total dissolved solids, chloride, ammonia, total Kjeldahl nitrogen, and conductivity), the specific capacity of the upper and lower monitor zones, and the identification of the base of the USDW.

n) Recommended casing depths in IW-1, IW-2 and the monitor intervals in MW-1 shall be accompanied by technical justification, geophysical logs with engineering and geological interpretations and water quality data. Department approval shall be based on the permittee's presentation that shows compliance with Department rules and this permit.

o) Confinement shall be demonstrated using, at a minimum, directly measured lithologic properties, geophysical evidence, and tests performed while pumping the formation, as described in items i) through iv) below:

i) Formation tests shall include flow meter logs, packer tests, water quality sampling during packer tests, and analysis of drawdown curves measured during packer tests. These tests shall be conducted under pumping conditions to directly measure hydraulic properties of the confining beds.

ii) For the purpose of determining confinement, flow meter, temperature and fluid resistivity logs shall be run in the pilot hole from the base the USDW to the potential confining unit immediately prior to the intersection of the top of the injection interval, under pumping conditions, at a pumping rate that adequately stresses the confining beds (as demonstrated by head loss across the beds), so that the permeability of the zones within the potential confining intervals can be evaluated.

iii) Other geophysical logs will be used as indirect evidence to deduce or correlate formation properties measured in pumping tests and direct lithologic sample analysis.

iv) Lithologic properties measured in laboratory analyses of core samples shall include: hydraulic conductivity (vertical and horizontal) Young's modulus/elastic modulus formation factor, Archie's cementation exponent and coefficient, and specific gravity.

p) If effluent is encountered or suspected during pilot hole drilling and testing, the Department shall be notified immediately by telephone and in writing and immediate appropriate precautionary measures shall be taken to prevent any upward fluid movement. These measures include pumping barite through the drill rod to form a density balance plug to prevent any upward fluid movement. The permittee will then provide full documentation of the event to the Department which will include, but not be limited to, geophysical logging, packer testing and thief sampling. If the presence of effluent is confirmed, the permittee will notify the Department of its plan to place a cement plug or drillable packer assembly just above the documented presence of effluent, prior to continuation of testing of the pilot hole.

q) Mechanical integrity of the injection well system shall be determined pursuant to Rule 62-528.300(6)(b)2, and (c), F.A.C.

i) The pressure test shall be accepted if tested with a liquid filled casing at 1.5 times the expected operating pressure with a test tolerance of not greater than + or - 5 percent.

ii) Verification of pressure gauge calibration must be provided to the Department representative at the time of the test and in the certified test report.

iii) Pad monitor wells shall be sampled and waters analyzed for water depth, chloride, total dissolved solids, temperature and conductivity one week prior to the onset of the mechanical integrity testing. (A copy of the SED reporting sheet is attached.)

r) UIC-TAC meetings are scheduled on the second and fourth Tuesday of each month subject to a five working day prior notice and timely receipt of critical data by all UIC-TAC members and the USEPA. Emergency meetings may be arranged when justified to avoid undue construction delays.

s) Department approval at a scheduled UIC-TAC meeting shall be based on the permittee's presentation that shows compliance with Department rules and this permit.

t) No drilling operations shall begin without an approved disposal site for drilling fluids, cuttings, or waste. It shall be the permittee's responsibility to obtain the necessary approval(s) for disposal prior to the start of construction.

u) Waters spilled during construction or testing shall be contained and properly disposed.

v) An interpretation of all test results and geophysical logs must be submitted with all submittals.

4. QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

a) Pursuant to Rule 62-528.440(5)(b), F.A.C., the Professional Engineer(s) of Record shall certify all documents related to the completion of the Class I injection well system (including the associated Floridan Aquifer monitor well) as a disposal facility. The Department shall be notified immediately of any change of the Engineer(s) of Record.

b) In accordance with Chapter 492, F.S., all documents prepared for the geological/hydrogeological evaluation of this injection well system shall be signed and sealed by a Florida Licensed Professional Geologist or qualified Florida Registered Professional Engineer.

c) Continuous on-site supervision by qualified personnel (engineer and/or geologist) is required during all testing, geophysical logging and cementing operations.

5. REPORTING REQUIREMENTS

a) All reports and surveys required by this permit shall be submitted concurrently to all the members of the Technical Advisory Committee and the United States Environmental Protection Agency, Region IV, Atlanta (UIC-TAC). The UIC-TAC shall consist of representatives from these agencies:

Department of Environmental Protection, West Palm Beach and Tallahassee
United States Geological Survey (USGS), Miami
South Florida Water Management District (SFWMD), West Palm Beach
Broward County Department of Natural Resources Protection (BCDNRP)
Special Advisors to the UIC-TAC: US Environmental Protection Agency (USEPA), Region IV, Atlanta

b) The Department and other applicable agencies must be notified of any unusual or abnormal events occurring during construction, and in the event the Permittee is temporarily unable to comply with the provisions of the permit (e.g., on-site spills, artesian flows, large volume circulation losses, equipment damage due to: fire, wind and drilling difficulties, etc.). 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.

c) The Department shall be notified at least 72 hours prior to all testing for mechanical integrity.

d) All testing for mechanical integrity must be initiated during normal business hours, Monday through Friday.

e) The permittee shall submit weekly construction progress reports no later than the 7th day immediately following the week of record. These reports shall include, at a minimum, the following information:

- i) A cover letter summary of the daily engineer report, driller's log and a projection for activities in the next reporting period.
- ii) Daily engineers reports and work log with detailed descriptions of all drilling progress, cementing, testing, logging, and casing installation activities with appropriate interpretations.

iii) Lithologic and geophysical logs and water quality test results, with interpretations.

iv) An interpretation of all test results and geophysical logs as they relate to the week's activities, submitted with the latest test results and logs, submitted under ii) and iii) above.

v) Detailed description of any unusual construction-related events that occur during the reporting period.

vi) Weekly water quality analysis and water levels for the four pad monitor wells. [See Specific Condition (SC) 2d]

vii) A certified evaluation of all logging and test results must be submitted with test data.

viii) Description of the formations encountered.

ix) Details of cementing operations including the following information, for each stage of cement: cement slurry composition, specific gravity, pumping rate, volume of cement pumped, theoretical fill depth, actual tag depth. And from both the physical tag and the geophysical logs, a percent fill, and an explanation of any variation between actual versus theoretical fill. For each casing, laboratory analysis of dry cement composition of a sample taken during the neat cement stage emplaced at the base of each casing.

x) An evaluation and interpretation of all test results shall be submitted with all test data.

f) Upon completion of analysis of cores and sample cuttings recovered during the construction of the monitor well and the injection well, the permittee shall contact the Underground Injection Control Section of the Department of Environmental Protection in Tallahassee to arrange for their transfer to the Florida State Geologic Survey.

g) Casing seat requests, as a minimum, shall include technical justification utilizing the following information:

Lithologic and geophysical logs with interpretations
Water quality data
Identification of confining units
Identification of monitoring zones
Drilling rate and weight on bit data, with interpretations related to the casing seat
Casing depth evaluation (mechanically secure formation, potential for grout seal)
Identification of the base of the USDW using water quality, RWA plots, and log interpretations

h) The injection test request shall, as a minimum, include technical justification utilizing the following:

Cement bond logs and interpretation (prior to, as well as, following the cementing of the tubing)
Temperature logs performed after each cementing stage
Theoretical versus actual cement calculations
Final downhole TV survey with interpretation
Water quality analysis of injection fluid from every source
Planned injection procedures
All required weekly progress report information must be current, and received by the Department
Certification of mechanical integrity and test results, with interpretation, including a copy of all logs and final video survey

i) Monitor zone requests shall, as a minimum, include technical justification utilizing the following:

Identification of the base of the USDW
Identification of confining beds
Water quality of proposed monitor zone
Transmissivity or specific capacity of proposed monitor zone
Packer test drawdown curves and interpretation

k) A final report of the construction and testing of the injection well and dual zone monitor well, shall be submitted no later than 120 days after commencement of operational testing, pursuant to Rule 62-528.430(1)(e), F.A.C. This report shall include, as a minimum, definitions of the injection interval, all relevant confining beds, the depth of the base of the USDW and all monitor zones, including all relevant data and interpretations.

6. OPERATIONAL TESTING REQUIREMENTS

a) The operational testing of the Class I injection well system under this permit shall not commence without written authorization from the Department.

b) Operational testing. Prior to operational testing, the permittee shall comply with the requirements of Rule 62-528.450(3)(a), (b) and (c), F.A.C.

c) Prior to operational testing approval, the following items must be submitted (with a request for operational testing approval) for UIC-TAC and USEPA review and Department approval:

i) Certification of completion of well construction and well construction drawings. The well construction drawings shall include a geologic stratigraphic cross section depicting the corresponding formations, the base of the USDW, and the boundaries of the confining and injection zone intervals.

ii) Data from the short term injection testing with interpretation, conducted pursuant to Rules 62-528.405(3)(a), 62-528.410(7)(e) and 62-528.450(3)(a)2., F.A.C. Each well shall first be tested for integrity of construction, and shall be followed by a short term injection test of such duration to allow for the prediction of the operating pressure. This test shall be conducted for a minimum of 24 hours at the maximum rate at which the well is to be permitted. Pressure/water level data from the injection well and both monitor zones shall be recorded continuously for at least 24 hours before the test and at least 12 hours following the test.

iii) A copy of the borehole television survey with interpretation.

iv) Lithologic and geophysical logs with interpretations.

v) Certification of mechanical integrity and interpretation of the test data.

vi) A description of the actual injection procedure including the anticipated maximum pressure and flow rate at which the well will be operated under normal and emergency conditions.

vii) Information concerning the compatibility of the injected waste with fluids and minerals in the receiving zone.

viii) Surface equipment (including pumping station, piping, pressure gauges and flow meters, and all appurtenances) completion certified by the engineer of record. Calibration certificates for pressure gauges and flow meters shall also be submitted.

ix) Signed and sealed record "as-built" engineering drawings of the injection well system including all well construction, the pump station, subsurface and surface piping and equipment, and appurtenances. These drawings shall include the location of sampling points for injectate and the dual monitor zone samples.

x) Draft operating and maintenance manual, including a description of water hammer control, with emergency discharge management plan procedures. The emergency discharge system must be fully constructed and operational prior to approval of operational testing.

xi) The demonstration of confinement prepared providing confirmation of confinement and defining the injection and confining sequences utilizing data collected during the drilling, logging and testing of the injection well and dual zone monitor well. The report shall include the results of hydraulic testing (permeability, porosity, etc.) on the cores, and shall be reviewed and updated as appropriate after the completion of any additional injection/monitor well pairs in the future from the confining interval. This submittal shall be prepared, signed, and sealed by a Florida Registered Professional Geologist or qualified Registered Professional Engineer.

xii) Wastestream analysis, sampled within 6 months of the request for operational testing, for Primary and Secondary Drinking Water Standards (62-550, F.A.C.) and Minimum Criteria Parameters (62-520, F.A.C.) as attached.

xiii) Background water quality data from the monitor and injection zones, analyzed for primary and secondary drinking water standards (62-550, F.A.C.) and minimum criteria parameters (62-520, F.A.C.) as attached.

xiii) A controlled monthly test of well injectivity (rate/pressure) shall be conducted in accordance with Rule 62-528.430(2)(d), F.A.C. The rate should approach maximum design flow. For reporting the injectivity test results, a summary sheet and sample graph from the FDEP Southeast District UIC Section is attached. The injectivity test results shall be reported to the Department in the MORs. The following data shall be recorded and reported at each injection rate:

i) injection flow rate (MGD)
ii) injection pressure (psig)
iii) wellhead pressure with no flow (shut-in pressure in psig)
iv) monitor zone pressures (psig)

All readings shall be taken after a minimum 5 minute period of stabilized flow.

Pursuant to Rule 62-528.430(2)(d), F.A.C., as part of the specific injectivity test, the well shall be shut-in for a period of time necessary to conduct a valid observation of pressure fall-off.

xiv) Other data obtained during well construction needed by the Department to evaluate whether the well will operate in compliance with Department Rules.

d) Prior to the authorization of operational testing by the Department, the permittee shall contact the Underground Injection Control Section of the Department, Southeast District, to arrange for a site inspection. The inspection will determine if all equipment has been installed, in compliance with the permit and Department rules, that is necessary to operate and monitor the injection well. During the inspection, emergency procedures and reporting requirements shall be reviewed.

7. OPERATIONAL TESTING CONDITIONS

a) Upon receipt of written authorization from the Department (SC 6a), the operational testing of the injection well system shall be subject to the following conditions:

b) The progress of the operational testing for the system shall extend for a 6 month period and may be reviewed during UIC-TAC meetings scheduled by the permittee at 3 months and 6 months after operational testing has begun. Reports evaluating the system's progress must be submitted to each member of the UIC-TAC and the USEPA, Region IV, Atlanta at least 2 weeks prior to the scheduled UIC-TAC meeting. The conditions for the operational testing period may be modified by the Department at each of these UIC-TAC review intervals.

c) Mechanical Integrity

i) Injection is prohibited until the permittee affirmatively demonstrates that the well has mechanical integrity. Prior to operational testing the permittee shall establish, and thereafter maintain the mechanical integrity of the well at all times.

ii) If the Department determines that the injection well lacks mechanical integrity, written notice shall be given to the permittee.

iii) Within 48 hours of receiving written notice that the well lacks mechanical integrity, unless the Department requires immediate cessation of injection, the permittee shall cease injection into the well unless the Department allows continued injection pursuant to iv) below.

iv) The Department shall allow the permittee to continue operation of a well that lacks mechanical integrity if the permittee has made a satisfactory demonstration that fluid movement into or between USDWs is not occurring .

d) Any failure of the Class I injection well monitoring and recording equipment for a period of more than 48 hours shall be reported within 24 hours to the Department. An written report describing the incident shall also be given to the Department within 5 days of the start of the event. The final report shall contain a complete description of the occurrence, a discussion of its cause(s) and the steps being taken to reduce, eliminate, and prevent recurrence of the event, and all other information deemed necessary by the Department.

e) No underground injection is allowed that causes or allows movement of fluid into an underground source of drinking water.

f) The permittee shall report any noncompliance which may endanger health or the environment, including:

i) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or

ii) 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.

iii) Any information shall be provided orally within 24 hours of 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 condition shall contain a written 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.

g) The injection well system shall be monitored in accordance with Rules 62-528.425(1)(g) and 62-528.430(2), F.A.C. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The following injection well performance and monitor zone data shall be recorded and reported in the Monthly Operating Report (MOR) as indicated below.

(i) Injection well performance:

(1) Physical characteristics of the injection well:

Flow rate parameters:

- average daily flow rate to injection well (MGD)
- daily maximum sustained (15 minutes minimum) flow rate injection well (MGD)
- daily minimum sustained (15 minutes minimum) flow rate to injection well (MGD)
- monthly average of the daily flow rates to injection well (MGD)
- monthly maximum (peak hour) flow rate to injection well (MGD)
- monthly minimum flow rate to injection well (MGD)

Volume parameters:

- total daily flow to injection well (MG)
- monthly average of the daily flow volumes to injection well (MG)
- monthly maximum of the daily flow volumes to injection well (MG)
- monthly minimum of the daily flow volumes to injection well (MG)

Pressure parameters:

Injection pressure parameters:

- daily average injection pressure at injection well (psig)
- daily maximum sustained (15 minutes minimum) injection pressure at injection well (psig)
- daily minimum sustained (15 minutes minimum) injection pressure at injection well (psig)
- monthly average injection pressure at injection well (psig)
- monthly maximum sustained injection pressure at injection well (psig)
- monthly minimum sustained injection pressure at injection well (psig)

Miscellaneous:

- monthly wellhead pressure with no flow (shut-in pressure, psig)

(2) Chemical characteristics of the wastestream from the wet well sampled weekly:

- residue, total filterable (total dissolved solids, TDS) (mg/L)
- chloride (mg/L)
- specific conductance (temperature compensated, umhos/cm)
- fecal coliform (# of colonies/100 ml)
- total suspended solids (TSS) (mg/L)
- nitrogen, ammonia, total as N (ammonia) (mg/L)
- nitrogen, total Kjeldahl as N (TKN) (mg/L)
- nitrogen, nitrate, total as N (nitrate) (mg/L)
- phosphorous, total as P (mg/L)
- pH (standard units)
- temperature (°F)
- sulfate, total as SO4 (mg/L)
- sodium (mg/L)

The MORs shall indicate monthly averages.

(ii) Monitor well performance:

(3) Physical characteristics - upper and lower monitor zones potentiometric surface or water table height relative to NGVD of 1983 (feet of head) or pressure (psig) referenced to NGVD of 1983:

- daily maximum pressure or water level (as appropriate)
- daily minimum pressure or water level (as appropriate)
- daily average pressure or water level (as appropriate)
- monthly maximum pressure or water level (as appropriate)
- monthly minimum pressure or water level (as appropriate)
- monthly average pressure or water level (as appropriate)

(4) Chemical characteristics of the upper and lower monitor zones sampled weekly:

- residue, total filterable (total dissolved solids, TDS) (mg/L)
- chloride (mg/L)
- specific conductance (temperature compensated, umhos/cm)
- nitrogen, ammonia, total as N (ammonia) (mg/L)
- nitrogen, total Kjeldahl as N (TKN) (mg/L)
- nitrogen, nitrate, total as N (nitrate) (mg/L)
- phosphorous, total as P (mg/L)
- fecal coliform (#of col/100 ml)
- pH (standard units)
- temperature (°F)
- sulfate, total as SO4 (mg/L)
- sodium (mg/L)

The MORs shall also indicate monthly averages.

h) Weekly sampling as described above will be continued for a minimum of 6 months. At that time the permittee may submit data for UIC-TAC and USEPA review and Department approval to demonstrate that reasonable assurance of groundwater stability has been established in justification of any written request to reduce the sampling frequency to monthly sampling.

i) A wastestream analysis (24 hour composite sample) for primary and secondary drinking water standards (Chapter 62-550, F.A.C.) and minimum criteria, see attached list, must be submitted annually (sampled 30 days after startup of the WTP and submitted within 120 days of the sampling date). VOC parameters and biological parameters shall be sampled either in-situ or grab.

j) A minimum of 3 well volumes of fluid shall be evacuated from the monitor systems prior to sampling for the chemical parameters listed above. All samples shall be analyzed by a state-certified laboratory. Sufficient purging shall have occurred when either of the following have occurred:

i) pH, specific conductivity <u>and</u> temperature when sampled, upon purging the third or subsequent well volume, each vary less than 5% from that sampled upon purging the previous well volume; or

ii) upon purging the fifth well volume

k) The flow to the injection well at the wellhead shall be monitored and controlled at all times to ensure the maximum fluid velocity down the well does not exceed that rate at which the well was tested, proposed to be a peak hourly flow rate of 10 feet per second-during normal operation, and when the permittee provides the Department with reasonable assurances that higher velocities will not compromise the integrity or operation of the injection well, then the injection well may be operated at 12 feet per second during planned testing, maintenance, or emergency conditions.

l) The pressure at the well head shall be monitored and controlled at all times to ensure the maximum pressures on the final casing and the tubing and packer does not exceed 66 percent of the mechanical integrity test pressures.

m) Pursuant to Rule 62-528.425(1)(b), F.A.C., the injection well system shall be monitored at all times by continuous indicating, recording and totalizing devices for flow rate and volume, and the pressure in all monitoring zones. The permittee shall calibrate all pressure gauges, flowmeters, chart recorders, and other related equipment associated with the injection well system on an annual basis. The permittee shall maintain all monitoring equipment and shall ensure that the monitoring equipment is calibrated and in proper operating condition at all times. Laboratory equipment, methods, and quality control will follow EPA guidelines as expressed in Standard Methods for the Examination of Water and Wastewater. The pressure gauges, flow meter, and chart records shall be calibrated using standard engineering methods. The monitoring zone pressures shall be referenced to the National Geodetic Vertical Datum (NGVD) of 1983, and the MOR shall reference the pressures to NGVD.

n) A qualified representative of the Engineer of Record must be present for the start-up operations.

o) All required data submissions, including Monthly Operating Reports (MORs), shall be clearly identified on each page with Facility Name, ID Number, permit number, date of sampling/recording, operator's name, license and telephone number, and type of data shown. (Monitor zones will be identified by monitor well number and depth interval.) The lead plant operator or higher official must sign and date each submittal. An approved copy (MOR summary sheet) from the FDEP Southeast District, UIC Section is attached for your use.

p) The permittee shall submit monthly to the Department the results of all injection well and monitor well data required by this permit no later than the last day of the month immediately following the month of record. The results shall be sent to the Florida Department of Environmental Protection, Southeast District, Underground Injection Control Section, Post Office Box 15425, West Palm Beach, Florida, 33416. A copy of this report shall also be sent to the Florida Department of Environmental Protection, Underground Injection Control Program, MS 3530, 2600 Blair Stone Road, Tallahassee, Florida, 32399-2400.

q) The Department must be notified in writing of the date of start-up of operations.

8. SURFACE EQUIPMENT

a) The surface equipment for the injection well system shall maintain compliance with Chapter 62-600, F.A.C. for water hammer control, screening, access for logging and testing, reliability and flexibility in the event of damage to the well and concentrate piping. A regular program of exercising the valves integral to the well head shall be instituted. At a minimum, all valves integral to the injection well system shall be exercised during the regularly scheduled quarterly injectivity testing.

b) The injection well and monitoring well surface equipment and piping shall be kept free of corrosion at all times.

c) Spillage onto the injection well pad during construction activities, and any waters spilled during mechanical integrity testing, other maintenance, testing or repairs to the system shall be contained by an impermeable wall around the edge of the pad and directed to a sump pump which in turn discharges to the pumping station wet well or via other approved means to the injection well system.

d) The injection well construction pad with impermeable perimeter retaining wall shall be maintained and retained in service for the life of the injection well. The injection and monitoring well pad(s) are not, unless specific approval is obtained from the Department, to be used for storage of any material or equipment at any time.

e) The four surficial aquifer monitor wells installed at the corners of the injection well pad shall be secured, maintained, and retained in service.

f) The integrity of the monitor zone sampling systems shall be maintained at all times. Sampling lines shall be clearly and unambiguously identified by monitoring zone at the point at which samples are drawn. All reasonable and prudent precautions shall be taken to insure that samples are properly identified by monitor zone and that samples obtained are representative of those zones. Sampling lines and equipment shall be kept free of contamination with independent discharges and no interconnections with any other lines.

9. FINANCIAL RESPONSIBILITY

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

b) The permittee shall review annually the plugging and abandonment cost estimates. An increase of 10 percent or more over the cost estimate upon which financial responsibility is based shall require the permittee to submit documentation to obtain an updated Certificate of Demonstration of Financial Responsibility.

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

10. EMERGENCY DISPOSAL

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

b) Any proposed changes in emergency disposal methods shall be submitted for UIC-TAC and USEPA review and Department approval prior to implementation.

c) The alternate disposal method shall be maintained in working order at all times.

d) In the event of an emergency and/or discharge, or other abnormal event where the permittee is temporarily unable to comply with any of the conditions of this permit due to breakdown of equipment, power outages, destruction by hazard or fire, wind, or by other cause, the Department shall be notified in person or by telephone within 24 hours of the incident. A written report describing the incident shall also be submitted to the Department within 5 days of the start of the incident. The written report shall contain a complete description of and discuss the cause of the emergency and/or discharge, and if it has been corrected, the anticipated time the discharge is to continue, the steps being taken to reduce, eliminate, and prevent recurrence of the event, and all other information deemed necessary by the Department.

11. SIGNATORIES AND CERTIFICATION REQUIREMENTS

a) 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.

b) 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 on 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."

Issued this 15th day of April, 2002

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Melissa L Meeker

Melissa L. Meeker
Director of District Management

MLM/LAH/JRM/HVW

SOUTHEAST DISTRICT UIC SECTION

SURFICIAL AQUIFER MONITOR WELL QUARTERLY REPORT

FACILITY NAME ______________________ REPORT MO/YR. ______________________

OPERATOR NAME ______________________ LICENSE #______________________

I.D.NUMBER ______________________ PERMIT #______________________

INJECTION WELL #______________________

SAMPLING DATE______________________ TIME______________________

	PMW #1	PMW #2	PMW #3	PMW #4
LOCATION	NE CORNER	NW CORNER	SE CORNER	SW CORNER
ELEVATION OF TOC (NGVD)				
DEPTH TO WATER (TOC)				
WATER LEVEL (NGVD)				
CHLORIDES (MG/L.)				
CONDUCTIVITY (UMHOS)				
TEMPERATURE (F)				

ANALYZED BY:______________________ SAMPLED BY:______________________

PHONE #______________________ TITLE______________________

SITE PLAN OF PMW LOCATIONS

UNDERGROUND INJECTION CONTROL

INJECTIVITY TESTING SUMMARY SHEET

FACILITY______________________________

TIME

Deep Injection Well System
Injectivity Testing

Injection Well No. :

DATE OF TEST:

FDER PERMIT No.:

	START	SHUT-IN PRESSURE
	MINS AFTER SHUT -IN	CALIBRATED PRESSURE GAUGE AT WELL HEAD (PSI)
	10	
	20	
	30	

____
Signature of Lead Operator

Were Wellhead Valves Exercised ________YES ________NO

COLUMN: 1	2	3	4	5	6	7	8	9	10
TIME	INJECTION WELL SHUT-IN PRESSURE AFTER 30 MINUTES (PSI)	PUMP NUMBER(S) ON-LINE	INJECTION RATE (gpm) or (mgd)	Injection Pressure after 10 minutes of pumping		PRESSURE DIFFERENTIAL (Col 5 - Col 2)	INJECTIVITY INDEX (Col 4 divide by Col 7)	UPPER MONITOR ZONE IN FEET OF HEAD ABOVE NGVD (FEET)	LOWER MONITOR ZONE IN FEET OF HEAD ABOVE NGVD (FEET)
				CALIBRATED GAUGE AT INJECTION WELLHEAD (PSI)	PRESSURE RECORDER (PSI)	FROM CALIBRATED PRESSURE GAUGE AT INJECTION WELLHEAD (PSI)	FROM CALIBRATED PRESSURE GAUGE AT INJECTION WELLHEAD (GPM / PSI)		

NOTES

1. INJECTIVITY INDEX (GPM/PSI) = INJECTION RATE (GPM) (COLUMN 4)
   ____
   (INJECTION PRESSURE (PSI) - (SHUT-IN PRESSURE (PSI)
   (COLUMN 5) (COLUMN 2)

2. FOR MORE INFORMATION REGARDING EXECUTION OF THIS TEST CONSULT THE INJECTIVITY TESTING PROTOCOL IN THE O&M MANUAL

UN RGROUND INJECTION CO ROL

DATE OF TEST :

PERMIT NO. :

WELL NO.

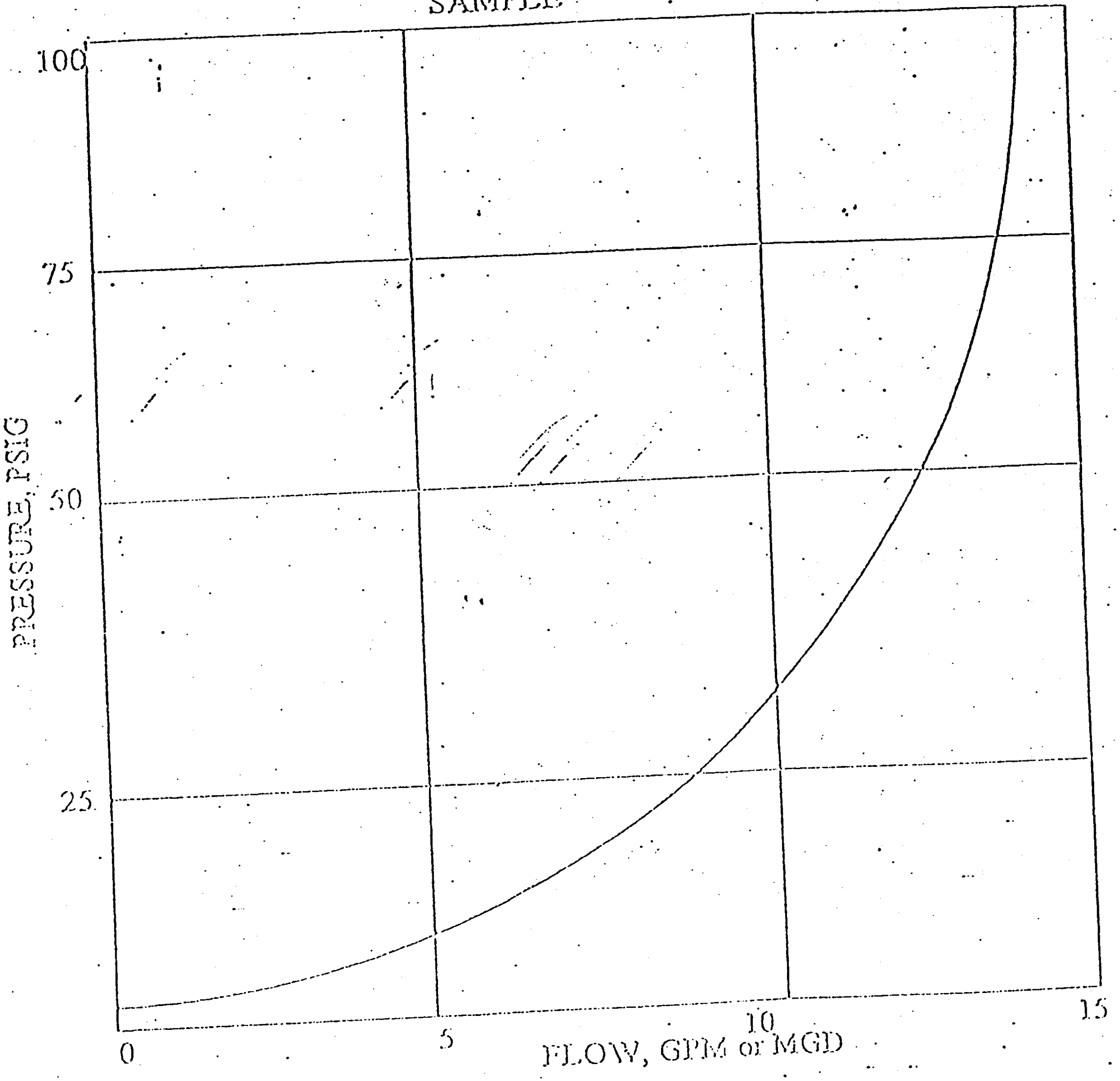
FACILITY :

I.D. # :

LEAD OPERATOR
SIGNATURE

INJECTIVITY TEST

SAMPLE



PRIMARY STANDARDS DRINKING WATER STANDARDS

Updated September 1998

PARAMETER

Alachlor
Aldicarb
Aldicarb sulfoxide
Aldicarb sulfone
Aroclors (Polychlorinated Biphenyls or PCB's)
Alpha, Gross
Antimony
Arsenic
Atrazine
Barium
Benzene
Benzo(a)pyrene
Beryllium
Bis(2-ethylhexyl) adipate (Di(2-ethylhexyl) adipate)
Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)
Cadmium
Carbofuran
Carbon Tetrachloride (Tetrachloromethane)
Chlordane
Chlorobenzene (Monochlorobenzene)
Chloroethylene (Vinyl Chloride)
Chromium
Coliforms, Total
Cyanide
2,4-D (2,4-Dichlorophenoxyacetic acid)
Dalapon (2,2-Dichloropropionic acid)
Dibromochloropropane (DBCP)
1,2-Dibromoethane (EDB, Ethylene Dibromide)
1,2-Dichlorobenzene (o-Dichlorobenzene)
1,4-Dichlorobenzene (p-Dichlorobenzene or Para Dichlorobenzene)
1,2-Dichloroethane (Ethylene dichloride)
1,1-Dichloroethylene (Vinylidene chloride)
cis-1,2-Dichloroethylene (1,2-Dichlorethylene)
trans-1,2-Dichloroethylene (1,2-Dichlorethylene)
Dichloromethane (Methylene chloride)
1,2-Dichloropropane
Di(2-ethylhexyl) adipate (Bis(2-ethylhexyl) adipate)
Di(2-ethylhexyl) phthalate (Bis(2-ethylhexyl) phthalate)
Dinoseb
Diquat
EDB (Ethylene dibromide, 1,2-Dibromoethane)
Endothall
Endrin
Ethylbenzene
Ethylene dichloride (1,2-Dichloroethane)
Fluoride
Glyphosate (Roundup)
Gross Alpha
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene (HCB)
gamma-Hexachlorocyclohexane (Lindane)
Hexachlorocyclopentadiene
Lead
Lindane (gamma-Hexachlorocyclohexane)
Mercury
Methoxychlor
Methylene chloride (Dichloromethane)
Monochlorobenzene (Chlorobenzene)
Nickel
Nitrate (as N)
Nitrite (as N)
Total Nitrate + Nitrite (as N)
Oxamyl
Pentachlorophenol
Perchloroethylene (Tetrachloroethylene)
Picloram
Polychlorinated biphenyl (PCB or Aroclors)
Radium
Roundup (Glyphosate
Selenium
Silver
Silvex (2,4,5-TP)
Simazine
Sodium
Styrene (Vinyl benzene)
Tetrachloroethylene (Perchloroethylene)
Tetrachloromethane (Carbon Tetrachloride)
Thallium
Toluene
Toxaphene
2,4,5-TP (Silvex)
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene, TCE)
Trihalomethanes, Total
Vinyl Chloride (Chloroethylene)
Xylenes (total)

SECONDARY DRINKING WATER STANDARDS

- Aluminum
- Chloride
- Color
- Copper
- Corrosivity
- Ethylbenzene
- Fluoride
- Foaming Agents (MBAS)
- Iron
- Manganese
- Odor
- pH
- Silver
- Sulfate
- Toluene
- Total Dissolved Solids (TDS)
- Xylenes
- Zinc

MUNICIPAL WASTEWATER MINIMUM CRITERIA GROUND WATER MONITORING PARAMETERS

INORGANICS	Ammonia
	Nitrogen (organic)
	Orthophosphate (soluble)
	Phosphorus
	Total Kjeldahl Nitrogen
VOLATILE ORGANICS	Chloroethane
	Chloroform
	para-Dichlorobenzene
	1,2-Dichloroethylene (cis-1,2-Dichloroethylene or trans-1,2-Dichloroethylene)
Base/Neutral Organics	Anthracene
	Butylbenzylphthallate
	Dimethylphthallate
	Naphalene
	Phenanthrene
PESTICIDES AND PCBs	Aldrin
	Dieldrin
	Dioxin
Acid Extractables	2-chlorophenol
	Phenol
	2,4,6-trichlorophenol
Other	Conductivity
	Biological Oxygen Demand
	Temperature

PRIMARY STANDARDS DRINKING WATER STANDARDS
Updated September 1998

PARAMETER

- Alachlor
- Aldicarb
- Aldicarb sulfoxide
- Aldicarb sulfone
- Aroclors (Polychlorinated Biphenyls or PCB's)
- Alpha, Gross
- Antimony
- Arsenic
- Atrazine
- Barium
- Benzene
- Benzo(a)pyrene
- Beryllium
- Bis(2-ethylhexyl) adipate (Di(2-ethylhexyl) adipate)
- Bis(2-ethylhexyl) phthalate (Di(2-ethylhexyl) phthalate)
- Cadmium
- Carbofuran
- Carbon Tetrachloride (Tetrachloromethane)
- Chlordane
- Chlorobenzene (Monochlorobenzene)
- Chloroethylene (Vinyl Chloride)
- Chromium
- Coliforms, Total
- Cyanide
- 2,4-D (2,4-Dichlorophenoxyacetic acid)
- Dalapon (2,2-Dichloropropionic acid)
- Dibromochloropropane (DBCP)
- 1,2-Dibromoethane (EDB, Ethylene Dibromide)
- 1,2-Dichlorobenzene (o-Dichlorobenzene)
- 1,4-Dichlorobenzene (p-Dichlorobenzene or Para Dichlorobenzene)
- 1,2-Dichloroethane (Ethylene dichloride)
- 1,1-Dichloroethylene (Vinylidene chloride)
- cis-1,2-Dichloroethylene (1,2-Dichlorethylene)
- trans-1,2-Dichloroethylene (1,2-Dichlorethylene)
- Dichloromethane (Methylene chloride)
- 1,2-Dichloropropane
- Di(2-ethylhexyl) adipate (Bis(2-ethylhexyl) adipate)
- Di(2-ethylhexyl) phthalate (Bis(2-ethylhexyl) phthalate)
- Dinoseb
- Diquat
- EDB (Ethylene dibromide, 1,2-Dibromoethane)
- Endothall
- Endrin
- Ethylbenzene
- Ethylene dichloride (1,2-Dichloroethane)
- Fluoride
- Glyphosate (Roundup)
- Gross Alpha
- Heptachlor
- Heptachlor Epoxide
- Hexachlorobenzene (HCB)
- gamma-Hexachlorocyclohexane (Lindane)
- Hexachlorocyclopentadiene
- Lead
- Lindane (gamma-Hexachlorocyclohexane)
- Mercury
- Methoxychlor
- Methylene chloride (Dichloromethane)
- Monochlorobenzene (Chlorobenzene)
- Nickel
- Nitrate (as N)
- Nitrite (as N)
- Total Nitrate + Nitrite (as N)
- Oxamyl
- Pentachlorophenol
- Perchloroethylene (Tetrachloroethylene)
- Picloram
- Polychlorinated biphenyl (PCB or Aroclors)
- Radium
- Roundup (Glyphosate
- Selenium
- Silver
- Silvex (2,4,5-TP)
- Simazine
- Sodium
- Styrene (Vinyl benzene)
- Tetrachloroethylene (Perchloroethylene)
- Tetrachloromethane (Carbon Tetrachloride)
- Thallium
- Toluene
- Toxaphene
- 2,4,5-TP (Silvex)
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethylene (Trichloroethene, TCE)
- Trihalomethanes, Total
- Vinyl Chloride (Chloroethylene)
- Xylenes (total)

SECONDARY DRINKING WATER STANDARDS

Aluminum
Chloride
Color
Copper
Corrosivity
Ethylbenzene
Fluoride
Foaming Agents (MBAS)
Iron
Manganese
Odor
pH
Silver
Sulfate
Toluene
Total Dissolved Solids (TDS)
Xylenes
Zinc

MUNICIPAL WASTEWATER MINIMUM CRITERIA GROUND WATER MONITORING PARAMETERS

INORGANICS	Ammonia
	Nitrogen (organic)
	Orthophosphate (soluble)
	Phosphorus
	Total Kjeldahl Nitrogen
VOLATILE ORGANICS	Chloroethane
	Chloroform
	para-Dichlorobenzene
	1,2-Dichloroethylene (cis-1,2-Dichloroethylene or trans-1,2-Dichloroethylene)
Base/Neutral Organics	Anthracene
	Butylbenzylphthallate
	Dimethylphthallate
	Naphalene
	Phenanthrene
PESTICIDES AND PCBs	Aldrin
	Dieldrin
	Dioxin
Acid Extractables	2-chlorophenol
	Phenol
	2,4,6-trichlorophenol
Other	Conductivity
	Biological Oxygen Demand
	Temperature

NDERGROUND INJECTION CONTROL
MONTHLY OPERATING REPORT

Facility Name: CITY OF HOLLYWOOD SOUTHERN REGIONAL
Injection Well Description: CLASS I INJECTION WELL IW-1

Permit #: 156419-001-UC
Date of Issuance:
Expiration Date:
Facility ID#: 156419
Injection Well ID #: 196419-IW-1
Permitted Peak Hour Flow Rate, MGD: 18.6
Max Permitted Inj Pressure, PSIG: 0
Injection Interval: 3000 to 3500 ft
Casing Diameter, Inch: 24

Associated Monitoring Zone(s):

Monitoring Zone ID#	Description
156419-MW-1-U	upper zone of dual zone monitoring well MW-1
156419-MW-1-L	lower zone of dual zone monitoring well MW-1

THE FOLLOWING IS TO BE COMPLETED BY THE PERMITTEE:

REPORT MONTH / YEAR: ______________________ DATE OF SAMPLING / RECORDING: ______________________

OPERATOR'S NAME: ______________________________________

OPERATOR'S LICENSE NO: ____________________

OPERATOR'S PHONE: __________________ FAX : __________________ E-MAIL: ______________________

Parameter	Value	Units
Flow Rate AVG		MGD
Flow Rate MAX , (Peak Hour)		MGD
Flow Rate MIN		MGD
Flow Volume Total, Monthly		MG
Flow Volumes AVG		MG
Flow Volumes MAX		MG
Flow Volumes MIN		MG
Injection Pressure AVG		PSIG
Injection Pressure MAX (Sustained)		PSIG
Injection Pressure MIN (Sustained)		PSIG
Monthly Well-Head Pressure with No Flow (Shut-In)		PSIG

LEAD PLANT OPERATOR (Name): ____________________ (Signature): ____________________

Date: ____________________

IDERGROUND INJECTION CONTR
MONTHLY OPERATING REPORT

Facility Name: CITY OF HOLLYWOOD SOUTHERN REGIONAL

Injection Well Description: CLASS I INJECTION WELL IW-2

Permit #: 156419-001-UC

Date of Issuance:

Expiration Date:

Facility ID#: 156419

Injection Well ID #: 156419-IW-2

Permitted Peak Hour Flow Rate, MGD: 18.6

Max Permitted Inj Pressure, PSIG: 0

Injection Interval: 3000 to 3500 ft

Casing Diameter, Inch: 24

Associated Monitoring Zone(s):

Monitoring Zone ID#	Description
156419-MW-1-U	upper zone of dual zone monitoring well MW-1
156419-MW-1-L	lower zone of dual zone monitoring well MW-1

THE FOLLOWING IS TO BE COMPLETED BY THE PERMITTEE:

REPORT MONTH / YEAR: ____________________

DATE OF SAMPLING / RECORDING: ____________________

OPERATOR'S NAME: ____________________

OPERATOR'S LICENSE NO: ____________________

OPERATOR'S PHONE: ____________________

FAX : ____________________

E-MAIL: ____________________

Parameter	Value	Units
Flow Rate AVG	________	MGD
Flow Rate MAX , (Peak Hour)	________	MGD
Flow Rate MIN	________	MGD
Flow Volume Total, Monthly	________	MG
Flow Volumes AVG	________	MG
Flow Volumes MAX	________	MG
Flow Volumes MIN	________	MG
Injection Pressure AVG	________	PSIG
Injection Pressure MAX (Sustained)	________	PSIG
Injection Pressure MIN (Sustained)	________	PSIG
Monthly Well-Head Pressure with No Flow (Shut-In)	________	PSIG

LEAD PLANT OPERATOR (Name): ____________________

(Signature): ____________________

Date: ____________________

U ERGROUND INJECTION CONTRC
MONTHLY OPERATING REPORT

Facility Name: CITY OF HOLLYWOOD SOUTHERN REGIONAL

Sampling Point : WET WELL FOR IW-1 AND IW-2

Facility ID#: 156419

Wet Well ID#: 156419-WW-1

Permit Number: 156419-001-UC

Issue Date:

Expiration Date:

Associated Injection Well(s):

Injection Well ID#	Injection Well Description
156419-IW-2	CLASS I INJECTION WELL IW-2
196419-IW-1	CLASS I INJECTION WELL IW-1

THE FOLLOWING IS TO BE COMPLETED BY THE PERMITTEE:

REPORT MONTH / YEAR: ______________ DATE OF SAMPLING / RECORDING: ______________

OPERATOR'S NAME: ______________

OPERATOR'S LICENSE NO: ______________

OPERATOR'S PHONE: ______________ FAX : ______________ E-MAIL: ______________

Parameter	Sampling Frequency	Value	Units
Chloride	Weekly		mg/L
Fecal Coliform, MPN, EC MED, 44.5C (tube 31614)	Weekly		# col/100 mL
Nitrogen, Ammonia, Total as N	Weekly		mg/L as N
Nitrogen, Nitrate, Total as N	Weekly		mg/L as N
Nitrogen, Total Kjeldahl as N	Weekly		mg/L as N
pH	Weekly		s.u.
Phosphorus, Total as P	Weekly		mg/L as P
Residue, Total Filterable (dried at 180 C)	Weekly		mg/L
Sodium	Weekly		mg/L
Specific Conductance (Temperature Compensated)	Weekly		umhos/cm
Sulfate, Total as SO4	Weekly		mg/L as SO4
Temperature, Water	Weekly		deg C
Total Suspended Solids (TSS)	Weekly		mg/L

LEAD PLANT OPERATOR (Name): ______________ (Signature:) ______________

Date: ______________

UNDERGROUND INJECTION CONT L
MONTHLY OPERATING REPORT

Facility Name: CITY OF HOLLYWOOD SOUTHERN REGIONAL

Monitoring Well/Zone: upper zone of dual zone monitoring well MW-1

Facility ID#: 156419

Permit Number: 156419-001-UC

Monitoring Well ID#: 156419-MW-1-U

Issue Date:

As Identified in the Permit: upper monitoring zone of monitoring well MW-1

Expiration Date:

Monitoring Interval: 1400 to 1450 ft

Associated Injection Well(s):

Injection Well ID#	Injection Well Description
156419-IW-2	CLASS I INJECTION WELL IW-2
196419-IW-1	CLASS I INJECTION WELL IW-1

THE FOLLOWING IS TO BE COMPLETED BY THE PERMITTEE:

REPORT MONTH / YEAR: ____________________ DATE OF SAMPLING / RECORDING: ____________________

OPERATOR'S NAME: ______________________________________

OPERATOR'S LICENSE NO: ____________________

OPERATOR'S PHONE: ______________ FAX : ______________ E-MAIL: ______________________

Physical Characteristics Parameter	Recording Frequency	Reporting Requirements	Value	Units
Well-Head Monthly Minimum Pressure	Continous	Daily Min / Monthly Min of Daily	________	PSIG
Well-Head Monthly Average Pressure	Continous	Daily Avg / Monthly Avg of Daily	________	PSIG
Well-Head Monthly Maximum Pressure	Continous	Daily Max / Monthly Max of Daily	________	PSIG

Chemical Characteristics Parameter	Sampling Frequency	Reporting Requirements	Value	Units
Chloride	Weekly	Weekly / Monthly A	________	mg/L
Fecal Coliform, MPN, EC MED, 44.5C (tube 31614)	Weekly	Weekly / Monthly A	________	# col/100 mL
Nitrogen, Ammonia, Total as N	Weekly	Weekly / Monthly A	________	mg/L as N
Nitrogen, Nitrate, Total as N	Weekly	Weekly / Monthly A	________	mg/L as N
Nitrogen, Total Kjeldahl as N	Weekly	Weekly / Monthly A	________	mg/L as N
pH	Weekly	Weekly / Monthly A	________	s.u.
Phosphorus, Total as P	Weekly	Weekly / Monthly A	________	mg/L as P
Residue, Total Filterable (dried at 180 C)	Weekly	Weekly / Monthly A	________	mg/L
Sodium	Weekly	Weekly / Monthly A	________	mg/L
Specific Conductance (Temperature Compensated)	Weekly	Weekly / Monthly A	________	umhos/cm
Sulfate, Total as SO4	Weekly	Weekly / Monthly A	________	mg/L as SO4
Temperature, Water	Weekly	Weekly / Monthly A	________	deg C

LEAD PLANT OPERATOR (Name): ____________________ (Signature:) ____________________

Date: ____________________

JNDERGROUND INJECTION CON OL
MONTHLY OPERATING REPORT

Facility Name: CITY OF HOLLYWOOD SOUTHERN REGIONAL

Monitoring Well/Zone: lower zone of dual zone monitoring well MW-1

Facility ID#:	156419	**Permit Number:**	156419-001-UC
Monitoring Well ID#:	156419-MW-1-L	**Issue Date:**	
As Identified in the Permit:	lower zone of dual zone monitoring well MW-1	**Expiration Date:**	
Monitoring Interval:	1650 to 1700 ft		

Associated Injection Well(s):

Injection Well ID#	Injection Well Description
156419-IW-2	CLASS I INJECTION WELL IW-2
196419-IW-1	CLASS I INJECTION WELL IW-1

THE FOLLOWING IS TO BE COMPLETED BY THE PERMITTEE:

REPORT MONTH / YEAR: ____________________ DATE OF SAMPLING / RECORDING: ____________________

OPERATOR'S NAME: ______________________________

OPERATOR'S LICENSE NO: ____________________

OPERATOR'S PHONE: ______________ FAX : ______________ E-MAIL: ____________________

Physical Characteristics Parameter	Recording Frequency	Reporting Requirements	Value	Units
Well-Head Monthly Average Pressure	Continous	Daily Avg / Monthly Avg of Daily	________	PSIG
Well-Head Monthly Maximum Pressure	Continous	Daily Max / Monthly Max of Daily	________	PSIG
Well-Head Monthly Minimum Pressure	Continous	Daily Min / Monthly Min of Daily	________	PSIG

Chemical Characteristics Parameter	Sampling Frequency	Reporting Requirements	Value	Units
Chloride	Weekly	Weekly / Monthly A	________	mg/L
Fecal Coliform, MPN, EC MED, 44.5C (tube 31614)	Weekly	Weekly / Monthly A	________	# col/100 mL
Nitrogen, Ammonia, Total as N	Weekly	Weekly / Monthly A	________	mg/L as N
Nitrogen, Nitrate, Total as N	Weekly	Weekly / Monthly A	________	mg/L as N
Nitrogen, Total Kjeldahl as N	Weekly	Weekly / Monthly A	________	mg/L as N
pH	Weekly	Weekly / Monthly A	________	s.u.
Phosphorus, Total as P	Weekly	Weekly / Monthly A	________	mg/L as P
Residue, Total Filterable (dried at 180 C)	Weekly	Weekly / Monthly A	________	mg/L
Sodium	Weekly	Weekly / Monthly A	________	mg/L
Specific Conductance (Temperature Compensated)	Weekly	Weekly / Monthly A	________	umhos/cm
Sulfate, Total as SO4	Weekly	Weekly / Monthly A	________	mg/L as SO4
Temperature, Water	Weekly	Weekly / Monthly A	________	deg C

LEAD PLANT OPERATOR (Name):____________________ (Signature:) ____________________

Date: ____________________

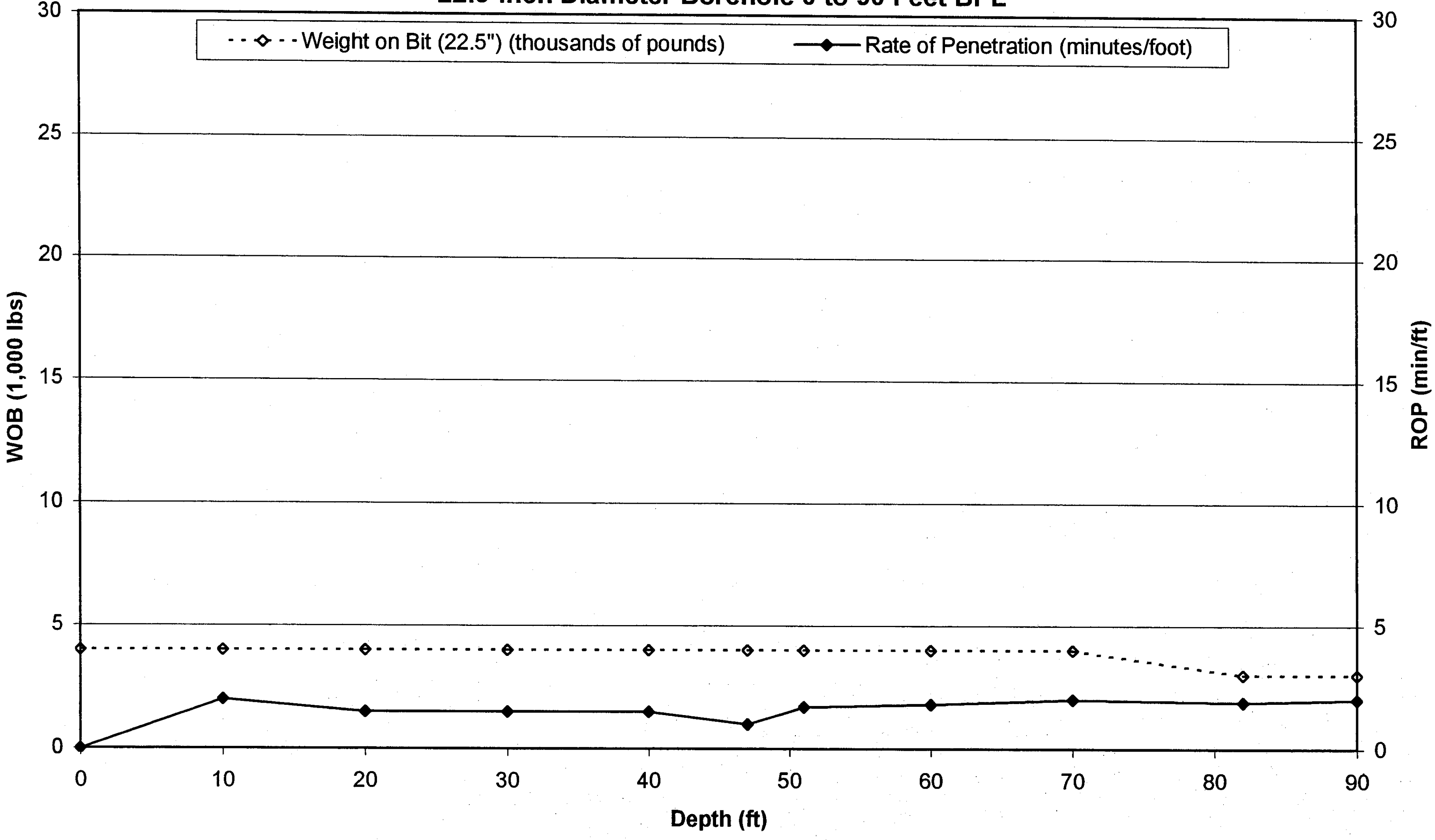
Appendix B

Weight on Bit / Rate of Penetration Graphs

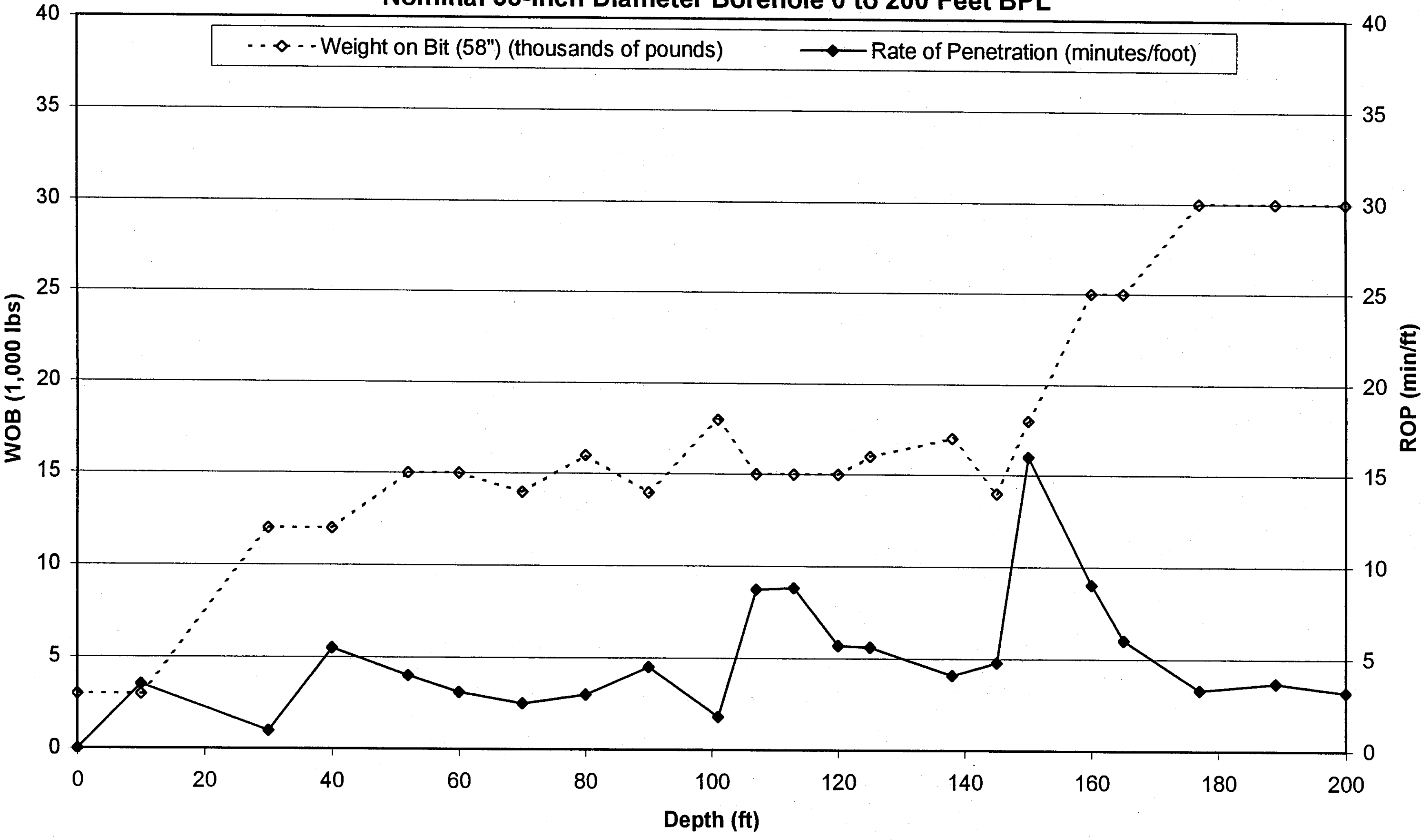
Injection Well No. 1 (IW-1) – Drilling Data

Weight on Bit / Rate of Penetration

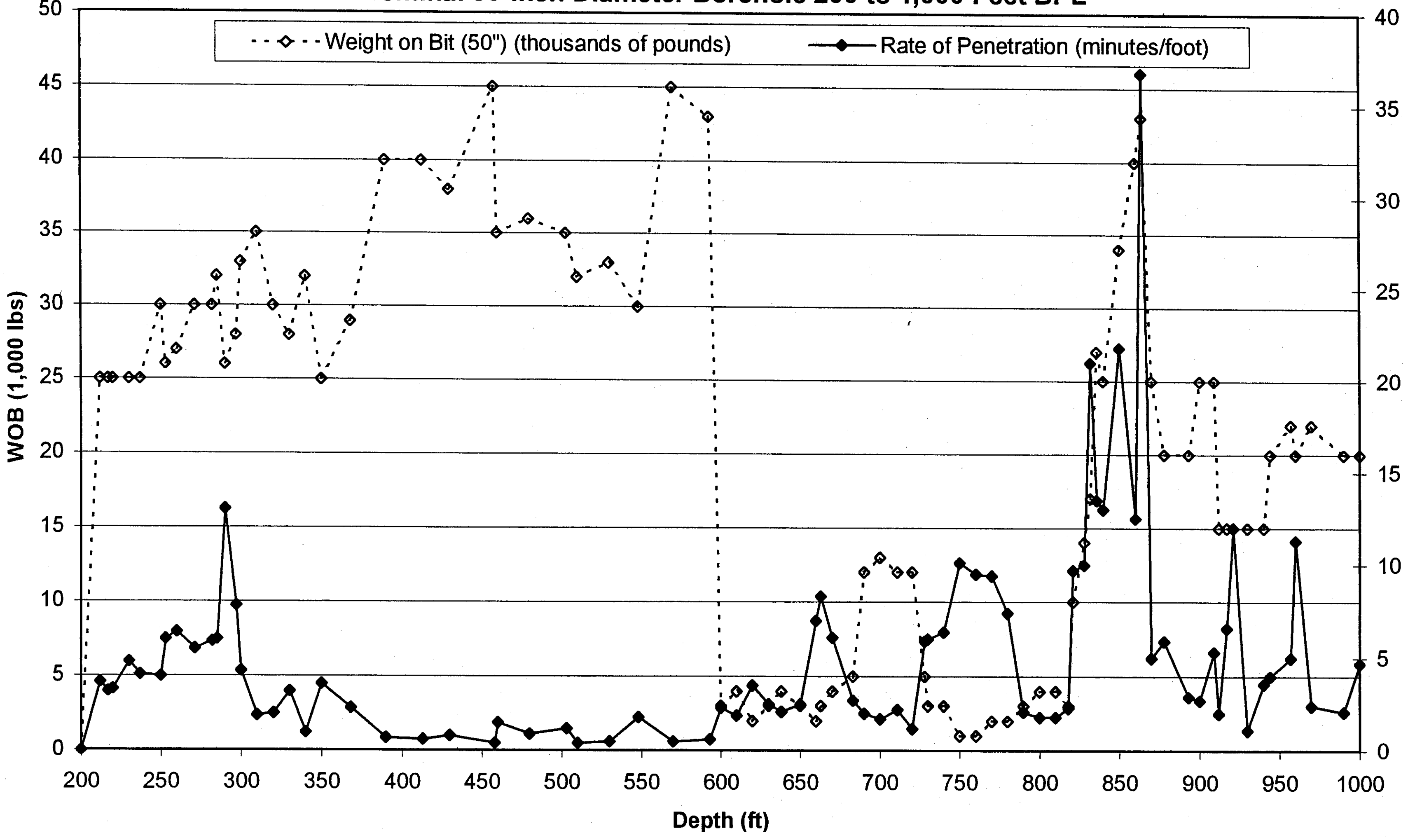
City of HollywoodSouthern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
22.5-inch Diameter Borehole 0 to 90 Feet BPL



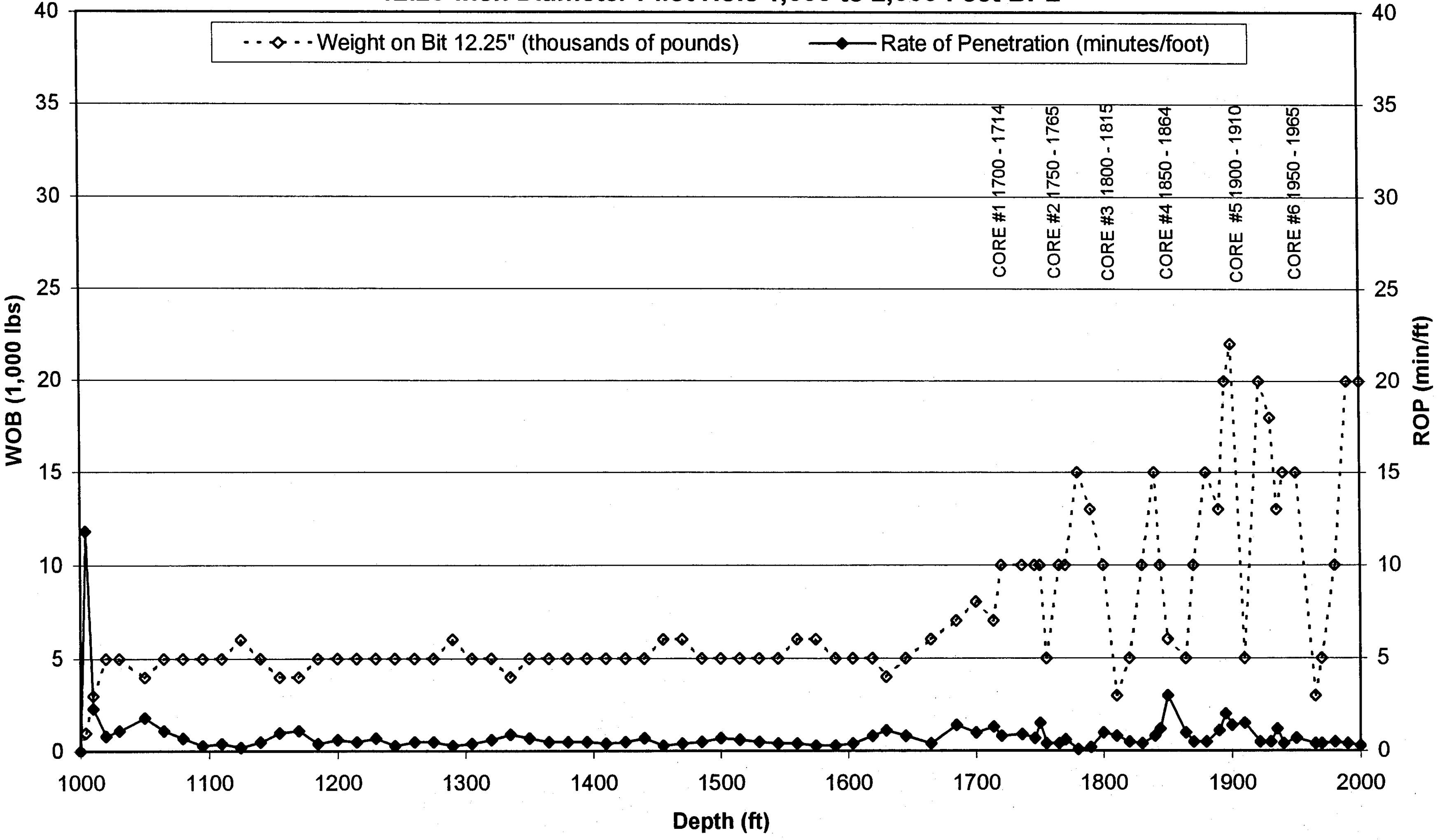
City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 58-inch Diameter Borehole 0 to 200 Feet BPL



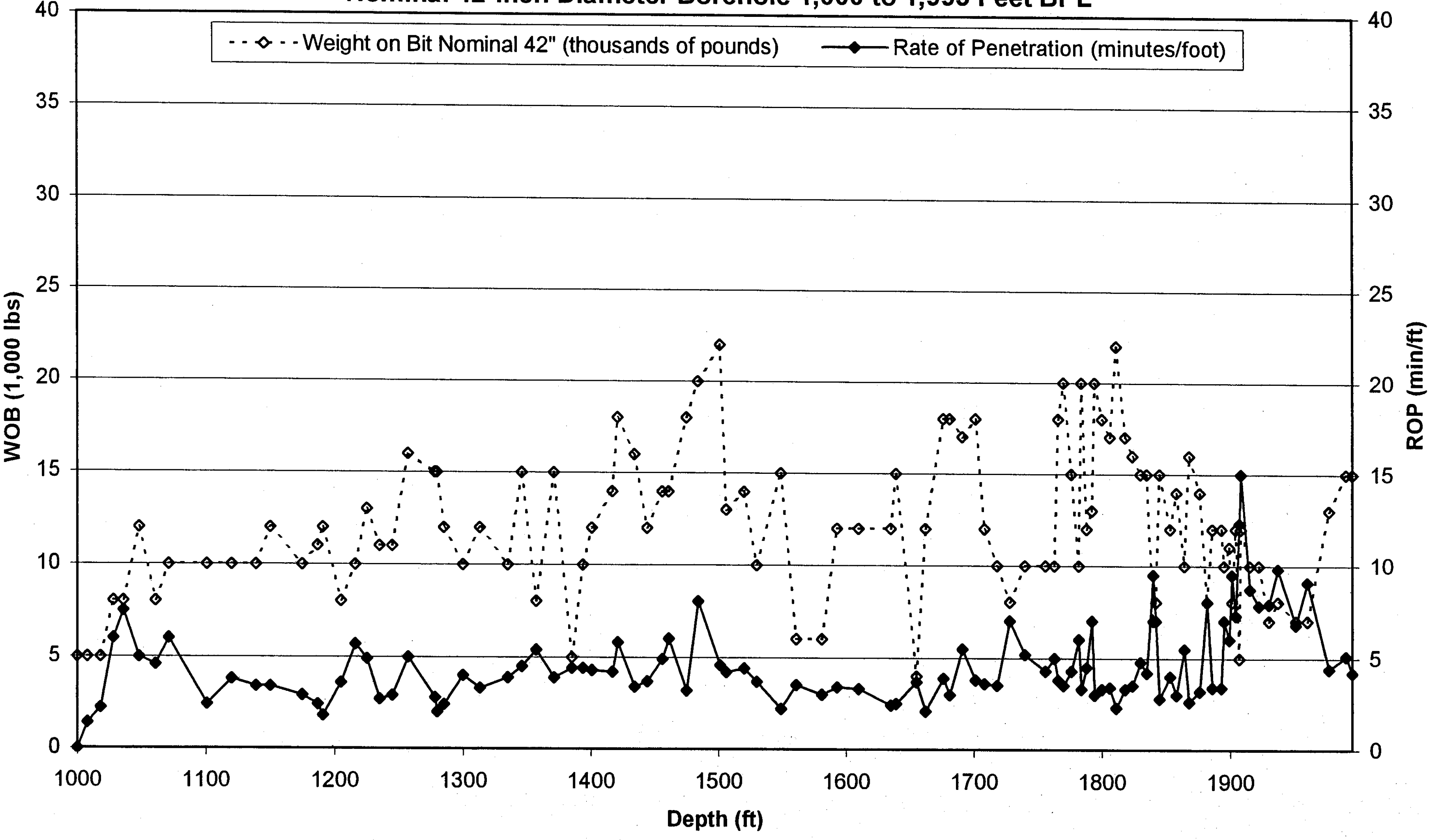
City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 50-inch Diameter Borehole 200 to 1,000 Feet BPL



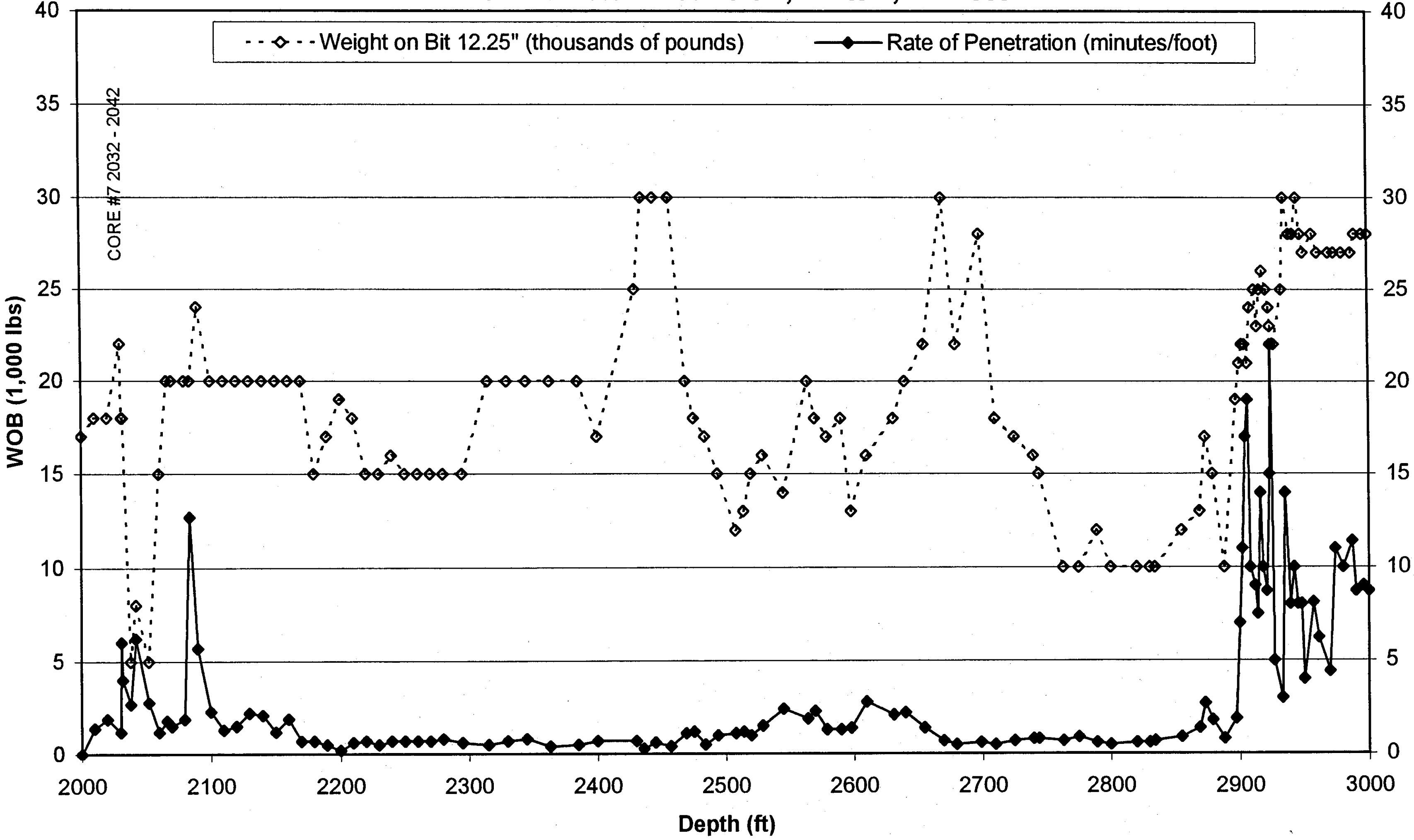
City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 1,000 to 2,000 Feet BPL



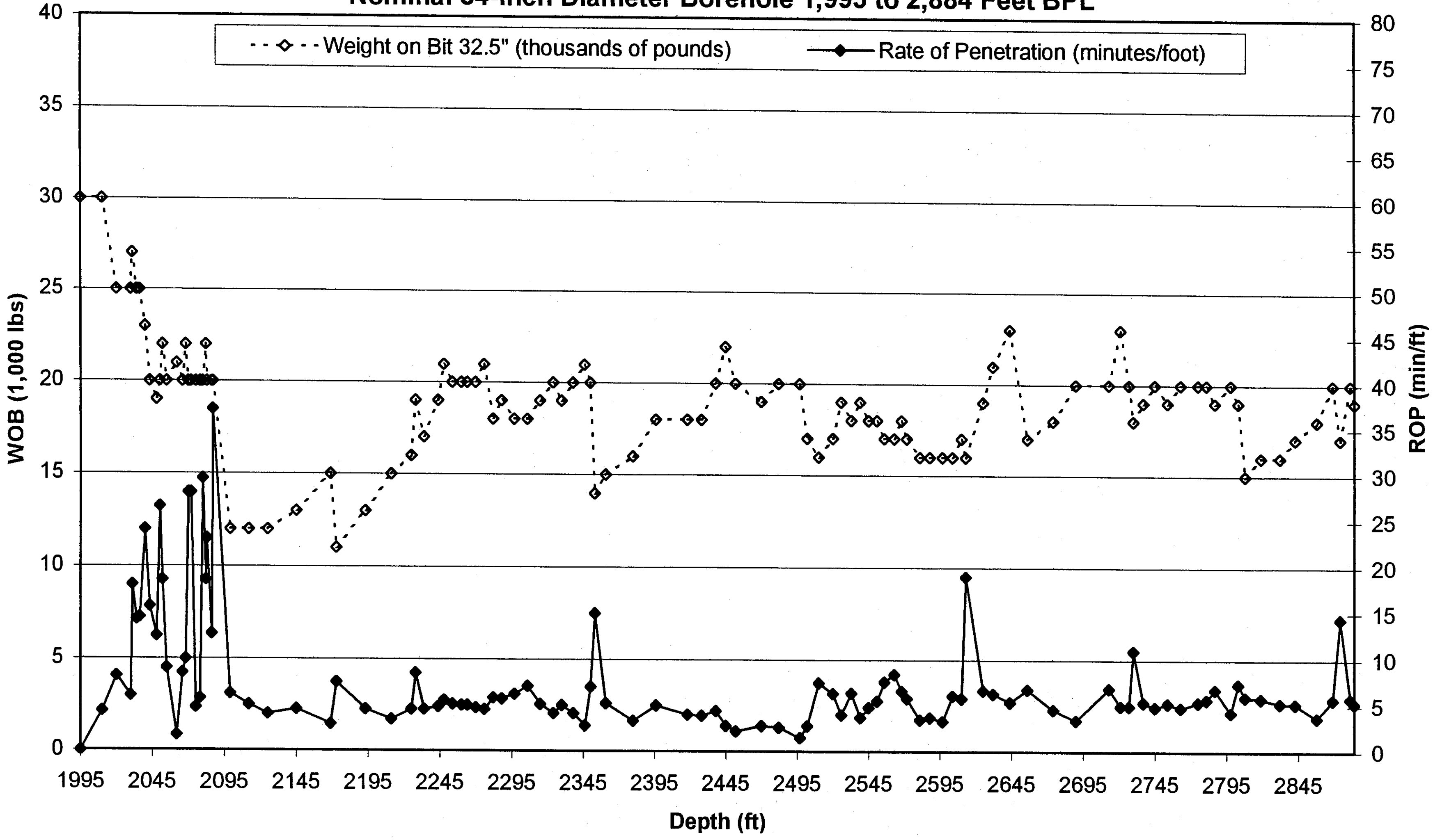
City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 42-inch Diameter Borehole 1,000 to 1,995 Feet BPL



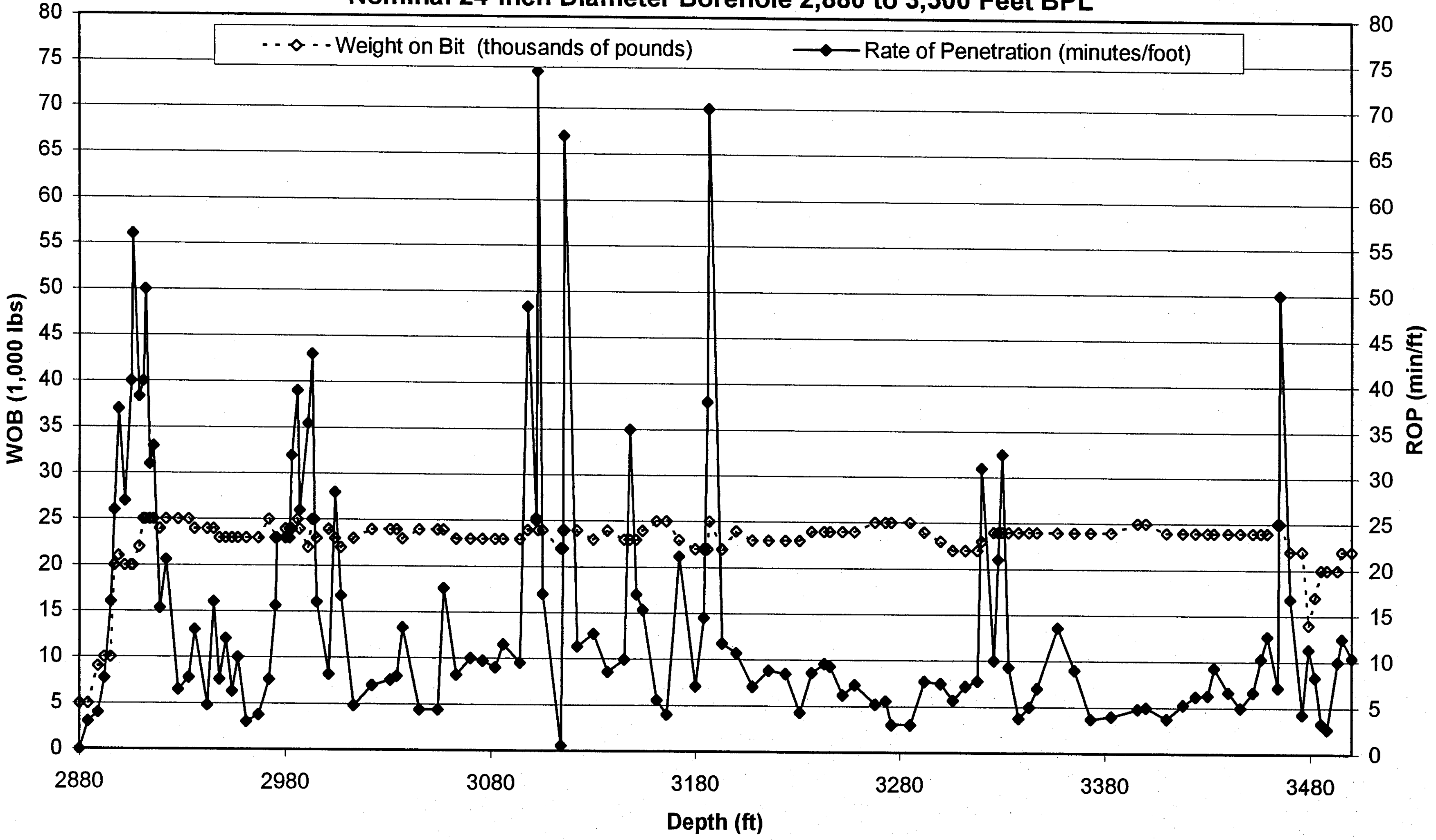
City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 2,000 to 3,000 Feet BPL



City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 34-inch Diameter Borehole 1,995 to 2,884 Feet BPL



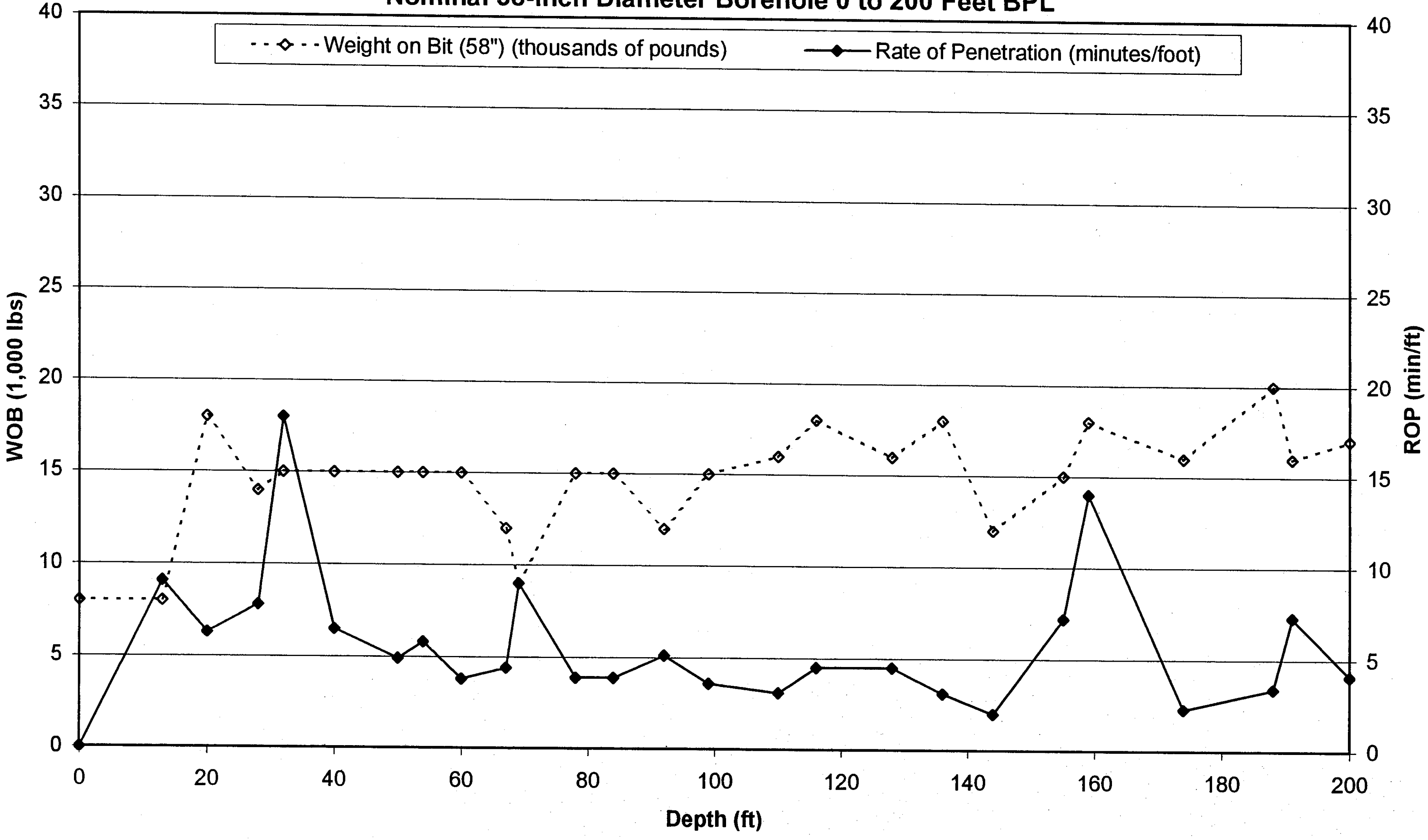
City of Hollywood Southern Regional WWTP
Injection Well IW - 1
Weight on Bit / Rate of Penetration
Nominal 24-inch Diameter Borehole 2,880 to 3,500 Feet BPL



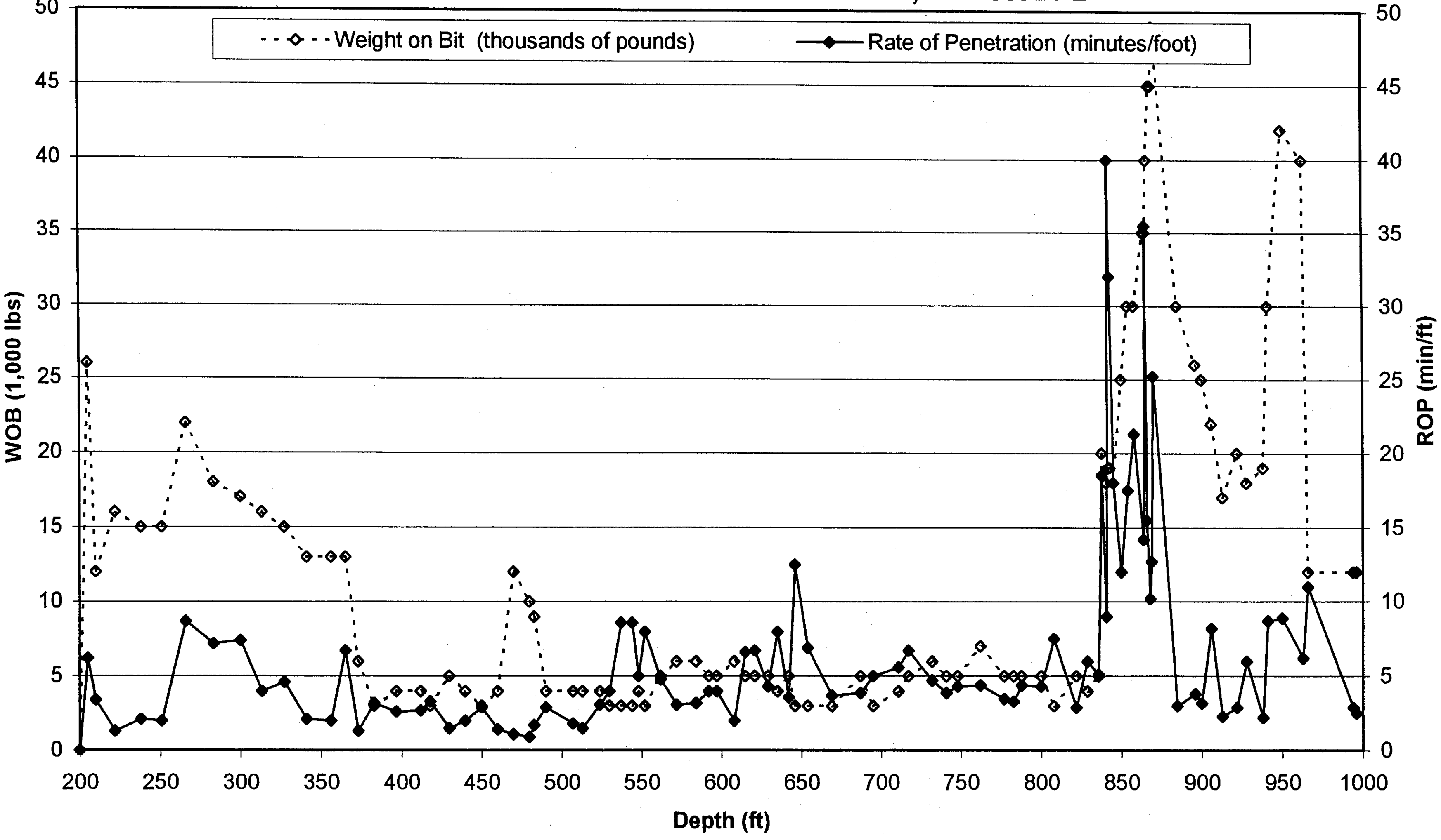
Injection Well No. 2 (IW-2) – Drilling Data

Weight on Bit / Rate of Penetration

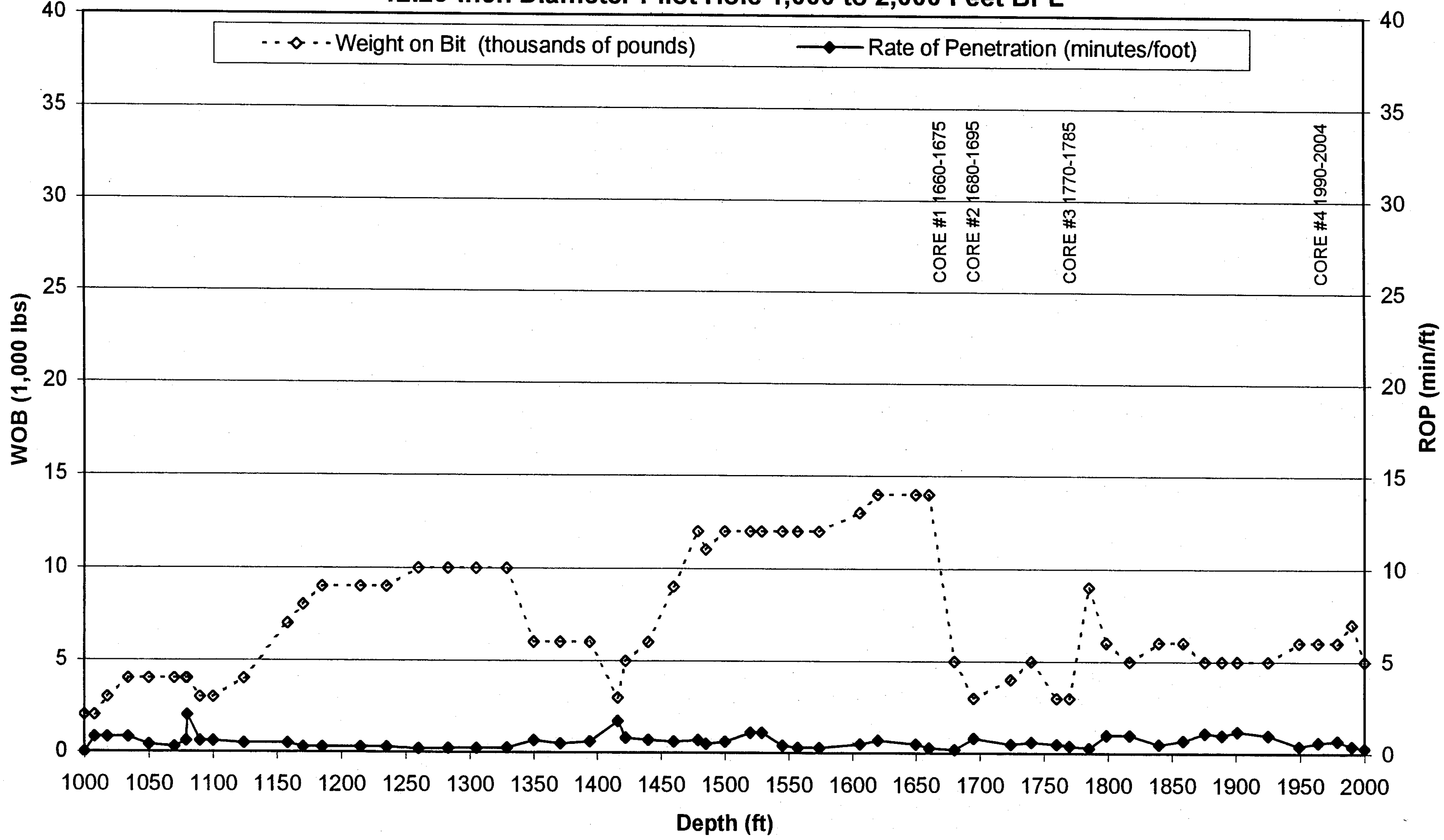
City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 58-inch Diameter Borehole 0 to 200 Feet BPL



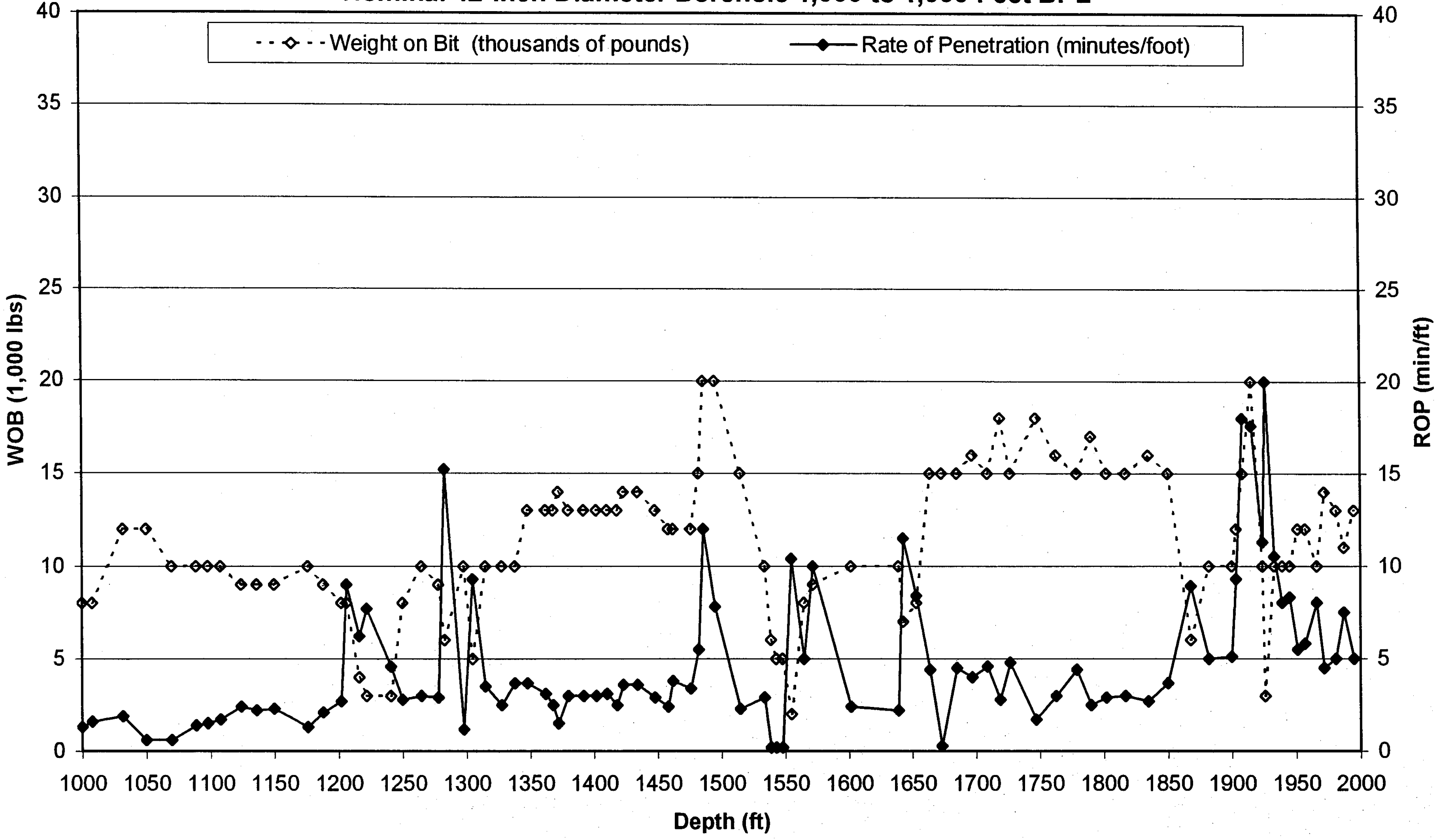
City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 50-inch Diameter Borehole 200 to 1,000 Feet BPL



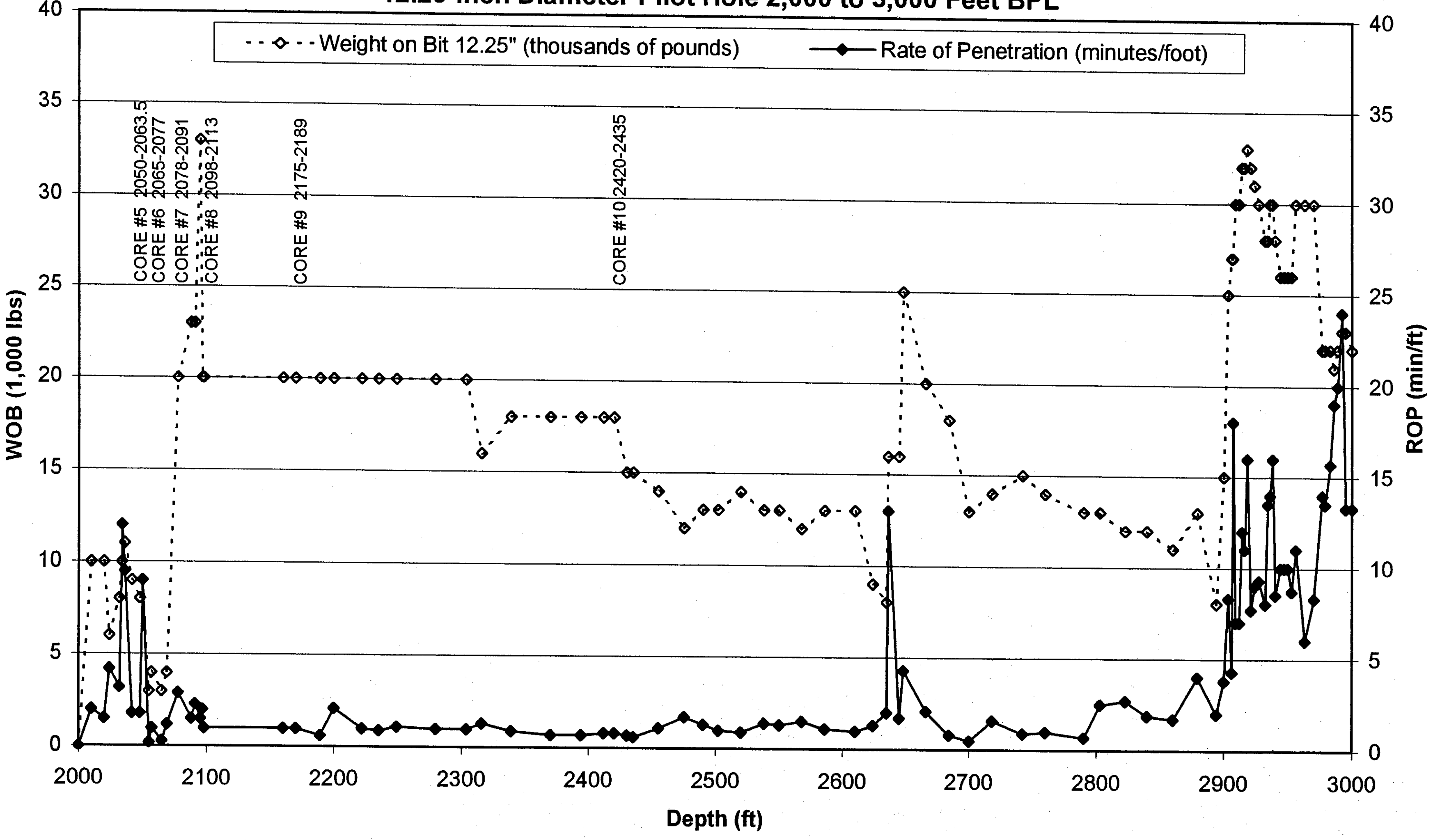
City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 1,000 to 2,000 Feet BPL



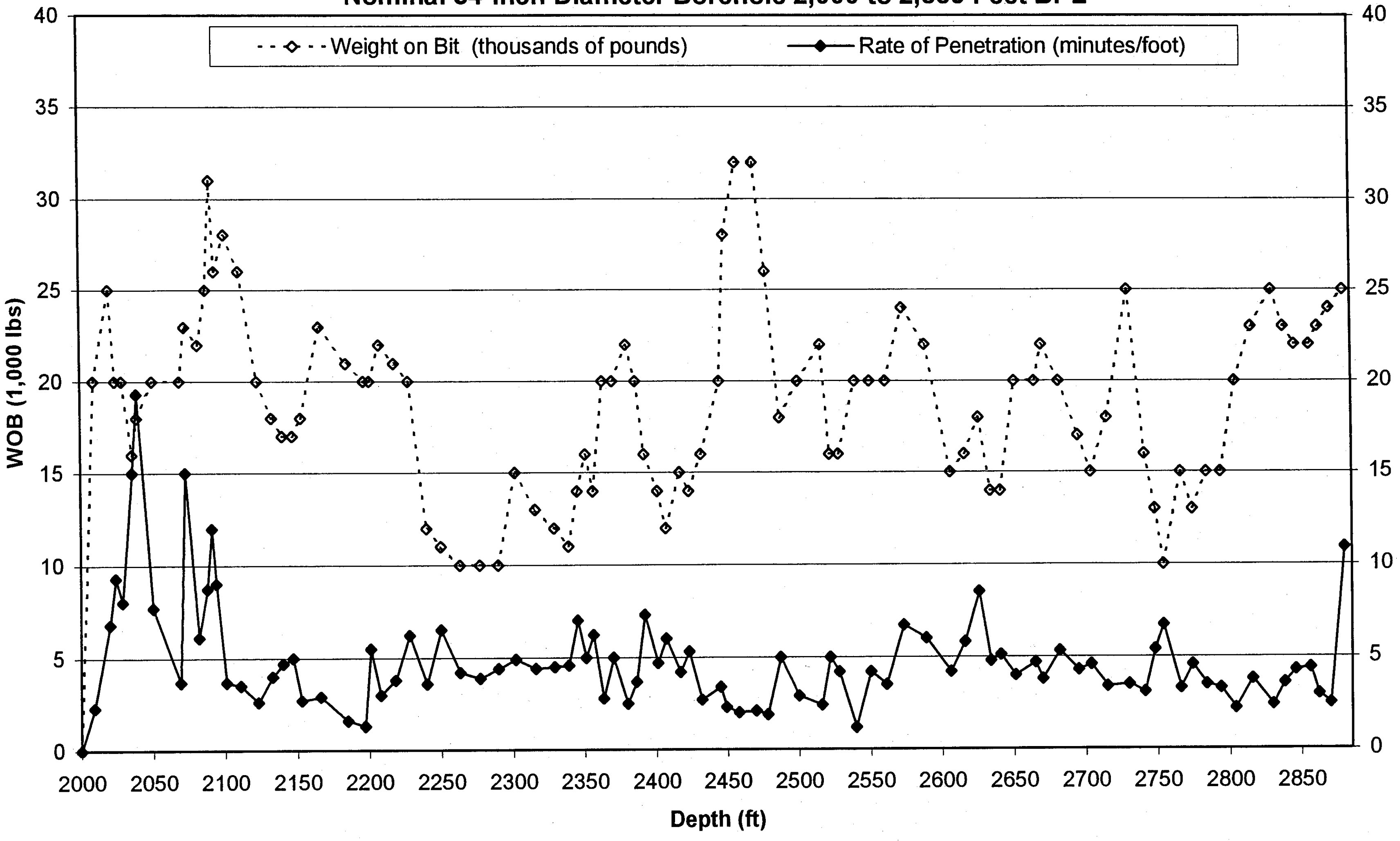
City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 42-inch Diameter Borehole 1,000 to 1,995 Feet BPL



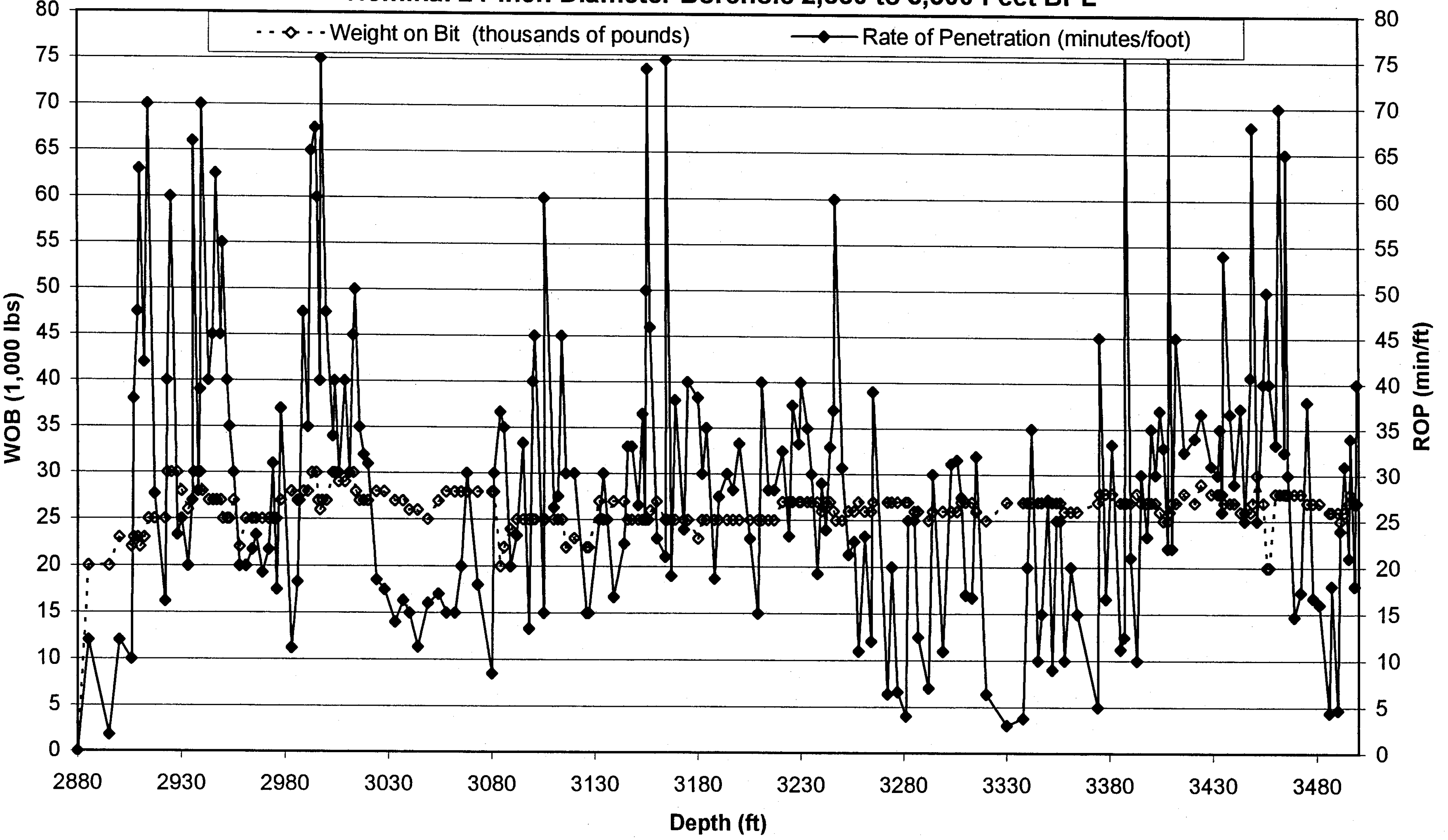
City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
12.25-inch Diameter Pilot Hole 2,000 to 3,000 Feet BPL



City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 34-inch Diameter Borehole 2,000 to 2,885 Feet BPL



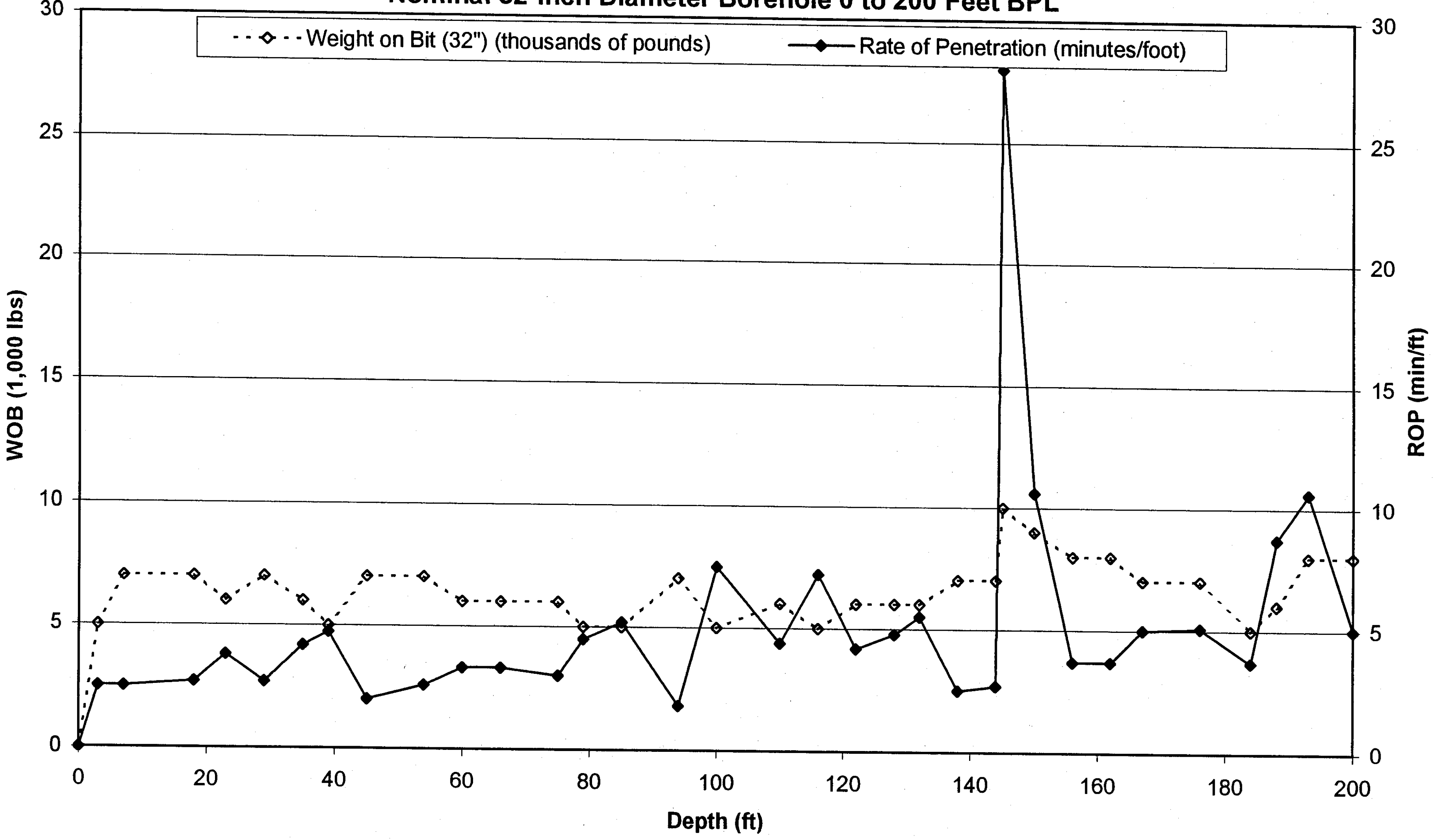
City of Hollywood Southern Regional WWTP
Injection Well IW - 2
Weight on Bit / Rate of Penetration
Nominal 24-inch Diameter Borehole 2,880 to 3,500 Feet BPL



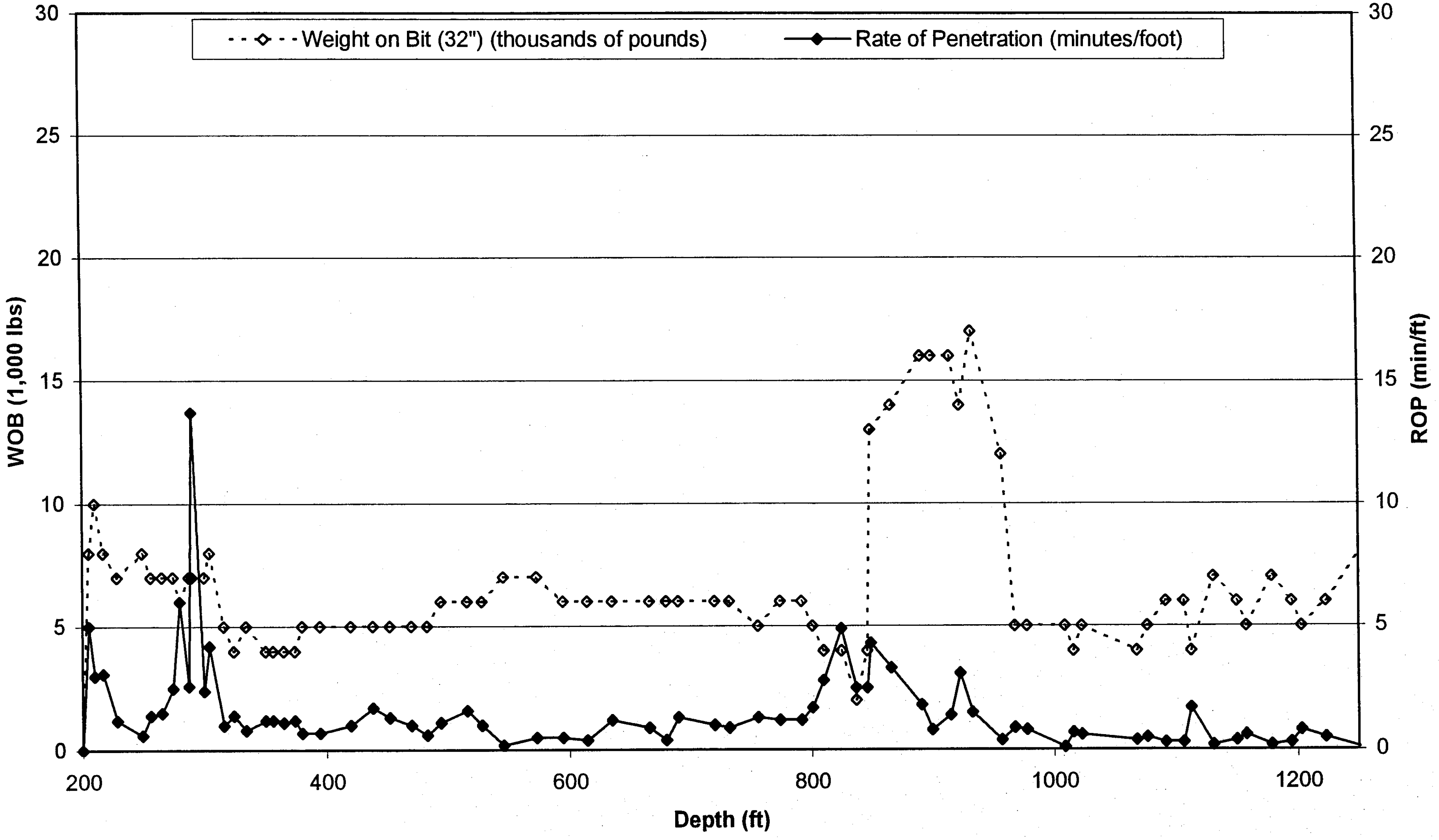
Monitor Well No. 1 (MW-1) – Drilling Data

Weight on Bit / Rate of Penetration

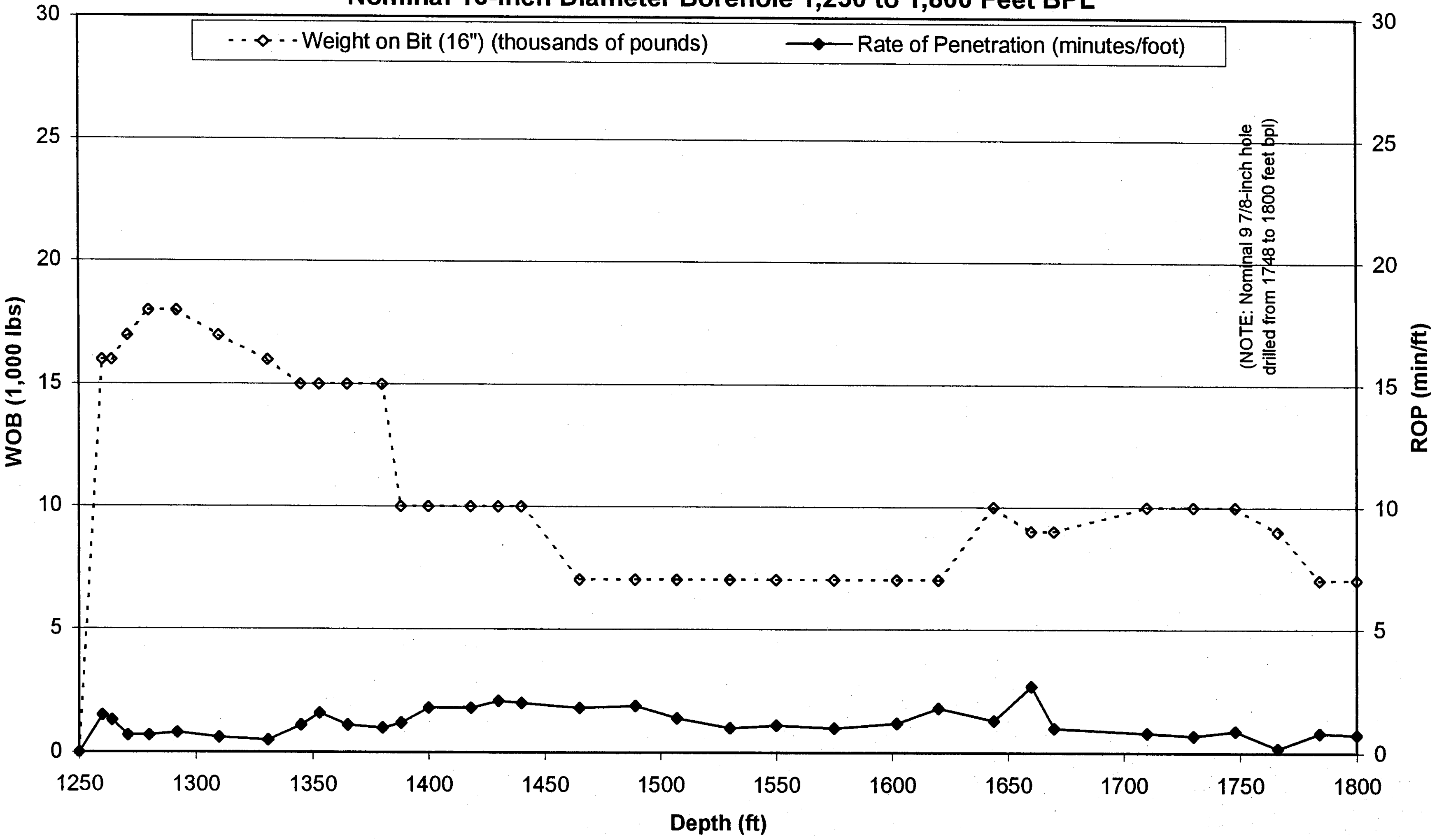
City of Hollywood Southern Regional WWTP
Monitor Well MW-1
Weight on Bit / Rate of Penetration
Nominal 32-inch Diameter Borehole 0 to 200 Feet BPL



City of Hollywood Southern Regional WWTP
Monitor Well MW-1
Weight on Bit / Rate of Penetration
Nominal 24-inch Diameter Borehole 200 to 1,250 Feet BPL



City of Hollywood Southern Regional WWTP
Monitor Well MW-1
Weight on Bit / Rate of Penetration
Nominal 16-inch Diameter Borehole 1,250 to 1,800 Feet BPL



MW - 1 WOB ROP 1250 to 1800 16

Appendix C

Inclination Surveys

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

Inclination Surveys

APPENDIX C
INCLINATION SURVEY
INJECTION WELL IW-1
CITY OF HOLLYWOOD

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
90	0.375	58
180	0.375	58
270	0.200	48 1/2
360	0.300	48 1/2
450	0.200	48 1/2
540	0.300	48 1/2
630	0.250	48 1/2
720	0.300	48 1/2
810	0.350	48 1/2
900	0.250	48 1/2
990	0.375	48 1/2
1090	0.250	12 1/4
1180	0.200	12 1/4
1270	0.150	12 1/4
1360	0.300	12 1/4
1450	0.260	12 1/4
1540	0.350	12 1/4
1630	0.400	12 1/4
1720	0.100	12 1/4
1810	0.300	12 1/4
1090	0.200	40 1/2
1180	0.125	40 1/2

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
1270	0.250	40 1/2
1360	0.275	40 1/2
1450	0.375	40 1/2
1540	0.250	40 1/2
1630	0.300	40 1/2
1720	0.200	40 1/2
1810	0.375	40 1/2
1900	0.250	40 1/2
1990	0.200	40 1/2
2080	0.300	12 1/4
2170	0.500	12 1/4
2260	0.550	12 1/4
2350	0.250	12 1/4
2440	0.250	12 1/4
2530	0.250	12 1/4
2620	0.200	12 1/4
2710	0.300	12 1/4
2800	0.400	12 1/4
2890	0.200	12 1/4
2980	0.250	12 1/4
2080	0.250	32 1/2
2170	0.300	32 1/2
2260	0.300	32 1/2
2350	0.200	32 1/2
2440	0.125	32 1/2
2530	0.200	32 1/2
2620	0.260	32 1/2

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
2710	0.200	32 1/2
2800	0.200	32 1/2
2970	0.300	22 1/2
3060	0.200	22 1/2
3150	0.300	22 1/2
3240	0.250	22 1/2
3330	0.250	22 1/2
3420	0.250	22 1/2

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

Inclination Surveys

APPENDIX C
INCLINATION SURVEY
INJECTION WELL IW-2
CITY OF HOLLYWOOD

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
90	0.250	58
180	0.250	58
270	0.300	48 1/2
360	0.200	48 1/2
450	0.250	48 1/2
540	0.300	48 1/2
630	0.300	48 1/2
720	0.150	48 1/2
810	0.300	48 1/2
900	0.250	48 1/2
990	0.250	48 1/2
1080	0.200	12 1/4
1170	0.250	12 1/4
1260	0.150	12 1/4
1350	0.300	12 1/4
1440	0.300	12 1/4
1530	0.300	12 1/4
1620	0.300	12 1/4
1710	0.250	12 1/4
1800	0.225	12 1/4
1890	0.250	12 1/4
1080	0.250	40 1/2

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
1170	0.250	40 1/2
1260	0.300	40 1/2
1350	0.200	40 1/2
1440	0.200	40 1/2
1530	0.350	40 1/2
1620	0.250	40 1/2
1710	0.250	40 1/2
1800	0.150	40 1/2
1890	0.250	40 1/2
1980	0.350	40 1/2
2080	0.300	12 1/4
2170	0.250	12 1/4
2260	0.250	12 1/4
2350	0.350	12 1/4
2440	0.250	12 1/4
2530	0.250	12 1/4
2620	0.350	12 1/4
2710	0.350	12 1/4
2800	0.300	12 1/4
2890	0.350	12 1/4
2980	0.300	12 1/4
2080	0.200	32 1/2
2170	0.250	32 1/2
2260	0.250	32 1/2
2350	0.250	32 1/2
2440	0.250	32 1/2
2530	0.400	32 1/2

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
2620	0.250	32 1/2
2710	0.200	32 1/2
2800	0.300	32 1/2
2890	0.300	22 1/2
2980	0.200	22 1/2
3070	0.200	22 1/2
3160	0.300	22 1/2
3250	0.250	22 1/2
3340	0.300	22 1/2
3430	0.200	22 1/2
3490	0.350	22 1/2

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

Inclination Surveys

APPENDIX C
INCLINATION SURVEY
MONITOR WELL MW-1
CITY OF HOLLYWOOD

Depth (feet bpl)	Inclination (degrees)	Bit Size (inches)
90	0.200	32 1/2
180	0.200	32 1/2
270	0.250	22 1/2
360	0.300	22 1/2
450	0.300	22 1/2
540	0.250	22 1/2
630	0.350	22 1/2
720	0.300	22 1/2
810	0.250	22 1/2
900	0.200	22 1/2
990	0.150	22 1/2
1080	0.350	22 1/2
1170	0.300	22 1/2
1340	0.300	14 3/4
1430	0.250	14 3/4
1520	0.350	14 3/4
1610	0.300	14 3/4
1700	0.200	14 3/4
1790	0.250	9 7/8

Appendix D

Geologic Logs

Injection Well No. 1 (IW-1) – Lithology

Geologic Log

GEOLOGIC LOG
(Drill Cuttings)
CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM
SOUTHERN REGIONAL WWTP
INJECTION WELL IW - 1

Depth (ft)	Thickness (ft)	Sample Description
0 - 10	10	LIMESTONE – 100%; 90% Dark yellowish brown (10YR 4/2), cryptocrystalline, hard, slightly sandy carbonate mudstone. 10% Very pale orange (10YR 8/2), very fine grained, sandy, partly sparry packstone. Trace Sandstone.
10 - 20	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately soft, pelloidal, partly sparry packstone with shell and shell fragments.
20 – 30	10	SANDSTONE – 100% Light greenish gray (5GY 8/1), fine to medium grained, subangular, poorly cemented with calcite. Trace Sandy Limestone.
30 – 40	10	SANDSTONE AND LIMESTONE – Sandstone 90%, yellowish gray (5Y 7/2), medium to fine grained subangular to subrounded, well sorted, moderately cemented with calcite with trace detrital carbonate. Limestone 10%, moderate yellowish brown (10YR 5/4), coarse grained, moderately hard, sparry, fossiliferous packstone.
40 – 50	10	SANDSTONE AND LIMESTONE – Sandstone 60%, as above. Limestone 40%; 30% yellowish gray (5Y 8/1), medium grained, moderately hard pelloidal, partly sparry packstone. 10% Pale yellowish brown (10YR 6/2), microcrystalline to cryptocrystalline, sparry, hard carbonate mudstone.
50 – 80	30	SANDSTONE – 100% Yellowish gray (5Y 7/2), fine to medium grained, moderately hard to hard, moderately well to well cemented with some detrital carbonate.
80 – 140	60	SANDSTONE AND SANDY LIMESTONE – Sandstone 80%, as above. Sandy Limestone 20% yellowish gray (5Y 8/1), fine to medium grained, hard, sparry packstone with medium grained angular to subangular quartz sand.
140 – 160	20	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 90%, yellowish gray (5Y 7/2), medium to occasionally coarse grained, hard highly sparry fossiliferous wackestone with very fine to medium grained quartz sand. Limestone 10%, grayish yellow (5Y 8/4), cryptocrystalline, hard sparry carbonate mudstone.
160 – 210	50	LIMESTONE AND SANDY LIMESTONE – Limestone 80%, yellowish gray (5Y 7/2) to grayish orange (10YR 7/4), fine to coarse grained, hard pelloidal, fossiliferous, highly sparry, slightly sandy packstone. Sandy Limestone 20%, yellowish gray (5Y 7/2), medium grained, hard, pelloidal packstone with medium grained quartz sand. Trace tests.

