APPENDIX A

Project Location Map

LPGP Map

UIC Permit R9UIC-CA1-FY17-1R


WD-7
(Proposed Well)
WD-6
(Proposed Well)
WD-3
(Existing Well)

APPENDIX B

Well Schematics

WD-3 as-built
WD-6 and WD-7 proposed

UIC Permit R9UIC-CA1-FY17-1R

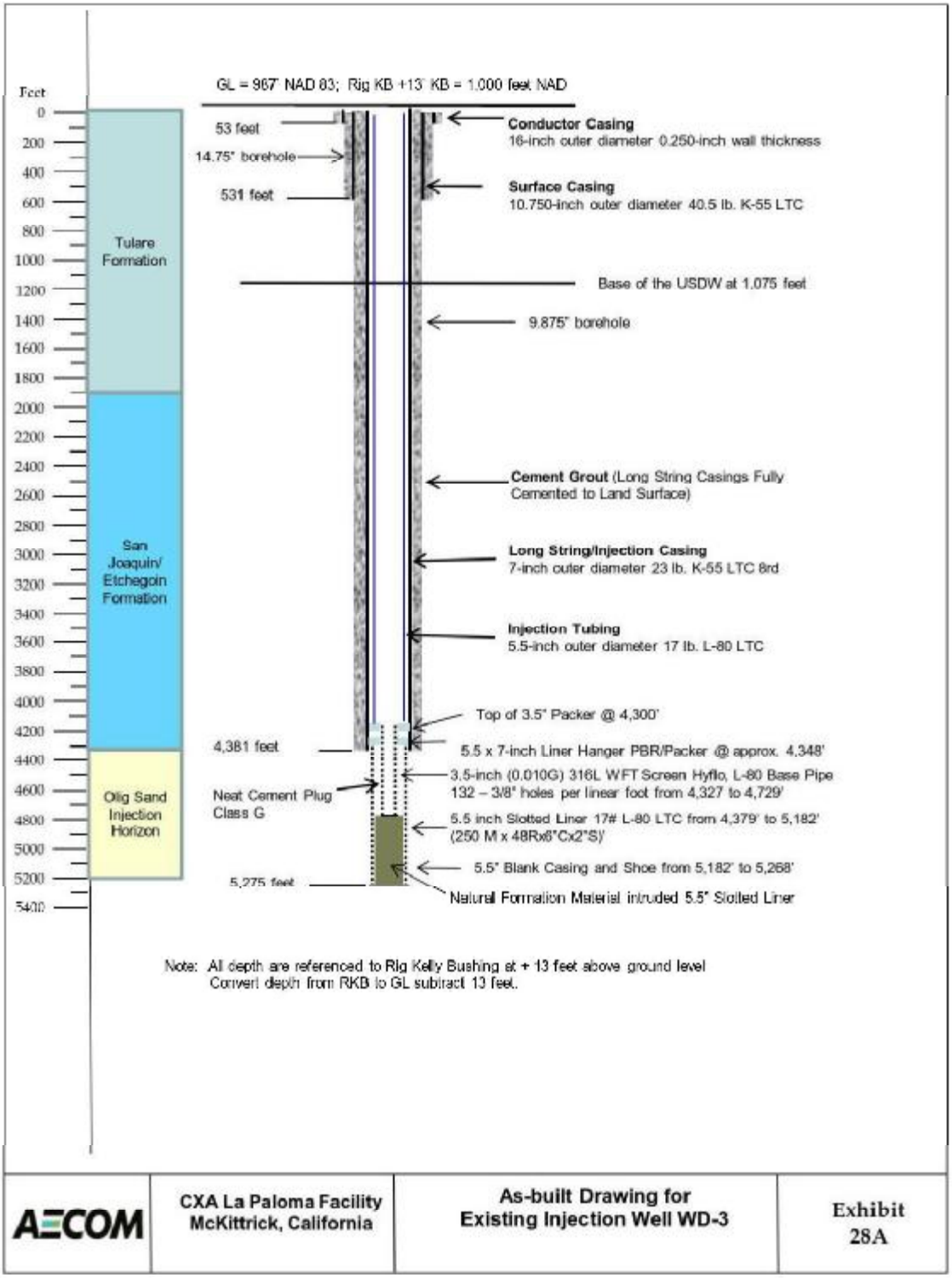


Exhibit 28A: Well Construction Schematic for WD-3 with single wire-wrapped screen liner