Depth (ft)	Thickness (ft)	Sample Description
210 – 230	20	LIMESTONE AND SANDY LIMESTONE – Limestone 80%, yellowish gray (5Y 8/1), fine to coarse grained, hard, slightly sandy, sparry packstone with shell fragments. Sandy Limestone 20%, yellowish gray (5Y 7/2), medium grained, moderately soft grainstone/packstone with medium grained quartz sand. Trace coarse shell fragments.
230 – 290	60	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, hard sparry, slightly sandy packstone/wackestone with trace fine grained phosphorite. Trace coarse shell fragments. Trace Clay below 270'.
290 – 350	60	LIMY SANDSTONE AND LIMESTONE – Limy Sandstone 90%, medium light gray (N6) to medium gray (N5), fine to medium grained with sparry matrix. Limestone 10%, yellowish gray (5Y 7/2), fine to medium grained, hard, sparry, slightly sandy packstone with trace fine grained phosphorite. Trace medium gray (N5) clay.
350 – 360	10	SANDY CLAYEY LIMESTONE AND LIMY SANDSTONE – Sandy Clayey Limestone 50%, light olive gray (5Y 5/2), fine to medium grained, moderately soft, phosphatic packstone with abundant fine grained quartz sand and Clay. Limy Sandstone 50%, light gray (N7) to light olive gray (5Y 5/2), fine to rarely coarse grained, moderately hard with abundant detrital carbonate and little clay. Trace large shell fragments.
360 – 440	80	CLAYEY SANDY LIMESTONE – 100% Pale olive (10Y 6/2), very fine to fine grained, moderately soft, slightly phosphatic wackestone with abundant clay and fine grained quartz sand.
440 – 500	60	SANDY CLAY AND CLAYEY LIMESTONE – Sandy Clay 50% to 60%, pale olive gray (10Y 6/2) to grayish yellow green (5GY 7/2), very soft, plastic, weakly calcareous, weakly phosphatic. Clayey Limestone 40% to 50%, pale olive gray (10Y 6/2), medium grained, moderately soft, friable, slightly phosphatic wackestone. Trace coarse shell fragments.
500 – 550	50	LIMY CLAY – 100% Pale olive (10Y 6/2), firm, non-plastic with abundant very fine to fine grained detrital carbonate and little to some very fine grained quartz sand.
550 – 560	10	SANDY CLAY – 100% Pale olive (10Y 6/2), firm, friable, non-plastic, highly calcareous with very fine grained quartz sand.
560 – 590	30	LIMY SANDY CLAY – 100% Pale olive (10Y 6/2), firm, friable, non-plastic with abundant very fine to fine grained detrital carbonate and very fine grained quartz sand.
590 – 610	20	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to soft, non-plastic to rarely plastic, slightly phosphatic with abundant very fine to fine grained quartz sand and fine grained detrital carbonate.
610 – 670	30	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm, non-plastic, slightly phosphatic with abundant very fine to fine grained quartz sand and fine grained detrital carbonate.
670 – 700	30	SANDY CLAY – 100% Pale olive (10Y 6/2), soft, low plasticity, calcareous, slightly phosphatic with abundant very fine to fine grained sand.

Depth (ft)	Thickness (ft)	Sample Description
700 - 720	20	SANDY CLAY – 100% Pale olive (10Y 6/2), very soft, moderately plastic, cohesive, calcareous, phosphatic with very fine to fine grained quartz sand.
720 – 750	30	SANDY CLAY – 100% Pale olive (10Y 6/2), moderately firm to soft, low plasticity, calcareous, slightly phosphatic with very fine to fine grained quartz sand.
750 – 760	10	SANDY CLAY – 100% Pale olive (10Y 6/2), very soft, plastic, cohesive, calcareous, slightly phosphatic with very fine to fine grained quartz sand.
760 – 770	10	SANDY CLAY – 100% Pale greenish yellow (10Y 8/2), soft moderately plastic, calcareous, moderately phosphatic, with very fine grained quartz sand.
770 – 780	10	SANDY CLAY – 100% Pale olive (10Y 6/2), very soft, plastic, cohesive, calcareous, slightly phosphatic with very fine to fine grained quartz sand.
780 – 810	30	SANDY CLAY – 100% Pale greenish yellow (10Y 8/2), soft, moderately plastic, calcareous, moderately phosphatic, with very fine grained quartz sand.
810 – 830	20	CLAY, CHERT AND CLAYEY LIMESTONE – Clay 90%, pale olive (10Y 6/2), soft to very soft, moderately plastic, calcareous, slightly phosphatic, with some very fine grained quartz sand. Chert 5%, olive gray (5Y 6/1) to olive black (5Y 2/1), fine grained with cryptocrystalline matrix, very hard. Clayey Limestone 5%, greenish gray (5GY 6/1), fine to medium grained, moderately hard, phosphatic wackestone/packstone with abundant Clay.
830 - 840	10	SANDY CLAY – 100% Grayish olive green (5GY 3/2), very stiff, low plasticity, phosphatic to highly phosphatic with very fine grained quartz sand and fine grained detrital carbonate.
840 - 860	20	CLAY – 100% Grayish olive (10Y 4/2), cohesive, very soft, high plasticity, slightly calcareous.
860 - 870	10	LIMESTONE - 100% White (N9) to olive gray (5Y 4/1), fine grained moderately hard, phosphatic packstone with micritic to sparry matrix, shell fragments and molds common.
870 - 890	20	LIMESTONE AND CLAY – Limestone 40% to 60%, as above. Clay 40% to 60%, pale olive (10Y 6/2), soft to very soft, moderately plastic to plastic, calcareous, slightly phosphatic. Trace black (N1) Chert.
890 - 900	10	CLAYEY LIMESTONE AND LIMESTONE – Clayey Limestone 70%, very light gray (N8) to pale olive (10Y 6/2), very fine to medium grained, soft to very soft, phosphatic wackestone. Limestone 30%; 20%, light olive gray (5Y 6/1) to olive gray (5Y 4/1), medium grained, moderately hard, phosphatic, partly sandy packstone/wackestone. 10% Yellowish gray (5Y 7/2), very fine grained, hard wackestone.

Depth (ft)	Thickness (ft)	Sample Description
900 - 910	10	LIMESTONE - 100%; 50% Yellowish gray (5Y 7/2), fine grained, moderately hard, sandy, phosphatic packstone. 30% Yellowish gray (5Y 8/1), medium to coarse grained, moderately hard, pelloidal fossiliferous packstone. 20% Medium light gray (N6), medium grained, hard, fossiliferous wackestone.
910 - 920	10	LIMESTONE - 100%; 70% Medium light gray (N6), medium to coarse grained, fossiliferous, slight sparry, micritic wackestone. 30% Packstone as above.
920 - 970	50	LIMESTONE - 100%; 80% Yellowish gray (5Y 8/1), fine to occasionally medium grained, hard, fossiliferous wackestone to mudstone. 20% Wackestone as above.
970 - 990	20	LIMESTONE - 100%; 80% Very pale orange (10YR 8/2), medium grained, moderately hard, fossiliferous packstone. 20% Very light gray (N8), fine to very coarse grained, hard, fossiliferous wackestone. Trace to few forams. Trace olive black (5Y 2/1), fine grained hard Limy Dolomite at 980'.
990 - 1,000	10	LIMESTONE - 100% Yellowish gray (5Y 8/1), medium grained, soft to moderately hard, pelloidal packstone with few forams.
1,000 – 1,060	60	LIMESTONE AND SANDY LIMESTONE – Limestone 90% to 95%, yellowish gray (5Y 8/1), medium to coarse grained, soft to moderately hard, pelloidal packstone. Sandy Limestone 10% to 5%, moderate yellowish green (5GY 7/4), medium to coarse grained, moderately hard, sparry, weakly vuggy packstone with medium grained quartz sand, shell molds, casts and shell fragments. Forams common.
1,060 – 1,070	10	LIMESTONE - 100%; 70% Limestone, light greenish gray (5G 8/1), medium to coarse grained, hard to moderately hard, vuggy packstone. 30% Yellowish gray (5Y 8/1), medium to coarse grained, moderately hard, pelloidal packstone with calcite lined vugs and forams.
1,070 – 1,080	10	LIMESTONE – 100% Yellowish gray (5Y 8/1) to light greenish gray (5GY 8/1), microcrystalline to fine grained, moderately soft, locally vuggy mudstone to wackestone with trace phosphorite.
1,080 – 1,170	90	LIMESTONE – 100%; 80% Yellowish gray (5Y 7/2) to grayish orange (10YR 7/4), fine to medium grained, moderately soft to hard, pelloidal packstone. 20% Pale yellowish brown (10YR 6/2), cryptocrystalline hard carbonate mudstone. Trace Dolomitic Limestone at 1,160'. Few large fossils and shell fragments.
1,170 – 1,260	90	LIMESTONE 100% - Grayish orange (10YR 7/4) to rarely dark yellowish orange (10YR 6/6), medium to coarse grained, moderately soft, pelloidal packstone to grainstone with abundant unconsolidated forams.
1,260 – 1,300	40	LIMESTONE – 100%; 90% Yellowish gray (5Y 8/1), cryptocrystalline to fine grained, soft to moderately hard, mudstone to packstone with abundant forams. 10% Yellowish gray (5Y 7/2), fine to medium grained soft wackestone. Trace light olive gray (5Y 6/1), cryptocrystalline, hard, carbonate mudstone.

Depth (ft)	Thickness (ft)	Sample Description
1,300 – 1,390	90	LIMESTONE – 100%; 60% to 70% Dominantly yellowish gray (5Y 8/1) packstone as above. 30% to 40% Medium light gray (N6), fine grained, hard to moderately hard, slightly sandy wackestone to packstone with fine grained quartz sand. Few fossils and shell fragments.
1,390 – 1,410	20	LIMESTONE - 100%; 80% Very pale orange (10YR 8/2), fine grained, moderately hard pelloidal packstone. 20% Pale yellowish brown (10YR 6/2), cryptocrystalline, hard, weakly vuggy packstone. Trace tests.
1,410 – 1,440	30	LIMESTONE – 100%; 80% to 60% Grayish orange (10YR 7/4), medium grained, moderately hard, pelloidal grainstone. 20% to 40% Pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1), cryptocrystalline, hard, partly weakly vuggy carbonate mudstone.
1,440 – 1,450	10	LIMESTONE - 100%; 60% Yellowish gray (5Y 8/1), medium grained, soft to moderately soft packstone. 20% Yellowish gray (5Y 8/1) to medium light gray (N6), very fine to fine grained, moderately hard, fossiliferous, micritic packstone. 20% Yellowish gray (5Y 8/1), cryptocrystalline to rarely very fine grained, hard, very weakly vuggy carbonate mudstone.
1,450 – 1,470	20	LIMESTONE – 100% Very pale orange (10YR 8/2), medium grained, soft pelloidal packstone with abundant forams.
1,470 – 1,500	30	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2), medium grained, moderately soft packstone. 30% Yellowish gray (5Y 7/2), cryptocrystalline, hard, carbonate mudstone with medium gray (N5), very fine grained to microcrystalline, hard packstone.
1,500 – 1,510	10	LIMESTONE – 100%; 50% Yellowish gray (5Y 8/1), fine to medium grained, moderately soft, pelloidal grainstone/packstone. 40% Yellowish gray (5Y 8/1), cryptocrystalline to rarely very fine grained, hard carbonate mudstone with trace crystalline carbonate. 10% White (N9), very fine to fine grained, very soft carbonate marl.
1,510 – 1,520	10	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, moderately soft, pelloidal packstone to wackestone with few forams.
1,520 – 1,530	10	LIMESTONE – 100%; 70% Medium light gray (N6) to medium gray (N5), fine to medium grained, moderately hard, fossiliferous grainstone to wackestone. 30% as above. Unconsolidated forams common.
1,530 – 1,540	10	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1), fine to medium grained, soft, pelloidal grainstone. 30% Olive black (5Y 2/1), cryptocrystalline, hard, silty carbonate mudstone. Abundant forams and few tests.
1,540 – 1,560	20	LIMESTONE – 100% Very pale orange (10YR 8/2), medium grained, soft pelloidal grainstone to wackestone with abundant forams and trace crystalline carbonate.

Depth (ft)	Thickness (ft)	Sample Description
1,560 – 1,600	40	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), fine grained, moderately soft, pelloidal, slightly fossiliferous packstone. 20% Yellowish gray (5Y 8/1) to medium light gray (N6), cryptocrystalline to very fine grained, hard, fossiliferous carbonate mudstone to wackestone. Forams common to abundant.
1,600 – 1,620	20	LIMESTONE – 100% Pale yellowish brown (10YR 6/2) to very pale orange (10YR 8/2), fine to medium grained, soft pelloidal packstone. Forams and tests common. Trace shell fragments and crystalline carbonate.
1,620 – 1,630	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, soft to moderately soft pelloidal grainstone.
1,630 – 1,640	10	LIMESTONE – 100% Grayish orange (10YR 7/4) to light olive gray (5Y 6/1), fine grained, moderately soft packstone with forams.
1,640 – 1,660	20	LIMESTONE - 100%; 90% Very pale orange (10 YR 8/2), very fine to medium grained, moderately soft, pelloidal carbonate mudstone to packstone. 10% Light olive gray (5Y 6/1), cryptocrystalline hard carbonate mudstone. Forams common
1,660 – 1,670	10	LIMESTONE – 100% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, partly weakly vuggy wackestone to packstone. Forams common.
1,670 – 1,720	50	LIMESTONE – 100%; 80% to 60% As above, percentage decreasing with depth. 20% to 40% Light olive gray (5Y 6/1) to medium light gray (N6), cryptocrystalline to fine grained, hard, partly weakly vuggy carbonate mudstone to wackestone, percentage increasing with depth. Unconsolidated forams common.
1,720 – 1,730	10	LIMESTONE – 100% Grayish orange (10YR 7/4), fine to medium grained, soft, pelloidal packstone to wackestone. Abundant unconsolidated forams and tests. Trace Dolomitic Limestone.
1,730 – 1,740	10	LIMESTONE – 100%; 70% As above. 30% Light gray (N7), fine grained, hard to rarely soft, partly weakly vuggy, partly micritic packstone to wackestone. Abundant unconsolidated forams.
1,740 – 1,750	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), very fine to medium grained, moderately hard to soft grainstone to packstone. 20% Very pale orange (10YR 8/2), cryptocrystalline, hard, partly weakly vuggy, rarely slightly sparry carbonate mudstone. Trace white (N9), very soft carbonate marl. Abundant forams.
1,750 – 1,760	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), fine to coarse grained, moderately soft, pelloidal grainstone to packstone. 20% Very pale orange (10YR 8/2), cryptocrystalline to very fine grained, hard, weakly vuggy carbonate mudstone. Abundant forams.
1,760 – 1,780	20	LIMESTONE – 100%; 90% Moderate yellowish brown (10YR 5/4), fine to medium grained, moderately soft, locally slightly Dolomitic packstone. 10% Light olive gray (5Y 6/1), coarse grained, hard wackestone with molds filled with crystalline carbonate.

Depth (ft)	Thickness (ft)	Sample Description
1,780 – 1,790	10	LIMESTONE AND SILTY LIMESTONE – Limestone 80%; 70% Moderate yellowish brown (10YR 5/4), medium grained, moderately hard grainstone. 10% Very pale orange (10YR 8/2), fine grained, moderately hard packstone. Forams common. Silty Limestone 20%; Black (N1), medium grained, moderately hard, silty, pelloidal packstone.
1,790 – 1,800	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2), fine to medium grained, moderately soft to soft, pelloidal packstone to wackestone with occasional molds. 10% Light olive gray (5Y 6/1), fine grained, hard, micritic carbonate mudstone.
1,800 – 1,810	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 7/2), fine to medium grained, soft, pelloidal to highly sparry packstone with dominantly grayish blue green (5BG 5/2) intraclasts. 20% Pale greenish yellow (10Y 8/2) to grayish yellow (5Y 8/4), microcrystalline to fine grained, slightly vuggy to vuggy, moderately hard wackestone to packstone. Trace white (N9), fine grained, hard carbonate mudstone and medium dark gray (N4), very soft argillaceous carbonate marl.
1,810 – 1,820	10	LIMESTONE – 100% Pale greenish yellow (10Y 8/2), fine to medium grained, soft, pelloidal wackestone. Trace medium light gray (N6), microcrystalline, slightly vuggy, hard carbonate mudstone.
1,820 – 1,840	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1), fine grained, soft, pelloidal wackestone. 30% Light greenish gray (5GY 8/1), fine grained, moderately hard, vuggy wackestone to packstone. Few unconsolidated forams.
1,840 – 1,850	10	LIMESTONE – 100; 80% Yellowish gray (5Y 8/1) to light greenish gray (5GY 8/1), fine grained, partly vuggy, locally oolitic/pelloidal wackestone. 20% Greenish gray (5G 6/1), cryptocrystalline to microcrystalline, hard, fossiliferous, sparry wackestone. Trace light olive gray (5Y 6/1) to yellowish gray (5Y 8/1), cryptocrystalline, hard, micritic carbonate mudstone.
1,850 – 1,870	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 7/2) to medium gray (N5), medium to coarse grained, hard grainstone to rarely packstone. 30% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), cryptocrystalline, hard, locally weakly vuggy carbonate mudstone. Forams common.
1,870 – 1,880	10	LIMESTONE – 100% Very pale orange (10YR 9/2), fine to very fine grained, moderately hard, locally weakly vuggy wackestone to carbonate mudstone.
1,880 – 1,890	10	LIMESTONE – 100%; 70% As above. 30% Very pale orange (10YR 8/2), very fine to medium grained, soft to moderately soft packstone. Trace crystalline carbonate.
1,890 – 1,900	10	DOLOMITE AND LIMESTONE - Dolomite 50%, moderate yellowish brown (10YR 5/4), cryptocrystalline, hard, slightly limy. Limestone 50%; 40% very pale orange (10YR 8/2), very fine to medium grained, soft to moderately hard wackestone to carbonate mudstone with few forams and tests. 10% Medium light gray (N6), fine grained, hard grainstone.

Depth (ft)	Thickness (ft)	Sample Description
1,900 – 1,910	10	LIMESTONE AND DOLOMITIC LIMESTONE – Limestone 80%, yellowish gray (5Y 8/1), very fine grained, hard, locally vuggy carbonate mudstone to wackestone. Trace white (N9), very soft carbonate marl. Dolomitic Limestone 20%, moderate yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2), fine grained, soft carbonate mudstone with very thin to 4 mm dark yellowish brown (10YR 4/2) Dolomite laminations.
1,910 – 1,920	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2), medium grained, moderately soft, pelloidal, locally vuggy grainstone to packstone. 40% Grayish orange (10YR 7/4), medium to coarse grained, hard, highly sparry packstone/wackestone. Few forams.
1,920 – 1,930	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal packstone with few forams.
1,930 – 1,940	10	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to very fine grained, moderately soft to moderately hard, pelloidal, fossiliferous packstone.
1,940 – 1,970	30	LIMESTONE - 100%; 50% to 60% White (N9) to very pale orange (10YR 8/2), microcrystalline to fine grained, moderately soft, pelloidal locally sparry, fossiliferous packstone. 40% to 50% Light greenish gray (5GY 8/1), fine to medium grained, moderately hard to hard, pelloidal wackestone. Trace greenish gray (5G 6/1) to medium bluish gray (5B 5/1), cryptocrystalline to very fine grained, hard carbonate mudstone. Abundant foram tests.
1,970 – 1,980	10	LIMESTONE – 100% White (N9) to very pale orange (10YR 8/2), microcrystalline to fine grained, moderately soft, pelloidal, locally sparry, fossiliferous packstone. Trace greenish gray (5G 6/1) to medium bluish gray (5B 5/1), hard, microcrystalline carbonate mudstone and light greenish gray (5GY 8/1), fine to medium grained, moderately hard, pelloidal wackestone.
1,980 – 2,010	30	LIMESTONE – 100% Light greenish gray (5GY 8/1), fine to medium grained, moderately hard, pelloidal, locally sparry wackestone to packstone. Trace greenish gray (5GY 8/1), hard microcrystalline carbonate mudstone.
2,010 – 2,020	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1), fine to medium grained, soft to moderately hard, pelloidal packstone. 20% Yellowish gray (5Y 8/1), cryptocrystalline, hard carbonate mudstone.
2,020 – 2,040	20	DOLOMITE AND LIMESTONE – Dolomite 80%; 60% Light olive gray (5Y 5/2) moderate yellowish brown (10YR 5/4) and olive black (5Y 2/1), fine grained to cryptocrystalline, hard to very hard, sucrosic, locally weakly vuggy. 10% Dark yellowish brown (10YR 4/4), medium grained to cryptocrystalline, hard. 10% Light olive gray (5Y 6/1), cryptocrystalline, very hard, weakly vuggy, vugs lined with very fine grained euhedral dolomite rhombs. Limestone 20%; 10% Yellowish gray (5Y 8/1), fine to medium grained, soft to moderately hard, pelloidal packstone. 10% Yellowish gray (5Y 8/1), fine to medium grained, soft to moderately hard, pelloidal, slightly to moderately Dolomitic packstone.

Depth (ft)	Thickness (ft)	Sample Description
2,040 – 2,050	10	DOLOMITE AND LIMESTONE – Dolomite 70% light olive gray (5Y 6/1) to dusky yellowish brown (10YR 2/2), very fine grained to cryptocrystalline, very hard, sucrosic. Limestone 30% very pale orange (10YR 8/2), medium to fine grained, moderately soft, rarely Dolomitic packstone. Trace medium gray (N5) to olive black (5Y 2/1) Limy Dolomite.
2,050 – 2,060	10	LIMESTONE – 100%; 70% Very pale orange (10YR 9/2), very fine grained to cryptocrystalline, hard carbonate mudstone. 30 % Very pale orange (10YR 8/2), medium to fine grained, moderately soft pelloidal packstone/grainstone.
2,060 - 2,070	10	DOLOMITE – 100%; 70% Moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), very fine grained to cryptocrystalline, hard to very hard, locally very weakly vuggy, sucrosic. 30% Pale yellowish brown (10YR 6/2), fine to medium grained, moderately hard.
2,070 – 2,080	10	DOLOMITE AND CLAY – Dolomite 90% moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2), very fine grained to cryptocrystalline, hard to very hard, locally very weakly vuggy, sucrosic. Clay 10% olive gray (5Y 4/1) to medium bluish gray (5B 5/1), soft to moderately firm, moderately plastic, non calcareous, cohesive.
2,080 – 2,090	10	DOLOMITE AND LIMY DOLOMITE – Dolomite 60%, dark yellowish brown (10YR 4/2), cryptocrystalline, hard to very hard. Limy Dolomite 40%, grayish brown (5YR 3/2), cryptocrystalline to fine grained, hard to very hard with euhedral crystals common and with 5% very pale orange (10YR 8/2), carbonate mudstone matrix and trace tests. Trace Dolomitic Limestone.
2,090 – 2,120	30	LIMESTONE – 100% Grayish orange (10YR 7/4), fine to coarse grained, moderately soft to moderately hard, well indurated, pelloidal, partly Dolomitic packstone with few tests and fossils. Few to common forams.
2,120 – 2,160	40	LIMESTONE – 100% Grayish orange (10YR 7/4), medium to fine grained, moderately hard to moderately soft, well indurated, pelloidal, fossiliferous packstone to grainstone. Trace white (N9), very soft carbonate marl to 2140'. Trace to few forams. Trace Dolomite.
2,160 – 2,240	80	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard, moderately to well indurated, pelloidal, partly sparry slightly fossiliferous packstone with few forams.
2,240 – 2,250	10	LIMESTONE – 100% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard to hard, well indurated, pelloidal partly fossiliferous packstone with trace casts and molds.
2,250 – 2,310	10	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard, well indurated, pelloidal, partly fossiliferous, partly sparry packstone. Few to common forams. Trace tests. Trace white (N9), very soft carbonate marl at 2,300'.

Depth (ft)	Thickness (ft)	Sample Description
2,310 – 2,340	30	LIMESTONE – 100%; 85% As above. 15% Light greenish gray (5GY 8/1), fine to medium grained, moderately hard to moderately soft, fossiliferous packstone. Abundant fossils.
2,340 – 2,350	10	LIMESTONE – 100% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, partly fossiliferous packstone. Trace Dolomitic Limestone.
2,350 – 2,370	20	LIMESTONE – 100%, 90% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, partly fossiliferous packstone. 10% Light gray (N7) to dark gray (N5), fine grained to microcrystalline, moderately hard to hard, slightly Dolomitic mudstone.
2,370 – 2,400	30	LIMESTONE – 100% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, partly fossiliferous packstone. Few echinoid fossils to 10mm in diameter. Trace very light gray (N8), very soft carbonate marl.
2,400 – 2,410	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, partly fossiliferous packstone. 40% Light greenish gray (5GY 8/1), cryptocrystalline to microcrystalline moderately soft, well indurated wackestone to locally mudstone with few fossils. Few 5mm to 10 mm echinoid tests and shell fragments.
2,410 - 2,440	30	LIMESTONE - 100%; 90% to 95% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, partly fossiliferous, weakly pelloidal to pelloidal packstone with trace tests. 10% to 5% Very pale orange (10YR 8/2) to light greenish gray (5GY 8/1), dominantly microcrystalline to cryptocrystalline, hard to moderately hard carbonate mudstone to wackestone. Trace grayish orange (10YR 7/4), cryptocrystalline, very hard Dolomite and white (N9) carbonate marl. Few echinoids up to 10mm in diameter. Trace Dolomitic Limestone at 2,440'.
2,440 - 2,470	30	LIMESTONE – 100%, Very pale orange (10YR 8/2), medium to fine grained, moderately hard, well indurated, pelloidal, partly fossiliferous packstone. Trace yellowish gray (5Y 7/2), fine grained, hard carbonate mudstone at 2,450'. Sparry at 2,470'.
2,470 - 2,490	20	LIMESTONE – 100%; 90% As above. 10% Dark greenish gray (5GY 4/1), cryptocrystalline, hard carbonate mudstone. Trace white (N9), remineralized shell fragments (calcite) at 2,490'.
2,490 - 2,500	10	LIMESTONE – 100%; Grayish orange (10YR 7/2) to pale yellowish brown (10YR 6/2), medium to fine grained, moderately soft to moderately hard, pelloidal, fossiliferous, locally sparry, well indurated packstone. Trace crystalline carbonate.
2,500 - 2,510	10	LIMESTONE AND DOLOMITIC LIMESTONE - Limestone 80%, very pale orange (10YR 8/2), fine to medium grained, moderately soft, well indurated, pelloidal packstone. Dolomitic Limestone 20%, Grayish orange (10YR 7/2) to pale yellowish brown (10YR 6/2), medium to fine grained, moderately soft to moderately hard, pelloidal, fossiliferous, locally sparry, well indurated packstone with 5% to 10% fine grained euhedral Dolomite crystals.

Depth (ft)	Thickness (ft)	Sample Description
2,510 – 2,520	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately hard to hard, very well indurated, pelloidal, fossiliferous packstone to wackestone with little crystalline carbonate.
2,520 – 2,540	20	LIMESTONE AND DOLOMITIC LIMESTONE – Limestone 80%, As above. Dolomitic Limestone 20%, grayish orange (10 YR 7/4), fine to medium grained, hard, fossiliferous packstone with tests and 20% to 50% fine grained euhedral to anhedral Dolomite crystals.
2,540 – 2,550	10	LIMESTONE - 100%; 90% Very pale orange (10YR 8/2), fine to medium grained, hard, pelloidal, fossiliferous packstone. 10% Medium gray (N5), cryptocrystalline, hard carbonate mudstone. Trace Dolomitic Limestone as above.
2,550 – 2,560	10	LIMESTONE - 100% Yellowish gray (5Y 7/2), dominantly fine to medium grained, hard to rarely soft, well indurated, pelloidal, locally weakly Dolomitic packstone.
2,560 – 2,570	10	LIMY DOLOMITE AND LIMESTONE – Limy Dolomite 70%, moderate yellowish brown (10YR 5/4), fine grained, hard with 10% to 50% very pale orange (10YR 8/2), cryptocrystalline to medium grained Limestone and tests. Limestone 30%, very pale orange (10YR 8/2), fine grained, moderately hard to moderately soft, pelloidal packstone.
2,570 – 2,580	10	LIMESTONE – 100% Pale yellowish brown (10YR 6/2), fine to medium grained, moderately soft to moderately hard, well indurated, pelloidal, fossiliferous packstone with few tests. Trace Dolomitic Limestone.
2,580 – 2,590	10	LIMESTONE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4), fine to medium grained, moderately hard, well indurated, pelloidal packstone.
2,590 – 2,610	20	LIMESTONE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4), fine grained, moderately hard, very well indurated, packstone to wackestone with forams common. Trace to little medium gray (N5), cryptocrystalline hard carbonate mudstone.
2,610 – 2,620	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1), fine grained, moderately soft to moderately hard, pelloidal, fossiliferous packstone to rarely grainstone. 10% Moderate yellowish brown (10YR 5/4), cryptocrystalline, very hard carbonate mudstone. 10% Medium light gray (N6), very fine grained, moderately hard carbonate mudstone.
2,620 – 2,640	20	LIMESTONE – 100%; 50% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard to hard, well indurated, fossiliferous packstone to grainstone. 30% Medium gray (N5), fine grained, hard, pelloidal packstone with few mudstone clasts. 20% Olive black (5Y 4/1), dominantly cryptocrystalline to rarely fine grained, very hard carbonate mudstone.
2,640 – 2,650	10	LIMESTONE – 100%; 80% Medium dark gray (N4), dark gray (N3), olive gray (5Y 4/1) and yellowish gray (5Y 8/1), cryptocrystalline, hard to very hard, locally very weakly vuggy carbonate mudstone. 20% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard packstone. Trace galuconite.

Depth (ft)	Thickness (ft)	Sample Description
2,650 – 2,660	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1), medium grained, moderately hard, pelloidal packstone. 20% Yellowish gray (5Y8/1), cryptocrystalline, hard carbonate mudstone.
2,660 – 2,670	10	LIMESTONE – 100% Grayish orange (10TR 7/3), very fine to fine grained, moderately hard, very well to well indurated, pelloidal packstone with little grainstone. Trace light olive gray (5Y 6/1), microcrystalline, moderately soft carbonate mudstone. Forams common.
2,670 – 2,710	40	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2), fine to medium grained, moderately hard to hard, dominantly very well indurated, locally sparry packstone. 10% Yellowish gray (5Y 8/1), cryptocrystalline, hard carbonate mudstone. Few forams. Trace white (N9), very fine grained, very soft wackestone with carbonate marl matrix at 2,610'. Trace olive black (5Y 2/1), cryptocrystalline, hard carbonate mudstone below 2,700'.
2,710 – 2,720	10	LIMESTONE – 100% Yellowish gray (5Y 8/1), cryptocrystalline, hard, very well indurated, very weakly vuggy carbonate mudstone.
2,720 – 2,730	10	LIMESTONE – 100%; 80% As above. 20% Yellowish gray (5Y 8/1), fine grained, moderately hard pelloidal packstone.
2,730 – 2,740	10	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2), fine grained, moderately soft, well indurated, pelloidal packstone. 30% Yellowish gray (5Y 8/1), cryptocrystalline, hard, very well indurated, very weakly vuggy carbonate mudstone.
2,740 – 2,770	30	LIMESTONE – 100% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately soft, pelloidal packstone.
2,770 – 2,780	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4), fine to medium grained, moderately soft packstone. 20% Light olive gray (5Y 6/1) to olive black (5Y 2/1), cryptocrystalline to microcrystalline, hard, locally vuggy carbonate mudstone.
2,780 – 2,810	30	LIMESTONE – 100%; 70% to 80% Very pale orange (10YR 9/2), microcrystalline to very fine grained, moderately soft, moderately indurated carbonate mudstone/wackestone. 20% to 30% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately hard, pelloidal, partly fossiliferous packstone. Few forams. Trace to little medium gray (N5) to dark gray (N4), microcrystalline Dolomitic carbonate marl with few prominent mottles.
2,810 – 2,830	20	LIMESTONE – 100%; 95% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately soft to moderately hard, pelloidal, partially weakly fossiliferous packstone. 5% Very pale orange (10YR 9/2) to yellowish gray (5Y 8/1), fine grained to microcrystalline, moderately hard mudstone to wackestone. Trace medium gray (N5), carbonate marl.

Depth (ft)	Thickness (ft)	Sample Description
2,830 – 2,840	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), microcrystalline to very fine grained, moderately soft, moderately indurated carbonate mudstone/wackestone. 15% Medium dark gray (N4), microcrystalline, hard carbonate mudstone. 5% Very pale orange (10YR 8/1),, microcrystalline to very fine grained, hard to moderately hard, locally pelloidal carbonate mudstone to wackestone.
2,840 – 2,850	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately soft to moderately hard, pelloidal, partially weakly fossiliferous packstone. 15% Light olive gray (5Y 6/1) to greenish gray (5GY 6/1), microcrystalline to very fine grained, moderately soft to moderately hard, weakly vuggy, slightly argillaceous carbonate mudstone. 5% Very pale orange (10YR 8/2), microcrystalline to very fine grained, hard to moderately hard, locally pelloidal mudstone to wackestone.
2,850 – 2,870	20	LIMESTONE - 100%; 60% Very pale orange (10YR 8/2), dominantly fine to medium grained, moderately soft to moderately hard, pelloidal, partially weakly fossiliferous packstone. 40% White (N9),, dominantly medium to coarse grained, soft, slightly fossiliferous, pelloidal packstone. Trace foram tests.
2,870 - 2,880	10	LIMESTONE AND DOLOMITE – Limestone 60%, white (N9), dominantly medium to coarse grained, soft to moderately hard pelloidal packstone. Dolomite 40%, pale yellowish brown (10YR 6/2) to locally dark greenish gray (5GY 4/1), varying to dark gray (N3), coarse grain sized crystals, hard to very hard, partly sucrosic.
2,880 - 2,890	10	DOLOMITE AND LIMESTONE – Dolomite 60%; 50% dark greenish gray (5GY 4/1) to dark gray (N3), microcrystalline, hard to very hard, sucrosic. 10% Pale yellowish brown (10YR 6/2), coarse grain sized, crystalline, hard. Limestone 40% very pale orange (10YR 8/2), fine to locally medium grained, soft to moderately hard packstone.
2,890 - 2,900	10	LIMESTONE AND DOLOMITE – Limestone 90%, white (N9), medium to coarse grained, soft to moderately hard, well indurated, pelloidal packstone. Dolomite 10%, dark greenish gray (5GY 4/1) to dark gray (N3), microcrystalline, very hard.
2,900 -2,910	10	DOLOMITE AND LIMESTONE – Dolomite 60%, light gray (N7) to greenish gray (5GY 6/1), cryptocrystalline to microcrystalline, very hard, very well indurated. Limestone 40%, very pale orange (10YR 8/2), medium to coarse grained, soft to moderately hard, pelloidal to oolitic packstone. Few shell fragments within matrix ranging from 2 mm to 10 mm.
2,910 - 2,920	10	DOLOMITIC LIMESTONE, LIMY DOLOMITE AND DOLOMITE – Dolomitic Limestone 80%, yellowish gray (5Y 8/1), cryptocrystalline to microcrystalline, hard, very well indurated, moderately vuggy mudstone to wackestone, vugs filled with grayish orange (10YR 7/4) Dolomite. Limy Dolomite 15%, medium gray (N5) to dark greenish gray (5GY 4/1), microcrystalline, hard, well indurated. Dolomite 5%, light olive gray (5Y 6/1) to very pale orange (10YR 8/2), microcrystalline to fine grained, very hard, locally sucrosic with thin Dolomite laminations.

Depth (ft)	Thickness (ft)	Sample Description
2,920 - 2,930	10	DOLOMITE AND LIMESTONE – Dolomite 95%, yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), microcrystalline to fine grained, partially sucrosic, very hard, locally weakly vuggy. Limestone 5%, white (N9), cryptocrystalline to medium grained, moderately hard, partially pelloidal packstone.
2,930 - 2,940	10	DOLOMITE – 100%, 50% Yellowish gray (5Y 8/1) as above. Dolomite 50%; 30% Light olive gray (5Y 6/1), microcrystalline to fine grained crystalline carbonate, very hard, very well indurated. 20%, Grayish orange (10YR 7/4), microcrystalline to coarse grained, very hard euhedral crystals.
2,940 - 2,950	10	DOLOMITE AND LIMESTONE – Dolomite 80%, grayish orange (10YR 7/3), microcrystalline, very hard. Limestone 10%, very pale orange (10YR 8/2), fine grained, moderately hard to moderately soft, pelloidal packstone. 10% Limestone, very pale orange (10YR 8/2), very fine grained, hard wackestone.
2,950 - 2,960	10	DOLOMITE AND LIMESTONE – Dolomite 70%; 40% yellowish gray (5Y 8/2), dominantly cryptocrystalline to very fine grained, very hard, weakly vuggy, vugs filled with moderate yellowish brown (10YR 5/4), very fine grained Dolomite crystals. Occasional fully healed fractures filled with Dolomite crystals as above. Occasionally encrusted with medium grained subhedral to anhedral Dolomite crystals. 20% Dark yellowish brown (10YR 4/2), microcrystalline, very well indurated, very hard. 10% Light olive gray (5Y 6/1), microcrystalline, very hard, weakly vuggy. Limestone 30%, very pale orange (10YR 8/2), fine to medium grained, moderately hard packstone to grainstone with few forams.
2,960 – 3,000	40	DOLOMITE AND LIMESTONE – Dolomite 70% to 60%, pale yellowish brown (10YR 6/2), microcrystalline to cryptocrystalline, very hard, very well indurated. Limestone 30% to 40%, 20% to 30%, very pale orange (10YR 8/2), fine to medium grained, moderately soft to hard, pelloidal packstone to grainstone with trace molds. 10% Very pale orange (10YR 8/2), cryptocrystalline to very fine grained, hard, very well indurated carbonate mudstone. Trace foram tests.
3,000 – 3,010	10	DOLOMITE – 100% Yellowish brown (10YR 6/4), cryptocrystalline to fine grained, very hard.
3,010 – 3,020	10	DOLOMITE – 100%; 80% Grayish orange (10YR 8/4), cryptocrystalline to rarely very fine grained, very hard, weakly vuggy, vugs lined and filled with Dolomite crystals, local fractures fully healed with Dolomite crystals. 20% Olive gray (5Y 3/2) to light olive gray (5Y 5/2), microcrystalline to cryptocrystalline, very hard.
3,020 - 3,030	10	DOLOMITE – 100%; 80% Grayish orange (10YR 8/4), cryptocrystalline to rarely very fine grained, very hard, weakly vuggy, vugs lined and filled with Dolomite crystals, local fractures fully healed with Dolomite crystals. 20% Yellowish brown (10YR 6/4), coarse grained to cryptocrystalline, very hard, locally very weakly vuggy.

Depth (ft)	Thickness (ft)	Sample Description
3,030 - 3,040	10	DOLOMITE – 100% Yellowish gray (5Y 8/1 to 5Y 7/1), microcrystalline to cryptocrystalline, very hard, slightly calcareous, locally weakly vuggy, vugs lined with fine to very fine grained euhedral Dolomite crystals with trace white (N9) Limestone inclusions.
3,040 - 3,060	20	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to pale yellowish brown (10YR 6/2), microcrystalline to rarely locally medium grained, very hard, dominantly sucrosic with trace white (N9), Limestone. Few prominent mottles at 3,060'.
3,060 - 3,080	20	DOLOMITE – 100% Dark yellowish brown (10YR 4/2), light olive gray (5Y 6/1) and yellowish gray (5Y 8/1), cryptocrystalline to coarse grained euhedral crystals, very hard, local fractures fully healed with Dolomite crystals. Trace very light gray (N8), fractured hard Limestone at 3,070', fractures fully healed with very fine to fine grained Dolomite crystals. Trace white (N9) carbonate mudstone lenses at 3,080.
3,080 - 3,090	10	DOLOMITE – 100%; 60% Pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 6/2), cryptocrystalline to fine grained, very hard, locally fossiliferous. 40% Pale yellowish brown (10YR 6/2), cryptocrystalline, very hard, local fractures fully healed with Dolomite crystals.
3,090 - 3,110	20	DOLOMITE – 100%; 90% Light olive gray (5Y 6/1), cryptocrystalline, very hard. 10% Moderate yellowish brown (10YR 5/4), cryptocrystalline to medium grained, very hard euhedral to anhedral crystals.
3,110 - 3,120	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2) to pale yellowish brown (10YR 6/2), dominantly very fine grained to cryptocrystalline, rarely coarse grained, subhedral crystals, very hard, sucrosic.
3,120 - 3,130	10	DOLOMITE – 100%, Yellowish brown (10YR 5/2) to dark yellowish brown (10YR 4/2), cryptocrystalline to microcrystalline, very hard. Rare fractures healed with fine to medium euhedral Dolomite crystals.
3,130 - 3,140	10	DOLOMITE – 100%, Olive gray (5Y 5/1), dominantly cryptocrystalline vuggy with vugs filled with euhedral to subhedral, medium to coarse Dolomite crystals.
3,140 - 3,150	10	DOLOMITE – 100%; 70% Pale yellowish brown (10YR 6/2), fine grained to microcrystalline, sucrosic, very hard, slightly calcareous with few limestone inclusions. 30% Light olive gray (5Y 7/1), very fine grained to microcrystalline, very hard, slightly calcareous. Trace light olive gray (5Y 4/2 to 5/2),, fine grained, very hard, locally weakly vuggy Dolomite with coarse grained Dolomite crystals filling vugs.
3,150 - 3,160	10	DOLOMITE – 100%, Yellowish gray (5Y 8/1 to 7/1), microcrystalline to cryptocrystalline, very hard, slightly calcareous, locally weakly vuggy with vugs lined with fine to medium euhedral Dolomite crystals.

Depth (ft)	Thickness (ft)	Sample Description
3,160 - 3,180	20	DOLOMITE – 100%, 70% Yellowish gray (5Y 7/2), microcrystalline to cryptocrystalline, very hard with few limestone inclusions. 20% Yellowish gray (5Y 7/2), cryptocrystalline to fine grained, commonly weakly vuggy and fractured, vugs and fractures healed with euhedral Dolomite crystals. 10% Light olive gray (5Y 5/2), medium grain sized, subhedral, very hard crystals. Trace white (N9), soft carbonate mudstone at 3,160'.
3,180 - 3,190	10	DOLOMITE – 100%, Yellowish gray (5Y 8/1) to light olive gray (5Y 7/1), cryptocrystalline, very hard with few distinct mottles and with fine to medium grained euhedral Dolomite crystals filling vugs and fractures.
3,190 - 3,210	20	DOLOMITE – 100%, Yellowish brown (10YR 5/2), dominantly cryptocrystalline to very fine grained, very hard, sucrosic.
3,210 - 3,220	10	DOLOMITE – 100%, Pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1), dominantly cryptocrystalline to very fine grained, very hard. Rare medium light gray (N6), very fine grained Limy Dolomite inclusions.
3,220 - 3,240	20	DOLOMITE – 100%, Dark yellowish brown (10YR 4/2 to 5/2), dominantly very fine grained to microcrystalline, rarely medium grained, very hard with little pale yellowish brown (10YR 6/2) and grayish orange (10YR 7/4), very fine grained to microcrystalline, hard Dolomite and rare fractures filled with euhedral to subhedral Dolomite crystals.
3,240 - 3,260	20	DOLOMITE - Olive gray (5Y 4/1 to 5/1), dominantly fine grained, hard, anhedral to subhedral crystals. Trace medium gray (N5), fine to medium grained, moderately hard, sucrosic, subhedral Dolomite crystals.
3,260 - 3,280	20	DOLOMITE – 100%, Dark yellowish brown (10YR 4/2) to yellowish brown (10YR 5/2), dominantly fine grained to very fine grained, locally medium grained, partially weakly vuggy, moderately hard with rare calcareous inclusions.
3,280 - 3,290	10	DOLOMITE – 100%, Pale orange (10YR 7/2), dominantly fine to very fine grained, locally coarse grained euhedral crystals, moderately hard, weakly indurated. Trace white (N9), microcrystalline, moderately soft carbonate mudstone.
3,290 - 3,300	10	DOLOMITE – 100%; 60% Pale orange (10YR 7/2) to very pale orange (10YR 8/2), dominantly fine grained, moderately hard subhedral crystals, locally weakly vuggy. 40% Dark yellowish brown (10YR 4/2) to yellowish brown (10YR 5/2), mostly fine grained, rarely coarse grained, moderately hard.
3,300 - 3,310	10	DOLOMITE – 100%; 60% Dark yellowish brown (10YR 4/2) to yellowish brown (10YR 5/2), dominantly fine grained, rarely subhedral coarse grained, hard, locally weakly vuggy with few very fine grained Dolomitic inclusions. 40% Pale orange (10YR 7/2), mostly fine grained to medium grained, moderately hard.

Depth (ft)	Thickness (ft)	Sample Description
3,310 - 3,320	10	DOLOMITE – 100%, 90% Yellowish brown (10YR 5/2), dominantly fine grained anhedral to locally medium grained subhedral, moderately hard. 10% Dark yellowish brown (10YR 5/4), fine grained, hard.
3,320 - 3,340	20	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4) to dark yellowish brown (10YR 4/2) and grayish orange (10YR 7/4), dominantly fine grained to microcrystalline, very hard, vuggy with vugs locally lined with medium grained euhedral Dolomite crystals. Few pale orange (10YR 7/2), fine grained, hard Dolomitic inclusions.
3,340 - 3,350	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2) to pale yellowish brown (10YR 6/2), microcrystalline to cryptocrystalline, very hard and sucrosic.
3,350 - 3,360	10	DOLOMITE – 100%; 50% Moderate yellowish brown (10YR 5/4), microcrystalline to very fine grained, moderately hard. 30% Dusky yellowish brown (10YR 2/2) to dark yellowish brown (10YR 4/2), very fine grained to microcrystalline, hard to very hard, weakly laminated, sucrosic with trace white (N9) Limestone inclusions. 20% Yellowish brown (10YR 4/4), fine grained, moderately hard, vuggy. Trace greenish black (5GY 2/1), fine to medium grained, hard, weakly vuggy Dolomite.
3,360 – 3,380	20	DOLOMITE – 100% Pale yellowish brown (10YR 4/2) to moderate yellowish brown (10 YR 5/4), microcrystalline to cryptocrystalline, hard to very hard, sucrosic.
3,380 – 3,390	10	DOLOMITE – 100% Dark yellowish brown (10YR 3/2), cryptocrystalline to microcrystalline, very hard, very weakly vuggy.
3,390 – 3,400	10	DOLOMITE – 100%; 80% Dusky yellowish brown (10YR 6/2 to 10YR 7/2), dominantly microcrystalline to cryptocrystalline, hard, locally weakly vuggy. 20% Yellowish brown (10YR 7/2), cryptocrystalline to microcrystalline, hard, weakly vuggy.
3,400 – 3,410	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2 to 10YR 7/2), dominantly cryptocrystalline to microcrystalline, hard, with rare closed fractures and vugs, vugs lined with medium to coarse grained euhedral to subhedral Dolomite crystals
3,410 – 3,420	10	DOLOMITE – 100%; 60% Dark yellowish brown (10YR 4/2), cryptocrystalline to microcrystalline, hard, with subhedral crystals. 40% Dark gray (N3), dominantly cryptocrystalline to microcrystalline, hard, with trace very pale orange (10YR 8/2), microcrystalline, hard, Limestone inclusions.
3,420 – 3,430	10	DOLOMITE – 100%; 85% Dark yellowish brown (10YR 4/2 to 10YR 5/2), dominantly fine grained to microcrystalline, very hard, sucrosic. 15% Pale yellowish brown (10YR 6/2), fine grained, moderately hard subhedral crystals, locally weakly laminated. Trace very pale orange (10YR 8/2), fine grained, moderately hard, sucrosic, slightly calcareous Dolomite

Depth (ft)	Thickness (ft)	Sample Description
3,430 – 3,440	10	DOLOMITE – 100% Dusky yellowish brown (10YR 2/2) to dark yellowish brown (10YR 4/2), dominantly microcrystalline to cryptocrystalline, locally fine grained subhedral crystals, hard with rare Limestone inclusions. Trace dusky yellowish brown (10YR 2/2) to black (N1), coarse to medium grained, hard Dolomite.
3,440 – 3,450	10	DOLOMITE 100%; 90% Pale yellowish brown (10YR 6/2 to 10YR 7/2), microcrystalline to fine grained, hard, subhedral crystals. 10% Dark yellowish brown (10YR 4/2), microcrystalline to cryptocrystalline, rarely locally vuggy with rare fully healed fractures filled with dark yellowish brown (10YR 3/2), euhedral to subhedral coarse to medium grained Dolomite crystals.
3,450 – 3,460	10	DOLOMITE – 100%; 90% Pale yellowish brown (10YR 7/2), very fine grained to microcrystalline, hard, locally weakly vuggy, partly sucrosic. 10% Dark yellowish brown (10YR 4/2), dominantly microcrystalline to very fine grained subhedral crystals, hard to very hard, thinly laminated and fractured.
3,460 – 3,500	40	DOLOMITE – 100%; 70% Grayish orange (10YR 7/4), very fine grained to microcrystalline, hard, sucrosic, locally weakly vuggy. 30% Pale yellowish brown (10YR 6/2), fine grained, moderately hard, partly vuggy. Trace yellowish gray (5Y 8/1) to white (N9), very fine grained, moderately hard, slightly calcareous Dolomite.

Injection Well No. 2 (IW-2) – Lithology

Geologic Log

GEOLOGIC LOG
(Drill Cuttings)

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP

INJECTION WELL IW - 2

Depth (ft)	Thickness (ft)	Sample Description
0 - 10	10	LIMESTONE AND ORGANICS – Limestone 95%, very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), very fine grained to microcrystalline, hard, locally slightly sandy wackestone to packstone. Organics 5%, brownish black (5YR 2/1), soft. Trace medium grained quartz sand, crystalline carbonate and shell fragments.
10 - 20	10	LIMESTONE – 100% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), fine to medium grained, hard, pelloidal packstone to rarely wackestone with trace tests.
20 - 30	10	SANDSTONE AND LIMESTONE – Sandstone 80%, yellowish gray (5Y 7/2), fine to coarse grained dominantly medium grained, subangular slightly phosphatic, quartz sandstone well cemented with calcite. Limestone 20%, as above.
30 - 40	10	LIMESTONE – 100%; 80% Pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), microcrystalline to fine grained, moderately hard to hard, locally slightly sandy wackestone. 20% Pale yellowish brown (10YR 6/2), fine to medium grained, hard, fossiliferous, highly sparry packstone. Trace to little crystalline carbonate.
40 - 50	10	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 80%, pale yellowish brown (10YR 6/2) to yellowish gray (5Y 7/2), fine to medium grained, hard, highly sparry, locally weakly phosphatic grainstone to locally packstone with abundant colorless fine grained quartz sand. Limestone 20%, white (N9) to yellowish gray (5Y 9/1), microcrystalline to fine grained, locally cryptocrystalline, moderately hard to hard, fossiliferous packstone to locally grainstone.
60 - 90	30	LIMESTONE – 100% Yellowish gray (5Y 7/2) to locally dusky yellow (5Y 5/4 to 5Y 6/4), fine to coarse, dominantly medium grained, hard, locally phosphatic, highly sparry with subhedral to euhedral calcite crystals, grainstone to locally packstone to rarely wackestone with abundant colorless fine grained quartz sand. Trace white (N9), cryptocrystalline, very soft marl. Trace fine grained quartz Sandstone well cemented with calcite. Trace shell fragments and forams.
90 – 130	40	LIMESTONE – 100% Yellowish gray (5Y 6/2 to 5Y 7/2), fine to medium grained, hard, sparry grainstone to locally wackestone. Trace to little fine grained quartz sandstone cemented with calcite. Trace shell fragments.

Depth (ft)	Thickness (ft)	Sample Description
130 – 150	20	SANDY LIMESTONE – 100% Yellowish gray (5Y 7/2 to 5Y 8/2), dominantly coarse to medium grained, moderately hard to hard, sparry, partially pelloidal, locally slightly phosphatic packstone to grainstone with medium grained subangular to subrounded quartz sand.
150 – 170	20	LIMESTONE AND SANDY LIMESTONE – Limestone 80% to 70%, yellowish gray (5Y 7/2) to grayish orange (10YR 7/4), fine to coarse grained, hard, pelloidal, fossiliferous, highly sparry, slightly phosphatic packstone. Sandy Limestone 20% to 30%, yellowish gray (5Y 7/2), medium grained, hard, pelloidal packstone with medium grained quartz sand and few shell fragments.
170 – 180	10	SANDY LIMESTONE AND LIMY SANDSTONE – Sandy Limestone 60%, light greenish gray (5GY 8/1), medium to coarse grained, hard, pelloidal, fossiliferous, slightly phosphatic packstone with fine to medium grained quartz sand. Limy Sandstone 40%, light olive gray (5Y 6/1), fine grained, hard, well cemented with calcite and with detrital carbonate.
180 – 190	10	LIMESTONE – 100% Yellowish gray (5Y 7/2), fine to coarse grained, hard, pelloidal fossiliferous, highly sparry, locally weakly vuggy, slightly phosphatic wackestone to packstone.
190 – 200	10	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 60%, yellowish gray (5Y 7/2) to light greenish gray (5GY 8/1), fine to medium grained, hard, pelloidal, slightly phosphatic packstone with fine to medium grained angular quartz sand. Limestone 40% as above.
200 – 210	10	LIMESTONE AND SHELL FRAGMENTS – Limestone 95%, light greenish gray (5GY 8/1), dominantly medium grained to microcrystalline, moderately hard, fossiliferous packstone to locally grainstone with abundant fine grained quartz sand. 5% Shell fragments and forams.
210 – 230	20	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1), medium to coarse grained, moderately hard, sparry packstone. 30% Yellowish gray (5Y 7/2), microcrystalline to cryptocrystalline, hard wackestone with little to abundant medium to coarse grained quartz sand. Shell fragments common.
230 - 250	20	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to coarse grained, hard sparry, weakly phosphatic, locally slightly sandy packstone.
250 – 260	10	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 60%, greenish gray (5GY 6/1 to 5GY 7/1), microcrystalline to cryptocrystalline, hard, weakly phosphatic wackestone with fine grained angular quartz sand. Limestone 40% as above.
260 - 350	90	LIMY SANDSTONE – 100% Greenish gray (5GY 6/1 to 5GY 7/1), fine grained, hard, well sorted, subangular to subrounded, well cemented with calcite, weakly phosphatic with fine to medium grained detrital carbonate. Locally weakly glauconitic at 330'. Few shell fragments at 350'.

Depth (ft)	Thickness (ft)	Sample Description
350 - 360	10	LIMY SANDSTONE, CLAY AND SANDY LIMESTONE – Limy Sandstone 40%, as above. Clay 40%, pale olive (10Y 6/2), soft to moderately soft, moderately plastic, calcareous, slightly sandy and phosphatic. Sandy Limestone 20%, yellowish gray (5Y 7/2), cryptocrystalline to microcrystalline, hard, slightly phosphatic wackestone to packstone with abundant colorless fine to medium grained, subangular, moderately sorted quartz sand. Trace euhedral calcite crystals. Trace shell fragments.
360 - 370	10	SANDY LIMESTONE – 100% Yellowish gray (5Y 7/2), cryptocrystalline to microcrystalline, hard, phosphatic wackestone to packstone with abundant colorless, fine to medium grained rarely coarse grained, subangular, moderately sorted quartz sand. Few medium gray (N5) to medium light gray (N6), fine grained, well sorted, angular quartz sand well cemented with calcite.
370 - 380	10	CLAYEY SANDY LIMESTONE AND LIMY SANDSTONE – Clayey Sandy Limestone 60%, pale olive (10Y 6/2), very fine to fine grained, moderately soft, slightly phosphatic wackestone with abundant Clay and fine grained quartz sand. Limy Sandstone 40%, light medium gray (N6), fine grained, hard to very hard, well sorted, subangular to subrounded, well cemented with calcite, weakly phosphatic to locally phosphatic with little detrital carbonate.
380 - 450	70	CLAYEY LIMESTONE – 100% Pale olive (10Y 6/2) to pale greenish yellow (10Y 8/2), very fine to fine grained, moderately soft, slightly phosphatic to locally phosphatic wackestone with little clay.
450 - 500	50	CLAYEY SANDY LIMESTONE – 100% Pale olive (10Y 6/2), very fine to fine grained, moderately soft, slightly phosphatic to locally phosphatic wackestone to packstone with little Clay and abundant very fine grained quartz sand.
500 - 520	20	LIMY CLAY AND CLAYEY SANDY LIMESTONE – Limy Clay 70%, pale olive (10Y 6/2), moderately soft to soft, non-plastic, slightly phosphatic with abundant very fine grained sand and detrital carbonate. Clayey Sandy Limestone 30%, as above. Trace olive black (5Y 2/1) Chert at 510'.
520 - 550	30	LIMY CLAY – 100% Pale olive (10Y 6/2), moderately soft to soft, non-plastic to weakly plastic, slightly phosphatic with little very fine grained quartz sand and detrital carbonate.
550 - 690	140	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), moderately soft to firm, non-plastic, slightly phosphatic to locally weakly phosphatic, friable with abundant very fine grained quartz sand and very fine to fine grained detrital carbonate matrix.
690 - 700	10	SANDY CLAY – 100% Light olive gray (5Y 6/1), very soft to soft, non-plastic, non-cohesive, with very fine grained quartz sand and very fine to fine grained detrital carbonate.
700 - 730	30	SANDY CLAY – 100% Light olive gray (5Y 6/1), firm to soft, locally plastic, highly calcareous with abundant very fine grained quartz sand.

Depth (ft)	Thickness (ft)	Sample Description
730 - 740	10	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to soft, friable, non-plastic to low plasticity, slightly phosphatic with abundant very fine grained quartz sand and very fine to fine grained detrital carbonate. Trace crystalline quartz.
740 - 750	10	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to very soft, non-plastic to moderate plasticity, slightly phosphatic with abundant very fine grained quartz sand and very fine to fine grained detrital carbonate.
750 - 760	10	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to soft, non-plastic to low plasticity, slightly phosphatic with abundant very fine grained quartz sand and very fine to fine grained detrital carbonate.
760 - 780	20	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), very soft, moderately plastic to plastic, non-cohesive, slightly phosphatic, highly calcareous with little very fine grained quartz sand.
780 - 800	20	LIMY CLAY AND PHOSPHORITE – Limy Clay 90%, pale olive (10Y 6/2), very soft to locally firm, low-plasticity to plastic, phosphatic, calcareous. Phosphorite 10%, brownish black (5YR 2/1) to black (N1), microcrystalline to cryptocrystalline, hard to very hard, clayey and slightly calcareous.
800 - 820	20	SANDY LIMY CLAY – 100% Pale greenish yellow (10Y 7/2), firm to very soft, non-plastic to plastic, cohesive to non-cohesive, moderately phosphatic to highly phosphatic, calcareous with little very fine grained quartz sand and abundant fine grained detrital carbonate. Trace olive gray (5Y 3/2), cryptocrystalline, very hard Chert.
820 - 830	10	CLAY AND PHOSPHORITE – Clay 90%, grayish olive (10Y 5/2), soft, cohesive, highly plastic, locally weakly phosphatic, weakly calcareous, glauconitic. Phosphorite 10%, brownish black (5YR 2/1) to black (N1), microcrystalline to cryptocrystalline, hard to very hard, slightly bituminous and weakly calcareous.
830 - 850	20	CLAY AND CHERT – Clay 90% As above. Chert 10% olive gray (5Y 3/2), cryptocrystalline, very hard.
850 - 880	30	CLAY – 100% As above. Trace olive gray (5Y 3/2), cryptocrystalline, very hard Chert and phosphorite.
880 - 900	20	LIMESTONE – 100% Light greenish gray (5GY 7/1 to 5GY 8/1), microcrystalline to very fine grained, moderately hard, locally slightly sandy, weakly clayey packstone with abundant fine grained phosphorite.
900 - 920	20	LIMESTONE – 100% Greenish gray (5GY 6/1 to 5Y 7/1) to light bluish gray (5B 8/1), microcrystalline to coarse grained, moderately hard to hard, locally sandy, locally highly phosphatic, fossiliferous packstone. Trace fossil burrows and white (N9) to very light gray (N8), cryptocrystalline, very soft, plastic marl. Trace forams.

Depth (ft)	Thickness (ft)	Sample Description
920 - 940	20	LIMESTONE – 100%; 80% Medium light gray (N6), medium to coarse grained, hard, fossiliferous, slightly sparry, partly micritic packstone to wackestone. 20% Light olive gray (5Y 6/1) to yellowish gray (5Y 8/1), fine to medium grained, hard, fossiliferous wackestone. Trace forams and brownish black (5Y 2/1), cryptocrystalline, very hard Dolomite, and white (N9), very soft, plastic marl.
940 – 970	30	LIMESTONE AND MARL – Limestone 80%; 50% yellowish gray (5Y 8/1), fine to coarse grained, hard, pelloidal, locally sparry, slightly phosphatic packstone. 30% Light bluish gray (5B 7/1), fine to medium grained, hard, pelloidal wackestone to carbonate mudstone with trace casts. Marl 20%, white (N9), very soft.
970 – 980	10	LIMESTONE – 100%; 70% Yellowish gray (5Y 7/2), medium grained, hard, pelloidal packstone/wackestone. 30% Light bluish gray (5B 7/1), microcrystalline to fine grained, very hard, slightly phosphatic carbonate mudstone. Trace to few forams.
980 – 1,000	20	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1), fine to coarse grained, moderately soft, pelloidal, fossiliferous grainstone to packstone. 20% Yellowish gray (5Y 8/1), cryptocrystalline, hard carbonate mudstone. 20% Light bluish gray (5B 7/1), medium to very fine grained hard, phosphatic wackestone. Forams common.
1,000 – 1,020	20	LIMESTONE – 100% Very pale orange (10YR 8/2), medium to fine grained, moderately soft, pelloidal grainstone/packstone.
1,020 – 1,040	20	LIMESTONE – 100% Very pale orange (10YR 8/2), coarse to fine grained, moderately hard, pelloidal, slightly fossiliferous, locally sparry grainstone to packstone. Molds and burrows common at 1,040'.
1,040 – 1,050	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2), fine grained, hard, fossiliferous, locally weakly vuggy wackestone to carbonate mudstone. 40% As above.
1,050 – 1,070	20	LIMESTONE – 100%; 70% Pale grayish orange (10YR 8/4), very fine to fine grained, moderately soft wackestone. 30% Grayish orange (10YR 7/4), medium grained, soft, pelloidal grainstone. Abundant forams. Trace very pale orange (10YR 9/2), very soft carbonate marl.
1,070 – 1,080	10	LIMESTONE – 100% Medium gray (N5) to medium light gray (N6) to rarely to yellowish gray (5Y 7/2), medium to fine grained, moderately hard, pelloidal, fossiliferous, locally weakly vuggy grainstone to wackestone. Forams common.
1,080 – 1,090	10	LIMESTONE – 100%; 80% As above. 20% Very pale orange (10YR 9/2), cryptocrystalline, hard, weakly vuggy carbonate mudstone.
1,090 – 1,100	10	LIMESTONE – 100% Grayish orange (10YR 7/4), very fine to medium grained, moderately hard, fossiliferous packstone to wackestone.
1,100 – 1,110	10	LIMESTONE – 100% Pale yellowish brown (10YR 7/2), microcrystalline, hard, weakly vuggy carbonate mudstone.

Depth (ft)	Thickness (ft)	Sample Description
1,110 – 1,150	40	LIMESTONE – 100% Yellowish gray (5Y 8/1) to pale yellowish brown (10YR 6/2), fine to medium grained, moderately soft to hard, pelloidal, locally fossiliferous packstone to wackestone with some casts and molds. Few to common forams and echinoids to 10 mm from 1,130' to 1,150'.
1,150 – 1,160	10	LIMESTONE – 100% Moderate yellowish brown (10YR 5/4), fine to medium grained, moderately hard, pelloidal, fossiliferous packstone with abundant forams.
1,160 – 1,170	10	LIMESTONE – 100%; 60% As above. 40% Pale yellowish brown (10YR 6/2), fine to medium grained, hard, fossiliferous, weakly vuggy wackestone to carbonate mudstone. Abundant forams.
1,170 – 1,180	10	LIMESTONE – 100% Pale yellowish brown (10YR 6/2 to 10YR 7/2), fine to medium grained, hard, pelloidal, fossiliferous, locally weakly vuggy packstone with abundant forams and common echinoids to 10 mm. Common fossil casts and molds.
1,180 – 1,200	20	LIMESTONE – 100%; 90% Pale yellowish brown (10YR 7/2), fine to medium grained, moderately hard to hard, pelloidal, fossiliferous, weakly vuggy packstone to locally wackestone with abundant forams. 10% Very light gray (N8) to white (N9), microcrystalline to fine grained, hard, locally vuggy to weakly vuggy, partly fossiliferous, pelloidal wackestone to locally packstone. Trace very pale orange (10YR 8/2 to 10YR 7/2), microcrystalline to cryptocrystalline, locally vuggy carbonate mudstone.
1,200 – 1,210	10	LIMESTONE – 100% Pale yellowish brown (10YR 7/2) to very pale orange (10YR 8/2), fine to medium grained, hard, pelloidal, weakly vuggy, fossiliferous to locally highly fossiliferous packstone.
1,210 – 1,250	40	LIMESTONE – 100%; 50% to 60% Pale yellowish brown (10YR 7/2) to very pale orange (10YR 8/2), fine to medium grained, hard, pelloidal, fossiliferous, weakly vuggy packstone. 50% to 40% Very pale orange (10YR 8/2 to 10YR 9/1), microcrystalline to very fine grained, hard, rarely weakly vuggy carbonate mudstone to locally wackestone. Abundant forams.
1,250 – 1,270	20	LIMESTONE – 100% Yellowish gray (5Y 8/1 to 5Y 9/1), microcrystalline to very fine grained, hard, partially pelloidal wackestone to rarely packstone. Few forams.
1,280 – 1,330	50	LIMESTONE – 100% Very pale orange (10YR 8/2 to 10YR 9/1), microcrystalline to fine grained, moderately hard, vuggy, fossiliferous packstone to locally wackstone. Abundant forams to 5 mm and few echinoids to 10 mm.
1,330 – 1,370	40	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2), microcrystalline to very fine grained, hard, locally weakly vuggy to vuggy carbonate mudstone to wackestone. 40% Very pale orange (10YR 8/2 to 10YR 9/2) to yellowish gray (5Y 8/1), fine to medium grained, moderately hard, vuggy, fossiliferous packstone with abundant forams. Trace white (N9), very soft carbonate marl.

Depth (ft)	Thickness (ft)	Sample Description
1,370 – 1,410	10	LIMESTONE – 100%; 40% Yellowish gray (5Y 8/1), microcrystalline to very fine grained, hard, weakly vuggy wackestone. 30% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, vuggy, fossiliferous packstone with forams. 30% Pale yellowish brown (10YR 6/2 to 10YR 7/2), cryptocrystalline to very fine grained, locally weakly vuggy carbonate mudstone. Trace medium dark gray (N4) to medium gray (N5), microcrystalline to fine grained, hard wackstone to carbonate mudstone and white (N9), cryptocrystalline, very soft carbonate marl.
1,410 – 1,420	10	LIMESTONE – 100%; 70% Grayish orange (10YR 7/4), microcrystalline to fine grained, soft to moderately soft, pelloidal packstone. 30% Very pale orange (10YR 8/2), fine grained, soft to very soft, locally weakly vuggy wackestone. Trace white (N9), very soft carbonate marl.
1,420 – 1,440	20	LIMESTONE – 100%; 80% to 60% Grayish orange (10YR 7/4), medium to fine grained, moderately hard, pelloidal packstone to grainstone. 20% to 40% Pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1), cryptocrystalline, hard, locally vuggy carbonate mudstone.
1,440 – 1,450	10	LIMESTONE – 100%; 50% Yellowish gray (5Y 8/1), medium grained, soft to moderately soft packstone to grainstone. 40% Yellowish gray (5Y 8/1), very fine to fine grained, moderately hard packstone to wackestone. Trace white (N9), very soft carbonate marl. 10% Light olive gray (5Y 8/1), fine to medium grained, hard, slightly phosphatic, slightly sandy packstone to wackestone.
1,450 – 1,460	10	LIMESTONE – 100%; 50% Very pale orange (10YR 9/2), fine to medium grained, moderately hard, pelloidal fossiliferous packstone/wackestone. 50% Pale yellowish brown (10YR 7/2), cryptocrystalline to fine grained, hard, pelloidal, weakly vuggy carbonate mudstone.
1,470 – 1,480	10	LIMESTONE – 100%; 60% Medium light gray (N6) to dark gray (N3), very fine to fine grained, hard, micritic packstone to wackestone. 20% Light gray (N7), medium grained, moderately hard grainstone. 20% Yellowish gray (5Y 8/1), fine grained, hard, weakly vuggy carbonate mudstone. Trace dark yellowish brown (10YR 4/2), very fine grained, hard Dolomite.
1,480 – 1,490	10	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2), medium to fine grained, moderately soft packstone. 20% Light olive gray (5Y 7/1), medium grained, hard, micritic, locally vuggy wackestone/mudstone. Forams common.
1,490 – 1,500	10	LIMESTONE – 100%; 50% Medium light gray (N6) to grayish black (N2), cryptocrystalline to fine grained, hard, locally weakly vuggy carbonate mudstone. 50% Yellowish gray (5Y 8/1), very fine to fine grained, moderately hard wackestone.

Depth (ft)	Thickness (ft)	Sample Description
1,500 – 1,510	10	LIMESTONE AND LIMY CLAY – Limestone 90%; 70% Very pale orange (10YR 8/2), fine grained, moderately hard wackestone with trace casts. 20% Light olive gray (5Y 7/1) to very light gray (N8), very fine grained, hard carbonate mudstone. Limy Clay, 10% dark yellowish brown (10YR 4/2), very soft, non-plastic with abundant fine grained detrital carbonate.
1,510 – 1,520	10	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1), cryptocrystalline to very fine grained, hard, locally weakly vuggy carbonate mudstone. 20% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), fine to medium grained, hard, fossiliferous, locally pelloidal packstone. Few forams. Trace light gray (N7), fine grained, hard wackestone to packstone and yellowish gray (5Y 8/1), microcrystalline, very soft carbonate marl.
1,520 – 1,530	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine grained, hard, vuggy, pelloidal packstone to grainstone. Trace yellowish gray (5Y 8/1 to 5Y 9/1), microcrystalline to fine grained, hard, slightly vuggy carbonate mudstone to wackestone.
1,530 – 1,540		LIMESTONE AND LIGNITE – Limestone 90%; 70% Very pale orange (10YR 8/2), as above. 20% Very light gray (N7), cryptocrystalline to microcrystalline, hard, moderately vuggy carbonate mudstone to wackestone. Lignite 10%, black (N1), microcrystalline to fine grained, moderately hard, calcareous. Few forams up to 10 mm.
1,540 – 1,550	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine grained, hard, vuggy, pelloidal packstone to grainstone. Trace yellowish gray (5Y 9/1) to light gray (N7), microcrystalline to fine grained, hard, weakly vuggy carbonate mudstone to wackestone.
1,550 – 1,560	10	LIMESTONE – 100%; 50% Yellowish gray (5Y 9/1), cryptocrystalline to microcrystalline, hard, weakly vuggy wackestone to locally carbonate mudstone. 40% Very pale orange (10YR 8/2), fine grained, hard, vuggy, locally pelloidal packstone to grainstone. 10% Medium light gray (N6) to light gray (N7), microcrystalline to fine grained, hard, vuggy, moderately fossiliferous packstone.
1,560 – 1,570	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), very fine to fine grained, hard, vuggy pelloidal packstone. 10% Yellowish gray (5Y 8/1), fine grained, moderately hard, vuggy pelloidal packstone. 10% Medium light gray (N6) to light gray (N7), cryptocrystalline to fine grained, weakly vuggy to locally vuggy carbonate mudstone to wackestone.
1,570 – 1,580	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine grained, moderately hard, vuggy, pelloidal packstone with abundant forams to 10mm.
1,580 – 1,590	10	LIMESTONE – 100%; 50% Very pale orange (10YR 8/2), As above. 30% Very pale orange (10YR 8/2) to light olive gray (5Y 6/1), moderately hard, weakly vuggy, locally pelloidal, locally weekly glauconitic wackestone. 10% Medium gray to medium light gray (N6), fine grained, hard wackestone.

Depth (ft)	Thickness (ft)	Sample Description
1,590 – 1,610	20	LIMESTONE – 100%; 85% Yellowish gray (5Y 8/1), fine grained, moderately hard to hard, weekly vuggy to locally moderately vuggy, partly pelloidal packstone. 15% Grayish black (N2) to rarely black (N1), fine to medium grained, hard, vuggy grainstone.
1,610 – 1,620	10	LIMESTONE – 100%; 50% Grayish orange (10YR 7/4 to 10YR 8/4), fine to medium grained, moderately hard, highly fossiliferous, vuggy pelloidal packstone to locally grainstone. 40% Grayish black (N2) to rarely black (N1), fine to medium grained, hard, vuggy grainstone. 10% White (N9), cryptocrystalline to microcrystalline, hard calcareous mudstone. Trace light gray (N7) to very light gray (N8), vuggy, packstone to grainstone. Abundant forams.
1,620 – 1,630	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2 to 10YR 9/2), very fine to fine grained, moderately hard to hard, weakly vuggy to vuggy, partially pelloidal packstone to rarely wackestone. 10% Pale yellowish brown (10YR 6/2), fine grained, hard, vuggy to highly vuggy pelloidal grainstone to locally packstone. Trace medium dark gray (N4), fine to medium grained, hard grainstone.
1,630 – 1,640	10	LIMESTONE – 100%; 60%% Very pale orange (10YR 8/2 to 10YR 9/2), very fine to fine grained, moderately hard to hard, weakly vuggy to vuggy, partially pelloidal packstone to rarely wackestone. 40% Light gray (N6), fine grained, hard, pelloidal packstone to carbonate mudstone. Abundant forams.
1,640 – 1,650	10	LIMESTONE – 100%; 80% Medium gray (N5), very fine grained, hard locally partly pelloidal and vuggy packstone/wackestone. 20% Very pale orange (10YR 8/2), fine grained, moderately hard, vuggy pelloidal, highly fossiliferous packstone. Abundant forams.
1,650 – 1,660	10	LIMESTONE – 100%; 90% Yellowish gray (5Y 8/1) to very pale orange (10YR 9/2), fine to medium grained, moderately hard, weekly vuggy, pelloidal packstone. 10% Light olive gray (5Y 7/1), microcrystalline, hard, locally slightly vuggy carbonate mudstone. Abundant forams.
1,660 – 1,670	10	LIMESTONE – 100%; 85% Yellowish gray (5Y 9/1) to white (N9), very fine grained to microcrystalline, hard, vuggy to locally weakly vuggy carbonate mudstone, vugs locally filled with medium light gray (N6), grainstone. 10% Very pale orange (10YR 7/2 to 10YR 9/2), fine grained, moderately hard, fossiliferous, locally phosphatic, vuggy to weakly vuggy pelloidal packstone to grainstone with abundant forams. 10% Pale yellowish brown (10YR 6/2 to 10YR 7/2), fine grained, hard, locally weakly vuggy grainstone with little shell.
1,670 – 1,690	20	LIMESTONE – 100%; 50% Medium light gray (N6) to medium dark gray (N4), microcrystalline to very fine grained, hard, locally vuggy carbonate mudstone to locally wackestone. 50% Very pale orange (10YR 7/2 to 10YR 9/2), fine grained, moderately hard, fossiliferous, locally phosphatic, vuggy to weakly vuggy pelloidal packstone to grainstone with abundant forams. Abundant forams.

Depth (ft)	Thickness (ft)	Sample Description
1,690 – 1,710	20	LIMESTONE 100%; 90% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4), fine to medium grained, moderately soft to moderately hard, pelloidal packstone to rarely grainstone. 10% Medium dark gray (N7) to yellowish gray (5Y 8/1), microcrystalline to rarely fine grained, hard, weakly vuggy carbonate mudstone to wackestone. Abundant forams.
1,710 – 1,720	10	LIMESTONE – 100%; 70% Grayish orange (10YR 7/4), cryptocrystalline to fine grained, moderately hard, locally weakly vuggy carbonate mudstone to packstone. 20% Light olive gray (5Y 6/1), cryptocrystalline, hard, vuggy carbonate mudstone. 10% Very pale orange (10YR 9/2), cryptocrystalline, moderately hard carbonate mudstone.
1,720 – 1,730	10	LIMESTONE AND MARL – Limestone 80% grayish orange (10YR 7/4), very fine grained, moderately soft to moderately hard, locally sparry packstone. Marl 20% bluish gray (5B 6/1), very soft, with detrital carbonate. Abundant forams from 1,730' to 1,750'.
1,730 – 1,750	20	Limestone – 100%; 90% Grayish orange (10YR 7/4) to yellowish gray (5Y 8/1), fine to medium grained, moderately hard packstone to wackestone. 10% Medium gray (N5), cryptocrystalline, hard carbonate mudstone. Abundant forams.
1,750 – 1,770	20	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) to pale yellowish brown (10YR 6/2), fine grained, moderately soft to moderately hard packstone to rarely grainstone. 10% Light olive gray (5GY 6/1 to 5GY 7/1), cryptocrystalline to fine grained, hard carbonate mudstone to wackestone.
1,770 – 1,780	10	LIMESTONE – 100% Pale yellowish brown (10YR 6/2 to 10YR 7/2), very fine grained, soft, pelloidal packstone. Forams common.
1,780 – 1,810	30	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4), very fine to fine grained, moderately soft, pelloidal packstone to weakly vuggy wackestone with few forams. 30% Light olive gray (5Y 6/1) to medium light gray (N6), very fine grained to cryptocrystalline, moderately hard, partly micritic wackestone to carbonate mudstone. Trace Dolomitic Limestone, crystalline carbonate and tests at 1,810'.
1,810 – 1,830	20	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to pale yellowish brown (10YR 7/2), fine to medium grained, soft, pelloidal fossiliferous packstone. 20% Yellowish gray (5Y 7/1), very fine grained to microcrystalline, soft wackestone. 10% Medium light gray (N6), cryptocrystalline, hard, locally vuggy carbonate mudstone. Abundant forams and tests.
1,830 – 1,840	10	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1), microcrystalline, hard, locally vuggy carbonate mudstone. 20% Yellowish gray (5Y 8/1), microcrystalline to fine grained, hard, weakly fossiliferous, partially pelloidal, slightly vuggy packstone/wackestone. 10% Medium gray (N5), fine grained, soft to moderately hard, slightly pelloidal packstone. Abundant forams.

Depth (ft)	Thickness (ft)	Sample Description
1,840 – 1,860	20	LIMESTONE – 100% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), cryptocrystalline to microcrystalline, hard, slightly vuggy to vuggy carbonate mudstone. Abundant unconsolidated forams.
1,860 – 1,890	30	LIMESTONE – 100%; 70% to 80% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), carbonate mudstone as above. 10% Yellowish gray (5Y 8/1), microcrystalline to fine grained, hard, weakly fossiliferous, partially pelloidal, slightly vuggy to vuggy packstone/wackestone. 10% to 20% Medium gray (N5), fine grained, moderately hard, moderately vuggy, partially pelloidal packstone/wackestone. Trace to little light bluish gray (5B 7/1 to 5B 8/1) to light gray (N7), cryptocrystalline to very fine grained, very soft, plastic, marl with little detrital carbonate between 1,870' and 1,890'. Abundant forams.
1,890 – 1,900	10	LIMESTONE – 100%; 40% Grayish orange (10YR 7/4) to pale orange (10YR 7/2), microcrystalline to very fine grained, moderately hard, carbonate mudstone to wackestone with little detrital carbonate. 40% Yellowish gray (5Y 8/1) to light olive gray (5Y 6/1), cryptocrystalline to microcrystalline, hard, weakly vuggy to vuggy carbonate mudstone. 10% Yellowish gray (5Y 8/1), microcrystalline to fine grained, hard, weakly fossiliferous, partly pelloidal, slightly vuggy to vuggy packstone/wackestone. 10% Medium gray (N5) to fine medium gray (N6), cryptocrystalline to fine grained, hard, locally vuggy, locally partly pelloidal carbonate mudstone to rarely packstone. Trace pale yellowish gray (10YR 6/2) to pale orange (10YR 7/2), microcrystalline, very soft, slightly plastic, cohesive marl. Forams common
1,900 – 1,940	40	LIMESTONE – 100%; 70% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), microcrystalline to fine grained, hard, weakly fossiliferous, partly pelloidal, slightly vuggy to locally vuggy packstone to carbonate mudstone/wackestone. 30% Medium gray (N5) to medium light gray (N6), cryptocrystalline to microcrystalline, very hard, locally weakly vuggy, locally slightly Dolomitic carbonate mudstone with thin laminations of dark gray (N3) Dolomitic grainstone. Forams common. Trace echinoid fossils between 1,940' and 1,950'.
1,940 – 1,990	50	LIMESTONE – 100%; 60% to 70% Yellowish gray (5Y 8/1), cryptocrystalline to microcrystalline, hard, locally slightly vuggy carbonate mudstone. 40% to 30% Very pale orange (10YR 8/2) to pale orange (10YR 7/2), fine grained, moderately hard to hard, fossiliferous, moderately vuggy to vuggy, pelloidal packstone. Trace light olive gray (N7), cryptocrystalline, hard carbonate mudstone. Forams common.
1,990 – 2,000	10	LIMESTONE – 100% Yellowish gray (5Y 9/1) to very pale orange (10YR 9/2), locally pale yellowish brown (10YR 6/2), fine grained, moderately hard, fossiliferous, locally weakly vuggy, pelloidal packstone to locally sparry grainstone. Trace yellowish gray (5Y 9/1), cryptocrystalline, hard carbonate mudstone. Few forams and echinoid fossils.

Depth (ft)	Thickness (ft)	Sample Description
2,000 – 2,010	10	DOLOMITE AND LIMESTONE – Dolomite 60%, light olive gray (5Y 6/1), microcrystalline to very fine grained, hard to very hard, locally sucrosic, locally limy. Limestone 40%, very pale orange (10YR 8/2), fine to medium grained, moderately hard, locally sparry pelloidal packstone with some tests and trace forams.
2,010 – 2,020	10	LIMY DOLOMITE, LIMESTONE AND DOLOMITE – Limy Dolomite 50%, olive gray (5Y 4/1) to light olive gray (5Y 6/1), cryptocrystalline to fine grained, hard to very hard, locally fossiliferous. Limestone 30%, as above. Dolomite 20%, as above.
2,020 – 2,030	10	LIMESTONE AND DOLOMITE – Limestone 70%; 50% very pale orange (10YR 8/2), fine to medium grained, moderately soft, pelloidal packstone to grainstone. 20% Light olive gray (5Y 6/1), cryptocrystalline to fine grained, hard fossiliferous wackestone. Dolomite 30%, yellowish gray (5Y 8/1), cryptocrystalline, very hard.
2,030 – 2,040	10	DOLOMITE – 100%; 60% Pale grayish orange (10YR 8/4), fine grained, hard to very hard, weakly vuggy, sucrosic. 40% Pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to fine grained, very hard, locally partly sucrosic.
2,040 – 2,050	10	LIMY DOLOMITE, DOLOMITE AND LIMESTONE – Limy Dolomite 50%, light olive gray (5Y 6/1), very fine grained to cryptocrystalline, hard weakly vuggy. Dolomite 30%, yellowish gray (5Y 8/1), cryptocrystalline, hard. Limestone 20%, very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal packstone with forams common.
2,050 – 2,060	10	LIMESTONE AND DOLOMITE – Limestone 80%; 50% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard, pelloidal, fossiliferous packstone with abundant medium grain sized forams. 30% Very light gray (N8), cryptocrystalline to microcrystalline, hard, very well indurated, locally vuggy, slightly Dolomitic carbonate mudstone. Dolomite 20%; 10% Medium gray (N5) to medium dark gray (N4), very fine grained to microcrystalline. hard, vuggy. 10% Light olive gray (5Y 5/2) to yellowish gray (5Y 6/2), fine to medium grained, locally microcrystalline, hard, well indurated to locally vuggy, locally sucrosic.
2,060 – 2,080	20	DOLOMITE – 100%; 50% Moderate yellowish brown (10YR 5/4), very fine grained to fine grained, hard, weakly vuggy, sucrosic. 40% Olive gray (5Y 4/1) to light olive gray (5Y 6/1), microcrystalline to fine grained, hard to very hard, very well indurated to vuggy. 10% Grayish black (N2) to dark gray (N3), microcrystalline, very hard, very well indurated.
2,080 – 2,090	10	DOLOMITE – 100%; 50% Moderate yellowish brown (10YR 5/4), very fine grained to fine grained, hard, weakly vuggy, sucrosic. 30% Olive gray (5Y 4/1) to locally dark yellowish brown (10YR 4/2), microcrystalline to very fine grained, very hard, very well indurated to locally weakly vuggy. 20% Pale yellowish brown (10YR 6/2) to yellowish brown (10YR 5/2), microcrystalline to cryptocrystalline, very hard, very well indurated to locally weakly vuggy.

Depth (ft)	Thickness (ft)	Sample Description
2,090 – 2,110	20	LIMESTONE – 100% Grayish orange (10YR 7/4) to pale yellowish brown (10YR 6/2), fine to medium grained, soft to moderately hard packstone/grainstone with abundant forams. Trace Dolomitic Limestone and trace medium gray (N5) carbonate mudstone.
2,110 – 2,170	60	LIMESTONE – 100%; 70% as above. 30% Grayish orange (10YR 7/4), fine to medium grained, moderately hard, locally sparry packstone. Forams common. Trace molds and casts. Trace medium dark gray (N4) carbonate mudstone at 2,140'.
2,170 – 2,270	100	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to coarse grained, moderately hard to moderately soft, well indurated, pelloidal, fossiliferous packstone to grainstone. Trace black (N1) lignite at 2,180'; trace medium gray (N5) Dolomite at 2,190'. Trace molds at 2,220', trace white (N9) very soft carbonate marl at 2,230' and 2,250'.
2,270 – 2,300	30	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal, partly fossiliferous, partly sparry, well indurated packstone.
2,300 – 2,320	20	LIMESTONE – 100%; 90% As above. 10% Very pale orange (10YR 8/2), very fine grained to cryptocrystalline, hard wackestone to carbonate mudstone. Few to common tests. Trace crystalline carbonate.
2,320 – 2,330	10	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to coarse grained, moderately hard, pelloidal, fossiliferous grainstone to packstone.
2,330 – 2,360	30	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard, pelloidal, fossiliferous grainstone to rarely packstone. Trace crystalline carbonate.
2,360 – 2,400	40	LIMESTONE – 100%; 70% As above. 30% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard pelloidal packstone. Trace tests and echinoids to 10 mm in diameter.
2,400 – 2,430	30	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal, fossiliferous packstone.
2,430 – 2,440	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately soft to moderately hard, pelloidal packstone to grainstone. Trace Dolomitic Limestone. Trace olive gray (5Y 4/1), very fine grained, soft silty Sandstone.
2,440 – 2,490	50	LIMESTONE – 100%; 70% As above. 30% Yellowish gray (5Y 8/1), very fine to fine grained, hard, well indurated wackestone to packstone. Abundant tests and forams. Sparry at 2,470'.
2,490 – 2,500	10	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard, pelloidal, fossiliferous, locally sparry, generally well indurated packstone. Forams common.
2,500 – 2,510	10	LIMESTONE – 100% Grayish orange (10YR 7/4), fine grained, moderately hard to hard, pelloidal, fossiliferous packstone. Trace white (N9) remineralized (calcite) shell fragments.
2,510 – 2,520	10	LIMESTONE AND DOLOMITIC LIMESTONE – Limestone 80%, very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), fine grained, moderately soft to hard, pelloidal, fossiliferous, locally sparry, well

Depth (ft)	Thickness (ft)	Sample Description
		indurated packstone. Dolomitic Limestone 20%, pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4), fine grained, moderately soft pelloidal packstone with 5% to 10% fine grained, euhedral Dolomite crystals.
2,520 – 2,530	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, hard to moderately hard, fossiliferous, locally very weakly vuggy, locally sparry wackestone/packstone.
2,530 – 2,560	30	LIMESTONE AND DOLOMITIC LIMESTONE – Limestone 80% yellowish gray (5Y 7/2), fine grained, moderately hard to moderately soft, pelloidal packstone. Dolomitic Limestone 20%, pale yellowish brown (10YR 6/2) to grayish orange (10YR 7/4), fine grained, moderately soft, pelloidal packstone with 10% to 40% euhedral to anhedral Dolomite crystals.
2,560 – 2,570	10	LIMESTONE, DOLOMITIC LIMESTONE AND LIMY DOLOMITE – Limestone 40%, pale grayish orange (10YR 8/4), fine to medium grained, moderately hard to moderately soft, pelloidal, fossiliferous, very well indurated packstone with tests common. Dolomitic Limestone 40%, as above. Limy Dolomite 20%, pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), very fine to medium grained, hard. Trace dark yellowish brown (10YR 4/2), hard cryptocrystalline to very fine grained Dolomite.
2,570 – 2,590	20	LIMESTONE – 100% Very pale orange (10YR 8/1) to pale grayish orange (10YR 8/4), fine to medium grained, moderately hard, well indurated, pelloidal, fossiliferous packstone. Trace white (N9), very soft Marl.
2,590 – 2,610	20	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1), dominantly medium grained, moderately hard, pelloidal packstone. 10% Light olive gray (5Y 7/1), very fine to medium grained, hard, fossiliferous packstone to wackestone. 10% Dark gray (N3), fine to medium grained, hard, highly fossiliferous packstone to locally cryptocrystalline carbonate mudstone. Trace medium light gray (N6) to medium gray (N5), very soft marl. Trace to little olive gray (5Y 4/1), cryptocrystalline, very hard Dolomite.
2,610 – 2,620	10	LIMESTONE AND DOLOMITE; Limestone 90%; 80% Medium dark gray (N4), dark gray (N3), olive gray (5Y 4/1) and yellowish gray (5Y 8/1), cryptocrystalline, hard to very hard, locally weakly vuggy carbonate mudstone. 10% Yellowish gray (5Y 8/1), fine to medium grained, moderately hard packstone. Dolomite 10%, brownish gray (5YR 4/1) to olive gray (5Y 3/2), cryptocrystalline, very hard.
2,620 – 2,630	10	LIMESTONE AND DOLOMITE; Limestone 90%, as above. Dolomite 10%; 5% brownish gray (5YR 4/1), as above. 5% Yellowish gray (5Y 8/1), microcrystalline to cryptocrystalline, very hard. Trace dark yellowish brown (10YR 4/2) Dolomite with subhedral crystals. Trace white (N9), very soft carbonate marl.
2,630 – 2,640	10	LIMESTONE – 100%; 80% As above. 20% Very light gray (N8), medium to coarse grained, very soft wackestone with carbonate marl matrix.

Depth (ft)	Thickness (ft)	Sample Description
2,640 – 2,670	30	LIMESTONE - 100%; 60% Medium dark gray (N4), dark gray (N3), olive gray (5Y 4/1) and yellowish gray (5Y 8/1), cryptocrystalline, hard to very hard, locally weakly vuggy carbonate mudstone. 40% Yellowish gray (5Y 8/1), fine to very fine grained, moderately hard, pelloidal, weakly fossiliferous packstone.
2,670 – 2,700	30	LIMESTONE - 100%; 80% Medium dark gray (N4), dark gray (N3), olive gray (5Y 4/1) and yellowish gray (5Y 8/1), cryptocrystalline, hard to very hard, locally weakly vuggy carbonate mudstone. 20% Light olive gray (5Y 6/1) to pale yellowish brown (10YR 6/2), fine to medium grained, moderately hard, pelloidal, fossiliferous grainstone to packstone. Trace to few forams and echinoids.
2,700 – 2,710	10	LIMESTONE – 100% Very pale orange (10YR 9/2), medium grained, moderately hard to rarely soft, pelloidal, fossiliferous packstone with few tests.
2,710 – 2,720	10	LIMESTONE - 100%; 90% As above. 10% Very pale orange (10YR 8/2), fine grained, hard, very weakly vuggy carbonate mudstone to wackestone. Trace medium dark gray (N4), hard carbonate mudstone.
2,720 – 2,730	10	LIMESTONE - 100%; 70% Very pale orange (10YR 9/2), medium grained, moderately hard to rarely soft, pelloidal, fossiliferous packstone with few tests. 30% Yellowish gray (5Y 8/1), fine grained, moderately hard, pelloidal packstone. Trace dark greenish gray (5GY 4/1), firm, weakly glauconitic Clay.
2,730 – 2,750	20	LIMESTONE – 100%; 60% to 70% Very pale orange (10YR 9/2), cryptocrystalline, hard carbonate mudstone. 40% to 30% Grayish orange (10YR 6/4) to very pale orange (10YR 8/2), fine to medium grained, hard, pelloidal packstone/grainstone. Trace white (N9), very soft carbonate Marl at 2,740'. Trace light olive gray (5Y 6/1), cryptocrystalline, hard carbonate mudstone.
2,750 – 2,770	20	LIMESTONE – 100%; 50% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal grainstone/packstone. 40% Very pale orange (10YR 8/2), fine grained, hard, well indurated packstone to wackestone. 10% Olive gray (5Y 6/1) and very pale orange (10YR 8/2), cryptocrystalline carbonate mudstone. Forams and tests common. Trace glauconite at 2,760'. Trace white (N9), very soft carbonate marl at 2,770'.
2,770 – 2,780	10	LIMESTONE - 100%; 80% Very pale orange (10YR 8/2) to grayish orange (10YR 7/4), medium grained, hard, pelloidal, slightly fossiliferous packstone to grainstone. 20% Very pale orange (10YR 8/2), cryptocrystalline to very fine grained packstone to wackestone. Trace mudstone as above.
2,780 – 2,790	10	LIMESTONE - 100%; 70% Very pale orange (10YR 8/2), fine grained, hard, pelloidal, packstone/wackestone. 30% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal packstone. Trace olive gray (5Y 4/1), cryptocrystalline hard carbonate mudstone.
2,790 – 2,810	20	LIMESTONE - 100% Very pale orange (10YR 8/2), fine to medium grained, soft to moderately soft, pelloidal, packstone to grainstone.

Depth (ft)	Thickness (ft)	Sample Description
2810 - 2820	10	LIMESTONE – 100%; 70% Grayish orange (10YR 7/4), medium to rarely coarse grained, hard to moderately soft, pelloidal, fossiliferous grainstone to packstone. 30% Very pale orange (10YR 8/2), cryptocrystalline, hard, very weakly vuggy carbonate mudstone.
2,820 – 2,840	20	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal, locally highly fossiliferous packstone. 10% mudstone as above.
2,840 – 2,870	30	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately hard, pelloidal, locally highly fossiliferous packstone.
2,870 – 2,880	10	LIMY DOLOMITE AND LIMESTONE – Limy Dolomite 60%, yellowish gray (5Y 8/1), medium grained, hard, euhedral to anhedral crystals. Limestone 40%, very pale orange (10YR 8/2), fine grained, moderately soft, pelloidal packstone.
2,880 – 2,900	20	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2), cryptocrystalline, hard, locally weakly vuggy carbonate mudstone with rare fractures fully healed with fine to medium grained euhedral Dolomite crystals. 40% Very pale orange (10YR 8/2), very fine grained, hard, pelloidal, locally very weakly Dolomitic packstone. Trace Limy Dolomite as above at 2,890'. Trace light olive gray (5Y 6/1), cryptocrystalline, hard, fractured Dolomite at 2,900'.
2,900 – 2,920	20	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), fine to medium grained, moderately hard to moderately soft, pelloidal packstone to rarely grainstone. 30% Very pale orange (10YR 8/2), cryptocrystalline, hard, weakly vuggy carbonate mudstone with rare fractures fully healed with fine to medium grained euhedral Dolomite crystals. Trace molds.
2,920 – 2,940	20	DOLOMITE AND LIMESTONE – Dolomite 80%, yellowish brown (10YR 6/4) to dark yellowish brown (10YR 4/2) to light olive gray (5Y 6/1), cryptocrystalline to very fine grained, very hard with trace fractures. Limestone 20%, very pale orange (10YR 8/2), very fine to fine grained, hard, pelloidal packstone. Trace tests.
2,940 – 2,970	30	DOLOMITE AND LIMESTONE – Dolomite 90% dark yellowish brown (10YR 4/2) to dark grayish orange (10YR 7/4), cryptocrystalline to microcrystalline to fine grained, very hard, sucrosic. Limestone 10% very pale orange (10YR 8/2), fine grained, moderately hard, pelloidal packstone to wackestone. Trace tests.
2,970 – 2,990	20	DOLOMITE AND LIMESTONE – Dolomite 90%, yellowish gray (5Y 8/1) to grayish orange (10YR 7/4), cryptocrystalline to medium grained, very hard, locally very weakly vuggy. Limestone 10%, very pale orange (10YR 8/2), fine grained, moderately hard pelloidal packstone.
2,990 – 3,000	10	DOLOMITE – 100% Light olive gray (5Y 6/1), cryptocrystalline to coarse grained, very hard, locally weakly fossiliferous.
3,000 – 3,010	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to yellowish brown (10YR 7/2), cryptocrystalline, very hard with rare fractures fully healed with fine to medium grained euhedral to subhedral Dolomite

Depth (ft)	Thickness (ft)	Sample Description
		crystals.
3,010 – 3,020	10	DOLOMITE – 100% Yellowish brown (10YR 5/2) to pale yellowish brown (10YR 6/2), microcrystalline, very hard
3,020 – 3,030	10	DOLOMITE – 100%; 75% Pale yellowish brown (10YR 6/2) to very pale yellowish brown (10YR 7/2), cryptocrystalline to microcrystalline, very hard. 20% Brownish gray (5YR 5/1) to locally medium dark gray (N4) cryptocrystalline, very hard. 5% Brownish gray (5YR 4/1) to dark gray (N3) microcrystalline to coarse grained very hard euhedral crystals.
3,030 – 3,040	10	DOLOMITE – 100% Very pale orange (10YR 8/2) to grayish orange (10YR 8/4), cryptocrystalline to rarely microcrystalline, very hard, locally weakly vuggy, vugs lined and filled with Dolomite crystals, locally fractured, fractures fully healed with moderate yellowish brown (10YR 5/4), medium grained euhedral Dolomite crystals.
3,040 – 3,050	10	DOLOMITE – 100%; 50% Pale yellowish brown (10YR 6/2), microcrystalline, very hard, locally fossiliferous, very weakly vuggy, vugs commonly filled with very fine grained Dolomite crystals. 50% Moderate yellowish brown (10YR 5/4) to dusky yellowish brown (10YR 2/2), very fine to coarse grained, very hard, sucrosic.
3,050 – 3,060	10	DOLOMITE – 100%; 70% Pale yellowish brown (10YR 6/2), cryptocrystalline, very hard, weakly vuggy and locally fractured, vugs and fractures filled with very fine to fine grained euhedral to subhedral Dolomite crystals. 30% Moderate yellowish brown (10YR 5/4), very fine to medium grained, very hard, sucrosic with trace breccia.
3,060 - 3,070	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4), microcrystalline to fine grained, hard to very hard, locally sucrosic.
3,070 – 3,090	20	DOLOMITE – 100%; 50% Pale yellowish brown (10YR 6/2) to pale orange (10YR 7/2), cryptocrystalline, hard to very hard, locally weakly vuggy and fractured, vugs filled with very fine grained Dolomite crystals, fractures fully healed with moderate yellowish brown (10YR 5/4) fine grained euhedral Dolomite crystals. 50% Dark yellowish brown (10YR 4/2), cryptocrystalline to microcrystalline, very hard, locally weakly sucrosic, locally fractured, fractures healed with very fine grained Dolomite crystals or moderate yellowish brown (10YR 5/4) fine grained subhedral Dolomite crystals. Trace yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), cryptocrystalline, very hard Dolomite.
3,090 – 3,100	10	DOLOMITE – 100%; 60% Pale yellowish brown (10YR 6/2) to pale orange (10YR 7/2), cryptocrystalline, very hard, locally weakly vuggy and fractured, vugs filled with very fine grained Dolomite crystals, fractures healed with moderate yellowish brown (10YR 5/4), fine grained subhedral Dolomite crystals. 40% Medium dark gray (N4) to medium gray (N3), cryptocrystalline, hard to very hard with rare fractures healed with moderate yellowish brown (10YR 5/4) fine grained subhedral Dolomite crystals.
3,100 – 3,110	10	DOLOMITE – 100%; 40% Pale yellowish brown (10YR 6/2) to pale orange (10YR 7/2) to very pale orange (10YR 6/2), cryptocrystalline,

Depth (ft)	Thickness (ft)	Sample Description
		hard, locally weakly vuggy and fractured, vugs filled with very fine grained Dolomite crystals, fractures healed with moderate yellowish brown (10YR 5/4), fine to coarse grained euhedral Dolomite crystals. 40% Grayish black (N2), dark gray (N3) to medium dark gray (N4), cryptocrystalline to microcrystalline, hard to very hard, locally sucrosic, weakly vuggy and fractured, vugs and fractures filled with yellowish gray (5Y 8/1), microcrystalline to fine grained Dolomite crystals. 20% Moderate yellowish brown (10YR 5/4), microcrystalline, very hard.
3,110 – 3,120	10	DOLOMITE – 100%; 60% Very pale yellowish brown (10YR 7/2), cryptocrystalline, very hard, locally weakly vuggy and fractured, vugs filled with very fine grained Dolomite crystals, fractures healed with moderate yellowish brown (10YR 5/4), fine grained euhedral to subhedral Dolomite crystals. 40% Moderate yellowish brown (10YR 5/4) to locally dark yellowish brown (10YR 4/2), microcrystalline, hard, weakly sucrosic, weakly vuggy and fractured, vugs filled with very fine grained Dolomite crystals, fractures healed with moderate yellowish brown (10YR 5/4), fine grained euhedral Dolomite crystals.
3,120 – 3,130	10	DOLOMITE – 100%; 70% Dark yellowish brown (10YR 4/2) to yellowish brown (10YR 5/2), microcrystalline, hard to very hard, locally weakly sucrosic. 30% Pale orange (10YR 7/2) to very pale orange (10YR 8/2), cryptocrystalline, very hard, rarely vuggy and fractured, vugs and fractures filled with microcrystalline Dolomite crystals.
3,130 – 3,140	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to yellowish brown (10YR 5/2), cryptocrystalline, hard, rare vugs partially to fully healed with moderate yellowish brown (10YR 5/4), very fine grained euhedral Dolomite crystals.
3,140 – 3,150	10	DOLOMITE - 30% Pale orange (10YR 7/2), cryptocrystalline to locally microcrystalline, hard to very hard, rarely vuggy, vugs filled with microcrystalline Dolomite crystals. Trace very pale orange (10YR 8/2), cryptocrystalline, very hard Dolomite.
3,150 – 3,160	10	DOLOMITE - 100%; 85% Very pale orange (10YR 8/2 to 10YR 9/2), cryptocrystalline, hard, weakly vuggy and fractured, vugs filled with microcrystalline Dolomite crystals, fractures healed with moderate yellowish (10YR 5/4), very fine grained subhedral to anhedral Dolomite crystals. 15% Yellowish brown (10YR 5/2), cryptocrystalline to locally microcrystalline, very hard, locally weakly sucrosic, rare fractures healed with fine to medium grained euhedral Dolomite crystals.
3,160 – 3,170	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to olive gray (5Y 5/1), cryptocrystalline to very fine grained, very hard, locally sucrosic. Trace yellowish gray (5Y 8/1) Dolomite breccia.
3,170 – 3,190	20	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to very pale orange (10YR 8/2), cryptocrystalline to microcrystalline, very hard. Trace moderate yellowish brown (10YR 5/4) fine to medium grained subhedral crystals.
3,190 – 3,200	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to moderate brown (5YR 3/4), microcrystalline to very fine grained, rarely fine

Depth (ft)	Thickness (ft)	Sample Description
		grained, very hard, sucrosic.
3,200 – 3,210	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2,) cryptocrystalline to microcrystalline, very hard.
3,210 – 3,230	20	DOLOMITE 100%; 60% Pale yellowish brown (10YR 4/2,) cryptocrystalline to microcrystalline, very hard. 40% Grayish black (N2), cryptocrystalline to microcrystalline, very hard, slightly sucrosic.
3,230 – 3,240	10	DOLOMITE – 100% Pale yellowish brown (10YR 4/2), microcrystalline to very fine grained, very hard, slightly sucrosic.
3,240 – 3,250	10	DOLOMITE – 100% Dark yellowish brown (10YR 6/2) to locally dusky yellowish brown (10YR 2/2), microcrystalline to cryptocrystalline, hard to very hard, rarely vuggy, vugs filled with dark yellowish brown (10YR 6/2), euhedral to subhedral Dolomite crystals.
3,250 – 3,260	10	DOLOMITE – 100%; 80% Dark yellowish brown (10YR 6/2) as above. 20% Pale yellowish brown (10YR 6/2) to pale orange (10YR 7/2) microcrystalline to very fine grained, hard.
3,260 – 3,270	10	DOLOMITE – 100%; 80% Moderate yellowish brown (10YR 5/4), microcrystalline to cryptocrystalline, very hard. 20% Yellowish brown (10YR 4/4,) dominantly very fine to fine, rarely medium grained, hard, weakly vuggy.
3,270 – 3,280	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2) to moderate yellowish brown (10YR 5/4), fine grained, moderately hard to hard, sucrosic.
3,280 – 3,290	10	DOLOMITE 100%; 50% As above, weakly vuggy. 50% Dark yellowish brown (10YR 4/2), to moderate yellowish brown (10YR 5/4) microcrystalline, hard to very hard, weakly vuggy.
3,290 – 3,300	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1), microcrystalline to very fine grained, hard to very hard.
3,300 – 3,310	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4 to 10YR 6/4), dominantly microcrystalline to very fine rarely fine grained, hard, locally weakly vuggy, slightly sucrosic.
3,310 – 3,330	20	DOLOMITE – 100% Dark yellowish brown (10YR 3/2 to 10YR 4/2,) microcrystalline to very fine grained, rarely cryptocrystalline, hard, weakly vuggy, slightly sucrosic.
3,330 – 3,340	10	DOLOMITE – 100% Moderate yellowish brown (10YR 5/4 to 10YR 6/4,) dominantly microcrystalline to very fine, rarely fine grained, hard, weakly vuggy, sucrosic.
3,340 – 3,350	10	DOLOMITE 100% Olive gray (5Y 3/2) dark gray (N3) to dark yellowish brown (10YR 4/2), cryptocrystalline to locally microcrystalline, hard to moderately hard, locally mottled.
3,350 – 3,370	20	DOLOMITE – 100% Pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to fine grained, very hard, locally sucrosic, locally very weakly vuggy at 3,370'.
3,370 – 3,380	10	DOLOMITE – 100%; 70% As above. 30% Dark yellowish brown (10YR 4/2), cryptocrystalline, very hard.