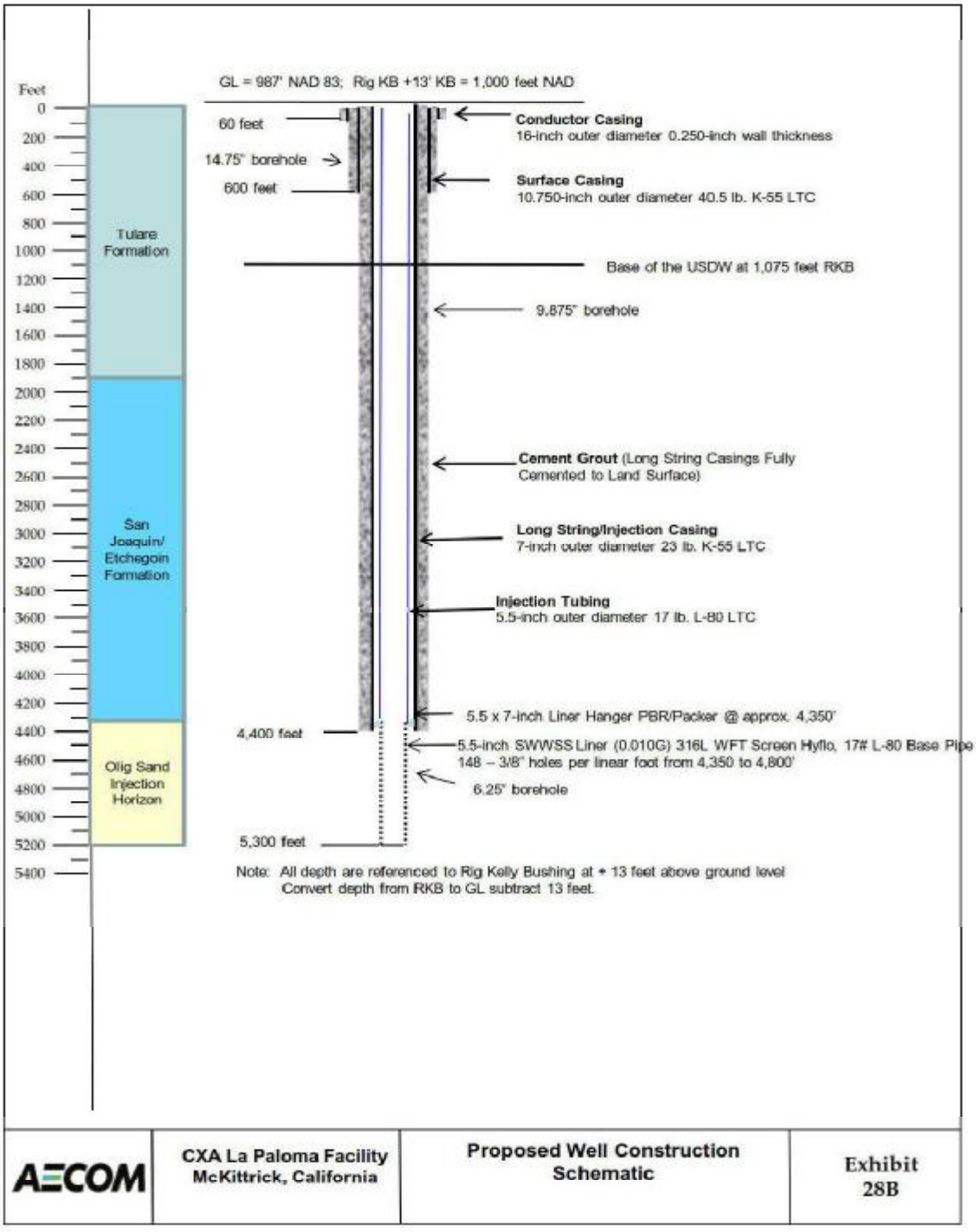


Exhibit 28B: Proposed Well Construction Schematic for WD-6 and WD-7

APPENDIX C

EPA Reporting Forms

UIC Permit R9UIC-CA1-FY17-1R

EPA Reporting Forms List

Form 7520-7: Application to Transfer Permit

Form 7520-8: Quarterly Injection Well Monitoring Report

Form 7520-11: Annual Disposal/Injection Well Monitoring Report

Form 7520-18: Injection Well Completion Report

Form 7520-19: Well Rework Record, Plugging and Abandonment Plan, or Plugging and Abandonment Affidavit

These forms are available for downloading at:

https://www.epa.gov/uic/underground-injection-control-reporting-forms-owners-or-operators

APPENDIX D

Logging Requirements

- Region 9 Radioactive Tracer Survey (RTS) Guidelines
- Region 9 Temperature Logging Guidelines

UIC Permit R9UIC-CA1-FY17-1R

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 9

RADIOACTIVE TRACER SURVEY (RTS) GUIDELINES

Introduction:
The intent of this guideline document is to provide general guidance to owners and operators of Class I non-hazardous underground injection wells for performing radioactive tracer surveys (RTS) used as a means of testing and measuring the external mechanical integrity of these wells as defined in 40 CFR Part 146.8(a)(2). These guidelines are general in nature and individual well conditions may require deviations from these procedures. All proposed plans and any deviations from these guidelines to conduct radioactive tracer surveys must be approved in advance by the EPA Region 9 Drinking Water Protection Section.

Basic Guidelines:
Prior to commencing performance of the RTS, the operator must have available onsite the following:

- EPA approved plan for conducting the RTS
- Reference Gamma Ray (GR) or Open Hole logs and complete well construction details

The logging company must provide a drawing of their tool configuration with tool diameter, tool length, spacing between detectors, ejector location, casing collar log (CCL), a sketch of the well to be tested construction details and equipment details as part of the logging record.

Tool must include dual GR detectors spaced below the ejector port, centralized with a bow spring centralizer (or motorized centralizer) and be run in conjunction with a CCL.

GR logs are usually run at approximately 60 ft /min. at a time constant of 1 second or 30 ft/min. at a time constant of 2 seconds. Indicate the logging speed and time constant on the logging record. The log scale should preferably correspond with that of the Reference lithology logs that are made available for onsite correlation.

The radioisotope typically utilized for tracer surveys in injection wells is sodium iodine 131 with a half-life of 8.05 days. It is important that the isotope be completely soluble with the injectate fluid.

Example Procedure:

Indicate the beginning and ending clock times on each log pass. Indicate the volume of water injected between log passes. Indicate the volume and concentration of each slug of tracer material and the depth and location of each slug. Where possible, the tracer survey should be conducted utilizing the facility's permitted injectate. If that is not possible, the injected water should have a specific gravity equivalent to that of the facility wastewater and be compatible with the formation and previously injected wastewater. A hydraulically actuated packoff (lubricator) should be utilized even when high well pressures are not expected.

Install the RTS tool with an upper and lower detector and CCL. The RTS tool should be configured to run a standard RTS and to conduct velocity shots. Place the RTS tool in the lubricator and mount lubricator onto the injection wellhead. Open the master valve and slowly start pumping into the well until the desired flow rate is reached.

<u>Radioactive Baseline Survey</u>

1. Run a Correlation GR log with a CCL for 200 to 400 feet at or near the injection interval, provided lithology changes are sufficient for correlation purposes. This will allow equipment to be set on proper depths with the Reference Open Hole or GR logs for the well. The CCL should be run through the packer setting depth and preferably past a short casing joint to collect reference depth information.

2. Run a Base GR log from total depth to approximately 400 feet above the packer setting depth. The log sensitivity should be set such that the slug trace response will take up the entire horizontal log scale in API units. The Base log need not be sensitive enough to show lithology. Record the Total Depth for this initial Base log.

3. Record the injection rate and pressure on the well log record for each log pass. The test should be conducted at the rate corresponding to the Maximum Authorized Injection Pressure (MAIP); however, where the well has been operating at a pressure and rate that are lower than the MAIP, the operator may request approval in advance that the RTS should be run at those operating pressures and rates in which the well normally operates (lower than the MAIP).

<u>Radioactive Tracer Depth Drive Survey</u>

4. Initiate the first slug/ejection with the ejector situated approximately 200 feet above the packer. Record the depth and time, verify ejection of the slug, then drop below the slug and record the time, logging speed, time constant, flow rate, etc. Proceed to make the first logging run up through the slug to above where the slug was initially ejected. Note the time when logging terminated, then again drop past the slug and repeat the logging procedure, each time overlapping the previous log and up to a point where the log returns to baseline. Repeat the

logging sequence until all tracer material has exited the wellbore or has diminished substantial amounts.

Radioactive Tracer Time Drive Survey

5. Initiate a second ejection with the tool set 2 to 5 feet above the injection interval and on time drive. Wait for the pre-calculated Wait-Time to observe whether any vertical migration is occurring. Increase the pump rate to the anticipated operating injection rate and leave on time drive for another 10 to 15 minutes. Note times, flow rates, pressures, and slug depth.

Radioactive Tracer Vertical Migration Survey

6. Initiate a third ejection approximately 200 feet above the packer, then follow the slug to the injection zone using multiple log passes as with the first slug/ejection to check for leakage around the packer.

Radioactive Tracer Velocity Survey

7. These can be performed at this juncture of the testing. First, run a velocity profile over the injection horizon noting injection rate. Make velocity shots of tracer material at recorded intervals while injection is occurring at less than normal or peak pumping rates. Run the gamma ray tool through the injection zone and record injectate across the intervals injected. Increase the well injection rate to maximum or normal pumping rate and repeat velocity shots of tracer material at recorded intervals. Run the GR tool through the injection zone and record injectate across the intervals injected at the higher well pumping rate. The information gathered from the two passes made at different pumping rates will allow flow distribution to be compared at the different rates.

Radioactive Post Tracer Survey

8. After sufficient testing has been done to determine the exit point of the tracer material and for indications of vertical migration, drop to and record this second total depth and run a final Base GR log from total depth to approximately 400 feet above the packer at the same logging speed and sensitivity as with initial base log. These two logs should overlay each other with all the “hot spots” being explainable.

Post Survey Requirements

9. Interpretation of the log must be provided by the logging company on the log itself. The well log heading should be completely filled out with all essential information provided such as well name and number, coordinates, well owner/operator, reference logs, and elevations, etc. documented. The log should

be depicted in a manner that fully describes the operations conducted with explanations inserted to minimize the possibility of misinterpretation. Three copies of the final prints must be forwarded to the EPA Region 9 Groundwater Office within 30 days of the survey. The electronic copy may be provided via mailed storage disk, email or a web accessed site. Courtesy field copies provided to the onsite EPA Inspector are not official records.

10. The operator provides an analytical interpretation of the logging results performed by a qualified analyst. This must include a written description of the procedure, the methodology used to calculate the Wait-Time and conclusions drawn from the test. The submittal must also include a fluid loss profile across the injection interval.

NOTE: The above referenced method for performing a Radioactive Tracer Survey (RTS) is not necessarily prescriptive of how all tests are to be conducted. Each underground injection well presents unique subsurface geological, pressure and injection rate situations which must be properly accounted for when designing specific RTS plans and procedures and approved in advance.