Depth (ft)	Thickness (ft)	Sample Description
3,380 – 3,390	10	DOLOMITE – 100% Pale yellowish brown (10YR 6/2), dominantly cryptocrystalline to microcrystalline, hard to very hard, weakly vuggy with mottles, vugs lined to fully healed with very fine to medium grained euhedral to subhedral Dolomite crystals.
3,390 – 3,400	10	DOLOMITE – 100%; 90% Dark yellowish brown (10YR 4/2) to yellowish brown (10YR 5/2), dominantly very fine grained to locally microcrystalline, hard, locally weakly vuggy. 10% Dusky yellowish brown (10YR 2/2), very fine grained, hard to very hard, weakly vuggy, vugs filled with very fine grained euhedral to subhedral Dolomite crystals. Trace pale yellowish brown (10YR 6/2), cryptocrystalline to microcrystalline, very hard Dolomite.
3,400 – 3,410	10	DOLOMITE – 100% Dark yellowish brown (10YR 4/2) to olive gray (5Y 3/2), dominantly microcrystalline locally cryptocrystalline to very fine grained, hard to very hard, prominent mottles locally common.
3,410 – 3,420	10	DOLOMITE - 100% Light olive gray (5Y 6/1) to olive gray (5Y 4/1), cryptocrystalline, very hard, locally weakly vuggy, vugs filled and lined with Dolomite crystals, locally fractured, fractures fully healed with Dolomite crystals.
3,420 – 3,430	10	DOLOMITE – 100%; 80% Pale yellowish brown (10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to very fine grained, hard to very hard, locally sucrosic. 20% As above.
3,430 – 3,440	10	DOLOMITE – 100% Yellowish brown (10YR 5/2) to pale yellowish brown (10YR 6/2), cryptocrystalline to microcrystalline, very hard, locally vuggy and fractured, vugs lined with dark yellowish brown (10YR 4/2), very fine to coarse grained anhedral to subhedral Dolomite crystals, fractures fully healed with dusky yellowish brown (10YR 2/2) to dark yellowish brown (10YR 4/2) Dolomite crystals.
3,440 – 3,450	10	DOLOMITE – 100% Light olive gray (5Y 5/2 to 5Y 6/2), cryptocrystalline to locally microcrystalline, very hard, locally vuggy, vugs lined with olive gray (5Y 3/2) to greenish black (5GY 2/1), fine to medium grained euhedral to subhedral Dolomite crystals, locally fractured, fractures fully healed with greenish black (5GY 2/1) Dolomite crystals.
3,450 – 3,460	10	DOLOMITE – 100%Yellowish brown (10YR 5/2), pale yellowish brown (10YR 6/2) to pale orange (10YR 7/2), cryptocrystalline to microcrystalline, very hard, locally vuggy and fractured, vugs and fractures lined with dark yellowish brown (10YR 4/2) to grayish black (N2), fine grained anhedral to subhedral Dolomite crystals. Trace light olive gray (5Y 5/2 to 5Y 6/2) Dolomite as above.
3,460 – 3,470	10	DOLOMITE – 100% Pale orange (10YR 7/2), cryptocrystalline to locally microcrystalline, very hard.
3,470 – 3,480	10	DOLOMITE – 100%; 85% to 50% Pale yellowish brown (10YR 6/2), cryptocrystalline, very hard, locally vuggy and fractured, vugs and fractures lined with dusky yellowish brown (10YR 2/2), very fine to fine grained anhedral to subhedral Dolomite crystals. 15% to 50% Dark yellowish brown (10YR 5/2 to 10YR 4/2), cryptocrystalline to microcrystalline, very hard, locally vuggy, vugs lined with dusky yellowish brown (10YR 2/2) fine grained anhedral to subhedral

Depth (ft)	Thickness (ft)	Sample Description
		Dolomite crystals, fractures fully healed with grayish black (N2) Dolomite crystals.
3,480 – 3,490	10	DOLOMITE – 100%; 50% Pale yellowish brown (10YR 6/2) as above. 50% Dark yellowish brown (10YR 5/2 to 10YR 4/2) as above.
3,490 – 3,500	10	DOLOMITE – 100%; 50% Moderate yellowish brown (10YR 5/4), cryptocrystalline, very hard, locally vuggy and fractured, vugs and fractures lined with dusky yellowish brown (10YR 2/2), very fine grained anhedral to subhedral Dolomite crystals. 50% Dark yellowish brown (10YR 5/2 to 10YR 4/2), cryptocrystalline to microcrystalline, very hard, locally vuggy and fractured, vugs and fractures lined with dusky yellowish brown (10YR 2/2) to grayish black (N2), fine grained anhedral to subhedral Dolomite crystals.

Monitor Well No. 1 (MW-1) – Lithology

Geologic Log

GEOLOGIC LOG
(Drill Cuttings)

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM
SOUTHERN REGIONAL WWTP

DUAL-ZONE MONITOR WELL MW-1

Depth (ft)	Thickness (ft)	Sample Description
0 - 20	20	LIMESTONE, AND ORGANICS - Limestone 97%, very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), very fine grained to microcrystalline, hard, wackestone to packstone. Trace colorless, medium to coarse grained, angular to subrounded quartz sand. Organics 3%, brownish black (5YR 2/1) to black (N1), soft to moderately hard.
20 - 30	10	LIMESTONE – 100%; 60% Yellowish gray (5Y 7/2), very fine to fine grained, hard, sucrosic grainstone. 20% Very pale orange (10YR 8/2) to yellowish gray (5Y 8/1), very fine grained to microcrystalline, hard wackestone to packstone. Trace coarse grained crystalline carbonate. 20% Light olive gray (5Y 5/2) to dusky yellow (5Y 6/4), microcrystalline, hard, locally moderately vuggy mudstone to wackestone. Trace shell molds.
30 - 110	90	LIMESTONE – 100% Pale greenish yellow (10Y 8/2) to yellowish gray (5Y 7/2), dominantly medium, fine to coarse grained, hard, porous grainstone. Little dusky yellow (5Y 6/4) to olive gray (5Y 3/2), fine to medium grained, hard grainstone between 40' and 60'. Trace burrow molds between 40' and 50'. Trace yellowish gray (5Y 8/1 to 9/1), cryptocrystalline very hard packstone.
110 - 130	20	LIMESTONE – 100%; 50% to 60 As above. 50% to 40% Light yellowish gray (5Y 7/1 to 5Y 8/1), fine grained to locally microcrystalline, hard to very hard grainstone. Trace fossil coral fragments.
130 - 170	30	SANDY LIMESTONE AND LIMESTONE - Sandy Limestone 70%, light greenish gray (5GY 8/1), fine to coarse grained, moderately hard, sparry, partially pelloidal, locally phosphatic grainstone. Little colorless, medium to coarse grained, angular quartz sand. Limestone 30%, yellowish gray (5Y 7/1 to 5Y 8/1), very fine grained, very hard grainstone between 140' and 150'. Little white (N9), microcrystalline to cryptocrystalline, hard, locally vuggy carbonate mudstone.
170 - 190	20	LIMESTONE AND SANDY LIMESTONE – Limestone 70%, yellowish gray (5Y 7/2) to grayish orange (10YR 7/4), fine to coarse grained, hard, pelloidal, fossiliferous, highly sparry, slightly phosphatic packstone. Sandy Limestone 30%, yellowish gray (5Y 7/2), medium grained, hard, pelloidal packstone with medium grained quartz sand and few shell fragments. Trace tests.

Depth (ft)	Thickness (ft)	Sample Description
190 - 200	10	SANDY LIMESTONE AND LIMESTONE – Sandy Limestone 70%, yellowish gray (5Y 7/2) to light greenish gray (5GY 8/1), dominantly medium grained, vuggy, slightly phosphatic, partially pelloidal packstone to grainstone with medium grained angular quartz sand and trace shell fragments. Limestone 20%, pale yellowish orange (10YR 9/6) to white (N9), microcrystalline to cryptocrystalline, moderately hard, highly fossiliferous, slightly sandy, highly vuggy locally well indurated packstone with shell fragments, fossil coral and forams. 10% Very pale orange (10YR 7/2 to 10YR 8/2), fine grained, very hard, slightly phosphatic grainstone.
200 - 210	10	LIMESTONE – 100% Light greenish gray (5GY 8/1) to yellowish gray (5Y 8/1), medium grained, moderately hard to hard, slightly sandy, locally vuggy, fossiliferous, partially pelloidal packstone to grainstone with colorless medium grained quartz sand and shell fragments.
210 - 220	10	CLAY AND LIMESTONE – Clay 80%, yellowish gray (5Y 7/2) to light olive gray (5Y 5/2), very soft. Limestone 20%, 15% yellowish gray (5Y 8/1), microcrystalline to cryptocrystalline, hard wackestone to packstone. 5% Grayish yellow green (5GY 6/2 to 5GY 7/2), fine grained, moderately soft, clayey, locally vuggy, highly phosphatic packstone to grainstone.
220 - 240	20	LIMESTONE AND SHELL FRAGMENTS – Limestone 90%, light greenish gray (5GY 8/1), fine to medium grained, moderately hard, fossiliferous, slightly sandy packstone to locally grainstone. Shell Fragments 10%, mollusks, foram fossils and other shell fragments.
240 - 250	10	LIMY SAND – 100% Colorless, dominantly medium grained, unconsolidated, mostly subrounded, well sorted quartz sand with 10% yellowish gray (5Y 8/1), fine to dominantly medium grained, hard, unconsolidated detrital carbonate. Few shell fragments.
250 - 310	60	LIMY SANDSTONE AND LIMESTONE – Limy Sandstone 90%, medium gray (N5) to medium light gray (N6), dominantly medium grained to fine, hard, well sorted, subangular well cemented phosphatic quartz sand, with abundant detrital carbonate. Induration increasing with depth. Limestone 10%, yellowish gray, microcrystalline to medium grained, hard, partially fossiliferous to fossiliferous, locally sparry, phosphatic packstone to locally grainstone. Trace shell fragments.
310 - 340	30	PHOSPHATIC LIMY SANDSTONE AND SANDY LIMESTONE – Phosphatic Sandy Limestone 70% to 80%, colorless, dominantly fine grained, hard, well sorted, dominantly subrounded quartz sand with light greenish gray (5GY 7/1 to 5GY 8/1), phosphatic limy matrix. . Limestone 20% to 30%, medium gray (N6), microcrystalline to medium grained, very hard, sandy, slightly phosphatic grainstone to locally packstone. Trace forams
350 - 360	10	LIMY SANDSTONE AND LIMESTONE – Limy Sandstone 80% medium light gray (N6) to medium gray (N7), fine to medium grained with sparry matrix. Limestone 20% yellowish gray (5Y 7/2), fine to medium grained, hard, sparry, sandy packstone with trace to little fine grained phosphorite. Trace shell fragments.

Depth (ft)	Thickness (ft)	Sample Description
360 - 370	10	SANDY CLAYEY LIMESTONE AND LIMY SANDSTONE – Sandy Clayey Limestone 60%, light olive gray (5Y 5/2), fine to medium grained, moderately soft phosphatic packstone with abundant fine grained quartz sand and clay. Limy Sandstone 40%, light gray (N7) to light olive gray (5Y 5/2), fine to rarely coarse grained, moderately hard with abundant detrital carbonate and little clay. Trace shell fragments.
370 - 440	70	CLAYEY SANDY LIMESTONE – 100% Pale olive (10Y 6/2), very fine to fine grained, moderately soft, slightly phosphatic wackestone with abundant clay and fine grained quartz sand. Clay content increasing with depth.
440 - 450	10	SANDY CLAY AND CLAYEY LIMESTONE – Sandy Clay 50% to 60%, pale olive gray (10Y 6/2) to grayish yellow green (5GY 7/2), very soft, plastic, weakly calcareous, weakly phosphatic. Clayey Limestone 40% to 50%, pale olive gray (10Y 6/2), medium grained, moderately soft, friable, slightly phosphatic wackestone.
450 - 480	30	CLAYEY SANDY LIMESTONE – 100% Pale olive (10Y 6/2), very fine to fine grained, moderately soft, slightly phosphatic wackestone with abundant clay and fine grained quartz sand. Clay content increasing with depth.
480 - 550	80	LIMY CLAY – 100% Pale olive (10Y 6/2), moderately soft to soft, non-plastic, slightly phosphatic with abundant very fine grained quartz sand and detrital carbonate.
550 - 700	150	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to soft, non-plastic to low plasticity, slightly phosphatic to locally moderately phosphatic, friable with abundant very fine to fine grained quartz sand and very fine to fine grained detrital carbonate.
700 - 730	30	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to very soft, low plasticity to plastic, slightly phosphatic to phosphatic, calcareous with very fine grained quartz sand.
730 - 760	30	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to soft, non-plastic to low plasticity, slightly phosphatic, friable with abundant very fine to fine grained quartz sand and very fine to fine grained detrital carbonate.
760 - 780	20	SANDY LIMY CLAY – 100% Pale olive (10Y 6/2), firm to very soft, low-plasticity to plastic, slightly phosphatic to locally phosphatic, calcareous, with very fine grained quartz sand.
780 - 790	10	LIMY CLAY AND PHOSPHORITE – Limy Clay 80% pale olive (10Y 6/2), firm to very soft, low plasticity to plastic, phosphatic, calcareous. Phosphorite 20% brownish black (5YR 2/1) to black (N1), microcrystalline to cryptocrystalline, very hard, well cemented, clayey and slightly calcareous.
790 - 830	40	SANDY CLAY – 100% Pale greenish yellow (10Y 7/2), soft, moderately plastic, calcareous, moderately phosphatic to phosphatic with very fine grained quartz sand.

Depth (ft)	Thickness (ft)	Sample Description
830 – 860	30	SANDY CLAY – 100% Grayish olive (10Y 5/2), very soft, cohesive, highly plastic, slightly calcareous with very fine grained quartz sand. Trace olive black (5Y 2/1) very hard Chert at 860'.
860 – 870	10	CLAY, LIMESTONE AND CHERT – Clay 60% As above. Limestone 20%, olive gray (5Y 4/1), fine grained, moderately hard, phosphatic, sparry packstone. Chert 10% black (N1), microcrystalline, weakly fossiliferous, very hard.
870 – 890	20	LIMESTONE – 100% Greenish gray (5GY 6/1) to light bluish gray (5B 7/1), fine grained, moderately hard, slightly sandy, slightly phosphatic packstone.
890 – 910	20	LIMESTONE - 100%; 50% Yellowish gray (5Y 7/2), fine grained, moderately hard, sandy, phosphatic packstone. 30% Yellowish gray (5Y 8/1), medium to coarse grained, moderately hard, pelloidal, fossiliferous packstone. 20% Medium light gray (N6), medium grained, hard, fossiliferous wackestone.
910 – 920	10	LIMESTONE - 100%; 70% Medium light gray (N6), medium to coarse grained, fossiliferous, slight sparry, micritic wackestone. 30% Yellowish gray (5Y 7/2), fine grained, moderately hard, sandy, phosphatic packstone.
920 - 940	20	LIMESTONE – 100%; 70% Greenish gray (5GY 6/1), medium to coarse grained, hard, fossiliferous, partly micritic packstone. 30% Yellowish gray (5Y 8/1), fine to medium grained, hard, fossiliferous wackestone. Trace shell casts.
940 - 980	40	LIMESTONE – 100%; 60% Yellowish gray (5Y 8/1) to bluish gray (5B 6/1), fine to coarse grained, hard, locally sparry, locally micritic packstone to wackestone. Trace white (N9), very soft carbonate marl. Trace shell molds at 970' and casts at 980'.
980 – 1,000	20	LIMESTONE – 100%; 40% Yellowish gray (5Y 8/1), fine grained, moderately soft, pelloidal, fossiliferous grainstone to packstone. 40% Light bluish gray (5B 7/1), medium to coarse grained, moderately hard, phosphatic, slightly glauconitic packstone to wackestone. 20% Yellowish gray (5Y 8/1), cryptocrystalline, moderately hard carbonate mudstone. Trace to little crystalline carbonate. Trace shell casts.
1,000 – 1,020	20	LIMESTONE – 100% Yellowish gray (5Y 7/1), medium grained, moderately soft to moderately hard, pelloidal, locally fossiliferous packstone with few forams.
1,020 – 1,040	20	LIMESTONE, SANDY LIMESTONE AND CHERT – Limestone 90%, yellowish gray (5Y 8/1), dominantly medium to coarse grained, moderately soft to moderately hard, pelloidal packstone. Sandy Limestone 5%, moderate yellowish green (5GY 7/4), medium to coarse grained, moderately hard to hard, sparry, phosphatic, weakly vuggy packstone with fine to medium grained quartz sand. Chert 5%, olive gray (5Y 6/1) to olive black (5Y 2/1), fine grained with cryptocrystalline matrix, very hard. Common fossils between 10 mm and 15 mm.

Depth (ft)	Thickness (ft)	Sample Description
1,040 – 1,050	10	LIMESTONE – 100% Light greenish gray (5G 8/1), medium to coarse grained, hard to moderately hard packstone.
1,050 – 1,070	20	LIMESTONE – 100%; 70% Limestone light greenish gray (5G 8/1), fine to dominantly medium grained, hard to moderately hard, weakly clayey packstone. 30% Yellowish gray (5Y 8/1), medium to coarse grained, moderately hard pelloidal packstone. Trace to little white (N9), very soft carbonate marl.
1,070 – 1,110	30	LIMESTONE –100% Yellowish gray (5Y 8/1) to light greenish gray (5GY 8/1), fine to medium grained, moderately soft, to moderately hard, locally sparry pelloidal packstone to wackestone with few forams. Locally phosphatic at 1090.
1,110 – 1,170	60	LIMESTONE –100% Yellowish gray (5Y 8/1) to pale yellowish brown (10YR 6/2), fine to medium grained, moderately soft to hard, pelloidal, locally fossiliferous packstone to wackestone with some casts and molds. Trace yellowish gray (5Y 7/2) to white (N9), carbonate marl at 1,120'. Trace pale yellowish brown ((10YR 6/2) to dark yellowish brown (10YR 4/2), microcrystalline to cryptocrystalline, hard glauconitic Limestone at 1,140'. Trace white (N9), very soft carbonate marl at 1,150'. Trace Dolomite at 1,170'.
1,170 – 1,220	50	LIMESTONE – 100% Moderate yellowish brown (10YR 5/4) to grayish orange (10YR 7/4), dominantly fine to medium grained, rarely coarse grained, moderately soft to hard, pelloidal packstone with few fossils and few to common forams. Trace Dolomitic Limestone from 1,180' to 1,190'.
1,220 – 1,260	40	LIMESTONE AND MARL – Limestone 80% to 90%; 50% to 70% grayish orange (10YR 7/4), medium to rarely coarse grained, moderately soft, pelloidal packstone to wackestone. 30% to 10% Pale yellowish brown (10YR 6/2) to light olive gray (5Y 4/1), cryptocrystalline to medium grained, hard, locally weakly vuggy, locally fossiliferous carbonate mudstone. Marl 20% to 10%, white (N9), very soft, carbonate marl with abundant forams.
1,260 – 1,280	20	LIMESTONE – 100%; 80% Yellowish gray (5Y 7/1 to 5Y 8/1), very fine to fine grained, locally weakly vuggy to vuggy, moderately hard packstone to wackestone with few forams. 20% Grayish orange (10YR 7/4), cryptocrystalline, hard, carbonate mudstone. Trace crystalline carbonate and few forams.
1,280 – 1,300	20	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1), cryptocrystalline to fine grained, moderately hard to moderately soft, locally vuggy wackestone to packstone. 10% to 20% Light olive gray (5Y 6/1, cryptocrystalline, hard carbonate mudstone. Abundant forams. Trace Dolomitic Limestone.
1,300 – 1,330	30	LIMESTONE – 100%; 80% Yellowish gray (5Y 8/1) wackestone to packstone as above. 20% Pale yellowish brown (10YR 6/2), medium to fine grained, moderately hard packstone to grainstone.

Depth (ft)	Thickness (ft)	Sample Description
1,330 – 1,390	60	LIMESTONE – 100%; 60% Grayish orange (10YR 8/4), very fine to fine grained, moderately soft to moderately hard wackestone to packstone. 20% Light olive gray (5Y 6/1) to yellowish gray (5Y 8/1), to medium light gray (N6), cryptocrystalline to very fine grained, hard, locally vuggy carbonate mudstone. Trace forams at 1,370'.
1,390 – 1,400	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), fine grained, moderately hard pelloidal packstone. 20% Light gray (N7), fine to medium grained, hard, carbonate mudstone to wackestone.
1,400 – 1,410	10	LIMESTONE – 100%; 60% Grayish orange (10YR 8/4), medium grained, moderately hard pelloidal packstone. 20% Grayish orange (10YR 8/4), fine to medium grained, moderately hard wackestone. 20% -Yellowish gray (5Y 7/1), cryptocrystalline, hard, carbonate mudstone. Trace forams.
1,410 – 1,440	30	LIMESTONE – 100%; 80% to 60% Grayish orange (10YR 7/4), medium to fine grained, moderately hard pelloidal packstone to grainstone. 20% to 40% Pale yellowish brown (10YR 6/2) to light olive gray (5Y 6/1), cryptocrystalline, hard, partly vuggy carbonate mudstone.
1,440 – 1,450	10	LIMESTONE – 100%; 50% Yellowish gray (5Y 8/1), medium grained, soft to moderately soft packstone. 20% Yellowish gray (5Y 8/1) to medium light gray (N6), very fine to fine grained, moderately hard, fossiliferous, micritic packstone/wackestone. 20% Yellowish gray (5Y 8/1), cryptocrystalline to fine grained, hard, weakly vuggy carbonate mudstone. 10% Light olive gray (5Y 8/1), fine to medium grained, hard, fossiliferous packstone with fine to coarse grained colorless quartz sand. Forams common.
1450 – 1,460	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately hard to moderately soft, pelloidal packstone to wackestone.
1,460 – 1,470	10	LIMESTONE – 100%; 60% Very pale orange (10YR 8/2), medium grained, moderately soft packstone. 30% Yellowish gray (5Y 7/2), cryptocrystalline, hard carbonate mudstone. 10% Medium gray (N5), very fine grained to microcrystalline, hard wackestone. Formas common
1,470 – 1,480	10	LIMESTONE – 100%; 50% Medium light gray (N6) to black (N1), cryptocrystalline to fine grained, hard, locally weakly vuggy carbonate mudstone with trace casts. 50% Yellowish gray (5Y 8/1), very fine to fine grained, moderately soft to moderately hard, rarely weakly Dolomitic wackestone to packstone.
1,480 – 1,500	20	LIMESTONE – 100%; 70% Very pale orange (10YR 8/2), medium to fine grained, moderately soft packstone. 20% Yellowish gray (5Y 7/2), cryptocrystalline, hard, carbonate mudstone. 10% Pale yellowish brown (10YR 6/2) to medium gray (N5), fine grained carbonate mudstone.
1,500 – 1,520	20	LIMESTONE – 100% Yellowish gray (5Y 8/1), fine to medium grained, moderately soft, pelloidal packstone to wackestone with few forams.

Depth (ft)	**Thickness (ft)**	**Sample Description**
1,520 – 1,550	30	LIMESTONE – 100%; 90% Pale yellowish brown (10YR 6/2) to pale orange (10YR 7/1), fine to medium grained, moderately soft to moderately hard, locally weakly vuggy to vuggy, pelloidal packstone to wackestone. 10% Yellowish gray (5Y 8/1), fine grained to locally cryptocrystalline, moderately hard to hard carbonate mudstone to wackestone.
1,550 – 1,590	40	LIMESTONE – 100%; 90% Pale orange (10YR 7/1) to very pale orange (10YR 8/2), fine grained, moderately soft, pelloidal, slightly fossiliferous packstone. 10% Light gray (N7) to medium dark gray (N4), cryptocrystalline to very fine grained, hard fossiliferous carbonate mudstone to wackestone. Forams common to abundant
1,590 – 1,600	10	LIMESTONE – 100%; 90% Medium light gray (N6), cryptocrystalline to very fine grained, hard, fossiliferous carbonate mudstone to wackestone. 10% Pale orange (10YR 7/1) to very pale orange (10YR 8/2), fine grained, moderately soft, pelloidal, slightly fossiliferous packstone.
1,600 – 1,620	20	LIMESTONE – 100%; 80% Pale orange (10YR 7/1) to very pale orange (10YR 8/2), fine grained, moderately soft, pelloidal, slightly fossiliferous packstone. 20% Medium light gray (N6), cryptocrystalline to very fine grained, hard fossiliferous carbonate mudstone to wackestone.
1,620 – 1,630	10	LIMESTONE – 100% Very pale orange (10YR 8/2), fine to medium grained, moderately soft pelloidal, slightly fossiliferous grainstone.
1,630 – 1,640	10	LIMESTONE – 100%; 90% Medium light gray (N6), cryptocrystalline to very fine grained, hard, fossiliferous carbonate mudstone to wackestone. 10% Pale orange (10YR 7/1), moderately soft, pelloidal packstone. Abundant forams.
1,640 – 1,670	30	LIMESTONE – 100% Pale orange (10YR 7/1) to very pale orange (10YR 8/2), fine to medium grained, moderately soft, pelloidal, fossiliferous packstone. Trace medium light gray (N6) Limestone. Few to abundant forams.
1,670 – 1,680	10	LIMESTONE – 100% Medium light gray (N6) to medium dark gray (N4), microcrystalline to very fine grained, hard, locally vuggy carbonate mudstone to locally wackestone with little pale orange (10YR 8/1), fossiliferous packstone and few forams.
1,680 – 1,710	30	LIMESTONE - 100%; 95% Pale orange (10YR 7/1) to very pale orange (10YR 8/2), fine to medium grained, moderately soft, pelloidal fossiliferous packstone. 5% Medium light gray (N6) to very light gray (N8), cryptocrystalline to microcrystalline, hard, locally vuggy carbonate mudstone. Abundant forams.
1,710 – 1,730	20	LIMESTONE – 100% Very pale orange (10YR 8/2) to white (N9), microcrystalline to very fine grained, moderately hard, partly weakly vuggy carbonate mudstone to wackestone. Forams common. Trace light gray (N7), fine grained, hard to soft, partly micritic packstone to wackestone.

Depth (ft)	Thickness (ft)	Sample Description
1,730 – 1,740	10	LIMESTONE – 100% Grayish orange (10YR 7/4), fine to medium grained, moderately soft, pelloidal packstone to wackestone. Abundant unconsolidated forams and tests.
1,740 – 1,750	10	LIMESTONE – 100%; 80% Very pale orange (10YR 8/2), fine to medium grained, moderately hard. 20% Very pale orange (10YR 8/2), cryptocrystalline, hard, partly weakly vuggy, rarely slightly sparry carbonate mudstone. Forams common. Trace to little crystalline carbonate.
1,750 – 1,790	40	LIMESTONE – 100%; 80% to 70% Yellowish gray (5Y 8/1) to very pale orange (10YR 8/2), fine to medium grained, moderately hard to moderately soft packstone to rarely grainstone. 20% to 30% Light olive gray (5GY 6/1), cryptocrystalline, hard, locally weakly vuggy carbonate mudstone. Trace yellowish gray (5Y 7/2), microcrystalline to cryptocrystalline, very soft carbonate mudstone at 1,760'. Forams common to abundant.
1,790 – 1,800	10	LIMESTONE – 100%; 90% Very pale orange (10YR 8/2), very fine to fine grained moderately hard wackestone. 10% Light olive gray (5GY 6/1), cryptocrystalline, hard, locally weakly vuggy carbonate mudstone. Abundant forams and tests.

Appendix E

Cores

Injection Well No. 1 (IW-1) – Lithology

Core Geologic Log

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #1

Depth (ft)	Sample Description
1700.0 – 1711.0	No Recovery
1711.0 – 1712.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine to medium grained, soft, well indurated packstone with forams. Indistinct lower contact.
1712.0 – 1712.3	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, very fine to fine grained, moderately soft, well indurated, wackestone. Poor core quality.
1712.3 – 1713.1	LIMESTONE (100%) very pale orange (10YR 8/2)) massive, fine to medium grained, moderately soft to moderately hard, well indurated, packstone with medium to coarse grain sized forams common in upper portion of unit to abundant in lower portion. Trace light gray (N7) to medium light gray (N^) hard, carbonate mudstone clasts from dominantly 1mm in diameter to rarely 4 mm in diameter throughout unit.
1713.1 – 1713.2	LIMESTONE (100%) yellowish gray (5Y 7/2) massive dominantly very fine to fine grained soft, well indurated packstone/wackestone with medium to coarse grain sized forams common. Indistinct lower contact.
1713.2 – 1713.7	LIMESTONE (100%), yellowish gray (5Y 8/1), massive, massive fine to medium grained moderately hard packstone with abundant fine to coarse grain sized forams. Gradational contact lower through lower .2 feet of unit..
1713.7 – 1713.8	LIMESTONE (100%) medium dark gray (N4) massive cryptocrystalline, hard, vuggy carbonate mudstone.

1713.8 – 1714.0	LIMESTONE (100%) Yellowish gray (5Y 8/1) massive, fine grained, soft well indurated packstone/wackestone.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #2

Depth (ft)	**Sample Description**
1750.0 – 1750.2	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine grained to cryptocrystalline, moderately hard, vuggy with vugs to 1 mm in diameter carbonate mudstone with occasional molds and few forams. Indistinct lower contact. No Recovery
1750.2 – 1751.1	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine to medium grained, soft, well indurated wackestone with trace light gray (N7) cryptocrystalline hard carbonate mudstone clasts to 5 mm in diameter.
1751.1 – 1765.0	No Recovery

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #3

Depth (ft)	Sample Description
1800.0 – 1804.3	No Recovery
1804.3 – 1805.4	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, medium grained, moderately hard to moderately soft, moderately indurated packstone. Weakly vuggy in upper .4' of section. Trace to few forams and trace moderately soft mudstone clasts to 4mm in diameter throughout section. Indistinct lower contact.
1805.4 – 1805.8	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, medium to coarse grained, moderately soft, moderately to poorly indurated packstone with coarse grained to 5mm in diameter forams and tests common. Indistinct lower contact.
1805.8 – 1805.9	LIMESTONE (100%) medium light gray (N6) cryptocrystalline, hard angular medium grained to 15mm carbonate mudstone clasts with yellowish gry (5Y 7/2) medium grained, moderately soft packstone matrix. Indistinct lower contact.
1805.9 – 1806.1	LIMESTONE (100%0 medium gray (N5) to medium light gray (N6) massive, dominantly very fine to medium grained, soft, moderately well indurated wackestone. Sharp horizontal lower contact.
1806.1 – 1806.9	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine to medium grained, moderately hard, moderately indurated, weakley vuggy packstone with coarse grain sized forams.
1806.9 – 1807.3	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, very fine grained, hard, well indurated, moderately vuggy with vugs dominantly 1 mm to

	rarely 5 mm in diameter. Wackestone to carbonate mudstone. Poor core quality
1807.3 – 1807.5	LIMESTONE (100%) medium to light gray (N6) and yellowish gray (5Y 8/1) massive to weakly laminated, moderately hard, well indurated, weakly vuggy packstone. Sharp horizontal lower contact.
1807.5 – 1807.7	LIMESTONE (100%) very pale orange (10YR 8/2) massive, fine grained, moderately hard, well indurated, vuggy with vugs generally< 1 mm in diameter, packstone.
1807.7 – 1808.2	LIMESTONE (100%) very pale orange (10YR 8/2) massive, fine grained, soft, friable, well indurated packstone. Poor core quality
1808.2 – 1809.5	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, very fine to fine grained, grain size increasing with depth, soft to moderately hard, hardness increasing with depth, very well to well indurated packstone with 5% to 10% medium gray (N5) coarse grained grading with depth to 5 mm hard carbonate mudstone clasts. Indistinct lower contact.
1809.5 – 1810.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine to medium grained, soft, well indurated, locally micritic and vuggy packstone
1810.0 – 1815.0	No Recovery

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #4

Depth (ft)	Sample Description
1850.0 – 1854.2	No Recovery
1854.2 – 1854.6	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine to medium grained, soft, very well indurated packstone. Indistinct lower contact.
1854.6 – 1854.7	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, medium to coarse grained, hard, moderately indurated packstone with medium light gray (N6) hard, coarse grained to 10 mm in diameter angular carbonate mudstone clasts. Indistinct lower contact.
1854.7 – 1857.4	LIMESTONE (100%) yellowish gray (5Y 8/1) to yellowish gray (5Y 7/2) massive, fine to coarse grained, moderately soft to soft, well indurated, very weakly vuggy with vugs 1 mm to 3 mm in diameter, packstone to wackestone with few forams. Indistinct lower contact.
1857.4 – 1861.8	LIMESTONE (100%) yellowish gray (5Y 7/2) generally massive, dominantly coarse grained grading to medium grain sized with depth, moderately hard, moderately to well indurated with induration increasing with depth grainstone grading to packstone with depth with abundant forams, 10mm thick wackestone lamination at 1857.6 and thin, medium gray (N5) moderately hard carbonate mudstone laminations at 1860.0. Indistinct lower contact.
1861.8 – 1862.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine grained, hard, moderately indurated, wackestone to carbonate mudstone with vertical boreholes to 2mm in diameter. Poor core quality.

1862.0 – 1862.9	LIMESTONE (100%) light gray (N7) weakly bedded, dominantly fine grained, hard, well indurated wackestone with few medium to coarse grained micritic packstone laminations to 15mm thick and yellowish gray (5Y 7/2) medium grained, soft packstone lenses in lower .5' of unit.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #5

Depth (ft)	Sample Description
1900.0 – 1901.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, very fine to medium grained, moderately soft, well indurated packstone to wackestone. Poor core quality.
1901.0 – 1901.3	LIMESTONE (100%) yellowish gray (5Y 8/1) generally massive, very fine grained, moderately soft, very well indurated wackestone with thin pale yellowish brown (10YR 6/2) dolomitic laminations in lower .1' of unit. Indistinct lower contact.
1901.3 – 1901.6	DOLOMITE AND LIMESTONE Dolomite (70%) dark yellowish brown (10YR 4/2) cryptocrystalline, moderately hard moderately indurated interlaminated with Limestone (30%) as above. Indistinct lower contact.
1901.6 – 1901.9	LIMESTONE (100%) yellowish gray (5Y 8/1) generally massive, very fine grained, moderately soft, well indurated, wackestone with few moderate yellowish brown (10YR 5/4) dolomitic laminations to 3 mm thick. Indistinct lower contact.
1901.9 – 1903.0	LIMESTONE (100%) yellowish gray (5Y 8/1) generally massive, medium grained grading with depth to very fine grained, moderately soft moderately well indurated, packstone grading with depth to well indurated wackestone. Unit exhibits rare thin >1 mm dolomitic laminations. Indistinct lower contact.
1903.0 – 1903.8	LIMESTONE (100%) yellowish gray (5Y 8/1), fine grained, soft, well indurated, packstone with thin (10 mm) cryptocrystalline, moderately hard carbonate mudstone beds with trace vertical burrows to 3 mm in diameter.

1903.8 – 1904.1	DOLOMITE (100%) yellowish gray (5Y 7/2) with light olive gray (5Y 5/2) wavy laminations common, cryptocrystalline, very hard, moderately vuggy with vugs generally <1 mm in diameter to rarely 5 mm in diameter..

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #6

Depth (ft)	Sample Description
1950.0 – 1957.6	No Recovery
1957.6 – 1958.6	LIMESTONE (100%) very pale orange (10YR 8/2) massive, fine grained, soft, well indurated wackestone. Sharp horizontal lower contact.
1958.6– 1958.9	LIMESTONE (100%) yellowish gray (5Y 7/2) massive, fine grained, hard, micritic, weakly vuggy carbonate mudstone to wackestone. Indistinct lower contact.
1958.9 – 1959.2	LIMESTONE (100%) very pale orange (10YR 8/2) massive, fine grained, moderately hard, well indurated, weakly vuggy wackestone. Poor core quality.
1959. 2– 1961.1	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, fine to medium grained, moderately soft, well indurated, packstone to wackestone with few tests. Hard carbonate mudstone lens at 1960.1. Sharp horizontal lower contact.
1961.1 – 1961.4	LIMESTONE (100%) yellowish gray (5Y 7/2), massive, medium grained, moderately soft, moderately indurated, packstone with few clasts to 5 mm in diameter. Sharp horizontal lower contact.
1961.4 – 1962.0	LIMESTONE (100%) very pale orange (10YR 8/2) massive, fine grained, hard, moderately indurated, weakly vuggy with vugs generally 1 mm in diameter packstone with molds common. Indistinct lower contact.

1962.0 – 1965.0	LIMESTONE (100%) very pale orange (10YR 8/2) generally massive, fine to medium grained, moderately soft, well indurated packstone with light olive gray (5Y 6/1) soft wackestone lamination at 1963.6

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 1

CORE #7

Depth (ft)	**Sample Description**
2032.0 – 2032.8	DOLOMITE (100%) Slightly limy, pale yellowish brown (10YR 6/2) to olive gray (5Y 4/1) massive, cryptocrystalline, very hard, moderately vuggy, vugs dominantly <1mm in diameter to rarely 5mm in diameter. Indistinct lower contact.
2032.8 – 2033.6	DOLOMITE AND LIMESTONE Dolomite (95%) light bluish gray (5B 8/1) to light olive gray (5Y 5/2) weakly laminated, cryptocrystalline, very hard, weakly vuggy to vuggy, vugs 2mm to 4mm in diameter with olive gray (5Y 4/2) inclusions and 5 mm lamination in upper .15' of section. Limestone (5%) very pale orange (10YR 8/2) very fine grained, moderately soft packstone occurring as occasional lenses with maximum thickness of 10mm. Indistinct lower contact.
2033.6 – 2034.8	DOLOMITE (100%) Medium bluish gray (5B 5/1) to light olive gray (5Y 6/1) massive dominantly cryptocrystalline to fine grained very hard, vuggy, vugs to 10mm in diameter in upper .2' of section trending to weakly vuggy with vugs generally 1mm to 2mm with depth. Indistinct lower contact.
2034.8 – 2.35.7	DOLOMITE AND LIMY DOLOMITE Dolomite 90% medium bluish gray (5B 5/1) to light olive gray (5Y 6/1) cryptocrystalline, very hard, weakly to moderately vuggy with Limy Dolomite (10%) grayish orange (10YR 7/4) microcrystalline to very fine grained, very hard occurring as lenses
2035.7 – 2040.0	No Recovery

2040.0 – 2041.3	DOLOMITE (100%) Grayish orange (10YR 6/4) massive, cryptocrystalline, very hard, weakly vuggy, vugs generally 1mm in diameter
2041.3 – 2041.9	DOLOMITE (100%) Dark yellowish orange (10YR 6/6) to moderate yellowish brown (10YR 5/4) cryptocrystalline, very hard, weakly vuggy with distinct mottles common.

End of Core

Injection Well No. 1 (IW-1) – Lithology

Core Analysis

Submittal Data
FROM

Youngquist Brothers, Inc.

15465 Pine Ridge Rd.
Ft. Myers, FL. 33908
239-489-4444 Fax: 239-489-4545

Project

City of Hollywood Southern Regional WWTP Injection Well System

I have reviewed this submittal for general conformance with the design concepts and contract documents. Generally no conflict with materials or dimensions will arise from the approval of this shop drawing submittal.

Number of Copies: 7

Submittal Number: 13198-01-A

Specification Section Number: 13198

Item Submitted: Rock Cores Injection #1 IW-1

New Submittal: ☒ Resubmitted: ☐

Youngquist Brothers, Inc. Representative:

Marybeth Rios

Marybeth Rios

Transmittal Date: February 14, 2003

☐ Approved
☐ Approved with changes
☐ Rejected, Revise & Resubmit
☐ Not Reviewed

By: ____________________

Firm: ____________________

Date: ____________________

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

February 4, 2003
File Number 02-188

Youngquist Brothers, Inc.
15465 Pine Ridge Road
Fort Myers, Florida 33908

RECEIVED FEB - 6 2003

Attention: Mr. Edward McCullers

Subject: Laboratory Testing of Rock Core Specimens from City of Hollywood Waste Water Treatment Plant, Injection Well IW-1

Gentlemen:

As requested, permeability and specific gravity tests have been completed on sixteen rock core samples provided for testing by your firm from the City of Hollywood Injection Well IW-1. The permeability tests were performed in general accordance with ASTM Standard D 5084 "Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible-Wall Permeameter" using the constant-head method (Method A) and the falling-head with increasing tailwater level method (Method C). Specific gravity was determined in general accordance with ASTM Standard D 854 "Specific Gravity of Soils".

Due to the irregular shape and short length of the core samples, each of the requested tests (i.e., vertical permeability test, horizontal permeability test and unconfined compression test) could not be performed on each sample. Priority was given to obtaining specimens from the samples for vertical and horizontal permeability tests.

Permeability Tests

The permeability test results are presented in Table 1. The vertical permeability tests were performed first on specimens maintained at the as-received diameter (except for one sample from Core 6) and cut to lengths of 4.4 to 9.9 cm. After completing the vertical permeability tests, horizontal permeability test specimens were obtained from the samples (except for one sample from Core 6) by coring 3.2 or 5.1 cm diameter cylinders from the vertical specimens. The horizontal specimens were trimmed to lengths of 7.5 to 8.3 cm to provide flat, parallel ends. The final moisture contents of the vertical test specimens that were cored for horizontal test specimens were not measured. The dry densities and degrees of saturation of those vertical permeability test specimens, therefore, were estimated using final moisture contents from the corresponding horizontal permeability test specimens.

The vertical permeability test specimens were air-dried, deaired under vacuum, and then saturated with deaired tap water from the bottom upward while still under vacuum. After testing, the vertical specimens were maintained submerged in water until cored for the horizontal specimens and retested for measurement of horizontal hydraulic conductivity. Each specimen was mounted in a triaxial-type permeameter and encased within a latex membrane. The specimens were confined using an average isotropic effective confining stress of 30 lb/in^2 and permeated with deaired ~~tap water under a back~~-pressure of 70 or 160 lb/in^2. Satisfactory saturation was verified by a B-factor equal ~~to or greater~~ than 95 percent, or a B-factor that remained relatively constant for two consecutive increments of applied cell pressure. The inflow to and outflow from each specimen were monitored with time, and the hydraulic conductivity was calculated for each recorded flow increment. The tests were continued until steady-state flow conditions were obtained, as evidenced by an outflow/inflow ratio between 0.75 and 1.25, and until stable values of hydraulic conductivity were measured.

The final degree of saturation was calculated upon completion of testing using the final dry mass, moisture content and volume, and the measured specific gravity. Although some of the calculated final degrees of saturation are low (i.e. less than 95%), the B-factors indicate satisfactory saturation. The calculated final degrees of saturation are potentially affected by occluded voids within the specimens, surface irregularities, and the use of final moisture contents for vertical permeability test specimens from corresponding horizontal permeability test specimens.

Specific Gravity Tests

The specific gravity of each sample was determined on a representative approximately 100 gram specimen ground to pass the U.S. Standard No. 40 sieve. The specific gravity measured on each sample is presented in Table 1.

Total Porosity

The total porosity, n, of each permeability test specimen was calculated using the measured dry density, γ_d, and measured specific gravity, G_s, from the equation: $n = 1 - [\gamma_d/(G_s)(\gamma_w)]$ where γ_w = unit weight of water. The calculated total porosities are presented in Table 1.

Unconfined compression tests on four samples are in progress. The test results will be forwarded next week.

If you have any questions about the test results, please contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

Shawkat Ali
Shawkat Ali, Ph.D., P.E.
Quality Control Manager

Thomas Ingra
Thomas S. Ingra, P.E.
Laboratory Director
Florida Registration No. 31987

SA/TSI/sa

Youngquist [illegible]thers, Inc.
File Number 02-188
February 4, 2003

Table 1

PERMEABILITY TEST RESULTS
CITY OF HOLLYWOOD WASTE WATER TREATMENT PLANT INJECTION WELL IW-1

Core No.	Sample No.	Depth Interval (feet)	D-5084 Test Method*	Test Specimen Orientation	G_s	Initial Conditions					$\bar{\sigma}_c$ (lb/in^2)	u_b (lb/in^2)	B Factor (%)	Average Hydraulic Gradient	Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
						Length (cm)	Diameter (cm)	w_c (%)	γ_d (lb/ft^3)	n					w_c (%)	γ_d (lb/ft^3)	S (%)	
1	1	1712.3 - 1713.1	A C	Vertical Horizontal	2.73	9.86 7.90	9.79 4.96	27.5 27.5	94.0 93.8	0.45 0.45	30 30	70 70	82** 87**	1 1	27.5 † 27.5	94.0 93.8	92 92	$3.0x10^{-3}$ $3.7x10^{-3}$
3	1	1804.7 - 1805.4	C C	Vertical Horizontal	2.74	8.12 8.07	9.88 5.02	29.9 29.9	91.5 91.5	0.46 0.47	30 30	70 70	86** 85**	1 1	29.9 † 29.9	91.5 91.5	94 94	$1.3x10^{-3}$ $4.3x10^{-3}$
	2	1806.0 - 1806.5	C C	Vertical Horizontal	2.73	9.07 7.50	9.46 5.02	19.8 19.8	103.7 109.0	0.39 0.36	30 30	70 70	93** 81**	1 2	19.8 † 19.8	103.7 109.0	84 96	$1.1x10^{-3}$ $1.3x10^{-3}$
	3	1808.2 - 1808.9	A A	Vertical Horizontal	2.74	9.47 8.28	9.74 5.02	9.5 9.5	132.5 132.0	0.23 0.23	30 30	160 70	96 78**	24 23	9.5 † 9.5	132.5 132.0	90 89	$5.7x10^{-6}$ $5.1x10^{-6}$
4	1	1862.0 - 1862.5	C C	Vertical Horizontal	2.69	9.02 7.79	9.84 5.14	9.8 9.8	130.7 132.5	0.22 0.21	30 30	70 70	79** 90**	2 2	9.8 † 9.8	130.7 132.5	93 99	$6.3x10^{-4}$ $3.2x10^{-3}$
	2	1862.5 - 1862.9	C C	Vertical Horizontal	2.70	8.98 7.91	9.82 5.13	10.1 10.1	128.3 124.4	0.24 0.26	30 30	70 70	76** 93**	2 2	10.1 † 10.1	128.3 124.4	87 77	$2.7x10^{-4}$ $1.8x10^{-3}$
5	1	1901.6 - 1901.9	A A	Vertical Horizontal	2.72	4.35 7.69	9.76 3.21	19.3 19.3	108.6 109.3	0.36 0.36	30 30	160 160	95 81**	54 23	19.3 † 19.3	108.6 109.3	93 95	$3.1x10^{-7}$ $6.7x10^{-6}$ ††
	2	1902.1 - 1902.5	A A	Vertical Horizontal	2.71	8.03 7.72	9.62 5.10	23.3 23.3	101.0 97.3	0.40 0.42	30 30	70 70	73** 75**	9 18	23.3 † 23.3	101.0 97.3	94 86	$3.0x10^{-5}$ $6.3x10^{-5}$
	3	1902.5 - 1903.0	A A	Vertical Horizontal	2.72	7.43 7.53	9.33 5.00	23.8 23.8	100.4 101.4	0.41 0.40	30 30	70 70	77** 78**	12 22	23.8 † 23.8	100.4 101.4	94 96	$1.5x10^{-5}$ $2.8x10^{-5}$
6	1	1962.4 - 1962.9	C C	Vertical Horizontal	2.70	7.97 7.74	9.61 5.01	28.2 28.2	95.2 95.0	0.43 0.44	30 30	70 70	77** 79**	2 2	28.2 † 28.2	95.2 95.0	99 99	$5.7x10^{-4}$ $6.3x10^{-4}$
	2	1962.9 - 1963.4	A	Vertical	2.73	7.49	3.12	20.8	98.2	0.42	30	70	54**	17	20.8	98.2	77	$1.6x10^{-4}$
7	1	2032.4 - 2032.7	A A	Vertical Horizontal	2.87	7.98 7.78	10.09 5.02	5.6 5.6	150.0 152.2	0.16 0.15	30 30	160 160	95 100	29 25	5.6 † 5.6	150.0 152.2	83 91	$1.7x10^{-7}$ $2.6x10^{-6}$
	2	2033.2 - 2033.6	C C	Vertical Horizontal	2.85	9.11 8.17	10.11 5.04	2.2 2.2	160.9 162.9	0.10 0.08	30 30	70 70	60** 80**	1 2	2.2 † 2.2	160.9 162.9	59 68	$1.1x10^{-3}$ *** $8.0x10^{-4}$ ***

Table 1 (Continued)

PERMEABILITY TEST RESULTS
CITY OF HOLLYWOOD WATER TREATMENT PLANT INJECTION WELL IW-1

Core No.	Sample No.	Core Depth (feet)	D-5084 Test Method*	Test Specimen Orientation	G_s	Initial Conditions					$\bar{\sigma}_c$ (lb/in^2)	u_b (lb/in^2)	B Factor (%)	Average Hydraulic Gradient	Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
						Length (cm)	Diameter (cm)	w_c (%)	γ_d (lb/ft^3)	n					w_c (%)	γ_d (lb/ft^3)	S (%)	
7	3	2034.0 - 2034.4	A	Vertical	2.85	9.15	10.10	3.7	158.4	0.11	30	160	95	60	3.7 †	158.4	86	$1.4x10^{-8}$
			A	Horizontal		8.01	5.02	3.7	160.4	0.10	30	160	87**	52	3.7	160.4	97	$8.2x10^{-9}$
	4	2034.8 - 2035.4	A	Vertical	2.86	9.68	10.08	3.7	156.1	0.13	30	160	95	23	3.7 †	156.1	74	$1.1x10^{-7}$
			A	Horizontal		8.16	5.03	3.7	158.6	0.11	30	160	--	32	3.7	158.6	84	$2.0x10^{-8}$
	5	2041.2 - 2041.9	A	Vertical	2.88	8.43	10.06	3.5	157.7	0.12	30	160	90**	18	3.5 †	157.7	72	$2.7x10^{-8}$
			A	Horizontal		8.16	5.02	3.5	160.4	0.11	30	160	95	32	3.5	160.4	84	$1.2x10^{-8}$

Where: w_c = Moisture content; γ_d = Dry density; G_s = Specific gravity; n = Total Porosity; $\bar{\sigma}_c$ = Average isotropic effective confining stress; u_b = Back-pressure; and S = Calculated degree of saturation using measured specific gravity.

* Method A=Constant-head test; Method C = Falling-head test with increasing tailwater level.

** B-Factor remained relatively constant for two consecutive increments of applied cell pressure.

*** The specimens contained voids that resulted in the high hydraulic conductivity.

† Vertical permeability test specimen was cored upon completion of testing to obtain horizontal permeability test specimen. The final moisture content of the vertical test specimen was not measured, and was assumed to be the same as the horizontal permeability test specimen.

†† Specimen had a crack extending through the entire length of the specimen that resulted from coring of the vertical specimen to obtain the horizontal specimen.

Youngquist Brothers, Inc.

5465 Pine Ridge Road
ort Myers, Fl 33908

Phone: 941-489-4444
Fax: 941-489-4545

TRANSMITTAL
No. 00131

PROJECT: City of Hollywood

DATE: 02/28/2003

TO: Hazen & Sawyer
Southern Regional WWTP
1621 North 14th Avenue
Hollywood, Florida 33020

REF: Cores
Ardaman & Associates,Inc
File Number 02-188

ATTN: Glenn Cunningham

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☐ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☐ Specifications	☐ Attached	☐ Returned for Corrections
☐ Other:	☐ Separate Cover Via:	☐ Due Date:

ITEM	PACKAGE	SUBMITTAL	DRAWING	REV.	ITEM NO.	COPIES	DATE	DESCRIPTION	STATUS
						1	02/28/2003	Laboratories Testing of Rock Core Specimens Injection IW-1	

Remarks:

RECEIVED
HAZEN AND SAWYER, P.C.
FIELD OFFICE

MAR 7 2003

P.Vnc; J.Nottel, A.Alvarez; J
G.C; J.Lafey
JOB No. 4304-005.7

CC:

Signed: Marybeth Rios
Marybeth Rios

Ardaman & Associates, Inc.

Geotechnical, Environmental and
Materials Consultants

February 25, 2003
File Number 02-188

Youngquist Brothers, Inc.
15465 Pine Ridge Road
Fort Myers, Florida 33908

Attention: Mr. Edward McCullers

Subject: Laboratory Testing of Rock Core Specimens from City of Hollywood Waste Water Treatment Plant, Injection Well IW-1

Gentlemen:

As requested unconfined compression tests have been completed on four rock core samples provided for testing by your firm from the City of Hollywood Injection Well IW-1. The tests were performed in general accordance with ASTM Standard D 2938 "Unconfined Compressive Strength of Intact Rock Core Specimens". Due to the irregular shape and short length of the core samples, unconfined compression tests could not be performed on all of the originally requested sixteen samples. As specified, priority was given to obtaining specimens from the samples for the vertical and horizontal permeability tests. Accordingly, sufficient sample size was only available from four of the sixteen samples for unconfined compression tests.

Unconfined Compression Tests

The specimens were cored to diameters of 3.1 to 5.0 cm, trimmed to lengths of 7.3 to 10.2 cm to provide a length to diameter ratio of approximately 2, and then capped with sulfur capping compound. The specimens were loaded at a constant rate of axial deformation of 0.013 cm/minute. The specimens failed in 2.0 to 12.6 minutes in accordance with the ASTM Standard D 2938 criteria of between 2 and 15 minutes. The unconfined compressive strengths and Young's modulus determined from the tests are summarized in Table 1. The stress-strain curves are presented in Figures 1 through 4.

If you have any questions or require additional testing services, please contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

Shawkat Ali

Shawkat Ali, Ph.D., P.E.
Quality Control Manager

Thomas Ingra

Thomas S. Ingra, P.E.
Laboratory Director
Florida Registration No. 31987

SA/TSI/sa

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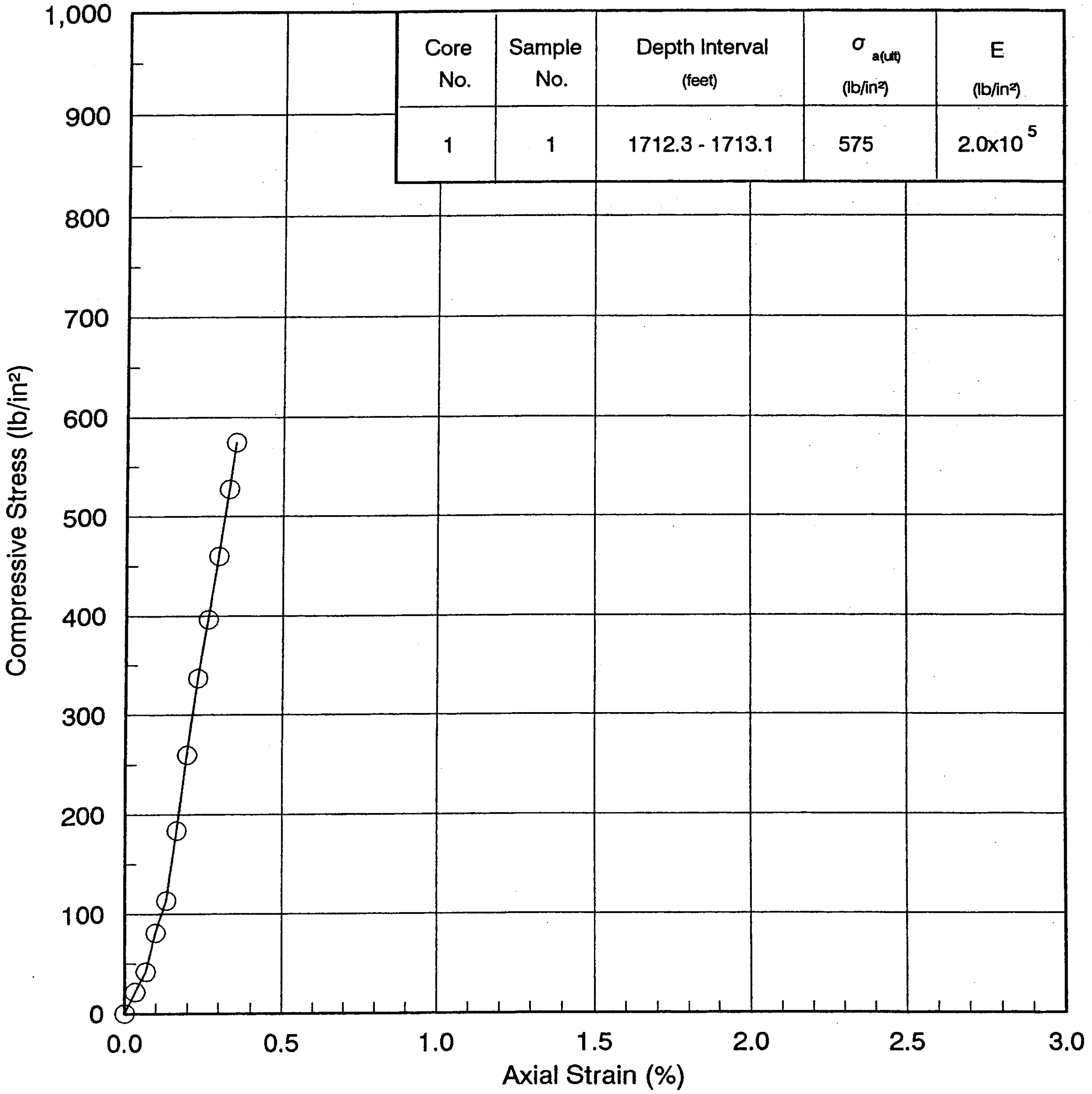
Table 1

UNCONFINED COMPRESSION TEST RESULTS
CITY OF HOLLYWOOD WASTE WATER TREATMENT PLANT INJECTION WELL IW-1

Core No.	Sample No.	Depth Interval (feet)	Specimen Dimensions			w_c (%)	γ_d (lb/ft^3)	Loading Rate (cm/min)	t_f (min)	Unconfined Compressive Strength, σ_a(ult) (lb/in^2)		Young's Modulus E (lb/in^2)**
			Length L (cm)	Diameter D (cm)	L/D					Measured	Corrected*	
1	1	1712.3 - 1713.1	7.74	3.20	2.42	18.1	88.3	0.013	2.0	575	585	$2.0\text{x}10^5$
3	1	1804.7 - 1805.4	7.63	3.14	2.43	16.4	88.9	0.013	2.4	725	740	$1.3\text{x}10^5$
3	3	1808.2 - 1808.9	7.28	3.25	2.24	2.3	129.6	0.013	4.8	4,150	4,205	$6.2\text{x}10^5$
7	5	2041.2 - 2041.9	10.19	5.04	2.02	1.0	167.2	0.013	12.6	13,120	13,140	$8.4\text{x}10^5$

Where: w_c = Moisture content; γ_d = Dry density; and t_f = Time to failure.

* Unconfined compressive strength corrected to L/D ratio of 2 in accordance with ASTM Standard D 2938-86.
** Young's modulus calculated from slope of the straight-line portion of the stress-strain curve.



Core No.	Sample No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
1	1	1712.3 - 1713.1	575	$2.0x10^{5}$

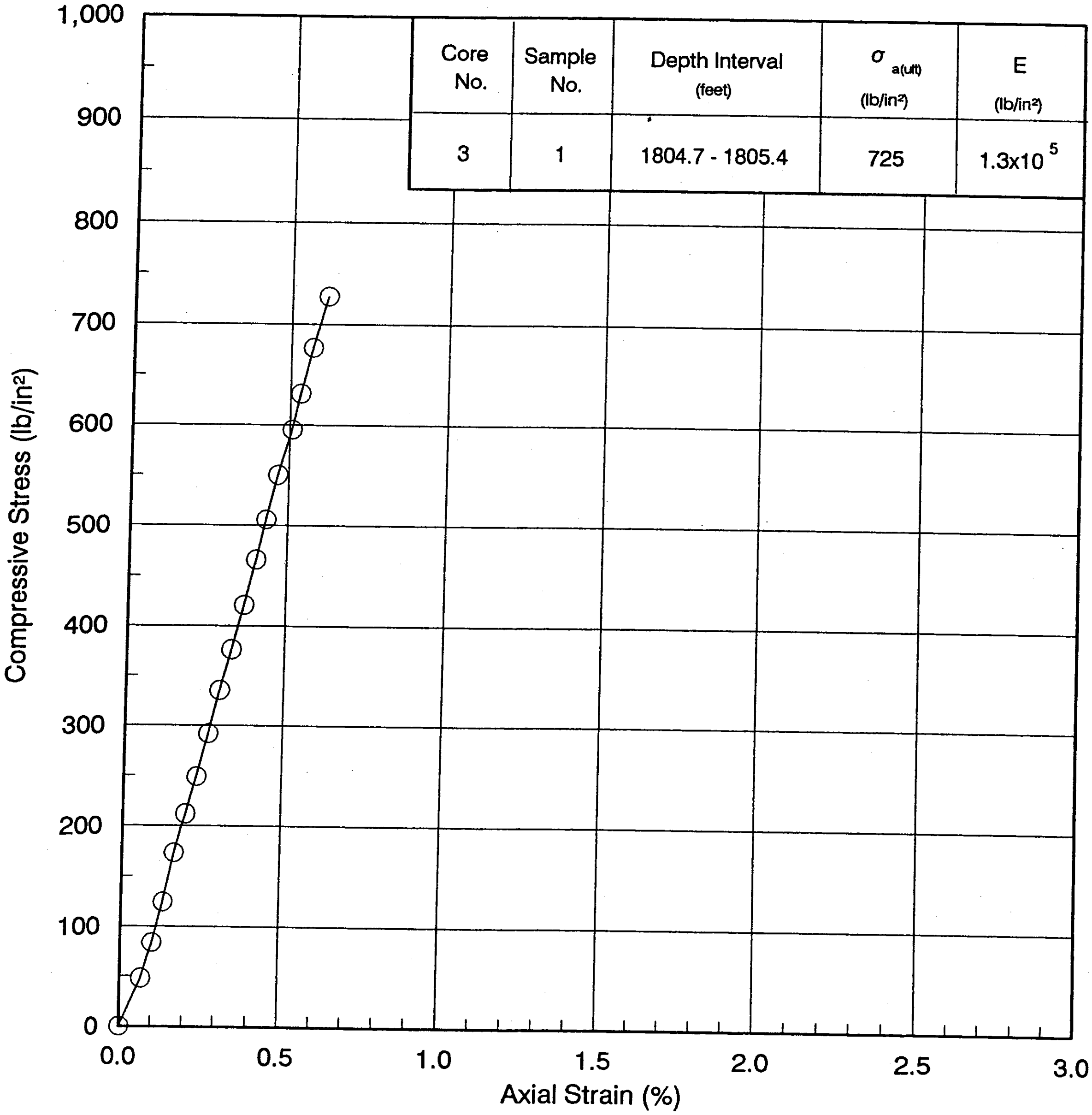
UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

CITY OF HOLLYWOOD
INJECTION WELL IW-1

YOUNGQUIST BROTHERS, INC.

DRAWN BY: SA
CHECKED BY: SA
DATE: 02-21-03
FILE NO.: 02-188
APPROVED BY:
FIGURE: 1



Core No.	Sample No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
3	1	1804.7 - 1805.4	725	1.3×10^5

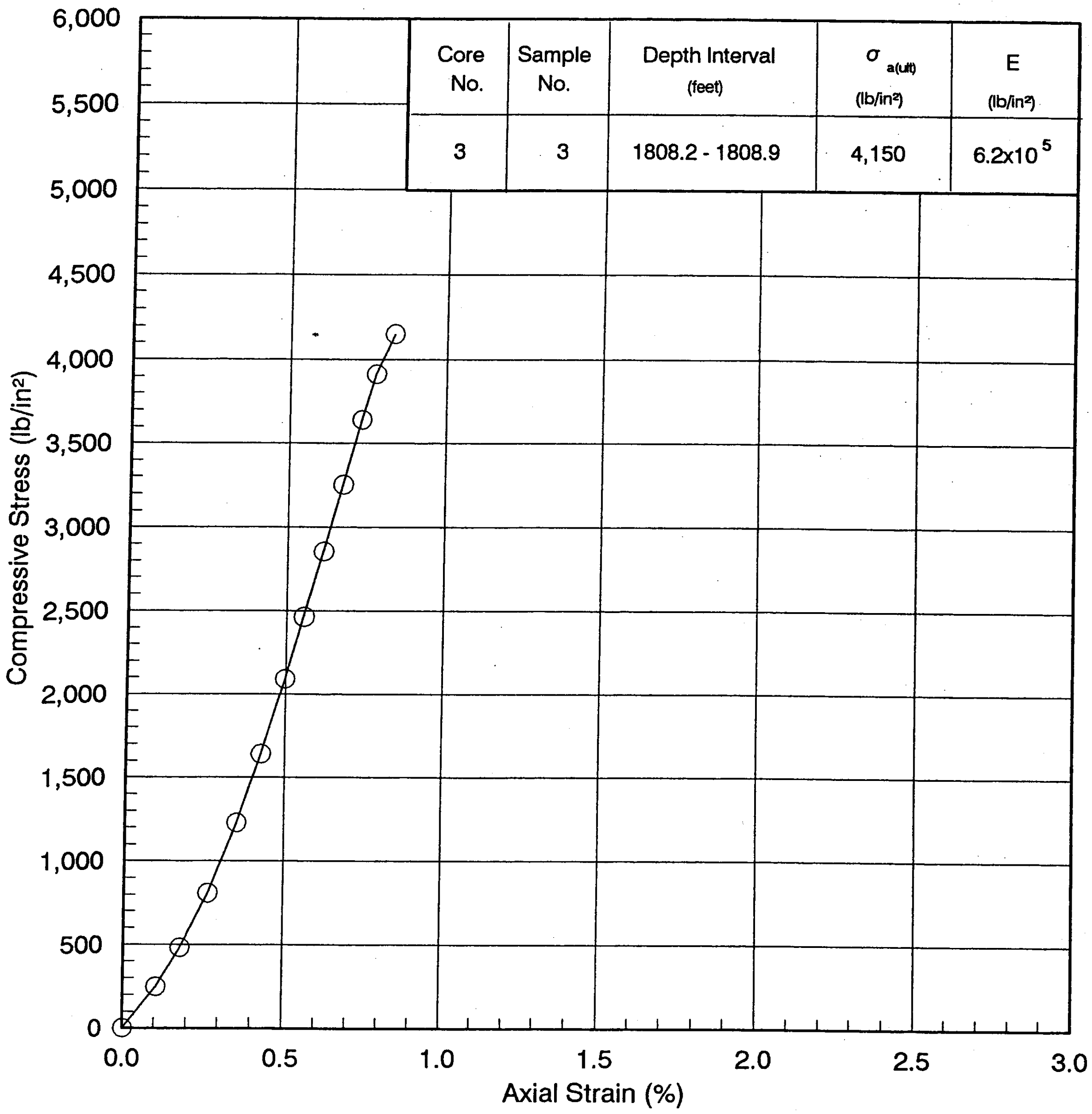
UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

CITY OF HOLLYWOOD
INJECTION WELL IW-1

YOUNGQUIST BROTHERS, INC.

DRAWN BY: SA	CHECKED BY: SA	DATE: 02-21-03
FILE NO.: 02-188	APPROVED BY:	FIGURE: 2



Core No.	Sample No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
3	3	1808.2 - 1808.9	4,150	$6.2\text{x}10^5$

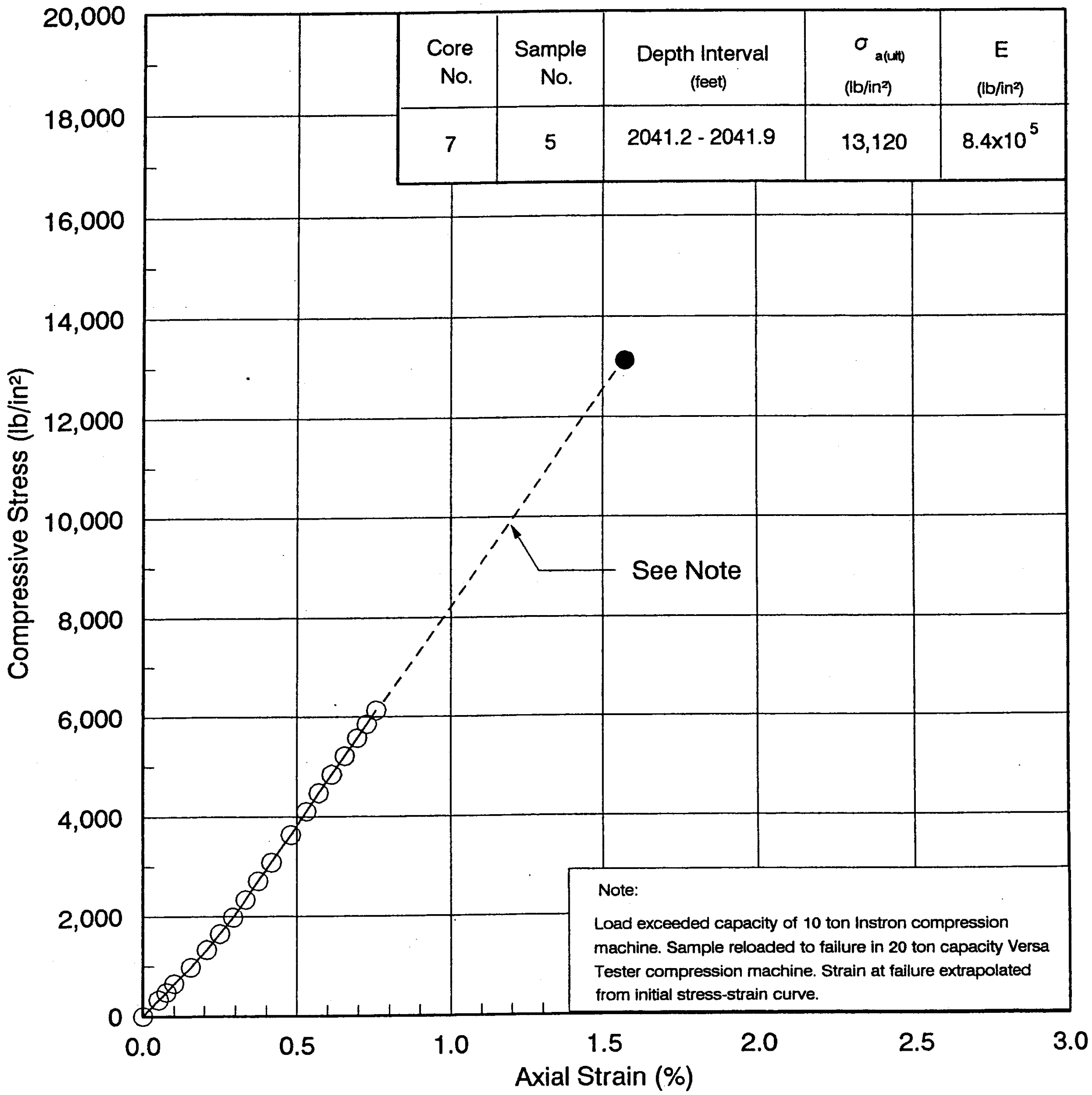
UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

CITY OF HOLLYWOOD
INJECTION WELL IW-1

YOUNGQUIST BROTHERS, INC.

DRAWN BY:	SA	CHECKED BY:	SA	DATE:	02-21-03
FILE NO.:	02-188	APPROVED BY:		FIGURE:	3



Core No.	Sample No.	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
7	5	2041.2 - 2041.9	13,120	$8.4x10^5$

Note:

Load exceeded capacity of 10 ton Instron compression machine. Sample reloaded to failure in 20 ton capacity Versa Tester compression machine. Strain at failure extrapolated from initial stress-strain curve.

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

CITY OF HOLLYWOOD
INJECTION WELL IW-1

YOUNGQUIST BROTHERS, INC.

DRAWN BY: SA	CHECKED BY: SA	DATE: 02-21-03
FILE NO.: 02-188	APPROVED BY:	FIGURE: 4

Injection Well No. 2 (IW-2) – Lithology

Core Geologic Log

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #1

Depth (ft)	**Sample Description**
1660.0 – 1660.6	LIMESTONE (100%) yellowish gray (5Y 9/1) to white (N9), massive, very fine grained to microcrystalline, moderately soft to moderately hard, weakly vuggy carbonate mudstone to wackestone with occasional burrows and molds.
1660.6 – 1661.6	LIMESTONE (100%) very pale orange (10YR 7/2 to 10YR 9/2) massive, very fine to medium grained, soft, fossiliferous, weakly vuggy, pelloidal packstone with forams. Sharp horizontal lower contact.
1661.6 – 1661.8	LIMESTONE (100%) medium light gray (N6), massive, cryptocrystalline to very fine grained, hard, vuggy carbonate mudstone. Sharp wavy lower contact.
1661.8 – 1662.5	LIMESTONE (100%) very pale orange (10YR 7/2 to 10YR 9/2), massive, dominantly very fine grained to microcrystalline, moderately soft to soft, packstone grading with depth to wackestone.
1662.5 – 1675.0	No Recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #2

Depth (ft)	Sample Description
1680.0 – 1682.2	LIMESTONE (100%) very pale orange (10YR 8/2 to 10 YR 9/2) massive, dominantly fine to medium rarely coarse grained, very soft, moderately indurated, partly fossiliferous, locally very weakly vuggy, pelloidal packstone with abundant fine to coarse grain sized forams. Trace forams to 8mm and yellowish gray (5Y 8/1) cryptocrystalline, moderately soft carbonate mudstone inclusions at 1681.8
1682.2 – 1682.5	LIMESTONE (100%) light brownish gray (5YR 7/1) to medium light gray (N6) to medium dark gray (N4), massive cryptocrystalline, hard, weakly vuggy, very well indurated carbonate mudstone. Sharp wavy lower contact.
1682.5 – 1683.3	LIMESTONE (100%) very pale orange (10 YR 8/2) to medium light gray (N6) massive, dominantly fine to rarely medium to coarse grained, moderately hard, fossiliferous locally weakly vuggy packstone with abundant fine to coarse grain sized forams and other fossils. Common molds and casts between 1683.0 and 1683.2. Medium light gray component decreasing with depth.
1683.3 – 1683.6	LIMESTONE (100%) very pale orange (10YR 7/2), massive, dominantly fine to medium grained, moderately hard, locally weakly friable, pelloidal packstone with fine to coarse grain sized forams common.
1683.6 – 1683.8	LIMESTONE (100%) medium gray (N5) to medium light gray (N6) grading with depth to very pale orange (10YR 8/2), massive, fine grained grading with depth to medium to coarse grained, partly pelloidal, indurated packstone. Gradational contact with lower unit.

1683.8 – 1684.0	LIMESTONE (100%) very pale orange (10 YR 9/2) to white (N9) massive, microcrystalline, moderately hard to hard, weakly vuggy carbonate mudstone to locally wackestone
1684.0 – 1695.0	No recovery

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #3

Depth (ft)	Sample Description
1770.0 – 1774.4	LIMESTONE (100%) pale yellowish brown (10YR 7/2) to pale orange (10YR 7/2) massive very fine grained, soft, very well indurated, pelloidal, locally weakly fossiliferous, very weakly vuggy, packstone to wackestone. Trace medium gray (N5) cryptocrystalline, hard carbonate mudstone lenses and inclusions to 2mm thick and trace forams.
1774.4 – 1775.5	LIMESTONE (100%) pale orange (10YR 7/2) grading with depth to yellowish brown (10YR 5/2) weakly bedded, dominantly medium grained, hard, pelloidal packstone to locally wackestone interbedded with thin wavy medium gray (N5) laminations grading with depth to dark gray (N3) packstone to wackestone. Vuggy 10mm to 20mm beds between 1775.3 and 1775.4. Gradational lower contact.
1775.5 – 1777.9	LIMESTONE (100%) pale yellowish brown (10YR 7/2) massive, very fine grained, soft pelloidal, very well indurated packstone to locally wackestone.
177.9 – 1778.2	LIMESTONE (100%) pale yellowish brown (10YR 6/2) grading with depth to yellowish brown (10 YR 5/2) generally massive to weekly bedded, dominantly fine to medium, rarely coarse grained, moderately hard, partly pelloidal packstone.
1778.2 – 1785.0	No recovery

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #4

Depth (ft)	Sample Description
1990.0 – 1990.5	LIMESTONE (100%) yellowish gray (5Y 9/1) massive, microcrystalline to fine grained, moderately soft to moderately hard, locally weakly vuggy, partially pelloidal packstone/wackestone to locally carbonate mudstone. Few to common fine to medium grain sized forams.
1990.5– 1993.1	LIMESTONE (100%) very pale orange (10YR 8/2) generally massive to locally very weakly bedded, dominantly very fine grained to medium grained, hard, partially pelloidal, rarely locally weakly vuggy wackestone to locally packstone. Few to common to abundant fine to medium grain sized forams. Trace to few veins to 3 mm filled with yellowish gray (5Y 9/1) microcrystalline to cryptocrystalline, very hard carbonate mudstone between 1991.3 and 1991.4.
1993.1 – 1993.5	LIMESTONE (100%) yellowish gray (5Y 9/1) fine grained, hard, wackestone grading with depth to cryptocrystalline, very hard, very vuggy carbonate mudstone. Indistinct contact between wackestone and carbonate mudstone at approximately 1993.2.
1993.5 – 2004.0	No recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #5

Depth (ft)	**Sample Description**
2050.0 – 2051.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, dominantly fine to medium grained, soft, well indurated, pelloidal, fossiliferous, locally sparry packstone with abundant fine to medium grain sized forams. Trace shell fragments.
2051.0 – 2051.2	LIMESTONE (100%) medium light gray (N6) to medium gray (N5), massive, microcrystalline to fine grained, moderately hard to hard, pelloidal, weakly fossiliferous, packstone with forams common. Common coarse grain sized yellowish gray (5Y 8/1), microcrystalline to cryptocrystalline carbonate mudstone to wackestone clasts and medium dark gray (N4), cryptocrystalline carbonate mudstone inclusions.
2051.2 – 2054.0	LIMESTONE (100%) yellowish gray (5Y 8/1), massive, dominantly fine to medium grained, moderately soft to moderately hard, well indurated, pelloidal, fossiliferous packstone with abundant fine to medium grain sized forams. Trace shell fragments. Sharp horizontal lower contact.
2054.0 – 2054.5	LIMESTONE (100%) very light gray (N8) to yellowish gray (5Y 8/1), massive, microcrystalline to very fine grained, moderately hard to hard, pelloidal, weakly fossiliferous, moderately vuggy packstone to wackestone. Trace very light gray (N8), microcrystalline carbonate mudstone inclusions and shell molds. Medium gray (N5), microcrystalline carbonate mudstone lenses to 5mm thick at 2054.3.
2054.5 – 2054.9	LIMESTONE (100%) massive, 50% yellowish gray (5Y 8/1), cryptocrystalline, hard, moderately vuggy carbonate mudstone with 50% light gray (5YR 6/1), microcrystalline to cryptocrystalline, moderately hard, weakly vuggy to vuggy carbonate mudstone to wackestone.

2054.9 – 2055.1	LIMESTONE (100%) massive 60% very light gray (N8) microcrystalline to very fine grained, hard carbonate mudstone with 40% light gray (N7) cryptocrystalline, hard angular carbonate mudstone inclusions to 25mm in diameter.
2055.1 – 2063.5	No Recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #6

Depth (ft)	Sample Description
2065.0 – 2065.5	No Recovery
2065.5 – 2066.2	LIMESTONE (100%) yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) massive, dominantly fine to medium grained, moderately soft pelloidal, weakly fossiliferous packstone with abundant medium grain sized forams. Indistinct lower contact.
2066.2 – 2066.5	DOLOMITE AND LIMESTONE olive gray (5Y 4/2), cryptocrystalline, very hard, weakly to moderately vuggy with yellowish gray (5Y 8/1) 2 mm to 5 mm diameter Dolomite inclusions and yellowish gray (5Y 8/1), cryptocrystalline, very hard, locally weakly vuggy 10 mm thick Limestone laminations intercalated into the Dolomite bedding. Few medium gray (N5) thin Limy Dolomite laminations at base of unit. Gradational lower contact.
2066.5 – 2068.4	LIMESTONE (100%) very pale orange (10YR 8/2) massive, very fine to medium grained, soft to moderately soft very well indurated pelloidal packstone. Gradational lower contact.
2068.4 – 2068.6	DOLOMITE (100%) grayish orange (10YR 7/4), cryptocrystalline, moderately hard to hard, weakly to moderately vuggy, sucrosic with sharp wavy lower contact.
2068.6 – 2069.7	DOLOMITE (100%) pale yellowish brown (10YR 6/2), generally massive, cryptocrystalline, very hard, locally weakly vuggy, locally weakly sucrosic with yellowish gray (5Y 8/1) Dolomite bedding 15 mm to 30 mm thick at 2068.7 and inclusions at 2068.9. Prominent brownish gray (5YR 4/1)

	mottles common from 2069.2 to 2069.7. Closed local vertical fracture 50mm in length at 2068.7. Sharp wavy lower contact.
2069.7 – 2070.0	DOLOMITE (100%) yellowish gray (10YR 7/2) massive, microcrystalline to cryptocrystalline, very hard, weakly vuggy to locally vuggy with sucrosic texture. Indistinct lower contact.
2070.0 – 2072.1	DOLOMITE (100%) pale yellowish brown (10YR 6/2) to locally olive gray (5Y 3/2) massive, cryptocrystalline, very hard, locally weakly vuggy with sucrosic texture. Indistinct lower contact.
2072.1 – 2074.0	DOLOMITE (100%) 50% to 60% pale orange (10YR 7/2) cryptocrystalline, very hard, locally sucrosic and vuggy. 50% to 40% Dark gray (N3) to locally medium light gray (N6) cryptocrystalline, very hard, vuggy to locally highly vuggy. Trace to few medium light gray (N6) Dolomitic Limestone inclusions. Thin 2 mm to 3 mm yellowish gray (5Y 8/1) dolomitic limestone laminations and inclusions at 2072.5. Gradational lower contact.
2074.0 – 2074.4	DOLOMITE (100%) Light olive gray (5Y 5/7) with prominent dark gray (N3) mottles common, massive, dominantly cryptocrystalline to microcrystalline, very hard, locally weakly vuggy.
2074.4 – 2077.0	No Recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #7

Depth (ft)	Sample Description
2078.0 – 2078.7	DOLOMITE (100%) pale yellowish brown (10YR 6/2 to dark yellowish brown (10YR 4/2) massive, cryptocrystalline, very hard, moderately vuggy, slightly sucrosic. Sharp horizontal lower contact.
2078.7 – 2078.8	DOLOMITE (100%) yellowish gray (5Y 8/1) to very pale orange (10YR 8/2) cryptocrystalline, very hard, very well indurated, with few medium dark gray (N4) lenses up to 2 mm. Sharp horizontal lower contact.
2078.8 – 2079.9	DOLOMITE (100%) olive gray (5Y 4/1) to dark yellowish brown (10YR 4/2) massive, cryptocrystalline, very hard, locally sucrosic texture, moderately vuggy with some 10 mm to 15 mm vugs. Indistinct lower contact
2080.0 – 2080.5	DOLOMITE (100%) moderate yellowish brown (10YR 5/4) to locally dark yellowish brown (10YR 4/2) massive, cryptocrystalline, very hard, weakly to moderately vuggy. Sharp horizontal lower contact.
2080.5 – 2080.7	DOLOMITE (100%) pale yellowish brown (10YR 6/2) massive, cryptocrystalline to fine grained, very hard, vuggy.
2080.7 – 2081.5	DOLOMITE (100%) olive gray (5Y 4/1) to locally pale orange (10YR 7/2) massive, cryptocrystalline, very hard, locally weakly vuggy. Sharp horizontal lower contact.
2081.5 – 2082.4	DOLOMITE (100%) medium gray (N5) to medium light gray (N6) massive, cryptocrystalline, very hard, locally very weakly vuggy with vugs decreasing with depth. Grayish orange (10YR 7/4) cryptocrystalline,

	very hard vuggy 5mm thick lens at 2082.1. Sharp horizontal lower contact.
2082.4 – 2082.5	CLAY (100%) dark gray (N3) to medium dark gray (N4), slightly silty, firm, moderately plastic, very well indurated non-calcareous. Sharp horizontal lower contact.
2082.5 – 2082.8	DOLOMITE BRECCIA (100%) yellowish gray (5Y 7/2) cryptocrystalline, very hard generally subangular to subrounded clasts from 5mm to approximately 30 mm in diameter with light olive gray (5Y 6/1) very firm non-calcareous clay matrix. Indistinct lower contact.
2082.8 – 2084.2	DOLOMITE (100%) yellowish brown (10YR 6/2) massive, cryptocrystalline, very hard, very weakly vuggy with very pale orange (10YR 8/2), cryptocrystalline, very hard inclusions at 2083.2. Sharp horizontal lower contact.
2084.2 – 2084.8	DOLOMITE (100%) pale yellowish brown (10YR 6/2) to moderately yellowish brown (10YR 5/4) to locally dark yellowish brown (10YR 4/2) massive, cryptocrystalline, very hard, and weakly vuggy. Gradational lower contact.
2084.8 – 2085.9	DOLOMITE (100%) pale yellowish brown (10YR 6/2 to 10YR 7/2) massive, cryptocrystalline, very hard, very weakly vuggy to well indurated. Sharp horizontal lower contact.
2085.9 – 2088.0	DOLOMITE (100%) grayish orange (10YR 7/4) grading with depth to pale yellowish brown (10YR 6/2) massive, cryptocrystalline, very hard, moderately vuggy to 2086.3 grading with depth to very well indurated. Trace dusky yellowish brown (10YR 2/2) Dolomite inclusions and 1 mm to 2 mm laminations at 2087.0.
2088.0 – 2091.0	No Recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #8

Depth (ft)	**Sample Description**
2098.0 – 2102.5	LIMESTONE (100%) grayish orange (10YR 7/4 to 10YR 8/4)) massive, dominantly fine grained, moderately soft to moderately hard, very well indurated, pelloidal, partially fossiliferous packstone with fine to medium grain sized forams common. Trace coarse grain sized forams and sparry shell fragments. Trace burrows partially healed with sparry calcite at 2099.3, and 2101.0. Few pale yellowish brown (10YR 6/2 to 10YR 7/2), microcrystalline, hard carbonate mudstone inclusions to 3mm at 2101.9, and 2103.0.
2102.5 – 2113.0	No recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #9

Depth (ft)	Sample Description
2175.0 – 2181.0	LIMESTONE (100%) yellowish gray (5Y 8/1) massive, dominantly fine to medium grained, moderately soft to moderately hard, well indurated, pelloidal wackestone to packstone with rare grainstone lenses. Trace shell molds and fossil casts at 2175.5 and 2179. Trace thin microcrystalline carbonate mudstone lenses throughout section. Common fine to medium, rarely coarse grain sized forams throughout section. Trace shell molds and casts at 2178.8.
2181.0 – 2189.0	No recovery.

End of Core

CITY OF HOLLYWOOD EFFLUENT DISPOSAL SYSTEM

SOUTHERN REGIONAL WWTP INJECTION WELLS

GEOLOGIC LOG

WELL IW - 2

CORE #10

Depth (ft)	Sample Description
2420.0 – 2424.3	LIMESTONE (100%) very pale orange (10YR 8/2) massive, dominantly fine to locally medium grained, moderately hard, pelloidal, fossiliferous, and very well indurated packstone locally grainstone. Medium to pebble grain sized forams and sparry shell fragments common to locally abundant. Trace burrows partially healed with sparry calcite and fossil casts. Pale yellowish brown (10YR 7/2), microcrystalline, hard carbonate mudstone pebble grain sized inclusions at 2420.2, 2421.0, and 2421.5.
2424.3 – 2426.1	LIMESTONE (100%) very pale orange (10YR 8/2) massive, dominantly very fine to locally fine to medium grained, moderately hard, pelloidal, well indurated packstone. Medium to pebble grain sized forams and sparry shell fragments common to locally abundant. Trace burrows, fossil molds and casts. Pebble grain sized, very pale orange (10YR 8/2) to pale yellowish brown (10YR 6/2), microcrystalline, hard carbonate mudstone inclusions at 2424.7, and 2425.3.
2426.1 – 2428.0	LIMESTONE (100%) very pale orange (10YR 8/2) massive, dominantly very fine, locally fine to medium grained, moderately soft to moderately hard, partially pelloidal, well indurated packstone to rarely grainstone. Few coarse to pebble grain sized forams. Trace shell fragments.
2428.0 – 2435.0	No Recovery.

End of Core

Injection Well No. 2 (IW-2) – Lithology

Core Analysis

Youngquist Brothers, Inc.

15465 Pine Ridge Road
Myers, Fl 33908

Phone: 941-489-4444
Fax: 941-489-4545

TRANSMITTAL
No. 00144

PROJECT: City of Hollywood

DATE: 08/08/2003

TO:
Hazen & Sawyer
2101 Corporate Blvd., Suite 301
Boca Raton, Florida 33431

REF:
Cores
Ardaman & Associates,Inc
File Number 02-188

ATTN: John Largey

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☐ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	**SENT VIA:**	☐ Returned
☑ Specifications	☐ Attached	☐ Returned for Corrections
☐ Other:	☐ Separate Cover Via:	☐ Due Date:

ITEM	PACKAGE	SUBMITTAL	DRAWING	REV.	ITEM NO.	COPIES	DATE	DESCRIPTION	STATUS
						1	07/07/2003	Laboratories Testing of Rock Core Specimens IW-2	

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

AUG 11 2003

JOB No.

Remarks:

CC:

Signed: Marybeth Rios
Marybeth Rios

Ardaman & Associates, Inc.
Geotechnical, Environmental and
Materials Consultants

June 25, 2003
File Number 02-188

Youngquist Brothers, Inc.
15465 Pine Ridge Road
Fort Myers, Florida 33908

Attention: Mr. Edward McCullers

Subject: Laboratory Testing of Rock Core Specimens from City of Hollywood Southern Regional Waste Water Treatment Plant, Effluent Disposal Well IW-2

Gentlemen:

As requested, permeability, unconfined compression and specific gravity tests have been completed on twenty one rock core samples provided for testing by your firm from city of Hollywood Southern Regional Waste Water Treatment Plant Effluent Disposal Well IW-2. The permeability tests were performed in general accordance with ASTM Standard D 5084 "Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible-Wall Permeameter" using the constant-head method (Method A) and the falling-head with increasing tailwater level method (Method C). The unconfined compression tests were performed in general accordance with ASTM Standard D 2938 "Unconfined Compressive Strength of Intact Rock Core Specimens". Specific gravity was determined in general accordance with ASTM Standard D 854 "Specific Gravity of Soils".

Due to the irregular shape and short length of the core samples, each of the requested tests (i.e., vertical permeability test, horizontal permeability test and unconfined compression test) could not be performed on each sample. Priority was given to obtaining specimens from the samples for vertical and horizontal permeability tests.

Permeability Tests

The permeability test results are presented in Table 1. The vertical permeability tests were performed first on specimens maintained at the as-received diameter and cut to lengths of 5.8 to 10.3 cm. After completing the vertical permeability tests, horizontal permeability test specimens were obtained by coring 3.3 or 5.0 cm diameter cylinders from the vertical specimens. The horizontal specimens were trimmed to lengths of 6.4 to 8.3 cm to provide flat, parallel ends. The final moisture contents of the vertical test specimens were not measured. The dry densities and degrees of saturation of the vertical permeability test specimens, therefore, were estimated using final moisture contents from the corresponding horizontal permeability test specimens.

The vertical permeability test specimens were air-dried, deaired under vacuum, and then saturated with deaired tap water from the bottom upward while still under vacuum. After testing, the vertical specimens were maintained submerged in water until cored for the horizontal specimens and retested for measurement of horizontal hydraulic conductivity. Each specimen was mounted in a triaxial-type permeameter and encased within a latex membrane. The specimens were confined using an average isotropic effective confining stress of 30 lb/in^2 and permeated with deaired tap water under a back-pressure of 70 or 160 lb/in^2. Satisfactory saturation was verified by a B-factor equal to or greater than 95 percent, or a B-factor that remained relatively constant for two consecutive increments of applied cell pressure. The inflow to and outflow from each specimen were monitored with time, and the hydraulic conductivity was calculated for each recorded flow increment. The tests were continued until steady-state flow conditions were obtained, as evidenced by an outflow/inflow ratio between 0.75 and 1.25, and until stable values of hydraulic conductivity were measured.

The final degree of saturation was calculated upon completion of testing using the final dry mass, moisture content and volume, and measured specific gravity. Although some of the calculated final degrees of saturation are low (i.e. less than 95%), the B-factors indicate satisfactory saturation. The calculated final degrees of saturation are potentially affected by occluded voids within the specimens, surface irregularities, and the use of final moisture contents for vertical permeability test specimens from corresponding horizontal permeability test specimens.

Specific Gravity Tests

The specific gravity of each sample was determined on a representative approximately 100 gram specimen ground to pass the U.S. Standard No. 40 sieve. The specific gravity measured on each sample is presented in Table 1.

Total Porosity

The total porosity, n, of each permeability test specimen was calculated using the measured dry density, γ_d, and measured specific gravity, G_s, from the equation: $n = 1 - [\gamma_d/(G_s)(\gamma_w)]$ where γ_w = unit weight of water. The calculated total porosities are presented in Table 1.

Unconfined Compression Tests

An unconfined compression test was performed on one core sample. The test was performed on an air-dried specimen cored to a diameter of 5.0 cm and trimmed to a length of 9.6 cm to provide a length to diameter ratio of approximately 2, and then capped with sulfur capping compound. The specimen was loaded at a constant rate of axial deformation of 0.013 cm/minute. The specimen failed in 15.2 minutes in general accordance with the ASTM Standard D 2938 criteria of between 2 and 15 minutes. The unconfined compressive strength and Young's modulus determined from the test are summarized in Table 2. The stress-strain curve is presented in Figure 1.

If you have any questions about the test results or require additional testing services, please contact us.

Very truly yours,
ARDAMAN & ASSOCIATES, INC.

Shawkat Ali, Ph.D., P.E.
Quality Control Manager

Thomas S. Ingra, P.E.
Laboratory Director
Florida Registration No. 31987

Youngquist Brothers, Inc.
File Number 02-188
June 25, 2003

Table 1

PERMEABILITY TEST RESULTS
CITY OF HOLLYWOOD SOUTHERN REGIONAL WASTE WATER TREATMENT PLANT, EFFLUENT DISPOSAL WELL IW-2

Core No.	Sample No.	Depth Interval (feet)	D-5084 Test Method*	Test Specimen Orientation	G_s	Initial Conditions					$\bar{\sigma}_c$ (lb/in^2)	u_b (lb/in^2)	B Factor (%)	Average Hydraulic Gradient	Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
						Length (cm)	Diameter (cm)	w_c (%)	γ_d (lb/ft^3)	n					w_c (%)	γ_d (lb/ft^3)	S (%)	
3	1	1770.0 - 1770.5	C A	Vertical Horizontal	2.72	7.62 7.79	9.46 5.10	23.0 23.0	103.2 103.2	0.39 0.39	30 30	70 160	56^{**} 69^{**}	18 20	$23.0^{\dagger}$ 23.0	103.2 103.2	97 97	$3.3x10^{-5}$ $4.3x10^{-5}$
	2	1772.3 - 1772.7	C A	Vertical Horizontal	2.71	9.18 8.09	9.74 5.10	24.3 24.3	101.8 101.1	0.40 0.40	30 30	70 160	93^{**} 77^{**}	2 23	$24.3^{\dagger}$ 24.3	101.8 101.1	100 98	$1.9x10^{-4}$ $2.3x10^{-4}$
	3	1773.3 - 1773.8	A A	Vertical Horizontal	2.71	7.08 7.97	9.77 3.27	22.9 22.9	100.5 103.5	0.41 0.39	30 30	160 160	95 80^{**}	17 25	$22.9^{\dagger}$ 22.9	100.5 103.5	91 98	$1.7x10^{-5}$ $2.2x10^{-5}$
	4	1776.3- 1776.6	C C	Vertical Horizontal	2.72	5.79 7.44	9.73 3.26	22.9 22.9	103.3 103.2	0.39 0.39	30 30	70 70	77^{**} 99	2 20	$22.9^{\dagger}$ 22.9	103.3 103.2	97 97	$1.4x10^{-4}$ $1.9x10^{-4}$
4	1	1990.7 - 1991.1	C C	Vertical Horizontal	2.71	8.11 8.13	9.71 5.09	25.8 25.8	97.5 97.7	0.42 0.42	30 30	70 70	100 91^{**}	2 1	$25.8^{\dagger}$ 25.8	97.5 97.7	95 96	$4.3x10^{-4}$ $3.9x10^{-4}$
	2	1991.6 - 1991.9	C A	Vertical Horizontal	2.71	6.37 8.27	9.74 3.25	25.4 25.4	97.5 98.6	0.42 0.42	30 30	70 160	84^{**} 97	2 38	$25.4^{\dagger}$ 25.4	97.5 98.6	94 96	$1.1x10^{-4}$ $3.4x10^{-4}$
5	1	2052.6 - 2053.2	C C	Vertical Horizontal	2.71	9.88 7.98	9.68 5.09	25.0 25.0	99.5 98.8	0.41 0.42	30 30	70 70	69^{**} 85^{**}	1 2	$25.0^{\dagger}$ 25.0	99.5 98.8	97 95	$1.9x10^{-3}$ $2.1x10^{-3}$
	2	2054.1 - 2054.5	C C	Vertical Horizontal	2.72	8.64 8.10	9.99 5.10	21.9 21.9	104.9 104.3	0.38 0.39	30 30	70 70	91^{**} 73^{**}	2 2	$21.9^{\dagger}$ 21.9	104.9 104.3	97 95	$1.5x10^{-4}$ $2.9x10^{-3}$
6	1	2065.5 - 2065.9	C A	Vertical Horizontal	2.72	7.79 7.10	9.92 5.10	18.6 18.6	107.8 108.7	0.36 0.36	30 30	70 160	93^{**} 100	2 20	$18.6^{\dagger}$ 18.6	107.8 108.7	88 90	$5.6x10^{-5}$ $6.9x10^{-5}$
	2	2067.3 - 2067.9	A A	Vertical Horizontal	2.72	9.04 8.15	9.81 5.10	22.0 22.0	106.2 105.4	0.37 0.38	30 30	160 160	96 96	36 21	$22.0^{\dagger}$ 22.0	106.2 105.4	100 98	$5.7x10^{-5}$ $6.5x10^{-5}$
	3	2067.9 - 2068.3	A A	Vertical Horizontal	2.73	9.17 8.06	9.56 5.08	21.9 21.9	106.8 106.0	0.37 0.38	30 30	160 160	96 94^{**}	2 27	$21.9^{\dagger}$ 21.9	106.8 106.0	100 98	$3.5x10^{-6}$ $5.0x10^{-6}$
	4	2068.4- 2069.1	C A	Vertical Horizontal	2.83	9.78 7.27	10.00 5.03	3.1 3.1	160.8 161.1	0.09 0.09	30 30	70 160	77^{**} 82^{**}	19 34	$3.1^{\dagger}$ 3.1	160.8 161.1	90 92	$3.8x10^{-7}$ $3.2x10^{-7}$
	5	2069.1- 2069.6	A A	Vertical Horizontal	2.84	6.70 8.31	9.98 3.27	1.9 1.9	168.3 167.2	0.05 0.06	30 30	160 160	82^{**} 78^{**}	55 56	$1.9^{\dagger}$ 1.9	168.3 167.2	100 88	$2.9x10^{-9}$ $9.3x10^{-9}$

Table 1 (cont'd)

PERMEABILITY TEST RESULTS
CITY OF HOLLYWOOD SOUTHERN REGIONAL WASTE WATER TREATMENT PLANT, EFFLUENT DISPOSAL WELL IW-2

Core No.	Sample No.	Depth Interval (feet)	D-5084 Test Method*	Test Specimen Orientation	G_s	Initial Conditions					$\bar{\sigma}_c$ (lb/in²)	u_b (lb/in²)	B Factor (%)	Average Hydraulic Gradient	Final Conditions			Hydraulic Conductivity k_{20} (cm/sec)
						Length (cm)	Diameter (cm)	w_c (%)	γ_d (lb/ft³)	n					w_c (%)	γ_d (lb/ft³)	S (%)	
7	1	2081.1 - 2081.6	A A	Vertical Horizontal	2.85	8.37 7.33	9.94 5.02	3.5 3.5	159.8 159.8	0.10 0.10	30 30	160 160	92** 95	50 32	3.5 † 3.5	159.8 159.8	88 86	1.8×10^{-9} 2.5×10^{-9}
	2	2081.6 - 2082.1	A A	Vertical Horizontal	2.85	9.57 7.47	10.01 5.03	2.8 2.8	161.7 162.6	0.09 0.09	30 30	160 160	88** 94**	56 72	2.8 † 2.8	161.7 162.6	79 85	1.3×10^{-9} 4.7×10^{-10}
	3	2084.3 - 2085.3	A A	Vertical Horizontal	2.85	10.29 7.68	10.01 5.03	1.4 1.4	163.9 164.2	0.08 0.08	30 30	160 160	97** 75**	56 56	1.4 † 1.4	163.9 164.2	46 47	1.4×10^{-8} 8.7×10^{-9}
	4	2085.3 - 2085.8	A A	Vertical Horizontal	2.83	9.89 7.73	10.04 5.04	1.9 1.9	162.3 163.1	0.08 0.08	30 30	160 160	91** 90**	57 108	1.9 † 1.9	162.3 163.1	63 67	2.5×10^{-8} 1.3×10^{-8}
	5	2087.4 - 2088.0	A A	Vertical Horizontal	2.82	9.58 7.89	9.95 5.03	1.8 1.8	166.3 164.5	0.05 0.07	30 30	160 160	89** 81**	43 107	1.8 † 1.8	166.3 164.5	86 71	9.6×10^{-10} 7.0×10^{-10}
8	1	2100.8-2101.2	C A	Vertical Horizontal	2.71	6.61 8.27	9.66 3.26	17.1 17.1	114.4 112.3	0.32 0.34	30 30	70 160	86** 91**	2 24	17.1 † 17.1	114.4 112.3	97 92	1.0×10^{-4} 1.5×10^{-4}
9	1	2175.9-2176.3	C C	Vertical Horizontal	2.73	8.05 6.35	9.90 5.07	21.0 21.0	106.5 106.8	0.37 0.37	30 30	70 70	98 82**	1 2	21.0 † 21.0	106.5 106.8	96 98	1.3×10^{-3} 2.8×10^{-3}
10	1	2422.4-2422.8	C A	Vertical Horizontal	2.72	9.21 8.12	9.78 5.08	17.1 17.1	115.8 114.5	0.32 0.33	30 30	70 160	95** 98	1 52	17.1 † 17.1	115.8 114.5	100 98	2.0×10^{-4} 2.3×10^{-4}

Where: w_c = Moisture content; γ_d = Dry density; G_s = Specific gravity; n = Total Porosity; $\bar{\sigma}_c$ = Average isotropic effective confining stress; u_b = Back-pressure; and S = Calculated degree of saturation using measured specific gravity.

* Method A=Constant-head test; Method C = Falling-head test with increasing tailwater level.

** B-Factor remained relatively constant for two consecutive increments of applied cell pressure.

† Vertical permeability test specimen was cored upon completion of testing to obtain horizontal permeability test specimen. The final moisture content of the vertical test specimen was not measured, and was assumed to be the same as the horizontal permeability test specimen.

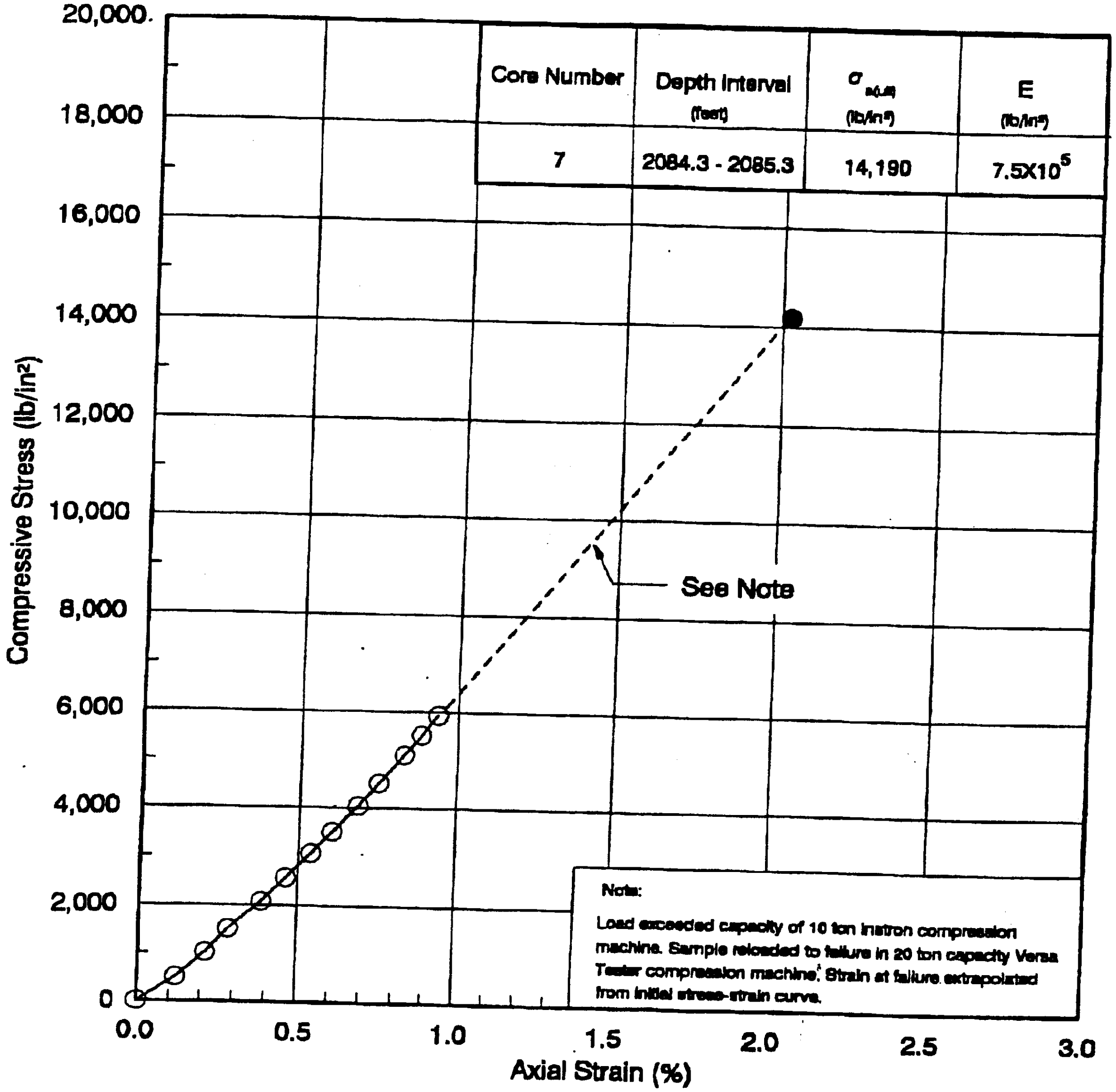
Table 2

UNCONFINED COMPRESSION TEST RESULTS
CITY OF HOLLYWOOD SOUTHERN REGIONAL WASTE WATER TREATMENT PLANT, EFFLUENT DISPOSAL WELL IW-2

Core Number	Depth Interval (ft)	Specimen Dimensions			w_c (%)	γ_d (lb/ft^3)	Loading Rate (cm/min)	t_f (min)	Unconfined Compressive Strength, σ_a(ult) (lb/in^2)	Young's Modulus, E (lb/in^2)*
		Length L (cm)	Diameter D (cm)	L/D						
7	2084.3 - 2085.3	9.60	5.10	1.88	0.9	164.7	0.013	15.2	14,190	7.5×10^5

Where: w_c = Moisture content; γ_d = Dry density; and t_f = Time to failure.

* Young's modulus calculated from slope of the straight-line portion of the stress-strain curve.



Core Number	Depth Interval (feet)	$\sigma_{a(ult)}$ (lb/in²)	E (lb/in²)
7	2084.3 - 2085.3	14,190	$7.5X10^5$

Note:

Load exceeded capacity of 10 ton Instron compression machine. Sample reloaded to failure in 20 ton capacity Versa Tester compression machine. Strain at failure extrapolated from initial stress-strain curve.

UNCONFINED COMPRESSION TEST

Ardaman & Associates, Inc.
Geotechnical, Environmental and Materials Consultants

CITY OF HOLLYWOOD SOUTHERN REGIONAL WWTP
EFFLUENT DISPOSAL WELL IW-2

YOUNGQUIST BROTHERS, INC.

DRAWN BY:	SA	CHECKED BY:	SA	DATE:	08-25-03
FILE NO.: 03-168		APPROVED BY: TM		FIGURE: 1	

Appendix F

Geophysical Logs

Injection Well No. 1 (IW-1) – Geophysical Logs

Geophysical Logs Index

APPENDIX F
GEOPHYSICAL LOGS INDEX

CITY OF HOLLYWOOD
SOUTH COUNTY REGIONAL WWTP

Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
Injection Well 1 (IW-1)			
X–Y Caliper / Gamma Ray	6/20/02	0-200	58.5
Temperature	6/20/02	0-200	58.5
Temperature (Cement Top)	6/20/02	0-200	52" csg
X–Y Caliper / Gamma Ray	7/02/02	200-1000	48.5
Temperature	7/02/02	200-1000	48.5
Temperature (Cement Top)	7/04/02	0-999	42" csg
X–Y Caliper / Gamma Ray	7/14/02	1000-2000	12¼
Dual Induction LL3/SP	7/14/02	1000-2000	12¼
Borehole Televiewer	7/14/02	1000-2000	12¼
Borehole Compensated Sonic / VDL	7/14/02	1000-2000	12¼
Flowmeter	7/14/02	1000-2000	12¼
Fluid Conductivity /Temperature	7/14/02	1000-2000	12¼
Television Survey	7/28–30/02	1050-1985	12¼
X–Y Caliper / Gamma Ray	8/12/02	1000-2000	40.5
Temperature	8/12/02	1000-2000	40.5
Temperature (Cement Top)	8/12-16/02	0-1990	34" csg
X–Y Caliper / Gamma Ray	8/23/02	2000-3000	12¼
Dual Induction LL3/SP	8/23/02	2000-3000	12¼
Borehole Televiewer	8/23/02	2000-3000	12¼
Borehole Compensated Sonic / VDL	8/23/02	2000-3000	12¼
Fluid Conductivity /Temperature	8/23/02	2000-3000	12¼
Flowmeter	8/23/02	2000-3000	12¼
Television Survey	8/26-27/02	2022-2987	12¼
X–Y Caliper / Gamma Ray	9/16/02	2000-2884	32.5
Temperature	9/16/02	2000-2884	32.5
Temperature (Cement Top)	9/18-21/02 & 10/24/02	0-2880	24" csg

Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
X–Y Caliper / Gamma Ray	10/03/02	3000-3500	22.5
Dual Induction LL3/SP	10/03/02	3000-3500	22.5
Borehole Compensated Sonic / VDL	10/03/02	3000-3500	22.5
Fluid Conductivity /Temperature	10/03/02	3000-3500	22.5
Television Survey	10/3/02 & 4/12/03	0–3415	24” csg, Open Hole
Temperature (High Resolution)	01/13/03	0–3500	24” csg, Open Hole
Radioactive Tracer Survey	01/14/03	0–3500	24” csg, Open Hole
Cement Bond Log	04/12/03	0-2880	24” csg

Injection Well No. 2 (IW-2) – Geophysical Logs

Geophysical Logs Index

APPENDIX F
GEOPHYSICAL LOGS INDEX
CITY OF HOLLYWOOD
SOUTH COUNTY REGIONAL WWTP

Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
Injection Well 2 (IW-2)			
X–Y Caliper / Gamma Ray	12/03/02	0-200	58.5
Temperature	12/03/02	0-200	58.5
Temperature (Cement Top)	12/04/02	0-200	50” csg
X–Y Caliper / Gamma Ray	12/14/02	200–1000	48.5
Temperature	12/14/02	200–1000	48.5
Temperature (Cement Top)	12/16/02	0-999	42” csg
X–Y Caliper / Gamma Ray	12/30/02	1000-2000	12¼
Dual Induction LL3/SP	12/30/02	1000-2000	12¼
Borehole Televiewer	12/30/02	1000-2000	12¼
Borehole Compensated Sonic / VDL	12/30/02	1000-2000	12¼
Flowmeter	12/30/02	1000-2000	12¼
Fluid Conductivity /Temperature	12/30/02	1000-2000	12¼
Television Survey	01/09/03	1000-2000	12¼
X–Y Caliper / Gamma Ray	02/03/03	1000-2000	40.5
Temperature	02/03/03	1000-2000	40.5
Temperature (Cement Top)	2/4–7/03	0-1990	34” csg
X–Y Caliper / Gamma Ray	02/18/03	1990-3000	12¼
Dual Induction LL3/SP	02/19/03	1990-3000	12¼
Borehole Televiewer	02/19/03	1990-3000	12¼
Borehole Compensated Sonic / VDL	02/19/03	1990-3000	12¼
Fluid Conductivity /Temperature	02/19/03	1990-3000	12¼
Flowmeter	02/19/03	1990-3000	12¼
Television Survey	02/27–28/03	2000-3000	12¼
X–Y Caliper / Gamma Ray	03/19/03	1990-2885	32.5
Temperature	03/19/03	1990-2885	32.5
Temperature (Cement Top)	3/22–25/03 & 04/16/03	0-2880	24” csg
Cement Bond Log	04/11/03	0-2880	24” csg
X–Y Caliper / Gamma Ray	04/11/03	2880-3500	22.5

Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
Dual Induction LL3/SP	04/11/03	2880-3500	22.5
Borehole Compensated Sonic / VDL	04/11/03	2880-3500	22.5
Fluid Conductivity /Temperature	04/11/03	2880-3500	22.5
Television Survey	05/08/03	0-3500	24 csg, Open Hole
Temperature (High Resolution)	05/08/03	0-3500	24 csg, Open Hole
Radioactive Tracer Survey	05/08/03	0-3500	24 csg, Open Hole

Monitor Well No. 1 (MW-1) – Geophysical Logs

Geophysical Logs Index

APPENDIX F
GEOPHYSICAL LOGS INDEX
CITY OF HOLLYWOOD
SOUTH COUNTY REGIONAL WWTP

Log	Date	Interval (feet bpl)	Borehole Diameter (inches)
Dual-Zone Monitor Well 1 (MW-1)			
X–Y Caliper / Gamma Ray	10/15/02	0-200	32.5
Temperature	10/15/02	0-200	32.5
Temperature (Cement Top)	10/16/02	0-200	24” csg
X–Y Caliper / Gamma Ray	10/31/02	200-1250	22.5
Dual Induction LL3/SP	10/31/02	200-1250	22.5
Borehole Televiewer	10/31/02	200-1250	22.5
Borehole Compensated Sonic / VDL	10/31/02	200-1250	22.5
Temperature	10/31/02	200-1250	22.5
Temperature (Cement Top)	11/02/02 & 11/27/02	0-1250	16” csg
Cement Bond Log	11/05/02	0-1250	16” csg
Television Survey	11/03/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
X–Y Caliper / Gamma Ray	11/05/02 & 11/14/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
Dual Induction LL3/SP	11/05/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
Borehole Televiewer	11/05/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
Borehole Compensated Sonic / VDL	11/05/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
Fluid Conductivity /Temperature	11/05/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
Flowmeter	11/05/02	1250-1800	$14^{3/4}$ & $9^{7/8}$
Cement Bond Log (Background)	11/15/02	0-1750	6⅝” csg
Temperature (Cement Top)	11/16 -18/02	0-1750	6⅝” csg
Cement Bond Log	12/12/02	950-1750	6⅝” csg

Injection Well No. 1 (IW-1)– Geophysical Logging

Flowmeter Analysis

HOLLYWOOD IW-1

Upper Interval
Flow Log Analysis

On July 14, 2002 flow logs were run under static and dynamic conditions to evaluate flow below casing at 999' to the bottom of the hole at 2000'. Water was being pumped out of the well at a dynamic flow rate of approximately 350 GPM.

Figure 1 is the quick look interpretation comparing the static down pass to the dynamic down pass. The line speed plot is shown for quality control. A caliper plot is also shown on this page for comparison.
The quick look flow plot shows both the static and dynamic passes overlapping from the bottom of the hole up to 1090', indicating no flow below this depth. The dynamic curve increases abruptly from 1080-1090' opposite a small fracture shown on the caliper plot.

Figure 2 is the percent flow analysis of the dynamic pass. It reaffirms the quick look presentation. Zero flow is evident below 1090'. A sudden increase in flow occurs from 1080'-1090', briefly bringing the total flow to 100%. Just above 1080' the flow falls off slightly before becoming steady near 1060' and above.

Figure 3 is the dynamic flow analysis presented in gallons per minute. It mirrors the percent flow analysis presentation but displays the flow in terms of the actual flow rate.

All of the flow being developed from this portion of the open hole is being generated from the 1055'-1090' interval.

HOLLYWOOD IW-1

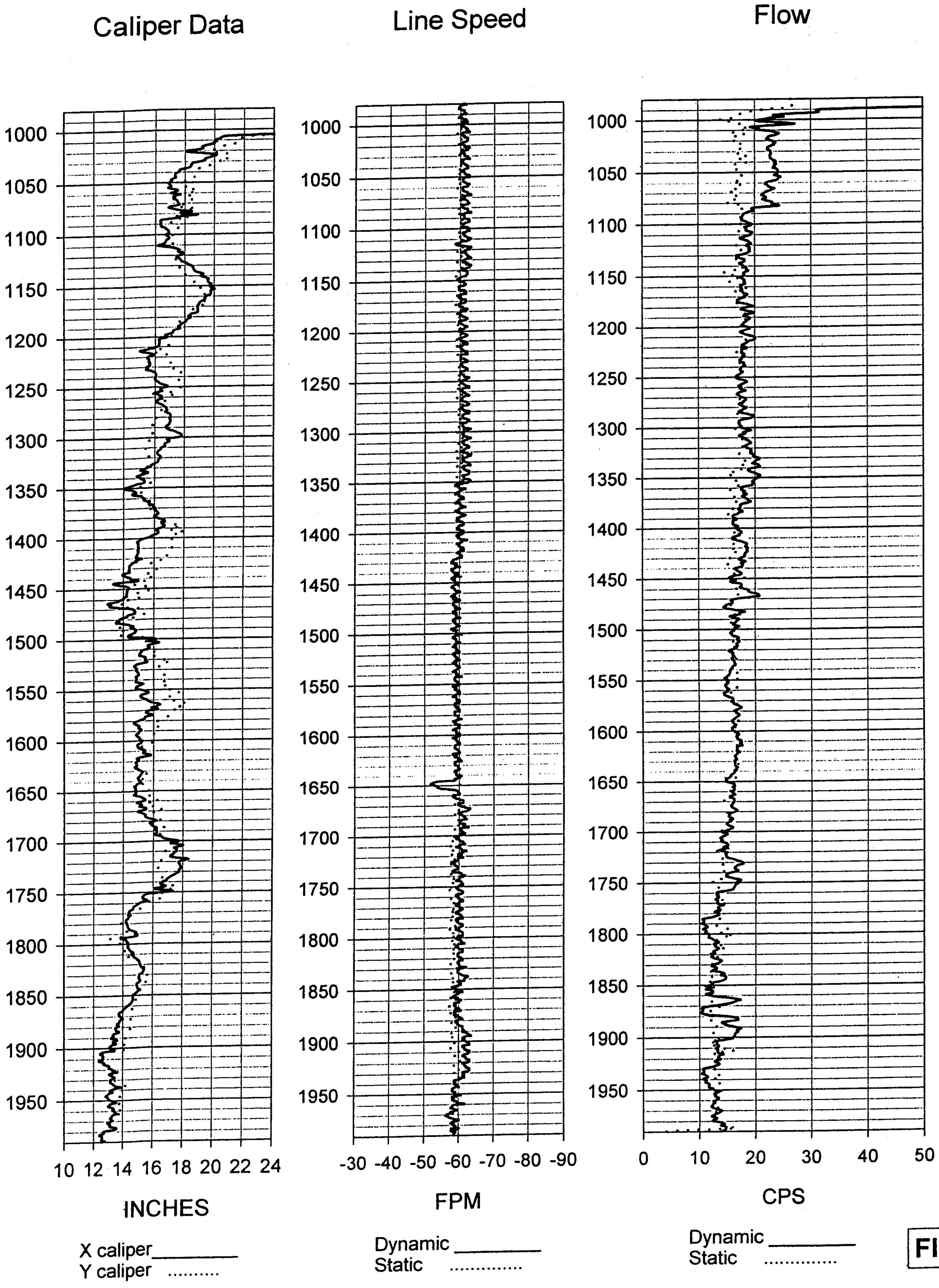


FIG 1

HOLLYWOOD IW-1

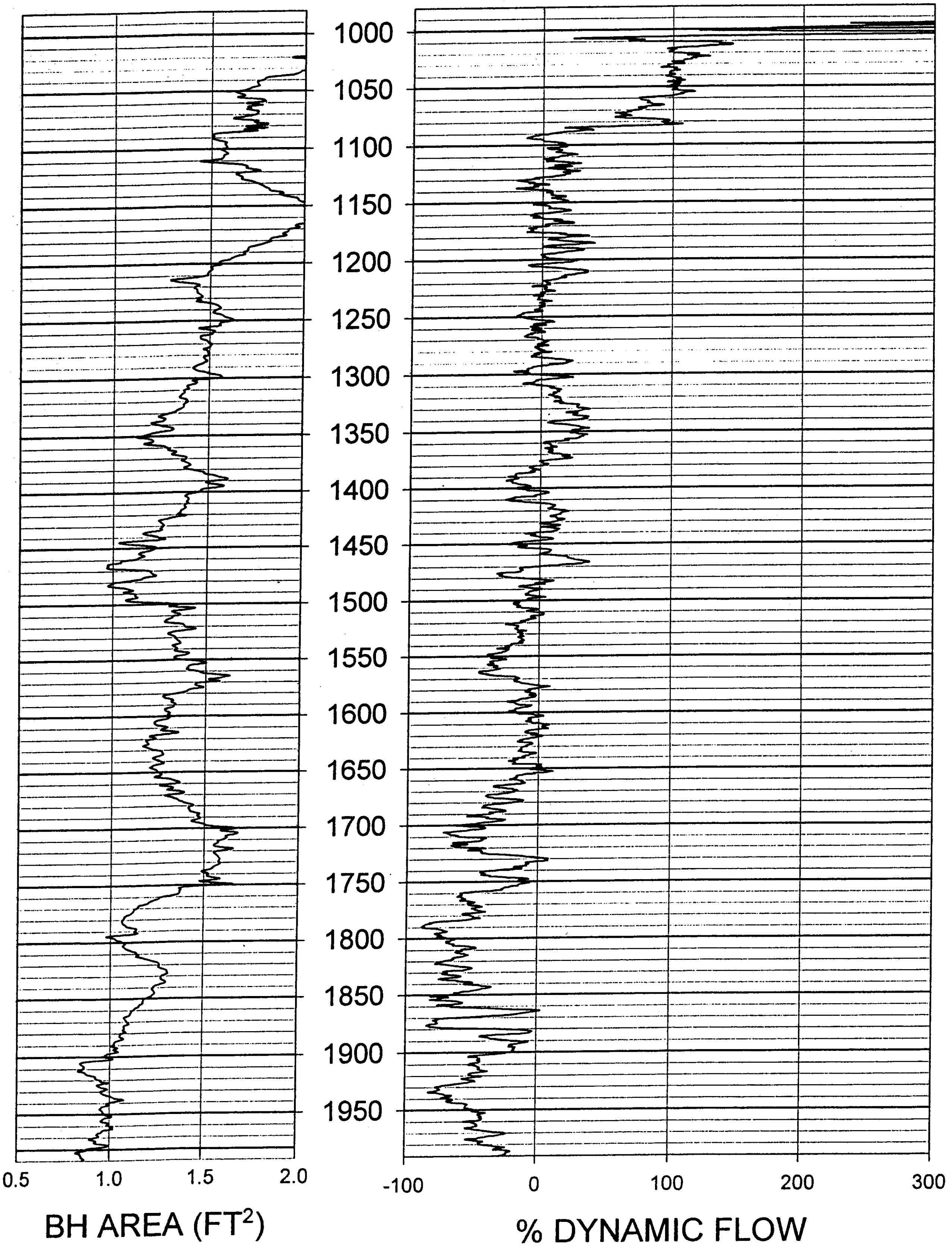


FIG 2

HOLLYWOOD IW-1

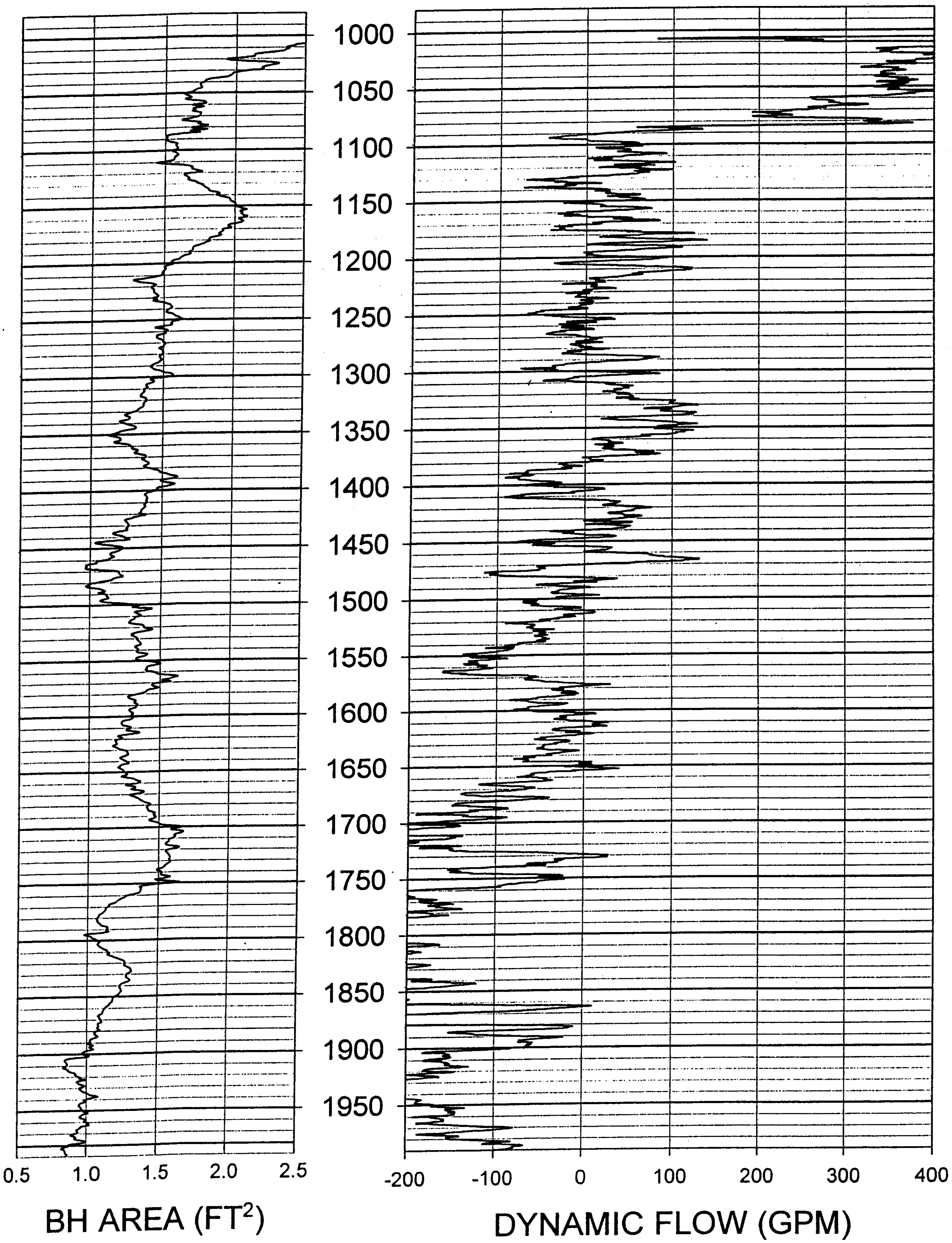
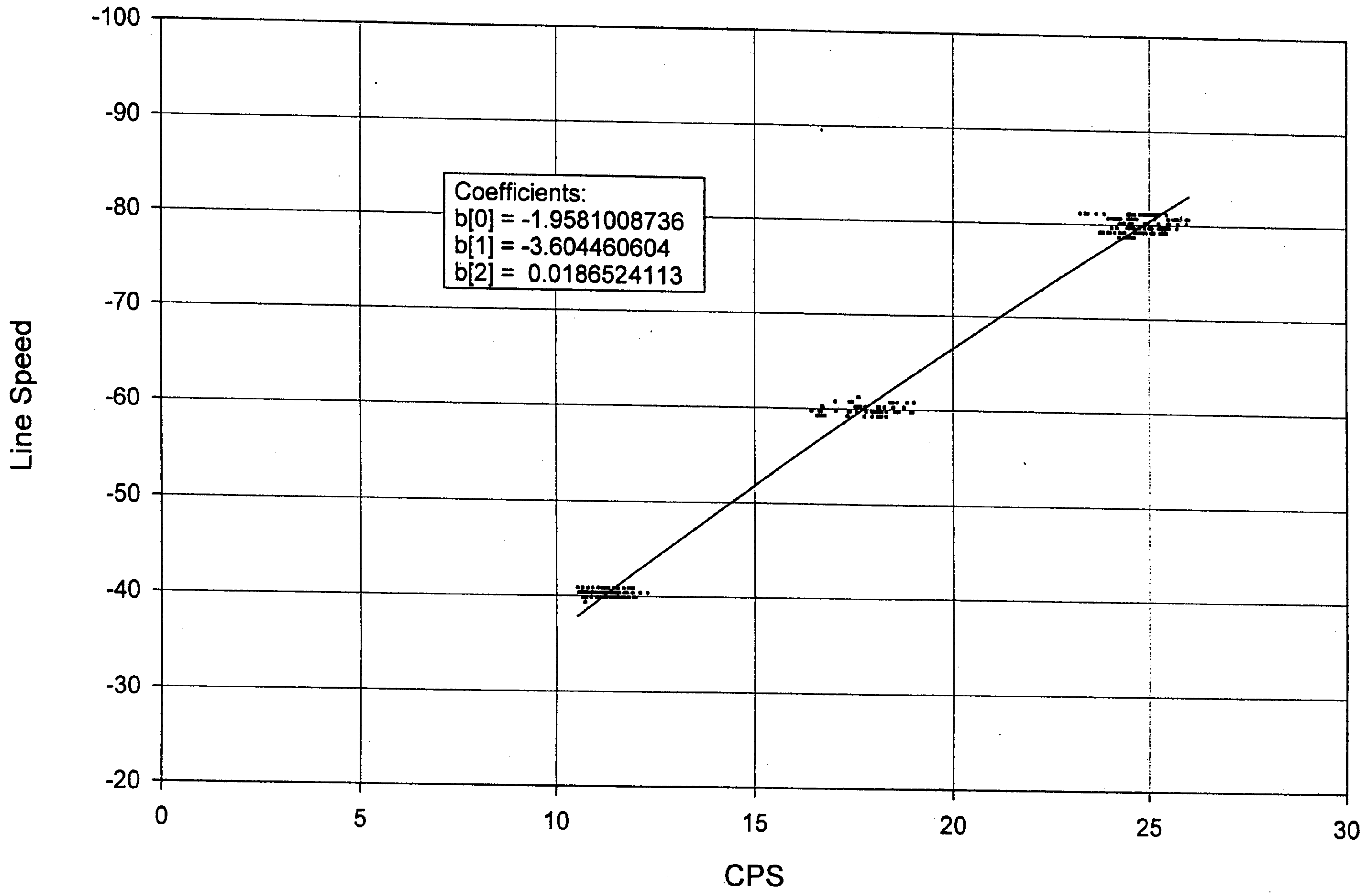


FIG 3

Hollywood IW-1 Run 5 Down Cals



Injection Well No. 2 (IW-1)– Geophysical Logging

Flowmeter Analysis

HOLLYWOOD IW-2
Lower Interval
Flow Log Analysis

On February 19, 2003 flow logs were run under static and dynamic conditions to evaluate flow below the 34-inch casing at 1990' to the bottom of the hole at 3000'. Water was being pumped out of the well at a dynamic flow rate of approximately 450 GPM.

Figure 1 is the quick look interpretation comparing the static down pass to the dynamic down pass. The line speed plot is shown for quality control. A caliper plot is also shown on this page for comparison.
The quick look flow plot shows both the static and dynamic passes overlapping from the bottom of the hole up to 2970', indicating no flow below this depth. The dynamic curve increases abruptly at approximately 2970' opposite a small fracture shown on the caliper plot.

Figure 2 is the percent flow analysis of the dynamic pass. It reaffirms the quick look presentation. Zero flow is evident below 2970'. A sudden increase in flow occurs at that depth which brings the flow to above 100%. Total flow continues to flirt with the 100% range all the way up from this point to inside of casing. Areas that seem to read slightly above and below 100% are being influenced by changes in caliper size that deviate from bit size.

Figure 3 is the dynamic flow analysis presented in gallons per minute. It mirrors the percent flow analysis presentation but displays the flow in terms of the actual flow rate.

HOLLYWOOD IW-2

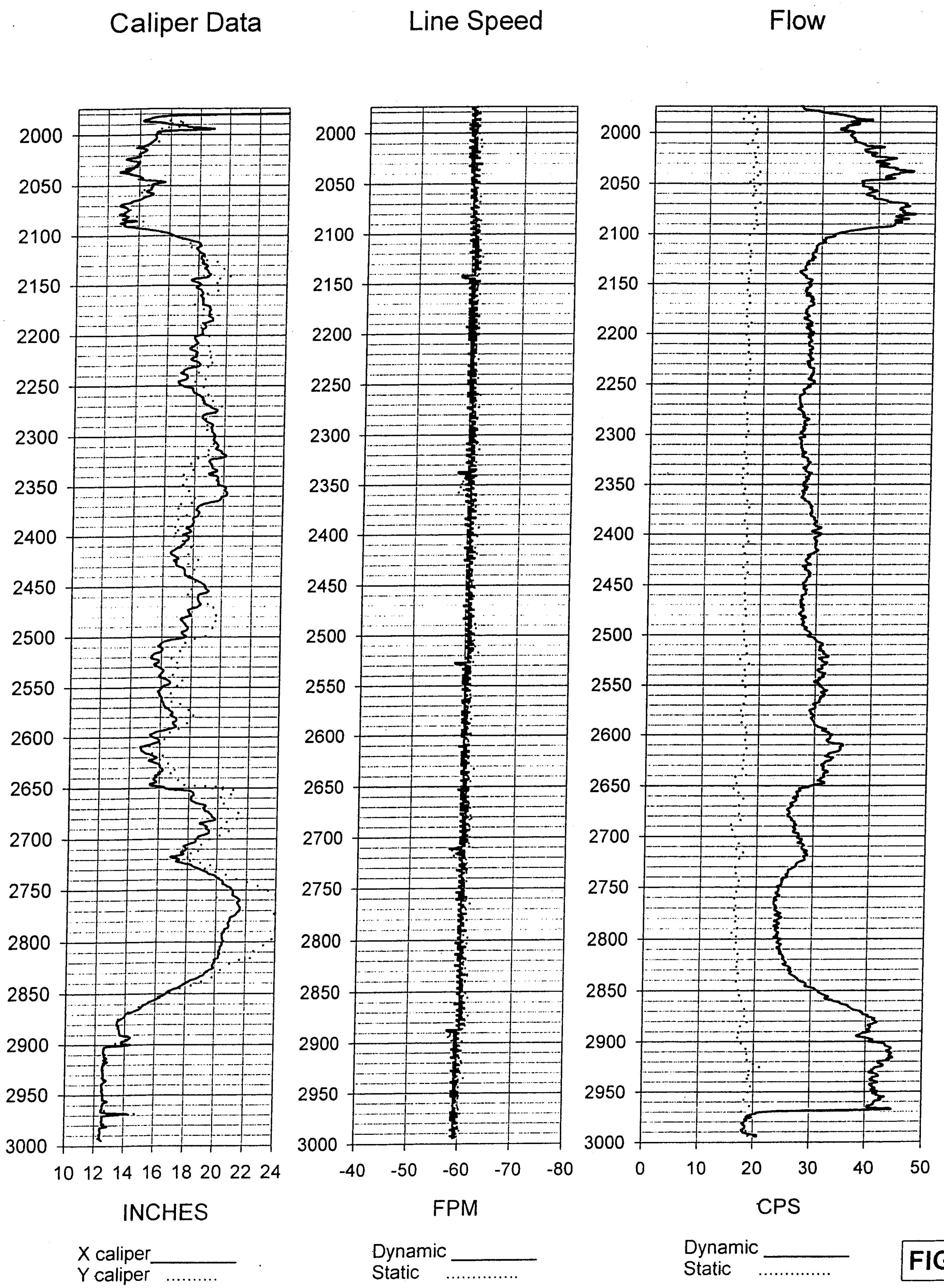
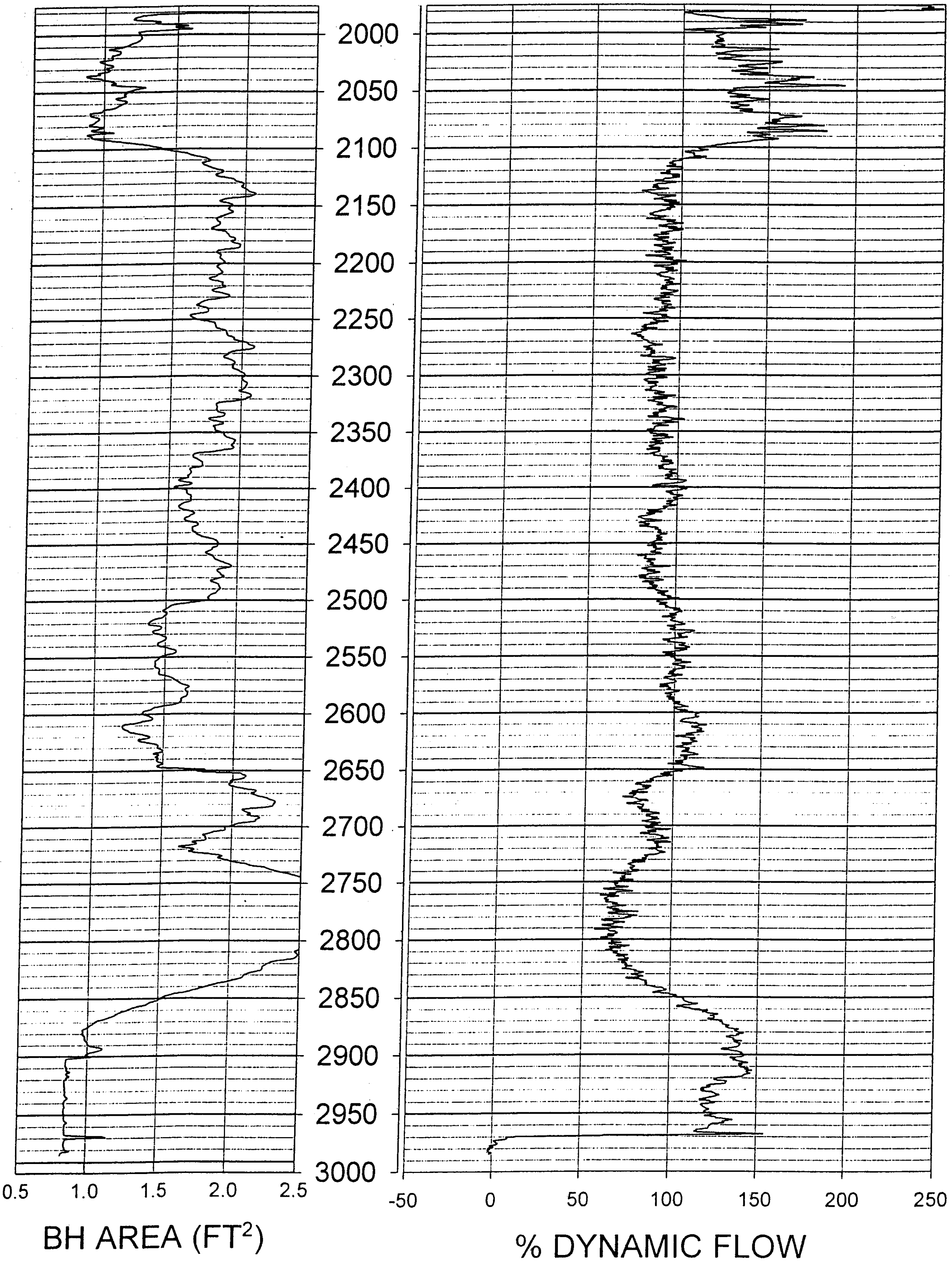


FIG 1

HOLLYWOOD IW-1



HOLLYWOOD IW-2

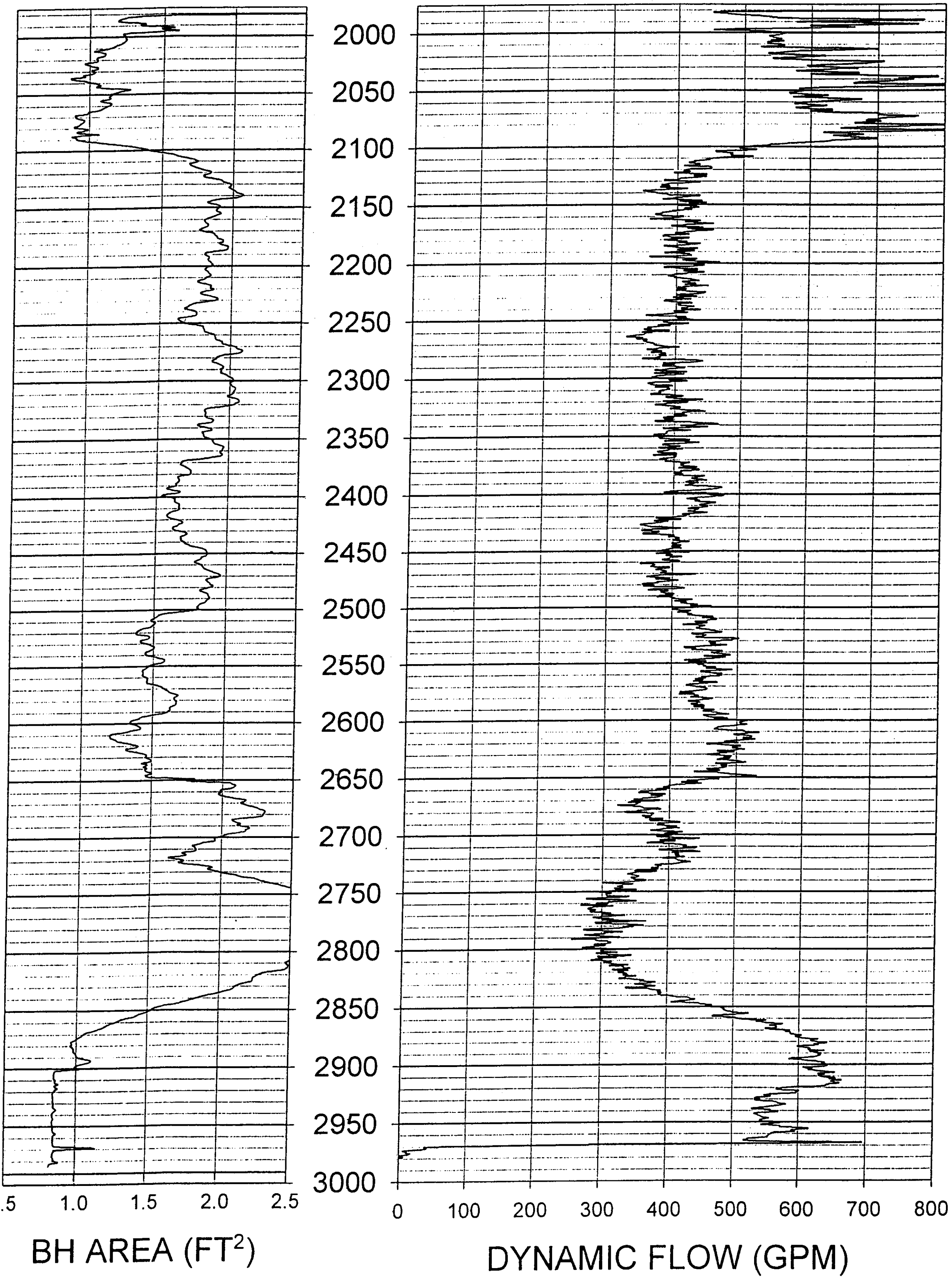
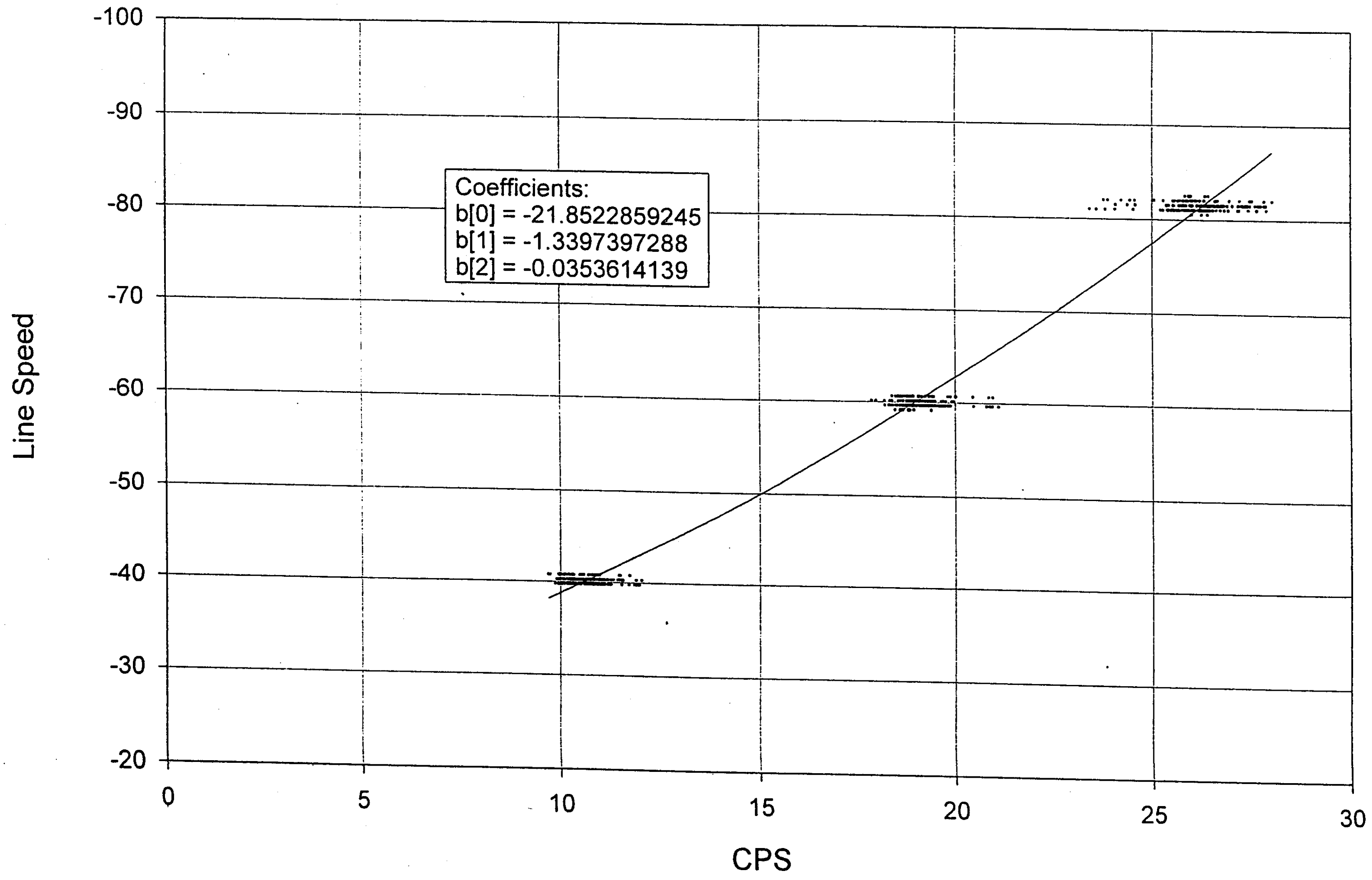


FIG 3

Hollywood IW-2 Run 8 Down Cals



Geophysical Logging

Quality Control and Quality Assurance Procedures

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LOGGING TOOLS

CALIBRATION THEORY
AND PRACTICE

CALIBRATION

Few logging tools give a response immediately useful in formation evaluation. Logging tools generally exert some disturbance on the formation (pass electric current through it, bombard it with sub-atomic particles, etc.). The tools' detectors measure this disturbance after it has passed through the formation. This measurement may be made in counts per second, it is referred to as the raw measurement. Such responses are of limited interest to a geoscientist.

Calibration links this raw measurement to a useful formation property. All calibrations work on the same principle. A tool is placed in environments (usually two) of known physical property and the tool's responses in these environments are measured. An arithmetic relation (usually a straight line) between these points is constructed and used to convert actual measurements to calibrated values. For example, by recording the X-Y Caliper Tool's response (pulses per second, ***raw measurement***) to rings of known size (inches, ***calibrated measurement***); we can derive an equation that will allow measurement of an unknown hole diameter.

The Primary Standard for all logging tools is dependent on the physical property it has been designed to measure. This Primary Standard may be one of the following:

- API standard test pits, such as those found at the University of Houston.
- A test fixture from the tool manufacturer.
- Part of the tool's electronic circuitry.

Each following Tool Section describes the primary standard adopted by Florida Geophysical Logging.

Manufacturing plants and operations bases use Secondary Standards when needed as it is impractical to calibrate, and re-calibrate, each tool in some primary standards such as the Houston API pits. These secondary calibrators are carefully referenced directly to the primary standard.

Some examples of these secondary Standards are :

- The Natural Gamma Ray jig
- The Compensated Neutron water tank
- The Aluminum and Magnesium blocks for density calibrations

CALIBRATION TECHNIQUE

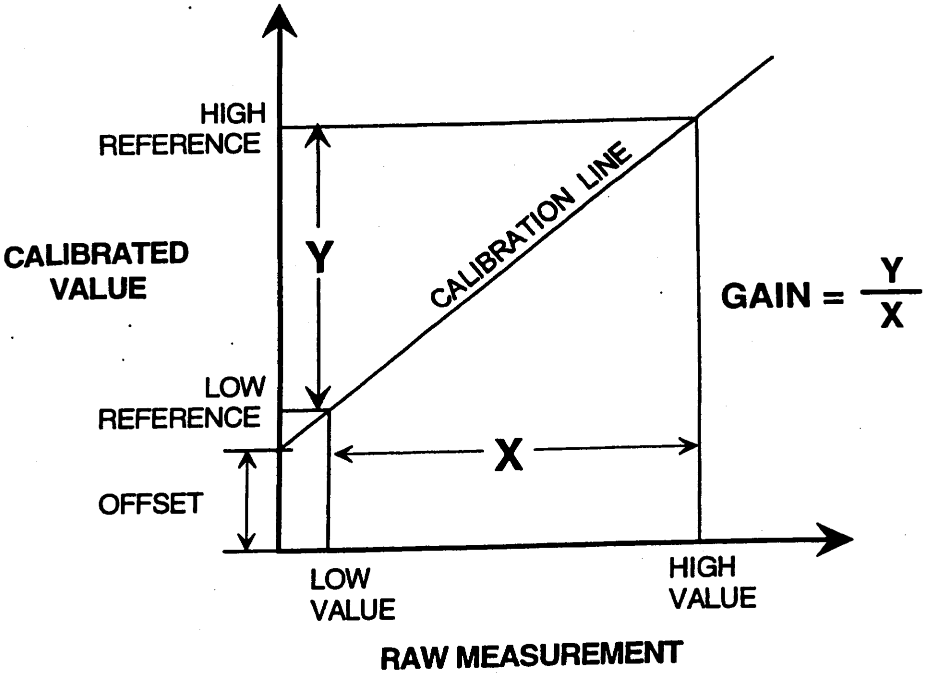
Some tools such as the X-Y Caliper Tool and the Fluid Resistivity Tool use multiple straight line segments to compute calibrated values. These tools use a modified version of the technique described below where a 2 point calibration scheme is described. The Flowmeter Tool is calibrated over 3 points and the data is fit to a quadratic equation.

We express a tool's linear response by:

$$y = mx + b$$

where y = calibrated response of the tool
m = slope or gain of the tool
x = raw value from tool
b = intercept or offset

This linear relationship between raw or measured values and calibrated values is shown
below :



$$Gain = \frac{High\,Cal - Low\,Cal}{High\,Meas - Low\,Meas} \qquad (A)$$

$$Offset\ or\ Intercept = Low\,Cal - (Gain \times Low\,Meas) \qquad (B)$$

VERIFICATION

A verification confirms that the tool response and calibration are still valid. It does not modify the relation between tool response and physical property measurement (i.e., the calibration).

Any verification method has to be fast, accurate, precise and rugged. They are normally done on the catwalk or drill floor, and take rig time.

DUAL INDUCTION TOOL (DIT)

The shop calibration of the Dual Induction Tool (DIT) involves placing the tool in a zero conductivity medium. This is accomplished by elevating the tool on tall wooden stands away from any metal or electrical fields (overhead or underground power lines). The height of the stands depends on ground conductivity which in turn is related to ground moisture content. A distance of 3 meters above the ground will normally remove any ground effect from the measurement. The tool zero conductivity signal is recorded for both deep and medium. Next a calibration loop of known conductivity is placed over the deep and medium sensor. The value of the loop is designed to represent a 500 mmho formation. This provides the “High Cal” value. Field verification is done to verify tool response in between master calibrations.

BOREHOLE COMPENSATED SONIC LOG (BHC)

The primary calibration for the BHC involves centralizing the tool in a section of water-filled steel casing and mechanically adjusting the spacers within the tool until the 4 individual transmitter to receiver pairs read the correct transit time for the 5 foot and 3 foot spacings. This procedure is done when the tool is built or whenever major repairs are performed on the transmitter/receiver section. Normal quality control procedures for all Compensated Sonic Logs requires logging the value of Delta T in the casing either on the way in the hole, or immediately after the logging run. This is an excellent verification that the entire system is functioning properly. Sometimes, this casing check is difficult in pipe that is well bonded. If possible, the logging engineer finds a section of "free pipe" to record the casing check.

X-Y CALIPER TOOL (XYT)

The calibration of this tool is done by opening the caliper arms into two or more rings of known inside diameter, the smaller ring serves as the low calibrate value, the large ring is the high calibrate value. The gain and offset are calculated using the technique presented in the introduction. The size of the caliper rings used in the calibration and verification are selected based on the hole size that is being logged. Several size rings are available.

HIGH RESOLUTION TEMPERATURE TOOL (HRT)

The shop calibration of the HRT uses two water baths of different temperatures. The low temperature bath is chosen to be 32°F because when logging a Deep Injection Well we often see borehole temperature in the 40° range. The high temperature bath is normally between 150°F and 212°F. The gain and offset are calculated using the technique presented in the introduction. All the tools Florida Geophysical Logging uses have fast response RTD sensors. The HRT is an extremely stable tool and requires calibration only after major repairs or component replacement. Because of the linearity of the sensor a single point verification made in the field will instantly tell if the tool is still in calibration and capable of recording accurate temperature. This verification is done in a fluid that has reached temperature equilibrium.

FLUID CONDUCTIVITY TEMPERATURE TOOL (FCT)

The shop calibration of the fluid conductivity measurement involves placing the tool in a series of different salt solutions. The solutions are allowed to reach temperature and salinity equilibrium and are then measured with a precision digital conductivity meter. The tool is placed in each of the solutions and a multi-point calibration is made between tool output in pulses and fluid conductivity. The FCT is an extremely stable tool and requires calibration only after major repairs or component replacement. A single point verification made in the field instantly tells if the tool is in calibration and capable of recording accurate fluid conductivity. This verification is generally done with a water sample obtained from the well.

For calibration of the temperature tool see HRT section.

GAMMA RAY TOOL (GRT)

The primary calibration standard for all gamma ray tools is the API Gamma Ray Test Pit at the University of Houston. The API standard defines the difference between two radioactive formations as 200 Gamma Ray API units. After primary calibration, the tool is removed and moved to a distance away from the pit. A background reading in air is recorded. Next, a small radioactive source is placed at a fixed distance from the detector of the tool. By subtracting the background reading from the response to the radioactive source, a value in API units is assigned to the calibrator or Jig. This Jig is used to calibrate other tools of similar design without taking it to the API test well.

FLOWMETER TOOL (FMT)

Quantitative analysis of flowmeter measurements requires calibration of the probe. Since the probe is a mechanical system utilizing components that are subject to wear (e.g. bearings) it must be calibrated before every use. Calibration is done by moving the tool at a known velocity through a static fluid column and measuring the number of pulses or counts output from the tool. It is important to calibrate the tool in the same diameter hole that the measurements will be made[1]. Two different velocities are required to establish a calibration line. Florida Geophysical Logging uses three principal velocities (50, 70 and 100 fpm) to establish a calibration line. A second order linear fit of the calibration data is performed. By mathematically fitting a curve through the calibration data points it is possible to "back calculate" an unknown velocity if the number of counts are known. The equation is of the form :

$$V_{fm} = b_0 + (b_1 \times counts) + (b_2 \times counts^2) \qquad (3)$$

where b_0 , b_1, and b_2 are the coeficients determined by the linear curve fit routine.

Counts represent the raw signal from the flowmeter tool

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[1] *Application Of The Borehole Flowmeter Method To Measure Spatially Variable Hydraulic Conductivity At The MADE Site - Kenneth R. Rehfeldt, Illinois State Water Survey*

Appendix G

Video Surveys

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

Video Survey

APPENDIX F
VIDEO SURVEYS
CITY OF HOLLYWOOD
SOUTH COUNTY REGIONAL WWTP
INJECTION WELL IW-1

Interval (feet bpl)	Observations Injection Well 1 (IW-1)
1,048–1,073	**Light colored generally massive Limestone:** No fractures or caverns. Generally well indurated, weakly vuggy, finer grained thin bed at 1,054, minor washout at 1,062, lighter colored thin vuggy bed at 1,064.
1,073–1,083	**Light colored Limestone:** No fractures or caverns. Dominantly light gray vuggy mudstone interbedded with light colored limestone as above.
1,083–1,106	**Light colored massive Limestone:** No fractures, vugs or caverns. Generally very well indurated, few dark gray mudstone inclusions at 1,092.
1,106–1,120	**Light colored Limestone:** No fractures, or caverns. Generally well indurated with few mudstone clasts from 1,106 to 1,107, thin gray mudstone bed at 1,107, few mudstone clasts from 1,107 to 1,108, weakly vuggy bed from 1,109 to 1,111.
1,120–1,213	**Light colored generally massive Limestone:** No fractures or caverns. Generally well indurated with few minor washouts. Few gray mudstone clasts from 1,120 to 1,121, thin dark horizontal lamination at 1,125, slightly washed out from 1,152 to 1,153, washouts at 1,175 and 1,182.
1,213–,1349	**Light colored generally massive Limestone:** No fractures or caverns. Generally well to very well indurated. Thin gray wackestone/mudstone bed and lenses at 1,215, dark horizontal mudstone laminations at 1,219 and 1,227, dark gray mudstone lens at 1,231, thin dark gray mudstone beds at 1,255 and 1,256, gray mudstone lens at 1,264. Minor washout at 1,282. Borehole predominantly coated with filter cake from 1,288 to 1,349.
1,349–1,450	**Light colored generally massive Limestone:** No fractures or caverns. Observation partially obscured by filter cake. Dominantly well indurated, thin horizontal gray wackestone bed at 1,349, thin gray vuggy horizontal mudstone bed at 1,366, minor washout at 1,368, light gray very well indurated wackestone/mudstone bed at 1,369, weakly vuggy at 1,425, minor washouts at 1,423 and 1,442.
1,450–1,478	**Light orange colored generally massive Limestone:** No fractures or caverns. Generally well indurated, thin gray horizontal bed at 1,475.
1,478–1,482	**Gray colored massive Limestone:** No fractures, vugs or caverns. Well indurated, weakly vuggy.
,1482–1,487	**Light colored massive Limestone:** No fractures, vuggs or caverns. Well to very well indurated.
1,487–1,496	**Gray to dark gray colored massive Limestone:** No fractures, vugs or caverns. Well indurated, minor washout at 1,491.
1,496–1,504	**Light colored generally massive Limestone:** No fractures, vugs or caverns. Generally well indurated, thin very light colored bed at 1,499.

Interval (feet bpl)	Observations Injection Well 1 (IW-1)
1,504–1,506	**Very light colored massive Limestone:** No fractures, vugs or caverns. Very fine grained, very well indurated.
1,506–1,524	**Light colored massive Limestone:** No fractures, vugs or caverns. Well indurated.
1,524–1,563	**Light colored generally massive Limestone:** No fractures, vugs or caverns. Very well indurated, dominantly light colored interbedded with darker beds and laminations. Few dark horizontal laminations at 1,524, minor washout at 1,542, thin dark beds at 1,530 and 1,547 thin mudstone bed at 1,549.
1,563–1,700	**Light colored Limestone:** No fractures or caverns. Observation partially obscured by filter cake. Generally very well indurated, dominantly light colored interbedded with darker beds and laminations. Thin dark horizontal mudstone beds at 1,569 and 1,569, dark mudstone lenses at 1,581 and 1,583, dark thin laminations at 1,605, weakly vuggy and micritic at 1,612, Thin horizontal mudstone beds at 1,617, dark thin horizontal lamination at 1,619, mudstone clasts common at 1,620 and 1,626, thin dark horizontal lamination at 1,637, few mudstone clasts at 1,655, thin dark mudstone beds at 1,644, 1,661 and 1,664, mudstone lenses at 1,669 and 1,673, gray poorly indurated mudstone bed at 1,678, mudstone lenses at 1,684, mudstone bed from 1,692 to 1,694.
1,700–1,900	**Light colored Limestone:** No fractures or caverns. Generally well to very well indurated, dominantly light colored occasionally interbedded with darker beds and laminations. Thin gray horizontal beds at 1,720 and 1,722, thin gray horizontal rough textured beds at 1,735 and 1,738, few gray clasts at 1,740, gray horizontal laminations at 1,740, gray wavy laminations at 1,745, gray horizontal bed at 1,753, thin gray beds at 1,755 and 1,761, laminated light orange and gray limestone from 1,764 to 1,765, gray mudstone lens at 1,781, gray lamination at 1,784, minor washouts at 1,786 and 1,791, thin coarser grained bed at 1,805, very well indurated below 1,851, few minor to moderate washout from 1,851 to 1,877, darker mudstone lens at 1,882, few mudstone clasts at 1,895, sharp low angle contact at 1,897.
1,900-1,905	**Light colored massive Limestone:** No fractures, vugs or caverns. Well indurated with few minor washouts, gray mudstone lens at 1,902.
1,905–1,907	**Laminated light colored Limestone and dark colored Dolomite:** No fractures, vugs or caverns. Very well indurated with horizontal laminations.
1,907–1,985	**Light colored generally massive Limestone:** No fractures or caverns. Very well to moderately well indurated, minor washouts at 1,911, minor to moderate washouts from 1,913 to 1,923 thin coarser grained bed at 1,933, thin vuggy zone at 1,944, few moderate vugs at 1,951, washouts at 1.976, thin coarser grained bed at 1,983.
1,985–2,022	**No Video**
2,022–2,028	**Light colored generally massive Limestone:** No fractures, vugs or caverns. Well indurated. Thin dark bed at 2,025.
2,028–2,044	**Dark colored massive Dolomite:** Minor cavern at 2,029, light colored very well indurated bed from 2,030 to 2,031, thin washed out bed at 2,032, open vertical fracture from 2,033 to 2,034, closed high angle fracture at 2,035, poorly indurated and partially washed out from 2,035 to 2,039. Moderate to large cavern from 2,036 to 2,038, closed low angle fracture at 2,039, darker colored dominantly weakly vuggy to vuggy from 2,040 to 2,044. Sharp wavy lower contact at 2,044.

Interval (feet bpl)	Observations Injection Well 1 (IW-1)
2,044–2,062	**Light colored generally massive Limestone:** Dominantly very well indurated, thin wavy washed out bed at 2,046, well to moderately indurated at 2,052 and 2,055, minor washout at 2,055. Sharp horizontal lower contact at 2,062.
2,062–2,091	**Dark colored generally massive Dolomite:** Generally very well indurated, minor caverns and fractures at 2,064, 2,070 and 2,076, weakly vuggy to vuggy with minor caverns at 2,076, high angle fracture at 2,077, minor low angle to high angle closed fractures from 2,078 to 2,079, moderate cavern with blue gray clay colored clay at 2,079, weakly vuggy at 2,079 and 2,081, moderate cavern at 2,081 with low angle to high angle moderately open fractures, closed horizontal fractures at 2,082, weakly vuggy with high angle open fractures at 2,083, closed horizontal fracture and minor cavern at 2,084, closed high angle fracture and vuggy at 2,085, minor cavern and occasional large vugs at 2,085, blocky texture at 2,087.
2,091–2,556	**Light colored dominantly massive Limestone:** No fractures or caverns. Dominantly very well to well indurated, dolomitic or micritic from 2,090 to 2,093, faint darker lamination at 2,100, moderately indurated with minor washouts from 2,123, to 2,130, minor washouts at 2,158, dark lens at 2,170, fossil cast at 2,175, minor washout at 2,184, few dark lenses from 2,190 to 2,191, minor washout at 2,195, fossil cast at 2,219, thin dark lamination at 2,278, minor washout at 2,282, few light colored clasts at 2,308, very small very dark lenses at 2,312 and 2,317, thin dark lamination and small dark lenses at 2,324, thin dark lamination at 2,368, shell fragments at 2,373, light colored rounded clasts at 2,377, dark wavy lamination at 2,383, thin darker lens at 2,385, shell fragments at 2,391,thin darker bed at 2,413, molds at 2,444, minor washout at 2,453, small dark lens at 2,458 and 2,496, dark lamination at 2,503, molds at 2,520 and2,521, dark lamination at 2,548.
2,556–2,596	**Light to moderately light colored massive Limestone:** No fractures or caverns. Dominantly very well indurated, dark lenses at 2,556 and 2,560, light gray lenses at 2,565, weakly vuggy at 2,572 and 2,571, minor washouts at 2,572, 2,591 and 2,593.
2596–2607	**Light colored massive Limestone:** No fractures or caverns. Well indurated, locally weakly to moderately vuggy.
2,607–2,616	**Gray to light gray colored Limestone:** No fractures or caverns. Faint bedding features, generally very well indurated with occasional vugs.
2,616–2,633	**Light colored weakly bedded Limestone:** No caverns. Generally very well indurated, minor washout at 2,620, dark gray vuggy bed from 2,624 to 2,625 fully healed horizontal fracture at 2,626.
2,633–2,660	**Light gray and light orange colored interbedded Limestone:** Micritic from 2,632 to 2635, vuggy at 2,638, light gray colored and very well indurated from 2,638 to 2,640, dark to light gray colored, very well indurated to weakly vuggy from 2,640 to 2,641, rough texture at 2,641, light colored and very well indurated from 2,641 to 2,643, gray colored and very well indurated from 2,643 to 2,645, light colored and very well indurated from 2,645 to 2,647, sharp horizontal contact at 2,647, shallow cavern, moderately fractured with blocky texture at 2,648, gray very well indurated mudstone bed at 2,656.

Interval (feet bpl)	Observations Injection Well 1 (IW-1)
2,660-2,871	**Light colored weakly bedded Limestone:** No fractures or caverns. Generally well to very well indurated, thin gray moderately vuggy bed at 2,661, thin gray mudstone bed at 2,668, very light colored thin beds at 2,669 and 2,670 very light colored thin wavy lamination at 2,672, weakly vuggy from 2,672 to 2,673, dark colored lenses at 2,675 and 2,684, very light mudstone or marl lenses at 2,687, mudstone bed at 2,715 weakly vuggy from 2,719 to 2,722, mudstone lenses at 2,727, thin dark colored beds at 2,732, and 2,735 minor washout at 2,736, thin dark bed at 2,737, thin weakly vuggy bed at 2,774, thin coarser grained bed at 2,777, very well indurated at 2,800, thin mudstone bed at 2,805, few dark lenses at 2,807, very well indurated from 2,810 to 2,822, minor washout at 2,863, thin dark vuggy dolomite and dolomitic limestone bed at 2,866, dolomitic limestone at 2,871.
2,871–2,875	**Dark colored massive Dolomite:** Very well indurated, Vuggy with occasional variable fractures and blocky texture, shallow cavern at 2,874.
2,875-2,890	**Light colored Limestone and Dolomite:** No fractures vugs or caverns. Very well to well indurated. Dolomitic limestone from 2,875 to 2,876, thin dolomite bed at 2,877, limestone and dolomite from 2,877 to 2,878, dark colored laminations at 2,880, thin light colored wavy bed at 2,882.
2,890-2,931	**Dark colored Dolomite:** Generally very well indurated to weakly vuggy. Cavernous and highly fractured with blocky texture from 2,892 to 2,898, shallow cavern at 2,900, light colored lens at 2,901, thin breccia beds at 2,904 and 2,905, crystal lined vugs at 2,907, shallow cavern with crystal lined vugs at 2,911, shallow cavern at 2,913, variable angle closed fractures at 2,914, thin washed out limestone bed at 2,920, shallow cavern with closed fractures at 2,921, shallow cavern at 2,925, open vertical fracture and shallow cavern with crystal lined vugs at 2,927.
2,931-2,936	**Light to dark colored Dolomite**: Weakly laminated and vuggy at 2,930 and 2,936.
2,936-2,946	**Moderately light colored Dolomite**: Generally well indurated to weakly vuggy. High angle closed fracture at 2940, pen vertical fracture at 2,942.
2,946-2,948	**Dark colored cavernous Dolomite:** Highly fractured with blocky texture.
2,948-2,955	**Moderately light to moderately dark colored Dolomite:** Generally very well indurated to weakly vuggy with closed fractures common. Moderately closed horizontal fracture at 2,949, closed vertical fracture at 2,949, closed vertical fracture at 2,950, thin breccia bed at 2,953, very well indurated from 2,953 to 2,954 .
2,955-2,967	**Moderately dark colored generally massive Dolomite:** Moderately vuggy to vuggy from 2,954 to 2,959, open high angle to horizontal fractures at 2,960, closed variable angle fractures from 2,960 to 2,962, open horizontal fractures at 2,962, few closed low to high angle from 2,963 to 2,967.
2,967-2,970	**Dark colored cavernous Dolomite:** Highly fractured with blocky texture, moderate caverns from 2,967 to 2,969.
2,970-3,003	**Moderately dark colored Dolomite:** Generally massive to weakly bedded, moderately vuggy to very well indurated. Sharp horizontal contacts at ,2971 and 2,972, crystal lined vugs at 2,972, variable angle closed fractures at 2,974 and ,2978, open horizontal fracture with minor cavern at 2,989, open horizontal fracture at 2,995.

Interval (feet bpl)	Observations Injection Well 1 (IW-1)
3,003-3,011	**Moderately dark colored Dolomite:** Generally massive, dominantly well indurated to weakly vuggy, light colored wavy laminations at 3,010, open high angle fracture at 3,011.
3,011-3,016	**Dark colored cavernous Dolomite:** Highly fractured with blocky texture.
3,016-3,025	**Light colored Dolomite:** Generally massive and vuggy, vuggs commonly lines with crystals. Few closed variable angle fractures. Dark lenses at 3,018.
3,025-3,035	**Light colored massive Dolomite:** Weakly vuggy to very well indurated, fully healed high angle and horizontal fractures at 3,030, closed horizontal fractures at 3,033.
3,035-3,057	**Light colored Dolomite:** Generally massive to locally weakly bedded, closed fractures common, moderately vuggy to well indurated, vuggy from 3035 to 3037, thin dark beds at 3,038 and 3039, few dark laminations at ,3040 moderate angled moderately open fracture at 3,054.
3,057-3,059	**Dark colored Dolomite:** Massive, well indurated to weakly vuggy, closed fractures common.
3,059-3,067	**Dark colored Dolomite:** Generally massive and vuggy, closed fractures common. Highly vuggy at 3,062, wavy laminations at 3,064, open horizontal fracture at 3,065, open moderate angle fracture at 3,066.
3,067-3,095	**Light colored Dolomite:** Generally massive, moderately to highly vuggy. Moderate angle fracture at 3,068, open horizontal fracture at 3085, fully healed high angle fractures at 3,089, closed low angle fracture at 3089, open horizontal fractures at 3,090 and 3,093, closed variable angle fractures from 3,094 to 3,095.
3,095-3,096	**Dark colored cavernous Dolomite:** Highly fractured with blocky texture.
3,096-3,109	**Light to dark colored massive Dolomite:** Moderately to highly vuggy, vugs commonly lined with crystals, variable angle moderately open to closed fractures common.
3,109-3,130	**Dark colored highly cavernous Dolomite:** Highly fractured with blocky texture.
3,130-3,135	**Dark colored Dolomite:** Generally massive, highly vuggy, local blocky texture, variable angle closed fractures common.
3,135-3,144	**Dark colored Dolomite:** Well indurated to vuggy, healed horizontal fracture at 3,137, laminated from 3,140 to 3,141 and from 3,143 to 3,144
3,144-3,200	**Light to dark colored massive Dolomite:** Generally vuggy to highly vuggy, large vugs lined with crystals common. . Shallow cavern at 3,150, wavy laminations at 3,151, open low angle fracture at 3,156, thin clastic bed with dark gray matrix at 3,173, closed high angle fracture at 3,187, dark mottles at 3,188, and 3,191, closed horizontal fracture at 3,195, dark mottles at 3,196.
3,200-3,225	**Moderately dark colored massive Dolomite:** Weakly vuggy to well indurated. Few closed vertical to high angle fractures, vuggy at 3,219, fully healed high angle fracture at 3,221, thin dark wavy bed at 3,225.
3,225-3,230	**Dark colored weakly bedded Dolomite:** Highly vuggy to vuggy. Wavy laminations at 3,226, closed horizontal fracture at 3,227, faint thin darker bed at 3,228.

Interval (feet bpl)	Observations Injection Well 1 (IW-1)
3,230-3,248	**Moderately dark colored Dolomite:** Generally massive, dominantly well indurated to weakly vuggy. Thin dark horizontal bed at 3,232, very well indurated at 3,237, minor cavern at 3,237, fully healed vertical fracture at 3,238, closed low angle fracture at 3,240, closed horizontal fracture at 3,241, closed moderate angle fracture at 3,246.
3,248-3,251	**Moderately dark colored massive Dolomite:** Highly vuggy with large crystal lined vugs.
3,251-3,268	**Light colored generally massive Dolomite:** Moderately vuggy to vuggy, vugs occasionally lined with crystals. Thin dark laminations at 3,255, open horizontal fracture at 3,259, faint thin gray horizontal bed at 3,265.
3,268-3,293	**Dark colored generally massive Dolomite:** Dominantly very well indurated to locally weakly vuggy. Closed vertical fracture at 3,268, thin light beds at 3,270 and 3,274, darker lamination at 3,280, minor cavern at 3,283, vuggy from 3,286 to 3,287.
3,293-3,310	**Light colored generally massive Dolomite:** Dominantly moderately vuggy. Highly vuggy at 3,293, healed high angle fracture at 3,293, open horizontal fracture at 3,298, closed hi angle fracture at 3,300, healed low angle fracture at 3,301, moderate cavern at 3,307, laminations at 3,310.
3,310-3,328	**Moderately dark colored generally massive Dolomite**: Very well to well indurated, closed to moderately open fractures common. Thin light colored wavy lamination at 3,311, open horizontal fracture with minor cavern at 3,318, open vertical fractures from 3,322 to 3,326.
3,328-3,355	**Light colored massive Dolomite with little Limestone:** Highly vuggy to vuggy. High angle moderately open fractures at 3,347, open vertical fractures from 3,351 to 3,353, light Limestone lenses and thin bed at 3,354.
3,335-3,468	**Light colored Dolomite interbedded with dark colored Dolomite:** Vuggy to very well indurated. Dark beds at 3,356 and 3,358, sharp horizontal contact at 3,358, light colored limestone lenses from 3,358 to 3,360, high angle closed fractures at 3,359, very well indurated from 3,363 to 3,365, faint laminations at 3,366, dark laminations at 3,369, dark bed at 3,375, vuggy at 3,375, closed horizontal fracture at 3,375, vuggy at 3,375, closed horizontal at 3378, wavy contact at 3380, dark laminations at 3382, moderately vuggy with crystal lined vugs at 3,388, 3,391, 3,393 and 3,396, sharp horizontal contact at 3,409, blocky texture at 3,410. Light colored limestone lens at 3,411, weakly to moderately vuggy from 3,411 to 3,418, closed horizontal fracture at 3,418, dark colored laminations at 3,419 and from 3,423 to 3,424, wavy contact at 3,424, highly fractured with blocky texture at 3,433, closed variable angle fractures from 3,433 to 3,436, minor cavern at 3,441, closed fractures common from 3,445 to 3,450, hi angle moderately open fracture at 3,456, sharp horizontal contact at 3,456, open variable angle fractures from 3,458 to 3,460 and at 3,462, closed high to low angle fractures from 3,463 to 3,464, open fracture at 3,467.
3,468-3,492	**Light colored massive Dolomite:** Very well indurated to locally vuggy with vugs lined with crystals. Occasional closed vertical fractures from 3,490 to 3,491.
3,492-3,500	**Dark colored massive Dolomite:** Highly vuggy to vuggy, vugs commonly lines with crystals with occasional gray lenses.

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

Video Survey

APPENDIX F
VIDEO SURVEYS
CITY OF HOLLYWOOD
SOUTH COUNTY REGIONAL WWTP
INJECTION WELL IW-2

Interval (feet bpl)	Observations Injection Well 2 (IW-2)
1,018–1,072	**Light colored generally massive Limestone:** No fractures vugs or caverns. Generally well to very well indurated. Thin light colored bed at 1,028, thin light lamination at 1,038, minor washouts at 1,045 and 1,049, coarser grained beds at 1,050 and 1,061, rougher texture at 1,069, wavy contacts at 1,117 and 1,121, trace gray mudstone clasts at 1,123, few faint laminations from 1,123 to 1,124, trace mudstone clasts at 1,125 and 1,126
1,072–1,080	**Light colored Limestone:** No fractures or caverns. Dominantly light gray massive, vuggy mudstone interbedded with light colored very well indurated limestone as above from 1,076 to 1,078. Sharp horizontal contact at 1,078.
1,080–1,106	**Light colored generally massive Limestone:** No fractures or caverns. Generally very well indurated, minor washout at 1,082, thin weakly vuggy bed at 1,090, faint wavy laminations at 1,097, weakly vuggy at 1,101, minor washout at 1,103.
1,106–1,115	**Light colored generally massive Limestone:** No fractures, or caverns. Generally well indurated to locally weakly vuggy with few minor washouts. Thin light colored bed at 1,111.
1,115–1,217	**Light colored generally massive Limestone:** No fractures or caverns, locally weakly bedded. Generally very well indurated. Wavy contacts at 1,117 and 1,121, minor washouts at 1,123, gray mudstone clast at 1,123, few faint laminations from 1,123 to 1,124, trace gray mudstone clasts at 1,125 and 1,126, weakly vuggy and washed out at 1,150, thin vuggy bed at 1,165, minor washout at 1,172, faint wavy lamination at 1,187, vuggy with minor washout at 1,194, faint laminations at 1,199, washout at 1,201, thin light colored horizontal bed at 1,209, weakly vuggy with minor washout at 1,212, minor washout at 1,217.
1,217–1,365	**Light colored Limestone:** No fractures or caverns, massive to weakly bedded. Generally well to very well indurated. Observations partially obscured by filter cake. Thin light colored bed at 1,223, vuggy bed at 1,228, weakly vuggy to vuggy mudstone/wackestone from 1,252 to 1,254, low angle dark brown wavy laminations at 1,270, gray weakly vuggy mudstone bed at 1,273, faint laminations at 1,287, washout at 1,332, thin dark colored wavy laminations at 1,333, weakly laminated at 1,335, gray lenses at 1,346, light gray vuggy mudstone bed at 1,348, gray vuggy mudstone lens at 1,363.
1,365–1,421	**Light colored generally massive Limestone:** No fractures vugs, or caverns, locally weakly bedded. Dominantly well indurated, observation partially obscured by filter cake. Gray lenses at 1,375, minor washouts at 1,380 and 1,387, thin gray mudstone beds at 1,390 and 1,410, weakly washed out bed from 1,419 to 1,421.
1,421-1,423	**Gray colored massive Limestone:** No caverns, generally vuggy to well indurated.
1,423-1,438	**Light colored generally massive Limestone** No caverns, generally well indurated. Thin washed out bed at 1,424, closed horizontal fracture at 1,425, thin gray weakly vuggy mudstone bed at 1,429, thin gray well indurated mudstone bed at 1,432, gray mudstone lenses at 1,435.

Interval (feet bpl)	Observations Injection Well 2 (IW-2)
1,438-1,441	**Gray colored massive Limestone:** No fractures or caverns. Locally vuggy with locally blocky texture.
1,441–1,460	**Light colored generally massive Limestone:** No fractures or caverns. Generally well indurated, observations partially obscured by filter cake. Thin light colored very well indurated bed at 1,451, thin gray vuggy mudstone bed from 1,452 to 1,453, weakly vuggy gray mudstone bed at 1,458.
1,460-1,465	**Gray colored massive Limestone:** No fractures or caverns. Generally weakly vuggy with locally blocky texture.
1,465-1,484	**Interbedded light to gray colored Limestone:** No fractures, vuggs or caverns. Dominantly light colored, well to very well indurated. Thin gray mudstone beds at 1,466, 1,473, 1,476, and 1,477, dark gray lenses at 1,478, thin washed out bed at 1,478.
1,484–1,487	**Gray colored massive Limestone:** No fractures, vugs or caverns. Well indurated mudstone.
1,487–1,492	**Light colored generally massive Limestone:** No fractures, vuggs or caverns. Well to very well indurated, observations partially obscured by filter cake. Thin light colored lamination at 1,489
1,492–1,498	**Gray to dark gray colored massive Limestone:** No fractures or caverns. Well indurated, minor washout at 1,495, vuggy from 1,496 to 1,498 with rough texture, sharp horizontal contact at 1,498.
1,498–1,599	**Light colored generally massive Limestone:** No fractures, vugs or caverns. Generally well indurated. Dark gray mudstone bed at 1,505, darker colored very well indurated, faintly laminated bed from 1,522 to 1,524, faint horizontal contact at 1,524, gray colored inclusions at 1,5401, gray very well indurated bed from 1,45 to 1,546, wavy horizontal contact at 1,546, thin gray coarse grained beds at 1,547, thin light colored coarse grained beds at 1,555, moderately thin gray bed at 1,580.
1,599–1,837	**Light colored Limestone interbedded with gray colored Limestone:** No fractures or caverns. Generally very well indurated, dominantly light colored interbedded with darker beds and laminations. Dark colored laminations at 1,602 and 1,608, gray colored bed with sharp upper contact at 1,612, wavy laminations at 1,619, thin gray mudstone bed at 1,621, thin gray weakly vuggy mudstone bed at 1,627, weakly vuggy at 1,631, faint laminations from 1,634 to 1,635, dark to light gray wavy laminations at 1,638, weakly vuggy at 1,639, light gray bed with locally blocky texture from 1,645 to 1,646, gray mudstone bed from 1,653 to 1,655, gray weakly vuggy mudstone bed from 1,664 to 1,665, thin light colored locally weakly vuggy bed at 1,670, gray weakly vuggy bed from 1,678 to 1,679, gray vuggy mudstone bed from 1,683 to 1,685, light gray mudstone beds with sharp upper contacts at 1,687 and 1689,light gray weakly vuggy beds at 1,693, 1,698 and from 1,701 to 1,702, light gray mudstone lenses at 1,704, 1,707 and 1,710, light gray well indurated bed at 1,713, light gray vuggy mudstone bed at 1,719, light gray well indurated bed at 1,721, gray mudstone lenses at 1,723 and 1,724,weakly vuggy mudstone bed at 1,738,gray weakly vuggy to vuggy mudstone lenses at 1,744, 1.746, 1,752 and 1,754, gray colored clasts at 1,756, gray laminations from 1,760 to 1,761, gray laminations to thin beds from 1,763 to 1,765,laminated at 1,767 and 1,768, very dark gray laminations at 1,772 and 1,777, light gray well indurated bed from 1,780 to 1,781, light gray vuggy bed at 1,783, light gray mudstone lenses at 1,792, thin mudstone bed with wavy upper contact at 1,798, gray to dark gray mudstone beds at 1,798 and from 1,800 to 1,801, gray clasts at 1,805, mudstone bed with minor washouts at 1,808, thin gray bed at 1,814, gray mudstone lenses at 1,822 and 1,828, thin gray weakly vuggy

Interval (feet bpl)	Observations Injection Well 2 (IW-2)
	beds at 1,831, dark gray weakly vuggy mudstone bed at 1,834.
1,837–1,904	**Light colored Limestone:** No fractures or caverns. Generally very well to well indurated, dominantly light colored interbedded with thin darker beds and laminations, observation partially obscured by filter cake. Gray very well indurated mudstone bed at 1,838, dark gray lenses from 1,840 to 1,841, thin gray bed at 1,844, gray mudstone bed with sharp horizontal contact at 1,845, gray mudstone clasts at 1,851, thin dark gray mudstone bed at 1,870, thin coarser grained bed at 1,881,coarser textured from 1,894 to 1,896, gray very well indurated mudstone bed at 1,899, vuggy from 1,900 to 1,903.
1,904–1,907	**Laminated light colored Limestone and dark colored Dolomite:** No fractures, vugs or caverns. Very well indurated with horizontal laminations.
1,907–1,911	**Gray colored generally massive Limestone:** No fractures, vugs or caverns. Well indurated mudstone. Very thin dark laminations at 1,908
1,911–1,990	**Light colored Limestone:** No fractures or caverns, generally massive with thin gray beds common. Generally well to very well indurated, observations partially obscured by filter cake. Moderately indurated from 1,911 to 1,920, gray lenses at 1,917 and 1,919, minor washouts from 1,921 to 1,922, gray lenses at 1,923, gray weakly vuggy bed at 1,925, moderately indurated with larger sized grains at 1,925 and 1,927, gray clasts at 1,928 and 1,930, gray vuggy mudstone bed at 1,934, weakly vuggy with gray lenses at 1,938, small mudstone clasts at 1,941, thin light gray moderately vuggy bed at 1,944, moderately indurated at 1,945 and 1,950, thin moderately vuggy mudstone bed with sharp wavy lower contact at 1,952,thin gray mudstone beds at 1,953, 1,954 and 1,955, thin coarser grained bed at 1,958, thin gray vuggy bed at 1,960, gray mudstone inclusions at 1,977,minor washout at 1,979, thin vuggy bed at 1,981, gray mudstone lenses at 1,983.
1,990-2,001	**No Video**
2,001-2,015	**Light colored generally massive Limestone:** No fractures or caverns. Moderately to well indurated. Thin gray lenses at 2,005, thin weakly vuggy bed at 2,013.
2,015-2,035	**Light colored Limestone with gray colored Dolomite interbeds:** No fractures, vugs or caverns. Dominantly light colored moderately to well indurated Limestone. Thin gray Dolomite beds at 2,017 and 2,025, gray dolomite bed at 2,028, thin gray Dolomite beds at 2,029 and 2,034.
2,035-2,051	**Dark to light colored Dolomite with little Limestone:** Thin light colored washed out Limestone bed at 2,037, weakly vuggy at 2,037 and 2,040, very well indurated from 2,042 to 2,043, vuggy to highly vuggy from 2,043 to 2,050, light colored partially washed out Limestone lenses at 2,045 and 2,049, minor cavern or washed out Limestone bed at 2,050, blocky texture at 2,051.
2,051-2,070	**Light colored generally massive Limestone with few Dolomite interbeds:** No fractures or caverns. Generally very well indurated, moderate washouts at 2,051 and 2,054, gray Dolomite bed at 2,056, gray vuggy mudstone bed from 2,060 to 2,061, minor washouts at 2,062 and 2,063, weakly vuggy at 2,067, dark thin vuggy Dolomite bed at 2,069, sharp wavy lower contact.
2,070-2,098	**Dark colored generally massive Dolomite:** Generally weakly vuggy. Fully closed local high angle fracture at 2,075, dominantly highly vuggy at 2,076 and 2,081, washed out

Interval (feet bpl)	**Observations Injection Well 2 (IW-2)**
	Limestone bed at 2,082, blocky texture at 2,084, closed horizontal fracture with locally blocky texture at 2,085, highly vuggy from 2,085 to 2,087, washed out light colored Limestone bed from 2,089 to 2,090,very well indurated from 2,089 to 2,091, thin partially washed out Limestone bed at 2,093, thin Limestone bed at 2,094, laminated Dolomite and Limestone from 2,095 to 2,098.
2,098-2,599	**Light colored dominantly massive Limestone:** Generally well to very well indurated. Thin gray bed at 2,128, minor washout at 2,155, thin dark weakly vuggy beds at 2,166 and 2,170, fossil casts and minor washout at 2,172, minor washout at 2,306, weakly vuggy at 2,312, minor washout at 2,327, moderate washout at 2,335, thin coarser grained bed at 2,339, thin darker colored beds at 2,361 and 2,370, weakly vuggy at 2,393, thin gray bed at 2,415, minor washout at 2,422, observations partially obscured by filter cake from 2,432 to 2,454, very weakly vuggy at 2,498, fully healed vertical fracture at 2,527, moderately indurated at 2,553, few lighter colored lenses at 2,564, minor washouts at 2,575, 2,589 and 2,597.
2,599-2,629	**Light to dark colored Limestone with few Dolomite interbeds:** No fractures or caverns. Dominantly moderately to well indurated, gray blocky textured mudstone bed from 2,600 to 2,601, wavy gray well indurated bed at 2,601, gray mudstone inclusions at 2,603, very well indurated at 2,606 and 2,611, gray mudstone bed at 2,612, vuggy at 2,614, Limestone and Dolomite at 2,616, gray colored Dolomite beds with blocky texture at 2,621 and 2,626
2,629-2,661	**Dominantly light to gray colored interbedded Limestone:** No fractures or caverns. Gray and moderately vuggy from 2,629 to 2,631, light colored and very well indurated from 2,630 to 2,638, gray colored highly vuggy beds at 2,638 and 2,644, light colored and well indurated from 2,644 to 2,645 with sharp lower contact, gray vuggy micritic bed from 2,645 to 2,647, light colored and well indurated from 2,647 to 2,649 with sharp lower contact, gray and moderately vuggy from 2,649 to 2,650, light colored and very well indurated from 2,650 to 2,652, gray vuggy with blocky texture at 2,653, gray with light colored inclusions at 2,254 and 2,257, light colored with minor washouts from 2,657 to 2,660, gray colored and weakly vuggy from 2,660 to 2,661.
2,661-2,673	**Light colored massive Limestone:** No fractures vugs or caverns. Very well indurated .
2,670-2,870	**Light colored weakly bedded Limestone:** Generally well to moderately indurated. Vuggy at 2,679 and 2,682, minor washout at 2,691, light gray bed from 2,673 to 2,674, faint thin bed at 2,687, vuggy at 2,691 and from 2,713 to 2,719, minor washout at 2,713, weakly to moderately vuggy at 2,720, 2,721 and from 2,725 to 2,727, minor washout at 2,734, weakly vuggy at 2,772 and 2,779, moderately indurated at 2,789, thin light gray bed at 2,791, very well indurated at 2,789, very light colored poorly indurated bed at 2,796, thin very light colored bed at 2,798, weakly vuggy at 2,802, faint bedding at 2,812, thin lighter colored bed at 2,815, light gray wavy laminations at 2,818, generally very well to well indurated from 2,800 to 2,847, thin lighter colored beds at 2,844 and 2.848, well indurated from 2,848 to 2,870, minor washout at 2,859, fully closed low angle fracture at 2,865, minor washout at 2,867.
2,870-2,881	**Light colored Limestone with interbedded Dolomite:** Generally well indurated. Dark moderately vuggy Dolomite bed at 2,871, Dolomitic Limestone at 2,872, moderately vuggy Limy Dolomite from 2,877 to 2,878, vuggy at 2,879, thin dark brown Dolomite bed at 2,880, Dolomitic with variable angle closed fractures from 2,878 to 2,880, thin dark highly vuggy Dolomite bed at 2,881.
2,881-2,904	**Light colored generally massive Limestone with interbedded Dolomite:** Generally well to very well indurated. Closed horizontal fracture at 2,881,highly vuggy mudstone

Interval (feet bpl)	**Observations Injection Well 2 (IW-2)**
	bed from 2,883 to 2,884, Dolomitic Limestone bed at 2,886, open horizontal fracture at 2,888, closed low angle fracture at 2,891, variably fractured and healed with Dolomite at 2,896, dark Dolomite lenses at 2,899, thin darker colored bed at 2,901, moderate washout at 2,902
2,904-2,940	**Light to dark colored Dolomite with interbedded light colored Limestone:** Weakly vuggy Limestone bed at 2,906, light colored Limestone lenses at 2,908, Dolomitic Limestone breccia bed from 2,911 to 2,912, thin washed out Limestone bed at 2,913, high angle moderately closed fracture at 2,913, well indurated Limestone bed at 2,916, open horizontal crystal lined fracture and moderate cavern at 2,917, thin Limestone bed at 2,918, highly fractured with blocky texture at 2,920, thin Limestone bed at 2,921, crystal lined vugs at 2,922, minor cavern at 2,923, closed vertical fracture at 2,925, vuggy at 2,925, Limestone lenses at 2,927 and 2,931, thin Limestone bed at 2,933, minor cavern at 2,933, moderately vuggy Limestone bed from 2,936 to 2,937, closed high angle fracture and moderate cavern at 2,937, large crystal lined vugs at 2,939, thin vuggy Limestone bed at 2,940.
2,940-2,987	**Light to dark colored generally massive Dolomite**: Generally weakly to moderately vuggy. Crystal lined vugs at 2,940, well indurated to very weakly vuggy from 2,050 to 2,059, thin dark bed at 2,951, closed low angle fracture at 2,952, closed high angle fracture at 2,953, closed low angle fracture at 2,958, shallow cavern at 2,959, closed high angle fracture at 2,962, well indurated to weakly vuggy from 2,962 to 2,965, closed high angle and horizontal fractures at 2,964, fully healed moderate angle fracture at 2,965, open low angle and closed high angle fractures at 2,965, weakly bedded and vuggy with variable angle closed fractures from 2,966 to 2,967. High angle closed fractures at 2,967 and 2,968.
2,987-3,032	**Light colored generally massive Dolomite:** Generally well indurated. Open low angle fracture at 3,013, closed horizontal fractures at 3,017 and 3,016, moderately vuggy at 3,018 and 3,020, open horizontal fractures at 3,027 and 3,024, closed high angle fractures at 3,025, 3,027 and 3,029, faint wavy laminations at 3,029.
3,032-3,062	**Dark to moderately dark colored massive fractured Dolomite:** Highly fractured, highly vuggy with blocky texture and moderate caverns.
3,062-3,068	**Light to moderately dark colored massive Dolomite:** Moderately vuggy. Open high angle fractures at 3,063 and 3,067
3,068-3,087	**Dark to moderately dark colored massive fractured Dolomite:** Generally weakly vuggy. Highly fractured with blocky texture. Highly vuggy from 3,082 to 3,087
3,115-3,120	**Light to dark colored massive Dolomite:** Highly vuggy, vugs commonly lined with Dolomite crystals.
3,120-3,126	**Light colored Dolomite Breccia:** Light colored angular breccia with dark colored matrix. Open to closed fractures common.
3,126-3,132	**Moderately light colored massive Dolomite:** Generally vuggy to highly vuggy. Crystal lined vugs at 3,129, fractured with blocky texture at 3,130.
3,132-3,158	**Light colored generally massive Dolomite:** Generally weakly to moderately vuggy. Thin laminations at 3,137 and 3,140, highly vuggy at 3,148, closed vertical fractures from 3,148 to 3,154.

Interval (feet bpl)	Observations Injection Well 2 (IW-2)
3,158-3,264	**Light colored generally massive Dolomite:** Generally well indurated to vuggy. Open horizontal fracture at 3,158, locally moderately fractured and vuggy from 3,161 to 3,167, shallow crystal lined cavern at 3,170, vuggy at 3,170, open horizontal fracture at 3,173, shallow crystal lined cavern at 3,175, vuggy 3,180, variable angle moderately closed fractures from 3,208 to 3,219, minor caverns at 3,214 and 3,216, thin laminations at 3,217 minor cavern at 3,223, few closed vertical fractures at 3,224 and 3,228, highly vuggy from 3,231 to 3,237 and from 3,240 to 3,257, locally fractured with blocky texture at 3,258, high vuggy with crystal lined vugs from 3,240 to 3,257, closed vertical fractures from 3,261 to 3,264.
3,264-3,270	**Dark colored massive Dolomite:** Generally vuggy to well indurated. Shallow cavern at 3,264, open high angle fracture at 3,266, highly vuggy with few closed fractures at 3,269.
3,270-3,312	**Moderately dark colored generally massive Dolomite:** Generally weakly to moderately vuggy. Highly vuggy at 3,273, closed vertical fractures from 3,270 to 3,272, highly vuggy at 3,279 and 3,283 and from 3,286 to 3,288, low angle closed fracture at 3,291, Highly vuggy from 3,292 to 3,294, closed variable angle fractures from 3,297 to 3,309,thin dark colored bed at 3,300, highly vuggy at 3,311.
3,312-3,336	**Dark colored massive Dolomite:** Highly vuggy to vuggy, moderate angle closed fracture at 3,322.
3,336-3,373	**Moderately light colored Dolomite with darker colored Dolomite interbeds:** Generally well indurated. Moderately fractured and vuggy at 3,338, dark horizontal lamination at 3,342, closed to moderately open fractures from 3,340 to 3,342, dark vuggy bed from 3,343 to 3,345, closed horizontal fracture at 3,345, dark colored horizontal bed at 3,348, wavy laminations at 3,352, closed high angle fractures from 3,353 to 3,354, thin dark horizontal bed at 3,355, thin dark beds from 3,361 to 3,369.
3,373-3,379	**Moderately dark colored massive Dolomite:** Vuggy with large vugs common. Moderate cavern at 3,375 highly fractured with blocky texture at 3,377 and 3,378.
3,379-3,443	**Moderately light colored Dolomite with darker colored Dolomite interbeds:** Generally well indurated to vuggy. Dark colored well indurated bed at 3,380, darker colored and vuggy from 3,381 to 3,383, closed vertical fractures at 3,386, moderate cavern at 3,388, closed vertical fractures at 3,388 and 3,389, fractured with moderate cavern at 3,393, thin dark colored bed at 3,397, highly vuggy from 3,399 to 3,406 with moderate cavern at 3,403, closed horizontal fracture at 3,405, thin dark colored bed at 3,407, dark colored wavy laminations at 3,408 and 3,410, thin dark horizontal laminations at 3,411, highly vuggy with fractures common from 3,414 to 3,416, vuggy from 3,416 to 3,432, variable angle fractures grading from closed to open with depth from 3,432 to 3,443.
3,443-3,457	**Dark colored highly fractured massive Dolomite:** Highly fractured and cavernous with blocky texture, caverns occasionally lined with crystals.
3,457-3,489	**Light colored generally massive Dolomite:** Generally vuggy to moderately vuggy. Open vertical and horizontal fractures from 3,465 to 3,472, moderately fractured to fractured from 3,475 to 3,488, highly vuggy from 3,482 to 3,488, dark blocky textured bed at 3,486.
3,489-3,493	**Dark colored highly fractured massive Dolomite:** Highly fractured and cavernous with blocky texture.

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

Video Survey

APPENDIX F
VIDEO SURVEYS
CITY OF HOLLYWOOD
SOUTH COUNTY REGIONAL WWTP
DUAL ZONE MONITORING WELL MW–1

Interval (feet bpl)	Observations Dual-Zone monitor Well 1 (IW-1)
1,251–1,344	**Light colored generally massive Limestone:** No fractures or caverns. General rough wall texture. Vuggy low angle bedding at 1,312 and between 1,316 and 1,322. Thin laminations at 1,333 and 1,335. Occasional inclusions and lens of dark grayish carbonate mudstone from 1,329 to 1,330, and at 1,333. Minor washouts from 1,329 to 1,330, at 1,339, 1,287, and 1,285.
1,344–1,461	**Light colored generally massive Limestone:** No fractures or caverns, generally well indurated with thin horizontal gray laminations at 1,349, 1,370, and 1,425, and occasional thin gray beds from 1,353 to 1,354. Gray vuggy mudstone between 1,364 and 1,365 with sharp contact upper and gradational contact at base. Grayish colored very well indurated wackestone/mudstone from 1,368 to 1,370, 1,375 to 1,377, and 1,389 to 1,391. Large vugs from 1,440 and 1,441. Minor washouts from 1,417 to 1,418 and 1,449 to 1,451.
1,461–1,476	**Light orange colored generally massive Limestone:** No fractures, vugs or caverns. Generally well indurated with thin dark laminations at 1,463, and minor washouts at 1,465, 1,470, and 1,472.
1,476–1,480	**Gray colored massive Limestone:** No fractures, vugs or caverns. Well indurated, weakly vuggy with minor washout at 1,480.
1,481–1,499	**Light colored massive Limestone:** No fractures, vugs or caverns. Generally well indurated. Orange grayish to gray carbonate mudstone bedding between 1,490 and 1,493 with sharp contact at top and gradational lower contact. Grayish inclusions between 1,492 and 1,493 and minor washouts at 1,482, from 1,487 to 1,488, 1,494 to 1,495 and at 1,497.
1,499–1,511	**Orange grayish to gray Limestone:** No fractures or caverns. Moderate rough texture. Vuggy thin bedding at 1,485, 1,504, 1,508 and from 1,512 to 1,513. Thin light orange mudstone laminations at 1,507. Dark gray mudstone inclusions at 1,505 and minor washouts from 1,494 to 1,495, 1,502 to 1,503.
1,511–1,528	**Light colored Limestone:** No fractures or caverns. Generally massive and well indurated. Thin darker colored beds at 1,523, 1,525, 1,526 and 1,527 to 1,528. Inclusions of dark gray mudstone at 1,512, 1,512, and 1,524. Minor washouts from 1,512 to 1,514.
1,528–1,590	**Pale orange colored Limestone:** No fractures or caverns. Generally massive, very well indurated with gray laminations to thin beds at 1,529, 1,539, 1,544, 1,547 and 1,559. Vuggy beds from 1,553 to 1,555, 1,566, 1,569, 1,572, 1,578, 1,581 and 1,583. Gray colored beds from 1,543 to 1,546 with sharp upper contact and gradational lower. Dark grayish mudstone Inclusions at 1,527, 1,530, 1,541 and 1,561. Minor washouts between 1,530 and 1,532, 1,553 and 1,554 and 1,586.

Interval (feet bpl)	Observations Dual-Zone monitor Well 1 (IW-1)
1,590–1,774	**Light colored interbedded Limestone:** No fractures or caverns. Generally massive and very well indurated, weakly vuggy at 1,595. 1,658, 1,630, 1,680 and 1,707. Medium gray bedding at 1,609 and 1,615. Pale orange, moderately thick beds from 1,618 to 1,623, 1,681 to 1,683, and 1,691 to 1,692, generally with sharp upper contact and gradational lower contact. Pale orange mudstone beds from 1,696 to 1,697. Thin laminations from 1,610 to 1,617, 1,635 to 1,636, and at 1,646, 1,670, 1,683, 1,698, and 1,773. Gray mudstone inclusions from 1,624 to 1,625, 1,929, 1,719, and from 1,255 to 1,756. Minor washouts at 1,627, 1,643, and 1,685.
1,774–1,794	**Moderately dark colored generally massive Limestone:** No fractures, vugs or caverns. Poor visibility. Moderately indurated with occasional very thin laminations from 1,774 to 1,775 and minor washout at 1,778.

Appendix H

Packer Pumping Test Data and Graphs

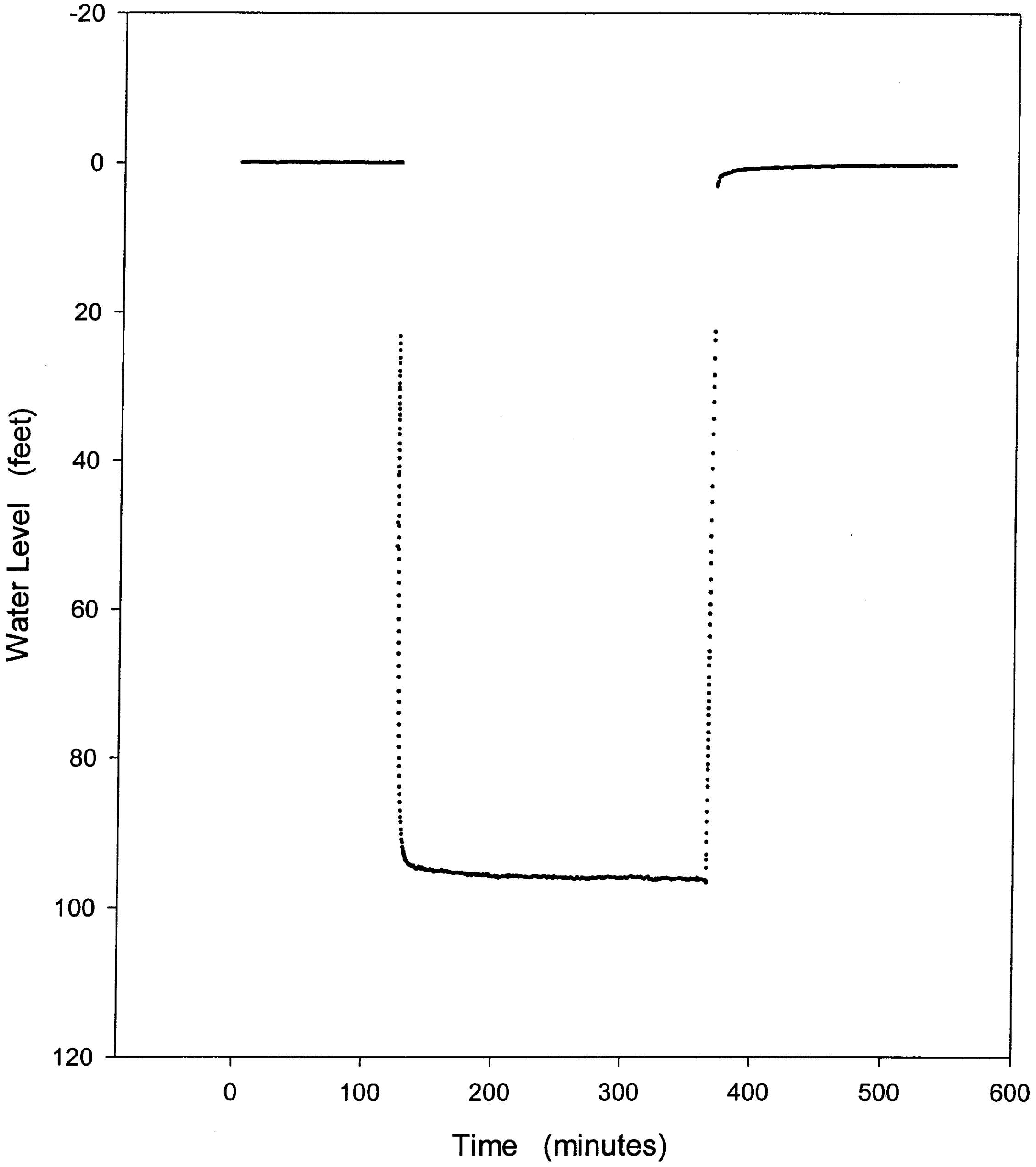
Injection Well No. 1 (IW-1) – Packer Tests

Packer Test Data

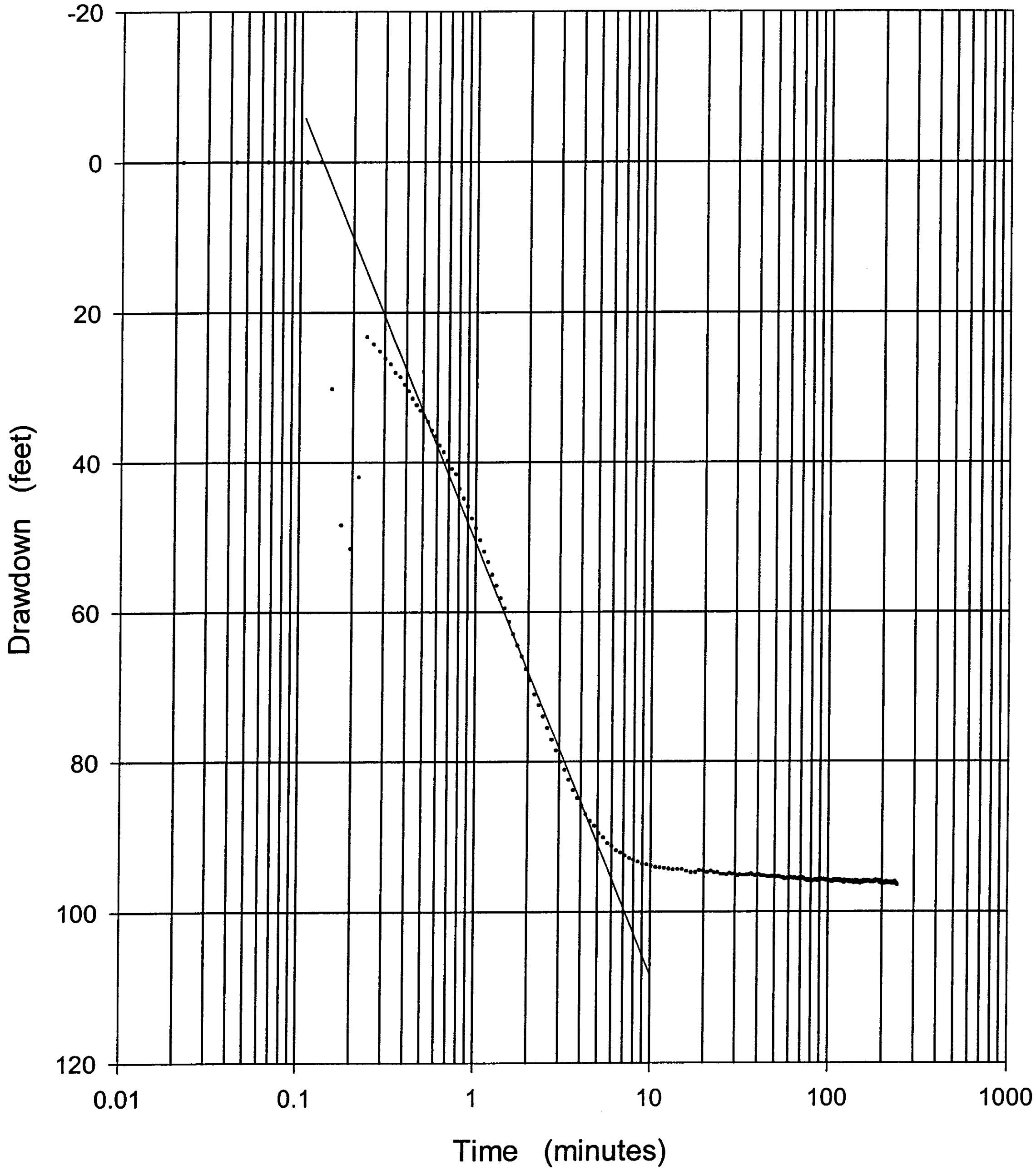
Injection Well No. 1 (IW-1) – Packer Tests

1,354 – 1,370

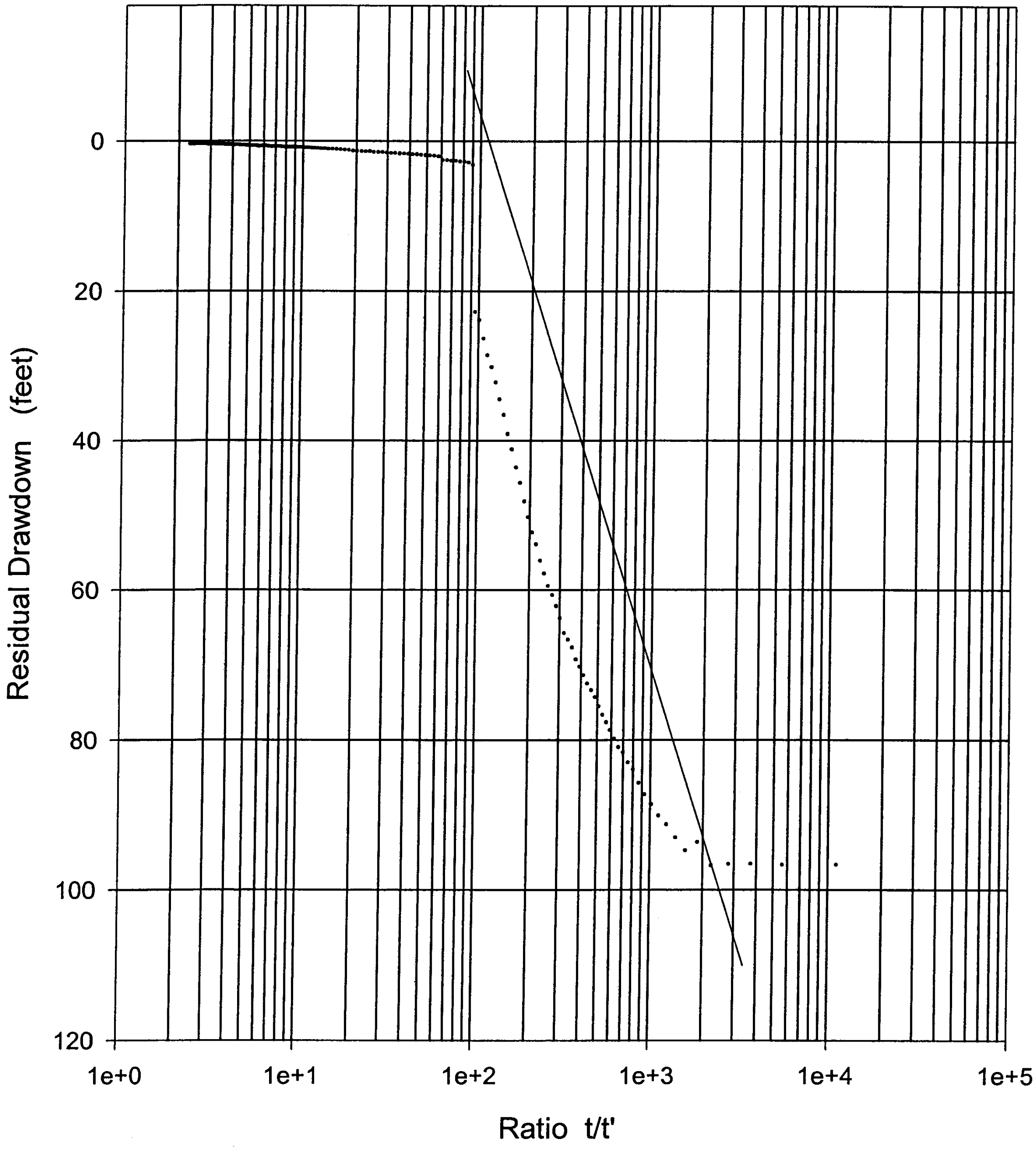
CITY OF HOLLYWOOD
IW -1
1,354 - 1,370
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
IW -1
1,354 - 1,370
DRAWDOWN



CITY OF HOLLYWOOD
IW -1
1,354 - 1,370
RESIDUAL DRAWDOWN vs t/t'



CITY OF HOLLYWOOD
IW -1
1,354 - 1,370
BACKGROUND DATA

Time	Water Level
0	0
0.0218	0
0.0437	-0.014
0.0655	-0.014
0.0873	-0.014
0.1092	-0.014
0.131	-0.014
0.1528	-0.014
0.1747	-0.014
0.1965	0
0.2183	-0.014
0.2402	0
0.262	-0.014
0.2838	-0.014
0.3057	-0.014
0.3275	-0.014
0.3493	-0.014
0.3712	-0.014
0.393	-0.014
0.4148	-0.014
0.4367	-0.014
0.4588	-0.014
0.4823	-0.014
0.5072	-0.014
0.5335	0
0.5615	0
0.5912	0
0.6225	0
0.6557	-0.014
0.6908	0
0.7282	0
0.7677	0.029
0.8095	-0.029
0.8538	0.029
0.9008	-0.014
0.9507	-0.029
1.0033	-0.043
1.0592	-0.029
1.1183	-0.014
1.181	-0.029
1.2473	-0.029
1.3177	-0.029
1.3922	-0.014
1.4712	-0.029
1.5548	-0.029
1.6433	-0.014
1.7372	-0.029
1.8365	-0.029
1.9418	-0.029
2.0533	-0.014
2.1715	-0.029
2.2967	-0.014
2.4292	-0.014
2.5697	-0.014
2.7185	-0.014
2.876	-0.014
3.0428	-0.014
3.2197	-0.014
3.407	-0.014
3.6053	-0.014
3.8155	-0.014
4.0382	-0.014
4.274	-0.014
4.5238	-0.014
4.7885	-0.014
5.0688	-0.014
5.3657	-0.043
5.6802	-0.058
6.0133	-0.072
6.3662	-0.072
6.74	-0.072
7.136	-0.072
7.5553	-0.072
7.9997	-0.072
8.4703	-0.072
8.9688	-0.072
9.4968	-0.072
10.0562	-0.072
10.6487	-0.072
11.2762	-0.058
11.941	-0.058
12.6452	-0.072
13.391	-0.029
14.181	-0.029
15.0178	-0.014
15.9043	0
16.8433	-0.029
17.838	0
18.838	0
19.838	-0.029
20.838	-0.014
21.838	-0.029
22.838	-0.014
23.838	-0.072
24.838	-0.043
25.838	-0.029
26.838	0.043
27.838	0
28.838	0.014
29.838	-0.058
30.838	0
31.838	-0.029
32.838	-0.087
33.838	-0.029
34.838	-0.072
35.838	-0.043
36.838	-0.13
37.838	-0.101
38.838	-0.058
39.838	-0.058
40.838	-0.101
41.838	-0.072
42.838	-0.087
43.838	-0.058
44.838	-0.029
45.838	-0.058
46.838	-0.029
47.838	-0.072
48.838	-0.058
49.838	-0.087
50.838	-0.058
51.838	-0.014
52.838	-0.072
53.838	-0.072
54.838	0.014
55.838	-0.029
56.838	-0.087
57.838	0
58.838	0.029
59.838	0.014
60.838	-0.072
61.838	-0.116
62.838	0
63.838	-0.087
64.838	-0.043
65.838	-0.072
66.838	-0.072
67.838	0.014
68.838	-0.087
69.838	-0.043
70.838	-0.043
71.838	-0.043
72.838	-0.043
73.838	-0.029
74.838	-0.043
75.838	-0.043
76.838	-0.043
77.838	-0.043
78.838	-0.087
79.838	-0.101
80.838	-0.101
81.838	-0.058
82.838	-0.043
83.838	-0.043
84.838	-0.101
85.838	-0.101
86.838	-0.087
87.838	-0.087
88.838	-0.087
89.838	-0.072
90.838	-0.043
91.838	-0.043
92.838	-0.116
93.838	-0.087
94.838	-0.043
95.838	-0.043
96.838	-0.058
97.838	-0.014
98.838	-0.029
99.838	-0.014
100.838	-0.014
101.838	0
102.838	-0.029
103.838	0
104.838	0
105.838	-0.087
106.838	-0.029
107.838	-0.029
108.838	-0.058
109.838	-0.029
110.838	-0.014
111.838	-0.014
112.838	-0.029
113.838	-0.058
114.838	-0.072
115.838	-0.029
116.838	0
117.838	0
118.838	0
119.838	-0.101
120.838	-0.072
121.838	-0.072
122.838	-0.072
123.838	-0.058

CITY OF HOLLYWOOD
IW -1
1,354 - 1,370
DRAWDOWN DATA

Time	Water level	Time	Water level	Time	Water level	Time	Water level
0	0	20.8347	94.784	110.8347	95.779	200.8347	96.37
0.0217	-0.014	21.8347	94.61	111.8347	95.923	201.8347	96.327
0.0433	-0.014	22.8347	94.812	112.8347	95.866	202.8347	96.154
0.065	-0.029	23.8347	94.74	113.8347	95.88	203.8347	96.327
0.0867	-0.029	24.8347	95.029	114.8347	95.88	204.8347	96.14
0.1083	-0.029	25.8347	95.043	115.8347	95.779	205.8347	96.269
0.13	-0.014	26.8347	95.072	116.8347	95.779	206.8347	96.111
0.1517	30.19	27.8347	94.899	117.8347	95.995	207.8347	96.082
0.1733	48.378	28.8347	95.029	118.8347	96.024	208.8347	96.067
0.195	51.538	29.8347	94.971	119.8347	95.851	209.8347	96.154
0.2167	41.969	30.8347	95.231	120.8347	95.923	210.8347	96.024
0.2383	23.275	31.8347	95.087	121.8347	95.88	211.8347	96.082
0.26	24.242	32.8347	95.159	122.8347	96.154	212.8347	96.096
0.2817	25.181	33.8347	95.159	123.8347	95.793	213.8347	96.154
0.3033	26.162	34.8347	95.13	124.8347	95.909	214.8347	96.284
0.325	26.884	35.8347	95.072	125.8347	95.967	215.8347	96.197
0.3467	27.996	36.8347	94.957	126.8347	96.01	216.8347	96.226
0.3683	28.588	37.8347	95.159	127.8347	95.938	217.8347	96.168
0.39	29.627	38.8347	95.231	128.8347	95.923	218.8347	96.168
0.4117	30.479	39.8347	95.058	129.8347	95.938	219.8347	96.154
0.4333	31.46	40.8347	95.087	130.8347	96.082	220.8347	96.082
0.4555	32.37	41.8347	95.26	131.8347	96.01	221.8347	96.096
0.479	33.092	42.8347	95.216	132.8347	95.938	222.8347	96.125
0.5038	33.857	43.8347	95.274	133.8347	96.053	223.8347	96.197
0.5302	34.55	44.8347	95.288	134.8347	96.082	224.8347	96.255
0.5582	35.748	45.8347	95.375	135.8347	96.053	225.8347	96.14
0.5878	36.469	46.8347	95.389	136.8347	95.938	226.8347	96.313
0.6192	37.74	47.8347	95.288	137.8347	96.024	227.8347	96.241
0.6523	38.606	48.8347	95.288	138.8347	96.154	228.8347	96.284
0.6875	39.703	49.8347	95.346	139.8347	96.212	229.8347	96.125
0.7248	40.858	50.8347	95.375	140.8347	96.154	230.8347	96.212
0.7643	41.565	51.8347	95.361	141.8347	95.909	231.8347	96.241
0.8062	43.499	52.8347	95.303	142.8347	96.053	232.8347	96.183
0.8505	44.813	53.8347	95.404	143.8347	96.125	233.8347	96.284
0.8975	45.895	54.8347	95.476	144.8347	96.154	234.8347	96.01
0.9473	47.497	55.8347	95.462	145.8347	95.952	235.8347	96.327
1	48.796	56.8347	95.649	146.8347	96.082	236.8347	96.212
1.0558	50.384	57.8347	95.563	147.8347	96.067	237.8347	96.226
1.115	51.943	58.8347	95.534	148.8347	96.183	238.8347	96.255
1.1777	53.314	59.8347	95.664	149.8347	96.082	239.8347	96.342
1.244	55.031	60.8347	95.476	150.8347	96.269	240.8347	96.37
1.3143	56.489	61.8347	95.476	151.8347	96.039	241.8347	96.471
1.3888	58.163	62.8347	95.519	152.8347	96.14		
1.4678	59.548	63.8347	95.591	153.8347	95.967		
1.5515	61.338	64.8347	95.476	154.8347	96.096		
1.64	62.983	65.8347	95.591	155.8347	96.039		
1.7338	64.513	66.8347	95.635	156.8347	96.154		
1.8332	65.97	67.8347	95.649	157.8347	95.981		
1.9385	67.658	68.8347	95.534	158.8347	95.88		
2.05	69.13	69.8347	95.678	159.8347	95.967		
2.1682	71.049	70.8347	95.591	160.8347	96.067		
2.2933	72.478	71.8347	95.505	161.8347	95.938		
2.4258	73.979	72.8347	95.577	162.8347	96.082		
2.5663	75.523	73.8347	95.779	163.8347	95.923		
2.7152	77.066	74.8347	95.779	164.8347	95.923		
2.8727	78.524	75.8347	95.88	165.8347	95.866		
3.0395	80.039	76.8347	95.866	166.8347	95.938		
3.2163	81.092	77.8347	95.736	167.8347	95.923		
3.4037	82.434	78.8347	95.923	168.8347	96.01		
3.602	83.848	79.8347	95.779	169.8347	96.01		
3.8122	84.872	80.8347	96.039	170.8347	95.923		
4.0348	85.882	81.8347	95.88	171.8347	96.01		
4.2707	87.036	82.8347	95.88	172.8347	96.14		
4.5205	87.916	83.8347	95.765	173.8347	96.024		
4.7852	88.537	84.8347	95.837	174.8347	96.111		
5.0655	89.547	85.8347	95.909	175.8347	95.981		
5.3623	90.109	86.8347	95.75	176.8347	96.111		
5.6768	90.888	87.8347	95.923	177.8347	96.01		
6.01	91.235	88.8347	95.678	178.8347	95.967		
6.3628	91.855	89.8347	95.837	179.8347	96.111		
6.7367	92.129	90.8347	95.779	180.8347	96.067		
7.1327	92.519	91.8347	95.721	181.8347	95.938		
7.552	92.879	92.8347	95.736	182.8347	95.866		
7.9963	93.096	93.8347	95.779	183.8347	95.822		
8.467	93.355	94.8347	95.721	184.8347	95.952		
8.9655	93.644	95.8347	95.793	185.8347	95.923		
9.4935	93.702	96.8347	95.88	186.8347	95.981		
10.0528	93.875	97.8347	95.736	187.8347	95.995		
10.6453	94.062	98.8347	95.837	188.8347	95.894		
11.2728	94.149	99.8347	95.866	189.8347	95.938		
11.9377	94.221	100.8347	95.894	190.8347	95.909		
12.6418	94.307	101.8347	95.851	191.8347	95.967		
13.3877	94.408	102.8347	95.938	192.8347	96.125		
14.1777	94.351	103.8347	95.938	193.8347	96.183		
15.0145	94.365	104.8347	96.039	194.8347	95.995		
15.901	94.582	105.8347	95.967	195.8347	95.995		
16.84	94.784	106.8347	95.981	196.8347	95.909		
17.8347	94.784	107.8347	95.765	197.8347	96.269		
18.8347	94.524	108.8347	95.779	198.8347	96.212		
19.8347	94.567	109.8347	95.851	199.8347	96.168		

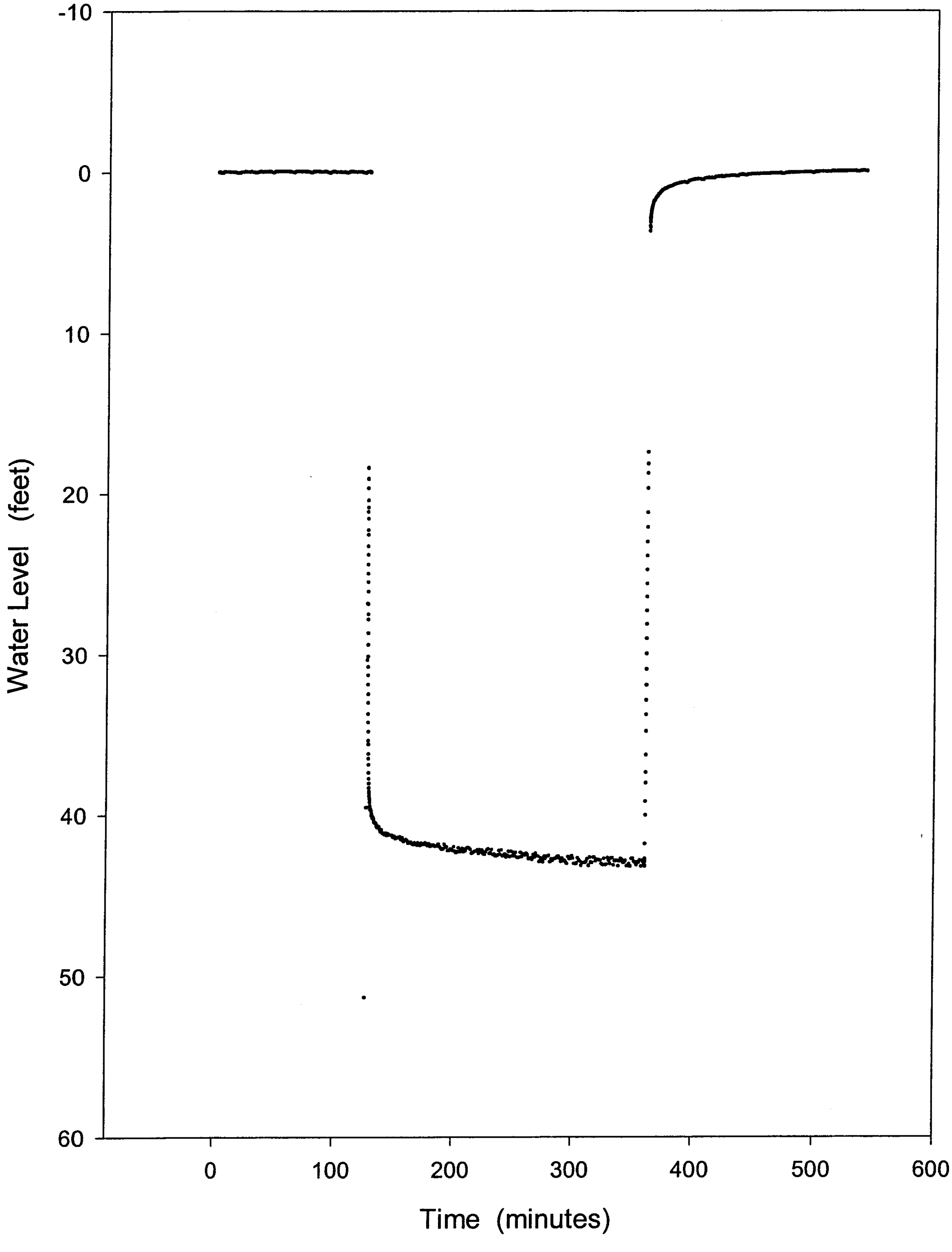
CITY OF HOLLYWOOD
IW -1
1,354 - 1,370
RECOVERY DATA