References and Additional Information:

Refer to the following EPA publications for additional information and guidance on running and interpreting radioactive tracer and temperature logs for evaluation of injection well integrity:

- Dr. R. M. McKinley's publication EPA/600/R-94/124, *Temperature, Radioactive Tracer, and Noise Logging for Injection Well Integrity*.
  It is out of print, but can be downloaded (searched as "600R94124") from the National Service Center for Environmental Publications (NSCEP) site:

  https://www.epa.gov/nscep

- EPA Region 8 UIC Program Staff Guidance Document at:
  http://www2.epa.gov/sites/production/files/documents/INFO-RATS.pdf

Special acknowledgments for additional consultation with:
Texas World Operations, Inc.
Dr. R.M. McKinley

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 9

TEMPERATURE LOGGING GUIDELINES

A Temperature “Decay” Log (two separate temperature logging passes) must satisfy the following criteria to be considered a valid MIT as specified by 40 CFR §146.8(c)(1). Variances to these requirements are expected for certain circumstances, but they must be approved prior to running the log. As a general rule, the well shall inject for approximately six (6) months prior to running a temperature decay progression sequence of logs.

1. With the printed log, also provide raw data for both logging runs (at least one data reading per foot depth) unless the logging truck is equipped with an analog panel as the processing device.

2. The heading on the log must be complete and include all the pertinent information, such as correct well name, location, elevations, etc.

3. The total shut-in times must be clearly shown in the heading. Minimum shut-in time for active injectors is twelve (12) hours for running the initial temperature log, followed by a second log, a minimum of four (4) hours later. These two log runs will be superimposed on the same track for final presentation.

4. The logging speed must be kept between twenty (20) and fifty (50) feet per minute (30 ft/min optimum) for both logs. The temperature sensor should be located as close to the bottom of the tool string as possible (logging downhole).

5. The vertical depth scale of the log should be one (1) or two (2) inches per one-hundred (100) feet to match lithology logs (see 7(b)). The horizontal temperature scale should be no more than one Fahrenheit degree per inch spacing.

6. The right hand tracks must contain the "absolute" temperature and the "differential" temperature curves with both log runs identified and clearly superimposed for comparison and interpretation purposes.

7. The left hand tracks must contain (unless impractical, but EPA must pre-approve any deviations):

(a) a collar locator log,

(b) a lithology log which includes either:

(i) an historic Gamma Ray that is "readable", i.e. one that demonstrates lithologic changes without either excessive activity by the needle or severely dampened responses; or

(ii) a copy of an original spontaneous potential (SP) curve from either the subject well or from a representative, nearby well.

(c) A clear identification on the log showing the base of the lowermost Underground Source of Drinking Water (USDW). A USDW is basically a formation that contains less than ten thousand (10,000) parts per million (ppm) Total Dissolved Solids (TDS) and is further defined in 40 CFR §144.3.

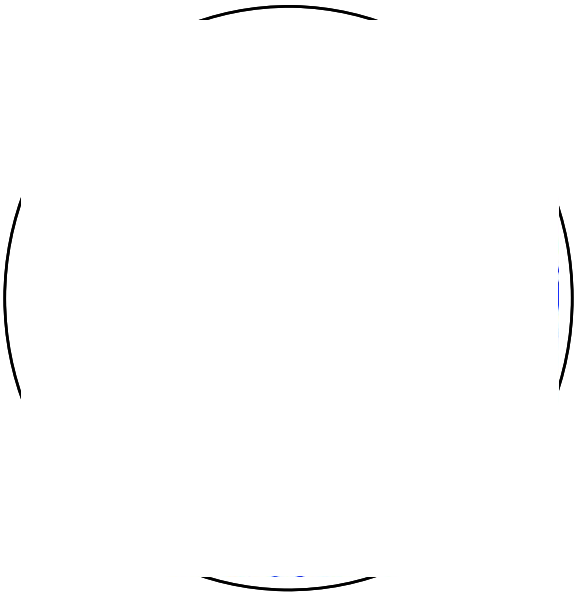
APPENDIX E

EPA Region 9 UIC Pressure Falloff Requirements

UIC Permit R9UIC-CA1-FY17-1R

EPA Region 9
UIC PRESSURE FALLOFF REQUIREMENTS

Condensed version of the EPA Region 6
UIC PRESSURE FALLOFF TESTING GUIDELINE
Third Revision



August 8, 2002

TABLE OF CONTENTS

APPENDIX

Semilog Plot Determination of the Appropriate Time Function for the Semilog Plot
Parameter Calculations and Considerations
Skin
Radius of Investigation
Effective Wellbore Radius
Reservoir Injection Pressure Corrected for Skin Effects
Determination of the Appropriate Fluid Viscosity
Reservoir Thickness
Use of Computer Software
Common Sense Check

REQUIREMENTS

UIC PRESSURE FALLOFF TESTING GUIDELINE
Third Revision
August 8, 2002

1.0 Background

Region 9 has adopted the Region 6 UIC Pressure Falloff Testing Guideline requirements for monitoring Class 1 Non Hazardous waste disposal wells. Under 40 CFR 146.13(d)(1), operators are required annually to monitor the pressure buildup in the injection zone, including at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure falloff curve.