Time	Water Level
0	96.471
0.0217	96.63
0.0433	96.644
0.065	96.514
0.0867	96.572
0.1083	96.731
0.13	93.643
0.1517	94.711
0.1733	92.994
0.195	91.263
0.2167	90.08
0.2383	88.594
0.26	87.252
0.2817	85.723
0.3033	83.905
0.325	82.967
0.3467	81.611
0.3683	80.933
0.39	79.807
0.4117	78.682
0.4333	77.629
0.4555	76.619
0.479	75.493
0.5038	74.31
0.5302	73.372
0.5582	72.449
0.5878	71.366
0.6192	70.226
0.6523	69.231
0.6875	67.658
0.7248	66.59
0.7643	65.724
0.8062	63.747
0.8505	62.145
0.8975	60.688
0.9473	59.447
1	57.787
1.0558	56.07
1.115	53.905
1.1777	52.346
1.244	50.282
1.3143	48.146
1.3888	45.649
1.4678	43.585
1.5515	41.146
1.64	39.082
1.7338	36.541
1.8332	34.448
1.9385	32.196
2.05	30.146
2.1682	28.544
2.2933	26.306
2.4258	23.837
2.5663	22.74
2.7152	3.147
2.8727	2.83
3.0395	2.714
3.2163	2.671
3.4037	2.598
3.602	2.584
3.8122	2.526
4.0348	2.483
4.2707	2.006
4.5205	1.934
4.7852	1.876
5.0655	1.862
5.3623	1.804
5.6768	1.746
6.01	1.732
6.3628	1.703
6.7367	1.66
7.1327	1.617
7.552	1.573
7.9963	1.559
8.467	1.53
8.9655	1.443
9.4935	1.472
10.0528	1.429
10.6453	1.342
11.2728	1.371
11.9377	1.342
12.6418	1.313
13.3877	1.284
14.1777	1.169
15.0145	1.126
15.901	1.097
16.84	1.068
17.8347	1.024
18.8347	1.01
19.8347	0.996
20.8347	0.967
21.8347	0.938
22.8347	0.909
23.8347	0.895
24.8347	0.88
25.8347	0.866
26.8347	0.851
27.8347	0.837
28.8347	0.822
29.8347	0.808
30.8347	0.793
31.8347	0.793
32.8347	0.808
33.8347	0.808
34.8347	0.793
35.8347	0.75
36.8347	0.736
37.8347	0.721
38.8347	0.707
39.8347	0.707
40.8347	0.692
41.8347	0.721
42.8347	0.736
43.8347	0.721
44.8347	0.678
45.8347	0.663
46.8347	0.649
47.8347	0.649
48.8347	0.649
49.8347	0.635
50.8347	0.663
51.8347	0.692
52.8347	0.678
53.8347	0.635
54.8347	0.62
55.8347	0.606
56.8347	0.606
57.8347	0.606
58.8347	0.62
59.8347	0.635
60.8347	0.649
61.8347	0.562
62.8347	0.577
63.8347	0.562
64.8347	0.562
65.8347	0.548
66.8347	0.548
67.8347	0.548
68.8347	0.534
69.8347	0.534
70.8347	0.534
71.8347	0.519
72.8347	0.519
73.8347	0.519
74.8347	0.505
75.8347	0.505
76.8347	0.505
77.8347	0.505
78.8347	0.519
79.8347	0.534
80.8347	0.548
81.8347	0.548
82.8347	0.476
83.8347	0.476
84.8347	0.476
85.8347	0.476
86.8347	0.461
87.8347	0.461
88.8347	0.49
89.8347	0.49
90.8347	0.519
91.8347	0.519
92.8347	0.447
93.8347	0.447
94.8347	0.432
95.8347	0.432
96.8347	0.432
97.8347	0.432
98.8347	0.418
99.8347	0.418
100.8347	0.432
101.8347	0.418
102.8347	0.432
103.8347	0.418
104.8347	0.404
105.8347	0.418
106.8347	0.404
107.8347	0.418
108.8347	0.404
109.8347	0.404
110.8347	0.418
111.8347	0.404
112.8347	0.404
113.8347	0.404
114.8347	0.404
115.8347	0.404
116.8347	0.404
117.8347	0.404
118.8347	0.418
119.8347	0.404
120.8347	0.404
121.8347	0.404
122.8347	0.404
123.8347	0.389
124.8347	0.432
125.8347	0.432
126.8347	0.461
127.8347	0.389
128.8347	0.375
129.8347	0.375
130.8347	0.36
131.8347	0.36
132.8347	0.375
133.8347	0.36
134.8347	0.36
135.8347	0.36
136.8347	0.36
137.8347	0.36
138.8347	0.346
139.8347	0.36
140.8347	0.36
141.8347	0.346
142.8347	0.36
143.8347	0.346
144.8347	0.346
145.8347	0.346
146.8347	0.346
147.8347	0.346
148.8347	0.346
149.8347	0.346
150.8347	0.331
151.8347	0.346
152.8347	0.346
153.8347	0.346
154.8347	0.331
155.8347	0.331
156.8347	0.331
157.8347	0.331
158.8347	0.331
159.8347	0.331
160.8347	0.331
161.8347	0.317
162.8347	0.331
163.8347	0.331
164.8347	0.317
165.8347	0.331
166.8347	0.317
167.8347	0.331
168.8347	0.331
169.8347	0.404
170.8347	0.389
171.8347	0.331
172.8347	0.331
173.8347	0.317
174.8347	0.317
175.8347	0.331
176.8347	0.331
177.8347	0.331
178.8347	0.317
179.8347	0.317
180.8347	0.317
181.8347	0.331
182.8347	0.36
183.8347	0.375
184.8347	0.302
185.8347	0.36

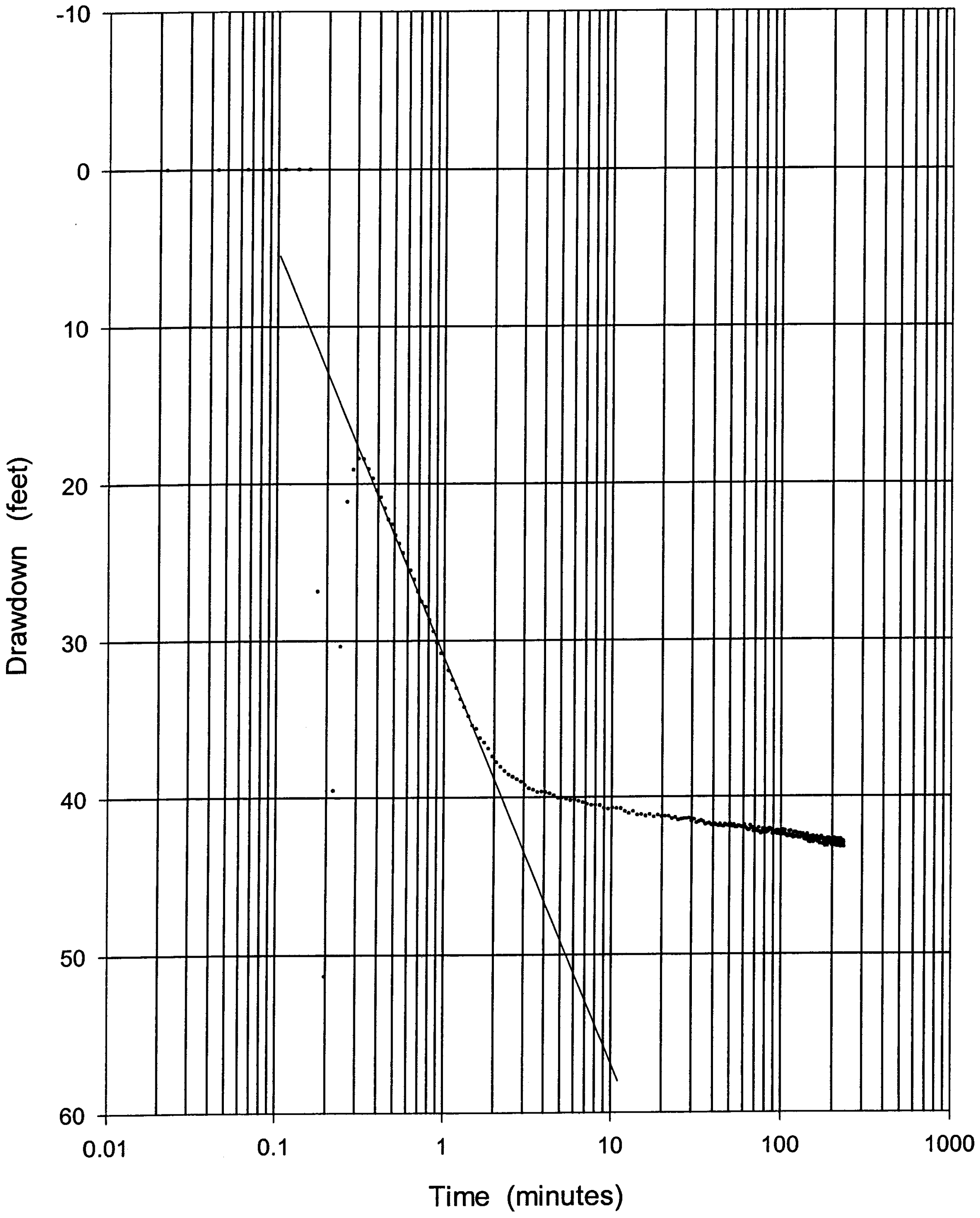
Injection Well No. 1 (IW-1) – Packer Tests

1,404 – 1,420

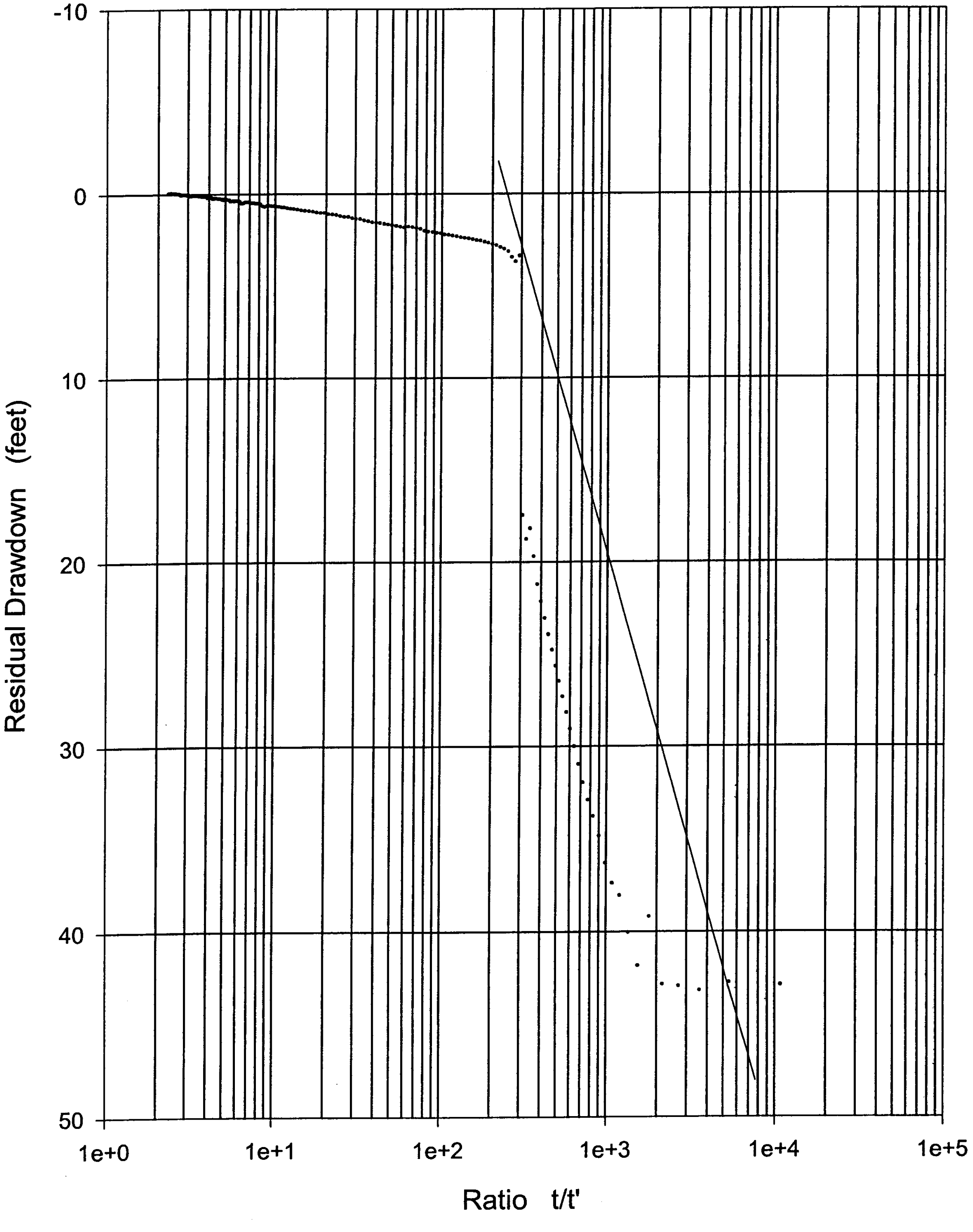
CITY OF HOLLYWOOD
IW -1
1,404 - 1,420
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
IW -1
1,404 - 1,420
DRAWDOWN



CITY OF HOLLYWOOD
IW -1
1,404 - 1,420
RESIDUAL DRAWDOWN vs t/t'



CITY OF HOLLYWOOD
IW -1
1,404 - 1,420
BACKGROUND DATA

Time	Water Level
0	0
0.0217	-0.014
0.0433	-0.014
0.065	-0.014
0.0867	-0.014
0.1083	-0.014
0.13	-0.014
0.1517	-0.014
0.1733	-0.014
0.195	-0.014
0.2167	-0.014
0.2383	-0.014
0.26	-0.014
0.2817	-0.014
0.3033	-0.014
0.325	-0.014
0.3467	-0.014
0.3683	-0.014
0.39	-0.014
0.4117	-0.014
0.4333	-0.014
0.4555	-0.014
0.479	-0.014
0.5038	-0.014
0.5302	-0.014
0.5582	-0.014
0.5878	-0.014
0.6192	-0.014
0.6523	-0.014
0.6875	-0.014
0.7248	-0.014
0.7643	0.014
0.8062	0.029
0.8505	0.014
0.8975	0.029
0.9473	0.029
1	0.014
1.0558	0.029
1.115	0.029
1.1777	0.029
1.244	0.029
1.3143	0.029
1.3888	0.029
1.4678	0.029
1.5515	0.029
1.64	0.029
1.7338	0.029
1.8332	0.014
1.9385	0.029
2.05	0.029
2.1682	0.029
2.2933	0.029
2.4258	0.029
2.5663	0.029
2.7152	0.029
2.8727	0.029
3.0395	0.043
3.2163	0.029
3.4037	0
3.602	-0.014
3.8122	-0.014
4.0348	-0.014
4.2707	-0.014
4.5205	-0.014
4.7852	-0.014
5.0655	-0.014
5.3623	-0.029
5.6768	-0.029
6.01	-0.014
6.3628	-0.014
6.7367	-0.014
7.1327	-0.029
7.552	-0.014
7.9963	-0.014
8.467	-0.014
8.9655	-0.014
9.4935	-0.014
10.0528	-0.014
10.6453	-0.014
11.2728	-0.029
11.9377	-0.014
12.6418	-0.029
13.3877	-0.029
14.1777	0
15.0145	0.014
15.901	0.029
16.84	0.014
17.8347	0.029
18.8347	-0.014
19.8347	-0.029
20.8347	-0.029
21.8347	-0.043
22.8347	-0.029
23.8347	-0.029
24.8347	-0.029
25.8347	-0.029
26.8347	-0.043
27.8347	-0.029
28.8347	-0.014
29.8347	0.014
30.8347	0
31.8347	0.014
32.8347	-0.029
33.8347	-0.043
34.8347	-0.043
35.8347	-0.043
36.8347	-0.029
37.8347	-0.043
38.8347	-0.043
39.8347	-0.043
40.8347	-0.043
41.8347	-0.043
42.8347	-0.043
43.8347	-0.029
44.8347	0.014
45.8347	0.014
46.8347	-0.043
47.8347	-0.043
48.8347	-0.043
49.8347	-0.058
50.8347	-0.058
51.8347	-0.058
52.8347	-0.058
53.8347	-0.058
54.8347	-0.058
55.8347	-0.058
56.8347	-0.058
57.8347	-0.058
58.8347	-0.043
59.8347	-0.043
60.8347	-0.014
61.8347	-0.014
62.8347	0
63.8347	-0.043
64.8347	-0.058
65.8347	-0.058
66.8347	-0.058
67.8347	-0.058
68.8347	-0.043
69.8347	-0.058
70.8347	-0.058
71.8347	-0.043
72.8347	-0.043
73.8347	-0.043
74.8347	-0.014
75.8347	-0.014
76.8347	0.014
77.8347	0.014
78.8347	-0.043
79.8347	-0.043
80.8347	-0.043
81.8347	-0.058
82.8347	-0.043
83.8347	-0.043
84.8347	-0.029
85.8347	-0.029
86.8347	-0.029
87.8347	-0.043
88.8347	-0.043
89.8347	-0.043
90.8347	0
91.8347	0.014
92.8347	0.043
93.8347	-0.029
94.8347	-0.043
95.8347	-0.043
96.8347	-0.043
97.8347	-0.029
98.8347	-0.029
99.8347	-0.029
100.8347	-0.029
101.8347	-0.029
102.8347	-0.029
103.8347	-0.029
104.8347	-0.029
105.8347	0
106.8347	0.014
107.8347	0.029
108.8347	-0.014
109.8347	-0.043
110.8347	-0.043
111.8347	-0.058
112.8347	-0.029
113.8347	-0.029
114.8347	-0.029
115.8347	-0.029
116.8347	-0.029
117.8347	-0.029
118.8347	-0.029
119.8347	-0.029
120.8347	0.014
121.8347	0.029
122.8347	0.043
123.8347	-0.029
124.8347	-0.029
125.8347	-0.043
126.8347	0.029

CITY OF HOLLYWOOD
IW -1
1,404 - 1,420
DRAWDOWN DATA

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	0	20.838	41.246	110.838	42.501	200.838	43.122
0.0218	0	21.838	41.246	111.838	42.227	201.838	43.079
0.0437	-0.014	22.838	41.39	112.838	42.458	202.838	42.675
0.0655	-0.014	23.838	41.318	113.838	42.184	203.838	42.848
0.0873	-0.014	24.838	41.477	114.838	42.559	204.838	43.05
0.1092	-0.014	25.838	41.419	115.838	42.516	205.838	42.703
0.131	-0.014	26.838	41.39	116.838	42.444	206.838	42.689
0.1528	0	27.838	41.404	117.838	42.631	207.838	43.136
0.1747	26.854	28.838	41.361	118.838	42.53	208.838	42.877
0.1965	51.32	29.838	41.549	119.838	42.27	209.838	42.833
0.2183	39.542	30.838	41.433	120.838	42.602	210.838	42.862
0.2402	30.362	31.838	41.664	121.838	42.27	211.838	43.18
0.262	21.138	32.838	41.578	122.838	42.559	212.838	42.891
0.2838	19.102	33.838	41.534	123.838	42.343	213.838	42.732
0.3057	18.395	34.838	41.592	124.838	42.545	214.838	42.804
0.3275	18.423	35.838	41.765	125.838	42.343	215.838	42.978
0.3493	19.059	36.838	41.708	126.838	42.646	216.838	42.963
0.3712	19.665	37.838	41.679	127.838	42.646	217.838	42.862
0.393	20.416	38.838	41.794	128.838	42.646	218.838	43.18
0.4148	20.863	39.838	41.837	129.838	42.343	219.838	43.165
0.4367	21.571	40.838	41.736	130.838	42.602	220.838	43.064
0.4588	22.278	41.838	41.823	131.838	42.429	221.838	43.209
0.4823	22.581	42.838	41.881	132.838	42.458	222.838	42.732
0.5072	23.289	43.838	41.736	133.838	42.501	223.838	42.732
0.5335	23.823	44.838	41.881	134.838	42.386	224.838	42.92
0.5615	24.415	45.838	41.895	135.838	42.501	225.838	42.963
0.5912	24.992	46.838	41.751	136.838	42.732	226.838	43.122
0.6225	25.512	47.838	41.837	137.838	42.732	227.838	42.949
0.6557	26.104	48.838	41.852	138.838	42.675	228.838	42.963
0.6908	26.883	49.838	41.736	139.838	42.776	229.838	42.833
0.7282	27.518	50.838	41.78	140.838	42.487	230.838	43.209
0.7677	27.836	51.838	41.91	141.838	42.646	231.838	42.862
0.8095	28.688	52.838	41.78	142.838	42.386	232.838	42.978
0.8538	29.409	53.838	41.953	143.838	42.559	233.838	43.209
0.9008	30.146	54.838	41.953	144.838	42.574		
0.9507	30.795	55.838	41.866	145.838	42.905		
1.0033	31.315	56.838	41.866	146.838	42.675		
1.0592	31.892	57.838	41.938	147.838	42.732		
1.1183	32.498	58.838	41.953	148.838	42.934		
1.181	33.033	59.838	41.924	149.838	42.574		
1.2473	33.725	60.838	41.809	150.838	42.732		
1.3177	34.245	61.838	41.982	151.838	42.588		
1.3922	34.822	62.838	42.068	152.838	42.574		
1.4712	35.4	63.838	42.141	153.838	42.53		
1.5548	35.616	64.838	42.112	154.838	42.934		
1.6433	36.223	65.838	41.837	155.838	42.747		
1.7372	36.511	66.838	42.011	156.838	42.848		
1.8365	36.901	67.838	41.982	157.838	42.747		
1.9418	37.392	68.838	42.227	158.838	42.718		
2.0533	37.767	69.838	42.213	159.838	42.718		
2.1715	38.056	70.838	42.112	160.838	42.602		
2.2967	38.33	71.838	42.155	161.838	42.574		
2.4292	38.547	72.838	42.227	162.838	42.718		
2.5697	38.691	73.838	41.982	163.838	42.905		
2.7185	38.85	74.838	42.256	164.838	42.703		
2.876	39.008	75.838	42.357	165.838	42.862		
3.0428	39.225	76.838	42.299	166.838	42.833		
3.2197	39.441	77.838	42.054	167.838	42.963		
3.407	39.528	78.838	42.299	168.838	43.035		
3.6053	39.687	79.838	42.213	169.838	42.617		
3.8155	39.658	80.838	42.097	170.838	42.747		
4.0382	39.672	81.838	42.314	171.838	42.732		
4.274	39.745	82.838	42.141	172.838	42.559		
4.5238	39.874	83.838	42.242	173.838	42.718		
4.7885	40.048	84.838	42.054	174.838	43.035		
5.0688	40.033	85.838	42.039	175.838	43.05		
5.3657	40.12	86.838	42.068	176.838	43.007		
5.6802	40.206	87.838	42.155	177.838	42.689		
6.0133	40.163	88.838	42.386	178.838	42.804		
6.3662	40.25	89.838	42.357	179.838	42.891		
6.74	40.336	90.838	42.285	180.838	43.151		
7.136	40.452	91.838	42.256	181.838	42.992		
7.5553	40.51	92.838	42.242	182.838	42.978		
7.9997	40.495	93.838	42.169	183.838	42.992		
8.4703	40.524	94.838	42.4	184.838	42.905		
8.9688	40.712	95.838	42.169	185.838	42.747		
9.4968	40.769	96.838	42.314	186.838	43.165		
10.0562	40.697	97.838	42.198	187.838	42.66		
10.6487	40.726	98.838	42.429	188.838	42.949		
11.2762	40.74	99.838	42.458	189.838	42.992		
11.941	40.914	100.838	42.285	190.838	42.66		
12.6452	41.044	101.838	42.155	191.838	42.66		
13.391	40.914	102.838	42.126	192.838	42.877		
14.181	41.145	103.838	42.415	193.838	42.776		
15.0178	41.116	104.838	42.357	194.838	42.776		
15.9043	41.217	105.838	42.155	195.838	42.833		
16.8433	41.116	106.838	42.472	196.838	42.833		
17.838	41.274	107.838	42.444	197.838	43.05		
18.838	41.173	108.838	42.559	198.838	43.122		
19.838	41.26	109.838	42.545	199.838	42.732		

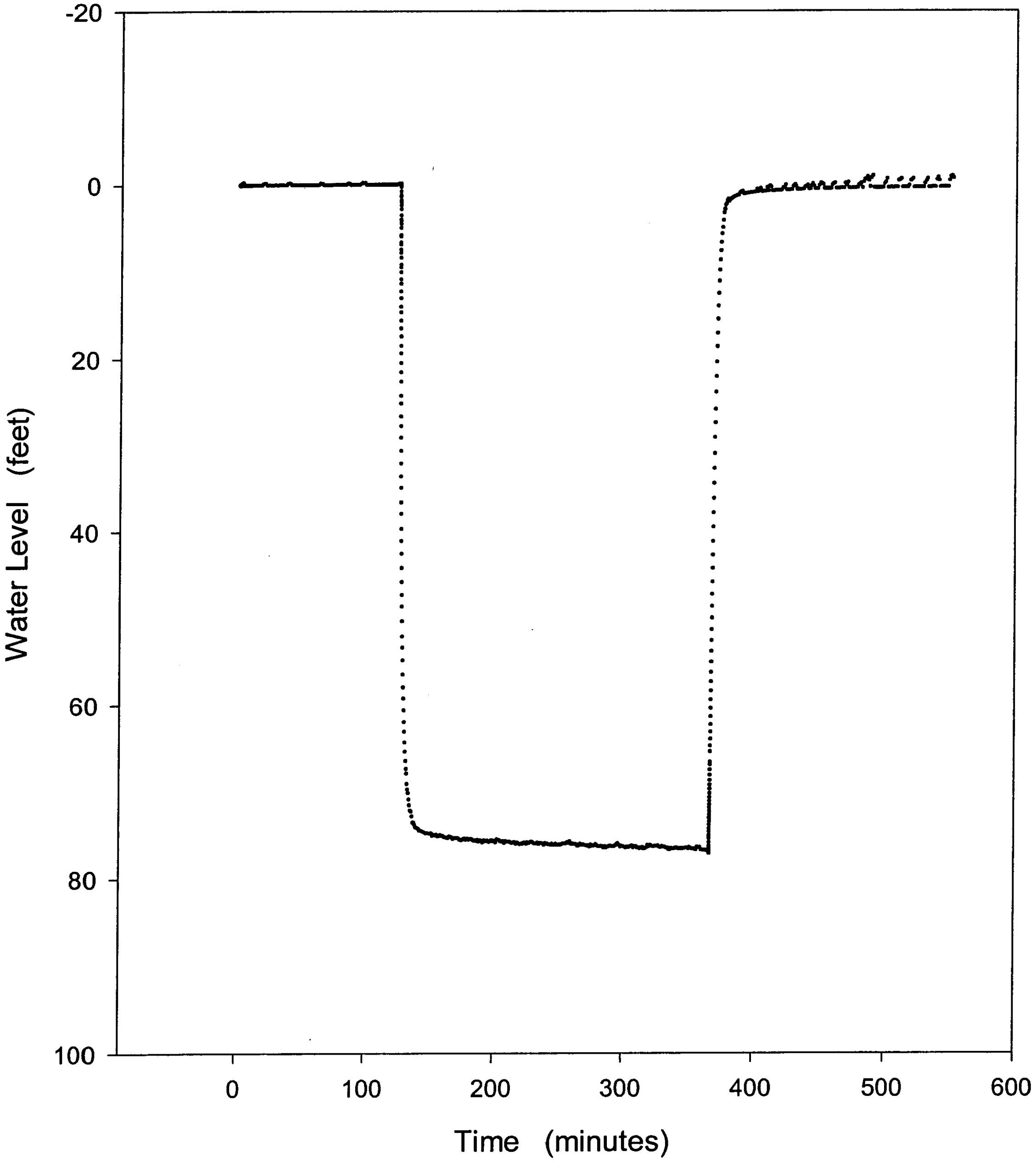
CITY OF HOLLYWOOD
IW -1
1,404 - 1,420
RECOVERY DATA

Time	Water level
0	43.209
0.0217	42.877
0.0433	42.733
0.065	43.166
0.0867	42.935
0.1083	42.848
0.13	39.182
0.1517	41.823
0.1733	40.034
0.195	38.042
0.2167	37.392
0.2383	36.31
0.26	34.837
0.2817	33.784
0.3033	32.903
0.325	31.95
0.3467	30.969
0.3683	30.002
0.39	29.063
0.4117	28.168
0.4333	27.317
0.4555	26.465
0.479	25.642
0.5038	24.776
0.5302	23.924
0.5582	23.044
0.5878	22.134
0.6192	21.21
0.6523	19.694
0.6875	18.178
0.7248	18.756
0.7643	17.457
0.8062	3.365
0.8505	3.668
0.8975	3.437
0.9473	3.119
1	2.989
1.0558	2.888
1.115	2.787
1.1777	2.73
1.244	2.657
1.3143	2.6
1.3888	2.542
1.4678	2.513
1.5515	2.455
1.64	2.412
1.7338	2.383
1.8332	2.354
1.9385	2.296
2.05	2.267
2.1682	2.224
2.2933	2.195
2.4258	2.138
2.5663	2.109
2.7152	2.065
2.8727	2.036
3.0395	1.993
3.2163	1.892
3.4037	1.849
3.602	1.805
3.8122	1.777
4.0348	1.82
4.2707	1.777
4.5205	1.733
4.7852	1.675
5.0655	1.647
5.3623	1.618
5.6768	1.574
6.01	1.546
6.3628	1.531
6.7367	1.473
7.1327	1.43
7.552	1.358
7.9963	1.343
8.467	1.314
8.9655	1.242
9.4935	1.228
10.0528	1.185
10.6453	1.127
11.2728	1.098
11.9377	1.083
12.6418	1.026
13.3877	1.026
14.1777	0.997
15.0145	0.954
15.901	0.925
16.84	0.896
17.8347	0.867
18.8347	0.838
19.8347	0.795
20.8347	0.78
21.8347	0.751
22.8347	0.722
23.8347	0.708
24.8347	0.679
25.8347	0.665
26.8347	0.65
27.8347	0.636
28.8347	0.621
29.8347	0.636
30.8347	0.679
31.8347	0.65
32.8347	0.549
33.8347	0.52
34.8347	0.506
35.8347	0.491
36.8347	0.477
37.8347	0.463
38.8347	0.463
39.8347	0.434
40.8347	0.434
41.8347	0.434
42.8347	0.463
43.8347	0.491
44.8347	0.491
45.8347	0.405
46.8347	0.39
47.8347	0.376
48.8347	0.361
49.8347	0.361
50.8347	0.39
51.8347	0.361
52.8347	0.39
53.8347	0.376
54.8347	0.304
55.8347	0.304
56.8347	0.289
57.8347	0.275
58.8347	0.275
59.8347	0.26
60.8347	0.304
61.8347	0.304
62.8347	0.26
63.8347	0.246
64.8347	0.246
65.8347	0.246
66.8347	0.232
67.8347	0.232
68.8347	0.217
69.8347	0.217
70.8347	0.217
71.8347	0.246
72.8347	0.246
73.8347	0.246
74.8347	0.174
75.8347	0.174
76.8347	0.159
77.8347	0.159
78.8347	0.174
79.8347	0.203
80.8347	0.217
81.8347	0.159
82.8347	0.145
83.8347	0.145
84.8347	0.13
85.8347	0.13
86.8347	0.13
87.8347	0.13
88.8347	0.116
89.8347	0.116
90.8347	0.13
91.8347	0.116
92.8347	0.116
93.8347	0.116
94.8347	0.102
95.8347	0.102
96.8347	0.102
97.8347	0.102
98.8347	0.102
99.8347	0.102
100.8347	0.087
101.8347	0.087
102.8347	0.087
103.8347	0.073
104.8347	0.073
105.8347	0.073
106.8347	0.073
107.8347	0.073
108.8347	0.058
109.8347	0.102
110.8347	0.102
111.8347	0.116
112.8347	0.073
113.8347	0.058
114.8347	0.058
115.8347	0.058
116.8347	0.044
117.8347	0.044
118.8347	0.044
119.8347	0.044
120.8347	0.029
121.8347	0.044
122.8347	0.029
123.8347	0.029
124.8347	0.029
125.8347	0.029
126.8347	0.029
127.8347	0.029
128.8347	0.015
129.8347	0.015
130.8347	0.015
131.8347	0.015
132.8347	0.015
133.8347	0.015
134.8347	0.029
135.8347	0.058
136.8347	0.044
137.8347	0
138.8347	0
139.8347	0
140.8347	-0.014
141.8347	-0.014
142.8347	-0.014
143.8347	-0.014
144.8347	-0.014
145.8347	-0.028
146.8347	-0.014
147.8347	-0.028
148.8347	-0.028
149.8347	-0.028
150.8347	-0.028
151.8347	-0.043
152.8347	-0.043
153.8347	-0.043
154.8347	-0.028
155.8347	-0.043
156.8347	-0.043
157.8347	-0.043
158.8347	-0.043
159.8347	-0.043
160.8347	-0.043
161.8347	-0.043
162.8347	-0.043
163.8347	-0.057
164.8347	-0.057
165.8347	-0.057
166.8347	-0.057
167.8347	-0.057
168.8347	-0.057
169.8347	-0.072
170.8347	-0.072
171.8347	-0.043
172.8347	-0.028
173.8347	-0.028
174.8347	-0.057
175.8347	-0.072
176.8347	-0.072
177.8347	-0.072
178.8347	-0.072
179.8347	-0.057
180.8347	-0.043

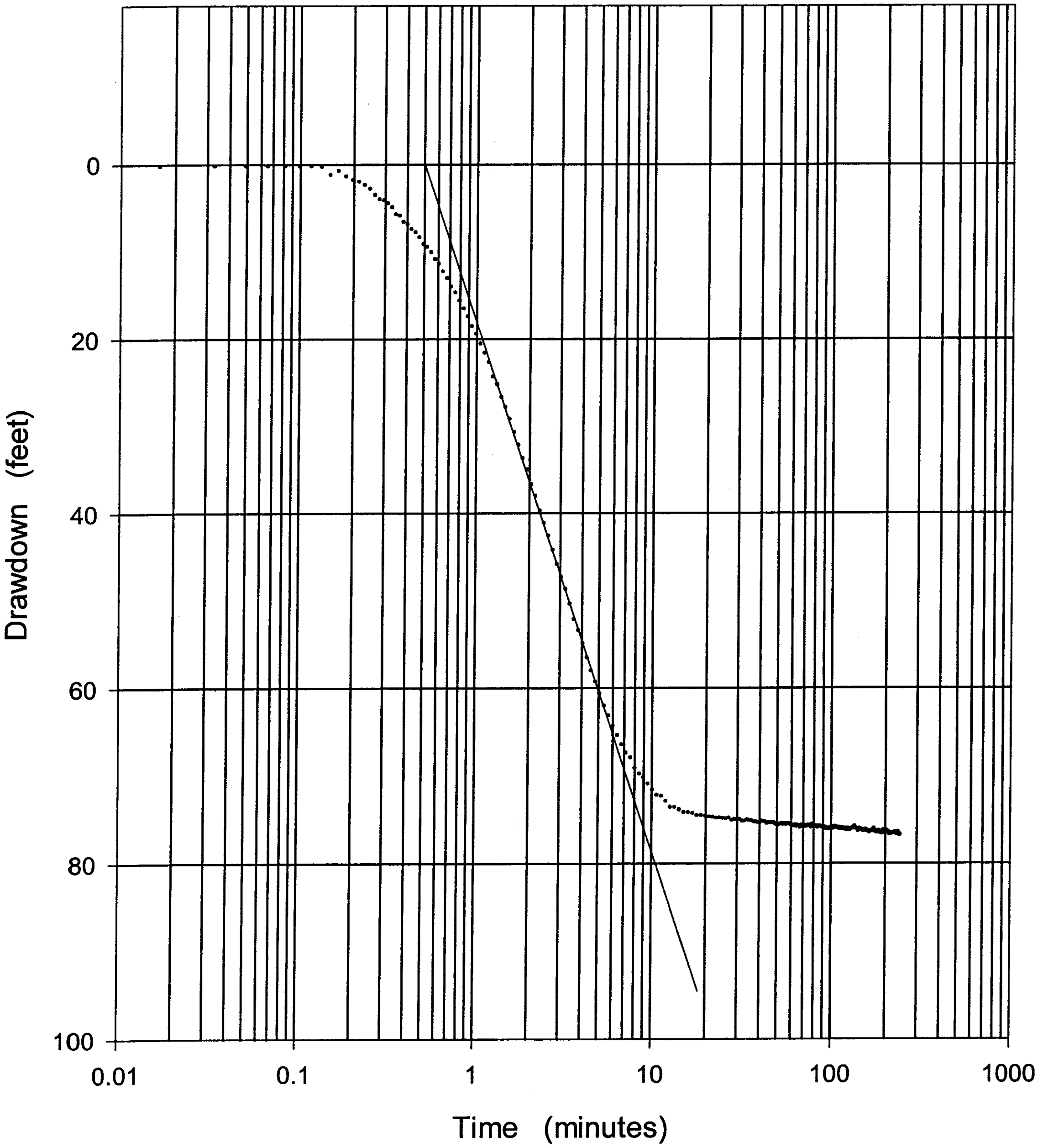
Injection Well No. 1 (IW-1) – Packer Tests

1,769 – 1,785

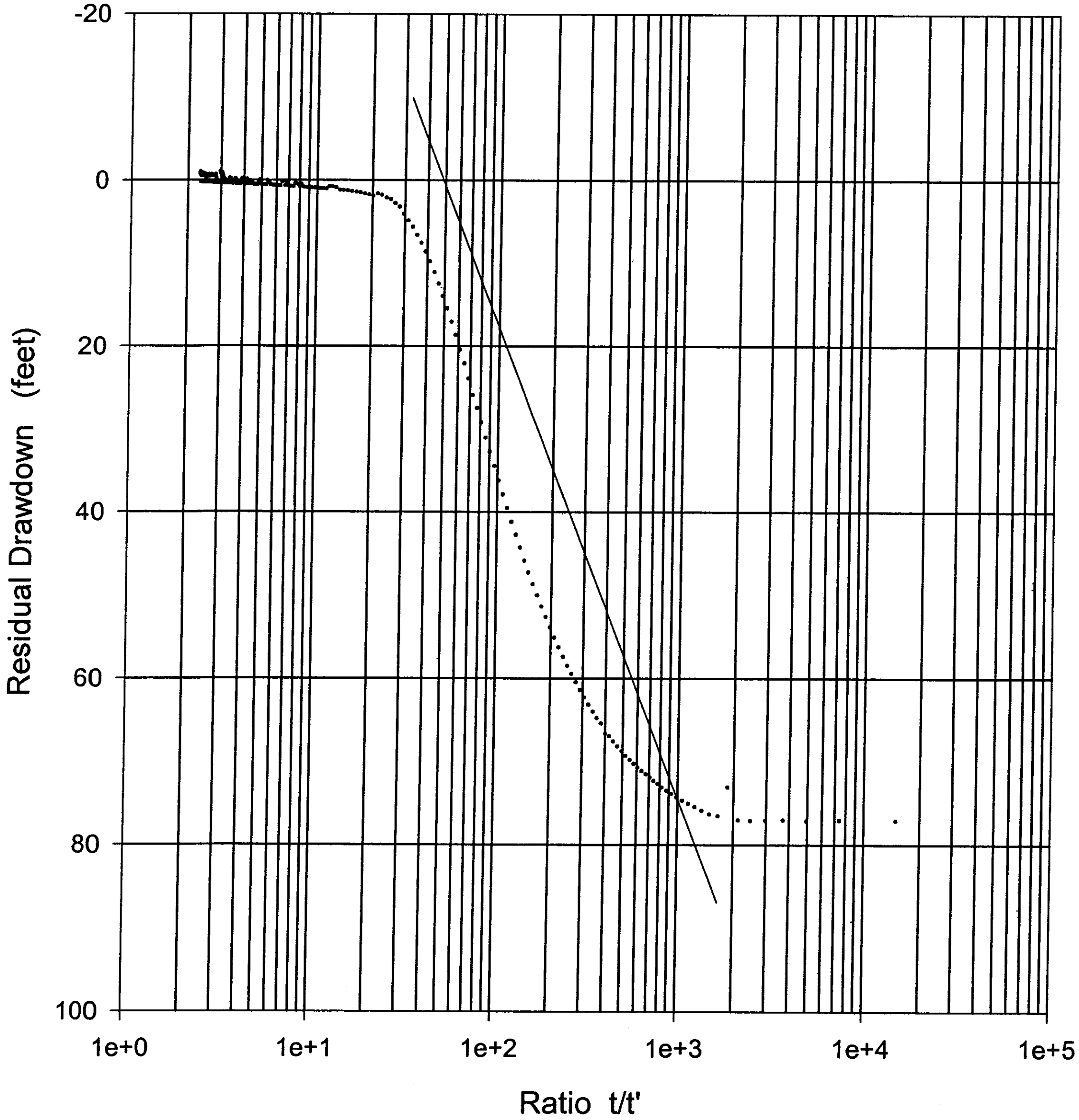
CITY OF HOLLYWOOD
IW -1
1,769 - 1,785
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
IW -1
1,769 - 1,785
DRAWDOWN



CITY OF HOLLYWOOD
IW -1
1,769 - 1,785
RESIDUAL DRWADOWN vs t/t'



CITY OF HOLLYWOOD
IW -1
1769-1785
BACKGROUND DATA

Time	Water Level	Time	Water Level	Time	Water Level
0	0	15.8882	0.029	105.8218	-0.043
0.0163	0.101	16.8272	0.029	106.8218	-0.058
0.0327	0.101	17.8218	-0.144	107.8218	-0.058
0.049	0.101	18.8218	-0.173	108.8218	-0.043
0.0653	0.087	19.8218	-0.202	109.8218	-0.058
0.0817	0.101	20.8218	0.029	110.8218	-0.058
0.098	0.101	21.8218	0.029	111.8218	-0.058
0.1143	0.087	22.8218	0.014	112.8218	-0.058
0.1307	0.087	23.8218	0.029	113.8218	-0.058
0.147	0.087	24.8218	0.029	114.8218	-0.058
0.1633	0.101	25.8218	0.029	115.8218	-0.058
0.1797	0.101	26.8218	0.014	116.8218	-0.058
0.196	0.101	27.8218	0.014	117.8218	-0.058
0.2123	0.087	28.8218	0.029	118.8218	-0.058
0.2287	0.087	29.8218	0.014	119.8218	-0.058
0.245	0.087	30.8218	0.014	120.8218	-0.058
0.2613	0.087	31.8218	0.014	121.8218	-0.058
0.2777	0.101	32.8218	0.014	122.8218	-0.13
0.294	0.101	33.8218	0.014	123.8218	-0.202
0.3103	0.101	34.8218	0.014	124.8218	-0.217
0.3267	0.101	35.8218	0		
0.3433	0.087	36.8218	-0.173		
0.361	0.101	37.8218	-0.217		
0.3797	0.101	38.8218	-0.173		
0.3995	0.087	39.8218	0.014		
0.4205	0.101	40.8218	0		
0.4427	0.087	41.8218	0.014		
0.4662	0.087	42.8218	0		
0.491	0.058	43.8218	0		
0.5173	0.029	44.8218	0		
0.5453	0.043	45.8218	0		
0.575	0.029	46.8218	-0.014		
0.6063	0.115	47.8218	0		
0.6395	-0.058	48.8218	0		
0.6747	0.014	49.8218	-0.014		
0.712	0.014	50.8218	-0.014		
0.7515	-0.043	51.8218	-0.014		
0.7933	-0.029	52.8218	-0.014		
0.8377	-0.101	53.8218	-0.014		
0.8847	-0.072	54.8218	-0.014		
0.9345	-0.058	55.8218	-0.014		
0.9872	-0.101	56.8218	-0.014		
1.043	-0.087	57.8218	-0.014		
1.1022	-0.115	58.8218	-0.014		
1.1648	-0.144	59.8218	-0.014		
1.2312	-0.087	60.8218	-0.029		
1.3015	-0.159	61.8218	-0.202		
1.376	-0.159	62.8218	-0.159		
1.455	-0.115	63.8218	-0.159		
1.5387	-0.144	64.8218	-0.014		
1.6272	-0.159	65.8218	-0.014		
1.721	-0.173	66.8218	-0.029		
1.8203	-0.159	67.8218	-0.014		
1.9257	-0.159	68.8218	-0.029		
2.0372	-0.202	69.8218	-0.014		
2.1553	-0.245	70.8218	-0.029		
2.2805	-0.159	71.8218	-0.029		
2.413	-0.245	72.8218	-0.029		
2.5535	-0.26	73.8218	-0.029		
2.7023	-0.217	74.8218	-0.029		
2.8598	-0.217	75.8218	-0.029		
3.0267	0.058	76.8218	-0.029		
3.2035	0.058	77.8218	-0.029		
3.3908	0.058	78.8218	-0.029		
3.5892	0.043	79.8218	-0.029		
3.7993	0.043	80.8218	-0.029		
4.022	0.043	81.8218	-0.029		
4.2578	0.043	82.8218	-0.144		
4.5077	0.043	83.8218	-0.188		
4.7723	0.043	84.8218	-0.159		
5.0527	0.043	85.8218	-0.014		
5.3495	0.043	86.8218	-0.029		
5.664	0.043	87.8218	-0.029		
5.9972	0.043	88.8218	-0.029		
6.35	0.043	89.8218	-0.029		
6.7238	0.043	90.8218	-0.029		
7.1198	0.043	91.8218	-0.043		
7.5392	0.043	92.8218	-0.043		
7.9835	0.043	93.8218	-0.173		
8.4542	0.043	94.8218	-0.26		
8.9527	0.029	95.8218	-0.231		
9.4807	0.029	96.8218	-0.289		
10.04	0.029	97.8218	-0.029		
10.6325	0.029	98.8218	-0.043		
11.26	0.029	99.8218	-0.043		
11.9248	0.029	100.8218	-0.043		
12.629	0.029	101.8218	-0.043		
13.3748	0.029	102.8218	-0.043		
14.1648	0.029	103.8218	-0.043		
15.0017	0.029	104.8218	-0.058		

CITY OF HOLLYWOOD
IW -1
1,769 -1,785
DRAWDOWN DATA

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	0	15.8882	74.16	105.8218	75.805	195.8218	76.31
0.0163	0.144	16.8272	74.261	106.8218	75.92	196.8218	76.151
0.0327	0.159	17.8218	74.478	107.8218	75.992	197.8218	76.252
0.049	0.159	18.8218	74.492	108.8218	75.978	198.8218	76.339
0.0653	0.144	19.8218	74.564	109.8218	75.863	199.8218	76.295
0.0817	0.144	20.8218	74.651	110.8218	76.064	200.8218	76.266
0.098	0.159	21.8218	74.694	111.8218	75.92	201.8218	76.281
0.1143	0.159	22.8218	74.781	112.8218	75.935	202.8218	76.238
0.1307	0.231	23.8218	74.766	113.8218	75.964	203.8218	76.396
0.147	1.169	24.8218	74.809	114.8218	76.108	204.8218	76.44
0.1633	0.722	25.8218	74.853	115.8218	75.92	205.8218	76.324
0.1797	1.328	26.8218	74.781	116.8218	75.964	206.8218	76.382
0.196	1.79	27.8218	75.069	117.8218	76.05	207.8218	76.382
0.2123	1.949	28.8218	74.939	118.8218	76.093	208.8218	76.483
0.2287	2.324	29.8218	74.997	119.8218	76.137	209.8218	76.483
0.245	2.757	30.8218	74.925	120.8218	76.007	210.8218	76.685
0.2613	3.465	31.8218	75.141	121.8218	76.18	211.8218	76.656
0.2777	3.955	32.8218	75.127	122.8218	76.18	212.8218	76.526
0.294	4.071	33.8218	74.997	123.8218	75.992	213.8218	76.569
0.3103	4.446	34.8218	75.069	124.8218	76.137	214.8218	76.569
0.3267	4.894	35.8218	75.084	125.8218	76.18	215.8218	76.512
0.3433	5.702	36.8218	75.228	126.8218	76.079	216.8218	76.483
0.361	5.861	37.8218	75.242	127.8218	76.122	217.8218	76.512
0.3797	6.554	38.8218	75.3	128.8218	75.992	218.8218	76.598
0.3995	6.799	39.8218	75.329	129.8218	76.021	219.8218	76.541
0.4205	7.391	40.8218	75.141	130.8218	75.964	220.8218	76.598
0.4427	7.766	41.8218	75.199	131.8218	75.992	221.8218	76.512
0.4662	8.329	42.8218	75.242	132.8218	75.819	222.8218	76.541
0.491	9.109	43.8218	75.43	133.8218	75.906	223.8218	76.497
0.5173	9.427	44.8218	75.329	134.8218	75.718	224.8218	76.483
0.5453	10.018	45.8218	75.358	135.8218	76.036	225.8218	76.584
0.575	10.827	46.8218	75.314	136.8218	76.007	226.8218	76.396
0.6063	11.346	47.8218	75.343	137.8218	76.064	227.8218	76.541
0.6395	12.227	48.8218	75.502	138.8218	76.021	228.8218	76.569
0.6747	12.992	49.8218	75.588	139.8218	76.122	229.8218	76.598
0.712	13.973	50.8218	75.588	140.8218	76.281	230.8218	76.613
0.7515	14.637	51.8218	75.459	141.8218	76.108	231.8218	76.699
0.7933	15.59	52.8218	75.387	142.8218	76.007	232.8218	76.382
0.8377	16.499	53.8218	75.545	143.8218	76.151	233.8218	76.44
0.8847	17.409	54.8218	75.415	144.8218	76.064	234.8218	76.411
0.9345	18.506	55.8218	75.545	145.8218	76.137	235.8218	76.699
0.9872	19.372	56.8218	75.459	146.8218	76.165	236.8218	76.728
1.043	20.498	57.8218	75.43	147.8218	76.238	237.8218	76.742
1.1022	21.551	58.8218	75.502	148.8218	76.151	238.8218	76.742
1.1648	22.648	59.8218	75.661	149.8218	76.339	239.8218	76.8
1.2312	24.279	60.8218	75.632	150.8218	76.122	240.8218	76.714
1.3015	25.145	61.8218	75.675	151.8218	76.252	241.8218	76.685
1.376	26.632	62.8218	75.56	152.8218	76.223		
1.455	27.786	63.8218	75.762	153.8218	76.151		
1.5387	29.114	64.8218	75.574	154.8218	76.079		
1.6272	30.615	65.8218	75.661	155.8218	76.223		
1.721	32.101	66.8218	75.863	156.8218	76.295		
1.8203	33.617	67.8218	75.574	157.8218	76.295		
1.9257	34.93	68.8218	75.733	158.8218	76.252		
2.0372	36.633	69.8218	75.733	159.8218	76.295		
2.1553	37.931	70.8218	75.617	160.8218	76.454		
2.2805	39.663	71.8218	75.776	161.8218	76.324		
2.413	41.063	72.8218	75.675	162.8218	76.454		
2.5535	42.535	73.8218	75.588	163.8218	76.367		
2.7023	44.18	74.8218	75.733	164.8218	76.324		
2.8598	45.796	75.8218	75.646	165.8218	76.238		
3.0267	47.297	76.8218	75.848	166.8218	76.266		
3.2035	48.638	77.8218	75.487	167.8218	76.339		
3.3908	50.341	78.8218	75.56	168.8218	76.31		
3.5892	52.101	79.8218	75.574	169.8218	76.223		
3.7993	53.371	80.8218	75.747	170.8218	76.122		
4.022	54.843	81.8218	75.762	171.8218	75.978		
4.2578	56.488	82.8218	75.689	172.8218	76.151		
4.5077	57.974	83.8218	75.92	173.8218	76.367		
4.7723	59.243	84.8218	75.689	174.8218	76.252		
5.0527	60.614	85.8218	75.747	175.8218	76.295		
5.3495	61.97	86.8218	75.747	176.8218	76.353		
5.664	63.081	87.8218	75.762	177.8218	76.483		
5.9972	64.322	88.8218	75.877	178.8218	76.367		
6.35	65.36	89.8218	75.906	179.8218	76.411		
6.7238	66.442	90.8218	75.834	180.8218	76.382		
7.1198	67.366	91.8218	75.834	181.8218	76.281		
7.5392	67.9	92.8218	76.021	182.8218	76.238		
7.9835	69.111	93.8218	75.877	183.8218	76.483		
8.4542	69.746	94.8218	75.964	184.8218	76.31		
8.9527	70.15	95.8218	76.079	185.8218	76.324		
9.4807	70.886	96.8218	75.992	186.8218	76.454		
10.04	71.549	97.8218	76.021	187.8218	76.44		
10.6325	72.155	98.8218	75.906	188.8218	76.555		
11.26	72.271	99.8218	75.877	189.8218	76.468		
11.9248	72.833	100.8218	76.021	190.8218	76.396		
12.629	73.554	101.8218	75.834	191.8218	76.598		
13.3748	73.54	102.8218	75.978	192.8218	76.541		
14.1648	73.829	103.8218	75.848	193.8218	76.44		
15.0017	74.132	104.8218	75.762	194.8218	76.151		

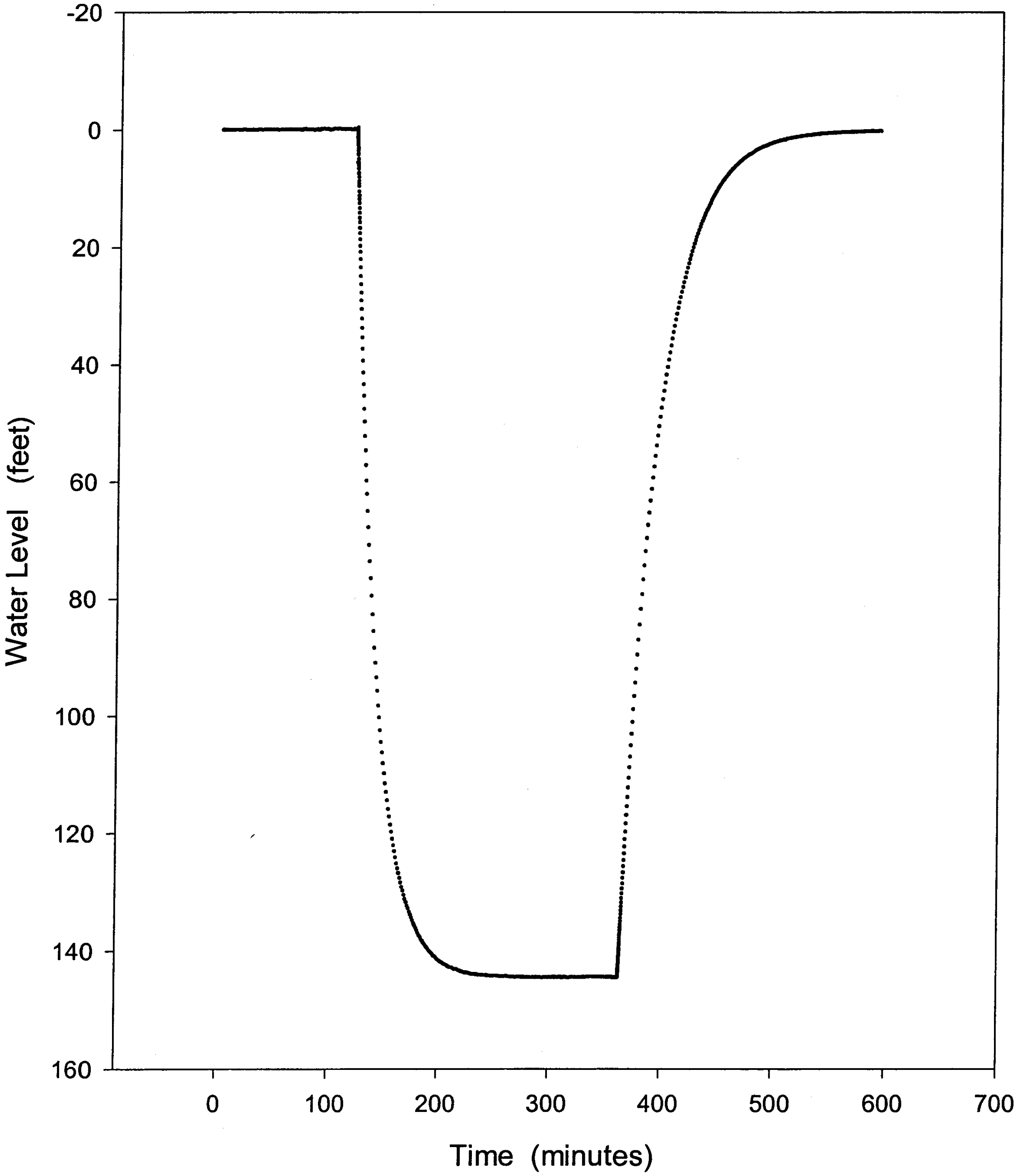
CITY OF HOLLYWOOD
IW -1
1,769 - 1,785
RECOVERY DATA

Time	Water Level
0	76.685
0.0163	77.089
0.0327	77.017
0.049	77.118
0.0653	76.988
0.0817	77.046
0.098	77.06
0.1143	77.002
0.1307	73.05
0.147	76.526
0.1633	76.281
0.1797	75.848
0.196	75.401
0.2123	75.026
0.2287	74.622
0.245	74.247
0.2613	73.843
0.2777	73.454
0.294	73.064
0.3103	72.675
0.3267	72.271
0.3433	71.881
0.361	71.506
0.3797	71.102
0.3995	70.67
0.4205	70.222
0.4427	69.746
0.4662	69.256
0.491	68.736
0.5173	68.131
0.5453	67.539
0.575	66.933
0.6063	66.63
0.6395	65.433
0.6747	64.755
0.712	63.976
0.7515	63.153
0.7933	62.302
0.8377	61.379
0.8847	60.441
0.9345	59.46
0.9872	58.45
1.043	57.382
1.1022	56.271
1.1648	55.088
1.2312	53.876
1.3015	52.621
1.376	51.366
1.455	50.009
1.5387	48.668
1.6272	47.268
1.721	45.839
1.8203	44.267
1.9257	42.737
2.0372	41.164
2.1553	39.519
2.2805	37.874
2.413	36.2
2.5535	34.439
2.7023	32.708
2.8598	30.99
3.0267	29.143
3.2035	27.44
3.3908	25.867
3.5892	23.89
3.7993	22.085
4.022	20.44
4.2578	18.636
4.5077	17.077
4.7723	15.46
5.0527	13.959
5.3495	12.487
5.664	11.087
5.9972	9.802
6.35	8.633
6.7238	7.565
7.1198	6.597
7.5392	5.63
7.9835	4.894
8.4542	4.086
8.9527	3.205
9.4807	2.786
10.04	2.31
10.6325	2.137
11.26	1.805
11.9248	1.646
12.629	1.906
13.3748	1.761
14.1648	1.631
15.0017	1.516
15.8882	1.429
16.8272	1.357
17.8218	1.285
18.8218	1.242
19.8218	1.198
20.8218	0.91
21.8218	0.809
22.8218	0.765
23.8218	1.054
24.8218	1.025
25.8218	0.996
26.8218	0.967
27.8218	0.953
28.8218	0.924
29.8218	0.91
30.8218	0.881
31.8218	0.866
32.8218	0.852
33.8218	0.505
34.8218	0.809
35.8218	0.505
36.8218	0.404
37.8218	0.794
38.8218	0.765
39.8218	0.751
40.8218	0.751
41.8218	0.303
42.8218	0.693
43.8218	0.145
44.8218	0.26
45.8218	0.708
46.8218	0.693
47.8218	0.679
48.8218	0.664
49.8218	0.664
50.8218	0.65
51.8218	0.635
52.8218	0.621
53.8218	0.361
54.8218	0.303
55.8218	0.029
56.8218	0.607
57.8218	0.592
58.8218	0.592
59.8218	0.578
60.8218	0.578
61.8218	0.188
62.8218	-0.014
63.8218	0.202
64.8218	0.563
65.8218	0.549
66.8218	0.549
67.8218	0.534
68.8218	0.534
69.8218	0.52
70.8218	0.26
71.8218	0.217
72.8218	0.072
73.8218	0.52
74.8218	0.52
75.8218	0.159
76.8218	-0.115
77.8218	0.173
78.8218	0.491
79.8218	0.491
80.8218	0.477
81.8218	0.087
82.8218	-0.187
83.8218	-0.115
84.8218	-0.014
85.8218	0.462
86.8218	0.462
87.8218	0.462
88.8218	0.448
89.8218	0.448
90.8218	0.448
91.8218	0.029
92.8218	-0.115
93.8218	-0.173
94.8218	0.433
95.8218	0.433
96.8218	0.433
97.8218	0.419
98.8218	0.419
99.8218	0.419
100.8218	0.404
101.8218	-0.144
102.8218	0.043
103.8218	-0.231
104.8218	0.419
105.8218	0.404
106.8218	0.39
107.8218	0.39
108.8218	0.39
109.8218	0.376
110.8218	0.376
111.8218	0.043
112.8218	-0.043
113.8218	-0.159
114.8218	0.376
115.8218	-0.303
116.8218	-0.606
117.8218	-0.577
118.8218	-0.866
119.8218	-0.462
120.8218	0.246
121.8218	-0.779
122.8218	-1.025
123.8218	0.361
124.8218	0.347
125.8218	0.361
126.8218	0.347
127.8218	0.347
128.8218	0.347
129.8218	0.347
130.8218	0.332
131.8218	-0.086
132.8218	-0.274
133.8218	-0.678
134.8218	0.332
135.8218	0.332
136.8218	0.318
137.8218	0.318
138.8218	0.332
139.8218	0.318
140.8218	0.318
141.8218	0.318
142.8218	-0.462
143.8218	-0.548
144.8218	-0.664
145.8218	0.318
146.8218	0.318
147.8218	0.318
148.8218	0.303
149.8218	0.303
150.8218	0.087
151.8218	-0.433
152.8218	-0.548
153.8218	-0.678
154.8218	0.303
155.8218	0.289
156.8218	0.289
157.8218	0.289
158.8218	0.289
159.8218	0.289
160.8218	0.289
161.8218	0.289
162.8218	-0.144
163.8218	-0.404
164.8218	-0.693
165.8218	0.289
166.8218	0.289
167.8218	0.274
168.8218	0.274
169.8218	0.274
170.8218	0.274
171.8218	-0.548
172.8218	-0.808
173.8218	-0.476
174.8218	0.274
175.8218	0.26
176.8218	0.26
177.8218	0.26
178.8218	0.26
179.8218	0.26
180.8218	0.26
181.8218	-0.476
182.8218	-0.924
183.8218	-0.981
184.8218	-0.751

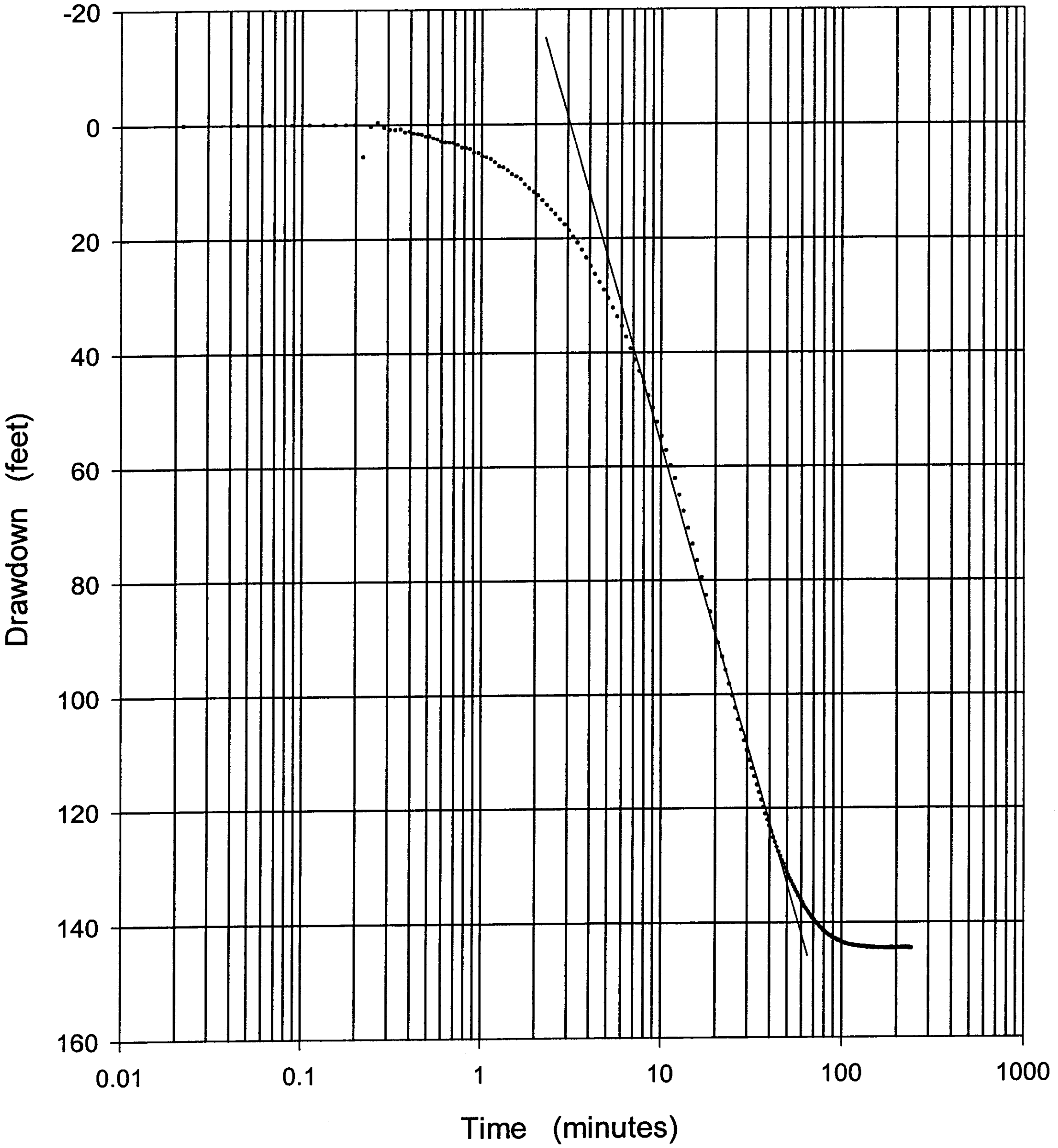
Injection Well No. 1 (IW-1) – Packer Tests

1,894 – 1,910

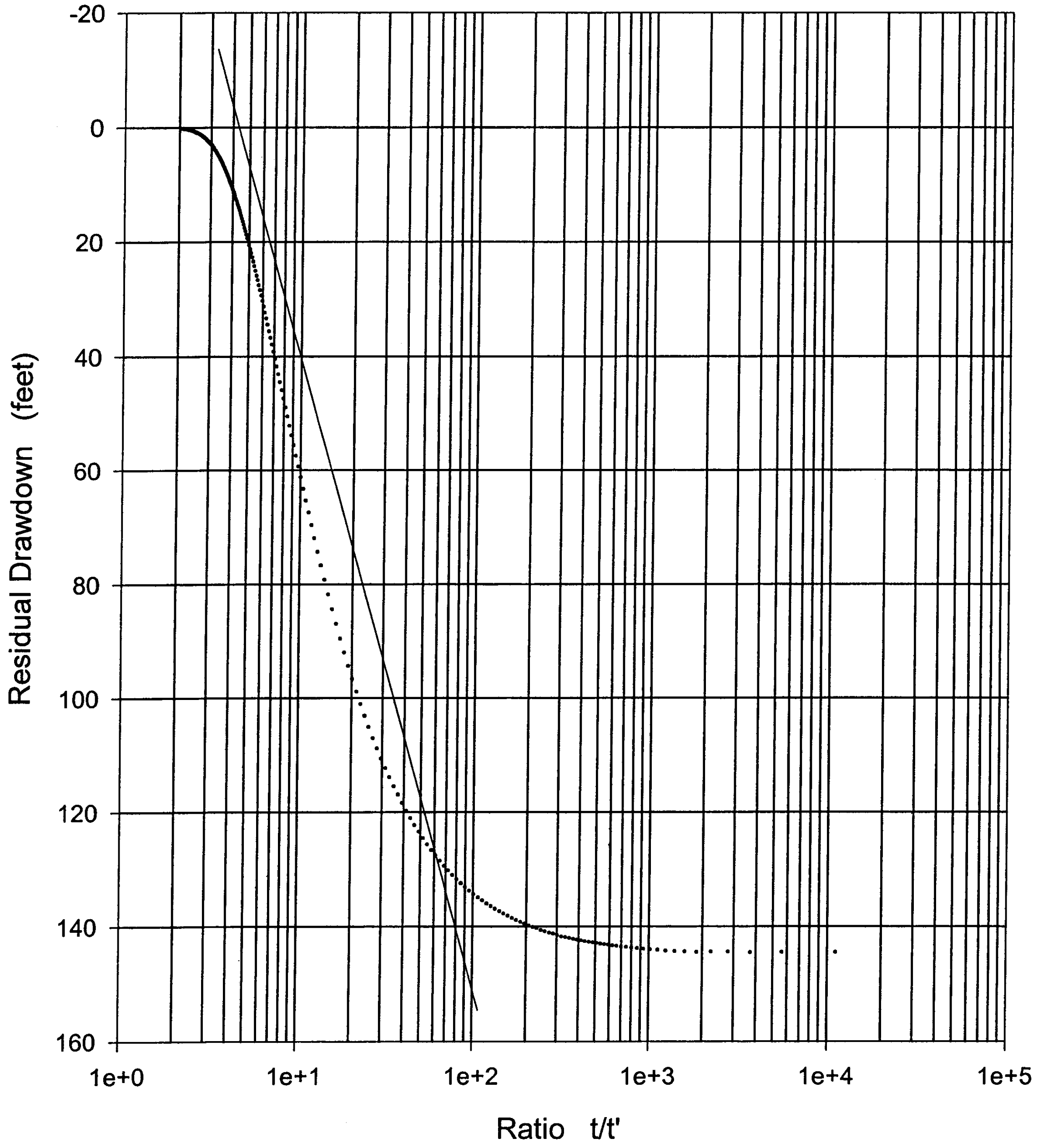
CITY OF HOLLYWOOD
IW -1
1,894 - 1,910
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
IW -1
1,894 - 1,910
DRAWDOWN



CITY OF HOLLYWOOD
1,894 - 1,910
RESIDUAL DRAWDOWN vs t/t'



CITY OF HOLLYWOOD
IW -1
1,894 - 1,910
BACKGROUND DATA

Time	Water Level
0	0
0.0218	0
0.0437	-0.014
0.0655	-0.014
0.0873	-0.014
0.1092	-0.014
0.131	-0.014
0.1528	-0.014
0.1747	-0.014
0.1965	-0.014
0.2183	-0.014
0.2402	-0.014
0.262	-0.014
0.2838	-0.014
0.3057	-0.014
0.3275	-0.014
0.3493	-0.014
0.3712	-0.014
0.393	-0.014
0.4148	-0.014
0.4367	-0.014
0.4588	-0.014
0.4823	-0.014
0.5072	-0.014
0.5335	-0.014
0.5615	-0.014
0.5912	-0.014
0.6225	-0.014
0.6557	-0.014
0.6908	-0.014
0.7282	-0.014
0.7677	0.029
0.8095	-0.043
0.8538	-0.014
0.9008	-0.043
0.9507	-0.043
1.0033	-0.043
1.0592	-0.043
1.1183	-0.043
1.181	-0.043
1.2473	-0.043
1.3177	-0.043
1.3922	-0.043
1.4712	-0.043
1.5548	-0.043
1.6433	-0.043
1.7372	-0.043
1.8365	-0.043
1.9418	-0.043
2.0533	-0.043
2.1715	-0.043
2.2967	-0.043
2.4292	-0.043
2.5697	-0.043
2.7185	-0.043
2.876	-0.043
3.0428	-0.043
3.2197	-0.058
3.407	0.014
3.6053	0.014
3.8155	0.014
4.0382	0.014
4.274	0
4.5238	0
4.7885	0
5.0688	0
5.3657	-0.014
5.6802	-0.014
6.0133	-0.014
6.3662	-0.014
6.74	-0.014
7.136	-0.014
7.5553	-0.014
7.9997	-0.029
8.4703	-0.014
8.9688	-0.029
9.4968	-0.029
10.0562	-0.029
10.6487	-0.029
11.2762	-0.029
11.941	-0.029
12.6452	-0.029
13.391	-0.029
14.181	-0.029
15.0178	-0.014
15.9043	-0.014
16.8433	-0.029
17.838	-0.087
18.838	-0.072
19.838	-0.072
20.838	-0.029
21.838	-0.029
22.838	-0.043
23.838	-0.043
24.838	-0.043
25.838	-0.043
26.838	-0.058
27.838	-0.029
28.838	-0.029
29.838	-0.043
30.838	-0.043
31.838	-0.115
32.838	-0.087
33.838	-0.087
34.838	-0.029
35.838	-0.043
36.838	-0.058
37.838	-0.058
38.838	-0.058
39.838	-0.072
40.838	-0.058
41.838	-0.058
42.838	-0.058
43.838	-0.058
44.838	-0.101
45.838	-0.087
46.838	-0.072
47.838	-0.115
48.838	-0.101
49.838	-0.029
50.838	-0.058
51.838	-0.072
52.838	-0.072
53.838	-0.058
54.838	-0.072
55.838	-0.072
56.838	-0.058
57.838	-0.115
58.838	-0.115
59.838	-0.115
60.838	-0.115
61.838	-0.115
62.838	-0.115
63.838	-0.115
64.838	-0.115
65.838	-0.115
66.838	-0.072
67.838	-0.101
68.838	-0.101
69.838	-0.087
70.838	0.029
71.838	-0.159
72.838	-0.188
73.838	-0.202
74.838	-0.101
75.838	-0.101
76.838	-0.101
77.838	-0.115
78.838	-0.101
79.838	-0.115
80.838	-0.101
81.838	-0.014
82.838	-0.101
83.838	-0.101
84.838	-0.159
85.838	-0.029
86.838	-0.043
87.838	-0.217
88.838	-0.188
89.838	-0.217
90.838	-0.231
91.838	-0.188
92.838	-0.159
93.838	-0.202
94.838	-0.188
95.838	-0.029
96.838	-0.058
97.838	-0.058
98.838	-0.173
99.838	-0.231
100.838	-0.202
101.838	-0.188
102.838	-0.231
103.838	-0.202
104.838	-0.217
105.838	-0.188
106.838	-0.173
107.838	-0.144
108.838	-0.144
109.838	-0.13
110.838	-0.13
111.838	-0.159
112.838	-0.159
113.838	-0.13
114.838	-0.13
115.838	-0.101
116.838	-0.101
117.838	-0.217
118.838	-0.159
119.838	-0.173
120.838	-0.101

CITY OF HOLLYWOOD
IW -1
1,894 - 1,910
DRAWDOWN DATA

Time	Water Level
0	0
0.0218	-0.029
0.0437	-0.043
0.0655	-0.043
0.0873	-0.043
0.1092	-0.043
0.131	-0.043
0.1528	-0.043
0.1747	-0.043
0.1965	-0.043
0.2183	5.587
0.2402	0.318
0.262	-0.404
0.2838	0.491
0.3057	0.808
0.3275	0.895
0.3493	0.765
0.3712	1.314
0.393	1.169
0.4148	1.516
0.4367	1.646
0.4588	1.689
0.4823	2.079
0.5072	2.021
0.5335	2.396
0.5615	2.584
0.5912	2.902
0.6225	3.075
0.6557	3.147
0.6908	3.176
0.7282	3.522
0.7677	4.028
0.8095	4.057
0.8538	4.259
0.9008	4.937
0.9507	4.98
1.0033	5.558
1.0592	5.731
1.1183	6.049
1.181	6.583
1.2473	7.305
1.3177	7.507
1.3922	8.055
1.4712	8.705
1.5548	9.08
1.6433	9.6
1.7372	10.509
1.8365	11.202
1.9418	11.823
2.0533	12.472
2.1715	13.338
2.2967	14.132
2.4292	14.984
2.5697	15.749
2.7185	16.716
2.876	17.568
3.0428	18.65
3.2197	19.733
3.407	20.743
3.6053	21.999
3.8155	23.37
4.0382	24.871
4.274	26.242
4.5238	27.685
4.7885	29.027
5.0688	30.499
5.3657	32.13
5.6802	33.718
6.0133	35.363
6.3662	37.282
6.74	39.317
7.136	41.352
7.5553	43.314
7.9997	45.277
8.4703	47.542
8.9688	49.706
9.4968	52.159
10.0562	54.641
10.6487	57.166
11.2762	59.792
11.941	62.1
12.6452	64.985
13.391	67.813
14.181	70.828
15.0178	73.598
15.9043	76.497
16.8433	79.483
17.838	82.628
18.838	85.527
19.838	88.368
20.838	90.993
21.838	93.445
22.838	95.738
23.838	98.219
24.838	100.281
25.838	102.43
26.838	104.449
27.838	106.252
28.838	108.126
29.838	109.828
30.838	111.53
31.838	112.986
32.838	114.442
33.838	115.913
34.838	117.211
35.838	118.552
36.838	119.777
37.838	120.96
38.838	122.055
39.838	123.079
40.838	124.117
41.838	125.141
42.838	125.977
43.838	126.799
44.838	127.621
45.838	128.399
46.838	129.163
47.838	129.769
48.838	130.504
49.838	131.182
50.838	131.744
51.838	132.306
52.838	132.796
53.838	133.344
54.838	133.834
55.838	134.31
56.838	134.815
57.838	135.319
58.838	135.694
59.838	136.127
60.838	136.458
61.838	136.948
62.838	137.338
63.838	137.626
64.838	137.943
65.838	138.246
66.838	138.592
67.838	138.866
68.838	139.154
69.838	139.37
70.838	139.572
71.838	139.904
72.838	140.105
73.838	140.264
74.838	140.509
75.838	140.783
76.838	140.855
77.838	141.042
78.838	141.316
79.838	141.417
80.838	141.561
81.838	141.763
82.838	141.864
83.838	141.965
84.838	142.138
85.838	142.239
86.838	142.325
87.838	142.383
88.838	142.599
89.838	142.643
90.838	142.758
91.838	142.758
92.838	142.83
93.838	142.96
94.838	143.104
95.838	143.046
96.838	143.089
97.838	143.176
98.838	143.291
99.838	143.32
100.838	143.435
101.838	143.479
102.838	143.551
103.838	143.637
104.838	143.709
105.838	143.623
106.838	143.666
107.838	143.724
108.838	143.796
109.838	143.825
110.838	143.897
111.838	143.897
112.838	143.926
113.838	143.954
114.838	143.926
115.838	144.012
116.838	144.041
117.838	144.026
118.838	144.041
119.838	144.07
120.838	144.084
121.838	144.113
122.838	144.113
123.838	144.084
124.838	144.214
125.838	144.171
126.838	144.199
127.838	144.185
128.838	144.228
129.838	144.185
130.838	144.228
131.838	144.185
132.838	144.185
133.838	144.199
134.838	144.243
135.838	144.243
136.838	144.358
137.838	144.3
138.838	144.372
139.838	144.271
140.838	144.243
141.838	144.228
142.838	144.315
143.838	144.329
144.838	144.344
145.838	144.401
146.838	144.344
147.838	144.358
148.838	144.329
149.838	144.444
150.838	144.444
151.838	144.372
152.838	144.372
153.838	144.372
154.838	144.416
155.838	144.416
156.838	144.416
157.838	144.416
158.838	144.444
159.838	144.444
160.838	144.416
161.838	144.459
162.838	144.459
163.838	144.488
164.838	144.473
165.838	144.43
166.838	144.473
167.838	144.473
168.838	144.43
169.838	144.444
170.838	144.459
171.838	144.444
172.838	144.488
173.838	144.502
174.838	144.488
175.838	144.459
176.838	144.488
177.838	144.416
178.838	144.444
179.838	144.502
180.838	144.416
181.838	144.488
182.838	144.43
183.838	144.43
184.838	144.358
185.838	144.517
186.838	144.401
187.838	144.517
188.838	144.416
189.838	144.43
190.838	144.372
191.838	144.502
192.838	144.517
193.838	144.344
194.838	144.43
195.838	144.43
196.838	144.488
197.838	144.502
198.838	144.488
199.838	144.416
200.838	144.444
201.838	144.387
202.838	144.444
203.838	144.387
204.838	144.473
205.838	144.473
206.838	144.459
207.838	144.459
208.838	144.416
209.838	144.459
210.838	144.401
211.838	144.416
212.838	144.416
213.838	144.387
214.838	144.344
215.838	144.387
216.838	144.372
217.838	144.344
218.838	144.372
219.838	144.372
220.838	144.401
221.838	144.401
222.838	144.387
223.838	144.401
224.838	144.344
225.838	144.329
226.838	144.401
227.838	144.43
228.838	144.372
229.838	144.43
230.838	144.459
231.838	144.416
232.838	144.416
233.838	144.43
234.838	144.43
235.838	144.43
236.838	144.416
237.838	144.56
238.838	144.459
239.838	144.488
240.838	144.531
241.838	144.473

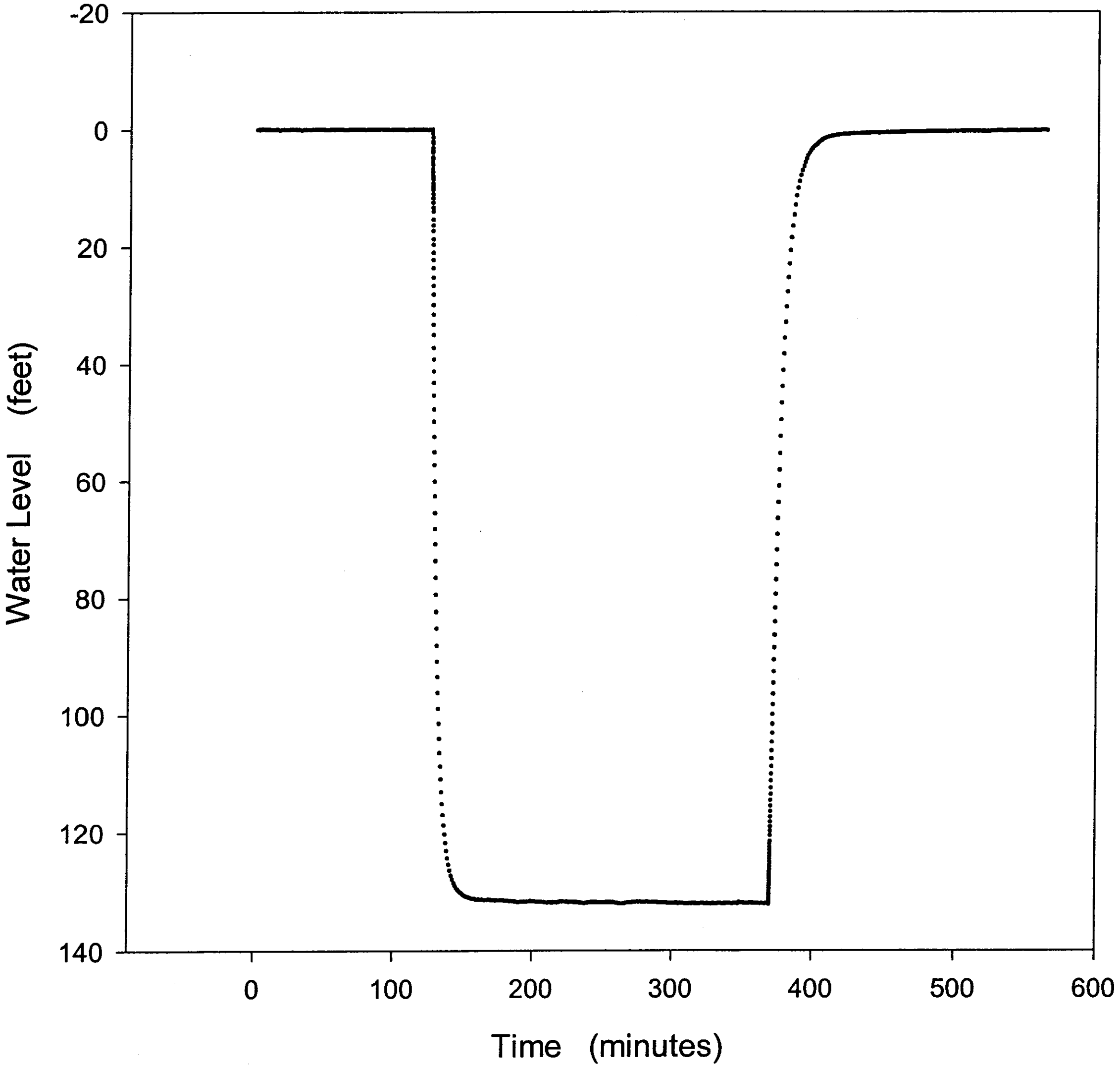
CITY OF HOLLYWOOD
IW -1
1,894 - 1,910
RECOVERY DATA

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	144.473	20.8347	74.319	110.8347	4.23	200.8347	0.346
0.0217	144.502	21.8347	71.924	111.8347	4.1	201.8347	0.332
0.0433	144.444	22.8347	69.645	112.8347	4.042	202.8347	0.317
0.065	144.516	23.8347	67.438	113.8347	3.941	203.8347	0.317
0.0867	144.43	24.8347	65.303	114.8347	3.811	204.8347	0.303
0.1083	144.415	25.8347	63.24	115.8347	3.609	205.8347	0.303
0.13	144.473	26.8347	61.234	116.8347	3.493	206.8347	0.289
0.1517	144.372	27.8347	59.315	117.8347	3.407	207.8347	0.274
0.1733	144.329	28.8347	57.425	118.8347	3.277	208.8347	0.274
0.195	144.242	29.8347	55.579	119.8347	3.19	209.8347	0.274
0.2167	144.084	30.8347	53.833	120.8347	3.089	210.8347	0.26
0.2383	143.997	31.8347	52.145	121.8347	3.003	211.8347	0.274
0.26	143.911	32.8347	50.514	122.8347	2.916	212.8347	0.332
0.2817	143.81	33.8347	48.913	123.8347	2.815	213.8347	0.216
0.3033	143.695	34.8347	47.369	124.8347	2.728	214.8347	0.202
0.325	143.608	35.8347	45.911	125.8347	2.656	215.8347	0.216
0.3467	143.522	36.8347	44.468	126.8347	2.569	216.8347	0.231
0.3683	143.406	37.8347	43.083	127.8347	2.512	217.8347	0.245
0.39	143.305	38.8347	41.727	128.8347	2.425	218.8347	0.216
0.4117	143.204	39.8347	40.413	129.8347	2.338	219.8347	0.216
0.4333	143.104	40.8347	39.158	130.8347	2.281	220.8347	0.144
0.4555	143.003	41.8347	37.917	131.8347	2.237	221.8347	0.173
0.479	142.902	42.8347	36.719	132.8347	2.18	222.8347	0.202
0.5038	142.801	43.8347	35.565	133.8347	2.064	223.8347	0.216
0.5302	142.686	44.8347	34.439	134.8347	2.035	224.8347	0.187
0.5582	142.57	45.8347	33.371	135.8347	1.949	225.8347	0.187
0.5878	142.426	46.8347	32.303	136.8347	1.905	226.8347	0.187
0.6192	142.296	47.8347	31.293	137.8347	1.848	227.8347	0.115
0.6523	142.167	48.8347	30.297	138.8347	1.79	228.8347	0.173
0.6875	142.008	49.8347	29.359	139.8347	1.747		
0.7248	141.849	50.8347	28.435	140.8347	1.689		
0.7643	141.749	51.8347	27.541	141.8347	1.646		
0.8062	141.489	52.8347	26.704	142.8347	1.646		
0.8505	141.273	53.8347	25.881	143.8347	1.617		
0.8975	141.071	54.8347	25.058	144.8347	1.487		
0.9473	140.84	55.8347	24.236	145.8347	1.458		
1	140.61	56.8347	23.427	146.8347	1.415		
1.0558	140.35	57.8347	22.691	147.8347	1.371		
1.115	140.105	58.8347	21.97	148.8347	1.342		
1.1777	139.802	59.8347	21.277	149.8347	1.299		
1.244	139.514	60.8347	20.613	150.8347	1.27		
1.3143	139.211	61.8347	19.963	151.8347	1.227		
1.3888	138.894	62.8347	19.343	152.8347	1.198		
1.4678	138.534	63.8347	18.736	153.8347	1.169		
1.5515	138.159	64.8347	18.13	154.8347	1.111		
1.64	137.77	65.8347	17.582	155.8347	1.083		
1.7338	137.366	66.8347	17.019	156.8347	1.054		
1.8332	136.934	67.8347	16.485	157.8347	1.025		
1.9385	136.472	68.8347	15.965	158.8347	0.996		
2.05	135.997	69.8347	15.474	159.8347	0.967		
2.1682	135.478	70.8347	14.984	160.8347	0.938		
2.2933	134.944	71.8347	14.522	161.8347	0.924		
2.4258	134.382	72.8347	14.06	162.8347	0.895		
2.5663	133.777	73.8347	13.627	163.8347	0.866		
2.7152	133.142	74.8347	13.266	164.8347	0.837		
2.8727	132.479	75.8347	12.847	165.8347	0.88		
3.0395	131.787	76.8347	12.472	166.8347	0.794		
3.2163	131.052	77.8347	11.981	167.8347	0.823		
3.4037	130.244	78.8347	11.606	168.8347	0.736		
3.602	129.437	79.8347	11.245	169.8347	0.736		
3.8122	128.558	80.8347	10.899	170.8347	0.707		
4.0348	127.62	81.8347	10.552	171.8347	0.693		
4.2707	126.669	82.8347	10.22	172.8347	0.678		
4.5205	125.66	83.8347	9.888	173.8347	0.722		
4.7852	124.593	84.8347	9.6	174.8347	0.592		
5.0655	123.454	85.8347	9.282	175.8347	0.606		
5.3623	122.315	86.8347	8.993	176.8347	0.563		
5.6768	121.06	87.8347	8.719	177.8347	0.563		
6.01	119.763	88.8347	8.459	178.8347	0.563		
6.3628	118.378	89.8347	8.185	179.8347	0.577		
6.7367	116.951	90.8347	7.925	180.8347	0.534		
7.1327	115.466	91.8347	7.68	181.8347	0.52		
7.552	113.894	92.8347	7.449	182.8347	0.52		
7.9963	112.279	93.8347	7.203	183.8347	0.505		
8.467	110.592	94.8347	7.001	184.8347	0.491		
8.9655	108.818	95.8347	6.77	185.8347	0.476		
9.4935	107.016	96.8347	6.554	186.8347	0.447		
10.0528	105.083	97.8347	6.352	187.8347	0.462		
10.6453	103.093	98.8347	6.164	188.8347	0.462		
11.2728	101.031	99.8347	5.962	189.8347	0.433		
11.9377	98.882	100.8347	5.789	190.8347	0.433		
12.6418	96.647	101.8347	5.601	191.8347	0.433		
13.3877	94.354	102.8347	5.428	192.8347	0.404		
14.1777	92.003	103.8347	5.255	193.8347	0.39		
15.0145	89.565	104.8347	5.096	194.8347	0.39		
15.901	86.998	105.8347	4.937	195.8347	0.375		
16.84	84.431	106.8347	4.793	196.8347	0.375		
17.8347	81.777	107.8347	4.634	197.8347	0.361		
18.8347	79.223	108.8347	4.504	198.8347	0.346		
19.8347	76.728	109.8347	4.36	199.8347	0.332		

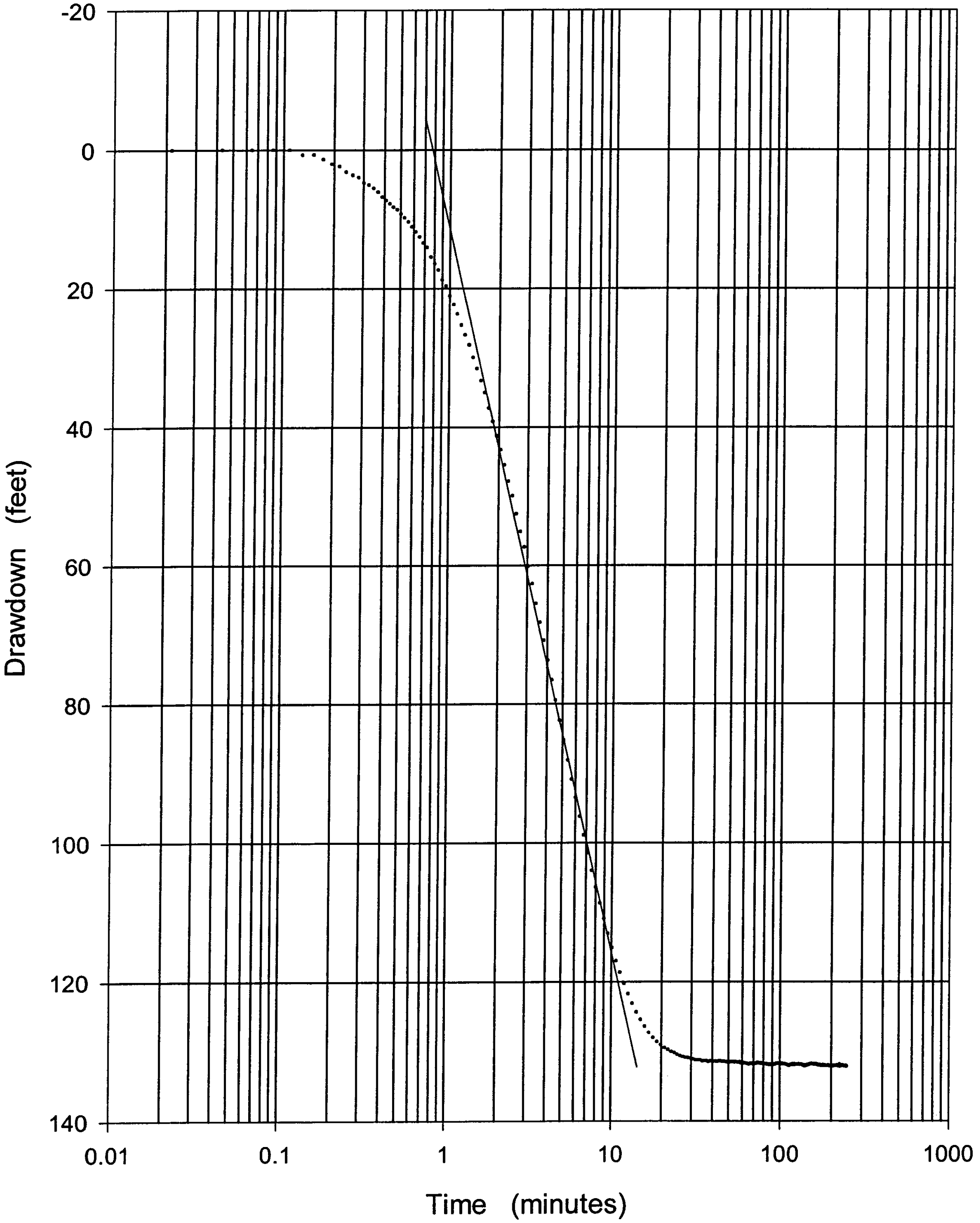
Injection Well No. 1 (IW-1) – Packer Tests

1,959 – 1,975

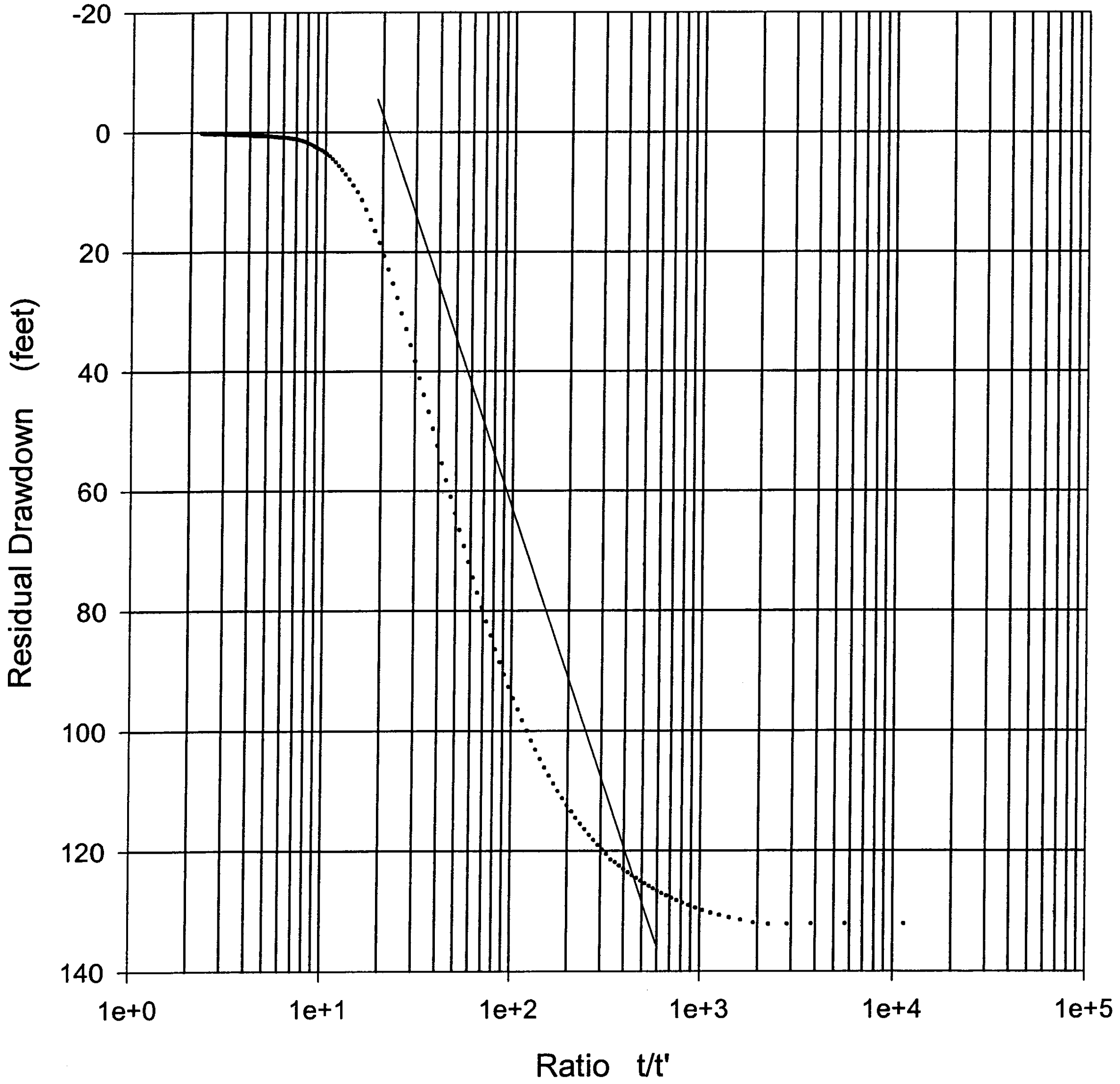
CITY OF HOLLYWOOD
IW -1
1,959 - 1,975
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
IW - 1
1,959 - 1975
DRAWDOWN



CITY OF HOLLYWOOD
IW -1
1,959 - 1,975
RESIDUAL DRAWDOWN vs t/t'



CITY OF HOLLYWOOD
IW-1
1959 - 1975
BACKGROUND DATA

Time	Water Level
0	0
0.0217	0
0.0433	0
0.065	0
0.0867	0
0.1083	0
0.13	0
0.1517	0.014
0.1733	0
0.195	0
0.2167	0
0.2383	0
0.26	0
0.2817	0
0.3033	0.014
0.325	0
0.3467	0
0.3683	0.014
0.39	0
0.4117	0
0.4333	0.014
0.4555	0
0.479	0
0.5038	0.014
0.5302	0
0.5582	0
0.5878	0
0.6192	0
0.6523	-0.014
0.6875	-0.014
0.7248	-0.014
0.7643	-0.072
0.8062	0.014
0.8505	0.014
0.8975	0.029
0.9473	0.029
1	0.029
1.0558	0.029
1.115	0.014
1.1777	0.014
1.244	0.014
1.3143	0.014
1.3888	0.014
1.4678	0.014
1.5515	0.014
1.64	0
1.7338	0
1.8332	-0.029
1.9385	-0.029
2.05	0.014
2.1682	-0.029
2.2933	-0.029
2.4258	-0.014
2.5663	-0.029
2.7152	-0.043
2.8727	-0.043
3.0395	-0.043
3.2163	-0.087
3.4037	-0.101
3.602	-0.101
3.8122	-0.087
4.0348	-0.058
4.2707	-0.058
4.5205	-0.043
4.7852	-0.043
5.0655	-0.043
5.3623	-0.029
5.6768	-0.029
6.01	-0.029
6.3628	0
6.7367	-0.014
7.1327	-0.014
7.552	-0.014
7.9963	-0.014
8.467	-0.014
8.9655	-0.014
9.4935	0
10.0528	-0.014
10.6453	-0.014
11.2728	-0.014
11.9377	-0.014
12.6418	-0.029
13.3877	-0.014
14.1777	-0.029
15.0145	0.014
15.901	0.043
16.84	0.014
17.8347	-0.043
18.8347	-0.014
19.8347	-0.029
20.8347	-0.029
21.8347	-0.029
22.8347	-0.029
23.8347	-0.043
24.8347	-0.043
25.8347	-0.043
26.8347	-0.043
27.8347	-0.029
28.8347	-0.029
29.8347	-0.029
30.8347	0.029
31.8347	0.029
32.8347	-0.029
33.8347	-0.014
34.8347	-0.029
35.8347	-0.043
36.8347	-0.043
37.8347	-0.029
38.8347	-0.043
39.8347	-0.043
40.8347	-0.043
41.8347	-0.043
42.8347	-0.043
43.8347	-0.043
44.8347	-0.043
45.8347	-0.043
46.8347	-0.043
47.8347	-0.029
48.8347	0.014
49.8347	0.014
50.8347	0.029
51.8347	-0.029
52.8347	-0.043
53.8347	-0.043
54.8347	-0.029
55.8347	-0.043
56.8347	-0.043
57.8347	-0.043
58.8347	-0.043
59.8347	-0.043
60.8347	-0.014
61.8347	0
62.8347	0.029
63.8347	0
64.8347	-0.029
65.8347	-0.043
66.8347	-0.043
67.8347	-0.043
68.8347	-0.043
69.8347	-0.043
70.8347	-0.043
71.8347	-0.043
72.8347	-0.043
73.8347	-0.043
74.8347	-0.043
75.8347	-0.029
76.8347	0.014
77.8347	0.014
78.8347	-0.029
79.8347	-0.043
80.8347	-0.043
81.8347	-0.043
82.8347	-0.043
83.8347	-0.043
84.8347	-0.043
85.8347	-0.043
86.8347	-0.043
87.8347	-0.043
88.8347	-0.043
89.8347	-0.043
90.8347	-0.043
91.8347	-0.043
92.8347	-0.014
93.8347	0
94.8347	0.014
95.8347	-0.014
96.8347	-0.029
97.8347	-0.043
98.8347	-0.029
99.8347	-0.043
100.8347	-0.029
101.8347	-0.043
102.8347	-0.043
103.8347	-0.043
104.8347	0
105.8347	0.029
106.8347	0.029
107.8347	-0.029
108.8347	-0.029
109.8347	-0.029
110.8347	-0.029
111.8347	-0.029
112.8347	-0.043
113.8347	-0.029
114.8347	-0.043
115.8347	-0.029
116.8347	-0.029
117.8347	-0.029
118.8347	-0.029
119.8347	-0.014
120.8347	0.014
121.8347	0.029
122.8347	-0.014
123.8347	-0.014
124.8347	0.029

CITY OF HOLLYWOOD
IW-1
1959 - 1975
DRAWDOWN DATA

Time	Water Level
0	0
0.0215	0
0.043	-0.029
0.0645	-0.029
0.086	-0.029
0.1075	-0.029
0.129	0.693
0.1505	0.65
0.172	1.328
0.1935	2.007
0.215	2.31
0.2365	3.133
0.258	3.58
0.2795	3.912
0.301	4.721
0.3225	4.995
0.344	5.471
0.3655	6.005
0.387	6.77
0.4085	7.247
0.43	7.723
0.4522	8.171
0.4757	8.546
0.5005	9.181
0.5268	9.758
0.5548	10.336
0.5845	11.057
0.6158	11.765
0.649	12.486
0.6842	13.353
0.7215	14.002
0.761	15.402
0.8028	16.34
0.8472	17.293
0.8942	18.707
0.944	19.602
0.9967	21.017
1.0525	22.258
1.1117	23.6
1.1743	25.231
1.2407	26.645
1.311	28.103
1.3855	29.907
1.4645	31.509
1.5482	33.27
1.6367	34.987
1.7305	37.209
1.8298	39.186
1.9352	41.25
2.0467	43.212
2.1648	45.42
2.29	47.786
2.4225	49.893
2.563	52.49
2.7118	55.102
2.8693	57.338
3.0362	60.137
3.213	62.662
3.4003	65.532
3.5987	68.23
3.8088	70.841
4.0315	73.712
4.2673	76.539
4.5172	79.453
4.7818	82.367
5.0622	85.222
5.359	88.122
5.6735	90.876
6.0067	93.487
6.3595	96.198
6.7333	98.895
7.1293	101.447
7.5487	104
7.993	106.423
8.4637	108.73
8.9622	110.936
9.4902	113.07
10.0495	115.089
10.642	116.992
11.2695	118.708
11.9343	120.265
12.6385	121.736
13.3843	123.106
14.1743	124.345
15.0112	125.427
15.8977	126.407
16.8367	127.301
17.8313	127.993
18.8313	128.599
19.8313	129.06
20.8313	129.492
21.8313	129.752
22.8313	130.04
23.8313	130.213
24.8313	130.444
25.8313	130.631
26.8313	130.761
27.8313	130.905
28.8313	130.92
29.8313	131.021
30.8313	131.121
31.8313	131.251
32.8313	131.251
33.8313	131.251
34.8313	131.395
35.8313	131.381
36.8313	131.367
37.8313	131.467
38.8313	131.381
39.8313	131.424
40.8313	131.439
41.8313	131.424
42.8313	131.467
43.8313	131.381
44.8313	131.41
45.8313	131.496
46.8313	131.439
47.8313	131.511
48.8313	131.554
49.8313	131.496
50.8313	131.554
51.8313	131.496
52.8313	131.511
53.8313	131.554
54.8313	131.54
55.8313	131.568
56.8313	131.626
57.8313	131.554
58.8313	131.655
59.8313	131.64
60.8313	131.655
61.8313	131.684
62.8313	131.713
63.8313	131.77
64.8313	131.828
65.8313	131.828
66.8313	131.785
67.8313	131.756
68.8313	131.785
69.8313	131.727
70.8313	131.799
71.8313	131.741
72.8313	131.727
73.8313	131.626
74.8313	131.741
75.8313	131.713
76.8313	131.684
77.8313	131.785
78.8313	131.756
79.8313	131.799
80.8313	131.813
81.8313	131.813
82.8313	131.828
83.8313	131.828
84.8313	131.886
85.8313	131.914
86.8313	131.9
87.8313	131.9
88.8313	131.9
89.8313	131.929
90.8313	131.857
91.8313	131.9
92.8313	131.886
93.8313	131.857
94.8313	131.785
95.8313	131.741
96.8313	131.713
97.8313	131.756
98.8313	131.77
99.8313	131.77
100.8313	131.741
101.8313	131.857
102.8313	131.77
103.8313	131.813
104.8313	131.828
105.8313	131.799
106.8313	131.857
107.8313	131.857
108.8313	131.886
109.8313	131.972
110.8313	131.943
111.8313	131.986
112.8313	132.059
113.8313	132.001
114.8313	131.943
115.8313	131.929
116.8313	131.9
117.8313	131.857
118.8313	131.857
119.8313	131.929
120.8313	131.871
121.8313	131.857
122.8313	131.914
123.8313	131.886
124.8313	131.886
125.8313	131.886
126.8313	131.886
127.8313	131.929
128.8313	131.857
129.8313	131.9
130.8313	131.871
131.8313	131.871
132.8313	131.9
133.8313	131.871
134.8313	131.914
135.8313	131.972
136.8313	132.03
137.8313	132.044
138.8313	132.116
139.8313	132.087
140.8313	132.102
141.8313	132.059
142.8313	131.958
143.8313	131.972
144.8313	131.929
145.8313	131.929
146.8313	131.943
147.8313	131.871
148.8313	131.842
149.8313	131.828
150.8313	131.813
151.8313	131.828
152.8313	131.77
153.8313	131.828
154.8313	131.828
155.8313	131.828
156.8313	131.842
157.8313	131.799
158.8313	131.828
159.8313	131.9
160.8313	131.886
161.8313	131.886
162.8313	131.842
163.8313	131.871
164.8313	131.857
165.8313	131.914
166.8313	131.958
167.8313	131.943
168.8313	131.986
169.8313	131.943
170.8313	131.986
171.8313	131.943
172.8313	132.015
173.8313	131.986
174.8313	132.015
175.8313	132.001
176.8313	132.044
177.8313	132.015
178.8313	131.943
179.8313	132.087
180.8313	132.015
181.8313	132.03
182.8313	132.059
183.8313	132.073
184.8313	132.087
185.8313	132.102
186.8313	132.087
187.8313	132.087
188.8313	132.073
189.8313	132.087
190.8313	132.03
191.8313	132.102
192.8313	132.073
193.8313	132.087
194.8313	132.087
195.8313	132.116
196.8313	132.073
197.8313	132.044
198.8313	132.073
199.8313	132.159
200.8313	132.073
201.8313	132.131
202.8313	132.116
203.8313	132.145
204.8313	132.059
205.8313	132.059
206.8313	132.087
207.8313	132.087
208.8313	132.044
209.8313	132.073
210.8313	132.044
211.8313	132.087
212.8313	132.073
213.8313	132.102
214.8313	132.015
215.8313	132.03
216.8313	132.073
217.8313	132.073
218.8313	132.102
219.8313	132.059
220.8313	132.001
221.8313	132.044
222.8313	132.131
223.8313	131.842
224.8313	131.958
225.8313	131.972
226.8313	132.001
227.8313	132.015
228.8313	132.044
229.8313	132.087
230.8313	132.03
231.8313	132.001
232.8313	132.03
233.8313	132.015
234.8313	132.059
235.8313	132.102
236.8313	132.073
237.8313	132.087
238.8313	132.087
239.8313	132.073
240.8313	132.116
241.8313	132.102
242.8313	132.073
243.8313	132.059
244.8313	132.159

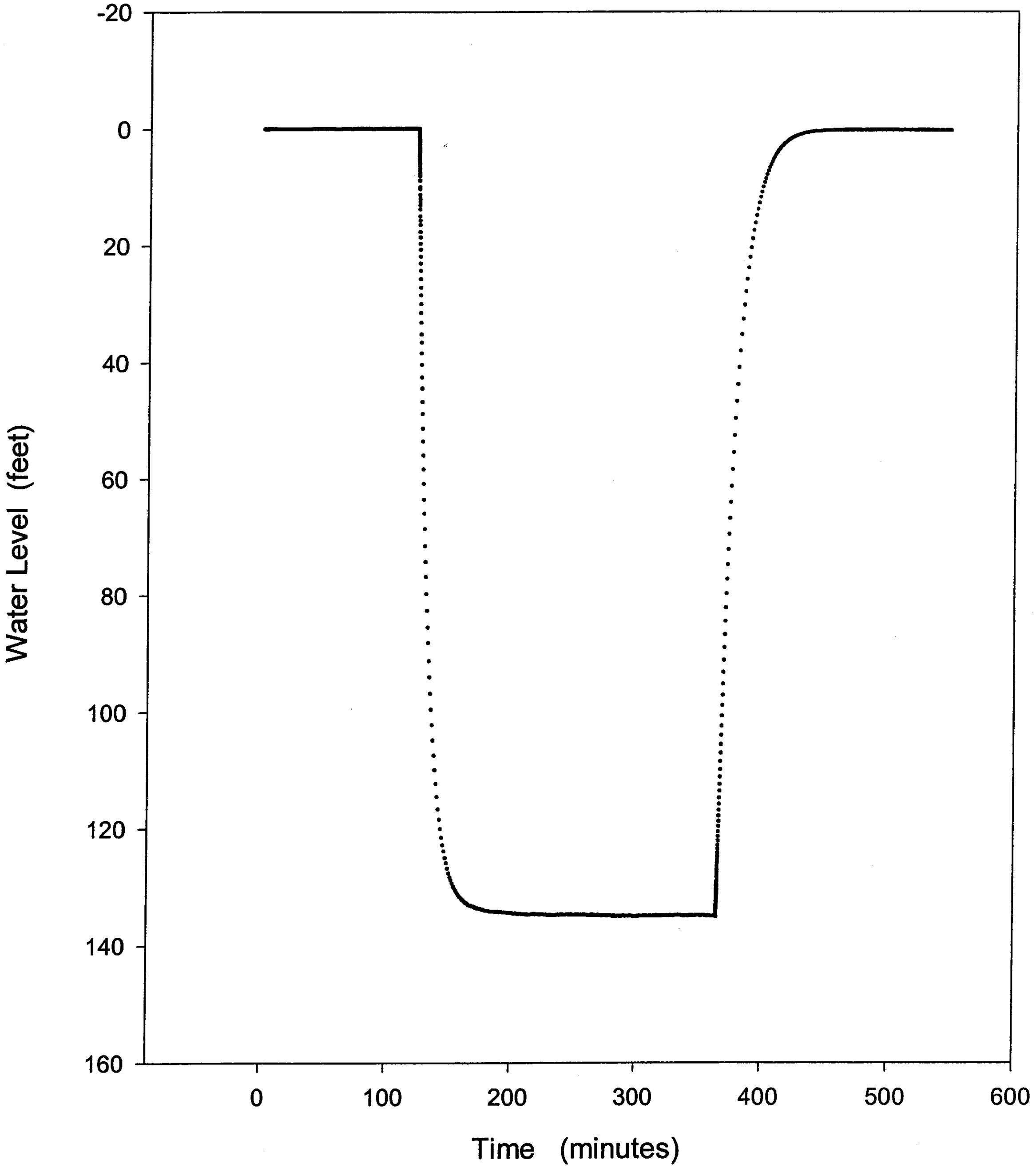
CITY OF HOLLYWOOD
1959 - 1975
IW-1
RECOVERY DATA

Time	Water Level
0	0
0.0215	0
0.043	-0.014
0.0645	-0.029
0.086	0.014
0.1075	0.043
0.129	-0.202
0.1505	-0.663
0.172	-1.052
0.1935	-1.456
0.215	-1.86
0.2365	-2.263
0.258	-2.682
0.2795	-3.085
0.301	-3.474
0.3225	-3.893
0.344	-4.296
0.3655	-4.7
0.387	-5.075
0.4085	-5.478
0.43	-5.882
0.4522	-6.3
0.4757	-6.704
0.5005	-7.151
0.5268	-7.598
0.5548	-8.045
0.5845	-8.549
0.6158	-9.112
0.649	-9.66
0.6842	-10.265
0.7215	-10.654
0.761	-11.62
0.8028	-12.356
0.8472	-13.105
0.8942	-13.913
0.944	-14.778
0.9967	-15.715
1.0525	-16.638
1.1117	-17.619
1.1743	-18.657
1.2407	-19.738
1.311	-20.892
1.3855	-22.089
1.4645	-23.343
1.5482	-24.655
1.6367	-26.025
1.7305	-27.482
1.8298	-28.996
1.9352	-30.553
2.0467	-32.212
2.1648	-33.914
2.29	-35.716
2.4225	-37.562
2.563	-39.495
2.7118	-41.514
2.8693	-43.591
3.0362	-45.754
3.213	-48.048
3.4003	-50.341
3.5987	-52.721
3.8088	-55.173
4.0315	-57.698
4.2673	-60.28
4.5172	-62.92
4.7818	-65.617
5.0622	-68.358
5.359	-71.157
5.6735	-73.942
6.0067	-76.755
6.3595	-79.669
6.7333	-82.526
7.1293	-85.369
7.5487	-88.211
7.993	-91.025
8.4637	-93.825
8.9622	-96.567
9.4902	-99.251
10.0495	-101.877
10.642	-104.432
11.2695	-106.871
11.9343	-109.238
12.6385	-111.504
13.3843	-113.654
14.1743	-115.646
15.0112	-117.494
15.8977	-119.226
16.8367	-120.799
17.8313	-122.113
18.8313	-123.253
19.8313	-124.249
20.8313	-125.086
21.8313	-125.837
22.8313	-126.515
23.8313	-127.136
24.8313	-127.67
25.8313	-128.132
26.8313	-128.522
27.8313	-128.854
28.8313	-129.157
29.8313	-129.373
30.8313	-129.59
31.8313	-129.807
32.8313	-130.037
33.8313	-130.225
34.8313	-130.384
35.8313	-130.514
36.8313	-130.629
37.8313	-130.745
38.8313	-130.831
39.8313	-130.904
40.8313	-130.961
41.8313	-131.034
42.8313	-131.077
43.8313	-131.135
44.8313	-131.163
45.8313	-131.207
46.8313	-131.25
47.8313	-131.265
48.8313	-131.293
49.8313	-131.322
50.8313	-131.322
51.8313	-131.308
52.8313	-131.308
53.8313	-131.366
54.8313	-131.394
55.8313	-131.409
56.8313	-131.423
57.8313	-131.438
58.8313	-131.452
59.8313	-131.467
60.8313	-131.467
61.8313	-131.481
62.8313	-131.496
63.8313	-131.496
64.8313	-131.51
65.8313	-131.524
66.8313	-131.524
67.8313	-131.539
68.8313	-131.539
69.8313	-131.553
70.8313	-131.553
71.8313	-131.568
72.8313	-131.582
73.8313	-131.553
74.8313	-131.539
75.8313	-131.553
76.8313	-131.553
77.8313	-131.611
78.8313	-131.625
79.8313	-131.625
80.8313	-131.625
81.8313	-131.64
82.8313	-131.64
83.8313	-131.64
84.8313	-131.654
85.8313	-131.654
86.8313	-131.669
87.8313	-131.669
88.8313	-131.669
89.8313	-131.683
90.8313	-131.683
91.8313	-131.683
92.8313	-131.698
93.8313	-131.698
94.8313	-131.712
95.8313	-131.712
96.8313	-131.712
97.8313	-131.726
98.8313	-131.712
99.8313	-131.726
100.8313	-131.726
101.8313	-131.741
102.8313	-131.741
103.8313	-131.712
104.8313	-131.698
105.8313	-131.683
106.8313	-131.741
107.8313	-131.741
108.8313	-131.755
109.8313	-131.755
110.8313	-131.77
111.8313	-131.77
112.8313	-131.77
113.8313	-131.77
114.8313	-131.77
115.8313	-131.784
116.8313	-131.784
117.8313	-131.784
118.8313	-131.799
119.8313	-131.784
120.8313	-131.755
121.8313	-131.755
122.8313	-131.741
123.8313	-131.784
124.8313	-131.799
125.8313	-131.813
126.8313	-131.813
127.8313	-131.813
128.8313	-131.828
129.8313	-131.828
130.8313	-131.828
131.8313	-131.828
132.8313	-131.828
133.8313	-131.842
134.8313	-131.842
135.8313	-131.842
136.8313	-131.842
137.8313	-131.842
138.8313	-131.856
139.8313	-131.856
140.8313	-131.871
141.8313	-131.871
142.8313	-131.856
143.8313	-131.871
144.8313	-131.871
145.8313	-131.856
146.8313	-131.828
147.8313	-131.828
148.8313	-131.813
149.8313	-131.828
150.8313	-131.799
151.8313	-131.828
152.8313	-131.813
153.8313	-131.813
154.8313	-131.885
155.8313	-131.9
156.8313	-131.9
157.8313	-131.9
158.8313	-131.914
159.8313	-131.914
160.8313	-131.914
161.8313	-131.914
162.8313	-131.885
163.8313	-131.842
164.8313	-131.842
165.8313	-131.914
166.8313	-131.914
167.8313	-131.929
168.8313	-131.929
169.8313	-131.943
170.8313	-131.943
171.8313	-131.914
172.8313	-131.871
173.8313	-131.856
174.8313	-131.914
175.8313	-131.929
176.8313	-131.943
177.8313	-131.957
178.8313	-131.957
179.8313	-131.943
180.8313	-131.957
181.8313	-131.929
182.8313	-131.885
183.8313	-131.885
184.8313	-132.015
185.8313	-131.929
186.8313	-131.957
187.8313	-131.957
188.8313	-131.957
189.8313	-131.972
190.8313	-131.972
191.8313	-131.972
192.8313	-131.986
193.8313	-131.929

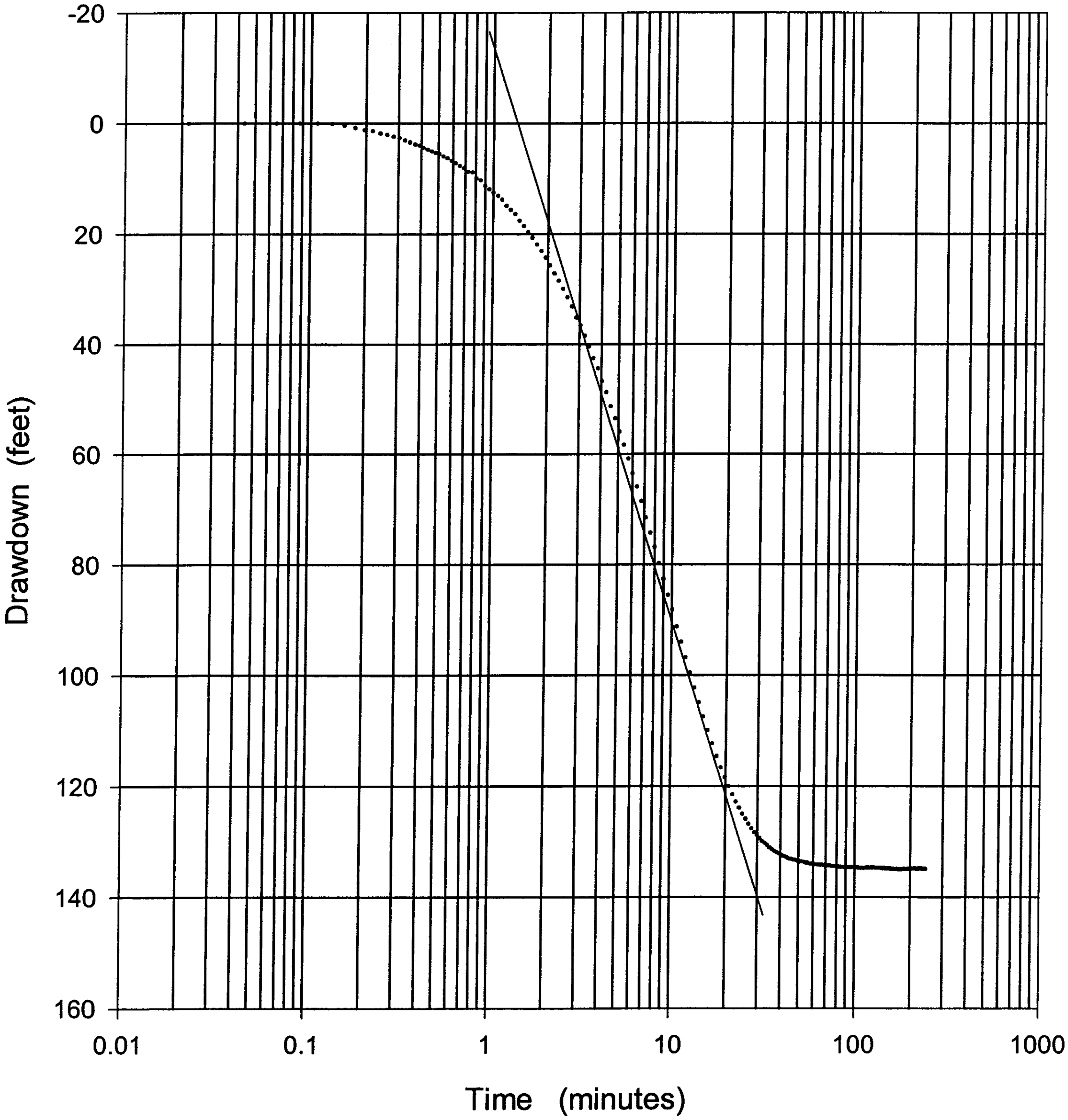
Injection Well No. 1 (IW-1) – Packer Tests

2,046 – 2,062

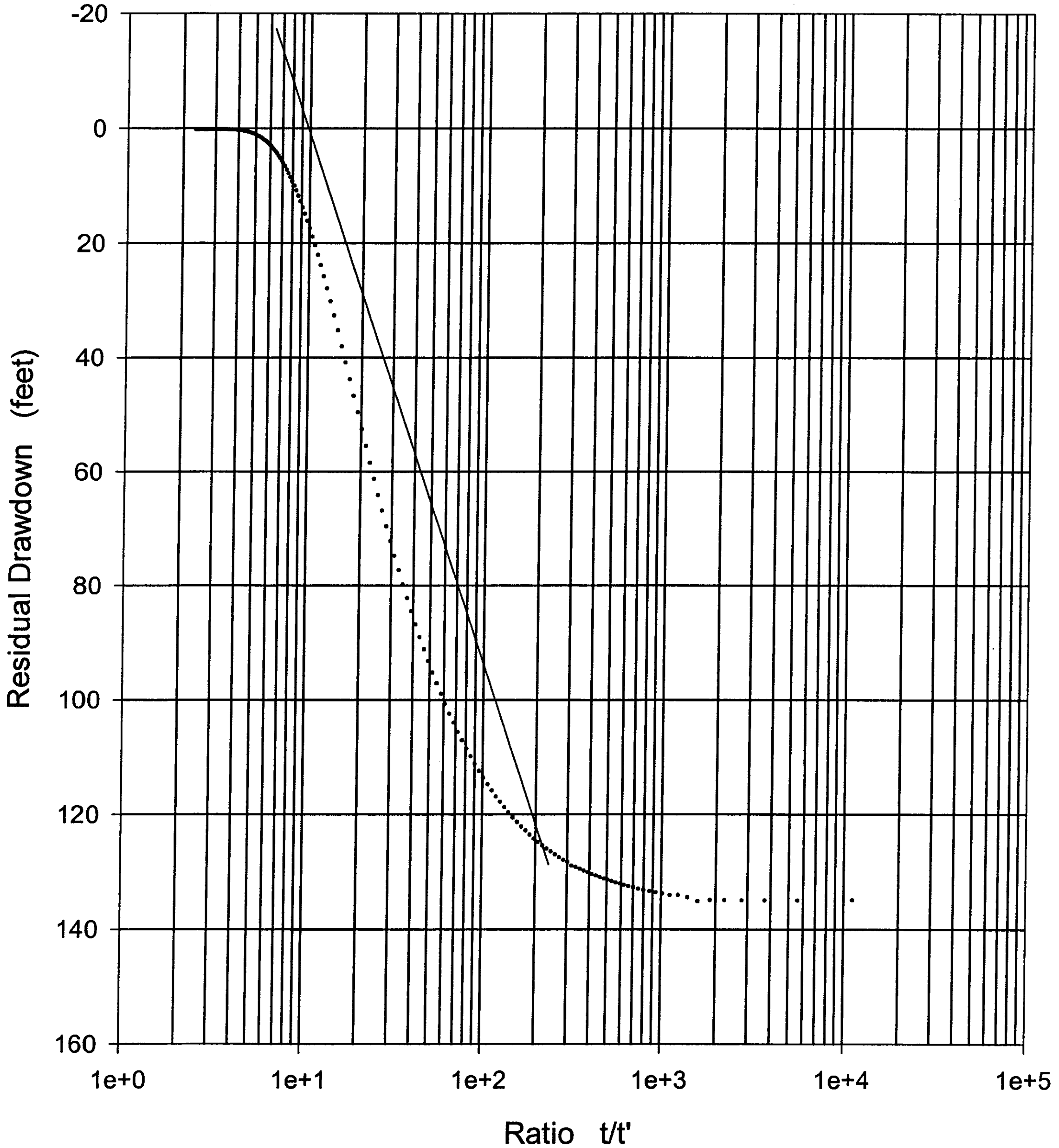
CITY OF HOLLYWOOD
IW-1
2046 - 2062
BACKGROUND, DRAWDOWN and RECOVERY DATA



CITY OF HOLLYWOOD
IW-1
2046 -2062
DRAWDOWN



CITY OF HOLLYWOOD
IW-1
2046 - 2062
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
IW-1
2046 - 2062
BACKGROUND DATA

Time	Water Level
0.0000	0
0.0218	0
0.0437	0
0.0655	-0.014
0.0873	-0.014
0.1092	-0.014
0.1310	-0.014
0.1528	-0.014
0.1747	-0.014
0.1965	0
0.2183	-0.014
0.2402	-0.014
0.2620	-0.014
0.2838	-0.014
0.3057	0
0.3275	-0.014
0.3493	-0.014
0.3712	-0.014
0.3930	-0.014
0.4148	-0.014
0.4367	-0.014
0.4588	-0.014
0.4823	-0.014
0.5072	-0.014
0.5335	-0.014
0.5615	-0.014
0.5912	-0.014
0.6225	-0.014
0.6557	0
0.6908	-0.014
0.7282	0
0.7677	0
0.8095	0
0.8538	0
0.9008	0.014
0.9507	0
1.0033	0
1.0592	0
1.1183	0
1.1810	0
1.2473	0
1.3177	0
1.3922	0
1.4712	0
1.5548	0
1.6433	0
1.7372	0
1.8365	0
1.9418	0
2.0533	0
2.1715	0
2.2967	0
2.4292	0
2.5697	0
2.7185	0
2.8760	0.043
3.0428	0
3.2197	0
3.4070	-0.029
3.6053	-0.029
3.8155	-0.029
4.0382	-0.029
4.2740	-0.043
4.5238	-0.043
4.7885	-0.014
5.0688	-0.029
5.3657	-0.043
5.6802	-0.043
6.0133	-0.043
6.3662	-0.043
6.7400	-0.043
7.1360	-0.043
7.5553	-0.043
7.9997	-0.043
8.4703	-0.014
8.9688	-0.014
9.4968	-0.043
10.0562	-0.043
10.6487	-0.043
11.2762	-0.043
11.9410	-0.043
12.6452	-0.043
13.3910	-0.043
14.1810	-0.043
15.0178	-0.043
15.9043	-0.043
16.8433	-0.058
17.8380	-0.043
18.8380	-0.043
19.8380	-0.043
20.8380	-0.058
21.8380	-0.043
22.8380	-0.058
23.8380	-0.058
24.8380	-0.058
25.8380	-0.058
26.8380	-0.058
27.8380	-0.058
28.8380	-0.058
29.8380	-0.058
30.8380	-0.058
31.8380	-0.058
32.8380	-0.029
33.8380	-0.029
34.8380	-0.014
35.8380	-0.029
36.8380	-0.029
37.8380	-0.058
38.8380	-0.072
39.8380	-0.058
40.8380	-0.072
41.8380	-0.043
42.8380	-0.072
43.8380	-0.072
44.8380	-0.072
45.8380	-0.072
46.8380	-0.072
47.8380	-0.072
48.8380	-0.072
49.8380	-0.043
50.8380	-0.087
51.8380	-0.072
52.8380	-0.087
53.8380	-0.072
54.8380	-0.087
55.8380	-0.072
56.8380	-0.058
57.8380	-0.058
58.8380	-0.029
59.8380	-0.043
60.8380	-0.058
61.8380	-0.101
62.8380	-0.101
63.8380	-0.072
64.8380	-0.101
65.8380	-0.101
66.8380	-0.101
67.8380	-0.101
68.8380	-0.058
69.8380	-0.058
70.8380	-0.072
71.8380	-0.072
72.8380	-0.072
73.8380	-0.115
74.8380	-0.087
75.8380	-0.101
76.8380	-0.115
77.8380	-0.115
78.8380	-0.087
79.8380	-0.101
80.8380	-0.115
81.8380	-0.087
82.8380	-0.115
83.8380	-0.072
84.8380	-0.087
85.8380	-0.043
86.8380	-0.043
87.8380	-0.087
88.8380	-0.087
89.8380	-0.087
90.8380	-0.087
91.8380	-0.087
92.8380	-0.087
93.8380	-0.115
94.8380	-0.115
95.8380	-0.101
96.8380	-0.087
97.8380	-0.101
98.8380	-0.101
99.8380	-0.115
100.8380	-0.101
101.8380	-0.101
102.8380	-0.101
103.8380	-0.101
104.8380	-0.13
105.8380	-0.13
106.8380	-0.101
107.8380	-0.101
108.8380	-0.087
109.8380	-0.058
110.8380	-0.058
111.8380	-0.13
112.8380	-0.13
113.8380	-0.13
114.8380	-0.13
115.8380	-0.115
116.8380	-0.115
117.8380	-0.115
118.8380	-0.115
119.8380	-0.115
120.8380	-0.115
121.8380	-0.101
122.8380	-0.087

City of Hollywood
IW-1
2046 -2062
DRAWDOWN DATA

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	0	6.7367	68.59	70.8347	134.248	140.8347	134.854	210.8347	134.839
0.0217	-0.014	7.1327	71.547	71.8347	134.364	141.8347	134.782	211.8347	134.782
0.0433	-0.014	7.5520	74.274	72.8347	134.306	142.8347	134.681	212.8347	134.868
0.0650	-0.014	7.9963	76.87	73.8347	134.349	143.8347	134.825	213.8347	134.854
0.0867	-0.014	8.4670	79.784	74.8347	134.378	144.8347	134.767	214.8347	134.897
0.1083	0	8.9655	82.611	75.8347	134.45	145.8347	134.811	215.8347	134.926
0.1300	0.014	9.4935	85.51	76.8347	134.45	146.8347	134.839	216.8347	134.998
0.1517	0.361	10.0528	88.193	77.8347	134.421	147.8347	134.767	217.8347	134.883
0.1733	0.794	10.6453	91.265	78.8347	134.421	148.8347	134.825	218.8347	134.926
0.1950	1.169	11.2728	93.99	79.8347	134.522	149.8347	134.811	219.8347	134.94
0.2167	1.343	11.9377	96.832	80.8347	134.537	150.8347	134.883	220.8347	134.911
0.2383	1.776	12.6418	99.543	81.8347	134.479	151.8347	134.839	221.8347	134.868
0.2600	2.007	13.3877	102.239	82.8347	134.565	152.8347	134.825	222.8347	134.811
0.2817	2.367	14.1777	104.85	83.8347	134.638	153.8347	134.868	223.8347	134.897
0.3033	2.613	15.0145	107.431	84.8347	134.551	154.8347	134.926	224.8347	134.911
0.3250	3.06	15.9010	109.925	85.8347	134.551	155.8347	134.825	225.8347	134.868
0.3467	3.407	16.8400	112.305	86.8347	134.652	156.8347	134.868	226.8347	134.839
0.3683	3.768	17.8347	114.568	87.8347	134.638	157.8347	134.854	227.8347	134.811
0.3900	4.013	18.8347	116.659	88.8347	134.638	158.8347	134.955	228.8347	134.868
0.4117	4.374	19.8347	118.461	89.8347	134.666	159.8347	134.969	229.8347	134.911
0.4333	4.677	20.8347	120.047	90.8347	134.58	160.8347	134.868	230.8347	134.839
0.4555	5.009	21.8347	121.518	91.8347	134.724	161.8347	134.969	231.8347	134.811
0.4790	5.327	22.8347	122.816	92.8347	134.695	162.8347	134.969	232.8347	134.854
0.5038	5.5	23.8347	123.897	93.8347	134.666	163.8347	134.955	233.8347	134.897
0.5302	5.947	24.8347	125.007	94.8347	134.652	164.8347	134.969	234.8347	134.998
0.5582	6.308	25.8347	125.901	95.8347	134.609	165.8347	134.969	235.8347	134.883
0.5878	6.756	26.8347	126.795	96.8347	134.594	166.8347	134.984	236.8347	134.897
0.6192	7.218	27.8347	127.631	97.8347	134.666	167.8347	134.911	237.8347	134.969
0.6523	7.709	28.8347	128.338	98.8347	134.638	168.8347	134.911	238.8347	134.969
0.6875	8.069	29.8347	128.828	99.8347	134.652	169.8347	134.969	239.8347	134.955
0.7248	8.748	30.8347	129.404	100.8347	134.724	170.8347	134.94	240.8347	134.897
0.7643	8.849	31.8347	129.909	101.8347	134.71	171.8347	134.969	241.8347	134.94
0.8062	9.96	32.8347	130.298	102.8347	134.666	172.8347	135.012		
0.8505	10.278	33.8347	130.659	103.8347	134.666	173.8347	134.926		
0.8975	11.288	34.8347	131.077	104.8347	134.738	174.8347	134.984		
0.9473	11.923	35.8347	131.379	105.8347	134.695	175.8347	134.969		
1.0000	12.53	36.8347	131.711	106.8347	134.753	176.8347	135.027		
1.0558	13.093	37.8347	131.87	107.8347	134.811	177.8347	135.056		
1.1150	13.8	38.8347	132.129	108.8347	134.767	178.8347	134.984		
1.1777	14.955	39.8347	132.273	109.8347	134.753	179.8347	135.041		
1.2440	15.662	40.8347	132.504	110.8347	134.782	180.8347	134.911		
1.3143	16.427	41.8347	132.691	111.8347	134.811	181.8347	134.955		
1.3888	17.625	42.8347	132.792	112.8347	134.811	182.8347	134.969		
1.4678	18.548	43.8347	132.994	113.8347	134.796	183.8347	134.955		
1.5515	19.645	44.8347	133.124	114.8347	134.753	184.8347	134.897		
1.6400	20.67	45.8347	133.138	115.8347	134.71	185.8347	134.998		
1.7338	21.882	46.8347	133.268	116.8347	134.753	186.8347	134.911		
1.8332	23.037	47.8347	133.311	117.8347	134.666	187.8347	134.984		
1.9385	24.264	48.8347	133.383	118.8347	134.738	188.8347	134.955		
2.0500	25.664	49.8347	133.556	119.8347	134.695	189.8347	134.926		
2.1682	27.136	50.8347	133.556	120.8347	134.724	190.8347	134.969		
2.2933	28.449	51.8347	133.643	121.8347	134.724	191.8347	134.94		
2.4258	29.921	52.8347	133.657	122.8347	134.695	192.8347	134.926		
2.5663	31.465	53.8347	133.744	123.8347	134.695	193.8347	134.955		
2.7152	33.125	54.8347	133.859	124.8347	134.767	194.8347	134.854		
2.8727	35.145	55.8347	133.816	125.8347	134.652	195.8347	134.984		
3.0395	36.574	56.8347	133.931	126.8347	134.724	196.8347	134.911		
3.2163	38.421	57.8347	134.018	127.8347	134.724	197.8347	134.94		
3.4037	40.355	58.8347	134.003	128.8347	134.738	198.8347	134.911		
3.6020	42.519	59.8347	134.046	129.8347	134.695	199.8347	134.926		
3.8122	44.409	60.8347	134.147	130.8347	134.767	200.8347	134.883		
4.0348	46.747	61.8347	134.176	131.8347	134.71	201.8347	134.897		
4.2707	48.781	62.8347	134.162	132.8347	134.753	202.8347	134.839		
4.5205	51.321	63.8347	134.191	133.8347	134.753	203.8347	134.926		
4.7852	53.543	64.8347	134.191	134.8347	134.767	204.8347	134.911		
5.0655	55.938	65.8347	134.263	135.8347	134.767	205.8347	134.854		
5.3623	58.333	66.8347	134.176	136.8347	134.71	206.8347	134.897		
5.6768	60.843	67.8347	134.248	137.8347	134.738	207.8347	134.911		
6.0100	63.541	68.8347	134.306	138.8347	134.782	208.8347	134.868		
6.3628	65.936	69.8347	134.277	139.8347	134.825	209.8347	134.811		

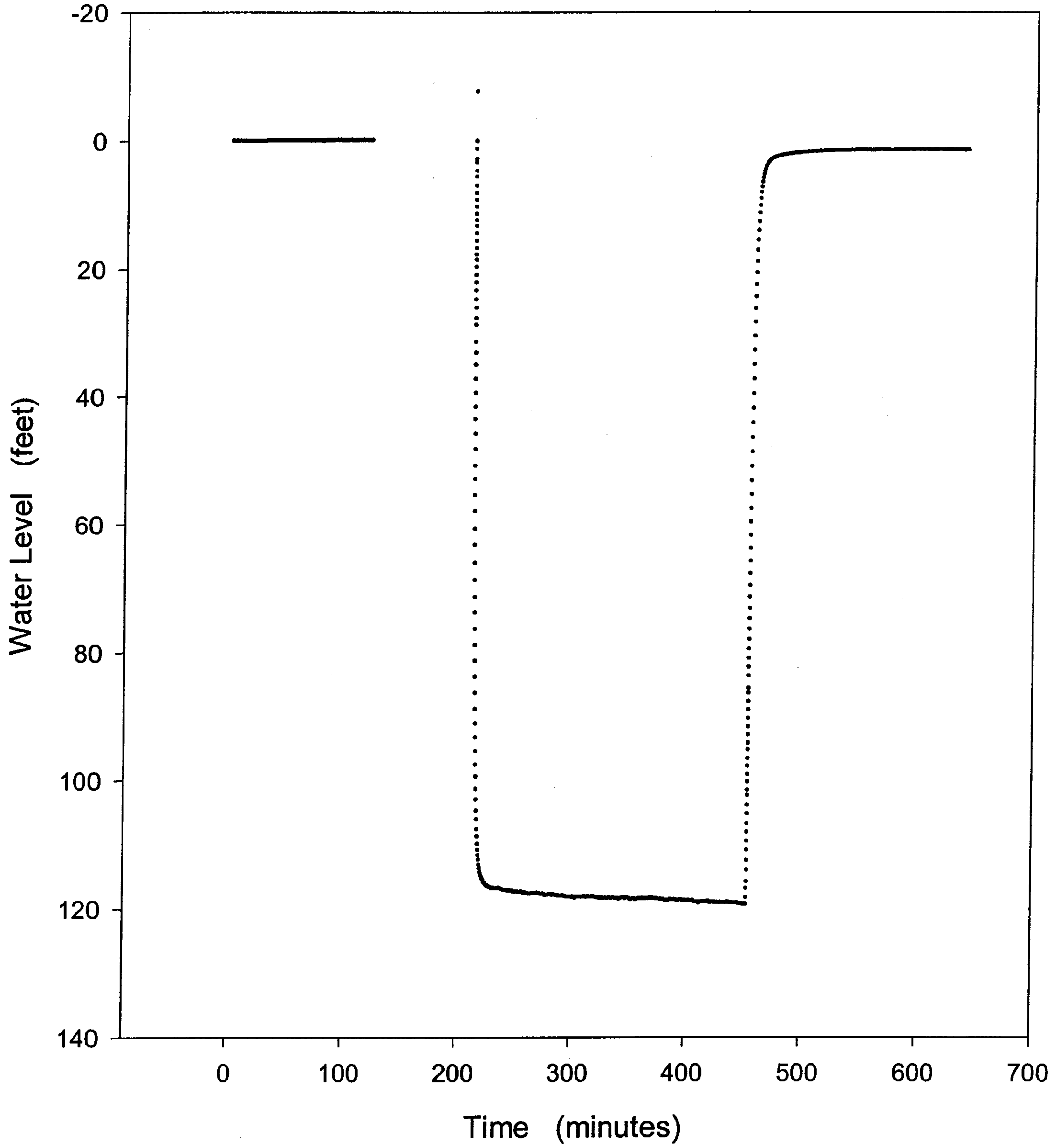
CITY OF HOLLYWOOD
IW-1
2046 - 2062
RECOVERY DATA

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	134.94	6.7367	82.178	70.8347	0.534	140.8347	0.173
0.0217	134.94	7.1327	79.769	71.8347	0.505	141.8347	0.202
0.0433	134.969	7.5520	77.288	72.8347	0.462	142.8347	0.202
0.0650	134.954	7.9963	74.778	73.8347	0.447	143.8347	0.202
0.0867	134.969	8.4670	72.167	74.8347	0.418	144.8347	0.202
0.1083	134.926	8.9655	69.556	75.8347	0.404	145.8347	0.187
0.1300	134.911	9.4935	66.815	76.8347	0.375	146.8347	0.202
0.1517	135.113	10.0528	64.089	77.8347	0.39	147.8347	0.202
0.1733	134.421	10.6453	61.304	78.8347	0.375	148.8347	0.202
0.1950	134.032	11.2728	58.477	79.8347	0.361	149.8347	0.202
0.2167	134.032	11.9377	55.505	80.8347	0.303	150.8347	0.202
0.2383	133.787	12.6418	52.576	81.8347	0.303	151.8347	0.187
0.2600	133.585	13.3877	49.618	82.8347	0.274	152.8347	0.202
0.2817	133.369	14.1777	46.718	83.8347	0.274	153.8347	0.216
0.3033	133.152	15.0145	43.789	84.8347	0.26	154.8347	0.231
0.3250	132.922	15.9010	40.888	85.8347	0.245	155.8347	0.231
0.3467	132.706	16.8400	38.046	86.8347	0.245	156.8347	0.187
0.3683	132.489	17.8347	35.217	87.8347	0.231	157.8347	0.187
0.3900	132.287	18.8347	32.576	88.8347	0.231	158.8347	0.187
0.4117	132.057	19.8347	30.152	89.8347	0.231	159.8347	0.187
0.4333	131.855	20.8347	27.886	90.8347	0.216	160.8347	0.187
0.4555	131.624	21.8347	25.793	91.8347	0.216	161.8347	0.187
0.4790	131.408	22.8347	23.816	92.8347	0.202	162.8347	0.202
0.5038	131.177	23.8347	22.027	93.8347	0.202	163.8347	0.187
0.5302	130.918	24.8347	20.381	94.8347	0.202	164.8347	0.187
0.5582	130.658	25.8347	18.837	95.8347	0.202	165.8347	0.202
0.5878	130.384	26.8347	17.394	96.8347	0.202	166.8347	0.202
0.6192	130.096	27.8347	16.095	97.8347	0.187	167.8347	0.187
0.6523	129.808	28.8347	14.853	98.8347	0.187	168.8347	0.216
0.6875	129.462	29.8347	13.771	99.8347	0.187	169.8347	0.216
0.7248	129.13	30.8347	12.703	100.8347	0.187	170.8347	0.231
0.7643	128.914	31.8347	11.735	101.8347	0.187	171.8347	0.216
0.8062	128.337	32.8347	10.826	102.8347	0.187	172.8347	0.231
0.8505	127.962	33.8347	9.974	103.8347	0.173	173.8347	0.245
0.8975	127.472	34.8347	9.224	104.8347	0.187	174.8347	0.216
0.9473	126.997	35.8347	8.545	105.8347	0.173	175.8347	0.216
1.0000	126.492	36.8347	7.853	106.8347	0.173	176.8347	0.245
1.0558	125.958	37.8347	7.203	107.8347	0.187	177.8347	0.26
1.1150	125.411	38.8347	6.611	108.8347	0.173	178.8347	0.245
1.1777	124.834	39.8347	6.12	109.8347	0.173	179.8347	0.202
1.2440	124.214	40.8347	5.644	110.8347	0.173	180.8347	0.202
1.3143	123.551	41.8347	5.182	111.8347	0.202	181.8347	0.202
1.3888	122.859	42.8347	4.763	112.8347	0.216	182.8347	0.245
1.4678	122.138	43.8347	4.388	113.8347	0.216		
1.5515	121.359	44.8347	4.056	114.8347	0.187		
1.6400	120.552	45.8347	3.724	115.8347	0.173		
1.7338	119.658	46.8347	3.435	116.8347	0.173		
1.8332	118.778	47.8347	3.161	117.8347	0.173		
1.9385	117.856	48.8347	2.916	118.8347	0.173		
2.0500	116.861	49.8347	2.685	119.8347	0.173		
2.1682	115.851	50.8347	2.468	120.8347	0.173		
2.2933	114.741	51.8347	2.281	121.8347	0.173		
2.4258	113.617	52.8347	2.107	122.8347	0.173		
2.5663	112.42	53.8347	1.934	123.8347	0.173		
2.7152	111.165	54.8347	1.79	124.8347	0.173		
2.8727	109.867	55.8347	1.645	125.8347	0.173		
3.0395	108.498	56.8347	1.516	126.8347	0.173		
3.2163	107.056	57.8347	1.4	127.8347	0.173		
3.4037	105.585	58.8347	1.299	128.8347	0.173		
3.6020	103.999	59.8347	1.198	129.8347	0.173		
3.8122	102.427	60.8347	1.111	130.8347	0.173		
4.0348	100.696	61.8347	1.025	131.8347	0.187		
4.2707	98.922	62.8347	0.953	132.8347	0.173		
4.5205	97.12	63.8347	0.88	133.8347	0.173		
4.7852	95.202	64.8347	0.823	134.8347	0.173		
5.0655	93.197	65.8347	0.75	135.8347	0.173		
5.3623	91.135	66.8347	0.693	136.8347	0.173		
5.6768	89	67.8347	0.649	137.8347	0.173		
6.0100	86.793	68.8347	0.606	138.8347	0.173		
6.3628	84.5	69.8347	0.577	139.8347	0.173		

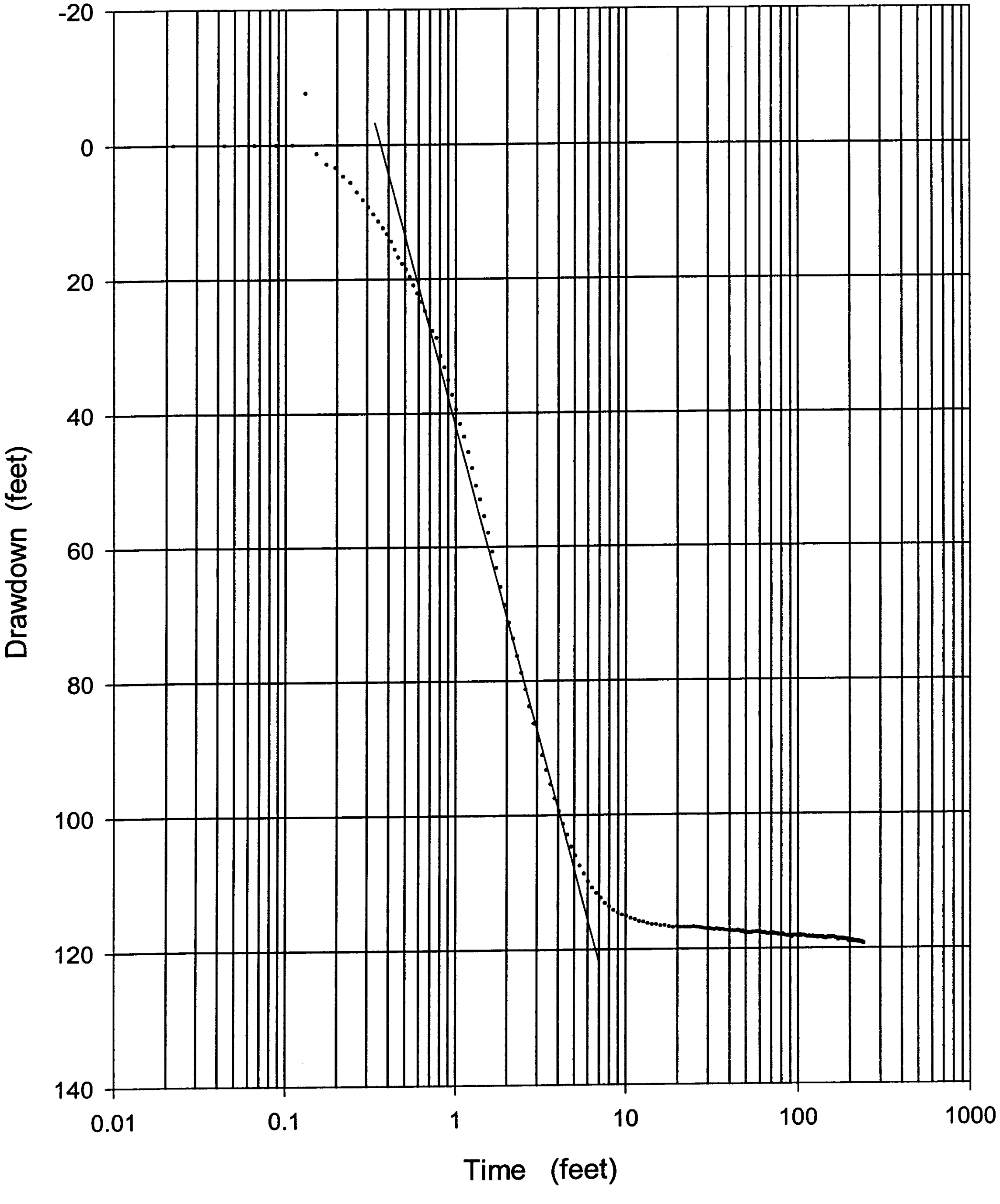
Injection Well No. 1 (IW-1) – Packer Tests

2,193 – 2,209

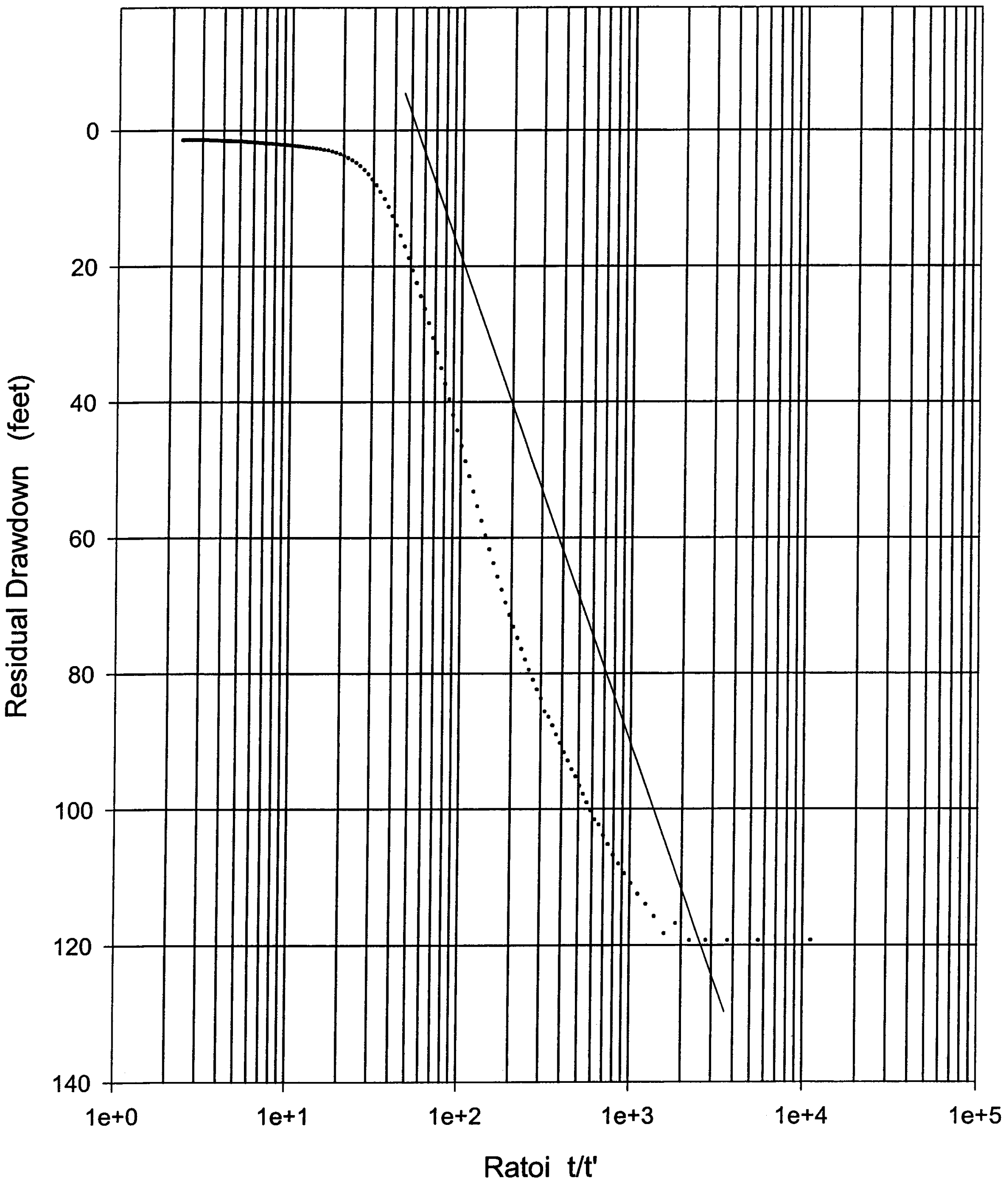
CITY OF HOLLYWOOD
IW-1
2193 - 2209
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
IW-1
2193 - 2209
DRAWDOWN



CITY OF HOLLYWOOD
IW-1
2193 - 2209
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
IW-1
2193 - 2209
BACKGROUND DATA

Time	Water Level	Time	Water Level	Time	Water Level
0	0	8.9688	-0.029	80.838	-0.115
0.0218	0	9.4968	-0.029	81.838	-0.115
0.0437	0	10.0562	-0.043	82.838	-0.115
0.0655	0	10.6487	-0.043	83.838	-0.115
0.0873	0	11.2762	-0.043	84.838	-0.115
0.1092	0	11.9410	-0.043	85.838	-0.115
0.1310	0	12.6452	-0.029	86.838	-0.101
0.1528	0	13.3910	-0.043	87.838	-0.13
0.1747	-0.014	14.1810	-0.043	88.838	-0.115
0.1965	0	15.0178	-0.043	89.838	-0.115
0.2183	0	15.9043	-0.043	90.838	-0.13
0.2402	0	16.8433	-0.043	91.838	-0.13
0.2620	0	17.8380	-0.043	92.838	-0.13
0.2838	0	18.8380	-0.043	93.838	-0.13
0.3057	0	19.8380	-0.043	94.838	-0.13
0.3275	0	20.8380	-0.043	95.838	-0.13
0.3493	0	21.8380	-0.043	96.838	-0.115
0.3712	-0.014	22.8380	-0.043	97.838	-0.101
0.3930	-0.014	23.8380	-0.043	98.838	-0.13
0.4148	0	24.8380	-0.043	99.838	-0.13
0.4367	0	25.8380	-0.043	100.838	-0.13
0.4588	0	26.8380	-0.014	101.838	-0.13
0.4823	0	27.8380	0	102.838	-0.13
0.5072	0	28.8380	-0.014	103.838	-0.13
0.5335	0	29.8380	-0.058	104.838	-0.101
0.5615	0	30.8380	-0.058	105.838	-0.087
0.5912	0	31.8380	-0.058	106.838	-0.087
0.6225	0	32.8380	-0.058	107.838	-0.13
0.6557	0	33.8380	-0.072	108.838	-0.13
0.6908	0	34.8380	-0.072	109.838	-0.144
0.7282	0	35.8380	-0.058	110.838	-0.144
0.7677	0.014	36.8380	-0.058	111.838	-0.144
0.8095	0.014	37.8380	-0.072	112.838	-0.144
0.8538	0	38.8380	-0.058	113.838	-0.144
0.9008	0	39.8380	-0.072	114.838	-0.144
0.9507	0.014	40.8380	-0.072	115.838	-0.144
1.0033	0	41.8380	-0.072	116.838	-0.144
1.0592	0.014	42.8380	-0.072	117.838	-0.115
1.1183	0.014	43.8380	-0.072	118.838	-0.144
1.1810	0.014	44.8380	-0.072	119.838	-0.144
1.2473	0.014	45.8380	-0.072	120.838	-0.101
1.3177	0	46.8380	-0.087	121.838	-0.13
1.3922	0	47.8380	-0.072		
1.4712	0	48.8380	-0.072		
1.5548	0.014	49.8380	-0.072		
1.6433	0	50.8380	-0.072		
1.7372	0.014	51.8380	-0.072		
1.8365	0.014	52.8380	-0.072		
1.9418	0.014	53.8380	-0.072		
2.0533	0.014	54.8380	-0.072		
2.1715	0.014	55.8380	-0.072		
2.2967	0.014	56.8380	-0.072		
2.4292	0.014	57.8380	-0.072		
2.5697	0.014	58.8380	-0.072		
2.7185	0.014	59.8380	-0.087		
2.8760	0.014	60.8380	-0.072		
3.0428	0	61.8380	-0.087		
3.2197	-0.029	62.8380	-0.087		
3.4070	-0.043	63.8380	-0.087		
3.6053	-0.043	64.8380	-0.072		
3.8155	-0.043	65.8380	-0.087		
4.0382	-0.043	66.8380	-0.087		
4.2740	-0.043	67.8380	-0.087		
4.5238	-0.043	68.8380	-0.087		
4.7885	-0.043	69.8380	-0.087		
5.0688	-0.029	70.8380	-0.087		
5.3657	-0.029	71.8380	-0.087		
5.6802	-0.029	72.8380	-0.101		
6.0133	-0.029	73.8380	-0.101		
6.3662	-0.043	74.8380	-0.101		
6.7400	-0.043	75.8380	-0.101		
7.1360	-0.043	76.8380	-0.101		
7.5553	-0.043	77.8380	-0.072		
7.9997	-0.029	78.8380	-0.014		
8.4703	-0.043	79.8380	-0.072		

CITY OF HOLLYWOOD
IW-1
2193 - 2209
DRAWDOWN DATA

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	0	8.9655	114.57	80.8347	117.872	155.8347	118.42	230.8347	119.084
0.0217	0.014	9.4935	114.916	81.8347	117.887	156.8347	118.348	231.8347	119.141
0.0433	0.014	10.0528	115.061	82.8347	118.031	157.8347	118.391	232.8347	119.069
0.0650	0	10.6453	115.392	83.8347	118.074	158.8347	118.319	233.8347	119.069
0.0867	0	11.2728	115.58	84.8347	118.132	159.8347	118.348	234.8347	119.228
0.1083	0.014	11.9377	115.854	85.8347	118.132	160.8347	118.406	235.8347	119.228
0.1300	-7.695	12.6418	115.969	86.8347	118.103	161.8347	118.406	236.8347	119.285
0.1517	1.256	13.3877	116.171	87.8347	118.132	162.8347	118.42	237.8347	119.228
0.1733	2.858	14.1777	116.344	88.8347	118.175	163.8347	118.478	238.8347	119.343
0.1950	3.364	15.0145	116.33	89.8347	118.06	164.8347	118.464	239.8347	119.242
0.2167	4.663	15.9010	116.546	90.8347	118.089	165.8347	118.521	240.8347	119.271
0.2383	5.572	16.8400	116.488	91.8347	118.319	166.8347	118.492		
0.2600	6.987	17.8347	116.676	92.8347	118.146	167.8347	118.521		
0.2817	8.156	18.8347	116.791	93.8347	118.103	168.8347	118.55		
0.3033	9.224	19.8347	116.676	94.8347	118.132	169.8347	118.608		
0.3250	10.278	20.8347	116.791	95.8347	118.103	170.8347	118.781		
0.3467	11.375	21.8347	116.762	96.8347	118.103	171.8347	118.709		
0.3683	12.371	22.8347	116.805	97.8347	118.117	172.8347	118.68		
0.3900	13.28	23.8347	116.805	98.8347	118.146	173.8347	118.665		
0.4117	14.363	24.8347	116.704	99.8347	118.045	174.8347	118.55		
0.4333	15.561	25.8347	116.805	100.8347	118.074	175.8347	118.579		
0.4555	16.73	26.8347	116.82	101.8347	118.204	176.8347	118.608		
0.4790	17.697	27.8347	116.906	102.8347	118.031	177.8347	118.593		
0.5038	18.52	28.8347	116.993	103.8347	118.074	178.8347	118.579		
0.5302	19.631	29.8347	117.036	104.8347	118.146	179.8347	118.579		
0.5582	20.916	30.8347	117.022	105.8347	118.117	180.8347	118.694		
0.5878	22.099	31.8347	117.108	106.8347	118.074	181.8347	118.694		
0.6192	23.369	32.8347	117.166	107.8347	118.074	182.8347	118.608		
0.6523	24.741	33.8347	117.036	108.8347	118.132	183.8347	118.608		
0.6875	26.068	34.8347	117.151	109.8347	118.175	184.8347	118.622		
0.7248	27.699	35.8347	117.166	110.8347	118.218	185.8347	118.68		
0.7643	28.738	36.8347	117.166	111.8347	118.305	186.8347	118.723		
0.8062	31.451	37.8347	117.296	112.8347	118.291	187.8347	118.665		
0.8505	33.14	38.8347	117.296	113.8347	118.291	188.8347	118.752		
0.8975	35.03	39.8347	117.353	114.8347	118.334	189.8347	118.737		
0.9473	37.209	40.8347	117.31	115.8347	118.233	190.8347	118.723		
1.0000	39.432	41.8347	117.353	116.8347	118.319	191.8347	118.709		
1.0558	41.596	42.8347	117.382	117.8347	118.334	192.8347	118.752		
1.1150	43.53	43.8347	117.324	118.8347	118.291	193.8347	118.781		
1.1777	45.824	44.8347	117.281	119.8347	118.348	194.8347	118.723		
1.2440	48.219	45.8347	117.339	120.8347	118.319	195.8347	118.925		
1.3143	50.817	46.8347	117.526	121.8347	118.204	196.8347	118.983		
1.3888	52.88	47.8347	117.397	122.8347	118.305	197.8347	118.997		
1.4678	55.39	48.8347	117.613	123.8347	118.377	198.8347	118.925		
1.5515	57.915	49.8347	117.555	124.8347	118.305	199.8347	119.112		
1.6400	60.743	50.8347	117.642	125.8347	118.291	200.8347	118.983		
1.7338	63.181	51.8347	117.656	126.8347	118.334	201.8347	118.954		
1.8332	66.009	52.8347	117.642	127.8347	118.319	202.8347	118.896		
1.9385	68.663	53.8347	117.656	128.8347	118.348	203.8347	118.882		
2.0500	71.332	54.8347	117.555	129.8347	118.42	204.8347	118.867		
2.1682	73.727	55.8347	117.57	130.8347	118.464	205.8347	118.882		
2.2933	76.309	56.8347	117.555	131.8347	118.334	206.8347	118.867		
2.4258	78.804	57.8347	117.526	132.8347	118.305	207.8347	118.838		
2.5663	81.271	58.8347	117.512	133.8347	118.305	208.8347	118.968		
2.7152	83.809	59.8347	117.555	134.8347	118.305	209.8347	119.084		
2.8727	86.334	60.8347	117.584	135.8347	118.406	210.8347	118.939		
3.0395	88.843	61.8347	117.671	136.8347	118.348	211.8347	118.997		
3.2163	91.093	62.8347	117.685	137.8347	118.305	212.8347	118.983		
3.4037	93.285	63.8347	117.656	138.8347	118.348	213.8347	118.997		
3.6020	95.405	64.8347	117.685	139.8347	118.492	214.8347	119.011		
3.8122	97.525	65.8347	117.829	140.8347	118.536	215.8347	118.983		
4.0348	99.386	66.8347	117.858	141.8347	118.464	216.8347	119.04		
4.2707	101.333	67.8347	117.786	142.8347	118.435	217.8347	119.069		
4.5205	102.933	68.8347	117.757	143.8347	118.42	218.8347	118.983		
4.7852	104.707	69.8347	117.743	144.8347	118.579	219.8347	119.026		
5.0655	106.048	70.8347	117.728	145.8347	118.507	220.8347	119.055		
5.3623	107.562	71.8347	117.858	146.8347	118.42	221.8347	119.026		
5.6768	108.73	72.8347	117.743	147.8347	118.363	222.8347	119.084		
6.0100	109.884	73.8347	117.786	148.8347	118.435	223.8347	119.011		
6.3628	110.85	74.8347	117.872	149.8347	118.406	224.8347	118.968		
6.7367	111.658	75.8347	117.93	150.8347	118.334	225.8347	118.997		
7.1327	112.35	76.8347	117.872	151.8347	118.492	226.8347	119.098		
7.5520	113.143	77.8347	117.988	152.8347	118.377	227.8347	119.069		
7.9963	113.662	78.8347	117.944	153.8347	118.406	228.8347	119.112		
8.4670	114.21	79.8347	117.944	154.8347	118.377	229.8347	119.141		

CITY OF HOLLYWOOD
IW-1
2193 - 3309
RECOVERY DATA

Time	Water Level
0	119.271
0.0217	119.329
0.0433	119.329
0.0650	119.3
0.0867	119.285
0.1083	116.82
0.1300	118.291
0.1517	115.782
0.1733	113.994
0.1950	112.508
0.2167	110.922
0.2383	109.495
0.2600	108.067
0.2817	106.798
0.3033	105.241
0.3250	103.885
0.3467	102.328
0.3683	101.578
0.3900	100.28
0.4117	99.083
0.4333	97.799
0.4555	96.617
0.4790	95.232
0.5038	94.194
0.5302	92.882
0.5582	91.656
0.5878	90.3
0.6192	89.002
0.6523	87.689
0.6875	86.42
0.7248	85.641
0.7643	83.723
0.8062	82.353
0.8505	80.939
0.8975	79.482
0.9473	77.968
1.0000	76.395
1.0558	74.765
1.1150	73.121
1.1777	71.375
1.2440	69.543
1.3143	67.697
1.3888	65.749
1.4678	63.773
1.5515	61.753
1.6400	59.675
1.7338	57.526
1.8332	55.376
1.9385	53.197
2.0500	50.961
2.1682	48.724
2.2933	46.474
2.4258	44.179
2.5663	41.899
2.7152	39.591
2.8727	37.296
3.0395	35.016
3.2163	32.765
3.4037	30.571
3.6020	28.377
3.8122	26.27
4.0348	24.394
4.2707	22.475
4.5205	20.613
4.7852	18.823
5.0655	17.105
5.3623	15.518
5.6768	14.002
6.0100	12.616
6.3628	11.288
6.7367	10.119
7.1327	9.051
7.5520	8.084
7.9963	7.232
8.4670	6.482
8.9655	5.847
9.4935	5.269
10.0528	4.793
10.6453	4.403
11.2728	4.057
11.9377	3.768
12.6418	3.479
13.3877	3.277
14.1777	3.118
15.0145	2.959
15.9010	2.844
16.8400	2.728
17.8347	2.656
18.8347	2.584
19.8347	2.526
20.8347	2.469
21.8347	2.411
22.8347	2.368
23.8347	2.324
24.8347	2.281
25.8347	2.238
26.8347	2.209
27.8347	2.18
28.8347	2.137
29.8347	2.122
30.8347	2.093
31.8347	2.064
32.8347	2.035
33.8347	2.021
34.8347	1.992
35.8347	1.963
36.8347	1.949
37.8347	1.949
38.8347	1.963
39.8347	1.934
40.8347	1.877
41.8347	1.862
42.8347	1.848
43.8347	1.819
44.8347	1.805
45.8347	1.79
46.8347	1.776
47.8347	1.761
48.8347	1.747
49.8347	1.732
50.8347	1.718
51.8347	1.718
52.8347	1.703
53.8347	1.675
54.8347	1.689
55.8347	1.646
56.8347	1.631
57.8347	1.631
58.8347	1.646
59.8347	1.617
60.8347	1.602
61.8347	1.617
62.8347	1.617
63.8347	1.617
64.8347	1.602
65.8347	1.574
66.8347	1.588
67.8347	1.602
68.8347	1.631
69.8347	1.559
70.8347	1.574
71.8347	1.559
72.8347	1.545
73.8347	1.559
74.8347	1.545
75.8347	1.545
76.8347	1.559
77.8347	1.516
78.8347	1.516
79.8347	1.53
80.8347	1.53
81.8347	1.516
82.8347	1.501
83.8347	1.516
84.8347	1.487
85.8347	1.501
86.8347	1.501
87.8347	1.487
88.8347	1.472
89.8347	1.472
90.8347	1.458
91.8347	1.472
92.8347	1.458
93.8347	1.487
94.8347	1.487
95.8347	1.444
96.8347	1.472
97.8347	1.444
98.8347	1.472
99.8347	1.444
100.8347	1.472
101.8347	1.458
102.8347	1.458
103.8347	1.458
104.8347	1.458
105.8347	1.415
106.8347	1.444
107.8347	1.444
108.8347	1.429
109.8347	1.415
110.8347	1.415
111.8347	1.415
112.8347	1.444
113.8347	1.444
114.8347	1.444
115.8347	1.429
116.8347	1.444
117.8347	1.458
118.8347	1.472
119.8347	1.487
120.8347	1.444
121.8347	1.429
122.8347	1.429
123.8347	1.429
124.8347	1.429
125.8347	1.429
126.8347	1.429
127.8347	1.429
128.8347	1.415
129.8347	1.429
130.8347	1.429
131.8347	1.429
132.8347	1.415
133.8347	1.415
134.8347	1.415
135.8347	1.415
136.8347	1.415
137.8347	1.415
138.8347	1.415
139.8347	1.415
140.8347	1.415
141.8347	1.415
142.8347	1.415
143.8347	1.4
144.8347	1.415
145.8347	1.4
146.8347	1.4
147.8347	1.415
148.8347	1.415
149.8347	1.4
150.8347	1.4
151.8347	1.4
152.8347	1.4
153.8347	1.415
154.8347	1.444
155.8347	1.429
156.8347	1.4
157.8347	1.386
158.8347	1.386
159.8347	1.386
160.8347	1.386
161.8347	1.371
162.8347	1.4
163.8347	1.4
164.8347	1.4
165.8347	1.386
166.8347	1.4
167.8347	1.386
168.8347	1.4
169.8347	1.386
170.8347	1.386
171.8347	1.386
172.8347	1.386
173.8347	1.386
174.8347	1.386
175.8347	1.386
176.8347	1.386
177.8347	1.386
178.8347	1.386
179.8347	1.386
180.8347	1.415
181.8347	1.429
182.8347	1.444
183.8347	1.386
184.8347	1.415
185.8347	1.429
186.8347	

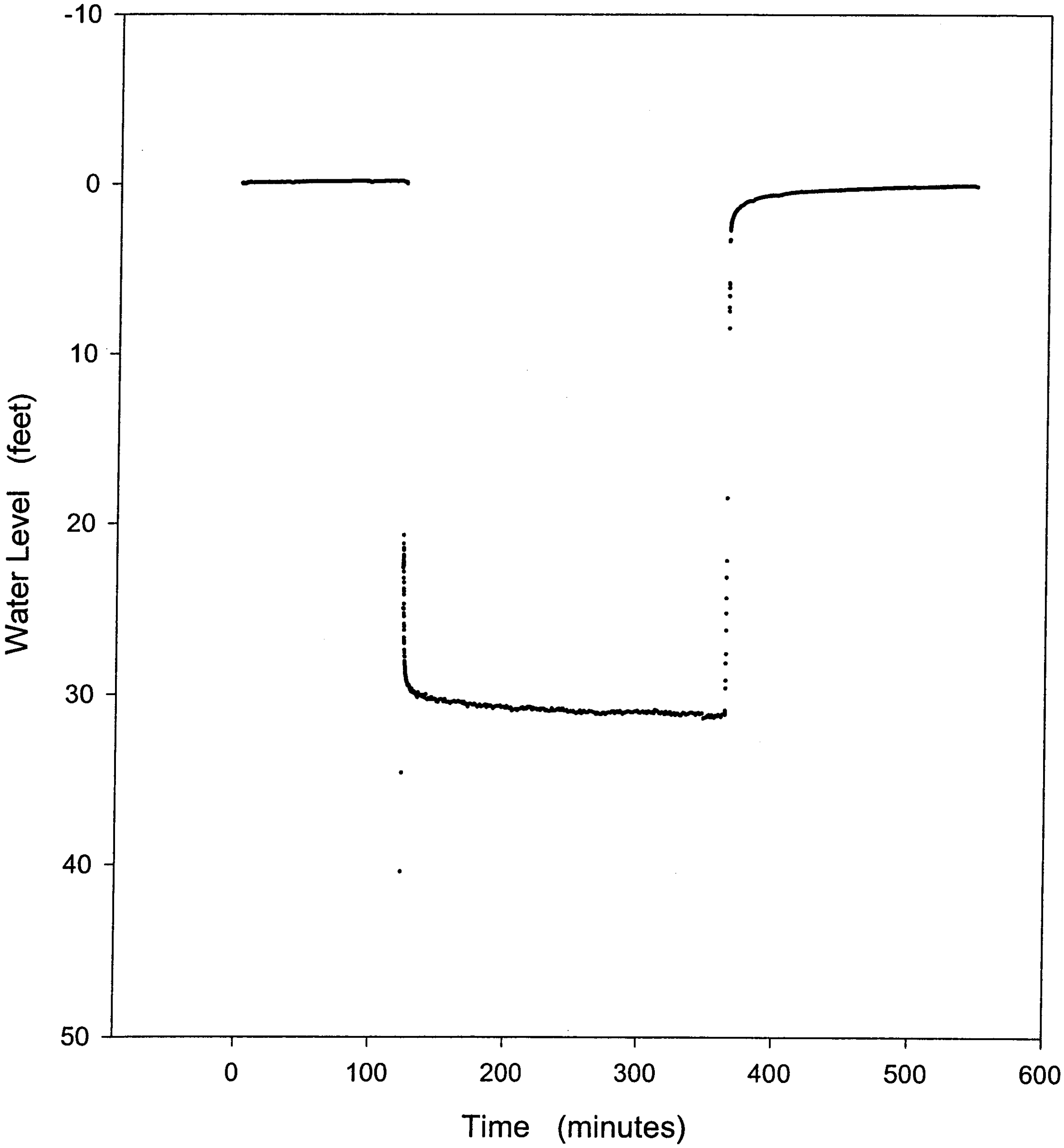
Injection Well No. 2 (IW-2) – Packer Tests

Packer Test Data

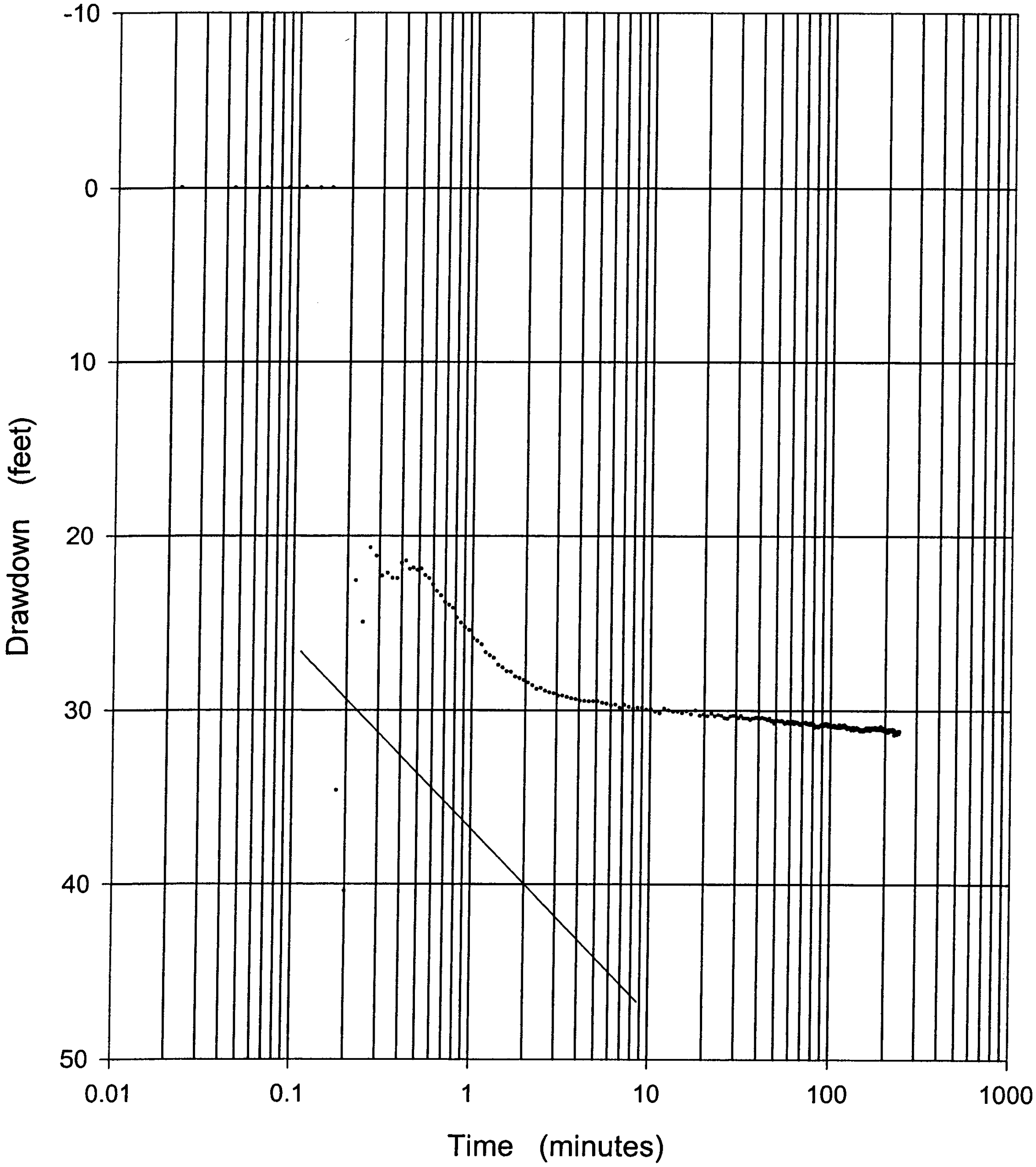
Injection Well No. 2 (IW-2) – Packer Tests

1,390 – 1,408

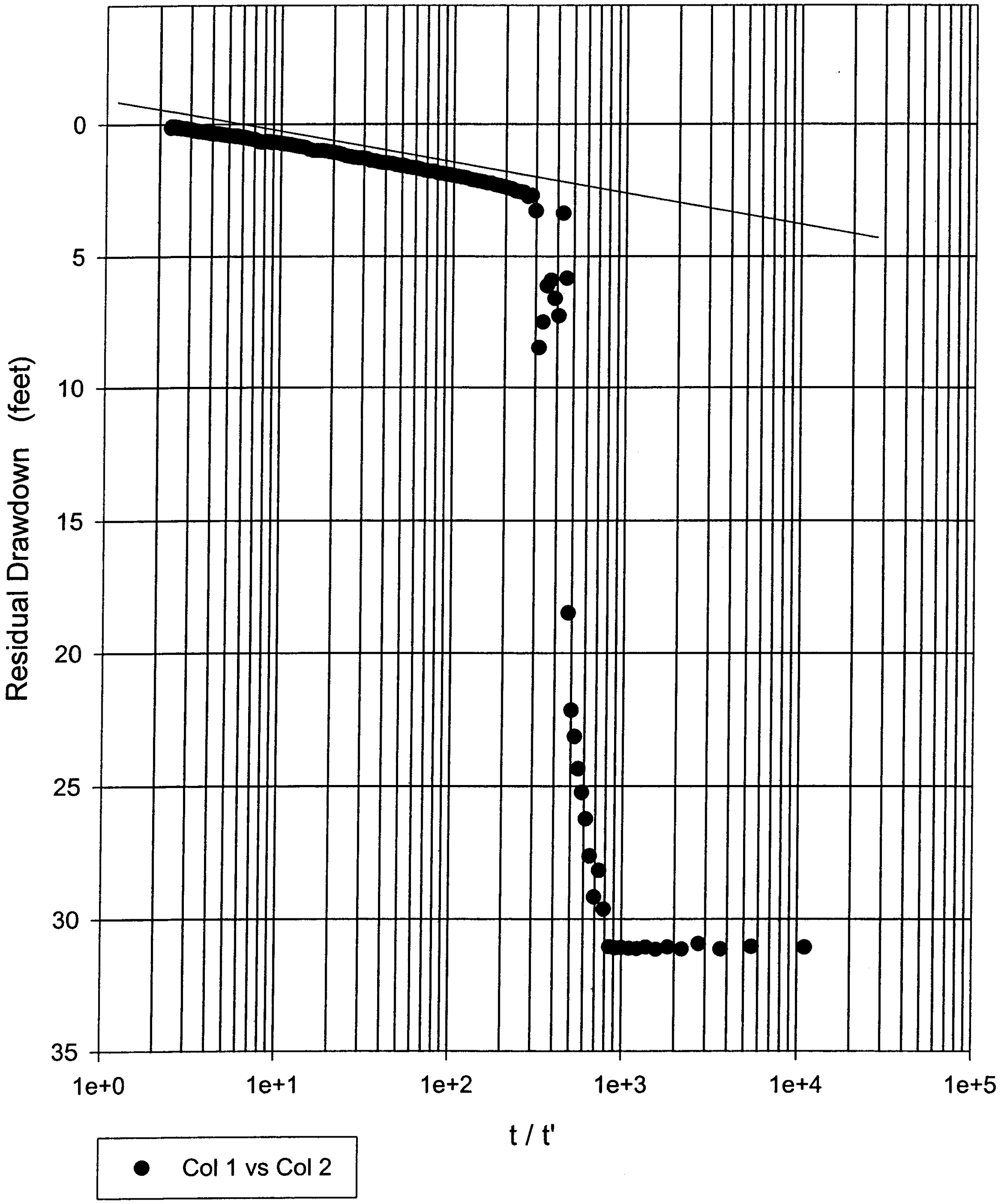
CITY OF HOLLYWOOD
SRWWIP
IW-2
1390 -1408
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
SRWWTP
IW-2
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1390-1408
RESIDUAL DRAWDOWN vs t/t'



CITY OF HOLLYWOOD
SRWWTP
IW-2
1390-1408
BACKGROUND

Time	Water Level
0	0
0.022	0
0.044	0
0.066	-0.014
0.088	-0.014
0.11	-0.014
0.132	-0.014
0.154	-0.014
0.176	-0.014
0.198	-0.014
0.22	-0.014
0.242	-0.029
0.264	-0.014
0.286	-0.029
0.308	-0.014
0.33	-0.014
0.352	-0.014
0.374	-0.029
0.396	-0.014
0.418	-0.014
0.44	-0.014
0.4622	-0.029
0.4857	-0.014
0.5105	-0.014
0.5368	-0.014
0.5648	-0.014
0.5945	-0.014
0.6258	-0.014
0.659	-0.014
0.6942	-0.014
0.7315	-0.014
0.771	0
0.8128	0
0.8572	0
0.9042	0
0.954	0
1.0067	0
1.0625	0
1.1217	0
1.1843	0
1.2507	0
1.321	0
1.3955	0
1.4745	0.014
1.5582	0
1.6467	0
1.7405	0
1.8398	0
1.9452	0
2.0567	0
2.1748	0
2.3	-0.014
2.4325	-0.014
2.573	-0.014
2.7218	-0.014
2.8793	-0.014
3.0462	-0.014
3.223	-0.014
3.4103	-0.058
3.6087	-0.058
3.8188	-0.058
4.0415	-0.058
4.2773	-0.058
4.5272	-0.058
4.7918	-0.058
5.0722	-0.072
5.369	-0.072
5.6835	-0.058
6.0167	-0.072
6.3695	-0.072
6.7433	-0.072
7.1393	-0.058
7.5587	-0.058
8.003	-0.058
8.4737	-0.058
8.9722	-0.058
9.5002	-0.072
10.0595	-0.072
10.652	-0.058
11.2795	-0.072
11.9443	-0.072
12.6485	-0.072
13.3943	-0.072
14.1843	-0.072
15.0212	-0.072
15.9077	-0.072
16.8467	-0.072
17.8413	-0.072
18.8413	-0.087
19.8413	-0.072
20.8413	-0.072
21.8413	-0.072
22.8413	-0.087
23.8413	-0.072
24.8413	-0.087
25.8413	-0.087
26.8413	-0.087
27.8413	-0.087
28.8413	-0.101
29.8413	-0.087
30.8413	-0.087
31.8413	-0.087
32.8413	-0.101
33.8413	-0.101
34.8413	-0.101
35.8413	-0.072
36.8413	-0.043
37.8413	-0.043
38.8413	-0.101
39.8413	-0.101
40.8413	-0.101
41.8413	-0.087
42.8413	-0.101
43.8413	-0.101
44.8413	-0.116
45.8413	-0.101
46.8413	-0.116
47.8413	-0.116
48.8413	-0.116
49.8413	-0.116
50.8413	-0.116
51.8413	-0.13
52.8413	-0.13
53.8413	-0.13
54.8413	-0.13
55.8413	-0.13
56.8413	-0.13
57.8413	-0.13
58.8413	-0.13
59.8413	-0.13
60.8413	-0.13
61.8413	-0.13
62.8413	-0.13
63.8413	-0.13
64.8413	-0.13
65.8413	-0.13
66.8413	-0.13
67.8413	-0.13
68.8413	-0.144
69.8413	-0.144
70.8413	-0.144
71.8413	-0.144
72.8413	-0.144
73.8413	-0.144
74.8413	-0.144
75.8413	-0.144
76.8413	-0.13
77.8413	-0.144
78.8413	-0.144
79.8413	-0.144
80.8413	-0.144
81.8413	-0.159
82.8413	-0.159
83.8413	-0.159
84.8413	-0.159
85.8413	-0.159
86.8413	-0.159
87.8413	-0.159
88.8413	-0.159
89.8413	-0.159
90.8413	-0.159
91.8413	-0.159
92.8413	-0.144
93.8413	-0.159
94.8413	-0.13
95.8413	-0.087
96.8413	-0.087
97.8413	-0.13
98.8413	-0.144
99.8413	-0.144
100.8413	-0.144
101.8413	-0.144
102.8413	-0.144
103.8413	-0.144
104.8413	-0.144
105.8413	-0.144
106.8413	-0.159
107.8413	-0.159
108.8413	-0.159
109.8413	-0.144
110.8413	-0.159
111.8413	-0.159
112.8413	-0.159
113.8413	-0.159
114.8413	-0.159
115.8413	-0.144
116.8413	-0.159
117.8413	-0.159
118.8413	-0.159
119.8413	-0.159
120.8413	-0.116
121.8413	-0.101
122.8413	-0.087

CITY OF HOLLYWOOD
SRWWTP
IW-2
1390-1408
DRAWDOWN

Time	Water Level
0	0
0.0222	-0.029
0.0443	-0.014
0.0665	-0.014
0.0887	-0.029
0.1108	-0.043
0.133	-0.014
0.1552	-0.014
0.1773	34.605
0.1995	40.393
0.2217	22.581
0.2438	24.977
0.266	20.69
0.2882	21.18
0.3103	22.321
0.3325	22.162
0.3547	22.451
0.3768	22.465
0.399	21.57
0.4212	21.44
0.4433	21.931
0.4655	21.844
0.489	21.989
0.5138	21.917
0.5402	22.292
0.5682	22.465
0.5978	22.826
0.6292	23.201
0.6623	23.461
0.6975	23.822
0.7348	23.981
0.7743	24.169
0.8162	24.717
0.8605	25.006
0.9075	25.28
0.9573	25.439
1.01	25.887
1.0658	26.045
1.125	26.247
1.1877	26.695
1.254	26.868
1.3243	27.012
1.3988	27.417
1.4778	27.561
1.5615	27.778
1.65	27.806
1.7438	28.081
1.8432	28.167
1.9485	28.283
2.06	28.413
2.1782	28.571
2.3033	28.788
2.4358	28.716
2.5763	28.889
2.7252	28.976
2.8827	29.033
3.0495	29.178
3.2263	29.163
3.4137	29.25
3.612	29.322
3.8222	29.365
4.0448	29.452
4.2807	29.466
4.5305	29.495
4.7952	29.481
5.0755	29.481
5.3723	29.568
5.6868	29.611
6.02	29.712
6.3728	29.669
6.7467	29.856
7.1427	29.683
7.562	29.798
8.0063	29.9
8.477	29.842
8.9755	29.842
9.5035	29.957
10.0628	29.928
10.6553	30.073
11.2828	30.174
11.9477	29.9
12.6518	30.001
13.3977	30.073
14.1877	30.073
15.0245	30.159
15.911	30.044
16.85	30.217
17.8447	30.001
18.8447	30.304
19.8447	30.232
20.8447	30.318
21.8447	30.174
22.8447	30.318
23.8447	30.26
24.8447	30.289
25.8447	30.434
26.8447	30.462
27.8447	30.318
28.8447	30.289
29.8447	30.304
30.8447	30.434
31.8447	30.289
32.8447	30.448
33.8447	30.448
34.8447	30.448
35.8447	30.535
36.8447	30.448
37.8447	30.434
38.8447	30.39
39.8447	30.448
40.8447	30.448
41.8447	30.405
42.8447	30.448
43.8447	30.462
44.8447	30.535
45.8447	30.448
46.8447	30.592
47.8447	30.564
48.8447	30.737
49.8447	30.564
50.8447	30.564
51.8447	30.592
52.8447	30.607
53.8447	30.564
54.8447	30.636
55.8447	30.751
56.8447	30.693
57.8447	30.607
58.8447	30.722
59.8447	30.693
60.8447	30.665
61.8447	30.607
62.8447	30.766
63.8447	30.65
64.8447	30.708
65.8447	30.665
66.8447	30.751
67.8447	30.823
68.8447	30.737
69.8447	30.708
70.8447	30.693
71.8447	30.693
72.8447	30.665
73.8447	30.766
74.8447	30.737
75.8447	30.751
76.8447	30.809
77.8447	30.693
78.8447	30.78
79.8447	30.823
80.8447	30.766
81.8447	30.968
82.8447	30.896
83.8447	30.896
84.8447	30.881
85.8447	30.953
86.8447	30.881
87.8447	30.867
88.8447	30.809
89.8447	30.766
90.8447	30.881
91.8447	30.823
92.8447	30.852
93.8447	30.737
94.8447	30.78
95.8447	30.751
96.8447	30.91
97.8447	30.794
98.8447	30.867
99.8447	30.838
100.8447	30.91
101.8447	30.867
102.8447	30.939
103.8447	30.838
104.8447	30.867
105.8447	30.852
106.8447	30.953
107.8447	30.924
108.8447	30.968
109.8447	30.968
110.8447	30.968
111.8447	30.809
112.8447	30.953
113.8447	30.968
114.8447	30.924
115.8447	30.881
116.8447	30.838
117.8447	30.939
118.8447	30.924
119.8447	30.823
120.8447	30.953
121.8447	30.953
122.8447	30.924
123.8447	31.04
124.8447	31.011
125.8447	30.968
126.8447	31.011
127.8447	30.968
128.8447	31.054
129.8447	31.112
130.8447	31.054
131.8447	31.054
132.8447	30.953
133.8447	31.112
134.8447	31.054
135.8447	30.968
136.8447	31.025
137.8447	31.069
138.8447	31.054
139.8447	30.968
140.8447	30.982
141.8447	31.011
142.8447	31.04
143.8447	31.069
144.8447	31.155
145.8447	31.069
146.8447	31.141
147.8447	31.155
148.8447	31.155
149.8447	31.083
150.8447	31.083
151.8447	31.17
152.8447	31.112
153.8447	31.054
154.8447	31.054
155.8447	31.083
156.8447	30.997
157.8447	30.982
158.8447	31.112
159.8447	31.04
160.8447	30.997
161.8447	31.054
162.8447	30.968
163.8447	31.054
164.8447	31.141
165.8447	31.054
166.8447	31.083
167.8447	31.025
168.8447	30.982
169.8447	31.011
170.8447	31.04
171.8447	31.054
172.8447	31.04
173.8447	30.997
174.8447	30.982
175.8447	30.953
176.8447	31.069
177.8447	31.069
178.8447	31.04
179.8447	30.997
180.8447	31.054
181.8447	31.011
182.8447	31.098
183.8447	30.982
184.8447	31.011
185.8447	31.069
186.8447	31.025
187.8447	31.098
188.8447	30.91
189.8447	30.939
190.8447	30.997
191.8447	31.098
192.8447	31.112
193.8447	31.04
194.8447	31.083
195.8447	31.155
196.8447	31.011
197.8447	31.126
198.8447	31.112
199.8447	31.04
200.8447	31.184
201.8447	31.141
202.8447	31.098
203.8447	31.213
204.8447	31.126
205.8447	31.126
206.8447	31.199
207.8447	31.242
208.8447	31.155
209.8447	31.083
210.8447	31.098
211.8447	31.184
212.8447	31.155
213.8447	31.126
214.8447	31.069
215.8447	31.069
216.8447	31.083
217.8447	31.112
218.8447	31.184
219.8447	31.098
220.8447	31.069
221.8447	31.141
222.8447	31.126
223.8447	31.098
224.8447	31.401
225.8447	31.357
226.8447	31.343
227.8447	31.256
228.8447	31.213
229.8447	31.343
230.8447	31.199
231.8447	31.314
232.8447	31.357
233.8447	31.242
234.8447	31.271
235.8447	31.184
236.8447	31.256
237.8447	31.314
238.8447	31.17
239.8447	31.17
240.8447	31.184

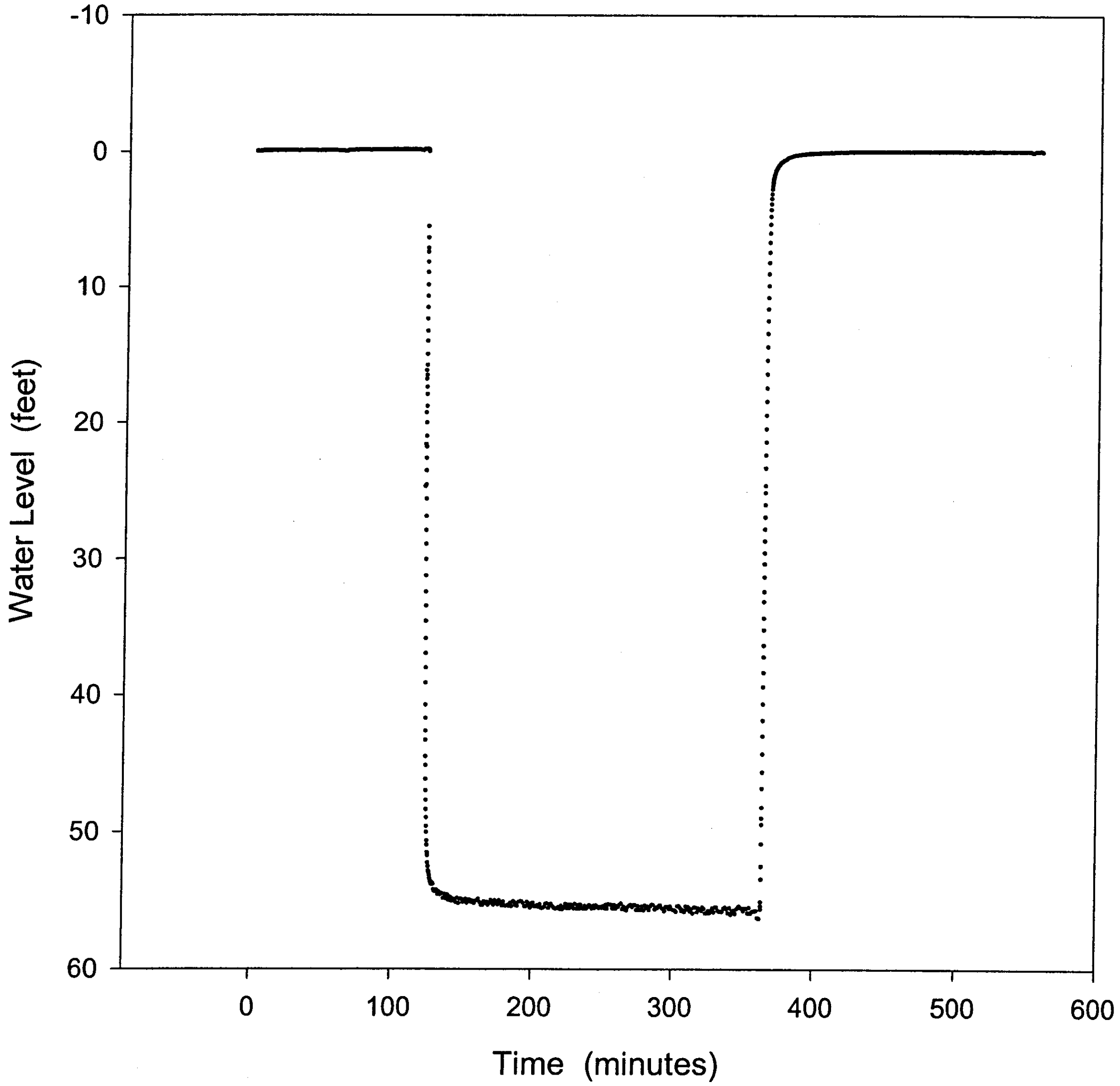
CITY OF HOLLYWOOD
SRWWTP
IW-2
1390-1408
RECOVERY

Time	Water Level	Time	Water Level	Time	Water Level
0	31.184	20.838	0.837	110.838	0.245
0.0218	31.069	21.838	0.808	111.838	0.231
0.0437	31.04	22.838	0.78	112.838	0.231
0.0655	31.141	23.838	0.765	113.838	0.216
0.0873	30.939	24.838	0.751	114.838	0.216
0.1092	31.141	25.838	0.736	115.838	0.202
0.131	31.069	26.838	0.722	116.838	0.202
0.1528	31.155	27.838	0.707	117.838	0.202
0.1747	31.069	28.838	0.693	118.838	0.202
0.1965	31.126	29.838	0.678	119.838	0.202
0.2183	31.112	30.838	0.693	120.838	0.202
0.2402	31.083	31.838	0.65	121.838	0.188
0.262	31.097	32.838	0.664	122.838	0.188
0.2838	31.054	33.838	0.65	123.838	0.188
0.3057	29.625	34.838	0.664	124.838	0.188
0.3275	28.167	35.838	0.678	125.838	0.188
0.3493	29.163	36.838	0.65	126.838	0.188
0.3712	27.619	37.838	0.65	127.838	0.188
0.393	26.233	38.838	0.606	128.838	0.188
0.4148	25.237	39.838	0.577	129.838	0.188
0.4367	24.356	40.838	0.563	130.838	0.173
0.4588	23.143	41.838	0.563	131.838	0.159
0.4823	22.162	42.838	0.548	132.838	0.173
0.5072	18.481	43.838	0.534	133.838	0.173
0.5335	5.833	44.838	0.52	134.838	0.173
0.5615	3.364	45.838	0.505	135.838	0.159
0.5912	7.263	46.838	0.491	136.838	0.159
0.6225	6.598	47.838	0.491	137.838	0.173
0.6557	5.905	48.838	0.476	138.838	0.173
0.6908	6.122	49.838	0.476	139.838	0.173
0.7282	7.494	50.838	0.462	140.838	0.159
0.7677	8.475	51.838	0.447	141.838	0.159
0.8095	3.277	52.838	0.433	142.838	0.159
0.8538	2.7	53.838	0.462	143.838	0.159
0.9008	2.729	54.838	0.447	144.838	0.159
0.9507	2.584	55.838	0.447	145.838	0.159
1.0033	2.556	56.838	0.433	146.838	0.144
1.0592	2.527	57.838	0.433	147.838	0.144
1.1183	2.454	58.838	0.433	148.838	0.144
1.181	2.411	59.838	0.433	149.838	0.144
1.2473	2.368	60.838	0.419	150.838	0.144
1.3177	2.325	61.838	0.419	151.838	0.13
1.3922	2.296	62.838	0.404	152.838	0.13
1.4712	2.238	63.838	0.404	153.838	0.13
1.5548	2.223	64.838	0.404	154.838	0.13
1.6433	2.18	65.838	0.39	155.838	0.13
1.7372	2.151	66.838	0.39	156.838	0.13
1.8365	2.122	67.838	0.39	157.838	0.115
1.9418	2.093	68.838	0.375	158.838	0.13
2.0533	2.036	69.838	0.375	159.838	0.115
2.1715	2.007	70.838	0.375	160.838	0.101
2.2967	1.978	71.838	0.361	161.838	0.115
2.4292	1.949	72.838	0.361	162.838	0.115
2.5697	1.92	73.838	0.361	163.838	0.115
2.7185	1.891	74.838	0.361	164.838	0.101
2.876	1.862	75.838	0.346	165.838	0.101
3.0428	1.834	76.838	0.361	166.838	0.101
3.2197	1.776	77.838	0.346	167.838	0.101
3.407	1.776	78.838	0.346	168.838	0.101
3.6053	1.747	79.838	0.346	169.838	0.101
3.8155	1.704	80.838	0.332	170.838	0.101
4.0382	1.66	81.838	0.346	171.838	0.101
4.274	1.646	82.838	0.332	172.838	0.086
4.5238	1.617	83.838	0.332	173.838	0.101
4.7885	1.559	84.838	0.317	174.838	0.086
5.0688	1.559	85.838	0.317	175.838	0.101
5.3657	1.53	86.838	0.317	176.838	0.101
5.6802	1.487	87.838	0.317	177.838	0.086
6.0133	1.473	88.838	0.303	178.838	0.086
6.3662	1.458	89.838	0.303	179.838	0.086
6.74	1.429	90.838	0.303	180.838	0.086
7.136	1.386	91.838	0.289	181.838	0.115
7.5553	1.372	92.838	0.289	182.838	0.13
7.9997	1.299	93.838	0.289		
8.4703	1.285	94.838	0.289		
8.9688	1.27	95.838	0.274		
9.4968	1.256	96.838	0.274		
10.0562	1.227	97.838	0.274		
10.6487	1.198	98.838	0.274		
11.2762	1.141	99.838	0.26		
11.941	1.097	100.838	0.274		
12.6452	1.068	101.838	0.26		
13.391	1.039	102.838	0.26		
14.181	1.011	103.838	0.26		
15.0178	0.996	104.838	0.26		
15.9043	0.996	105.838	0.26		
16.8433	0.996	106.838	0.245		
17.838	0.953	107.838	0.245		
18.838	0.881	108.838	0.245		
19.838	0.852	109.838	0.245		

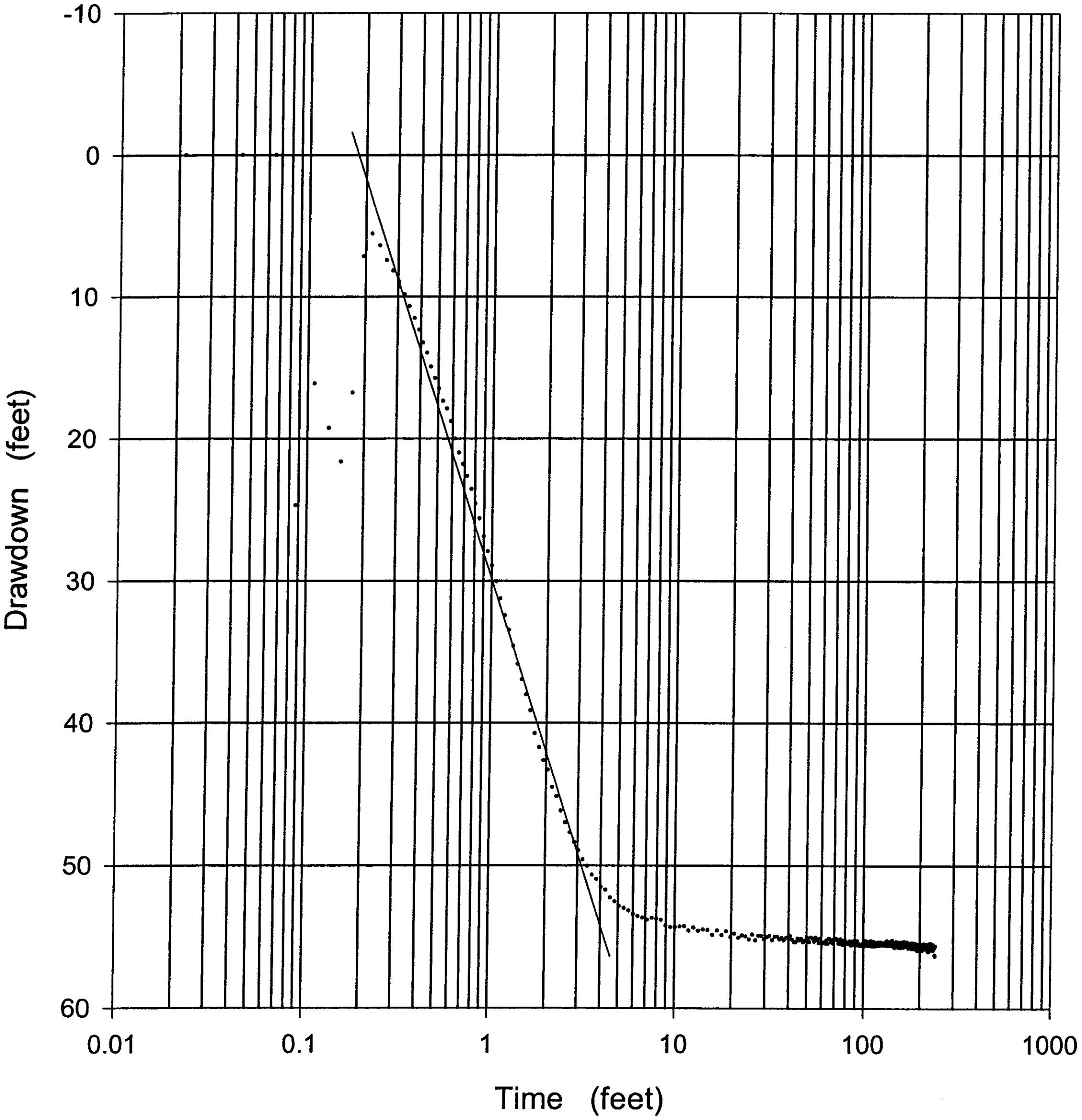
Injection Well No. 2 (IW-2) – Packer Tests

1,510 – 1,528

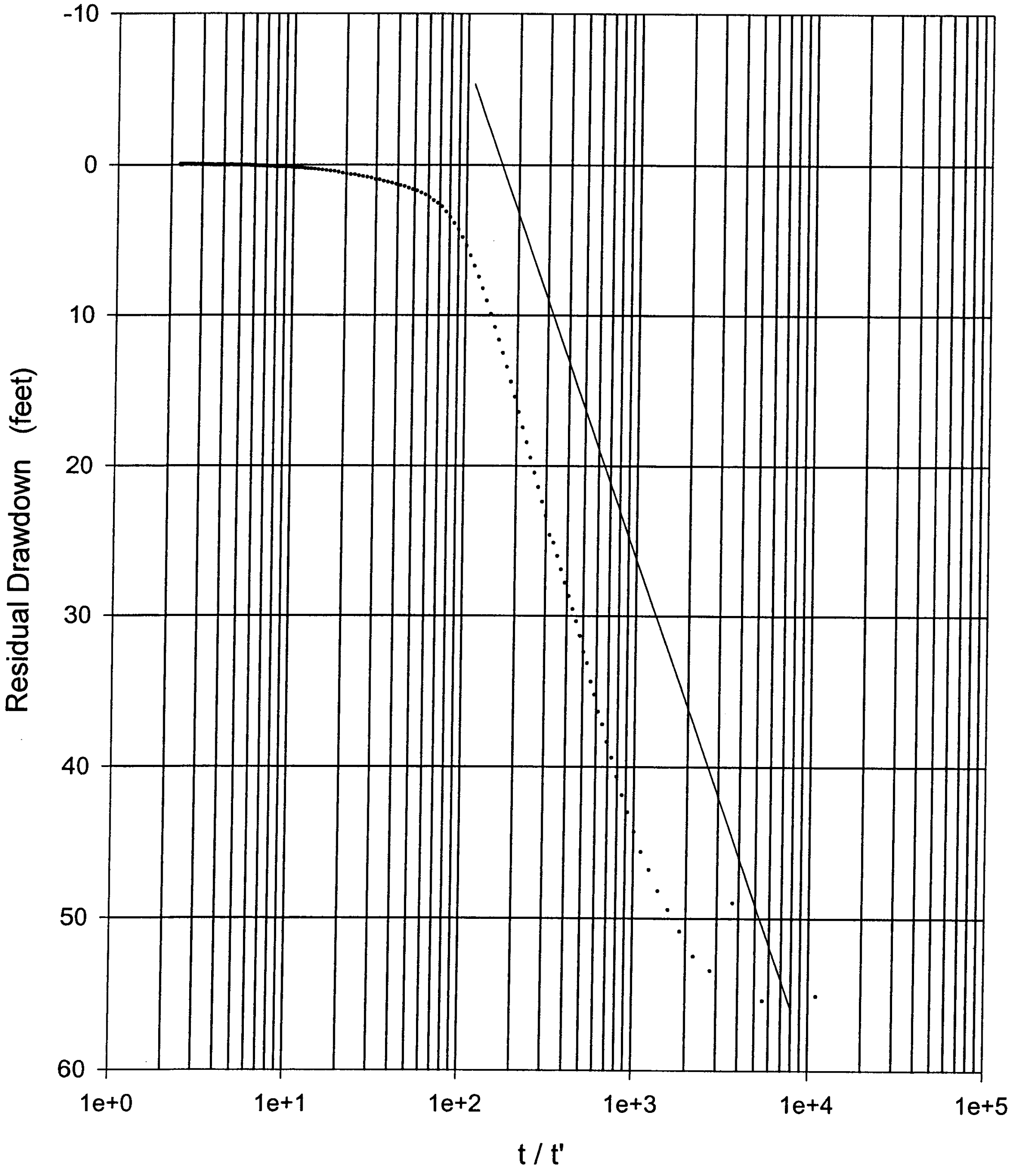
CITY OF HOLLYWOOD
SRWWTP
IW-2
1510-1528
BACKGROUND, DRAWDOWN AND RECOVERY



CITY OF HOLLYWOOD
SRWWTP
IW-2
1510-1528
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1510-1528
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1510-1528
BACKGROUND

Time	Water Level
0	0
0.0218	0
0.0437	-0.014
0.0655	-0.014
0.0873	-0.014
0.1092	-0.014
0.131	-0.014
0.1528	-0.029
0.1747	-0.014
0.1965	-0.014
0.2183	-0.014
0.2402	-0.029
0.262	-0.014
0.2838	-0.029
0.3057	-0.014
0.3275	-0.014
0.3493	-0.014
0.3712	-0.014
0.393	-0.014
0.4148	-0.014
0.4367	-0.014
0.4588	-0.014
0.4823	-0.014
0.5072	-0.014
0.5335	-0.014
0.5615	-0.014
0.5912	-0.014
0.6225	-0.014
0.6557	-0.014
0.6908	-0.014
0.7282	-0.014
0.7677	-0.014
0.8095	0
0.8538	-0.014
0.9008	-0.014
0.9507	-0.014
1.0033	-0.014
1.0592	0
1.1183	-0.014
1.181	0
1.2473	-0.014
1.3177	0
1.3922	0
1.4712	0
1.5548	0
1.6433	0
1.7372	-0.014
1.8365	0
1.9418	0
2.0533	0
2.1715	0
2.2967	0
2.4292	0
2.5697	0
2.7185	0
2.876	0
3.0428	0
3.2197	0
3.407	-0.043
3.6053	-0.043
3.8155	-0.043
4.0382	-0.043
4.274	-0.043
4.5238	-0.058
4.7885	-0.058
5.0688	-0.058
5.3657	-0.058
5.6802	-0.058
6.0133	-0.058
6.3662	-0.058
6.74	-0.058
7.136	-0.058
7.5553	-0.058
7.9997	-0.058
8.4703	-0.029
8.9688	-0.058
9.4968	-0.058
10.0562	-0.058
10.6487	-0.058
11.2762	-0.072
11.941	-0.072
12.6452	-0.072
13.391	-0.072
14.181	-0.043
15.0178	-0.072
15.9043	-0.072
16.8433	-0.058
17.838	-0.072
18.838	-0.072
19.838	-0.043
20.838	-0.072
21.838	-0.072
22.838	-0.072
23.838	-0.072
24.838	-0.087
25.838	-0.087
26.838	-0.087
27.838	-0.087
28.838	-0.058
29.838	-0.058
30.838	-0.058
31.838	-0.058
32.838	-0.058
33.838	-0.058
34.838	-0.072
35.838	-0.072
36.838	-0.072
37.838	-0.072
38.838	-0.072
39.838	-0.058
40.838	-0.072
41.838	-0.058
42.838	-0.058
43.838	-0.058
44.838	-0.058
45.838	-0.058
46.838	-0.072
47.838	-0.058
48.838	-0.072
49.838	-0.072
50.838	-0.072
51.838	-0.072
52.838	-0.072
53.838	-0.072
54.838	-0.072
55.838	-0.072
56.838	-0.058
57.838	-0.043
58.838	-0.043
59.838	-0.043
60.838	-0.043
61.838	-0.029
62.838	-0.014
63.838	-0.014
64.838	-0.087
65.838	-0.087
66.838	-0.087
67.838	-0.101
68.838	-0.101
69.838	-0.101
70.838	-0.101
71.838	-0.101
72.838	-0.115
73.838	-0.115
74.838	-0.115
75.838	-0.115
76.838	-0.115
77.838	-0.115
78.838	-0.13
79.838	-0.101
80.838	-0.101
81.838	-0.115
82.838	-0.115
83.838	-0.115
84.838	-0.115
85.838	-0.115
86.838	-0.115
87.838	-0.13
88.838	-0.13
89.838	-0.13
90.838	-0.13
91.838	-0.13
92.838	-0.13
93.838	-0.13
94.838	-0.13
95.838	-0.13
96.838	-0.144
97.838	-0.13
98.838	-0.144
99.838	-0.13
100.838	-0.13
101.838	-0.13
102.838	-0.13
103.838	-0.144
104.838	-0.144
105.838	-0.144
106.838	-0.144
107.838	-0.144
108.838	-0.13
109.838	-0.144
110.838	-0.144
111.838	-0.144
112.838	-0.144
113.838	-0.144
114.838	-0.144
115.838	-0.115
116.838	-0.101
117.838	-0.087
118.838	-0.159
119.838	-0.159
120.838	-0.173
121.838	-0.13

CITY OF HOLLYWOOD
SRWWTP
IW-2
1510-1528
DRAWDOWN

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	0	20.8347	54.772	110.8347	55.623	200.8347	55.493
0.0217	-0.014	21.8347	55.061	111.8347	55.349	201.8347	55.609
0.0433	-0.014	22.8347	54.902	112.8347	55.652	202.8347	55.941
0.065	-0.014	23.8347	54.96	113.8347	55.306	203.8347	55.926
0.0867	24.684	24.8347	55.176	114.8347	55.594	204.8347	55.768
0.1083	16.153	25.8347	54.844	115.8347	55.623	205.8347	55.926
0.13	19.271	26.8347	55.234	116.8347	55.407	206.8347	55.753
0.1517	21.609	27.8347	54.916	117.8347	55.623	207.8347	55.566
0.1733	16.788	28.8347	54.916	118.8347	55.508	208.8347	55.869
0.195	7.16	29.8347	55.162	119.8347	55.349	209.8347	55.493
0.2167	5.544	30.8347	55.017	120.8347	55.407	210.8347	55.493
0.2383	6.381	31.8347	54.916	121.8347	55.609	211.8347	55.753
0.26	7.435	32.8347	55.219	122.8347	55.407	212.8347	55.811
0.2817	8.171	33.8347	54.988	123.8347	55.566	213.8347	55.811
0.3033	8.936	34.8347	54.974	124.8347	55.349	214.8347	55.825
0.325	9.86	35.8347	55.162	125.8347	55.465	215.8347	55.58
0.3467	10.683	36.8347	55.061	126.8347	55.566	216.8347	55.508
0.3683	11.534	37.8347	55.234	127.8347	55.479	217.8347	55.609
0.39	12.357	38.8347	55.061	128.8347	55.537	218.8347	55.912
0.4117	13.266	39.8347	55.017	129.8347	55.421	219.8347	55.537
0.4333	13.988	40.8347	54.916	130.8347	55.58	220.8347	56.027
0.4555	14.955	41.8347	55.176	131.8347	55.32	221.8347	55.782
0.479	15.764	42.8347	55.364	132.8347	55.623	222.8347	55.739
0.5038	16.514	43.8347	55.364	133.8347	55.277	223.8347	55.984
0.5302	17.38	44.8347	55.104	134.8347	55.306	224.8347	55.652
0.5582	17.914	45.8347	55.234	135.8347	55.32	225.8347	55.537
0.5878	18.795	46.8347	55.118	136.8347	55.594	226.8347	55.436
0.6192	20.022	47.8347	55.364	137.8347	55.32	227.8347	55.537
0.6523	21.003	48.8347	55.248	138.8347	55.623	228.8347	55.594
0.6875	21.811	49.8347	55.003	139.8347	55.392	229.8347	55.768
0.7248	22.634	50.8347	55.075	140.8347	55.479	230.8347	55.58
0.7643	23.543	51.8347	55.349	141.8347	55.306	231.8347	55.594
0.8062	24.583	52.8347	55.017	142.8347	55.219	232.8347	55.926
0.8505	25.622	53.8347	55.104	143.8347	55.652	233.8347	55.522
0.8975	26.892	54.8347	55.32	144.8347	55.45	234.8347	55.941
0.9473	27.931	55.8347	55.017	145.8347	55.681	235.8347	55.825
1	28.941	56.8347	55.162	146.8347	55.739	236.8347	55.782
1.0558	30.053	57.8347	55.407	147.8347	55.479	237.8347	55.782
1.115	31.251	58.8347	55.104	148.8347	55.392	238.8347	55.753
1.1777	32.448	59.8347	55.407	149.8347	55.335	239.8347	56.273
1.244	33.473	60.8347	55.407	150.8347	55.493	240.8347	56.33
1.3143	34.599	61.8347	55.349	151.8347	55.364	241.8347	55.638
1.3888	35.869	62.8347	55.436	152.8347	55.349		
1.4678	36.965	63.8347	55.205	153.8347	55.724		
1.5515	38.019	64.8347	55.45	154.8347	55.407		
1.64	39.13	65.8347	55.089	155.8347	55.71		
1.7338	40.732	66.8347	55.176	156.8347	55.71		
1.8332	41.713	67.8347	55.378	157.8347	55.421		
1.9385	42.637	68.8347	55.436	158.8347	55.739		
2.05	43.301	69.8347	55.133	159.8347	55.364		
2.1682	44.498	70.8347	55.089	160.8347	55.58		
2.2933	45.148	71.8347	55.104	161.8347	55.45		
2.4258	46.158	72.8347	55.205	162.8347	55.724		
2.5663	46.995	73.8347	55.45	163.8347	55.436		
2.7152	47.687	74.8347	55.45	164.8347	55.306		
2.8727	48.365	75.8347	55.133	165.8347	55.32		
3.0395	48.957	76.8347	55.291	166.8347	55.667		
3.2163	49.606	77.8347	55.551	167.8347	55.522		
3.4037	50.039	78.8347	55.248	168.8347	55.566		
3.602	50.66	79.8347	55.19	169.8347	55.421		
3.8122	50.963	80.8347	55.45	170.8347	55.349		
4.0348	51.525	81.8347	55.436	171.8347	55.566		
4.2707	51.727	82.8347	55.364	172.8347	55.638		
4.5205	52.276	83.8347	55.493	173.8347	55.796		
4.7852	52.536	84.8347	55.277	174.8347	55.465		
5.0655	52.853	85.8347	55.58	175.8347	55.479		
5.3623	52.983	86.8347	55.566	176.8347	55.623		
5.6768	53.17	87.8347	55.493	177.8347	55.421		
6.01	53.416	88.8347	55.263	178.8347	55.638		
6.3628	53.56	89.8347	55.248	179.8347	55.71		
6.7367	53.675	90.8347	55.58	180.8347	55.724		
7.1327	53.82	91.8347	55.306	181.8347	55.84		
7.552	53.69	92.8347	55.263	182.8347	55.421		
7.9963	53.748	93.8347	55.45	183.8347	55.407		
8.467	53.82	94.8347	55.58	184.8347	55.551		
8.9655	54.224	95.8347	55.609	185.8347	55.796		
9.4935	54.339	96.8347	55.58	186.8347	55.71		
10.0528	54.325	97.8347	55.493	187.8347	55.84		
10.6453	54.281	98.8347	55.638	188.8347	55.436		
11.2728	54.253	99.8347	55.407	189.8347	55.667		
11.9377	54.57	100.8347	55.667	190.8347	55.479		
12.6418	54.368	101.8347	55.537	191.8347	55.811		
13.3877	54.584	102.8347	55.263	192.8347	55.638		
14.1777	54.498	103.8347	55.566	193.8347	55.955		
15.0145	54.512	104.8347	55.306	194.8347	55.508		
15.901	54.873	105.8347	55.594	195.8347	55.522		
16.84	54.556	106.8347	55.32	196.8347	55.854		
17.8347	54.887	107.8347	55.349	197.8347	55.58		
18.8347	54.613	108.8347	55.609	198.8347	55.638		
19.8347	55.017	109.8347	55.263	199.8347	55.768		

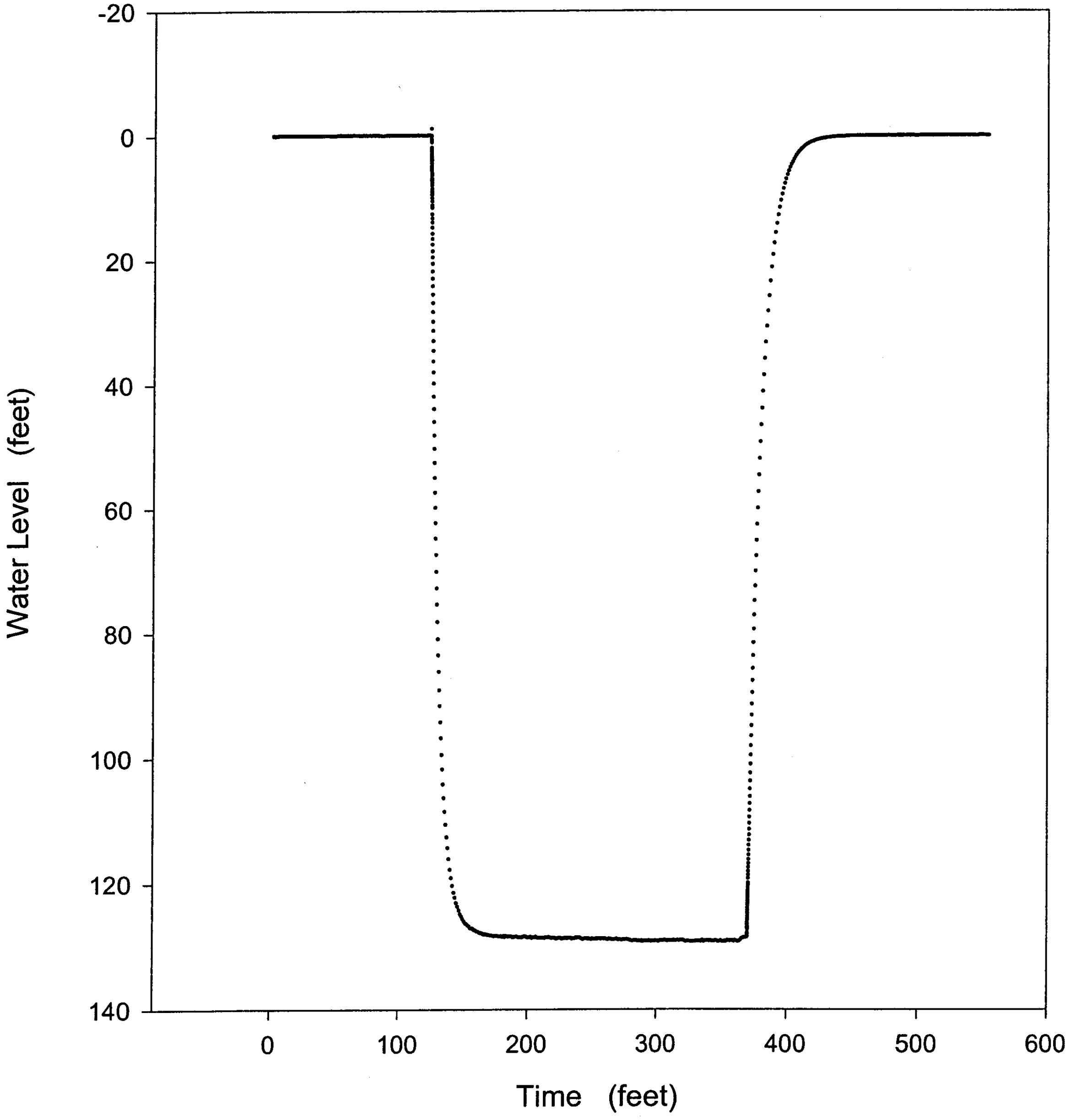
CITY OF HOLLYWOOD
SRWWTP
IW-2
1510-1528
RECOVERY

Time	Water Level
0	55.638
0.0218	55.104
0.0437	55.422
0.0655	48.986
0.0873	53.445
0.1092	52.507
0.131	50.862
0.1528	49.448
0.1747	48.207
0.1965	46.822
0.2183	45.624
0.2402	44.297
0.262	42.998
0.2838	41.858
0.3057	40.646
0.3275	39.39
0.3493	38.351
0.3712	37.197
0.393	36.345
0.4148	35.22
0.4367	34.368
0.4588	33.142
0.4823	32.406
0.5072	31.323
0.5335	30.356
0.5615	29.562
0.5912	28.682
0.6225	27.816
0.6557	26.921
0.6908	26.026
0.7282	25.146
0.7677	24.626
0.8095	23.342
0.8538	22.389
0.9008	21.422
0.9507	20.455
1.0033	19.459
1.0592	18.435
1.1183	17.439
1.181	16.414
1.2473	15.403
1.3177	14.407
1.3922	13.426
1.4712	12.502
1.5548	11.636
1.6433	10.784
1.7372	9.918
1.8365	9.023
1.9418	8.2
2.0533	7.435
2.1715	6.713
2.2967	6.021
2.4292	5.371
2.5697	4.794
2.7185	4.288
2.876	3.87
3.0428	3.48
3.2197	3.119
3.407	2.772
3.6053	2.541
3.8155	2.354
4.0382	2.152
4.274	1.978
4.5238	1.849
4.7885	1.704
5.0688	1.632
5.3657	1.531
5.6802	1.415
6.0133	1.358
6.3662	1.286
6.74	1.199
7.136	1.141
7.5553	1.069
7.9997	0.982
8.4703	0.953
8.9688	0.867
9.4968	0.809
10.0562	0.766
10.6487	0.722
11.2762	0.65
11.941	0.636
12.6452	0.593
13.391	0.549
14.181	0.463
15.0178	0.419
15.9043	0.39
16.8433	0.362
17.838	0.333
18.838	0.304
19.838	0.275
20.838	0.261
21.838	0.246
22.838	0.232
23.838	0.203
24.838	0.203
25.838	0.188
26.838	0.174
27.838	0.159
28.838	0.145
29.838	0.131
30.838	0.131
31.838	0.131
32.838	0.116
33.838	0.116
34.838	0.116
35.838	0.116
36.838	0.087
37.838	0.102
38.838	0.087
39.838	0.087
40.838	0.073
41.838	0.073
42.838	0.073
43.838	0.058
44.838	0.058
45.838	0.058
46.838	0.058
47.838	0.044
48.838	0.044
49.838	0.044
50.838	0.044
51.838	0.03
52.838	0.03
53.838	0.03
54.838	0.015
55.838	0.03
56.838	0.015
57.838	0.015
58.838	0.015
59.838	0.015
60.838	0.015
61.838	0.001
62.838	0.001
63.838	0.001
64.838	0.001
65.838	0.001
66.838	0.001
67.838	0.001
68.838	0.001
69.838	-0.014
70.838	-0.014
71.838	-0.014
72.838	-0.014
73.838	0.001
74.838	0.001
75.838	0.001
76.838	0.001
77.838	0.001
78.838	0.001
79.838	0.001
80.838	0.001
81.838	0.001
82.838	0.001
83.838	-0.014
84.838	0.001
85.838	0.001
86.838	-0.014
87.838	0.001
88.838	-0.014
89.838	0.001
90.838	-0.014
91.838	-0.014
92.838	0.001
93.838	0.001
94.838	0.001
95.838	0.001
96.838	0.001
97.838	0.001
98.838	-0.014
99.838	0.001
100.838	0.001
101.838	-0.014
102.838	-0.014
103.838	0.001
104.838	-0.014
105.838	-0.014
106.838	-0.028
107.838	-0.014
108.838	-0.014
109.838	-0.014
110.838	-0.028
111.838	-0.014
112.838	-0.014
113.838	-0.028
114.838	-0.014
115.838	-0.014
116.838	-0.014
117.838	-0.028
118.838	-0.028
119.838	-0.028
120.838	-0.014
121.838	-0.028
122.838	-0.028
123.838	-0.028
124.838	-0.028
125.838	-0.014
126.838	-0.028
127.838	-0.028
128.838	-0.028
129.838	-0.028
130.838	-0.028
131.838	-0.028
132.838	-0.043
133.838	-0.028
134.838	-0.028
135.838	-0.028
136.838	-0.028
137.838	-0.028
138.838	-0.028
139.838	-0.028
140.838	-0.028
141.838	-0.028
142.838	-0.043
143.838	-0.028
144.838	-0.028
145.838	-0.028
146.838	-0.028
147.838	-0.028
148.838	-0.028
149.838	-0.043
150.838	-0.043
151.838	-0.043
152.838	-0.028
153.838	-0.028
154.838	-0.028
155.838	-0.028
156.838	-0.043
157.838	-0.028
158.838	-0.043
159.838	-0.043
160.838	-0.043
161.838	-0.043
162.838	-0.043
163.838	-0.043
164.838	-0.043
165.838	-0.043
166.838	-0.028
167.838	-0.043
168.838	-0.028
169.838	-0.043
170.838	-0.043
171.838	-0.043
172.838	-0.028
173.838	-0.043
174.838	-0.028
175.838	-0.043
176.838	-0.043
177.838	-0.043
178.838	-0.043
179.838	-0.043
180.838	-0.043
181.838	-0.043
182.838	-0.043
183.838	-0.043
184.838	-0.043
185.838	-0.043
186.838	0.001
187.838	0.03
188.838	0.015
189.838	-0.043
190.838	-0.043
191.838	-0.028
192.838	-0.057
193.838	-0.057
194.838	0.001