All of the following parameters (Test, Period, Analysis) are critical for evaluation of technical adequacy of UIC permits:

A falloff **test** is a pressure transient test that consists of shutting in an injection well and measuring the pressure falloff. The falloff **period** is a replay of the injection preceding it; consequently, it is impacted by the magnitude, length, and rate fluctuations of the injection period. Falloff testing **analysis** provides transmissibility, skin factor, and well flowing and static pressures.

2.0 Purpose of Guideline

This guideline has been adopted by the Region 9 office of the Evironmental Protection Agency (EPA) to assist operators in **planning and conducting** the falloff test and preparing the **annual monitoring report**.

Falloff tests provide reservoir pressure data and characterize both the injection interval reservoir and the completion condition of the injection well. Both the reservoir parameters and pressure data are necessary for UIC permit demonstrations. Additionally, a valid falloff test is a monitoring requirement under 40 CFR Part 146 for all Class I injection wells.

The ultimate responsibility of conducting a valid falloff test is the task of the operator. Operators should QA/QC the pressure data and test results to confirm that the results “make sense” prior to submission of the report to the EPA for review.

3.0 Timing of Falloff Tests and Report Submission

Falloff **tests** must be conducted annually. The time **interval** for each test should not be less than 9 months or greater than 15 months from the previous test. This will ensure that the tests will be performed at relatively even intervals.

The falloff testing **report** should be submitted no later than 60 days following the test. Failure to submit a falloff test report will be considered a violation and may result in an enforcement action. Any exceptions should be approved by EPA prior to conducting the test.

4.0 Falloff Test Report Requirements

In general, the **report** to EPA should provide:

(1) general information and an overview of the falloff test,
(2) an analysis of the pressure data obtained during the test,
(3) a summary of the test results, and
(4) a comparison of those results with previously used parameters.

Some of the following operator and well data will not change so once acquired, it can be copied and submitted with each annual report. The **falloff test report** should include the following information:

1. **Company name and address**
2. **Test well name and location**
3. The name and phone number of **the facility contact person**. The contractor contact may be included if approved by the facility in addition to a facility contact person.
4. **A photocopy of an openhole log** (SP or Gamma Ray) through the injection interval illustrating the type of formation and thickness of the injection interval. The entire log is not necessary.
5. **Well schematic** showing the current wellbore configuration and completion information:
   - X Wellbore radius
   - X Completed interval depths
   - X Type of completion (perforated, screen and gravel packed, openhole)
6. **Depth of fill depth and date tagged.**
7. **Offset well information:**
   - X Distance between the test well and offset well(s) completed in the same interval or involved in an interference test
   - X Simple illustration of locations of the injection and offset wells
8. **Chronological listing of daily testing activities.**
9. **Electronic submission of the raw data (time, pressure, and temperature)** from all pressure gauges utilized on CD-ROM. A READ.ME file or the disk label should list all files included and any necessary explanations of the data. A separate file containing any

edited data used in the analysis can be submitted as an additional file.

10. **Tabular summary of the injection rate or rates preceding the falloff test.** At a minimum, rate information for 48 hours prior to the falloff or for a time equal to twice the time of the falloff test is recommended. If the rates varied and the rate information is greater than 10 entries, the rate data should be submitted electronically as well as a hard copy of the rates for the report. Including a rate vs time plot is also a good way to illustrate the magnitude and number of rate changes prior to the falloff test.
11. **Rate information from any offset wells completed in the same interval.** At a minimum, the injection rate data for the 48 hours preceding the falloff test should be included in a tabular and electronic format. Adding a rate vs time plot is also helpful to illustrate the rate changes.
12. **Hard copy of the time and pressure data** analyzed in the report.
13. **Pressure gauge information:** (See Appendix, page A-1 for more information on pressure gauges)
    - X List all the gauges utilized to test the well
    - X Depth of each gauge
    - X Manufacturer and type of gauge. Include the full range of the gauge.
    - X Resolution and accuracy of the gauge as a % of full range.
    - X Calibration certificate and manufacturer's recommended frequency of calibration
14. **General test information:**
    - X Date of the test
    - X Time synchronization: A specific time and date should be synchronized to an equivalent time in each pressure file submitted. Time synchronization should also be provided for the rate(s) of the test well and any offset wells.
    - X Location of the shut-in valve (e.g., note if at the wellhead or number of feet from the wellhead)
15. **Reservoir parameters (determination):**
    - X Formation fluid viscosity, μ_f cp (direct measurement or correlation)
    - X Porosity, φ fraction (well log correlation or core data)
    - X Total compressibility, c_t psi^{-1} (correlations, core measurement, or well test)
    - X Formation volume factor, rvb/stb (correlations, usually assumed 1 for water)
    - X Initial formation reservoir pressure - See Appendix, page A-1
    - X Date reservoir pressure was last stabilized (injection history)
    - X Justified interval thickness, h ft - See Appendix, page A-15
16. **Waste plume:**
    - X Cumulative injection volume into the completed interval
    - X Calculated radial distance to the waste front, r_{waste} ft
    - X Average historical waste fluid viscosity, if used in the analysis, μ_{waste} cp