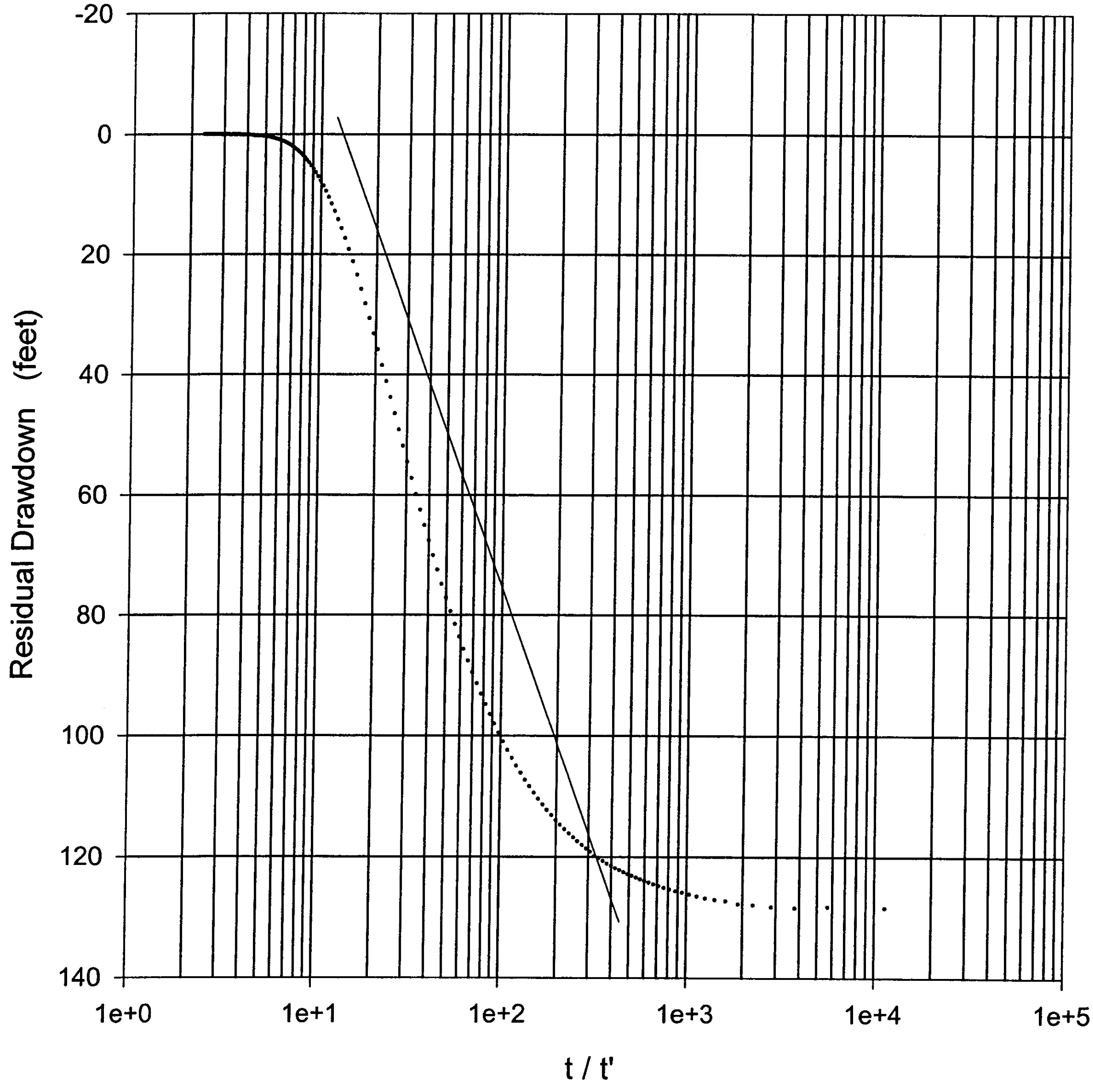
Injection Well No. 2 (IW-2) – Packer Tests

1,760 – 1,778

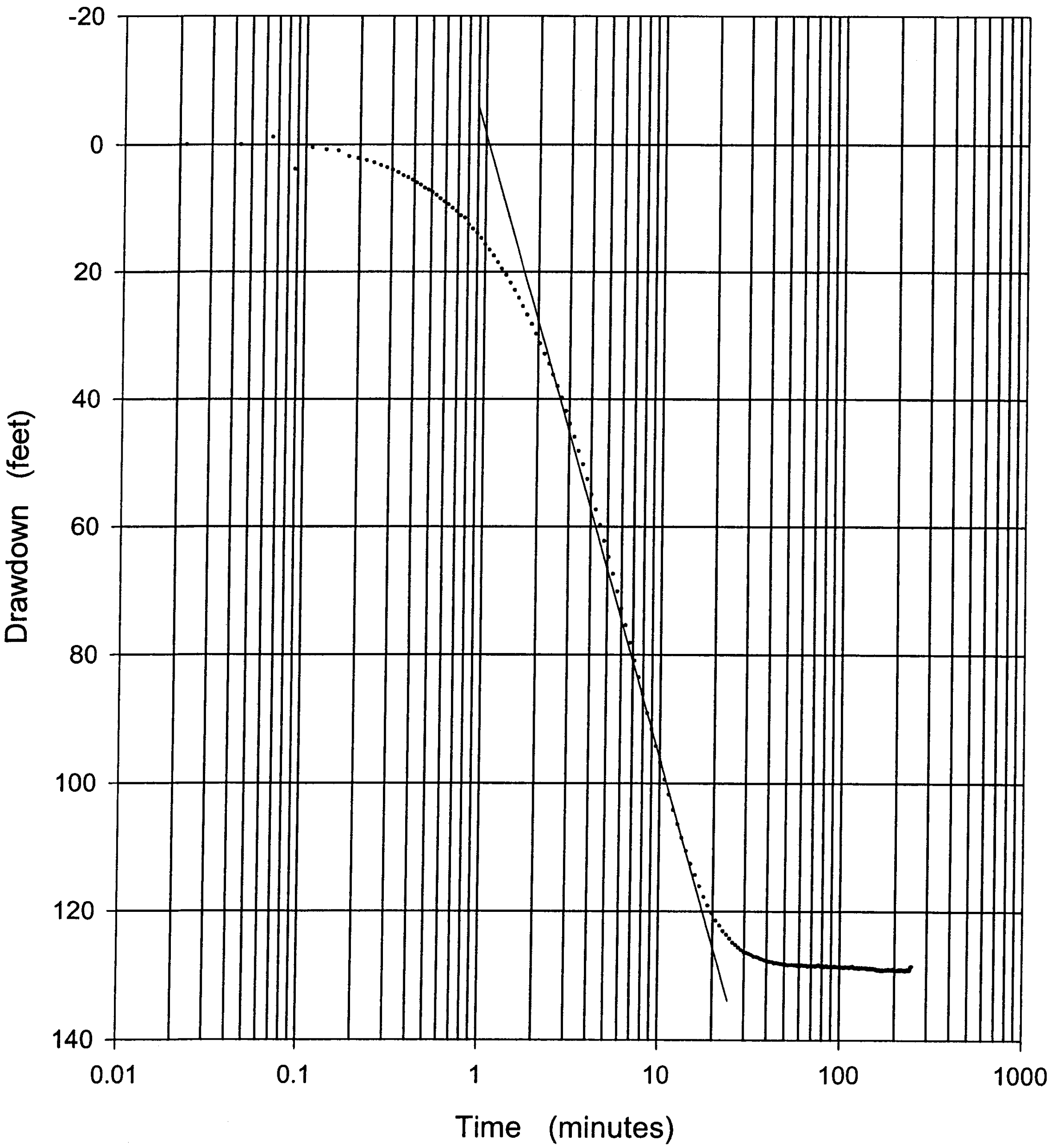
CITY OF HOLLYWOOD
SRWWTP
IW-2
1760-1778
BACKGROUND, DRAWDOWN AND RECOVERY



CITY OF HOLLYWOOD
SRWWTP
IW-2
1760-1778
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1760-1778
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1760-1778
BACKGROUND

Time	Water Level	Time	Water Level	Time	Water Level
0	0	20.8347	-0.043	110.8347	-0.115
0.0217	0	21.8347	-0.043	111.8347	-0.115
0.0433	0	22.8347	-0.043	112.8347	-0.115
0.065	-0.014	23.8347	-0.043	113.8347	-0.115
0.0867	0	24.8347	-0.043	114.8347	-0.101
0.1083	-0.014	25.8347	-0.043	115.8347	-0.072
0.13	-0.014	26.8347	-0.043	116.8347	-0.058
0.1517	-0.014	27.8347	-0.058	117.8347	-0.058
0.1733	-0.014	28.8347	-0.043	118.8347	-0.043
0.195	-0.014	29.8347	-0.043	119.8347	-0.101
0.2167	-0.014	30.8347	-0.043	120.8347	-0.115
0.2383	-0.014	31.8347	-0.043	121.8347	-0.115
0.26	-0.014	32.8347	-0.058	122.8347	-0.087
0.2817	-0.014	33.8347	-0.058		
0.3033	-0.014	34.8347	-0.043		
0.325	-0.029	35.8347	-0.058		
0.3467	-0.014	36.8347	-0.058		
0.3683	-0.014	37.8347	-0.058		
0.39	-0.014	38.8347	-0.058		
0.4117	-0.014	39.8347	-0.058		
0.4333	-0.014	40.8347	-0.058		
0.4555	-0.014	41.8347	-0.058		
0.479	-0.029	42.8347	-0.058		
0.5038	-0.014	43.8347	-0.058		
0.5302	-0.029	44.8347	-0.058		
0.5582	-0.014	45.8347	-0.014		
0.5878	-0.014	46.8347	-0.014		
0.6192	-0.014	47.8347	-0.014		
0.6523	-0.014	48.8347	-0.058		
0.6875	-0.014	49.8347	-0.072		
0.7248	-0.014	50.8347	-0.087		
0.7643	0.014	51.8347	-0.101		
0.8062	0.014	52.8347	-0.101		
0.8505	0.014	53.8347	-0.101		
0.8975	0.014	54.8347	-0.087		
0.9473	0.014	55.8347	-0.087		
1	0.014	56.8347	-0.087		
1.0558	0.014	57.8347	-0.101		
1.115	0.014	58.8347	-0.087		
1.1777	0.014	59.8347	-0.101		
1.244	0.014	60.8347	-0.087		
1.3143	0.014	61.8347	-0.101		
1.3888	0.014	62.8347	-0.101		
1.4678	0.014	63.8347	-0.101		
1.5515	0.029	64.8347	-0.101		
1.64	0.014	65.8347	-0.101		
1.7338	0.014	66.8347	-0.087		
1.8332	0.014	67.8347	-0.087		
1.9385	0.014	68.8347	-0.087		
2.05	0.029	69.8347	-0.101		
2.1682	0.014	70.8347	-0.087		
2.2933	0.014	71.8347	-0.101		
2.4258	0.014	72.8347	-0.087		
2.5663	0.014	73.8347	-0.101		
2.7152	0.014	74.8347	-0.101		
2.8727	0.014	75.8347	-0.087		
3.0395	0.014	76.8347	-0.101		
3.2163	-0.014	77.8347	-0.101		
3.4037	-0.029	78.8347	-0.087		
3.602	-0.029	79.8347	-0.101		
3.8122	-0.029	80.8347	-0.101		
4.0348	-0.029	81.8347	-0.087		
4.2707	-0.029	82.8347	-0.087		
4.5205	-0.043	83.8347	-0.058		
4.7852	-0.043	84.8347	-0.029		
5.0655	-0.043	85.8347	-0.029		
5.3623	-0.043	86.8347	-0.087		
5.6768	-0.029	87.8347	-0.087		
6.01	-0.043	88.8347	-0.101		
6.3628	-0.043	89.8347	-0.087		
6.7367	-0.043	90.8347	-0.101		
7.1327	-0.043	91.8347	-0.101		
7.552	-0.043	92.8347	-0.101		
7.9963	-0.043	93.8347	-0.101		
8.467	-0.043	94.8347	-0.101		
8.9655	-0.043	95.8347	-0.101		
9.4935	-0.043	96.8347	-0.101		
10.0528	-0.043	97.8347	-0.101		
10.6453	-0.043	98.8347	-0.115		
11.2728	-0.043	99.8347	-0.101		
11.9377	-0.043	100.8347	-0.115		
12.6418	-0.058	101.8347	-0.101		
13.3877	-0.058	102.8347	-0.101		
14.1777	-0.043	103.8347	-0.101		
15.0145	-0.043	104.8347	-0.101		
15.901	-0.058	105.8347	-0.115		
16.84	-0.058	106.8347	-0.101		
17.8347	-0.058	107.8347	-0.115		
18.8347	-0.058	108.8347	-0.115		
19.8347	-0.043	109.8347	-0.115		

CITY OF HOLLYWOOD
SRWWTP
IW-2
1760-1778
DRAWDOWN

Time	Water Level	Time	Water Level	Time	Water Level	Time	Water Level
0	0	20.8347	121.445	110.8347	128.668	200.8347	129.215
0.0217	-0.014	21.8347	122.223	111.8347	128.668	201.8347	129.187
0.0433	-0.029	22.8347	123.103	112.8347	128.812	202.8347	129.158
0.065	-1.169	23.8347	123.65	113.8347	128.725	203.8347	129.187
0.0867	3.869	24.8347	124.27	114.8347	128.74	204.8347	129.23
0.1083	0.476	25.8347	124.876	115.8347	128.61	205.8347	129.259
0.13	0.823	26.8347	125.236	116.8347	128.682	206.8347	129.244
0.1517	0.982	27.8347	125.64	117.8347	128.567	207.8347	129.201
0.1733	1.877	28.8347	126.029	118.8347	128.61	208.8347	129.201
0.195	2.18	29.8347	126.332	119.8347	128.754	209.8347	129.129
0.2167	2.497	30.8347	126.433	120.8347	128.855	210.8347	129.129
0.2383	2.858	31.8347	126.635	121.8347	128.869	211.8347	129.158
0.26	3.277	32.8347	126.779	122.8347	128.783	212.8347	129.215
0.2817	3.623	33.8347	127.067	123.8347	128.768	213.8347	129.042
0.3033	4.013	34.8347	127.096	124.8347	128.812	214.8347	129.215
0.325	4.403	35.8347	127.183	125.8347	128.783	215.8347	129.114
0.3467	4.865	36.8347	127.356	126.8347	128.826	216.8347	129.1
0.3683	5.182	37.8347	127.471	127.8347	128.927	217.8347	129.071
0.39	5.558	38.8347	127.615	128.8347	128.783	218.8347	129.129
0.4117	6.005	39.8347	127.658	129.8347	128.855	219.8347	129.1
0.4333	6.323	40.8347	127.817	130.8347	128.869	220.8347	129.143
0.4555	6.828	41.8347	127.86	131.8347	128.783	221.8347	129.172
0.479	7.131	42.8347	127.875	132.8347	128.812	222.8347	129.143
0.5038	7.535	43.8347	128.062	133.8347	128.783	223.8347	129.1
0.5302	7.954	44.8347	128.019	134.8347	128.783	224.8347	129.129
0.5582	8.502	45.8347	128.062	135.8347	128.826	225.8347	129.259
0.5878	8.964	46.8347	128.134	136.8347	128.783	226.8347	129.187
0.6192	9.412	47.8347	128.163	137.8347	128.812	227.8347	129.114
0.6523	9.989	48.8347	128.221	138.8347	128.783	228.8347	129.244
0.6875	10.48	49.8347	128.206	139.8347	128.884	229.8347	129.259
0.7248	11.158	50.8347	128.278	140.8347	128.927	230.8347	129.158
0.7643	11.519	51.8347	128.365	141.8347	128.826	231.8347	129.215
0.8062	12.573	52.8347	128.365	142.8347	128.869	232.8347	129.071
0.8505	13.237	53.8347	128.336	143.8347	128.884	233.8347	129.057
0.8975	13.901	54.8347	128.322	144.8347	128.985	234.8347	129.158
0.9473	14.723	55.8347	128.379	145.8347	128.913	235.8347	129.086
1	15.719	56.8347	128.394	146.8347	128.869	236.8347	129.1
1.0558	16.556	57.8347	128.35	147.8347	128.841	237.8347	129.201
1.115	17.466	58.8347	128.48	148.8347	128.941	238.8347	129.071
1.1777	18.519	59.8347	128.322	149.8347	128.956	239.8347	129.143
1.244	19.53	60.8347	128.509	150.8347	128.956	240.8347	129.215
1.3143	20.526	61.8347	128.35	151.8347	128.999	241.8347	129.172
1.3888	21.767	62.8347	128.394	152.8347	128.927	242.8347	128.999
1.4678	22.921	63.8347	128.466	153.8347	128.941	243.8347	128.783
1.5515	24.134	64.8347	128.394	154.8347	128.913	244.8347	128.624
1.64	25.476	65.8347	128.394	155.8347	128.898	245.8347	128.639
1.7338	26.832	66.8347	128.581	156.8347	128.97	246.8347	128.567
1.8332	28.261	67.8347	128.509	157.8347	128.999	247.8347	128.538
1.9385	29.82	68.8347	128.466	158.8347	129.114		
2.05	31.306	69.8347	128.408	159.8347	129.143		
2.1682	32.937	70.8347	128.509	160.8347	129.086		
2.2933	34.51	71.8347	128.567	161.8347	129.1		
2.4258	36.198	72.8347	128.509	162.8347	129.071		
2.5663	37.988	73.8347	128.595	163.8347	129.172		
2.7152	39.777	74.8347	128.495	164.8347	129.1		
2.8727	41.884	75.8347	128.408	165.8347	129.187		
3.0395	43.86	76.8347	128.379	166.8347	129.114		
3.2163	45.924	77.8347	128.538	167.8347	129.244		
3.4037	48.131	78.8347	128.581	168.8347	129.172		
3.602	50.238	79.8347	128.581	169.8347	129.158		
3.8122	52.532	80.8347	128.466	170.8347	129.172		
4.0348	54.97	81.8347	128.668	171.8347	129.158		
4.2707	57.336	82.8347	128.552	172.8347	129.1		
4.5205	59.746	83.8347	128.581	173.8347	129.201		
4.7852	62.256	84.8347	128.451	174.8347	129.158		
5.0655	64.737	85.8347	128.639	175.8347	129.201		
5.3623	67.377	86.8347	128.639	176.8347	129.172		
5.6768	70.118	87.8347	128.624	177.8347	129.1		
6.01	72.787	88.8347	128.624	178.8347	129.172		
6.3628	75.383	89.8347	128.624	179.8347	129.215		
6.7367	78.167	90.8347	128.639	180.8347	129.086		
7.1327	80.908	91.8347	128.668	181.8347	129.114		
7.552	83.475	92.8347	128.567	182.8347	129.114		
7.9963	86.129	93.8347	128.581	183.8347	129.071		
8.467	89.086	94.8347	128.538	184.8347	128.999		
8.9655	91.624	95.8347	128.61	185.8347	129.086		
9.4935	94.206	96.8347	128.682	186.8347	129.143		
10.0528	96.744	97.8347	128.682	187.8347	129.1		
10.6453	99.426	98.8347	128.639	188.8347	129.071		
11.2728	101.748	99.8347	128.711	189.8347	129.1		
11.9377	104.156	100.8347	128.797	190.8347	129.114		
12.6418	106.348	101.8347	128.711	191.8347	129.042		
13.3877	108.525	102.8347	128.668	192.8347	129.143		
14.1777	110.587	103.8347	128.668	193.8347	129.086		
15.0145	112.592	104.8347	128.812	194.8347	129.028		
15.901	114.307	105.8347	128.783	195.8347	129.086		
16.84	116.081	106.8347	128.725	196.8347	128.999		
17.8347	117.753	107.8347	128.653	197.8347	129.028		
18.8347	119.094	108.8347	128.74	198.8347	128.999		
19.8347	120.334	109.8347	128.696	199.8347	129.1		

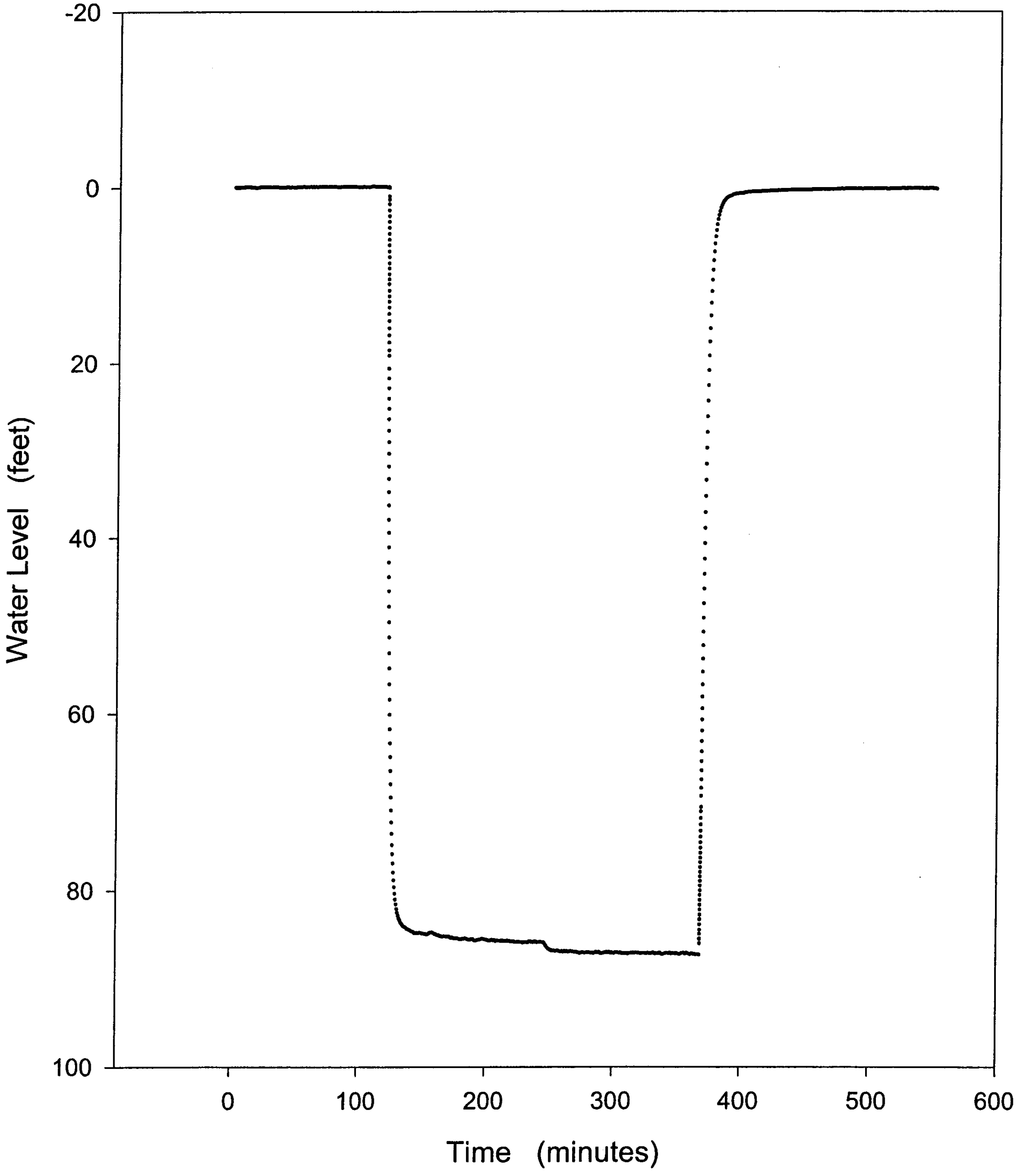
CITY OF HOLLYWOOD
SRWWTP
IW-2
1760-1778
RECOVERY

Time	Water Level	Time	Water Level	Time	Water Level
0.0218	128.437	20.838	15.662	109.838	0.044
0.0437	128.278	21.838	14.175	110.838	0.058
0.0655	128.451	22.838	12.804	111.838	0.044
0.0873	128.278	23.838	11.577	112.838	0.044
0.1092	127.976	24.838	10.466	113.838	0.015
0.131	127.832	25.838	9.455	114.838	0.015
0.1528	127.313	26.838	8.56	115.838	0.015
0.1747	127.125	27.838	7.738	116.838	0
0.1965	126.851	28.838	7.002	117.838	0.015
0.2183	126.563	29.838	6.338	118.838	0.015
0.2402	126.26	30.838	5.731	119.838	0.015
0.262	125.957	31.838	5.183	120.838	0
0.2838	125.712	32.838	4.692	121.838	0
0.3057	125.424	33.838	4.259	122.838	0
0.3275	125.136	34.838	3.855	123.838	0.015
0.3493	124.862	35.838	3.494	124.838	0
0.3712	124.573	36.838	3.162	125.838	0
0.393	124.285	37.838	2.873	126.838	0
0.4148	124.011	38.838	2.599	127.838	0.044
0.4367	123.737	39.838	2.368	128.838	0.029
0.4588	123.434	40.838	2.151	129.838	0.044
0.4823	123.16	41.838	1.964	130.838	0
0.5072	122.858	42.838	1.776	131.838	0
0.5335	122.555	43.838	1.617	132.838	-0.014
0.5615	122.209	44.838	1.473	133.838	0
0.5912	121.877	45.838	1.343	134.838	-0.014
0.6225	121.488	46.838	1.227	135.838	-0.014
0.6557	121.113	47.838	1.112	136.838	-0.014
0.6908	120.681	48.838	1.025	137.838	-0.014
0.7282	120.234	49.838	0.968	138.838	-0.014
0.7677	119.945	50.838	0.867	139.838	-0.014
0.8095	119.196	51.838	0.78	140.838	-0.028
0.8538	118.662	52.838	0.708	141.838	0
0.9008	118.085	53.838	0.65	142.838	-0.028
0.9507	117.465	54.838	0.607	143.838	-0.014
1.0033	116.845	55.838	0.549	144.838	-0.014
1.0592	116.197	56.838	0.506	145.838	-0.014
1.1183	115.49	57.838	0.462	146.838	-0.014
1.181	114.74	58.838	0.419	147.838	0.015
1.2473	113.962	59.838	0.39	148.838	-0.014
1.3177	113.154	60.838	0.376	149.838	-0.014
1.3922	112.303	61.838	0.332	150.838	-0.014
1.4712	111.395	62.838	0.318	151.838	-0.014
1.5548	110.458	63.838	0.304	152.838	-0.014
1.6433	109.463	64.838	0.275	153.838	-0.014
1.7372	108.41	65.838	0.26	154.838	-0.014
1.8365	107.314	66.838	0.231	155.838	-0.014
1.9418	106.175	67.838	0.217	156.838	-0.014
2.0533	104.978	68.838	0.203	157.838	-0.014
2.1715	103.709	69.838	0.188	158.838	-0.014
2.2967	102.397	70.838	0.174	159.838	-0.028
2.4292	100.998	71.838	0.203	160.838	-0.014
2.5697	99.556	72.838	0.217	161.838	-0.014
2.7185	98.056	73.838	0.188	162.838	-0.028
2.876	96.47	74.838	0.13	163.838	-0.014
3.0428	94.84	75.838	0.13	164.838	0
3.2197	93.124	76.838	0.116	165.838	0
3.407	91.379	77.838	0.101	166.838	-0.028
3.6053	89.562	78.838	0.101	167.838	-0.014
3.8155	87.629	79.838	0.087	168.838	-0.028
4.0382	85.697	80.838	0.087	169.838	-0.028
4.274	83.663	81.838	0.087	170.838	-0.014
4.5238	81.557	82.838	0.073	171.838	-0.028
4.7885	79.394	83.838	0.073	172.838	0
5.0688	77.158	84.838	0.073	173.838	0
5.3657	74.85	85.838	0.058	174.838	0
5.6802	72.499	86.838	0.087	175.838	0.029
6.0133	70.075	87.838	0.058	176.838	-0.028
6.3662	67.608	88.838	0.101	177.838	-0.043
6.74	65.084	89.838	0.044	178.838	-0.043
7.136	62.516	90.838	0.044	179.838	-0.043
7.5553	59.905	91.838	0.044	180.838	-0.057
7.9997	57.265	92.838	0.087	181.838	-0.028
8.4703	54.552	93.838	0.029	182.838	-0.028
8.9688	51.898	94.838	0.029	183.838	0
9.4968	49.199	95.838	0.029	184.838	0
10.0562	46.501	96.838	0.029		
10.6487	43.832	97.838	0.029		
11.2762	41.134	98.838	0.058		
11.941	38.493	99.838	0.073		
12.6452	35.838	100.838	0.015		
13.391	33.226	101.838	0.029		
14.181	30.672	102.838	0.029		
15.0178	28.218	103.838	0.044		
15.9043	25.794	104.838	0		
16.8433	23.412	105.838	0.029		
17.838	21.19	106.838	0.015		
18.838	19.169	107.838	0.015		
19.838	17.322	108.838	0.044		

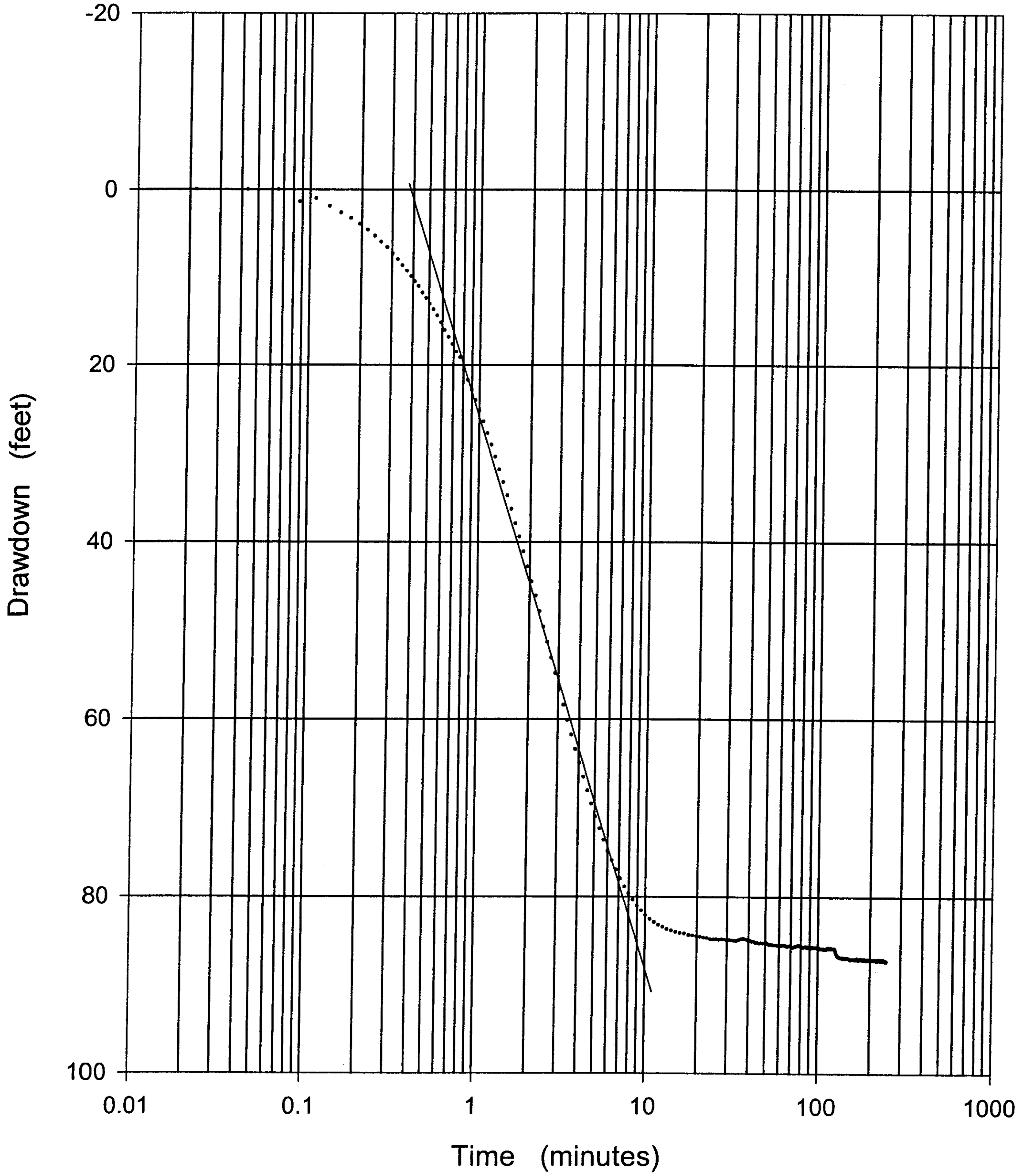
Injection Well No. 2 (IW-2) – Packer Tests

1,810 – 1,828

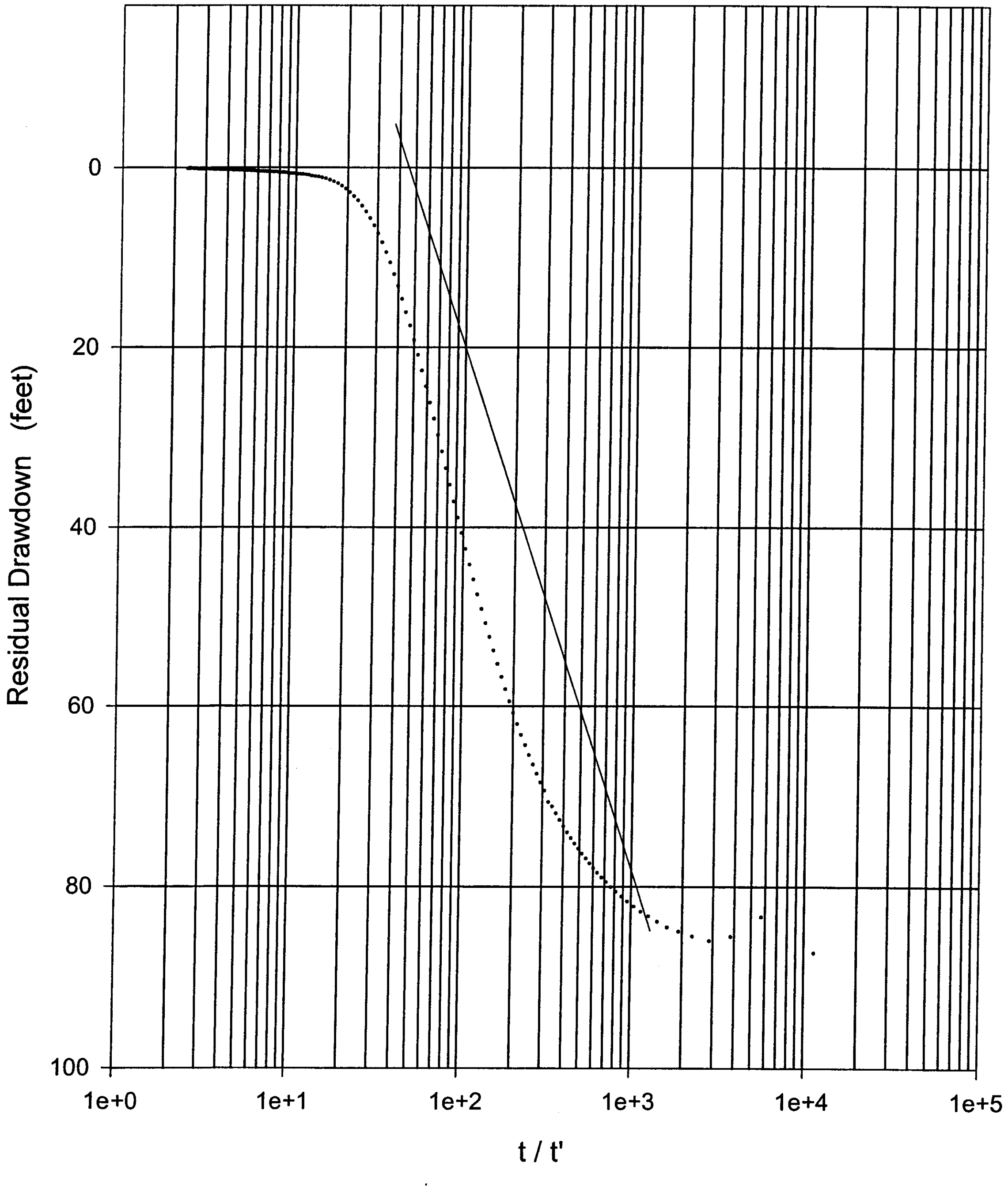
CITY OF HOLLYWOOD
SRWWTP
IW-2
1810-1828
BACKGROUND, DRAWDOWN AND RECOVERY



CITY OF HOLLYWOOD
SRWWTP
IW-2
1810-1828
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1810-1828
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
1810-1828
BACKGROUND

Time	Water Level
0	0
0.0217	-0.014
0.0433	-0.014
0.065	-0.029
0.0867	-0.029
0.1083	-0.029
0.13	-0.029
0.1517	-0.029
0.1733	-0.029
0.195	-0.029
0.2167	-0.043
0.2383	-0.029
0.26	-0.029
0.2817	-0.043
0.3033	-0.029
0.325	-0.043
0.3467	-0.029
0.3683	-0.029
0.39	-0.029
0.4117	-0.043
0.4333	-0.043
0.4555	-0.029
0.479	-0.029
0.5038	-0.029
0.5302	-0.029
0.5582	-0.029
0.5878	-0.029
0.6192	-0.029
0.6523	-0.029
0.6875	-0.029
0.7248	-0.029
0.7643	0
0.8062	0
0.8505	0
0.8975	0
0.9473	0
1	0
1.0558	0
1.115	0
1.1777	0
1.244	0
1.3143	0
1.3888	0
1.4678	0
1.5515	0
1.64	0
1.7338	0
1.8332	0
1.9385	0
2.05	0.014
2.1682	0
2.2933	0
2.4258	0.014
2.5663	0.014
2.7152	0
2.8727	0.014
3.0395	0.014
3.2163	-0.014
3.4037	-0.043
3.602	-0.029
3.8122	-0.043
4.0348	-0.043
4.2707	-0.043
4.5205	-0.043
4.7852	-0.043
5.0655	-0.043
5.3623	-0.043
5.6768	-0.043
6.01	-0.043
6.3628	-0.043
6.7367	-0.058
7.1327	-0.043
7.552	-0.058
7.9963	-0.058
8.467	-0.058
8.9655	-0.058
9.4935	-0.058
10.0528	-0.058
10.6453	-0.058
11.2728	-0.058
11.9377	-0.058
12.6418	-0.043
13.3877	-0.043
14.1777	-0.058
15.0145	-0.029
15.901	-0.014
16.84	-0.014
17.8347	0
18.8347	-0.058
19.8347	-0.072
20.8347	-0.072
21.8347	-0.072
22.8347	-0.058
23.8347	-0.058
24.8347	-0.058
25.8347	-0.058
26.8347	-0.058
27.8347	-0.043
28.8347	-0.072
29.8347	-0.058
30.8347	-0.072
31.8347	-0.072
32.8347	-0.072
33.8347	-0.043
34.8347	-0.043
35.8347	-0.029
36.8347	-0.014
37.8347	-0.043
38.8347	-0.014
39.8347	-0.072
40.8347	-0.058
41.8347	-0.043
42.8347	-0.014
43.8347	-0.072
44.8347	-0.043
45.8347	-0.043
46.8347	-0.014
47.8347	-0.072
48.8347	-0.087
49.8347	-0.087
50.8347	-0.087
51.8347	-0.087
52.8347	-0.101
53.8347	-0.101
54.8347	-0.072
55.8347	-0.087
56.8347	-0.087
57.8347	-0.087
58.8347	-0.101
59.8347	-0.087
60.8347	-0.101
61.8347	-0.087
62.8347	-0.101
63.8347	-0.087
64.8347	-0.087
65.8347	-0.101
66.8347	-0.101
67.8347	-0.101
68.8347	-0.101
69.8347	-0.101
70.8347	-0.115
71.8347	-0.101
72.8347	-0.101
73.8347	-0.101
74.8347	-0.115
75.8347	-0.101
76.8347	-0.101
77.8347	-0.115
78.8347	-0.115
79.8347	-0.072
80.8347	-0.058
81.8347	-0.043
82.8347	-0.101
83.8347	-0.115
84.8347	-0.101
85.8347	-0.115
86.8347	-0.115
87.8347	-0.115
88.8347	-0.115
89.8347	-0.115
90.8347	-0.115
91.8347	-0.115
92.8347	-0.115
93.8347	-0.115
94.8347	-0.087
95.8347	-0.087
96.8347	-0.058
97.8347	-0.072
98.8347	-0.072
99.8347	-0.058
100.8347	-0.13
101.8347	-0.072
102.8347	-0.087
103.8347	-0.072
104.8347	-0.072
105.8347	-0.058
106.8347	-0.13
107.8347	-0.144
108.8347	-0.144
109.8347	-0.13
110.8347	-0.13
111.8347	-0.115
112.8347	-0.13
113.8347	-0.13
114.8347	-0.13
115.8347	-0.13
116.8347	-0.13
117.8347	-0.101
118.8347	-0.087
119.8347	-0.087
120.8347	-0.087

CITY OF HOLLYWOOD
SRWWTP
IW-2
1810-1828
DRAWDOWN

Time	Water Level
0	0
0.0217	-0.014
0.0433	-0.014
0.065	-0.014
0.0867	1.357
0.1083	0.982
0.13	1.862
0.1517	2.584
0.1733	3.234
0.195	3.883
0.2167	4.547
0.2383	5.24
0.26	5.918
0.2817	6.539
0.3033	7.246
0.325	7.896
0.3467	8.603
0.3683	9.195
0.39	9.83
0.4117	10.408
0.4333	10.97
0.4555	11.721
0.479	12.356
0.5038	12.977
0.5302	13.626
0.5582	14.348
0.5878	15.156
0.6192	15.993
0.6523	16.802
0.6875	17.61
0.7248	18.519
0.7643	19.125
0.8062	20.612
0.8505	21.723
0.8975	22.863
0.9473	24.032
1	25.201
1.0558	26.414
1.115	27.727
1.1777	29.026
1.244	30.382
1.3143	31.825
1.3888	33.268
1.4678	34.769
1.5515	36.284
1.64	37.929
1.7338	39.416
1.8332	41.09
1.9385	42.821
2.05	44.495
2.1682	46.097
2.2933	47.857
2.4258	49.603
2.5663	51.32
2.7152	53.109
2.8727	54.854
3.0395	56.658
3.2163	58.404
3.4037	60.12
3.602	61.765
3.8122	63.352
4.0348	64.924
4.2707	66.468
4.5205	67.997
4.7852	69.483
5.0655	70.954
5.3623	72.31
5.6768	73.594
6.01	74.849
6.3628	75.887
6.7367	76.926
7.1327	77.95
7.552	78.859
7.9963	79.638
8.467	80.359
8.9655	81.022
9.4935	81.57
10.0528	82.104
10.6453	82.508
11.2728	82.869
11.9377	83.2
12.6418	83.417
13.3877	83.662
14.1777	83.806
15.0145	83.979
15.901	84.095
16.84	84.152
17.8347	84.325
18.8347	84.369
19.8347	84.455
20.8347	84.498
21.8347	84.628
22.8347	84.671
23.8347	84.801
24.8347	84.816
25.8347	84.787
26.8347	84.845
27.8347	84.787
28.8347	84.801
29.8347	84.888
30.8347	84.873
31.8347	84.902
32.8347	84.931
33.8347	84.974
34.8347	84.873
35.8347	84.787
36.8347	84.729
37.8347	84.744
38.8347	84.816
39.8347	84.931
40.8347	84.931
41.8347	85.046
42.8347	85.032
43.8347	85.162
44.8347	85.162
45.8347	85.234
46.8347	85.176
47.8347	85.191
48.8347	85.191
49.8347	85.22
50.8347	85.191
51.8347	85.306
52.8347	85.393
53.8347	85.335
54.8347	85.421
55.8347	85.436
56.8347	85.407
57.8347	85.421
58.8347	85.494
59.8347	85.494
60.8347	85.508
61.8347	85.45
62.8347	85.45
63.8347	85.436
64.8347	85.479
65.8347	85.537
66.8347	85.58
67.8347	85.551
68.8347	85.508
69.8347	85.494
70.8347	85.652
71.8347	85.681
72.8347	85.638
73.8347	85.58
74.8347	85.551
75.8347	85.537
76.8347	85.479
77.8347	85.465
78.8347	85.522
79.8347	85.551
80.8347	85.566
81.8347	85.667
82.8347	85.681
83.8347	85.623
84.8347	85.595
85.8347	85.652
86.8347	85.609
87.8347	85.739
88.8347	85.652
89.8347	85.696
90.8347	85.696
91.8347	85.739
92.8347	85.652
93.8347	85.71
94.8347	85.724
95.8347	85.71
96.8347	85.681
97.8347	85.71
98.8347	85.724
99.8347	85.782
100.8347	85.782
101.8347	85.753
102.8347	85.854
103.8347	85.854
104.8347	85.854
105.8347	85.825
106.8347	85.854
107.8347	85.854
108.8347	85.897
109.8347	85.854
110.8347	85.869
111.8347	85.84
112.8347	85.883
113.8347	85.796
114.8347	85.753
115.8347	85.825
116.8347	85.84
117.8347	85.825
118.8347	85.753
119.8347	85.84
120.8347	85.84
121.8347	85.84
122.8347	85.825
123.8347	85.869
124.8347	85.84
125.8347	85.984
126.8347	86.2
127.8347	86.417
128.8347	86.575
129.8347	86.647
130.8347	86.748
131.8347	86.792
132.8347	86.792
133.8347	86.835
134.8347	86.849
135.8347	86.806
136.8347	86.82
137.8347	86.893
138.8347	86.921
139.8347	86.864
140.8347	86.936
141.8347	86.864
142.8347	86.907
143.8347	86.878
144.8347	86.936
145.8347	86.921
146.8347	86.864
147.8347	86.893
148.8347	86.936
149.8347	86.95
150.8347	86.936
151.8347	87.008
152.8347	87.037
153.8347	87.08
154.8347	87.066
155.8347	87.008
156.8347	87.037
157.8347	87.051
158.8347	87.051
159.8347	87.008
160.8347	87.037
161.8347	87.037
162.8347	87.051
163.8347	87.066
164.8347	87.095
165.8347	87.022
166.8347	86.95
167.8347	87.022
168.8347	86.965
169.8347	87.08
170.8347	87.109
171.8347	87.08
172.8347	87.051
173.8347	87.037
174.8347	86.979
175.8347	87.022
176.8347	86.979
177.8347	87.066
178.8347	86.994
179.8347	87.095
180.8347	87.109
181.8347	87.008
182.8347	87.008
183.8347	87.051
184.8347	87.066
185.8347	87.022
186.8347	87.152
187.8347	87.08
188.8347	87.152
189.8347	87.08
190.8347	87.138
191.8347	87.167
192.8347	87.08
193.8347	87.08
194.8347	87.08
195.8347	87.051
196.8347	87.095
197.8347	87.051
198.8347	87.051
199.8347	87.066
200.8347	87.08
201.8347	87.152
202.8347	87.08
203.8347	87.109
204.8347	87.095
205.8347	87.123
206.8347	87.109
207.8347	87.08
208.8347	87.138
209.8347	87.138
210.8347	87.095
211.8347	87.051
212.8347	87.167
213.8347	87.123
214.8347	87.152
215.8347	87.123
216.8347	87.051
217.8347	87.181
218.8347	87.21
219.8347	87.181
220.8347	87.152
221.8347	87.095
222.8347	87.095
223.8347	87.123
224.8347	87.066
225.8347	87.167
226.8347	87.095
227.8347	87.152
228.8347	87.167
229.8347	87.095
230.8347	87.167
231.8347	87.21
232.8347	87.21
233.8347	87.109
234.8347	87.095
235.8347	87.066
236.8347	87.195
237.8347	87.066
238.8347	87.123
239.8347	87.181
240.8347	87.253
241.8347	87.152
242.8347	87.181
243.8347	87.195
244.8347	87.268
245.8347	87.253
246.8347	87.224
247.8347	87.282

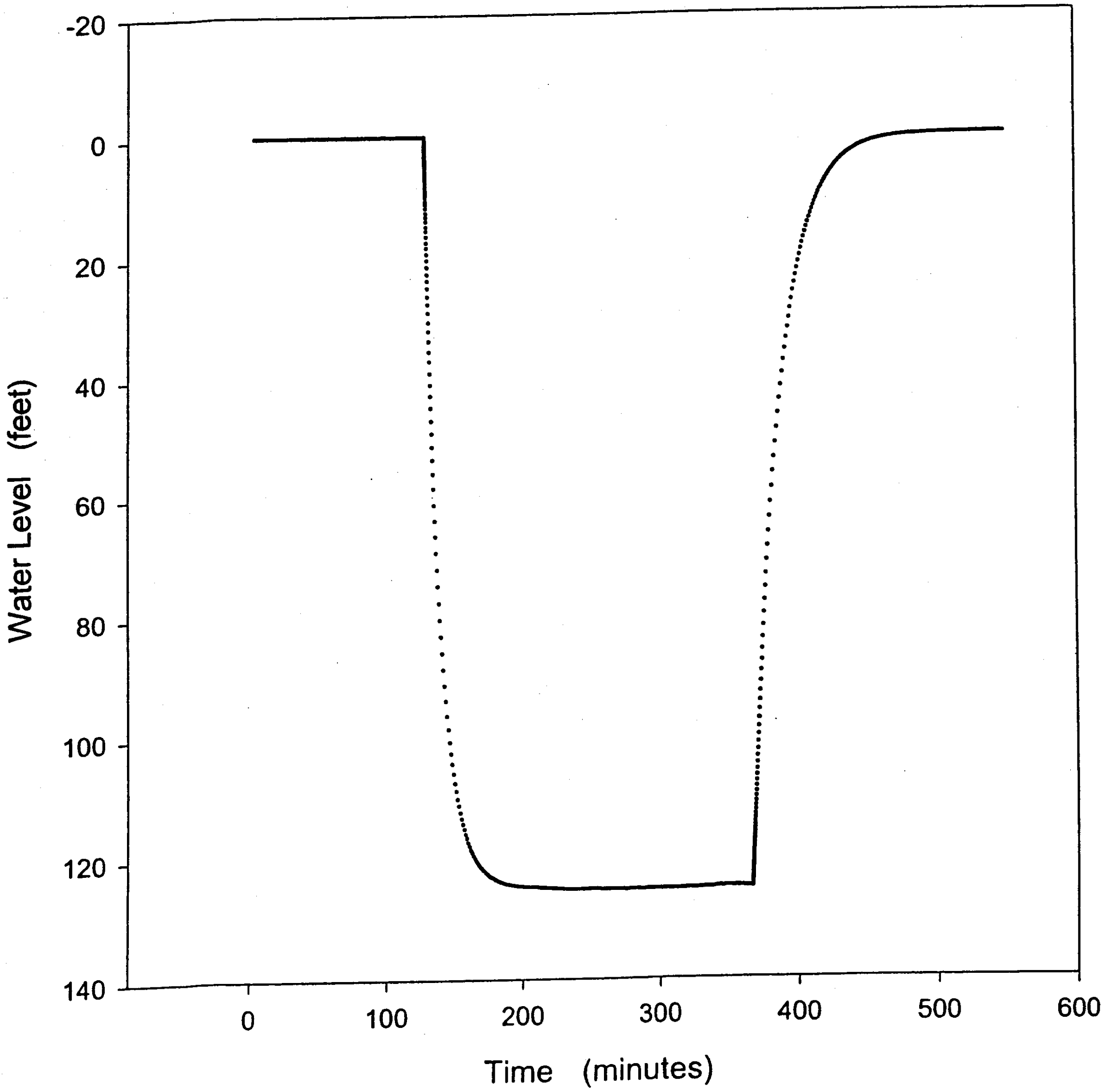
CITY OF HOLLYWOOD
SRWWTP
IW-2
1810-1828
RECOVERY

Time	Water Level	Time	Water Level	Time	Water Level
0	87.282	20.8347	0.982	110.8347	0.159
0.0217	87.282	21.8347	0.938	111.8347	0.159
0.0433	83.33	22.8347	0.823	112.8347	0.159
0.065	85.522	23.8347	0.779	113.8347	0.144
0.0867	85.998	24.8347	0.751	114.8347	0.159
0.1083	85.479	25.8347	0.736	115.8347	0.159
0.13	84.945	26.8347	0.722	116.8347	0.159
0.1517	84.484	27.8347	0.678	117.8347	0.159
0.1733	83.864	28.8347	0.664	118.8347	0.159
0.195	83.258	29.8347	0.664	119.8347	0.144
0.2167	82.768	30.8347	0.664	120.8347	0.144
0.2383	82.205	31.8347	0.577	121.8347	0.144
0.26	81.657	32.8347	0.563	122.8347	0.159
0.2817	81.109	33.8347	0.548	123.8347	0.173
0.3033	80.561	34.8347	0.534	124.8347	0.159
0.325	80.042	35.8347	0.548	125.8347	0.13
0.3467	79.493	36.8347	0.505	126.8347	0.159
0.3683	78.989	37.8347	0.491	127.8347	0.13
0.39	78.469	38.8347	0.505	128.8347	0.13
0.4117	77.95	39.8347	0.491	129.8347	0.13
0.4333	77.416	40.8347	0.476	130.8347	0.13
0.4555	76.868	41.8347	0.476	131.8347	0.159
0.479	76.349	42.8347	0.462	132.8347	0.159
0.5038	75.801	43.8347	0.462	133.8347	0.13
0.5302	75.224	44.8347	0.447	134.8347	0.13
0.5582	74.618	45.8347	0.433	135.8347	0.13
0.5878	73.983	46.8347	0.433	136.8347	0.159
0.6192	73.32	47.8347	0.419	137.8347	0.13
0.6523	72.613	48.8347	0.419	138.8347	0.13
0.6875	71.877	49.8347	0.404	139.8347	0.13
0.7248	71.113	50.8347	0.404	140.8347	0.115
0.7643	70.622	51.8347	0.39	141.8347	0.115
0.8062	69.382	52.8347	0.375	142.8347	0.159
0.8505	68.459	53.8347	0.375	143.8347	0.173
0.8975	67.492	54.8347	0.375	144.8347	0.173
0.9473	66.468	55.8347	0.375	145.8347	0.115
1	65.429	56.8347	0.361	146.8347	0.115
1.0558	64.318	57.8347	0.346	147.8347	0.115
1.115	63.179	58.8347	0.346	148.8347	0.115
1.1777	61.981	59.8347	0.346	149.8347	0.115
1.244	60.741	60.8347	0.346	150.8347	0.115
1.3143	59.457	61.8347	0.346	151.8347	0.115
1.3888	58.115	62.8347	0.332	152.8347	0.144
1.4678	56.73	63.8347	0.318	153.8347	0.115
1.5515	55.287	64.8347	0.332	154.8347	0.101
1.64	53.801	65.8347	0.318	155.8347	0.101
1.7338	52.286	66.8347	0.318	156.8347	0.101
1.8332	50.742	67.8347	0.318	157.8347	0.13
1.9385	49.17	68.8347	0.303	158.8347	0.101
2.05	47.539	69.8347	0.303	159.8347	0.101
2.1682	45.88	70.8347	0.289	160.8347	0.101
2.2933	44.206	71.8347	0.289	161.8347	0.101
2.4258	42.475	72.8347	0.289	162.8347	0.101
2.5663	40.686	73.8347	0.289	163.8347	0.101
2.7152	38.94	74.8347	0.289	164.8347	0.087
2.8727	37.136	75.8347	0.274	165.8347	0.087
3.0395	35.289	76.8347	0.274	166.8347	0.087
3.2163	33.456	77.8347	0.274	167.8347	0.101
3.4037	31.594	78.8347	0.274	168.8347	0.101
3.602	29.762	79.8347	0.274	169.8347	0.087
3.8122	27.943	80.8347	0.26	170.8347	0.101
4.0348	26.154	81.8347	0.274	171.8347	0.115
4.2707	24.364	82.8347	0.26	172.8347	0.115
4.5205	22.589	83.8347	0.26	173.8347	0.087
4.7852	20.857	84.8347	0.245	174.8347	0.13
5.0655	19.197	85.8347	0.245	175.8347	0.101
5.3623	17.581	86.8347	0.245	176.8347	0.087
5.6768	16.08	87.8347	0.245	177.8347	0.101
6.01	14.608	88.8347	0.245	178.8347	0.101
6.3628	13.179	89.8347	0.245	179.8347	0.115
6.7367	11.851	90.8347	0.231	180.8347	0.115
7.1327	10.552	91.8347	0.231	181.8347	0.144
7.552	9.397	92.8347	0.231		
7.9963	8.315	93.8347	0.231		
8.467	7.304	94.8347	0.231		
8.9655	6.424	95.8347	0.231		
9.4935	5.615	96.8347	0.231		
10.0528	4.879	97.8347	0.231		
10.6453	4.244	98.8347	0.216		
11.2728	3.652	99.8347	0.216		
11.9377	3.176	100.8347	0.216		
12.6418	2.743	101.8347	0.216		
13.3877	2.338	102.8347	0.216		
14.1777	2.021	103.8347	0.216		
15.0145	1.761	104.8347	0.202		
15.901	1.545	105.8347	0.216		
16.84	1.371	106.8347	0.173		
17.8347	1.213	107.8347	0.144		
18.8347	1.111	108.8347	0.188		
19.8347	1.039	109.8347	0.188		

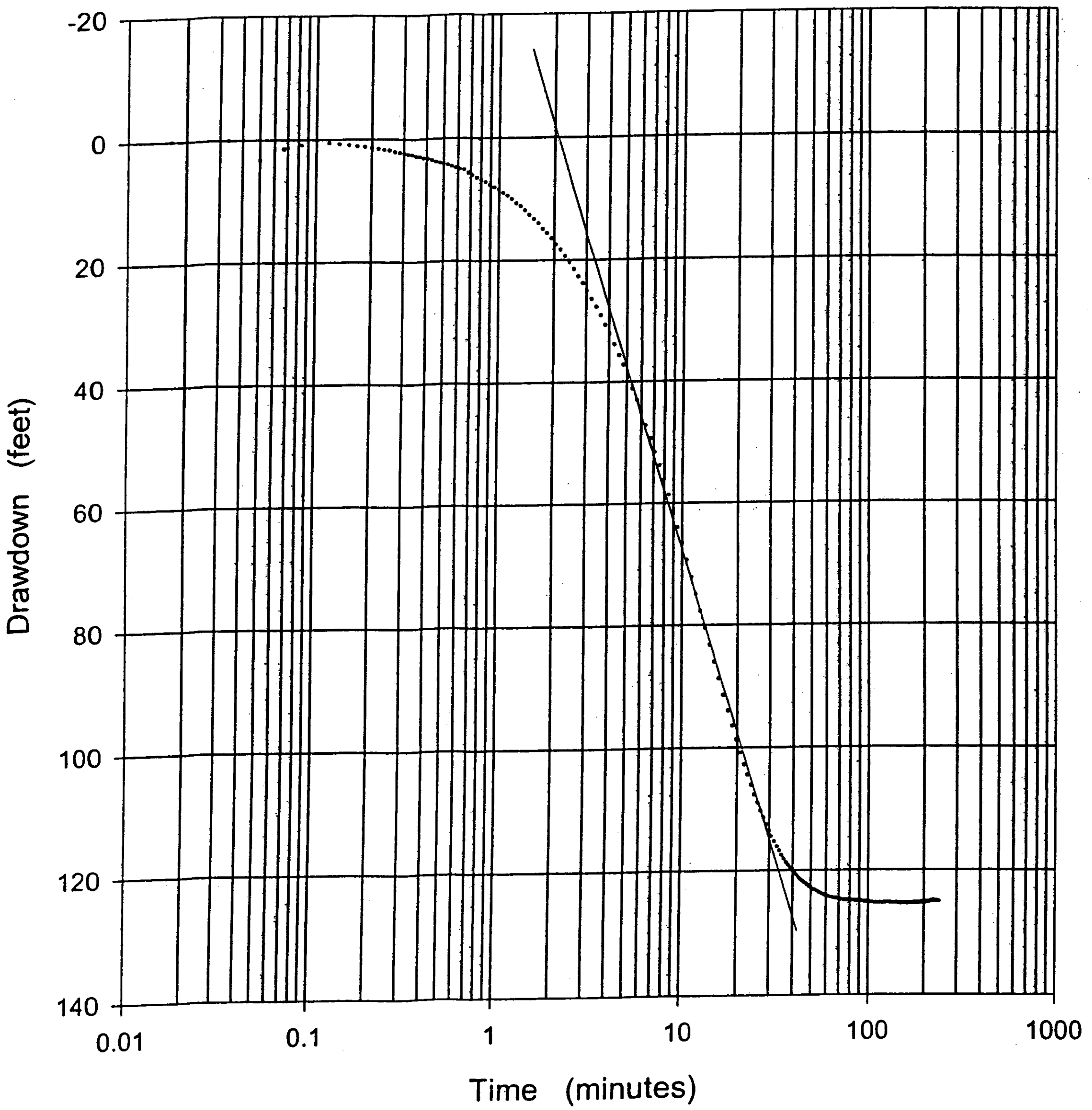
Injection Well No. 2 – Packer Tests

2,093 – 2,111

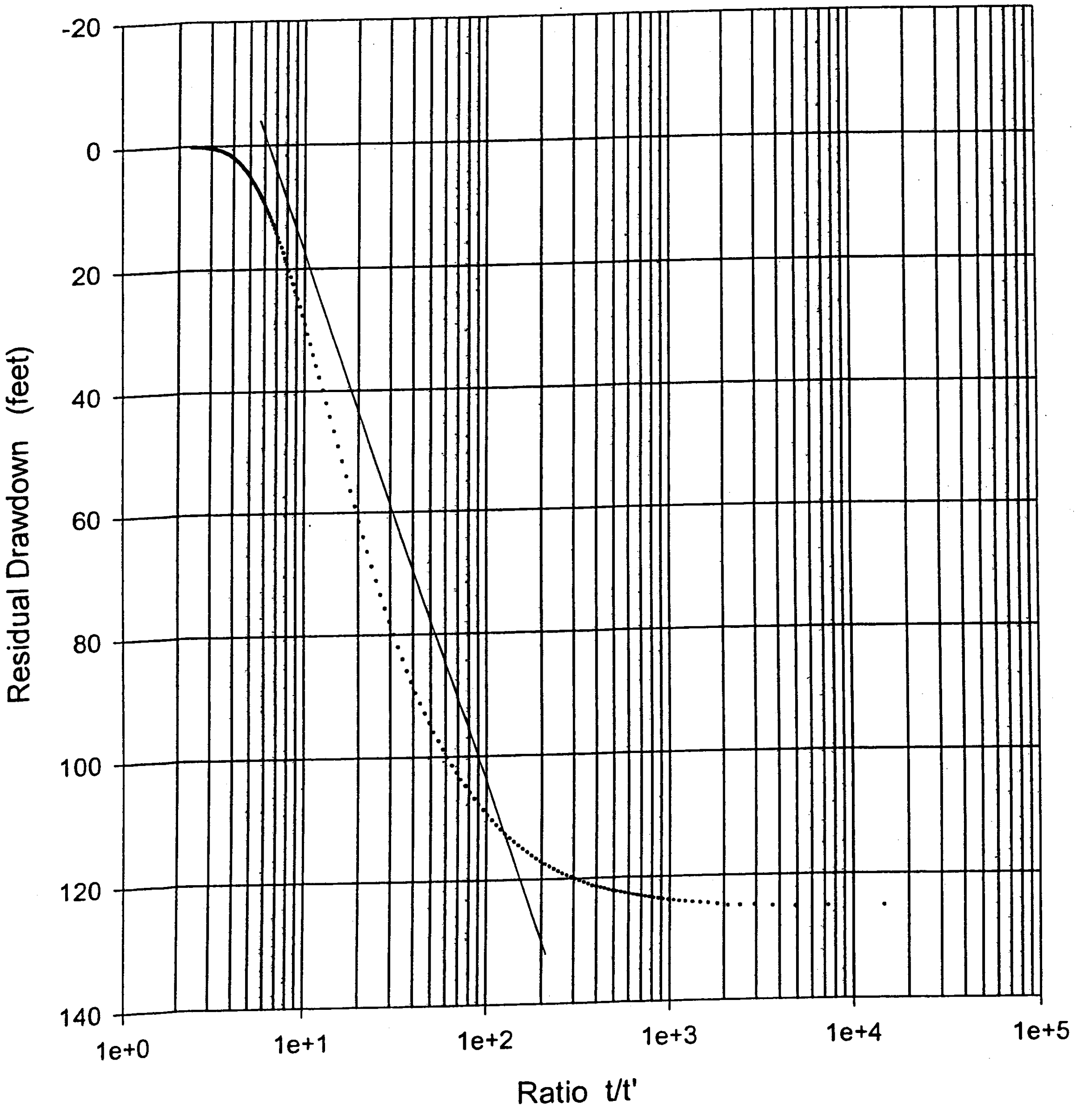
CITY OF HOLLYWOOD
SRWWTP
IW-2
2093 -2111
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
SRWWTP
IW-2
2093 - 2111
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
2093 - 2111
RESIDUAL DRAWDOWN VS t/t'



CITY OF HOLLYWOOD
SRWWTP
2093 - 2111
BACKGROUND DATA

Time	Wayer Level
0	0
0.0167	-0.014
0.0333	-0.014
0.05	-0.014
0.0667	-0.029
0.0833	-0.029
0.1	-0.029
0.1167	-0.029
0.1333	-0.029
0.15	-0.029
0.1667	-0.029
0.1833	-0.014
0.2	-0.014
0.2167	-0.029
0.2333	-0.029
0.25	-0.029
0.2667	-0.029
0.2833	-0.029
0.3	-0.029
0.3167	-0.029
0.3333	-0.014
0.35	-0.014
0.3677	-0.029
0.3863	-0.029
0.4062	-0.014
0.4272	-0.029
0.4493	-0.029
0.4728	-0.029
0.4977	-0.029
0.524	-0.029
0.552	-0.014
0.5817	-0.014
0.613	-0.014
0.6462	-0.014
0.6813	-0.014
0.7187	-0.014
0.7582	-0.014
0.8	-0.014
0.8443	0
0.8913	-0.014
0.9412	-0.014
0.9938	-0.014
1.0497	-0.014
1.1088	-0.014
1.1715	-0.014
1.2378	-0.014
1.3082	-0.014
1.3827	-0.014
1.4617	-0.014
1.5453	0
1.6338	0
1.7277	0.014
1.827	0.014
1.9323	0
2.0438	0.014
2.162	0.014
2.2872	0.014
2.4197	0.014
2.5602	0.014
2.709	0.014
2.8665	0.014
3.0333	0
3.2102	0
3.3975	0
3.5958	0
3.806	0
4.0287	-0.029
4.2645	-0.014
4.5143	0
4.779	-0.029
5.0593	-0.014
5.3562	-0.029
5.6707	-0.029
6.0038	-0.029
6.3567	-0.029
Time	Wayer Level
6.7305	-0.029
7.1265	-0.029
7.5458	-0.029
7.9902	-0.029
8.4608	-0.029
8.9593	-0.029
9.4873	-0.029
10.0467	-0.029
10.6392	-0.029
11.2667	-0.029
11.9315	-0.043
12.6357	-0.043
13.3815	-0.043
14.1715	-0.043
15.0083	-0.043
15.8948	-0.029
16.8338	-0.014
17.8285	-0.014
18.8285	-0.029
19.8285	-0.043
20.8285	-0.043
21.8285	-0.043
22.8285	-0.029
23.8285	-0.058
24.8285	-0.058
25.8285	-0.058
26.8285	-0.058
27.8285	-0.029
28.8285	-0.058
29.8285	-0.058
30.8285	-0.029
31.8285	-0.043
32.8285	-0.043
33.8285	-0.029
34.8285	-0.029
35.8285	-0.043
36.8285	-0.029
37.8285	-0.043
38.8285	-0.058
39.8285	-0.058
40.8285	-0.072
41.8285	-0.072
42.8285	-0.058
43.8285	-0.043
44.8285	-0.043
45.8285	-0.043
46.8285	-0.043
47.8285	-0.043
48.8285	-0.029
49.8285	-0.058
50.8285	-0.058
51.8285	-0.058
52.8285	-0.058
53.8285	-0.072
54.8285	-0.072
55.8285	-0.058
56.8285	-0.058
57.8285	-0.058
58.8285	-0.058
59.8285	-0.058
60.8285	-0.043
61.8285	-0.058
62.8285	-0.058
63.8285	-0.058
64.8285	-0.043
65.8285	-0.072
66.8285	-0.072
67.8285	-0.072
68.8285	-0.058
69.8285	-0.058
70.8285	-0.058
71.8285	-0.058
72.8285	-0.058
73.8285	-0.058
74.8285	-0.058
Time	Wayer Level
75.8285	-0.058
76.8285	-0.058
77.8285	-0.043
78.8285	-0.043
79.8285	-0.058
80.8285	-0.058
81.8285	-0.072
82.8285	-0.072
83.8285	-0.058
84.8285	-0.058
85.8285	-0.072
86.8285	-0.058
87.8285	-0.058
88.8285	-0.058
89.8285	-0.043
90.8285	-0.029
91.8285	-0.058
92.8285	-0.072
93.8285	-0.072
94.8285	-0.087
95.8285	-0.058
96.8285	-0.058
97.8285	-0.058
98.8285	-0.058
99.8285	-0.058
100.8285	-0.058
101.8285	-0.058
102.8285	-0.058
103.8285	-0.058
104.8285	-0.058
105.8285	-0.043
106.8285	-0.058
107.8285	-0.043
108.8285	-0.058
109.8285	-0.072
110.8285	-0.072
111.8285	-0.043
112.8285	-0.058
113.8285	-0.072
114.8285	-0.058
115.8285	-0.043
116.8285	-0.043
117.8285	-0.058
118.8285	-0.043
119.8285	-0.029
120.8285	-0.043
121.8285	-0.029
122.8285	-0.058
123.8285	-0.072

CITY OF HOLLYWOOD
SRWWTP
IW-2
2093 - 2111
DRAWDOWN DATA

Time	Water Level
0	0
0.0167	0
0.0333	-0.014
0.05	3.274
0.0667	1.463
0.0833	0.855
0.1	0.043
0.1167	0.58
0.1333	0.739
0.15	0.869
0.1667	1.116
0.1833	1.174
0.2	1.376
0.2167	1.536
0.2333	1.666
0.25	1.753
0.2667	2.057
0.2833	2.188
0.3	2.347
0.3167	2.477
0.3333	2.55
0.35	2.825
0.3677	2.883
0.3863	3.158
0.4062	3.231
0.4272	3.492
0.4493	3.752
0.4728	3.912
0.4977	4.071
0.524	4.274
0.552	4.535
0.5817	4.795
0.613	5.027
0.6462	5.114
0.6813	5.679
0.7187	6.012
0.7582	6.447
0.8	6.809
0.8443	7.142
0.8913	7.606
0.9412	8.04
0.9938	8.417
1.0497	8.982
1.1088	9.416
1.1715	9.967
1.2378	10.647
1.3082	11.125
1.3827	11.821
1.4617	12.574
1.5453	13.24
1.6338	13.935
1.7277	14.848
1.827	15.557
1.9323	16.426
2.0438	17.44
2.162	18.294
2.2872	19.351
2.4197	20.365
2.5602	21.509
2.709	22.682
2.8665	23.811
3.0333	24.998
3.2102	26.388
3.3975	27.691
3.5958	29.095
3.806	30.673
4.0287	32.178
4.2645	33.843
4.5143	35.623
4.779	37.215
5.0593	39.198
5.3562	41.151
5.6707	43.004
6.0038	45.015
6.3567	47.185
6.7305	49.326
7.1265	51.598
7.5458	53.797
7.9902	56.14
8.4608	58.584
8.9593	61.376
9.4873	63.979
10.0467	66.596
10.6392	69.372
11.2667	72.191
11.9315	74.938
12.6357	77.742
13.3815	80.532
14.1715	83.293
15.0083	86.067
15.8948	88.799
16.8338	91.486
17.8285	.94
18.8285	96.5
19.8285	98.724
20.8285	100.877
21.8285	102.769
22.8285	104.444
23.8285	106.076
24.8285	107.68
25.8285	108.979
26.8285	110.308
27.8285	111.405
28.8285	112.546
29.8285	113.571
30.8285	114.452
31.8285	115.275
32.8285	116.098
33.8285	116.762
34.8285	117.499
35.8285	118.09
36.8285	118.711
37.8285	119.13
38.8285	119.621
39.8285	120.054
40.8285	120.473
41.8285	120.79
42.8285	121.165
43.8285	121.469
44.8285	121.714
45.8285	122.003
46.8285	122.162
47.8285	122.421
48.8285	122.638
49.8285	122.811
50.8285	123.028
51.8285	123.186
52.8285	123.259
53.8285	123.417
54.8285	123.591
55.8285	123.692
56.8285	123.836
57.8285	123.908
58.8285	124.067
59.8285	124.067
60.8285	124.211
61.8285	124.255
62.8285	124.37
63.8285	124.399
64.8285	124.428
65.8285	124.514
66.8285	124.529
67.8285	124.572
68.8285	124.587
69.8285	124.688
70.8285	124.673
71.8285	124.76
72.8285	124.789
73.8285	124.832
74.8285	124.76
75.8285	124.861
76.8285	124.861
77.8285	124.818
78.8285	124.861
79.8285	124.904
80.8285	124.89
81.8285	124.919
82.8285	124.875
83.8285	124.919
84.8285	124.904
85.8285	124.904
86.8285	124.948
87.8285	124.962
88.8285	125.005
89.8285	125.077
90.8285	124.948
91.8285	125.049
92.8285	125.049
93.8285	125.049
94.8285	125.049
95.8285	125.135
96.8285	125.15
97.8285	125.092
98.8285	125.135
99.8285	125.193
100.8285	125.193
101.8285	125.207
102.8285	125.178
103.8285	125.222
104.8285	125.279
105.8285	125.265
106.8285	125.251
107.8285	125.337
108.8285	125.265
109.8285	125.323
110.8285	125.308
111.8285	125.294
112.8285	125.352
113.8285	125.308
114.8285	125.308
115.8285	125.323
116.8285	125.294
117.8285	125.323
118.8285	125.337
119.8285	125.308
120.8285	125.366
121.8285	125.308
122.8285	125.265
123.8285	125.279
124.8285	125.294
125.8285	125.236
126.8285	125.265
127.8285	125.279
128.8285	125.222
129.8285	125.251
130.8285	125.265
131.8285	125.337
132.8285	125.337
133.8285	125.294
134.8285	125.352
135.8285	125.352
136.8285	125.308
137.8285	125.337
138.8285	125.352
139.8285	125.294
140.8285	125.308
141.8285	125.294
142.8285	125.337
143.8285	125.352
144.8285	125.337
145.8285	125.352
146.8285	125.366
147.8285	125.381
148.8285	125.323
149.8285	125.453
150.8285	125.467
151.8285	125.438
152.8285	125.352
153.8285	125.337
154.8285	125.352
155.8285	125.352
156.8285	125.352
157.8285	125.366
158.8285	125.323
159.8285	125.409
160.8285	125.381
161.8285	125.438
162.8285	125.453
163.8285	125.395
164.8285	125.352
165.8285	125.323
166.8285	125.352
167.8285	125.323
168.8285	125.366
169.8285	125.381
170.8285	125.395
171.8285	125.381
172.8285	125.366
173.8285	125.366
174.8285	125.352
175.8285	125.323
176.8285	125.424
177.8285	125.308
178.8285	125.337
179.8285	125.366
180.8285	125.323
181.8285	125.366
182.8285	125.381
183.8285	125.366
184.8285	125.366
185.8285	125.381
186.8285	125.352
187.8285	125.366
188.8285	125.366
189.8285	125.337
190.8285	125.308
191.8285	125.352
192.8285	125.337
193.8285	125.337
194.8285	125.236
195.8285	125.323
196.8285	125.251
197.8285	125.294
198.8285	125.279
199.8285	125.323
200.8285	125.308
201.8285	125.265
202.8285	125.352
203.8285	125.265
204.8285	125.207
205.8285	125.294
206.8285	125.207
207.8285	125.236
208.8285	125.251
209.8285	125.135
210.8285	125.193
211.8285	125.222
212.8285	125.222
213.8285	125.15
214.8285	125.15
215.8285	125.092
216.8285	125.077
217.8285	125.063
218.8285	125.02
219.8285	124.962
220.8285	125.092
221.8285	125.106
222.8285	124.976
223.8285	125.02
224.8285	124.933
225.8285	124.962
226.8285	124.976
227.8285	125.02
228.8285	125.02
229.8285	125.063
230.8285	124.962
231.8285	124.919
232.8285	125.092
233.8285	124.991
234.8285	125.005
235.8285	125.034
236.8285	125.063
237.8285	125.106
238.8285	125.106
239.8285	125.121
240.8285	125.121
241.8285	125.077
242.8285	125.121

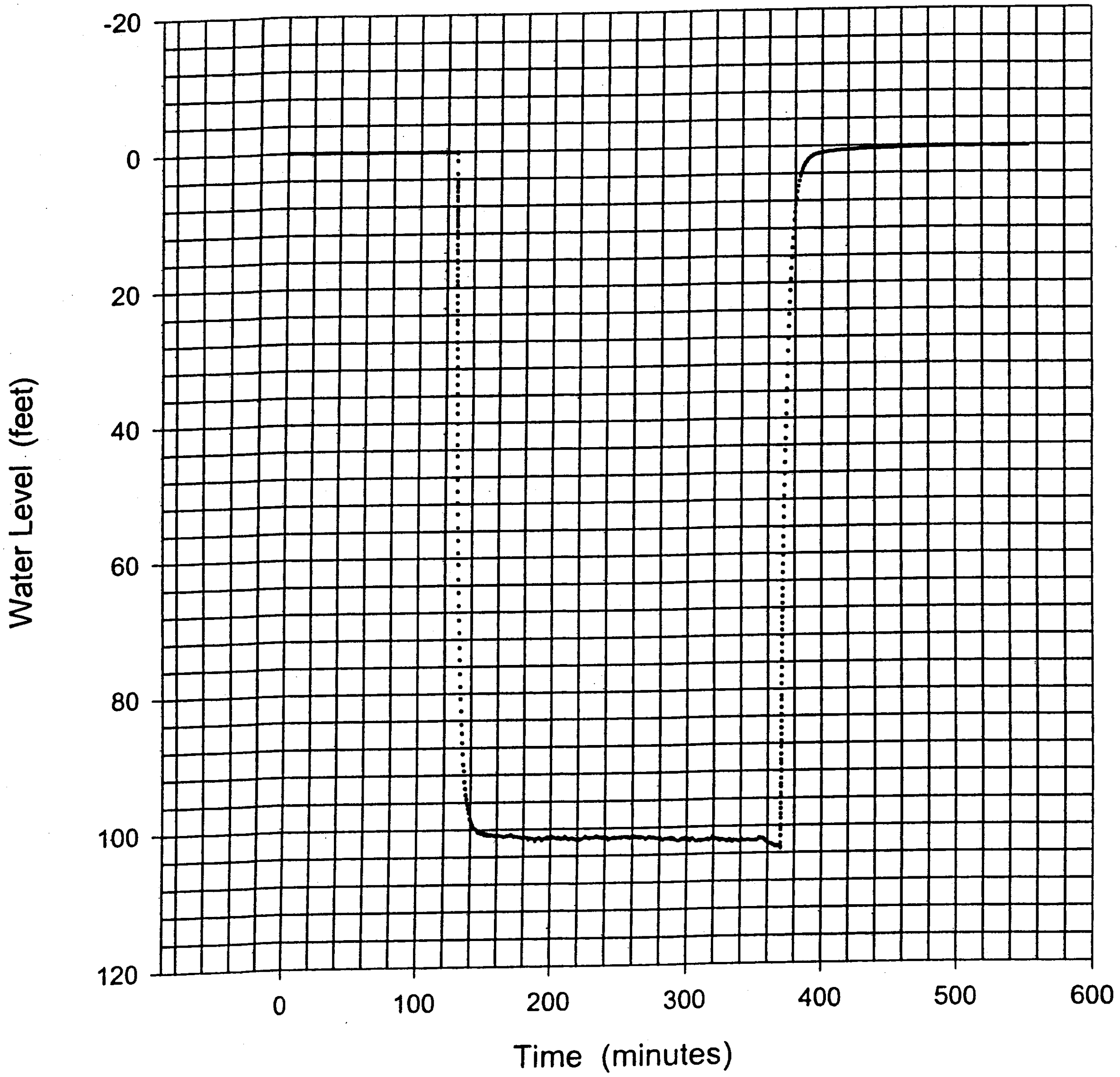
CITY OF HOLLYWOOD SRWWTP
iW-2
2093 - 2111
RECOVERY DATA

Time	Water Level
0	125.121
0.0165	125.193
0.033	125.164
0.0495	125.208
0.066	125.078
0.0825	124.89
0.099	124.933
0.1155	124.948
0.132	124.63
0.1485	124.471
0.165	124.385
0.1815	124.255
0.198	124.168
0.2145	124.053
0.231	123.923
0.2475	123.822
0.264	123.692
0.2805	123.562
0.297	123.461
0.3135	123.331
0.33	123.216
0.3467	123.1
0.3643	122.97
0.383	122.855
0.4028	122.725
0.4238	122.609
0.446	122.436
0.4695	122.292
0.4943	122.133
0.5207	121.96
0.5487	121.758
0.5783	121.584
0.6097	121.368
0.6428	121.252
0.678	120.906
0.7153	120.661
0.7548	120.386
0.7967	120.097
0.841	119.794
0.888	119.477
0.9378	119.159
0.9905	118.798
1.0463	118.408
1.1055	118.019
1.1682	117.6
1.2345	117.167
1.3048	116.705
1.3793	116.214
1.4583	115.665
1.542	115.117
1.6305	114.553
1.7243	113.947
1.8237	113.326
1.929	112.647
2.0405	111.94
2.1587	111.203
2.2838	110.409
2.4163	109.601
2.5568	108.748
2.7057	107.839
2.8632	106.9
3.03	105.889
3.2068	104.849
3.3942	103.766
3.5925	102.625
3.8027	101.426
4.0253	100.169
4.2612	98.869
4.511	97.482
4.7757	96.023
5.056	94.506
5.3528	92.931
5.6673	91.299
6.0005	89.579
6.3533	87.802
6.7272	85.967
7.1232	84.016
7.5425	82.036
7.9868	79.983
8.4575	77.873
8.956	75.705
9.484	73.478
10.0433	71.208
10.6358	68.837
11.2633	66.452
11.9282	64.008
12.6323	61.52
13.3782	58.989
14.1682	56.415
15.005	54.028
15.8915	51.569
16.8305	49.11
17.8252	46.621
18.8252	44.248
19.8252	41.977
20.8252	39.835
21.8252	37.78
22.8252	35.869
23.8252	34.046
24.8252	32.309
25.8252	30.673
26.8252	29.11
27.8252	27.604
28.8252	26.186
29.8252	24.883
30.8252	23.666
31.8252	22.479
32.8252	21.335
33.8252	20.293
34.8252	19.279
35.8252	18.323
36.8252	17.397
37.8252	16.528
38.8252	15.688
39.8252	14.92
40.8252	14.196
41.8252	13.487
42.8252	12.806
43.8252	12.169
44.8252	11.56
45.8252	10.995
46.8252	10.431
47.8252	9.924
48.8252	9.417
49.8252	8.968
50.8252	8.519
51.8252	8.098
52.8252	7.693
53.8252	7.316
54.8252	6.969
55.8252	6.606
56.8252	6.302
57.8252	5.998
58.8252	5.694
59.8252	5.419
60.8252	5.158
61.8252	4.912
62.8252	4.651
63.8252	4.448
64.8252	4.216
65.8252	4.028
66.8252	3.84
67.8252	3.666
68.8252	3.477
69.8252	3.318
70.8252	3.144
71.8252	3.014
72.8252	2.869
73.8252	2.753
74.8252	2.594
75.8252	2.478
76.8252	2.362
77.8252	2.246
78.8252	2.145
79.8252	2.043
80.8252	1.956
81.8252	1.913
82.8252	1.797
83.8252	1.724
84.8252	1.652
85.8252	1.565
86.8252	1.478
87.8252	1.406
88.8252	1.362
89.8252	1.304
90.8252	1.275
91.8252	1.232
92.8252	1.159
93.8252	1.116
94.8252	1.058
95.8252	1.014
96.8252	0.957
97.8252	0.928
98.8252	0.899
99.8252	0.855
100.8252	0.826
101.8252	0.812
102.8252	0.783
103.8252	0.754
104.8252	0.725
105.8252	0.725
106.8252	0.681
107.8252	0.667
108.8252	0.652
109.8252	0.609
110.8252	0.594
111.8252	0.58
112.8252	0.551
113.8252	0.536
114.8252	0.522
115.8252	0.507
116.8252	0.493
117.8252	0.507
118.8252	0.493
119.8252	0.493
120.8252	0.449
121.8252	0.435
122.8252	0.42
123.8252	0.406
124.8252	0.391
125.8252	0.391
126.8252	0.377
127.8252	0.377
128.8252	0.362
129.8252	0.348
130.8252	0.348
131.8252	0.348
132.8252	0.334
133.8252	0.319
134.8252	0.319
135.8252	0.319
136.8252	0.305
137.8252	0.305
138.8252	0.29
139.8252	0.276
140.8252	0.276
141.8252	0.276
142.8252	0.276
143.8252	0.261
144.8252	0.261
145.8252	0.261
146.8252	0.261
147.8252	0.247
148.8252	0.247
149.8252	0.232
150.8252	0.232
151.8252	0.232
152.8252	0.232
153.8252	0.218
154.8252	0.218
155.8252	0.218
156.8252	0.218
157.8252	0.189
158.8252	0.189
159.8252	0.189
160.8252	0.189
161.8252	0.189
162.8252	0.174
163.8252	0.174
164.8252	0.174
165.8252	0.174
166.8252	0.174
167.8252	0.174
168.8252	0.16
169.8252	0.16
170.8252	0.16
171.8252	0.145
172.8252	0.145
173.8252	0.16
174.8252	0.145
175.8252	0.145
176.8252	0.145
177.8252	0.131
178.8252	0.131
179.8252	0.131
180.8252	0.16
181.8252	0.16
182.8252	0.16

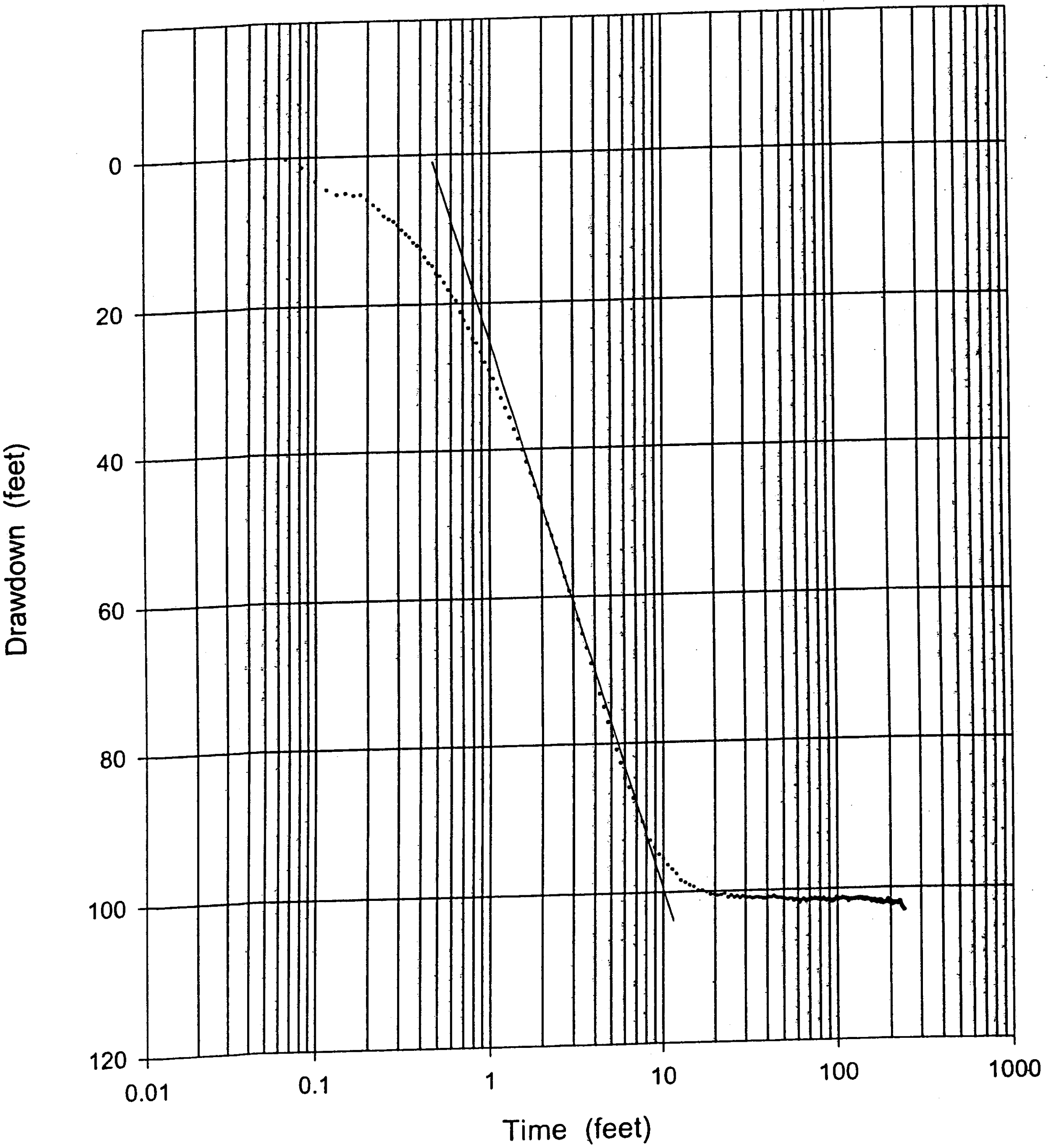
Injection Well No. 2 – Packer Tests

2,265 – 2,283

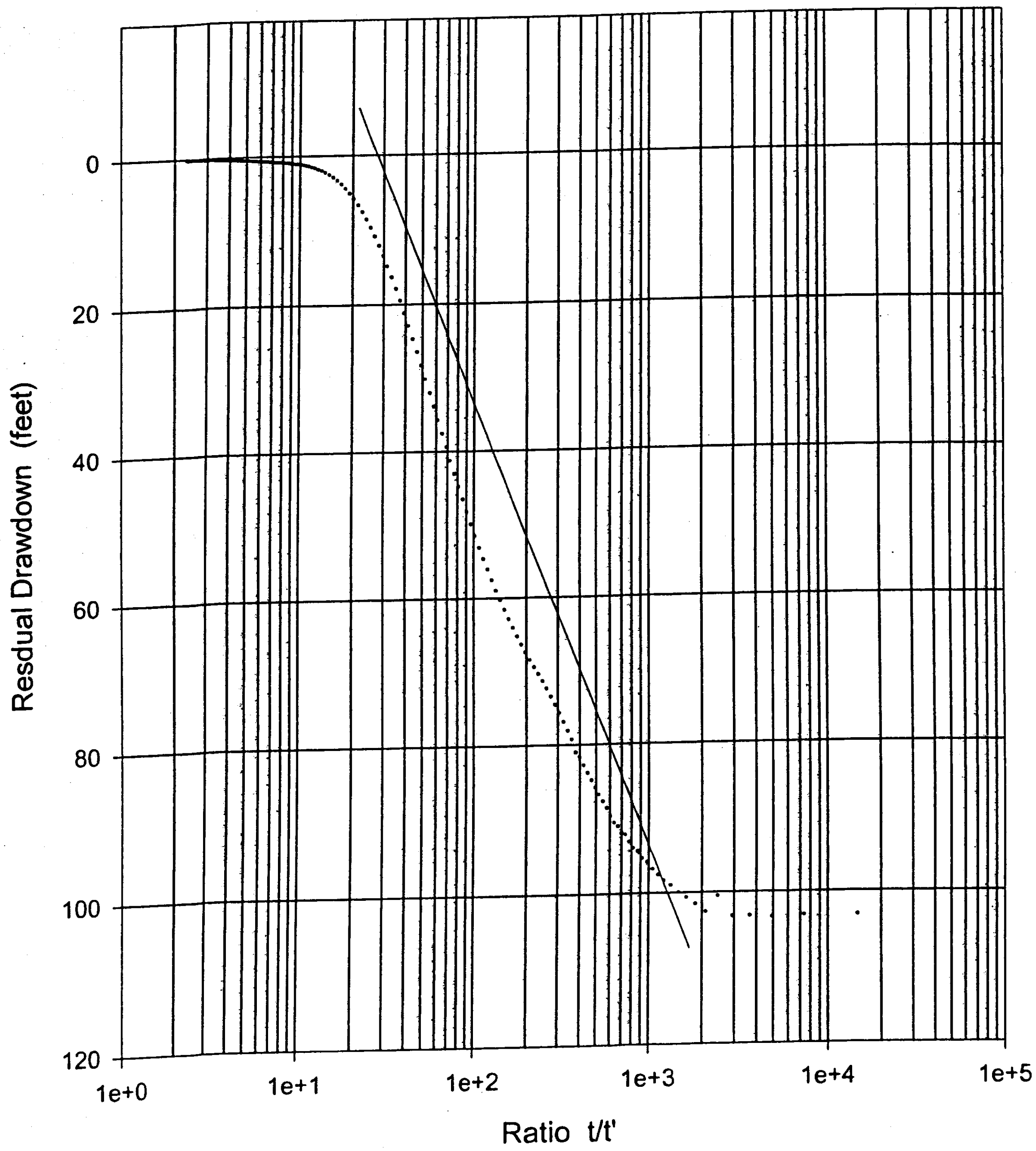
CITY OF HOLLYWOOD
SRWWTP
IW-2
2265-2283
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
SRWWTP
IW-2
2265 - 2283
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-1
2265 - 2283
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
2265 - 2283

Time	Water Level
0	0
0.0165	-0.014
0.033	-0.014
0.0495	-0.014
0.066	-0.014
0.0825	-0.014
0.099	-0.014
0.1155	-0.014
0.132	-0.014
0.1485	-0.014
0.165	0
0.1815	-0.014
0.198	-0.014
0.2145	-0.014
0.231	-0.014
0.2475	-0.014
0.264	-0.014
0.2805	-0.014
0.297	-0.014
0.3135	-0.014
0.33	-0.014
0.3467	0
0.3643	-0.014
0.383	-0.014
0.4028	0
0.4238	-0.014
0.446	-0.014
0.4695	0
0.4943	-0.014
0.5207	-0.014
0.5487	-0.014
0.5783	-0.014
0.6097	-0.014
0.6428	0.014
0.678	0.014
0.7153	0.014
0.7548	0.014
0.7967	0.014
0.841	0.014
0.888	0.029
0.9378	0.014
0.9905	0.029
1.0463	0.029
1.1055	0.029
1.1682	0.029
1.2345	0.029
1.3048	0.029
1.3793	0.014
1.4583	0.029
1.542	0.029
1.6305	0.029
1.7243	0.029
1.8237	0.014
1.929	0.014
2.0405	0.029
2.1587	0.029
2.2838	0.029
2.4163	0.029
2.5568	0.029
2.7057	0.029
2.8632	0.014
3.03	0.029
3.2068	0.029
3.3942	0.029
3.5925	0
3.8027	0
4.0253	0
4.2612	0
4.511	-0.014
4.7757	-0.014
5.056	0.014
5.3528	0
5.6673	0.014
6.0005	-0.014
6.3533	0
6.7272	0
7.1232	0
7.5425	0
7.9868	0.014
8.4575	0.014
8.956	0
9.484	0.014
10.0433	0
10.6358	0
11.2633	0.014
11.9282	0
12.6323	0
13.3782	0
14.1682	0
15.005	0
15.8915	0.014
16.8305	0
17.8252	0.014
18.8252	0.029
19.8252	0.014
20.8252	0.029
21.8252	0.029
22.8252	0
23.8252	0
24.8252	0.014
25.8252	0.014
26.8252	0.014
27.8252	0
28.8252	0.014
29.8252	0
30.8252	0
31.8252	0
32.8252	0.014
33.8252	0.014
34.8252	0.014
35.8252	0.014
36.8252	0.014
37.8252	0.014
38.8252	0.014
39.8252	0.014
40.8252	0.014
41.8252	0.014
42.8252	0
43.8252	0.014
44.8252	0
45.8252	0.014
46.8252	0.014
47.8252	0.014
48.8252	0.029
49.8252	0.043
50.8252	0.043
51.8252	0.043
52.8252	0.029
53.8252	0.029
54.8252	0.029
55.8252	0.029
56.8252	0.029
57.8252	0.029
58.8252	0.029
59.8252	0.029
60.8252	0.029
61.8252	0.058
62.8252	0.072
63.8252	0.058
64.8252	0.058
65.8252	0.072
66.8252	0.043
67.8252	0.029
68.8252	0.029
69.8252	0.043
70.8252	0.029
71.8252	0.043
72.8252	0.043
73.8252	0.043
74.8252	0.043
75.8252	0.043
76.8252	0.043
77.8252	0.043
78.8252	0.043
79.8252	0.043
80.8252	0.043
81.8252	0.043
82.8252	0.043
83.8252	0.043
84.8252	0.043
85.8252	0.043
86.8252	0.043
87.8252	0.043
88.8252	0.043
89.8252	0.043
90.8252	0.043
91.8252	0.043
92.8252	0.058
93.8252	0.072
94.8252	0.072
95.8252	0.087
96.8252	0.087
97.8252	0.058
98.8252	0.087
99.8252	0.087
100.8252	0.101
101.8252	0.101
102.8252	0.101
103.8252	0.072
104.8252	0.058
105.8252	0.058
106.8252	0.058
107.8252	0.058
108.8252	0.058
109.8252	0.058
110.8252	0.058
111.8252	0.058
112.8252	0.058
113.8252	0.058
114.8252	0.058
115.8252	0.072
116.8252	0.072
117.8252	0.058
118.8252	0.058
119.8252	0.087
120.8252	0.087
121.8252	0.101
122.8252	0.087
123.8252	0.087
124.8252	0.101
125.8252	0.101
126.8252	0.101

CITY OF HOLLYWOOD
SRWWTP
IW-2
2265 - 2283
DRAWDOWN DATA

Time	Water Level
0	0
0.0165	0.014
0.033	0.014
0.0495	5.187
0.066	0.261
0.0825	1.376
0.099	3.26
0.1155	4.434
0.132	5.1
0.1485	4.97
0.165	5.259
0.1815	5.187
0.198	5.882
0.2145	6.607
0.231	7.201
0.2475	8.07
0.264	8.504
0.2805	8.838
0.297	9.359
0.3135	9.996
0.33	10.547
0.3467	10.952
0.3643	11.677
0.383	12.097
0.4028	12.618
0.4238	13.661
0.446	14.472
0.4695	14.863
0.4943	15.906
0.5207	16.254
0.5487	17.137
0.5783	18.151
0.6097	19.005
0.6428	19.584
0.678	21.163
0.7153	22.278
0.7548	23.378
0.7967	24.812
0.841	25.42
0.888	26.679
0.9378	28.055
0.9905	29.097
1.0463	30.313
1.1055	31.717
1.1682	32.977
1.2345	34.352
1.3048	35.684
1.3793	37.29
1.4583	38.607
1.542	40.141
1.6305	41.733
1.7243	43.267
1.8237	44.946
1.929	46.581
2.0405	48.419
2.1587	50.155
2.2838	51.804
2.4163	53.497
2.5568	55.507
2.7057	57.388
2.8632	59.254
3.03	60.961
3.2068	63.159
3.3942	65.082
3.5925	67.035
3.8027	69.16
4.0253	71.04
4.2612	73.281
4.511	75.074
4.7757	77.127
5.056	79.006
5.3528	80.827
5.6673	82.619
6.0005	84.614
6.3533	85.9
6.7272	87.317
7.1232	88.935
7.5425	90.481
7.9868	91.435
8.4575	93.01
8.956	94.007
9.484	94.932
10.0433	95.539
10.6358	96.362
11.2633	96.969
11.9282	97.561
12.6323	98.457
13.3782	98.746
14.1682	99.107
15.005	99.353
15.8915	99.873
16.8305	99.844
17.8252	100.104
18.8252	100.422
19.8252	100.436
20.8252	100.61
21.8252	100.523
22.8252	100.364
23.8252	100.855
24.8252	100.581
25.8252	100.913
26.8252	100.711
27.8252	101
28.8252	100.754
29.8252	100.87
30.8252	100.942
31.8252	100.913
32.8252	101.101
33.8252	101
34.8252	100.899
35.8252	100.971
36.8252	101.029
37.8252	101.13
38.8252	101.072
39.8252	101.086
40.8252	100.899
41.8252	101.029
42.8252	100.927
43.8252	100.754
44.8252	100.971
45.8252	101.115
46.8252	101.057
47.8252	101.101
48.8252	101.13
49.8252	101.159
50.8252	101.231
51.8252	101.317
52.8252	101.375
53.8252	101.202
54.8252	101.245
55.8252	101.231
56.8252	101.577
57.8252	101.375
58.8252	101.332
59.8252	101.404
60.8252	101.476
61.8252	101.823
62.8252	101.433
63.8252	101.419
64.8252	101.231
65.8252	101.476
66.8252	101.707
67.8252	101.462
68.8252	101.39
69.8252	101.433
70.8252	101.173
71.8252	101.447
72.8252	101.419
73.8252	101.404
74.8252	101.13
75.8252	101.274
76.8252	101.39
77.8252	101.462
78.8252	101.26
79.8252	101.447
80.8252	101.577
81.8252	101.433
82.8252	101.462
83.8252	101.13
84.8252	101.433
85.8252	101.549
86.8252	101.606
87.8252	101.476
88.8252	101.375
89.8252	101.549
90.8252	101.462
91.8252	101.606
92.8252	101.736
93.8252	101.476
94.8252	101.765
95.8252	101.606
96.8252	101.491
97.8252	101.39
98.8252	101.144
99.8252	101.361
100.8252	101.433
101.8252	101.52
102.8252	101.332
103.8252	101.39
104.8252	101.447
105.8252	101.361
106.8252	101.159
107.8252	101.231
108.8252	101.419
109.8252	101.317
110.8252	101.462
111.8252	101.303
112.8252	101.491
113.8252	101.419
114.8252	101.361
115.8252	101.809
116.8252	101.592
117.8252	101.505
118.8252	101.549
119.8252	101.361
120.8252	101.592
121.8252	101.462
122.8252	101.491
123.8252	101.375
124.8252	101.563
125.8252	101.332
126.8252	101.346
127.8252	101.346
128.8252	101.433
129.8252	101.274
130.8252	101.52
131.8252	101.447
132.8252	101.26
133.8252	101.462
134.8252	101.216
135.8252	101.361
136.8252	101.505
137.8252	101.26
138.8252	101.592
139.8252	101.375
140.8252	101.39
141.8252	101.491
142.8252	101.707
143.8252	101.635
144.8252	101.447
145.8252	101.303
146.8252	101.534
147.8252	101.606
148.8252	101.433
149.8252	101.549
150.8252	101.606
151.8252	101.635
152.8252	101.635
153.8252	101.491
154.8252	101.837
155.8252	101.924
156.8252	101.751
157.8252	101.65
158.8252	101.679
159.8252	101.606
160.8252	101.751
161.8252	101.491
162.8252	101.852
163.8252	101.621
164.8252	101.837
165.8252	101.968
166.8252	102.04
167.8252	102.04
168.8252	101.852
169.8252	101.707
170.8252	101.895
171.8252	101.621
172.8252	101.621
173.8252	101.837
174.8252	101.722
175.8252	102.112
176.8252	101.751
177.8252	101.635
178.8252	101.895
179.8252	102.069
180.8252	102.184
181.8252	102.054
182.8252	101.968
183.8252	102.141
184.8252	101.982
185.8252	102.054
186.8252	101.996
187.8252	101.939
188.8252	101.823
189.8252	102.054
190.8252	101.924
191.8252	101.765
192.8252	101.534
193.8252	101.881
194.8252	101.78
195.8252	101.895
196.8252	101.794
197.8252	102.184
198.8252	101.968
199.8252	101.895
200.8252	102.04
201.8252	102.069
202.8252	102.256
203.8252	102.083
204.8252	101.895
205.8252	102.242
206.8252	102.343
207.8252	102.011
208.8252	102.083
209.8252	102.098
210.8252	102.213
211.8252	102.213
212.8252	102.17
213.8252	101.924
214.8252	102.184
215.8252	102.126
216.8252	102.155
217.8252	102.069
218.8252	102.025
219.8252	102.126
220.8252	102.17
221.8252	102.17
222.8252	102.17
223.8252	102.126
224.8252	102.184
225.8252	102.04
226.8252	101.794
227.8252	101.852
228.8252	101.91
229.8252	101.837
230.8252	102.141
231.8252	102.242
232.8252	102.444
233.8252	102.632
234.8252	102.661
235.8252	102.603
236.8252	102.834
237.8252	102.863
238.8252	103.051
239.8252	102.935
240.8252	103.036
241.8252	103.051
242.8252	102.95

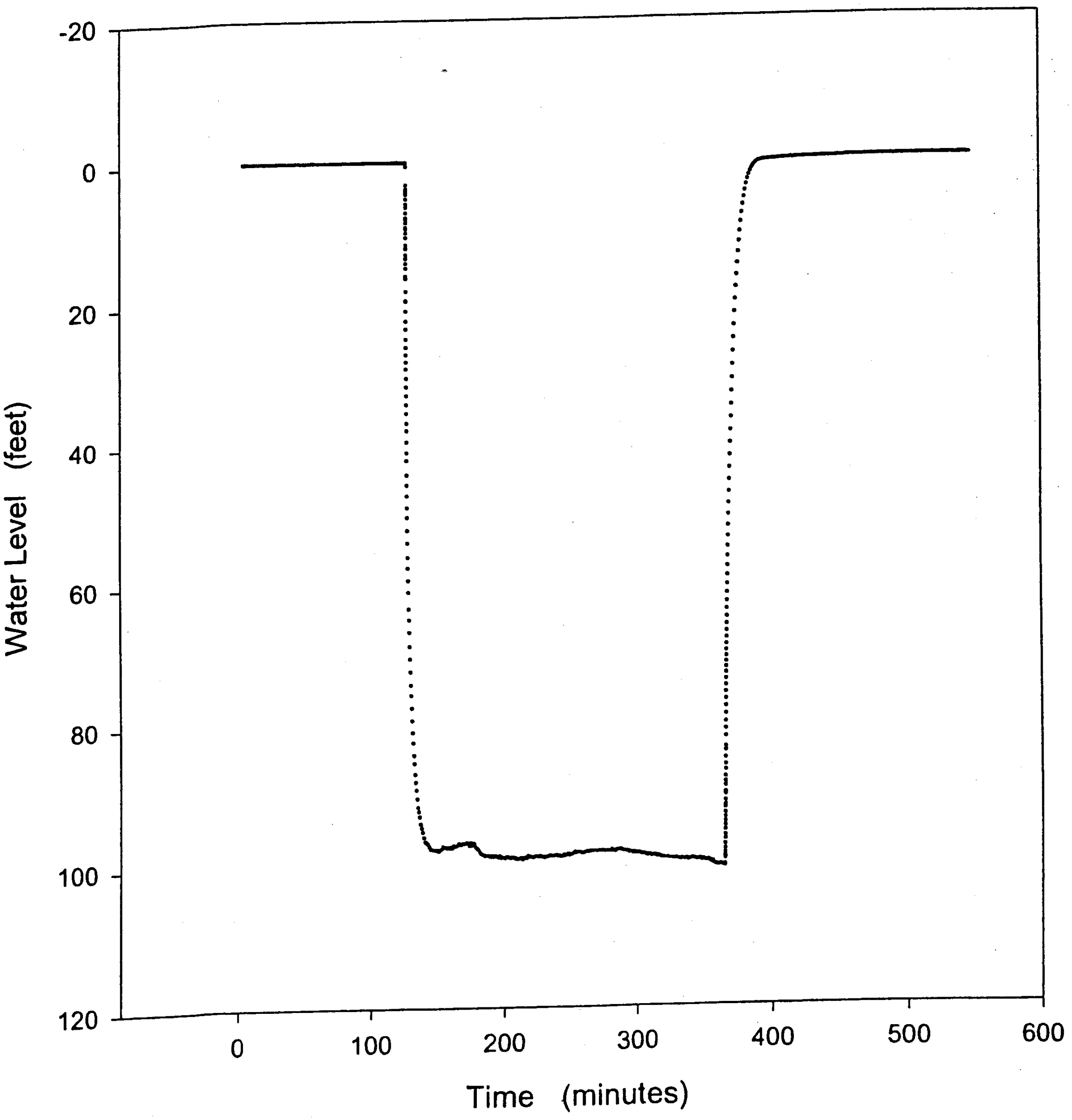
CITY OF HOLLYWOOD
SRWWTP
IW-2
2265 - 2283
RECOVERY DATA

Time	Water Level
0	103.051
0.0165	103.138
0.033	103.138
0.0495	103.354
0.066	103.167
0.0825	103.195
0.099	100.523
0.1155	102.574
0.132	101.52
0.1485	100.653
0.165	99.974
0.1815	98.977
0.198	98.327
0.2145	97.561
0.231	96.796
0.2475	95.842
0.264	95.308
0.2805	94.397
0.297	93.964
0.3135	93.126
0.33	92.143
0.3467	91.955
0.3643	91.031
0.383	90.481
0.4028	89.614
0.4238	88.559
0.446	87.663
0.4695	86.739
0.4943	85.77
0.5207	84.773
0.5487	83.776
0.5783	82.735
0.6097	81.651
0.6428	81.029
0.678	79.266
0.7153	78.095
0.7548	76.881
0.7967	75.652
0.841	74.553
0.888	73.397
0.9378	72.327
0.9905	71.329
1.0463	70.346
1.1055	69.406
1.1682	68.408
1.2345	67.382
1.3048	66.311
1.3793	65.198
1.4583	64.041
1.542	62.841
1.6305	61.597
1.7243	60.295
1.8237	58.964
1.929	57.561
2.0405	56.129
2.1587	54.668
2.2838	53.12
2.4163	51.529
2.5568	49.923
2.7057	48.274
2.8632	46.566
3.03	44.844
3.2068	43.065
3.3942	41.256
3.5925	39.418
3.8027	37.58
4.0253	35.727
4.2612	33.86
4.511	32.021
4.7757	30.139
5.056	28.315
5.3528	26.491
5.6673	24.696
6.0005	22.9
6.3533	21.177
Time	Water Level
6.7272	19.497
7.1232	17.904
7.5425	16.34
7.9868	14.877
8.4575	13.472
8.956	12.14
9.484	10.88
10.0433	9.706
10.6358	8.62
11.2633	7.62
11.9282	6.708
12.6323	5.867
13.3782	5.129
14.1682	4.448
15.005	3.868
15.8915	3.347
16.8305	2.926
17.8252	2.564
18.8252	2.274
19.8252	2.014
20.8252	1.825
21.8252	1.651
22.8252	1.521
23.8252	1.376
24.8252	1.289
25.8252	1.202
26.8252	1.144
27.8252	1.086
28.8252	1.072
29.8252	1.043
30.8252	1.014
31.8252	0.927
32.8252	0.912
33.8252	0.883
34.8252	0.855
35.8252	0.84
36.8252	0.811
37.8252	0.797
38.8252	0.797
39.8252	0.782
40.8252	0.739
41.8252	0.724
42.8252	0.71
43.8252	0.695
44.8252	0.681
45.8252	0.666
46.8252	0.652
47.8252	0.637
48.8252	0.623
49.8252	0.637
50.8252	0.623
51.8252	0.608
52.8252	0.594
53.8252	0.579
54.8252	0.579
55.8252	0.579
56.8252	0.55
57.8252	0.55
58.8252	0.521
59.8252	0.521
60.8252	0.507
61.8252	0.507
62.8252	0.507
63.8252	0.492
64.8252	0.492
65.8252	0.492
66.8252	0.463
67.8252	0.463
68.8252	0.463
69.8252	0.463
70.8252	0.449
71.8252	0.449
72.8252	0.449
73.8252	0.449
74.8252	0.449
Time	Water Level
75.8252	0.434
76.8252	0.434
77.8252	0.42
78.8252	0.42
79.8252	0.405
80.8252	0.405
81.8252	0.405
82.8252	0.391
83.8252	0.391
84.8252	0.391
85.8252	0.376
86.8252	0.376
87.8252	0.362
88.8252	0.362
89.8252	0.362
90.8252	0.362
91.8252	0.347
92.8252	0.347
93.8252	0.347
94.8252	0.347
95.8252	0.347
96.8252	0.347
97.8252	0.333
98.8252	0.318
99.8252	0.318
100.8252	0.318
101.8252	0.333
102.8252	0.333
103.8252	0.333
104.8252	0.318
105.8252	0.304
106.8252	0.289
107.8252	0.289
108.8252	0.289
109.8252	0.289
110.8252	0.275
111.8252	0.275
112.8252	0.26
113.8252	0.275
114.8252	0.26
115.8252	0.26
116.8252	0.26
117.8252	0.26
118.8252	0.26
119.8252	0.26
120.8252	0.26
121.8252	0.26
122.8252	0.246
123.8252	0.246
124.8252	0.246
125.8252	0.246
126.8252	0.246
127.8252	0.231
128.8252	0.217
129.8252	0.231
130.8252	0.231
131.8252	0.217
132.8252	0.231
133.8252	0.231
134.8252	0.217
135.8252	0.217
136.8252	0.202
137.8252	0.202
138.8252	0.202
139.8252	0.217
140.8252	0.202
141.8252	0.217
142.8252	0.202
143.8252	0.202
144.8252	0.202
145.8252	0.202
146.8252	0.202
147.8252	0.202
148.8252	0.202
149.8252	0.188
Time	Water Level
150.8252	0.188
151.8252	0.188
152.8252	0.188
153.8252	0.173
154.8252	0.188
155.8252	0.188
156.8252	0.173
157.8252	0.173
158.8252	0.173
159.8252	0.173
160.8252	0.173
161.8252	0.173
162.8252	0.159
163.8252	0.173
164.8252	0.173
165.8252	0.159
166.8252	0.159
167.8252	0.159
168.8252	0.159
169.8252	0.159
170.8252	0.159
171.8252	0.145
172.8252	0.159
173.8252	0.145
174.8252	0.159
175.8252	0.145
176.8252	0.159
177.8252	0.173
178.8252	0.173
179.8252	0.159
180.8252	0.145
181.8252	0.145
182.8252	0.159
183.8252	0.159