17. **Injection period:**
    - X Time of injection period
    - X Type of test fluid
    - X Type of pump used for the test (e.g., plant or pump truck)
    - X Type of rate meter used
    - X Final injection pressure and temperature
18. **Falloff period:**
    - X Total shut-in time, expressed in real time and Δt, elapsed time
    - X Final shut-in pressure and temperature
    - X Time well went on vacuum, if applicable
19. **Pressure gradient:**
    - X Gradient stops - for depth correction
20. **Calculated test data:** include all equations used and the parameter values assigned for each variable within the report
    - X Radius of investigation, r_i ft
    - X Slope or slopes from the semilog plot
    - X Transmissibility, kh/μ md-ft/cp
    - X Permeability (range based on values of h)
    - X Calculation of skin, s
    - X Calculation of skin pressure drop, ΔP_{skin}
    - X Discussion and justification of any reservoir or outer boundary models used to simulate the test
    - X Explanation for any pressure or temperature anomaly if observed
21. **Graphs:**
    - X Cartesian plot: pressure and temperature vs. time
    - X Log-log diagnostic plot: pressure and semilog derivative curves. Radial flow regime should be identified on the plot
    - X Semilog and expanded semilog plots: radial flow regime indicated and the semilog straight line drawn
    - X Injection rate(s) vs time: test well and offset wells (not a circular or strip chart)
22. **A copy of the latest radioactive tracer run** and a brief discussion of the results.

5.0 Planning

The **radial flow portion** of the test is the basis for all pressure transient calculations. Therefore the injectivity and falloff portions of the test should be designed not only to reach radial flow, but to sustain a time frame sufficient for analysis of the radial flow period.

General Operational Concerns

X Adequate storage for the waste should be ensured for the duration of the test

X Offset wells completed in the same formation as the test well should be shut-in, or at a minimum, provisions should be made to maintain a constant injection rate prior to and during the test

X Install a crown valve on the well prior to starting the test so the well does not have to be shut-in to install a pressure gauge

X The location of the shut-in valve on the well should be at or near the wellhead to minimize the wellbore storage period

X The condition of the well, junk in the hole, wellbore fill or the degree of wellbore damage (as measured by skin) may impact the length of time the well must be shut-in for a valid falloff test. This is especially critical for wells completed in relatively low transmissibility reservoirs or wells that have large skin factors.

X Cleaning out the well and acidizing may reduce the wellbore storage period and therefore the shut-in time of the well

X Accurate recordkeeping of injection rates is critical including a mechanism to synchronize times reported for injection rate and pressure data. The elapsed time format usually reported for pressure data does not allow an easy synchronization with real time rate information. Time synchronization of the data is especially critical when the analysis includes the consideration of injection from more than one well.

X Any unorthodox testing procedure, or any testing of a well with known or anticipated problems, should be discussed with EPA staff prior to performing the test.

X If more than one well is completed into the same reservoir, operators are encouraged to send at least two pulses to the test well by way of rate changes in the offset well following the falloff test. These pulses will demonstrate communication between the wells and, if maintained for sufficient duration, they can be **analyzed as an interference test** to obtain interwell reservoir parameters.

Site Specific Pretest Planning

1. Determine the time needed to reach radial flow during the injectivity and falloff portions of the test:
   - X Review previous welltests, if available
   - X Simulate the test using measured or estimated reservoir and well completion parameters
   - X Calculate the time to the beginning of radial flow using the empirically-based equations provided in the Appendix. The equations are different for the injectivity and falloff portions of the test with the skin factor influencing the falloff more than the injection period. (See Appendix, page A-4 for equations)
   - X Allow adequate time beyond the beginning of radial flow to observe radial flow so that a well developed semilog straight line occurs. A good rule of thumb is 3 to 5 times the time to reach radial flow to provide adequate radial flow data for analysis.

2. Adequate and consistent injection fluid should be available so that the injection rate into the test well can be held constant prior to the falloff. This rate should be high enough to

produce a measurable falloff at the test well given the resolution of the pressure gauge selected. The viscosity of the fluid should be consistent. Any mobility issues (k/μ) should be identified and addressed in the analysis if necessary.

3. Bottomhole pressure measurements are required. (See Appendix, page A-2 for additional information concerning pressure gauge selection.)

4. Use two pressure gauges during the test with one gauge serving as a backup, or for verification in cases of questionable data quality. The two gauges do not need to be the same type. (See Appendix, page A-1 for additional information concerning pressure gauges.)

6.0 Conducting the Falloff Test

1. Tag and record the depth to any fill in the test well

2. Simplify the pressure transients in the reservoir
   - X Maintain a constant injection rate in the test well prior to shut-in. This injection rate should be high enough and maintained for a sufficient duration to produce a measurable pressure transient that will result in a valid falloff test.
   - X Offset wells should be shut-in prior to and during the test. If shut-in is not feasible, a constant injection rate should be recorded and maintained during the test and then accounted for in the analysis.
   - X Do not shut-in two wells simultaneously or change the rate in an offset well during the test.

3. The test well should be shut-in <u>at the wellhead</u> in order to minimize wellbore storage and afterflow. (See Appendix, page A-3 for additional information.)

4. Maintain accurate rate records for the test well and any offset wells completed in the same injection interval.

5. Measure and record the viscosity of the injectate periodically during the injectivity portion of the test to confirm the consistency of the test fluid.