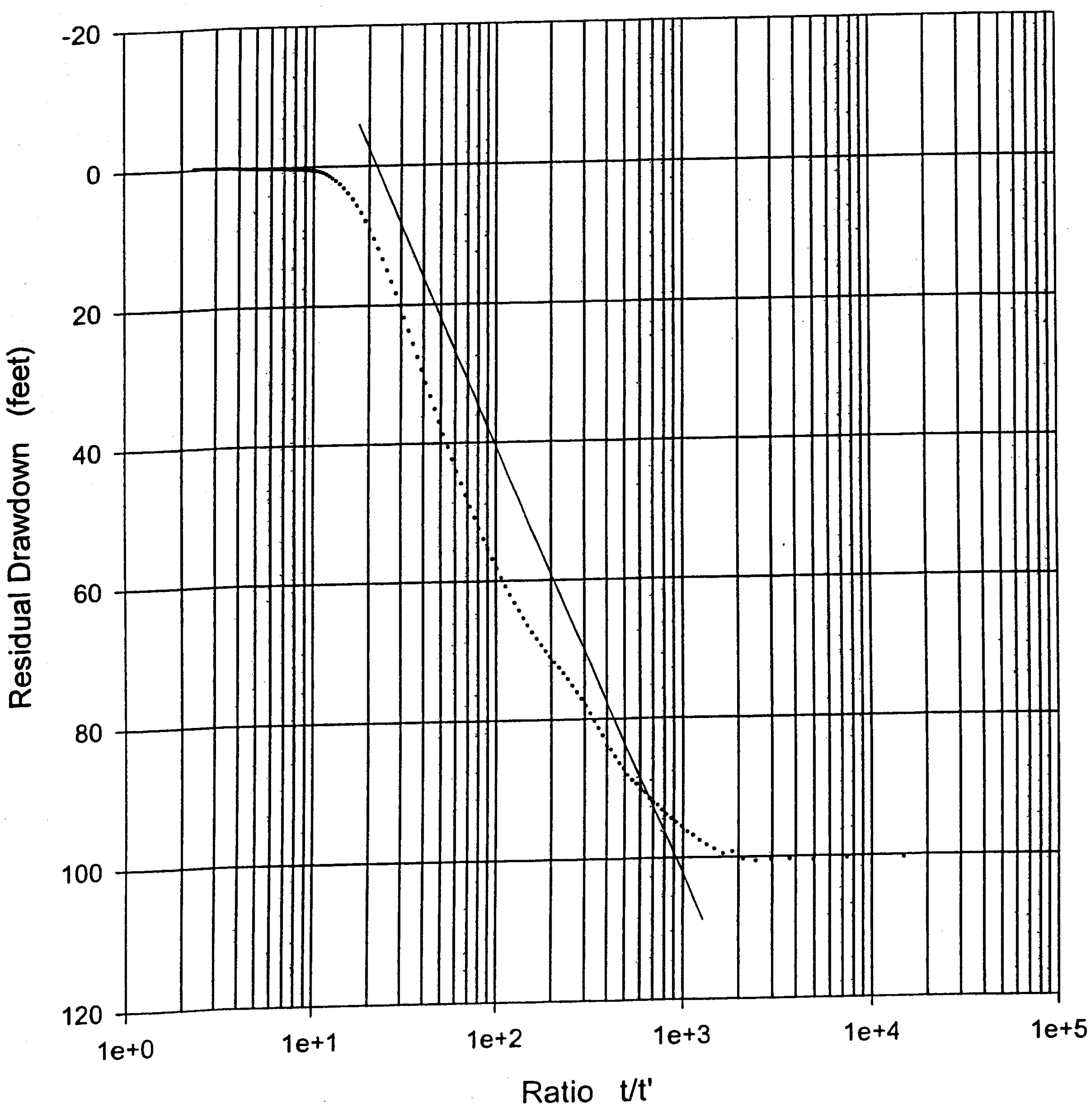
Injection Well No. 2 – Packer Tests

2,300 – 2,318

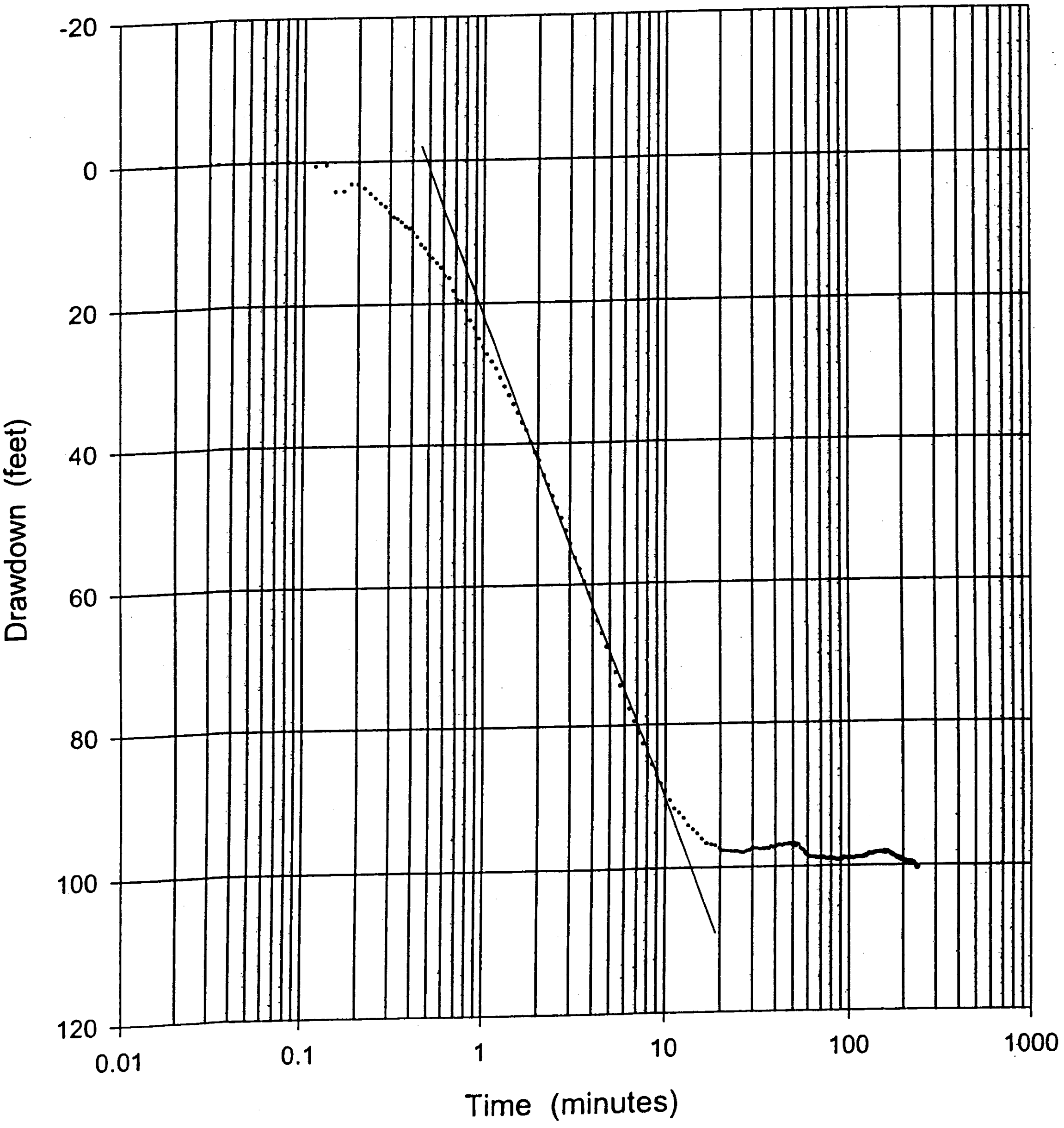
CITY OF HOLLYWOOD
SRWWTP
IW-2
2300 - 2318
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
SRWWTP
IW-2
2300 - 2318
RESIDUAL DRAWDOWN VS t/t'



CITY OF HOLLYWOOD
SRWWTP
IW-2
2300 - 2318
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
230 - 2318
BACKGROUND DATA

Time	Water Level
0	0
0.0165	-0.014
0.033	-0.014
0.0495	-0.014
0.066	-0.014
0.0825	-0.014
0.099	-0.014
0.1155	-0.014
0.132	-0.014
0.1485	-0.014
0.165	-0.014
0.1815	-0.014
0.198	-0.014
0.2145	-0.014
0.231	-0.014
0.2475	-0.014
0.264	-0.014
0.2805	-0.014
0.297	-0.014
0.3135	-0.014
0.33	-0.014
0.3467	-0.014
0.3643	-0.014
0.383	-0.014
0.4028	-0.014
0.4238	-0.014
0.446	-0.014
0.4695	-0.014
0.4943	-0.014
0.5207	-0.014
0.5487	-0.014
0.5783	-0.014
0.6097	-0.014
0.6428	0.014
0.678	0.014
0.7153	0.014
0.7548	0.029
0.7967	0.014
0.841	0.014
0.888	0.014
0.9378	0.029
0.9905	0.014
1.0463	0.014
1.1055	0.014
1.1682	0.029
1.2345	0.014
1.3048	0.014
1.3793	0.014
1.4583	0.014
1.542	0.014
1.6305	0.014
1.7243	0.014
1.8237	0.029
1.929	0
2.0405	0.014
2.1587	0.029
2.2838	0.029
2.4163	0
2.5568	0
2.7057	0
2.8632	0
3.03	-0.014
3.2068	-0.014
3.3942	-0.014
3.5925	-0.029
3.8027	-0.014
4.0253	-0.014
4.2612	0
4.511	0
4.7757	0
5.056	0
5.3528	0
5.6673	0
6.0005	0
6.3533	0
6.7272	0
7.1232	0
7.5425	0
7.9868	0
8.4575	0
8.956	0
9.484	0
10.0433	0
10.6358	0
11.2633	0
11.9282	0
12.6323	0
13.3782	0
14.1682	0
15.005	0
15.8915	0.029
16.8305	0.014
17.8252	0.029
18.8252	0.014
19.8252	0
20.8252	0
21.8252	0
22.8252	0
23.8252	0
24.8252	-0.014
25.8252	0
26.8252	0
27.8252	-0.014
28.8252	0
29.8252	0
30.8252	-0.014
31.8252	0.014
32.8252	0.014
33.8252	0.029
34.8252	0.014
35.8252	-0.014
36.8252	0.014
37.8252	0.029
38.8252	0.014
39.8252	-0.014
40.8252	-0.029
41.8252	-0.014
42.8252	0
43.8252	0
44.8252	0
45.8252	0
46.8252	0
47.8252	0.029
48.8252	0
49.8252	0
50.8252	-0.014
51.8252	-0.014
52.8252	-0.014
53.8252	-0.014
54.8252	0
55.8252	0
56.8252	0
57.8252	0
58.8252	0
59.8252	0
60.8252	0
61.8252	0
62.8252	0
63.8252	0
64.8252	0
65.8252	0
66.8252	0
67.8252	0
68.8252	0
69.8252	0
70.8252	0
71.8252	0
72.8252	0
73.8252	0
74.8252	0
75.8252	0
76.8252	0
77.8252	0.014
78.8252	0
79.8252	0.029
80.8252	0.014
81.8252	0.014
82.8252	0
83.8252	-0.014
84.8252	-0.014
85.8252	0
86.8252	0
87.8252	0.014
88.8252	0.014
89.8252	-0.014
90.8252	0
91.8252	0
92.8252	-0.014
93.8252	0
94.8252	-0.014
95.8252	-0.014
96.8252	-0.014
97.8252	0
98.8252	-0.014
99.8252	-0.014
100.8252	-0.014
101.8252	0
102.8252	-0.014
103.8252	-0.014
104.8252	-0.014
105.8252	0
106.8252	-0.014
107.8252	-0.014
108.8252	-0.014
109.8252	-0.014
110.8252	-0.014
111.8252	-0.014
112.8252	-0.014
113.8252	-0.014
114.8252	-0.014
115.8252	-0.014
116.8252	0.014
117.8252	0.014
118.8252	0.029
119.8252	0.014
120.8252	0
121.8252	0.014
122.8252	0.014

CITY OIF HOLLYWOOD
SRWWTP
IW-2
2300 - 2318
DRAWDOWN DATA

Time	Water Level
0	0
0.0165	0
0.033	0
0.0495	-0.014
0.066	-0.014
0.0825	-0.014
0.099	-0.014
0.1155	0.609
0.132	0.493
0.1485	4.173
0.165	4.158
0.1815	3.159
0.198	3.159
0.2145	3.753
0.231	4.535
0.2475	5.172
0.264	5.882
0.2805	6.346
0.297	7.128
0.3135	7.823
0.33	8.041
0.3467	8.519
0.3643	9.156
0.383	9.417
0.4028	9.967
0.4238	10.605
0.446	11.662
0.4695	12.169
0.4943	13.038
0.5207	13.559
0.5487	14.24
0.5783	14.921
0.6097	16.065
0.6428	16.398
0.678	18.194
0.7153	19.512
0.7548	19.613
0.7967	21.018
0.841	22.408
0.888	23.537
0.9378	25
0.9905	26.187
1.0463	27.229
1.1055	28.301
1.1682	29.256
1.2345	30.573
1.3048	31.804
1.3793	33.078
1.4583	34.352
1.542	35.611
1.6305	37.015
1.7243	38.086
1.8237	39.721
1.929	41.284
2.0405	42.399
2.1587	44.497
2.2838	45.929
2.4163	47.463
2.5568	49.141
2.7057	50.559
2.8632	52.368
3.03	54.219
3.2068	56.273
3.3942	57.792
3.5925	59.571
3.8027	61.235
4.0253	63.606
4.2612	65.154
4.511	66.933
4.7757	68.899
5.056	70.707
5.3528	72.543
5.6673	74.422
6.0005	75.911
6.3533	77.718

Time	Water Level
6.7272	79.525
7.1232	81.188
7.5425	82.676
7.9868	84.425
8.4575	85.581
8.956	87.113
9.484	88.255
10.0433	89.339
10.6358	90.582
11.2633	91.781
11.9282	92.359
12.6323	93.11
13.3782	94.122
14.1682	94.7
15.005	95.292
15.8915	96.029
16.8305	96.636
17.8252	96.823
18.8252	96.968
19.8252	97.358
20.8252	97.705
21.8252	97.734
22.8252	97.806
23.8252	97.835
24.8252	97.791
25.8252	97.965
26.8252	98.008
27.8252	97.806
28.8252	97.69
29.8252	97.387
30.8252	97.445
31.8252	97.445
32.8252	97.56
33.8252	97.488
34.8252	97.575
35.8252	97.43
36.8252	97.589
37.8252	97.228
38.8252	97.315
39.8252	97.344
40.8252	97.185
41.8252	96.968
42.8252	97.083
43.8252	97.141
44.8252	96.939
45.8252	96.968
46.8252	96.953
47.8252	96.809
48.8252	96.953
49.8252	97.271
50.8252	96.823
51.8252	97.242
52.8252	96.925
53.8252	96.968
54.8252	97.502
55.8252	97.661
56.8252	97.806
57.8252	98.167
58.8252	98.413
59.8252	98.499
60.8252	98.586
61.8252	98.759
62.8252	98.673
63.8252	98.759
64.8252	98.673
65.8252	98.875
66.8252	98.745
67.8252	98.918
68.8252	98.774
69.8252	98.73
70.8252	98.904
71.8252	98.918
72.8252	98.702
73.8252	99.048
74.8252	98.962

Time	Water Level
75.8252	99.019
76.8252	99.12
77.8252	98.875
78.8252	98.889
79.8252	99.019
80.8252	99.12
81.8252	98.918
82.8252	98.947
83.8252	99.164
84.8252	99.063
85.8252	99.265
86.8252	99.236
87.8252	99.12
88.8252	99.048
89.8252	99.337
90.8252	99.135
91.8252	99.034
92.8252	99.149
93.8252	98.745
94.8252	98.933
95.8252	98.904
96.8252	98.947
97.8252	99.048
98.8252	98.904
99.8252	98.846
100.8252	98.846
101.8252	98.976
102.8252	98.817
103.8252	98.962
104.8252	98.976
105.8252	99.092
106.8252	98.976
107.8252	98.889
108.8252	98.947
109.8252	98.774
110.8252	98.803
111.8252	98.875
112.8252	98.846
113.8252	98.817
114.8252	98.759
115.8252	98.846
116.8252	98.803
117.8252	98.918
118.8252	98.889
119.8252	98.889
120.8252	98.702
121.8252	98.788
122.8252	98.673
123.8252	98.557
124.8252	98.832
125.8252	98.658
126.8252	98.644
127.8252	98.456
128.8252	98.326
129.8252	98.456
130.8252	98.34
131.8252	98.34
132.8252	98.355
133.8252	98.499
134.8252	98.514
135.8252	98.441
136.8252	98.369
137.8252	98.254
138.8252	98.384
139.8252	98.225
140.8252	98.254
141.8252	98.239
142.8252	98.181
143.8252	98.225
144.8252	98.225
145.8252	98.225
146.8252	98.167
147.8252	98.225
148.8252	98.138
149.8252	98.138

Time	Water Level
150.8252	98.21
151.8252	98.254
152.8252	98.268
153.8252	98.225
154.8252	98.239
155.8252	98.225
156.8252	98.008
157.8252	98.268
158.8252	98.181
159.8252	98.369
160.8252	98.08
161.8252	98.037
162.8252	98.124
163.8252	98.023
164.8252	98.181
165.8252	98.225
166.8252	98.268
167.8252	98.283
168.8252	98.254
169.8252	98.47
170.8252	98.384
171.8252	98.47
172.8252	98.629
173.8252	98.413
174.8252	98.586
175.8252	98.557
176.8252	98.658
177.8252	98.528
178.8252	98.702
179.8252	98.774
180.8252	98.673
181.8252	98.788
182.8252	98.817
183.8252	99.019
184.8252	98.86
185.8252	98.86
186.8252	99.077
187.8252	99.019
188.8252	98.889
189.8252	98.99
190.8252	99.193
191.8252	98.99
192.8252	99.164
193.8252	99.12
194.8252	99.323
195.8252	99.265
196.8252	99.323
197.8252	99.337
198.8252	99.308
199.8252	99.337
200.8252	99.409
201.8252	99.409
202.8252	99.381
203.8252	99.482
204.8252	99.496
205.8252	99.352
206.8252	99.424
207.8252	99.511
208.8252	99.612
209.8252	99.453
210.8252	99.496
211.8252	99.568
212.8252	99.525
213.8252	99.424
214.8252	99.669
215.8252	99.583
216.8252	99.554
217.8252	99.409
218.8252	99.438
219.8252	99.583
220.8252	99.597
221.8252	99.597
222.8252	99.568
223.8252	99.525
224.8252	99.756

Time	Water Level
225.8252	99.554
226.8252	99.713
227.8252	99.771
228.8252	99.828
229.8252	99.698
230.8252	99.886
231.8252	100.059
232.8252	99.929
233.8252	100.247
234.8252	100.406
235.8252	100.392
236.8252	100.478
237.8252	100.377
238.8252	100.406
239.8252	100.507
240.8252	100.45
241.8252	100.45

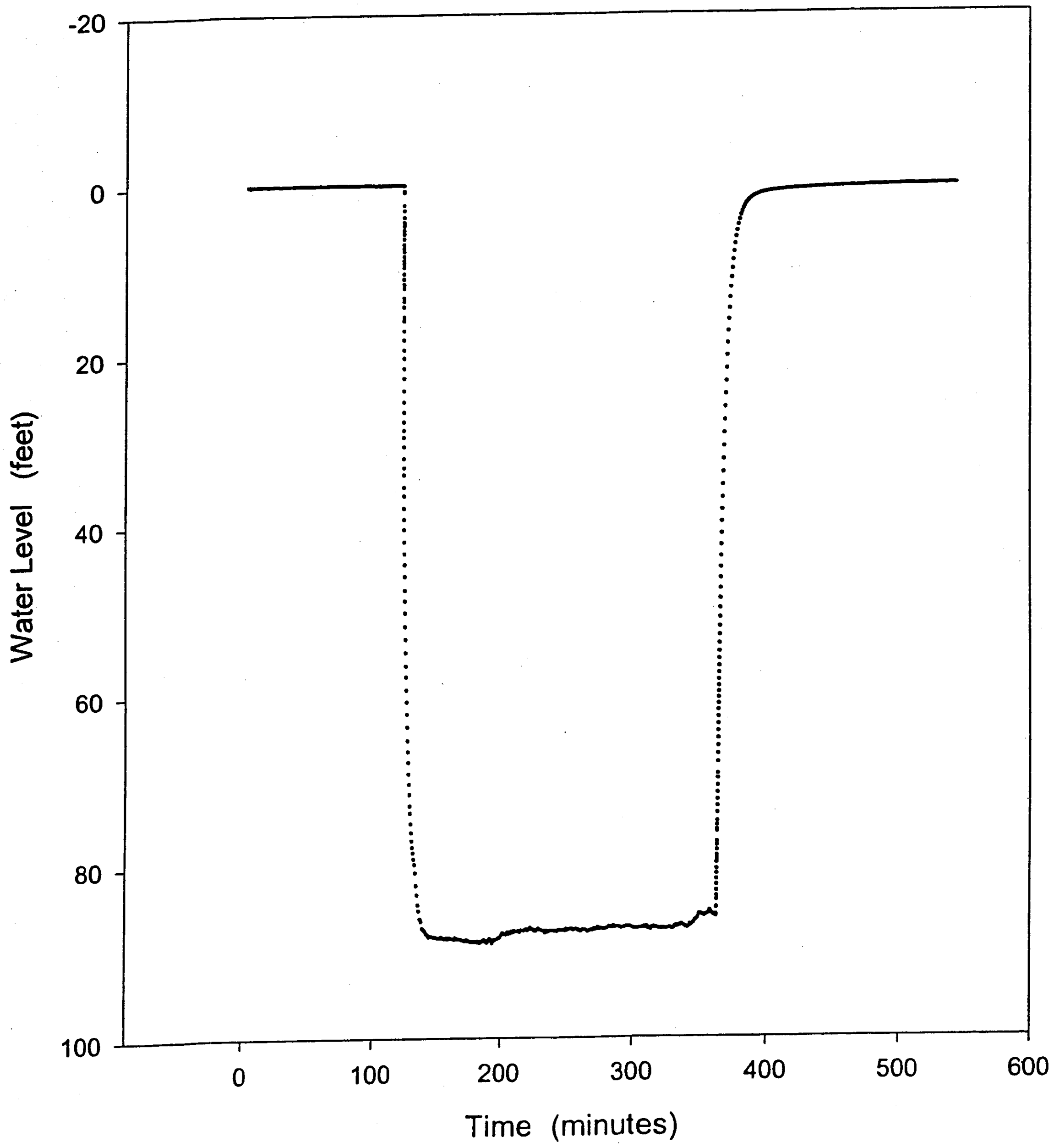
CITY OF HOLLYWOOD
SRWWTP
IW-2
2300 - 2318
RECOVERY DATA

Time	Water Level
0	100.45
0.0163	100.45
0.0327	100.407
0.049	100.609
0.0653	100.464
0.0817	100.479
0.098	100.667
0.1143	100.407
0.1307	99.251
0.147	99.554
0.1633	98.803
0.1797	98.225
0.196	97.604
0.2123	96.838
0.2287	96.318
0.245	95.581
0.2613	94.96
0.2777	94.397
0.294	93.804
0.3103	93.197
0.3267	92.432
0.3433	92.085
0.361	91.478
0.3797	90.611
0.3995	90.307
0.4205	89.397
0.4427	88.833
0.4662	88.111
0.491	87.143
0.5173	86.377
0.5453	85.423
0.575	84.411
0.6063	83.862
0.6395	82.402
0.6747	81.333
0.712	80.335
0.7515	79.222
0.7933	78.124
0.8377	77.112
0.8847	76.114
0.9345	75.174
0.9872	74.249
1.043	73.367
1.1022	72.572
1.1648	71.806
1.2312	71.025
1.3015	70.186
1.376	69.319
1.455	68.379
1.5387	67.439
1.6272	66.441
1.721	65.4
1.8203	64.316
1.9257	63.188
2.0372	62.016
2.1553	60.787
2.2805	59.528
2.413	58.198
2.5535	56.824
2.7023	55.406
2.8598	53.945
3.0267	52.397
3.2035	50.82
3.3908	49.214
3.5892	47.565
3.7993	45.872
4.022	44.135
4.2578	42.356
4.5077	40.561
4.7723	38.738
5.0527	36.914
5.3495	35.047
5.664	33.18
5.9972	31.283
6.35	29.372
6.7238	27.49
7.1198	25.594
7.5392	23.74
7.9835	21.844
8.4542	20.062
8.9527	18.296
9.4807	16.601
10.04	14.965
10.6325	13.386
11.26	11.88
11.9248	10.475
12.629	9.142
13.3748	7.882
14.1648	6.723
15.0017	5.68
15.8882	4.738
16.8272	3.883
17.8218	3.159
18.8218	2.565
19.8218	2.072
20.8218	1.667
21.8218	1.348
22.8218	1.087
23.8218	0.884
24.8218	0.754
25.8218	0.623
26.8218	0.58
27.8218	0.537
28.8218	0.479
29.8218	0.45
30.8218	0.435
31.8218	0.406
32.8218	0.392
33.8218	0.377
34.8218	0.363
35.8218	0.348
36.8218	0.334
37.8218	0.334
38.8218	0.305
39.8218	0.305
40.8218	0.305
41.8218	0.29
42.8218	0.261
43.8218	0.261
44.8218	0.261
45.8218	0.261
46.8218	0.247
47.8218	0.232
48.8218	0.232
49.8218	0.218
50.8218	0.203
51.8218	0.203
52.8218	0.203
53.8218	0.203
54.8218	0.189
55.8218	0.174
56.8218	0.174
57.8218	0.16
58.8218	0.16
59.8218	0.16
60.8218	0.145
61.8218	0.145
62.8218	0.131
63.8218	0.131
64.8218	0.131
65.8218	0.131
66.8218	0.131
67.8218	0.145
68.8218	0.145
69.8218	0.116
70.8218	0.102
71.8218	0.102
72.8218	0.087
73.8218	0.087
74.8218	0.087
75.8218	0.073
76.8218	0.073
77.8218	0.058
78.8218	0.073
79.8218	0.058
80.8218	0.058
81.8218	0.044
82.8218	0.044
83.8218	0.044
84.8218	0.044
85.8218	0.015
86.8218	0.015
87.8218	0.044
88.8218	0
89.8218	0.029
90.8218	0
91.8218	-0.014
92.8218	-0.014
93.8218	-0.014
94.8218	-0.029
95.8218	-0.014
96.8218	-0.014
97.8218	-0.014
98.8218	-0.029
99.8218	-0.014
100.8218	-0.029
101.8218	-0.029
102.8218	-0.029
103.8218	-0.029
104.8218	-0.029
105.8218	-0.043
106.8218	-0.043
107.8218	-0.043
108.8218	-0.043
109.8218	-0.043
110.8218	-0.043
111.8218	-0.058
112.8218	-0.043
113.8218	-0.058
114.8218	-0.058
115.8218	-0.072
116.8218	-0.058
117.8218	-0.072
118.8218	-0.072
119.8218	-0.058
120.8218	-0.072
121.8218	-0.087
122.8218	-0.072
123.8218	-0.072
124.8218	-0.072
125.8218	-0.087
126.8218	-0.087
127.8218	-0.058
128.8218	-0.058
129.8218	-0.072
130.8218	-0.087
131.8218	-0.087
132.8218	-0.087
133.8218	-0.101
134.8218	-0.087
135.8218	-0.101
136.8218	-0.101
137.8218	-0.101
138.8218	-0.101
139.8218	-0.101
140.8218	-0.101
141.8218	-0.101
142.8218	-0.087
143.8218	-0.087
144.8218	-0.115
145.8218	-0.115
146.8218	-0.115
147.8218	-0.13
148.8218	-0.115
149.8218	-0.115
150.8218	-0.13
151.8218	-0.13
152.8218	-0.13
153.8218	-0.13
154.8218	-0.13
155.8218	-0.144
156.8218	-0.13
157.8218	-0.13
158.8218	-0.13
159.8218	-0.13
160.8218	-0.13
161.8218	-0.144
162.8218	-0.144
163.8218	-0.144
164.8218	-0.144
165.8218	-0.144
166.8218	-0.144
167.8218	-0.144
168.8218	-0.144
169.8218	-0.144
170.8218	-0.144
171.8218	-0.144
172.8218	-0.13
173.8218	-0.13
174.8218	-0.13
175.8218	-0.144
176.8218	-0.13
177.8218	-0.144
178.8218	-0.159
179.8218	-0.159
180.8218	-0.144
181.8218	-0.13
182.8218	-0.13
183.8218	-0.13

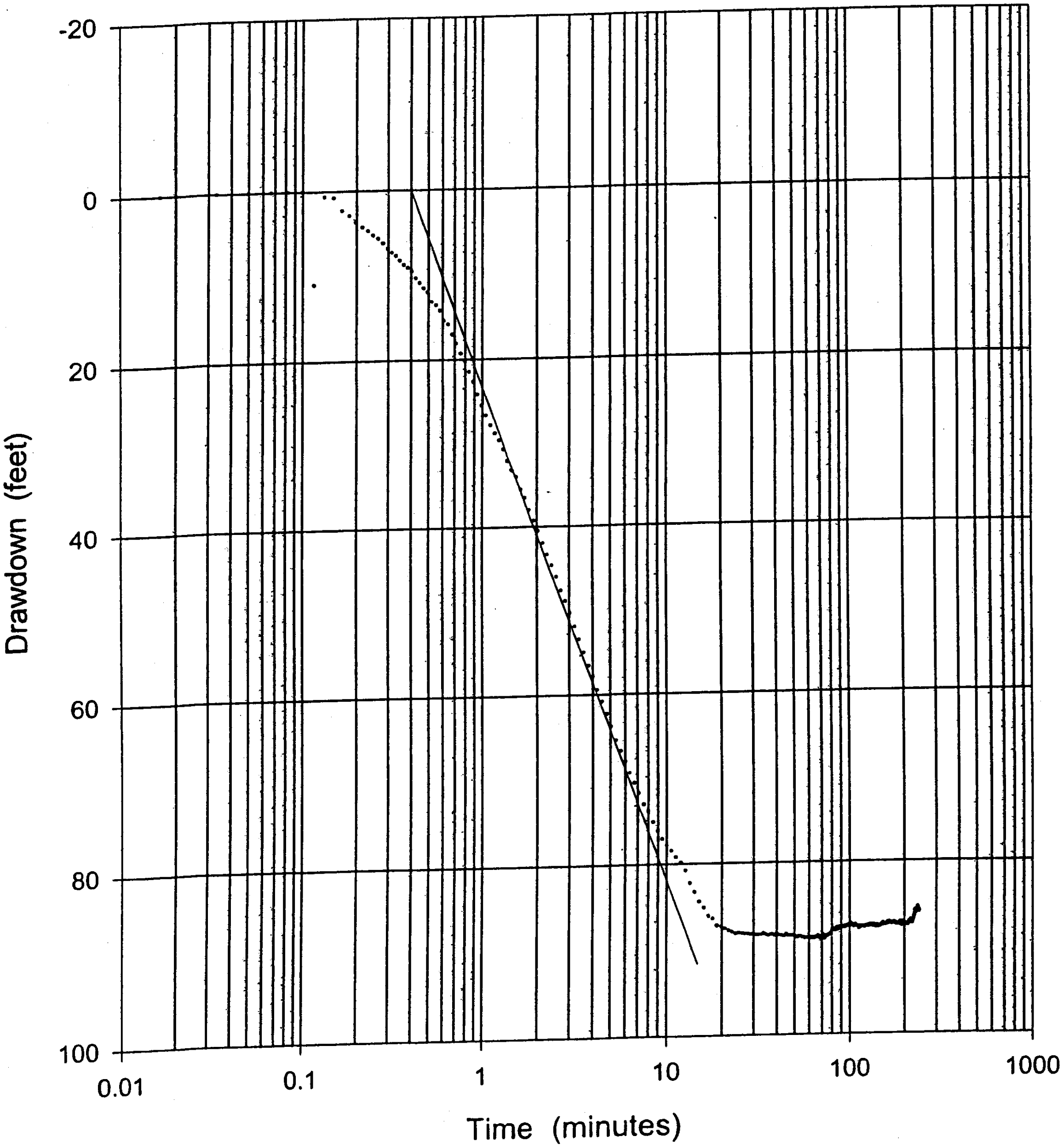
Injection Well No. 2 – Packer Tests

2,410 – 2,428

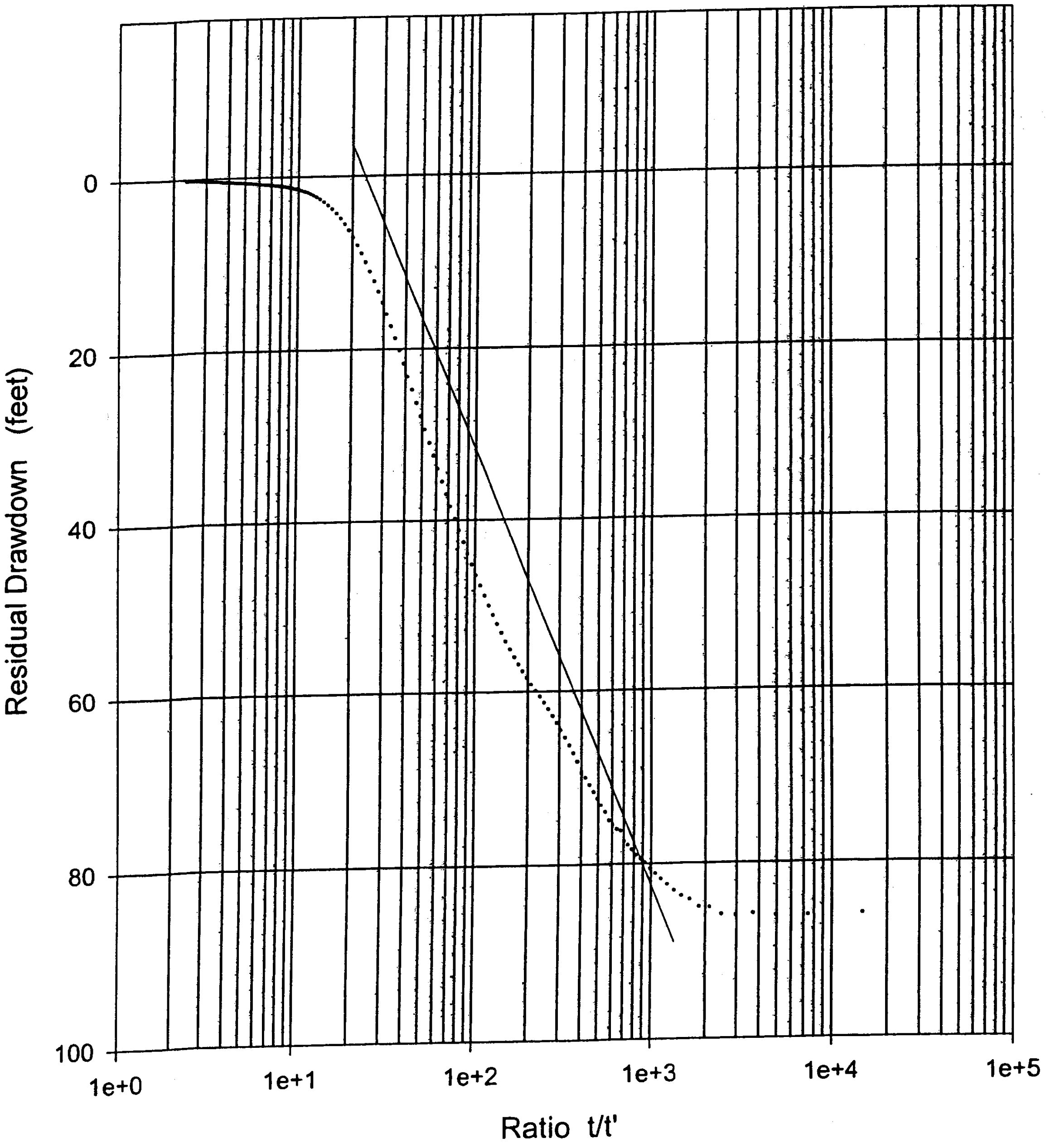
CITY OF HOLLYWOOD
SRWWTP
IW-2
2410 - 2428
BACKGROUND, DRAWDOWN AND RECOVERY DATA



CITY OF HOLLYWOOD
SRWWTP
IW-2
2410 - 2428
DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-2
2410 - 2428
RESIDUAL DRAWDOWN



CITY OF HOLLYWOOD
SRWWTP
IW-1
2410 - 2428
BACKGROUND DATA

Time	Water Level
0	0
0.0165	0
0.033	-0.014
0.0495	-0.014
0.066	-0.014
0.0825	-0.014
0.099	-0.014
0.1155	-0.014
0.132	-0.014
0.1485	-0.014
0.165	-0.014
0.1815	-0.014
0.198	-0.014
0.2145	-0.014
0.231	-0.014
0.2475	-0.014
0.264	-0.014
0.2805	-0.014
0.297	-0.014
0.3135	-0.014
0.33	-0.014
0.3467	-0.014
0.3643	-0.014
0.383	-0.014
0.4028	-0.014
0.4238	-0.014
0.446	-0.014
0.4695	-0.014
0.4943	-0.014
0.5207	-0.014
0.5487	-0.014
0.5783	-0.014
0.6097	-0.014
0.6428	0
0.678	0
0.7153	0
0.7548	0.014
0.7967	0.014
0.841	0
0.888	0.014
0.9378	0
0.9905	0.014
1.0463	0
1.1055	0
1.1682	0
1.2345	0.014
1.3048	0.014
1.3793	0.014
1.4583	0
1.542	0.014
1.6305	0.014
1.7243	0
1.8237	0.014
1.929	0.014
2.0405	0.014
2.1587	0.014
2.2838	0
2.4163	0.014
2.5568	0.014
2.7057	0.014
2.8632	0.014
3.03	0
3.2068	0
3.3942	0
3.5925	0
3.8027	0
4.0253	-0.014
4.2612	-0.014
4.511	-0.014
4.7757	-0.014
5.056	-0.014
5.3528	-0.014
5.6673	-0.014
6.0005	-0.014
6.3533	-0.014
6.7272	-0.014
7.1232	-0.014
7.5425	-0.014
7.9868	-0.014
8.4575	-0.014
8.956	-0.014
9.484	-0.014
10.0433	-0.014
10.6358	-0.029
11.2633	-0.029
11.9282	-0.029
12.6323	-0.029
13.3782	-0.029
14.1682	-0.014
15.005	-0.014
15.8915	-0.014
16.8305	-0.014
17.8252	-0.029
18.8252	-0.029
19.8252	-0.043
20.8252	-0.043
21.8252	-0.043
22.8252	-0.043
23.8252	-0.029
24.8252	-0.014
25.8252	-0.029
26.8252	-0.029
27.8252	-0.029
28.8252	-0.029
29.8252	-0.043
30.8252	-0.043
31.8252	-0.058
32.8252	-0.058
33.8252	-0.058
34.8252	-0.058
35.8252	-0.058
36.8252	-0.058
37.8252	-0.058
38.8252	-0.072
39.8252	-0.072
40.8252	-0.072
41.8252	-0.072
42.8252	-0.072
43.8252	-0.072
44.8252	-0.072
45.8252	-0.072
46.8252	-0.087
47.8252	-0.058
48.8252	-0.043
49.8252	-0.043
50.8252	-0.058
51.8252	-0.072
52.8252	-0.072
53.8252	-0.072
54.8252	-0.072
55.8252	-0.087
56.8252	-0.058
57.8252	-0.058
58.8252	-0.058
59.8252	-0.043
60.8252	-0.072
61.8252	-0.072
62.8252	-0.087
63.8252	-0.087
64.8252	-0.087
65.8252	-0.087
66.8252	-0.072
67.8252	-0.087
68.8252	-0.087
69.8252	-0.087
70.8252	-0.087
71.8252	-0.087
72.8252	-0.087
73.8252	-0.087
74.8252	-0.087
75.8252	-0.087
76.8252	-0.101
77.8252	-0.087
78.8252	-0.101
79.8252	-0.087
80.8252	-0.087
81.8252	-0.087
82.8252	-0.101
83.8252	-0.101
84.8252	-0.101
85.8252	-0.087
86.8252	-0.101
87.8252	-0.101
88.8252	-0.087
89.8252	-0.087
90.8252	-0.101
91.8252	-0.101
92.8252	-0.101
93.8252	-0.101
94.8252	-0.087
95.8252	-0.101
96.8252	-0.072
97.8252	-0.058
98.8252	-0.058
99.8252	-0.072
100.8252	-0.087
101.8252	-0.058
102.8252	-0.072
103.8252	-0.058
104.8252	-0.058
105.8252	-0.087
106.8252	-0.087
107.8252	-0.087
108.8252	-0.087
109.8252	-0.087
110.8252	-0.087
111.8252	-0.101
112.8252	-0.087
113.8252	-0.101
114.8252	-0.072
115.8252	-0.116
116.8252	-0.087
117.8252	-0.087
118.8252	-0.087
119.8252	-0.072
120.8252	-0.072

CITY OF HOLLYWOOD
SRWWTP
IW-2
2410 - 2428
DRAWDOWN DATA

Time	Water Level
0	0
0.0165	0
0.033	0
0.0495	-0.014
0.066	-0.014
0.0825	-0.014
0.099	-0.014
0.1155	10.938
0.132	0.623
0.1485	0.753
0.165	2.289
0.1815	2.898
0.198	3.695
0.2145	4.26
0.231	4.68
0.2475	5.216
0.264	5.621
0.2805	6.186
0.297	6.853
0.3135	7.287
0.33	7.678
0.3467	8.243
0.3643	8.736
0.383	9.098
0.4028	9.518
0.4238	10.315
0.446	10.894
0.4695	11.531
0.4943	11.981
0.5207	13.125
0.5487	13.53
0.5783	14.182
0.6097	15.384
0.6428	15.819
0.678	17.021
0.7153	18.078
0.7548	19.294
0.7967	20.25
0.841	21.466
0.888	22.639
0.9378	24.116
0.9905	25.434
1.0463	26.635
1.1055	27.808
1.1682	28.792
1.2345	29.617
1.3048	30.718
1.3793	32.122
1.4583	33.222
1.542	34.032
1.6305	35.509
1.7243	36.536
1.8237	37.984
1.929	39.286
2.0405	40.502
2.1587	41.949
2.2838	43.338
2.4163	44.641
2.5568	46.015
2.7057	47.636
2.8632	48.88
3.03	50.298
3.2068	51.904
3.3942	53.423
3.5925	54.985
3.8027	56.562
4.0253	57.849
4.2612	59.411
4.511	60.814
4.7757	62.275
5.056	63.779
5.3528	65.384
5.6673	66.657
6.0005	67.915
6.3533	69.259
6.7272	70.459
7.1232	71.631
7.5425	72.99
7.9868	73.828
8.4575	75.071
8.956	76.112
9.484	77.066
10.0433	77.833
10.6358	78.469
11.2633	79.206
11.9282	79.827
12.6323	80.796
13.3782	82.27
14.1682	83.34
15.005	84.481
15.8915	85.204
16.8305	86.143
17.8252	86.461
18.8252	87.271
19.8252	87.415
20.8252	87.617
21.8252	87.863
22.8252	88.022
23.8252	88.253
24.8252	88.167
25.8252	88.21
26.8252	88.282
27.8252	88.268
28.8252	88.354
29.8252	88.326
30.8252	88.427
31.8252	88.412
32.8252	88.427
33.8252	88.253
34.8252	88.398
35.8252	88.513
36.8252	88.441
37.8252	88.369
38.8252	88.571
39.8252	88.34
40.8252	88.47
41.8252	88.499
42.8252	88.557
43.8252	88.615
44.8252	88.354
45.8252	88.557
46.8252	88.571
47.8252	88.557
48.8252	88.542
49.8252	88.643
50.8252	88.716
51.8252	88.802
52.8252	88.615
53.8252	88.615
54.8252	88.817
55.8252	88.774
56.8252	88.904
57.8252	88.831
58.8252	88.86
59.8252	88.802
60.8252	88.918
61.8252	88.774
62.8252	88.961
63.8252	89.005
64.8252	88.802
65.8252	88.831
66.8252	88.629
67.8252	88.846
68.8252	89.005
69.8252	88.759
70.8252	88.513
71.8252	88.716
72.8252	89.048
73.8252	88.643
74.8252	88.716
75.8252	88.586
76.8252	88.586
77.8252	88.412
78.8252	88.398
79.8252	88.109
80.8252	87.849
81.8252	87.993
82.8252	88.022
83.8252	88.051
84.8252	87.733
85.8252	87.921
86.8252	87.979
87.8252	87.661
88.8252	87.849
89.8252	87.603
90.8252	87.704
91.8252	87.675
92.8252	87.632
93.8252	87.82
94.8252	87.56
95.8252	87.574
96.8252	87.632
97.8252	87.516
98.8252	87.43
99.8252	87.589
100.8252	87.487
101.8252	87.242
102.8252	87.43
103.8252	87.43
104.8252	87.661
105.8252	87.69
106.8252	87.487
107.8252	87.357
108.8252	87.531
109.8252	87.531
110.8252	87.646
111.8252	87.589
112.8252	87.906
113.8252	87.617
114.8252	87.82
115.8252	87.69
116.8252	87.603
117.8252	87.632
118.8252	87.646
119.8252	87.704
120.8252	87.617
121.8252	87.762
122.8252	87.589
123.8252	87.531
124.8252	87.589
125.8252	87.603
126.8252	87.545
127.8252	87.675
128.8252	87.415
129.8252	87.589
130.8252	87.473
131.8252	87.415
132.8252	87.415
133.8252	87.617
134.8252	87.545
135.8252	87.415
136.8252	87.444
137.8252	87.646
138.8252	87.545
139.8252	87.748
140.8252	87.531
141.8252	87.487
142.8252	87.487
143.8252	87.603
144.8252	87.748
145.8252	87.69
146.8252	87.589
147.8252	87.531
148.8252	87.646
149.8252	87.386
150.8252	87.531
151.8252	87.487
152.8252	87.227
153.8252	87.487
154.8252	87.357
155.8252	87.401
156.8252	87.516
157.8252	87.502
158.8252	87.458
159.8252	87.43
160.8252	87.3
161.8252	87.155
162.8252	87.256
163.8252	87.343
164.8252	87.097
165.8252	87.271
166.8252	87.184
167.8252	87.213
168.8252	87.227
169.8252	87.343
170.8252	87.372
171.8252	87.343
172.8252	87.271
173.8252	87.285
174.8252	87.155
175.8252	87.227
176.8252	87.227
177.8252	87.213
178.8252	87.328
179.8252	87.43
180.8252	87.386
181.8252	87.473
182.8252	87.444
183.8252	87.458
184.8252	87.386
185.8252	87.415
186.8252	87.357
187.8252	87.256
188.8252	87.343
189.8252	87.169
190.8252	87.516
191.8252	87.415
192.8252	87.589
193.8252	87.3
194.8252	87.227
195.8252	87.372
196.8252	87.3
197.8252	87.415
198.8252	87.473
199.8252	87.458
200.8252	87.531
201.8252	87.386
202.8252	87.444
203.8252	87.487
204.8252	87.473
205.8252	87.444
206.8252	87.386
207.8252	87.43
208.8252	87.545
209.8252	87.458
210.8252	87.227
211.8252	87.126
212.8252	87.271
213.8252	87.097
214.8252	87.083
215.8252	86.938
216.8252	87.083
217.8252	87.198
218.8252	87.328
219.8252	87.357
220.8252	87.328
221.8252	86.967
222.8252	87.097
223.8252	86.953
224.8252	86.808
225.8252	86.562
226.8252	86.476
227.8252	86.245
228.8252	85.854
229.8252	85.768
230.8252	85.869
231.8252	85.956
232.8252	86.028
233.8252	85.883
234.8252	85.825
235.8252	85.695
236.8252	85.406
237.8252	85.666
238.8252	85.84
239.8252	85.927
240.8252	86.028
241.8252	85.84

CITY OF HOLLYWOOD
SRWWTP
IW-2
2410 - 2428
RECOVERY DATA

Time	Water Level
0	85.84
0.0163	85.927
0.0327	86.086
0.049	86.086
0.0653	85.854
0.0817	86.057
0.098	85.912
0.1143	85.088
0.1307	85.031
0.147	84.164
0.1633	83.715
0.1797	83.094
0.196	82.4
0.2123	81.779
0.2287	81.128
0.245	80.593
0.2613	79.842
0.2777	79.437
0.294	79.018
0.3103	78.367
0.3267	77.833
0.3433	77.413
0.361	76.199
0.3797	76.011
0.3995	75.491
0.4205	74.985
0.4427	74.016
0.4662	73.235
0.491	72.484
0.5173	71.688
0.5453	70.879
0.575	70.026
0.6063	69.491
0.6395	68.132
0.6747	67.163
0.712	66.252
0.7515	65.341
0.7933	64.487
0.8377	63.649
0.8847	62.824
0.9345	62.029
0.9872	61.277
1.043	60.554
1.1022	59.888
1.1648	59.18
1.2312	58.428
1.3015	57.632
1.376	56.837
1.455	55.983
1.5387	55.115
1.6272	54.175
1.721	53.177
1.8203	52.15
1.9257	51.094
2.0372	49.994
2.1553	48.851
2.2805	47.679
2.413	46.464
2.5535	45.219
2.7023	43.917
2.8598	42.586
3.0267	41.226
3.2035	39.836
3.3908	38.418
3.5892	36.985
3.7993	35.494
4.022	33.989
4.2578	32.469
4.5077	30.949
4.7723	29.4
5.0527	27.866
5.3495	26.317
5.664	24.767
5.9972	23.262
6.35	21.727

Time	Water Level
6.7238	20.221
7.1198	18.773
7.5392	17.354
7.9835	15.992
8.4542	14.66
8.9527	13.4
9.4807	12.169
10.04	11.053
10.6325	9.953
11.26	8.939
11.9248	7.983
12.629	7.084
13.3748	6.259
14.1648	5.534
15.0017	4.868
15.8882	4.274
16.8272	3.767
17.8218	3.318
18.8218	2.941
19.8218	2.622
20.8218	2.362
21.8218	2.159
22.8218	1.97
23.8218	1.825
24.8218	1.71
25.8218	1.594
26.8218	1.492
27.8218	1.434
28.8218	1.376
29.8218	1.304
30.8218	1.246
31.8218	1.173
32.8218	1.13
33.8218	1.087
34.8218	1.058
35.8218	1.043
36.8218	1
37.8218	0.985
38.8218	0.956
39.8218	0.927
40.8218	0.927
41.8218	0.884
42.8218	0.884
43.8218	0.869
44.8218	0.855
45.8218	0.84
46.8218	0.811
47.8218	0.811
48.8218	0.797
49.8218	0.768
50.8218	0.753
51.8218	0.724
52.8218	0.724
53.8218	0.724
54.8218	0.71
55.8218	0.695
56.8218	0.695
57.8218	0.681
58.8218	0.666
59.8218	0.666
60.8218	0.652
61.8218	0.637
62.8218	0.637
63.8218	0.623
64.8218	0.623
65.8218	0.608
66.8218	0.608
67.8218	0.594
68.8218	0.579
69.8218	0.579
70.8218	0.579
71.8218	0.565
72.8218	0.565
73.8218	0.565
74.8218	0.55

Time	Water Level
75.8218	0.536
76.8218	0.536
77.8218	0.536
78.8218	0.521
79.8218	0.521
80.8218	0.521
81.8218	0.507
82.8218	0.492
83.8218	0.492
84.8218	0.492
85.8218	0.478
86.8218	0.478
87.8218	0.478
88.8218	0.464
89.8218	0.464
90.8218	0.464
91.8218	0.449
92.8218	0.449
93.8218	0.435
94.8218	0.435
95.8218	0.435
96.8218	0.42
97.8218	0.42
98.8218	0.42
99.8218	0.42
100.8218	0.406
101.8218	0.406
102.8218	0.406
103.8218	0.42
104.8218	0.42
105.8218	0.42
106.8218	0.406
107.8218	0.391
108.8218	0.391
109.8218	0.377
110.8218	0.377
111.8218	0.377
112.8218	0.362
113.8218	0.362
114.8218	0.362
115.8218	0.333
116.8218	0.333
117.8218	0.333
118.8218	0.333
119.8218	0.333
120.8218	0.319
121.8218	0.319
122.8218	0.362
123.8218	0.333
124.8218	0.319
125.8218	0.304
126.8218	0.304
127.8218	0.304
128.8218	0.304
129.8218	0.304
130.8218	0.304
131.8218	0.304
132.8218	0.29
133.8218	0.29
134.8218	0.29
135.8218	0.275
136.8218	0.275
137.8218	0.275
138.8218	0.29
139.8218	0.261
140.8218	0.275
141.8218	0.261
142.8218	0.246
143.8218	0.246
144.8218	0.246
145.8218	0.246
146.8218	0.246
147.8218	0.246
148.8218	0.246
149.8218	0.246

Time	Water Level
150.8218	0.232
151.8218	0.232
152.8218	0.232
153.8218	0.246
154.8218	0.232
155.8218	0.232
156.8218	0.232
157.8218	0.232
158.8218	0.232
159.8218	0.232
160.8218	0.232
161.8218	0.217
162.8218	0.203
163.8218	0.203
164.8218	0.203
165.8218	0.217
166.8218	0.203
167.8218	0.188
168.8218	0.188
169.8218	0.188
170.8218	0.203
171.8218	0.203
172.8218	0.203
173.8218	0.217
174.8218	0.188
175.8218	0.174
176.8218	0.174
177.8218	0.174
178.8218	0.174
179.8218	0.159
180.8218	0.188
181.8218	0.188

Packer Tests

Packer Testing Quality Control Procedures

Packer Testing and Quality Control Procedures

General

Check Pipe tally to make sure that packer or packers are set at correct depth.

Note date and time on all recorded data.

Observe the pressuring up of the packer or packers, noting pressure applied to packers.

Monitor and record pressure on packers periodically during all phases of test.

Identify elevation benchmark.

Development

Note time of start of development.

Note method of development (air lift, pumping, etc.)

Check and record conductivity of development fluid initially and thereafter (maximum every 15 minutes).

Visually observe and record turbidity of development fluid (maximum every 15 minutes).

Visually observe and estimate fluid development rate (maximum every 15 minutes).

Continue development until conductivity has stabilized for 45 to 60 minutes.

Background

Observe and record the installation depths of the transducers (inside drill pipe and annulus).

Check and record transducer readings (maximum every 15 minutes).

Official background does not start until stabilization from development has occurred.

Continue recording background for 2 hours.

Pumping Test

Prior to starting pumping measure and record water level in drill pipe and annulus (referenced to a known benchmark).

Observe and record water levels in drill pipe and annulus (maximum every 10 minutes).

Observe and record the pumping rate (maximum every 10 minutes).

Pumping shall continue for a minimum of 4 hours.

Just prior to ending pumping observe water sample collection in accordance with water sampling checklist.

After stopping pump observe and record total volume of water pumped.

Recovery

Observe and record water levels in drill pipe and annulus (maximum every 10 minutes).

Recovery shall continue for a minimum of 3 hours.

Appendix I

Packer Test Water Quality Laboratory Results

Injection Well No. 1 (IW-1) – Packer Testing

Packer Test Water Quality

Injection Well No. 1 (IW-1) – Packer Tests

1,354 – 1,370

FILE
4304

Fax message

SEVERN
TRENT
SERVICES

Date: 7/23/02

To: John Largey

Company: Hazen + Sawyer

Fax:

E-Mail: jlargey@hazenand sawyer.com

From: Ruth McKinley – Office Manager

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 **ext: 106**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.rmckinley@stl-inc.com

Subject: 217-745 Packer 2

Pages: 4

1354 - 1370

John

I don't know if this was emailed to you. It was faxed friday at about 3:30.

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```
*** TRANSMISSION REPORT ***

PRINT TIME 07/19 '02 15:24 ID:                         FAX:
                                                                 U*****2AP 181  I
    TIMER=--:--

FILE START       MODE          LOCATION                  STORE  TX/RX  TOTAL  CODE
No.  TIME                                                PAGE   PAGE   TIME
030  07/19 15:22 TX            9549207117                  3     3/ 0  02'27" OK

    ERROR PAGE=
```

Fax message **RUSH**

SEVERN
TRENT
SERVICES

Date: 09-19-02
To: John Largey
Company: YBT
Fax: 954 9207117
E-Mail:

From: Zuzan Franco - Customer Service
Subject: Sub # 217-76
@ PS 1107
Pages: 3 w/cover

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 ext: 111
Customer Service: ext: 340
Fax: 954-431-1959

www.stl-inc.com
www.zfranco@stl-inc.com

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SEVERN
TRENT
SERVICES
STL Miami

Page 1
July 23, 2002
Submission # 207000745
Order # 60003
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Site Location/Project
Hollywood WWTP IW-1
Hollywood IW-1 Pkr.2 1354-1370

Sample I.D.: IW-1 Pkr.2 1354-1370
Collected: 07/17/02 00:00
Received: 07/17/02 16:00
Collected by: Chris Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	11040	umhos	120.1	1.0	07/18/2002	07/18/2002	EH
Residue, Total Filterable (TDS)	6992	mg/L	SM2540C (160.1)	1.0	07/18/2002	07/19/2002	NM/EH
Chloride	3650	mg/L	300.0	1.0	07/18/2002	07/19/2002	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.05	07/18/2002	07/18/2002	RDB/MF
itrite (as N)	BDL	mg/L	300.0	0.05	07/18/2002	07/19/2002	SMF/RD
Sulfate	510	mg/L	300.0	1.0	07/18/2002	07/19/2002	MF
Nitrogen (Ammonia) as N	.569	mg/L	350.1	0.04	07/19/2002	07/19/2002	DTD/SM
Nitrogen (Kjeldahl) as "N"	1.14	mg/L	351.2	0.1	07/19/2002	07/19/2002	SM/DD
Nitrogen (Total Organic)	.571	mg/L	351.2	0.1	07/19/2002	07/19/2002	SM/DD
Nitrogen, Total as "N"	1.14	mg/L	353+351 CALC.	0.1	07/18/2002	07/19/2002	SMF/SM

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535
These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL representitive who signed this report or the QC department.

Wayne Khan
Project Manager

02/7-746

Submission Code

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

FDEP Facility No.
Page: ZF of
Sampling CompQAP No.)
Approval Date:

Original – Return w/Report Yellow – Lab Copy Pink – Sampler Copy

Report To: John Largey		**Report To Address:** jlargey@hazenandsawyer.com	
Bill To: YBI ~~Holt~~		**Billing Address:**	
Project Number/Name: Hollywood IW-1 Packer 2 1354-1370			**Site Location:** Hollywood WWTP IW-1
Project Contact: John Largey	**Phone:** (954) 920 9272	**FAX:** (954) 920 7117	
Alternate Contact: Cameron Webster	**Phone:** (941) 560 4510	**FAX:**	
Sampled By (print): Chris Harp.		**Sampler's Signature:**	

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp. °C
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH FLD	TEMP °C FLD	COND FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW-1 Packer2						GW		10	✓	✓	✓	✓	✓	✓	
2	1354-1370															
3																
4								Rush								
5								#								
6								PJ167								
7																
8																
9		PO 2T8U30														
10																

Special Comments: RUSH.

Total # of Containers: 10

QA/QC Report Needed? Yes [✓ No] (See price guide for applicable fees)

Report Format: Standard Other (specify)

(1) Relinquished by Signature: Chris Harp	**Date:** 7-17-02	**(2) Relinquished by Signature:** Mariano Varas	**Date:** 7-17-02	**DUE DATE REQUESTED** **Confirmation #**
Company: Y.B.I	**Time:** 1448	**Company:** STL	**Time:**	**Coating Code:** G / L / D
(1) Received by Signature: Mariano Varas	**Date:** 7-17-02	**(2) Received by Signature:**	**Date:** 7/17/02	**Misc. Charges**
Company: STL	**Time:** 1448	**Company:** STL	**Time:** 1800	**SHADED AREAS ARE FOR LAB USE ONLY**

STL-8242 (0800)

Injection Well No. 1 (IW-1) – Packer Tests

1,404 – 1,420

FILE
4304

Fax message

SEVERN TRENT SERVICES

Date: 07-22-02
To: John Largey
Company: Hazen + Sawyer
Fax: 954-987-2949
E-Mail: jlargey@hazenandsawyer.com

From: **Zuzan Franco - Customer Service**
Subject: Sub # 217-1092

Pages: 3 w/cover

Report is also being Faxed

STL Miami
10200 USA Today Way
Miramar, FL 33025
Tel: 954-431-4550 **ext: 111**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.zfranc @stl- c

E-MAILED
07-22-02

1404 - 1420

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SEVERN
TRENT
SERVICES
STL Miami

Page 1
July 22, 2002
Submission # 207000692
Order # 59727
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Site Location/Project
Hollywood WWTP IW1
Hollywd IW1 Packer#1 1404-1420

Sample I.D.: IW1 Packer #1 1404-1420
Collected: 07/16/02 09:00
Received: 07/16/02 17:00
Collected by: Chris Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	18600	umhos	120.1	1.0	07/17/2002	07/17/2002	DMO
Residue, Total Filterable (TDS)	13640	mg/L	SM2540C (160.1)	1.0	07/17/2002	07/18/2002	EH
Chloride	7170	mg/L	300.0	1.0	07/19/2002	07/19/2002	SMF
Nitrate (as N)	3.74	mg/L	300.0	0.05	07/17/2002	07/17/2002	SMF/RD
Nitrite (as N)	BDL	mg/L	300.0	0.05	07/17/2002	07/19/2002	MF
Sulfate	560	mg/L	300.0	1.0	07/17/2002	07/19/2002	MF
Nitrogen (Ammonia) as N	.576	mg/L	350.1	0.04	07/17/2002	07/17/2002	SM/DD
Nitrogen (Kjeldahl) as "N"	2.23	mg/L	351.2	0.1	07/17/2002	07/18/2002	SM/DD
Nitrogen (Total Organic)	1.65	mg/L	351.2	0.1	07/18/2002	07/18/2002	SM
Nitrogen, Total as "N"	5.97	mg/L	353+351 CALC.	0.1	07/17/2002	07/19/2002	SM/MF/

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535
These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL representitive who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 02/7-692
Orders: 59927
Entered to lims: ✓

SEVERN TRENT LABORATORIES, INC.
CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No.
Page: of
Sampling CompQAP No.)
Approval Date:
ZF

Report To: John Largey
Report To Address: jlargey@hazenandsawyer.com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood IW 1 Packer #1 1404' - 1420'
Site Location: Hollywood WWTP IW1
Project Contact: John Largey
Phone:
FAX:
Alternate Contact: Cameron Webster
Phone:
FAX:
Sampled By (print): Chris Harp.
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp: 1
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	1W1 Packer #1								10	✓	✓	✓	✓	✓	✓	
2	1404'-1420'	7-16-02	9 am				GW									
3																
4																
5																
6																
7																
8																
9	POU218U30															
10																

PJ 167

Special Comments: Please Rush
Due 07-18-02
Total # of Containers:

QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature:	Date: 7-16-02	(2) Relinquished by Signature:	Date: 7-16-02	DUE DATE REQUESTED Confirmation #	
Company: YBI	Time: 3 30	Company: STL	Time:	Coating Code:	Q / L / D
(1) Received by Signature:	Date: 7-16-02	(2) Received by Signature:	Date: 7/16/02	Misc. Charges	
Company: STL	Time: 1530	Company: STL	Time: 1700	SHADED AREAS ARE FOR LAB USE ONLY	

Injection Well No. 1 (IW-1) – Packer Tests

1,769 – 1,785

RUSH

Fax message

SEVERN
TRENT
SERVICES

Date: 7/31/02

To: John Largey

Company: Youngquist

Fax: 1-941-489-4545

E-Mail: 1-954-920-2724

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 **ext: 105**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.kkwilliams@stl-inc.com

From: **Kathy Williams - Customer Service**

Subject: Sub# 217-1265
Rush #PJ167

Pages: 3 w/cover

E-MAILED
7/31/02 KW

jlargey@hazenandsawyer.com

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SEVERN
TRENT
SERVICES
STL Miami

Page 1
July 31, 2002
Submission # 207001265
Order # 63358
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Site Location/Project
Hollywood WWTP IW1,1621 N-14 Ave,Hollywood,33020
Hollywood IW1 Packer#5

Sample I.D.: IW1 Packer#5 1769-1785
Collected: 07/24/02 19:00
Received: 07/26/02 17:00
Collected by: C. Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	436000	umhos	120.1	1.0	07/27/2002	07/27/2002	NMO
Residue, Total Filterable (TDS)	35708	mg/L	SM2540C (160.1)	1.0	07/29/2002	07/30/2002	RZ
Chloride	20830	mg/L	300.0	1.0	07/30/2002	07/30/2002	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.05	07/27/2002	07/27/2002	SM
Nitrite (as N)	BDL	mg/L	300.0	0.05	07/27/2002	07/27/2002	SM
Sulfate	2630	mg/L	300.0	1.0	07/27/2002	07/27/2002	SM
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	07/30/2002	07/30/2002	DTD/SM
Nitrogen (Kjeldahl) as "N"	.391	mg/L	351.2	0.1	07/30/2002	07/31/2002	DTD/SM
Nitrogen (Total Organic)	.391	mg/L	351.2	0.1	07/30/2002	07/31/2002	DTD/SM
Nitrogen, Total as "N"	.391	mg/L	353+351 CALC.	0.1	07/30/2002	07/31/2002	DTD/SM

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.

Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535

**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 07-1205
Orders: 63358
Entered to lims: AH

SEVERN TRENT LABORATORIES, INC.
CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No.
Page: ____ of ____
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Report To Address: J Largey @ Hazen + Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood IW 1 Packer #5 1769-1785
Site Location: Hollywood WWTP IW 1
1621 N-14 Ave Hollywood
33020
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** 941-560-4510 **FAX:**
Sampled By (print): Chris Harp
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 2
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW 1 Packer #5							63358	10	✓	✓	✓	✓	✓	✓	
2	1769'-1785'	7-24-02	7pm				GW									
3								Rush #								
4																
5								PJ 167								
6																
7								2 Day Turnaround								
8																
9																
10																

Special Comments:
Total # of Containers:
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web	Date: 7-26-02	(2) Relinquished by Signature: A. Williams	Date: 7.26.02
Company: YBI	Time:	Company: STL	Time: 16:25
(1) Received by Signature: A. Williams	Date: 7.26.02	(2) Received by Signature: Chris Harp	Date: 7/26/02
Company: STL	Time: ~~14~~ 16:00	Company: STL	Time: 17:00

DUE DATE REQUESTED
Confirmation #
Costing Code: ______ Q / L / D
Misc. Charges:
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 1 (IW-1) – Packer Tests

1,894 – 1,910

FILE
4304

RUSH

Fax message

Date: 07-22-02

To: Jim Largey

Company: YBI

Fax: 954 920 7117

E-Mail: Jlargey@hazenandsawyer.com

From: **Zuzan Franco - Customer Service**

Subject: Sub# 27-901
PJ 167

Pages: 3 w/cover

SEVERN
TRENT
SERVICES

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 **ext: 111**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.zfranco@stl-inc.com

1894-1910

NOTICE: THE MESSAGE CONTAINED IN THIS FAX IS INTENDED ONLY FOR THE PERSONAL AND CONFIDENTIAL USE OF THE RECIPIENT (S) NAMED ABOVE. This message may be a client communication and as such is Privileged and Confidential. If the reader of this message is not the intended recipient or an agent responsible for delivering it to the intended recipient, you are hereby notified that you have received this document in error and that any review, dissemination, distribution or copying of this message is STRICTLY PROHIBITED. If you have received this communication in error, please notify us immediately by telephone and return the original message to us by mail. THANK YOU.

SEVERN
TRENT
SERVICES

STL Miami

Page 1
July 22, 2002
Submission # 207000901
Order # 60975
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Site Location/Project
Hollywood WWTP IW1
Hollywood IW1

Sample I.D.: IW1 Packer #3 1896-1910
Collected: 07/19/02 09:45
Received: 07/19/02 12:20
Collected by: C.Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	48500	umhos	120.1	1.0	07/19/2002	07/19/2002	DMO
Residue, Total Filterable (TDS)	35100	mg/L	SM2540C (160.1)	1.0	07/19/2002	07/22/2002	RZ/EH
Chloride	23783	mg/L	300.0	1.0	07/22/2002	07/22/2002	RDB
Nitrate (as N)	6.34	mg/L	300.0	0.05	07/20/2002	07/22/2002	SM/RDB
Nitrite (as N)	BDL	mg/L	300.0	0.05	07/20/2002	07/22/2002	SM/RDB
Sulfate	2589	mg/L	300.0	1.0	07/20/2002	07/22/2002	SM/RDB
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	07/22/2002	07/22/2002	SM/DD
Nitrogen (Kjeldahl) as "N"	BDL	mg/L	351.2	0.1	07/22/2002	07/22/2002	SM/DD
Nitrogen (Total Organic)	BDL	mg/L	351.2	0.1	07/22/2002	07/22/2002	SM/DD
Nitrogen, Total as "N"	6.34	mg/L	353+351 CALC.	0.1	07/20/2002	07/22/2002	SM/RDB

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.

Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535

These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL representitive who signed this report or the QC department.

Wayne Khan
Project Manager

Submission Code: 02/07-901
Orders: G9752
Entered to lims: RA

SEVERN TRENT LABORATORIES, INC.
CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

FDEP Facility No. ________
Page: ______ of ______
Sampling CompQAP No.) ________
Approval Date: ________

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

Report To: John Largey
Report To Address: J Largay @ Hazen @ Sawyer • Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood IW 1 Packer #3 1894'-1910'
Site Location: Hollywood WWTP IW 1
Project Contact: John Largey
Phone: 954-920-2972
FAX: 954-920-7117
Alternate Contact: Cameron Webster
Phone: 941-560-4510
FAX:
Sampled By (print): Chris Harp
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp ____ C
Sealed Yes No

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW 1								10	✓	✓	✓	✓	✓	✓	
2	Packer #3															
3	1896-1910	7-19-02	9^{45} am				GW	Rush #								
4																
5																
6								PJ 167								
7																
8								2 Day Turnaround								
9																
10																

Special Comments:
Total # of Containers:
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web	Date: 7-19-02	(2) Relinquished by Signature:	Date: 7-19-02	DUE DATE REQUESTED Confirmation #
Company: YBI	Time:	Company: STC	Time:	Coating Code ________ Q / L / D
(1) Received by Signature:	Date: 7-19-02	(2) Received by Signature:	Date: 7-19-02	Misc. Charges
Company: STC	Time: 1028	Company: STL	Time: 12:25	SHADED AREAS ARE FOR LAB USE ONLY

STL-8242 (0800)

Injection Well No. 1 (IW-1) – Packer Tests

1,959 – 1,975

FILE
4304

RUSH

Fax message

Date: 07-26-02

To: John Largey

Company: YBT

Fax: 954-620-7117

E-Mail: jlargeyarczen@sawyer.com

From: **Zuzan Franco - Customer Service**

Subject: SWO # 217-1094
PJ 167

Pages: 3 w/cover

SEVERN
TRENT
SERVICES

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 **ext: 111**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.zfranco@stl-inc.com

E-MAILED
07-26-02

1959 - 1975

NOTICE: THE MESSAGE CONTAINED IN THIS FAX IS INTENDED ONLY FOR THE PERSONAL AND CONFIDENTIAL USE OF THE RECIPIENT (S) NAMED ABOVE. This message may be a client communication and as such is Privileged and Confidential. If the reader of this message is not the intended recipient or an agent responsible for delivering it to the intended recipient, you are hereby notified that you have received this document in error and that any review, dissemination, distribution or copying of this message is STRICTLY PROHIBITED. If you have received this communication in error, please notify us immediately by telephone and return the original message to us by mail. THANK YOU.

SEVERN
TRENT
SERVICES

STL Miami

Page 1
July 26, 2002
Submission # 207001094
Order # 62344
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Site Location/Project
Hollywood WWTP,1621 N-14 Ave,Hollywood,FL 33020
Hollywood IW1 Pkr #4 1959-1975

Sample I.D.: IW1 Pkr #4 1959-1975
Collected: 07/23/02 16:00
Received: 07/24/02 15:00
Collected by: Chris Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	49200	umhos	120.1	1.0	07/26/2002	07/26/2002	SM
Residue, Total Filterable (TDS)	38980	mg/L	SM2540C (160.1)	1.0	07/25/2002	07/26/2002	NM/EH
Chloride	21670	mg/L	300.0	1.0	07/25/2002	07/25/2002	SMF
Nitrate (as N)	14.0	mg/L	300.0	0.05	07/25/2002	07/25/2002	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.05	07/25/2002	07/25/2002	SMF
Sulfate	2948	mg/L	300.0	1.0	07/25/2002	07/25/2002	SMF
Nitrogen (Ammonia) as N	.042	mg/L	350.1	0.04	07/25/2002	07/25/2002	DTD
Nitrogen (Kjeldahl) as "N"	.349	mg/L	351.2	0.1	07/26/2002	07/26/2002	DTD
Nitrogen (Total Organic)	.307	mg/L	351.2	0.1	07/25/2002	07/26/2002	DTD
Nitrogen, Total as "N"	14.3	mg/L	353+351 CALC.	0.1	07/25/2002	07/26/2002	DTD

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535
These test results meet all the requirements of NELAC. All questions regarding this test report should be directed to the STL representitive who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 02-7-1094
Orders: 62344
Entered in lims:

SEVERN TRENT LABORATORIES, INC.
CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No. ____
Page: ____ of ____
Sampling CompQAP No.) ____
Approval Date: ____

Report To: John Largey
Report To Address: J Largey @ Hazen @ Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood IW 1 Packer #4 1959'-1975'
Site Location: Hollywood WWTP IW 1
1621 N-14 Ave Hollywood
33020
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** 941-560-4510 **FAX:**
Sampled By (print): Chris Harp
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp ____ °C
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW 1 Packer #4								10	✓	✓	✓	✓	✓	✓	
2	1959'-1975'	7-23-02	4 pm				GW									
3								Rush #								
4																
5								PJ 167								
6																
7								2 Day Turnaround								
8																
9																
10																

Special Comments:
Total # of Containers:
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Webs	Date: 7-24-02	(2) Relinquished by Signature: Mariano Garay	Date: 7-24-02
Company: YBI	Time: 11 am	Company: STL	Time: 12 20
(1) Received by Signature: Mariano Garay	Date: 7-24-02	(2) Received by Signature:	Date: 7/24/02
Company: STL	Time: 1100	Company:	Time: 1500

DUE DATE REQUESTED
Confirmation #
Copying Code: ____ O / L / D
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

STL-8242 (0800)

Injection Well No. 1 (IW-1) – Packer Tests

2,046 – 2,062

RUSH

Fax message

Date: 08-30-02

To: John Largey

Company: Hazen + Sawyer

Fax: 954-920-7170

E-Mail:

From: Zuzan Franco - Customer Service

Subject: Sub # 218-1412
PJ 167

Pages: 3 w/cover

SEVERN TRENT SERVICES

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 **ext: 111**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.zfranco@stl-inc.com

E-MAILED
08-30-02

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SEVERN
TRENT
SERVICES
STL Miami

Page 1
August 30, 2002
Submission # 208001412
Order # 73870
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Site Location/Project
Hollywood WWTP IW1,1621 N-14 Ave,Hollywood 33020
Hollywood IW 1 Packer #6

Sample I.D.: IW 1 Packer #6 2046-2062
Collected: 08/28/02 14:00
Received: 08/28/02 14:25
Collected by: D.Williams

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	53100	umhos	120.1	1.0	08/29/2002	08/29/2002	RDB
Residue, Total Filterable (TDS)	36700	mg/L	SM2540C (160.1)	1.0	08/28/2002	08/29/2002	EH
Chloride	20200	mg/L	300.0	1.0	08/28/2002	08/30/2002	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.05	08/28/2002	08/29/2002	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.05	08/28/2002	08/29/2002	SMF
Sulfate	2672	mg/L	300.0	1.0	08/28/2002	08/29/2002	SMF
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	08/29/2002	08/29/2002	DTD
Nitrogen (Kjeldahl) as "N"	BDL	mg/L	351.2	0.1	08/29/2002	08/29/2002	DTD
Nitrogen (Total Organic)	BDL	mg/L	351.2	0.1	08/29/2002	08/29/2002	DTD
Nitrogen, Total as "N"	BDL	mg/L	353+351 CALC.	0.1	08/28/2002	08/29/2002	SMF

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.

Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E Castellanos
Laboratory Manager

Submission Code: 02/08-1412
Orders: 73840
Entered to lims: RA

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No. ____________
Page: ________ of ________
Sampling CompQAP No.) ____________
Approval Date: ____________

Report To: John Largey
Report To Address: J Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood IW 1 Packer #6 2046-2062
Site Location: Hollywood WWTP IW 1
1621 N-14 Ave Hollywood
33020
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** 941-560-4510 **FAX:**
Sampled By (print): Dan Williams
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp ______ C
Sealed Yes No

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW 1 Packer #6								10	✓	✓	✓	✓	✓	✓	73870
2	2046-2062	8-28-02	2pm				GW									
3								Rush #								
4																
5								PJ 167								
6																
7								2 Day Turnaround								
8																
9								Due For 8-30-02								
10																

Special Comments:
Total # of Containers:

QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Webs	Date: 8-28-02	(2) Relinquished by Signature:	Date:
Company: YBI	Time: 2 25 pm	Company:	Time:
(1) Received by Signature:	Date: 8/28/02	(2) Received by Signature:	Date:
Company: STL	Time: 2:26	Company:	Time:

DUE DATE REQUESTED
Confirmation #
Coating Code: ____________ Q / L / D
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 1 (IW-1) – Packer Tests

2,193 – 2,209

Fax message

SEVERN
TRENT
SERVICES

STL Miami
10200 USA Today Way
Miramar, FL 33025

Tel: 954-431-4550 **ext: 111**
Customer Service: **ext: 340**
Fax: 954-431-1959

www.stl-inc.com
www.zfranco@stl-inc.com

E-MAILED
09-05-02

Date: 09-05-02

To: Jon Largey

Company: Hazen + Sawyer

Fax: 954-920 7117

E-Mail: Jlargey@hazen+sawyer.com

From: Zuzan Franco - Customer Service

Subject: Sub# 218-1550
RJ 167

Pages: 3 w/cover

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SEVERN
TRENT
SERVICES
STL Miami

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
September 6, 2002
Submission # 208001550
Order # 74869
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW1,1621 N-14 AVE,Hollywood 33020
Holly.IW1 Packer #7 2193-2209

Sample I.D.: IW 1 Packer # 7 2193-2209
Collected: 08/29/02 14:00
Received: 08/30/02 17:00
Collected by: Don Williams

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	51300	umhos	120.1	1.0	09/02/2002	09/02/2002	RDB
Residue, Total Filterable (TDS)	34800	mg/L	SM2540C (160.1)	1.0	08/31/2002	09/03/2002	EH
Chloride	21700	mg/L	300.0	1.0	09/03/2002	09/03/2002	RDB
Nitrate (as N)	0.80	mg/L	300.0	0.05	08/31/2002	08/31/2002	RDB/SM
Nitrite (as N)	BDL	mg/L	300.0	0.05	08/31/2002	08/31/2002	RDB/SM
Sulfate	2960	mg/L	300.0	1.0	09/03/2002	09/03/2002	RDB
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	09/02/2002	09/02/2002	DTD
Nitrogen (Kjeldahl) as "N"	BDL	mg/L	351.2	0.1	09/02/2002	09/02/2002	DTD
Nitrogen (Total Organic)	BDL	mg/L	351.2	0.1	09/02/2002	09/02/2002	DTD
Nitrogen, Total as "N"	0.80	mg/L	353+351 CALC.	0.1	09/02/2002	09/02/2002	SM/DD

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs: Ct.=#PH0217, La.=#9601, Md.=#271, Ma.=#M-FL535
OK.=#9523, SC.=#96023, Tn.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Wayne Khan
Project Manager

Submission Code: 0218-1550
Orders: 748609
Entered to lims: CM

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

FDEP Facility No.:
Page: ____ of ____
Sampling CompQAP No.)
Approval Date:

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

Report To: John Largey
Report To Address: J Largey @ Hazen and Sawyer . Com
Bill To: YBI   2193-2209
Billing Address:
Project Number/Name: Hollywood IW 1 Packer #7
Site Location: Hollywood WWTP IW 1
Project Contact: John Largey
Phone: 954-920-2972
FAX: 954-920-7117
1621 N-14 Ave Hollywood 33020
Alternate Contact: Cameron Webster
Phone: 941-560-4510
FAX:
Sampled By (print): Don Williams
Sampler's Signature:

ANALYSIS REQUIRED

PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 3.1 °C
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW 1 Packer #7								10	✓	✓	✓	✓	✓	✓	
2	2193-2209	8-29-02	2pm				GW									
3								Rush #								
4																
5								PJ 167								
6																
7								2 Day Turnaround								
8																
9																
10																

Special Comments: PO# 21008
Total # of Containers:
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web	Date: 8-29-02	(2) Relinquished by Signature: D. Williams	Date: 8/30/02
Company: YBI	Time:	Company: STL	Time: 17:15
(1) Received by Signature: D. Williams	Date: 8/30/02	(2) Received by Signature:	Date: 8/30/02
Company: STL	Time: 10:36	Company: STL	Time: 1700

DUE DATE REQUESTED
Confirmation #
Coating Code: Q / L / D
Misc. Charges:
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Testing

Packer Test Water Quality

Injection Well No. 2 (IW-2) – Packer Tests

1,390 – 1,408

SEVERN TRENT STL

E-MAILED

RUSH

Fax message

To: John

Company: YOUNGQUIST
1-941-489-4545

Fax: 1-954-920-7117

Email: jlargey@hazenand sawyer.com

Subject: Sub#
Rush#

From: Kathy Williams

Customer Service Ext: 105

kkwilliams@stl-inc.com

Date: 1-7 03

Pages: 2 Plus cover

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A part of Severn Trent plc

Severn Trent Laboratories Inc.
STL Miami • 10200 USA Today Way, Miramar, FL 33025
Tel: 954-431-4550 Fax: 954-431-1959 • *www.stl-inc.com*

SEVERN
TRENT
SERVICES
STL Miami

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
January 7, 2003
Submission # 301000109
Order # 484
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP, IW2
Hollywood WWTP IW2 Packer#1

Sample I.D.: Packer #1 IW2 (1390-1408)
Collected: 01/03/03 00:00
Received: 01/03/03 17:00
Collected by: C.W.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	16630	umhos	120.1	1.0	01/04/2003	01/04/2003	PR
Residue, Total Filterable (TDS)	9924	mg/L	SM2540C (160.1)	1.0	01/04/2003	01/05/2003	RZ
Chloride	7095	mg/L	300.0	1.0	01/04/2003	01/04/2003	RDB
Nitrate (as N)	BDL	mg/L	300.0	0.05	01/04/2003	01/04/2003	RDB
Nitrite (as N)	BDL	mg/L	300.0	0.05	01/04/2003	01/04/2003	RDB
Sulfate	537	mg/L	300.0	1.0	01/04/2003	01/04/2003	RDB
Nitrogen (Ammonia) as N	0.538	mg/L	350.1	0.04	01/06/2003	01/06/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.837	mg/L	351.2	0.1	01/07/2003	01/07/2003	DSR
Nitrogen (Total Organic)	0.299	mg/L	351.2	0.1	01/07/2003	01/07/2003	DSR
Nitrogen, Total as "N"	0.837	mg/L	353+351 CALC.	0.1	01/07/2003	01/07/2003	DSR/RD

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 3/1-109
Orders: 484
Entered to lims: EA

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report Yellow – Lab Copy Pink – Sampler Copy

FDEP Facility No.
Page: of
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IW 2 Packer #1 1390'-1408'
Site Location: Hollywood WWTP IW 2
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** 239-560-4510 **FAX:**
Sampled By (print): CW
Sampler's Signature:

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	ANALYSIS REQUIRED PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW (✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Sample Condition as Received Temp 4 °C Sealed Yes [✓ No] Lot number of Sampling Containers Used
1	Packer #1 IW2 1390-1408						GW		8	✓	✓	✓	✓	✓	✓	484.
2																
3																
4								Rush								
5								#								
6								PJ003								
7	Samples were collected															
8	on 1/3/3 per C. Webster															
9							1/6/3									
10								EC								

Special Comments:
Total # of Containers: 8
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Webs	Date: 1-3-03	(2) Relinquished by Signature: L Williams	Date: 1-3-03	DUE DATE REQUESTED Confirmation #
Company: YBI	Time:	Company: STL	Time: 15:55	Coating Code: Q / L / D
(1) Received by Signature: L Williams	Date: 1.3.03	(2) Received by Signature: EA	Date: 1/3/03.	Misc. Charges
Company: STL	Time: 9:30	Company: STL	Time: 17:00	SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

1,510 – 1,528

SEVERN TRENT **STL**

E-MAILED 1/7/03

Fax message

To: John Largey

From: Zuzan Franco

Customer Service Ext: 111

Company: Hazen+Sawyer

zfranco@stl-inc.com

Fax: 954-920-7117

Date: 1/7/03

Email: Jlargey@hazen+ Sawyer.com

Pages:

Subject: Sub # 3/1-146 RUSH # P31167

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SEVERN
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STL Miami

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
January 7, 2003
Submission # 301000146
Order # 689
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2,1621 N-14 Ave. Hollywood,33020
Hollywood IW-2 Packer#2

Sample I.D.: IW-2 Packer#2 1510' 1528'
Collected: 01/04/03 04:00
Received: 01/04/03 12:00
Collected by: Dixon M.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	43700	umhos	120.1	1.0	01/04/2003	01/04/2003	PR
Residue, Total Filterable (TDS)	29948	mg/L	SM2540C (160.1)	1.0	01/04/2003	01/05/2003	RZ
Chloride	22340	mg/L	300.0	1.0	01/04/2003	01/04/2003	RDB
Nitrate (as N)	BDL	mg/L	300.0	0.05	01/04/2003	01/04/2003	RDB
Nitrite (as N)	BDL	mg/L	300.0	0.05	01/04/2003	01/04/2003	RDB
Sulfate	1871	mg/L	300.0	1.0	01/04/2003	01/04/2003	RDB
Nitrogen (Ammonia) as N	0.106	mg/L	350.1	0.04	01/06/2003	01/06/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.900	mg/L	351.2	0.1	01/07/2003	01/07/2003	DSR
Nitrogen (Total Organic)	0.794	mg/L	351.2	0.1	01/07/2003	01/07/2003	DSR
Nitrogen, Total as "N"	0.900	mg/L	353+351 CALC.	0.1	01/07/2003	01/07/2003	DSR/RD

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 03|01146
Orders: 689
Entered to lims: ✓

SEVERN TRENT LABORATORIES, INC.
CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No.
Page: of
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Bill To: YBI
Report To Address: J Largey@Hazen + sawyer.com
Billing Address:
Project Number/Name: Hollywood IW-2 Packer #2 1510' to 1528'
Site Location: Hollywood WWTP IW2 11621 N-14 Ave Hollywood 33020
Project Contact: John Largey   Phone: 954-920-2972   FAX: 954 920 7117
Alternate Contact: Cameron webster   Phone: 941 560 4510   FAX:
Sampled By (print): Dixon mcclellan
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp ___ C
Sealed Yes No

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH FLD	TEMP °C FLD	COND FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	organic nitrogen Total nitrogen	nitrate nitrite	conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	IW-2 Packer #2								8							689.
2	1510' 1528'	1-4-03	4:AM				GW									
3								Rush #								
4																
5								PJ 167								
6																
7								2 Day Turnaround								
8																
9								01/07/03								
10																

Special Comments: PO# 218030
Total # of Containers:
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cameron Webster
Date: 1-4-03
Company: YBI
Time:

(2) Relinquished by Signature: A. Williams
Date: 1-4-03
Company: STL
Time: 11:55

(1) Received by Signature: A. Williams
Date: 1-4-03
Company: STL
Time: 11:15

(2) Received by Signature:
Date:
Company:
Time:

DUE DATE REQUESTED
Confirmation #
Costing Code: Q / L / D
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

1,760 – 1,778

SEVERN TRENT STL

E-MAILED

RUSH

Fax message

To: John

From: Kathy Williams

Customer Service Ext: 105

kkwilliams@stl-inc.com

Company: YOUNGQUIST

Fax: 1-954-920-7117

Date: 1/10/03

Email: jlargey@hazen andsawyr.com

Pages: 2 Plus cover

Subject: Sub # 311-252 Rush # PJ003

This message contains information intended only for the use of the person named above. It may also be confidential and/or privileged. If you are not the intended recipient of this message you are hereby notified that you must not disseminate, copy or take any action in reliance on it. If you have received this message in error please contact STL Miami at 954-431-4550. The views expressed in this fax are not necessarily those of the company STL.

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STL Miami

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
January 10, 2003
Submission # 301000252
Order # 1216
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2, 1621-N 14 Ave.
Hollywood WWTP IW2 Packer #3

Sample I.D.: Packer #3 IW2 (1760-1778)
Collected: 01/07/03 13:30
Received: 01/07/03 17:00
Collected by: C.W.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	49500	umhos	120.1	1.0	01/08/2003	01/08/2003	RDB
Residue, Total Filterable (TDS)	37460	mg/L	SM2540C (160.1)	1.0	01/08/2003	01/09/2003	YD
Chloride	21170	mg/L	300.0	1.0	01/08/2003	01/08/2003	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.05	01/08/2003	01/08/2003	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.05	01/08/2003	01/08/2003	SMF
Sulfate	2460	mg/L	300.0	1.0	01/08/2003	01/08/2003	SMF
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	01/10/2003	01/10/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.223	mg/L	351.2	0.1	01/08/2003	01/08/2003	DSR
Nitrogen (Total Organic)	0.223	mg/L	351.2	0.1	01/10/2003	01/10/2003	DSR
Nitrogen, Total as "N"	0.223	mg/L	353+351 CALC.	0.1	01/10/2003	01/10/2003	DSR

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 3/01-252
Orders: 1216
Entered to lims: EA

SEVERN TRENT LABORATORIES, INC.
CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

Original – Return w/Report Yellow – Lab Copy Pink – Sampler Copy

FDEP Facility No.
Page: of
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IW 2 Packer #3 1760-1778
Site Location: Hollywood WWTP IW2
1621- N 14 Ave.
33020
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** ~~954~~ 239-560-4510 **FAX:**
Sampled By (print): CW.
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 4
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH FLD	TEMP °C FLD	COND FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	Packer #3 IW2 1760-1778'	1-7-03	1 30 PM				GW		8	✓	✓	✓	✓	✓	✓	1216
2																
3																
4								Rush#								
5																
6								PJ003								
7																
8								Due: 01/10/03								
9																
10																

Special Comments:
Total # of Containers: 8
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web
Date: 1-7-03
Company: YBI
Time:
(2) Relinquished by Signature: Mariann Yoray
Date: 1-7-03
Company: STL
Time:
DUE DATE REQUESTED
Confirmation #
Coating Code: Q / L / D
(1) Received by Signature: Mariann Yoray
Date: 1-7-03
Company: STL
Time: 1550
(2) Received by Signature: EA
Date: 1/7/03
Company: STL
Time: 17:00
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

1,810 – 1,828

SEVERN TRENT STL

RUSH

E-MAILED 1/13/03

Fax message

To: John Largey

From: Zuzan Franco

Customer Service **Ext:** 111

Company: Hazen & Sawyer

zfranco@stl-inc.com

Fax: 1 954-920-7119

Date: 1/13/03

Email: jlargey@hazenand sawyer.com

Pages: 3

Subject: SDG# 31-322 Rush#PJ003

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STL Miami • 10200 USA Today Way, Miramar, FL 33025
Tel: 954-431-4550 Fax: 954-431-1959 • *www.stl-inc.com*

A part of Severn Trent plc

SEVERN TRENT SERVICES
STL Miami

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
January 13, 2003
Submission # 301000322
Order # 1492
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
1621 N-14 Ave.,Hollywood
Hollywood WWTP IW2 Packer #4

Sample I.D.: Packer #4 1810-1828
Collected: 01/08/03 10:00
Received: 01/08/03 16:00
Collected by: C.W.

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	51000	umhos	120.1	1.0	01/09/2003	01/09/2003	RDB
Residue, Total Filterable (TDS)	38640	mg/L	SM2540C (160.1)	1.0	01/10/2003	01/13/2003	YD
Chloride	23700	mg/L	300.0	1.0	01/09/2003	01/09/2003	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.05	01/09/2003	01/09/2003	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.05	01/09/2003	01/09/2003	SMF
Sulfate	2800	mg/L	300.0	1.0	01/09/2003	01/09/2003	SMF
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	01/10/2003	01/10/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.462	mg/L	351.2	0.1	01/09/2003	01/09/2003	DSR
Nitrogen (Total Organic)	0.462	mg/L	351.2	0.1	01/10/2003	01/10/2003	DSR
Nitrogen, Total as "N"	0.46	mg/L	353+351 CALC.	0.1	01/09/2003	01/09/2003	SMF/DS

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Wayne Khan

Project Manager

Submission Code: 03/01-322
Orders: 1492
Entered to lims: AN

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No. ______
Page: ______ of ______
Sampling CompQAP No.) ______
Approval Date: ______

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer.Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IW2 Packer #4 1810'-1828'
Site Location: Hollywood WWTP IW2
1621 N-14 Ave
Hollywood - FL - 33020
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** 239-560-4510 **FAX:**
Sampled By (print): C.W.
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 9.1 C
Sealed Yes [✓ No]

ITEM	SAMPLE ID	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1	Packer #4 1810-1825	1-8-03	10 am				GW		8	✓	✓	✓	✓	✓	✓	
2																
3								Rush # PJ 003								
4																
5																
6																
7																
8																
9																
10																

Special Comments: PO#218030
Total # of Containers: 8
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Webst	Date: 1-8-03	(2) Relinquished by Signature: Mariam Yoray	Date: 1-8-03
Company: YBI	Time:	Company: STL	Time: 4:00
(1) Received by Signature: Mariam Yoray	Date: 1-8-03	(2) Received by Signature:	Date: 1/8/03
Company: STL	Time: 1517	Company: STL	Time: 10:00

DUE DATE REQUESTED 1/11/03
Confirmation #
Coding Code: Q / L / D
Misc Charges:
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

2,093 – 2,111

SEVERN TRENT STL

E-MAILED

Fax message

To: John

Company: YOUNGQUIST

Fax: 1-954-920-7117 1-941-489-4545

Email: jlargey@hazenandsawyer.com

Subject: Sub # 312-1125 Rush # BH295

From: Kathy Williams

Customer Service Ext: 105

kkwilliams@stl-inc.com

Date: 2/26/03

Pages: 2 Plus cover

RUSH

New reading confirmed. What was originally reported. This is the final report.

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YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
February 26, 2003
Submission # 302001125
Order # 15572
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2,1621 N-14 AVE,Hollywood,FL33020
Hwd.WWTP IW2 Pkr # 5 2093-2111

Sample I.D.: IW2 Pkr # 5 2093-2111
Collected: 02/21/03 05:00
Received: 02/21/03 10:55
Collected by: D. McLellan

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	50900	umhos	120.1	1.0	02/24/2003	02/24/2003	RDB
Residue, Total Filterable (TDS)	42120	mg/L	SM2540C (160.1)	1.0	02/25/2003	02/25/2003	SN/YD
Chloride	21280	mg/L	300.0	1.0	02/22/2003	02/22/2003	SMF/RZ
Nitrate (as N)	1.70	mg/L	300.0	0.05	02/22/2003	02/22/2003	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.05	02/22/2003	02/22/2003	SMF
Sulfate	2680	mg/L	300.0	1.0	02/22/2003	02/22/2003	SMF/RZ
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	02/22/2003	02/22/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.159	mg/L	351.2	0.1	02/22/2003	02/22/2003	DSR
Nitrogen (Total Organic)	0.159	mg/L	351.2	0.1	02/22/2003	02/22/2003	DSR
Nitrogen, Total as "N"	1.86	mg/L	353+351 CALC.	0.1	02/24/2003	02/24/2003	DSR/MF

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 3/2-1125
Orders: 155722
Entered to lims: JD

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No.
Page: ____ of ____
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IW2 Packer #5 2093-2111
Site Location: Hollywood WWTP IW2
1621 N-14 Ave
Hollywood FL 33020
Project Contact: John Largey
Phone: 954-920-2972
FAX: 954-920-7117
Alternate Contact: Cameron Webster
Phone: 239-560-4510
FAX:
Sampled By (print): Dixon Mclellan.
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 3.1 C
Sealed Yes [✓ No]

ITEM	SAMPLE ID Packer #5 IW2 2093-2111	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulphate	TKN	TDS	Lot number of Sampling Containers Used
1		2-21-03	5am				GW		6	✓	✓	✓	✓	✓	✓	
2								Rush # BH-295 2/25/03								
3																
4																
5																
6																
7																
8																
9																
10																

Special Comments:
Total # of Containers: 6
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web
Date: 2-21-03
Company: YBI
Time:
(1) Received by Signature:
Date: 2/21/03
Company: STC
Time: 18:55 a.m.

(2) Relinquished by Signature:
Date:
Company:
Time:
(2) Received by Signature:
Date:
Company:
Time:

DUE DATE REQUESTED
Confirmation #
Coating Code: Q / L / D
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

2,265 – 2,283

SEVERN TRENT **STL**

E-MAILED

Fax message

To: John

From: Kathy Williams

Customer Service **Ext: 105**

Company: YOUNGQUIST

kkwilliams@stl-inc.com

Fax: B954-920-7117 1-941-489-4545

Date: 2/27/03

Email: jlargey@hazenandsawyer.com

Pages: 2 **Plus cover**

Subject: Swo # 312-1245
Rush # PU333

RUSH

This message contains information intended only for the use of the person named above. It may also be confidential and/or privileged. If you are not the intended recipient of this message you are hereby notified that you must not disseminate, copy or take any action in reliance on it. If you have received this message in error please contact STL Miami at 954-431-4550. The views expressed in this fax are not necessarily those of the company STL.

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
February 27, 2003
Submission # 302001245
Order # 16309
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2,1621 N-14 AVE,Hollywood,FL33020
Hollywood WWTP IW2 Packer #6

Sample I.D.: Packer 6 IW2 2265-2283
Collected: 02/24/03 12:00
Received: 02/24/03 15:31
Collected by: J. Jean

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	48800	umhos	120.1	1.0	02/25/2003	02/25/2003	SMF
Residue, Total Filterable (TDS)	43320	mg/L	SM2540C (160.1)	1.0	02/25/2003	02/26/2003	YD
Chloride	20300	mg/L	300.0	1.0	02/25/2003	02/25/2003	SMF
Nitrate (as N)	1.60	mg/L	300.0	0.05	02/25/2003	02/25/2003	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.05	02/25/2003	02/25/2003	SMF
Sulfate	2680	mg/L	300.0	1.0	02/25/2003	02/25/2003	SMF
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	02/27/2003	02/27/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.217	mg/L	351.2	0.1	02/26/2003	02/26/2003	DSR
Nitrogen (Total Organic)	0.217	mg/L	351.2	0.1	02/27/2003	02/27/2003	DSR
Nitrogen, Total as "N"	1.82	mg/L	353+351 CALC.	0.1	02/26/2003	02/26/2003	SMF/DS

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellanos
Laboratory Manager

Submission Code: 2/2-1245
Orders: 163089
Entered to lims:

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No. ____
Page: ____ of ____
Sampling CompQAP No.) ____
Approval Date: ____

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IW2 Packer # 6 2265-2283
Site Location: Hollywood WWTP IW2
1621 -N- 14 Ave
Hollywood FL 33020
Project Contact: John Largey **Phone:** 954-920-2972 **FAX:** 954-920-7117
Alternate Contact: Cameron Webster **Phone:** 239-560-4510 **FAX:**
Sampled By (print): Jean Jean
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 3.1 C
Sealed Yes [✓ No]

ITEM	SAMPLE ID Packer 6 IW2 2265-2283	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulphate	TKN	TDS	Lot number of Sampling Containers Used
1		2-24-03	12 noon				GW	Rush #	6	✓	✓	✓	✓	✓	✓	
2																
3																
4																
5								PJ 333								
6																
7								2/27/03								
8																
9																
10																

Special Comments:
Total # of Containers: 6
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web
Date:
Company: YBI
Time:
(2) Relinquished by Signature:
Date:
Company:
Time:
DUE DATE REQUESTED
Confirmation #
Coating Code: ____ Q / L / D
(1) Received by Signature:
Date: 2/24/05
Company: STL
Time: 3:31 pm
(2) Received by Signature:
Date: 2/24/03
Company:
Time: 1531
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

2,300 – 2,318

SEVERN TRENT **STL**

E-MAILED

RUSH

Fax message

To: John

From: Kathy Williams

Customer Service Ext: 105

kkwilliams@stl-inc.com

Company: YOUNGQUIST

954-920-7117

Fax: 1-941-489-4545

Date: 2/28/03

Email: jlargey@hazen and sawyer.com

Pages: 2 Plus cover

Subject: Sub # 32-1293
Rush # PJ333

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SEVERN TRENT STL

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
February 28, 2003
Submission # 302001293
Order # 16719
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2 1621 N-14 AVE Hollywood FL33020
Hollwood WWTP IW2 Packer#7

Sample I.D.: IW2 Packer#7 2300-2318
Collected: 02/25/03 12:00
Received: 02/25/03 18:00
Collected by: C.Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	50800	umhos	120.1	1.0	02/27/2003	02/27/2003	SN
Residue, Total Filterable (TDS)	41520	mg/L	SM2540C (160.1)	1.0	02/26/2003	02/27/2003	YD
Chloride	20180	mg/L	300.0	1.0	02/26/2003	02/26/2003	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.5	02/26/2003	02/26/2003	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.5	02/26/2003	02/26/2003	SMF
Sulfate	2600	mg/L	300.0	1.0	02/26/2003	02/26/2003	SMF
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	02/27/2003	02/27/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.174	mg/L	351.2	0.1	02/26/2003	02/26/2003	DSR
Nitrogen (Total Organic)	0.174	mg/L	351.2	0.1	02/27/2003	02/27/2003	DSR
Nitrogen, Total as "N"	0.174	mg/L	353+351 CALC.	0.1	02/26/2003	02/26/2003	SMF/DS

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 3/2-1293
Orders: 16719
Entered to lims: AH

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8675

Original – Return w/Report Yellow – Lab Copy Pink – Sampler Copy

FDEP Facility No.
Page: of
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IWZ Packer #7 2300-2318
Site Location: Hollywood WWTP IWZ
1621 N-14 Ave
Hollywood FL 33020
Project Contact: John Largey Phone: 954-920-2972 FAX: 954-920-7117
Alternate Contact: Cameron Webster Phone: 239-560-4510 FAX:
Sampled By (print): Chris Harp
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

ITEM	SAMPLE ID Packer 7 IWZ 2300-2318	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Sample Condition as Received Temp 35 °C Sealed Yes [✓ No] Lot number of Sampling Containers Used
1		2-25-03	12 noon				GW		6	✓	✓	✓	✓	✓	✓	16719
2																
3								Rush #								
4																
5								PJ 333								
6																
7								2/27/03								
8																
9																
10																

Special Comments:
Total # of Containers: 6
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Web	Date:	(2) Relinquished by Signature: Xavier Williams	Date: 2.25.03
Company: YBI	Time:	Company: STL	Time: 16:55
(1) Received by Signature: Xavier Williams	Date: 2.25.03	(2) Received by Signature:	Date: 2/25/03
Company: STL	Time: 16:10	Company: STL-Miami	Time: 18:00

DUE DATE REQUESTED
Confirmation #
Costing Code: Q / L / D
Misc. Charges
SHADED AREAS ARE FOR LAB USE ONLY

Injection Well No. 2 (IW-2) – Packer Tests

2,410 – 2,428

SEVERN TRENT STL

RUSH

E-MAILED

Fax message

To: John

Company: YOUNGQUIST

Fax: 954-920-7117
1-941-489-4545

Email: jlargay@hazenandsawyer.com

Subject: Sub # 3/2-1375
Rush # PJ333

From: Kathy Williams

Customer Service Ext: 105

kkwilliams@stl-inc.com

Date: 3/3/03

Pages: 2 Plus cover

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Severn Trent Laboratories Inc.
STL Miami • 10200 USA Today Way, Miramar, FL 33025
Tel: 954-431-4550 Fax: 954-431-1959 • www.stl-inc.com

A part of Severn Trent plc

SEVERN
TRENT STL

YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
March 3, 2003
Submission # 302001375
Order # 17174
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2 1621 N-14Ave Hollywood,FL 33020
WWTP IW2 Packer#8 2410-2428

Sample I.D.: IW2 Paker#8 2300-2318
Collected: 02/26/03 15:00
Received: 02/26/03 18:45
Collected by: C.Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Specific Conductance {grab}	50400	umhos	120.1	1.0	02/27/2003	02/27/2003	SN
Residue, Total Filterable (TDS)	19040	mg/L	SM2540C (160.1)	1.0	02/27/2003	02/28/2003	YD
Chloride	21200	mg/L	300.0	1.0	02/27/2003	02/27/2003	SMF
Nitrate (as N)	BDL	mg/L	300.0	0.50	02/27/2003	02/27/2003	SMF
Nitrite (as N)	BDL	mg/L	300.0	0.50	02/27/2003	02/27/2003	SMF
Sulfate	2580	mg/L	300.0	1.0	02/27/2003	02/27/2003	SMF
Nitrogen (Ammonia) as N	BDL	mg/L	350.1	0.04	02/27/2003	02/27/2003	DSR
Nitrogen (Kjeldahl) as "N"	0.202	mg/L	351.2	0.1	02/28/2003	02/28/2003	DSR
Nitrogen (Total Organic)	0.202	mg/L	351.2	0.1	02/28/2003	02/28/2003	DSR
Nitrogen, Total as "N"	0.202	mg/L	353+351 CALC.	0.1	02/28/2003	02/28/2003	DSR

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellano
Laboratory Manager

Submission Code: 3/2-1375
Orders: 17174
Entered to lims: AH

SEVERN TRENT LABORATORIES, INC.

CHAIN OF CUSTODY RECORD (DEP 62-770.900 – modified form)

10200 USA TODAY WAY, MIRAMAR, FLORIDA 33025
(954) 431-4550 • NAT'L WATS (800) LAB-8550 • FAX (954) 431-1959 • SAMPLE CUSTODY FAX (954) 432-8875

Original – Return w/Report   Yellow – Lab Copy   Pink – Sampler Copy

FDEP Facility No.
Page: ____ of ____
Sampling CompQAP No.)
Approval Date:

Report To: John Largey
Report To Address: J. Largey @ Hazen and Sawyer . Com
Bill To: YBI
Billing Address:
Project Number/Name: Hollywood WWTP IW2 Packer #8 2410-2428
Site Location: Hollywood WWTP IW2
1621 N-14 Ave
Hollywood FL 33020
Project Contact: John Largey
Phone: 954-920-2972
FAX: 954-920-7117
Alternate Contact: Cameron Webster
Phone: 239-560-4510
FAX:
Sampled By (print): Chris Harp
Sampler's Signature:

ANALYSIS REQUIRED
PLACE NAME OR METHOD NUMBER OF TESTS NEEDED IN LARGE BOXES BELOW
(✓) CHECK OFF WHICH SAMPLE ITEMS NEED EACH TEST PERFORMED

Sample Condition as Received
Temp 3.1
Sealed Yes [✓ No]

ITEM	SAMPLE ID Packer #8 IW2 2300-2318	DATE COLLECTED	TIME COLLECTED	pH ..... FLD	TEMP °C ..... FLD	COND ..... FLD	MATRIX DW SW GW SED S EFF HW BIO SA	SAMPLE LOCATION JOB DESCRIPTION (optional if needed when samples are from different site location)	# CONTAINERS	Ammonia Chloride	Organic Nitrogen Total Nitrogen	Nitrate Nitrite	Conductivity Sulfate	TKN	TDS	Lot number of Sampling Containers Used
1		2-26-03	3pm				GW	17174	6							
2								Rush #								
3																
4																
5								PJ 333								
6																
7																
8																
9																
10																

Special Comments:
Total # of Containers: 6
QA/QC Report Needed? Yes No (See price guide for applicable fees)
Report Format: Standard Other (specify)

(1) Relinquished by Signature: Cam Webs
Date:
Company: YBI
Time:
(1) Received by Signature: A. Williams
Date: 2-26-03
Company: STL
Time: 13:43

(2) Relinquished by Signature: A. Williams
Date: 2-26-03
Company: STL
Time: 16 35
(2) Received by Signature:
Date: 2/26/03
Company: STL-Miami
Time: 18:45

DUE DATE REQUESTED
Confirmation #
Coating Code: ____ Q / L / D
Misc. Charges:
SHADED AREAS ARE FOR LAB USE ONLY

STL-8242 (3-01)

SUB# 03/03 - 264
ORD# 19579
RA

Phone (954) 920-2972
Fax (954) 920-7117

Youngquist Brothers
HAZEN & SAWYER
City of Hollywood
Injection Well Field Office

Fax

To: Sample Custody/Ernesto

From: John Largey

Fax: 954 431 1959

Pages:

Phone:

Date: 3/6/2003

Re: Sample ID: IW-2 Packer#8 2410-2428
Submission 302001375
Order # 17174

CC:

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Please re-run the above referenced sample for Residue, Total Filterable (TDS) The rush number supplied by customer service is WK069 with a due date of 3/7/03. If you have any questions please call me at 954 920-2972.

John Largey

SEVERN TRENT **STL**

RUSH

Fax message

To: John

Company: Youngquist

Fax: 1-941-489-4545
954-920-7117

Email: jlargey@hazenandsawyer.com

Subject: Sub # 313-264
Rush # W1069

From: Kathy Williams
Customer Service
954-431-4550 extension: 105
kkwilliams@stl-inc.com

Date: 3/7/03

Pages: 2

* Scanner is down - will email report as soon as we can.
Thanks!

** A different sample bottle was used for the TDS rerun **

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YOUNGQ002775
John Largey
Youngquist Brothers
15465 Pine Ridge Road
Ft. Myers, FL 33908

Page 1
March 7, 2003
Submission # 303000264
Order # 19579
FDEP CompQAP# 990102
FL-DOH Certification# E86349,E86616

Site Location/Project
Hollywood WWTP IW2 1621 N-14 Ave,Hollywood FL33020
RELOG SUB # 302001375

Sample I.D.: 17174 (IW-2 Packer #8)
Collected: 02/26/03 15:00
Received: 02/26/03 16:45
Collected by: C. Harp

PARAMETER	RESULT	UNITS	METHOD	DETECTION LIMIT-RQL	DATE EXT.	DATE ANALY.	ANALYST
Residue, Total Filterable (TDS)	40170	mg/L	SM2540C (160.1)	1.0	03/06/2003	03/07/2003	YD

BDL: Indicates Analyte is Below Detection LimitMEDF: Matrix Effect Dilution Factor***
Work Subcontracted to Outside Labs Denoted by HRS Cert ID in Analyst Field
Qualifier following result conforms to FAC 62-160 Table 7***Unless otherwise noted, mg/Kg denotes wet weight***
***62-770: If the MDL using the most sensitive and currently available technology is higher than a specific criterion, the PQL shall be used.
Certs:CT.=#PH0217, LA.=#9601, MD.=#271, MA.=#M-FL535
SC.=#96023, TN.=#TN02826,P.R.=FL-00535
**These test results meet all the requirements of NELAC.All questions regarding this test report should be directed to the STL representative who signed this report or the QC department.

Maria E. Castellanos
Laboratory Manager

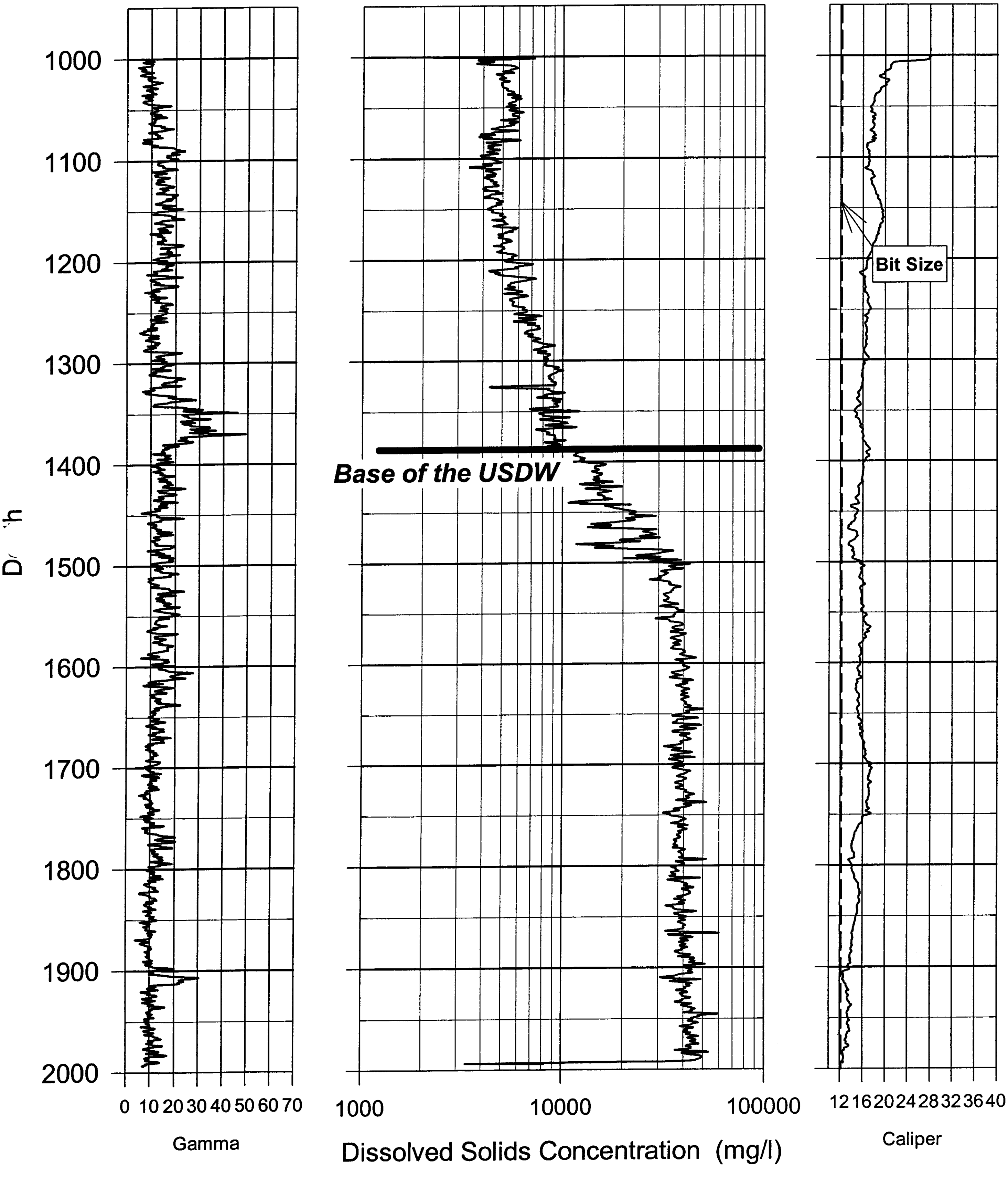
Appendix J

Log Derived Water Quality

Injection Well No. 1 (IW-1) – Water Quality

Log Derived Water Quality

HOLLYWOOD - Injection Well No. 1
Log Derived Water Quality

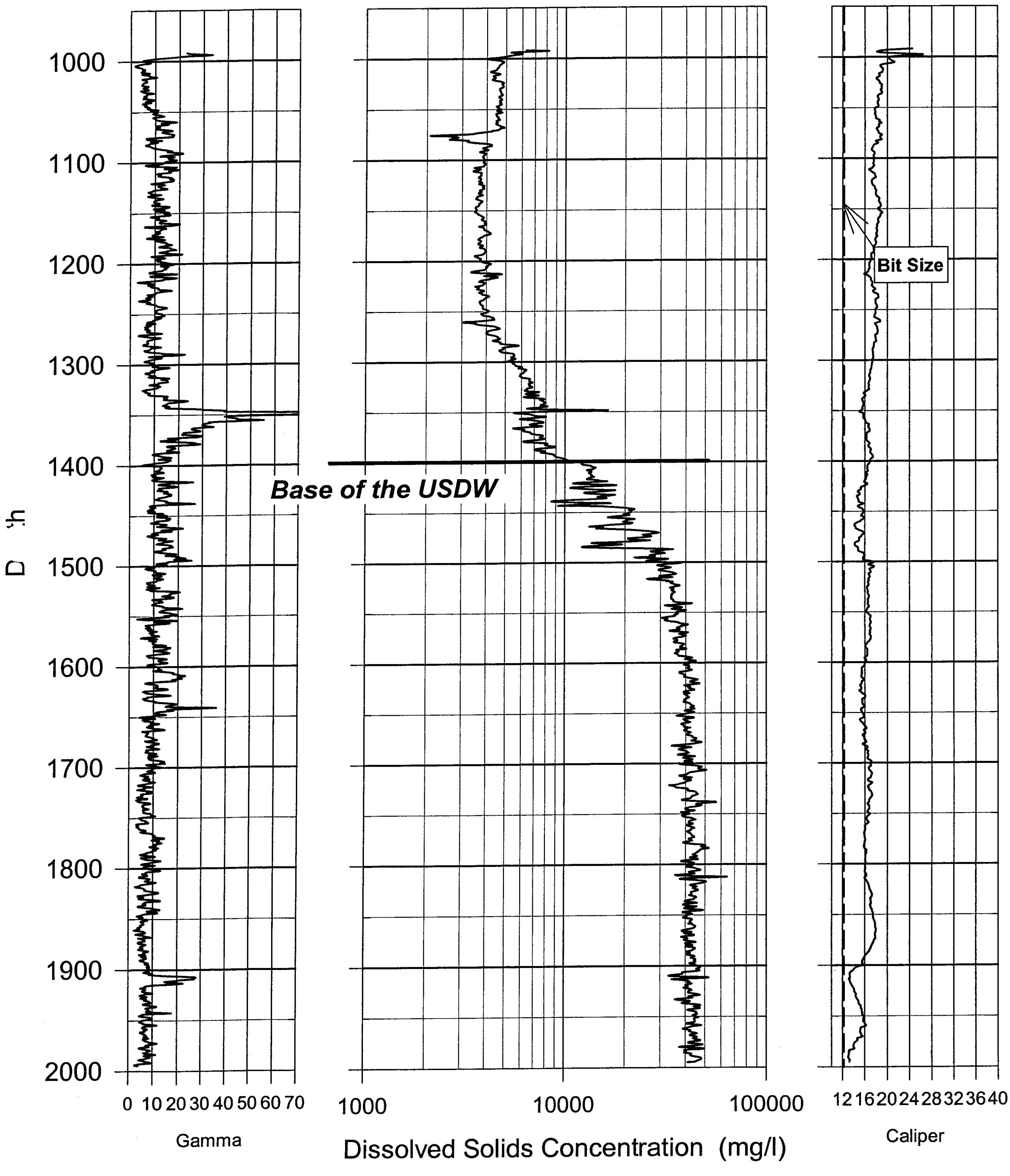


Used Best fit (a and m) values (R-H, m=2.0, a=1.0) non-Corrected Rt

Injection Well No. 2 (IW-2) – Water Quality

Log Derived Water Quality

HOLLYWOOD - Injection Well #2
Log Derived Water Quality



Used Best fit (a and m) values (R-H, m=2.0, a=1.0) non-Corrected Rt