7.0 Evaluation of the Falloff Test

1. Prepare a **Cartesian plot** of the pressure and temperature versus real time or elapsed time.
   - X Confirm pressure stabilization prior to shut-in of the test well
   - X Look for anomalous data, pressure drop at the end of the test, determine if pressure drop is within the gauge resolution

2. Prepare a **log-log diagnostic plot** of the pressure and semilog derivative. Identify the

flow regimes present in the welltest. (See Appendix, page A-6 for additional information.)

- X Use the appropriate time function depending on the length of the injection period and variation in the injection rate preceding the falloff (See Appendix, page A-10 for details on time functions.)
- X **Mark the various flow regimes** - particularly the radial flow period
- X Include the derivative of other plots, if appropriate (e.g., square root of time for linear flow)
- X If there is no radial flow period, attempt to type curve match the data

3. Prepare a **semilog plot**.
   - X Use the appropriate time function depending on the length of injection period and injection rate preceding the falloff
   - X Draw the semilog straight line through the radial flow portion of the plot and obtain the slope of the line
   - X Calculate the transmissibility, kh/μ
   - X Calculate the skin factor, s, and skin pressure drop, ΔP_{skin}
   - X Calculate the radius of investigation, r_i

4. Explain any anomalous results.

8.0 Technical References

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APPENDIX

Pressure Gauge Usage and Selection

Usage

X EPA recommends that two gauges be used during the test with one gauge serving as a backup.

X **Downhole pressure measurements** are less noisy and are required.

X A bottomhole surface readout gauge (SRO) allows tracking of pressures in real time. Analysis of this data can be performed in the field to confirm that the well has reached radial flow prior to ending the test.

X The derivative function plotted on the log-log plot amplifies noise in the data, so the use of a good pressure recording device is critical for application of this curve.

X Mechanical gauges should be **calibrated** before and after each test using a dead weight tester.

X Electronic gauges should also be **calibrated** according to the manufacturer's recommendations. The manufacturer's recommended frequency of calibration, and a copy of the gauge calibration certificate should be provided with the falloff testing report demonstrating this practice has been followed.

Selection

X The pressures must remain within the range of the pressure gauge. The larger percent of the gauge range utilized in the test, the better. Typical pressure gauge limits are 2000, 5000, and 10000 psi. Note that gauge accuracy and resolution are typically a function of percent of the full gauge range.

X Electronic downhole gauges generally offer much better resolution and sensitivity than a mechanical gauge but cost more. Additionally, the electronic gauge can generally run for a longer period of time, be programmed to measure pressure more frequently at various intervals for improved data density, and store data in digital form.

X Resolution of the pressure gauge must be sufficient to measure small pressure changes at the end of the test.

Test Design

General Operational Considerations

X The injection period controls what is seen on the falloff since the falloff is replay of the injection period. Therefore, the injection period must reach radial flow prior to shut-in of the well in order for the falloff test to reach radial flow

X Ideally to determine the optimal lengths of the injection and falloff periods, the test should be simulated using measured or estimated reservoir parameters. Alternatively, injection and falloff period lengths can be estimated from empirical equations using assumed reservoir and well parameters.

X The injection rate dictates the pressure buildup at the injection well. The pressure buildup from injection must be sufficient so that the pressure change during radial flow, usually occurring toward the end of the test, is large enough to measure with the pressure gauge selected.

X Waste storage and other operational issues require preplanning and need to be addressed prior to the test date. If brine must be brought in for the injection portion of the test, operators should insure that the fluid injected has a consistent viscosity and that there is adequate fluid available to obtain a valid falloff test. The use of the wastestream as the injection fluid affords several distinct advantages:

1. Brine does not have to be purchased or stored prior to use.
2. Onsite waste storage tanks may be used.
3. Plant wastestreams are generally consistent, i.e., no viscosity variations

X Rate changes cause pressure transients in the reservoir. **Constant rate injection in the test well and any offset wells completed in the same reservoir are critical to simplify the pressure transients in the reservoir.** Any significant injection rate fluctuations at the test well or offsets must be recorded and accounted for in the analysis using superposition.

X Unless an injectivity test is to be conducted, shutting in the well for an extend period of time prior to conducting the falloff test reduces the pressure buildup in the reservoir and is not recommended.

X Prior to conducting a test, a crown valve should be installed on the wellhead to allow the pressure gauge to be installed and lowered into the well without any interruption of the injection rate.

X The wellbore schematic should be reviewed for possible obstructions located in the well that may prevent the use or affect the setting depth of a downhole pressure gauge. The fill depth in the well should also be reported. The fill depth may not only impact the depth of the gauge, but usually prolongs the wellbore storage period and depending on the type of fill, may limit the interval thickness by isolating some of the injection intervals. A wellbore cleanout or stimulation may be needed prior to conducting the test for the test to reach radial flow and obtain valid results.

X The location of the shut-in valve can impact the duration of the wellbore storage period. The shut-in valve should be located near the wellhead. Afterflow into the wellbore prolongs the wellbore storage period.

X The area geology should be reviewed prior to conducting the test to determine the thickness and type of formation being tested along with any geological features such as natural fractures, a fault, or a pinchout that should be anticipated to impact the test.

Wellbore and Reservoir Data Needed to Simulate or Analyze the Falloff Test

X Wellbore radius, r_w - from wellbore schematic

X Net thickness, h - See Appendix, page A-15
X Porosity, φ - log or core data
X Viscosity of formation fluid, μ_f - direct measurement or correlations
X Viscosity of waste, μ_{waste} - direct measurement or correlations
X Total system compressibility, c_t - correlations, core measurement, or well test
X Permeability, k - previous welltests or core data
X Specific gravity of injection fluid, s.g. - direct measurement
X Injection rate, q - direct measurement

Design Calculations

When simulation software is unavailable the test periods can be estimated from empirical equations. The following are set of steps to calculate the time to reach radial flow from empirically-derived equations:

1. Estimate the wellbore storage coefficient, C (bbl/psi). There are two equations to calculate the wellbore storage coefficient depending on if the well remains fluid filled (positive surface pressure) or if the well goes on a vacuum (falling fluid level in the well):
   a. Well remains fluid filled:

$$C = V_w \cdot c_{waste}$$

where, V_w is the total wellbore volume, bbls
c_{waste} is the compressibility of the injectate, psi^{-1}

   b. Well goes on a vacuum:

$$C = \frac{V_u}{\frac{\rho \cdot g}{144 \cdot g_c}}$$

where, V_u is the wellbore volume per unit length, bbls/ft
ρ is the injectate density, psi/ft
g and g_c are gravitational constants

2. Calculate the time to reach radial flow for both the injection and falloff periods. Two different empirically-derived equations are used to calculate the time to reach radial flow, $t_{radial\ flow}$, for the injectivity and falloff periods:
   a. Injectivity period:

$$t_{radial\,flow} > \frac{(200000 + 12000s) \cdot C}{\frac{k \cdot h}{\mu}} \quad hours$$

   b. Falloff period:

$$t_{radial\,flow} > \frac{170000 \cdot C \cdot e^{0.14 \cdot s}}{\frac{k \cdot h}{\mu}} \quad hours$$

The wellbore storage coefficient is assumed to be the same for both the injectivity and falloff periods. The skin factor, s, influences the falloff more than the injection period. Use these equations with caution, as they tend to fall apart for a well with a large

permeability or a high skin factor. Also remember, the welltest should not only reach radial flow, but also sustain radial flow for a timeframe sufficient for analysis of the radial flow period. As a rule of thumb, a timeframe sufficient for analysis is 3 to 5 times the time needed to reach radial flow.

3. As an alternative to steps 1 and 2, to look a specific distance "L" into the reservoir and possibly confirm the absence or existence of a boundary, the following equation can be used to estimate the time to reach that distance:

$$t_{boundary} = \frac{948 \cdot \phi \cdot \mu \cdot c_t \cdot L_{boundary}}{k} \quad hours$$

where, $L_{boundary}$ = feet to boundary
$t_{boundary}$ = time to boundary, hrs

Again, this is the time to reach a distance "L" in the reservoir. Additional test time is required to observe a fully developed boundary past the time needed to just reach the boundary. As a rule of thumb, to see a fully developed boundary on a log-log plot, allow at least 5 times the time to reach it. Additionally, for a boundary to show up on the falloff, it must first be encountered during the injection period.

4. Calculate the expected slope of the semilog plot during radial flow to see if gauge resolution will be adequate using the following equation:

$$m_{semilog} = \frac{162.6 \cdot q \cdot \mathbf{B}}{\frac{k \cdot h}{\mu}}$$

where, q = the injection rate preceding the falloff test, bpd
B = formation volume factor for water, rvb/stb (usually assumed to be 1)

Considerations for Offset Wells Completed in the Same Interval

Rate fluctuations in offset wells create additional pressure transients in the reservoir and complicate the analysis. Always try to simplify the pressure transients in the reservoir. Do not simultaneously shut-in an offset well and the test well. The following items are key considerations in dealing with the impact of offset wells on a falloff test:

X Shut-in all offset wells prior to the test
X If shutting in offset wells is not feasible, maintain a constant injection rate prior to and during the test
X Obtain accurate injection records of offset injection prior to and during the test
X At least one of the real time points corresponding to an injection rate in an offset well should be synchronized to a specific time relating to the test well
X **Following the falloff test in the test well, send at least two pulses from the offset well to the test well by fluctuating the rate in the offset well.** The pressure pulses can confirm communication between the wells and can be simulated in the analysis if observed at the test well. The pulses can also be analyzed as an interference test using an Ei type curve.

X If time permits, conduct an interference test to allow evaluation of the reservoir without the wellbore effects observed during a falloff test.

Falloff Test Analysis

In performing a falloff test analysis, a series of plots and calculations should be prepared to QA/QC the test, identify flow regimes, and determine well completion and reservoir parameters. Individual plots, flow regime signatures, and calculations are discussed in the following sections.

Cartesian Plot

X The pressure data prior to shut-in of the well should be reviewed on a Cartesian plot to confirm pressure stabilization prior to the test. A well that has reached radial flow during the injectivity portion of the test should have a consistent injection pressure.

X A Cartesian plot of the pressure and temperature versus real time or elapsed time should be the first plot made from the falloff test data. Late time pressure data should be expanded to determine the pressure drop occurring during this portion of the test. The pressure changes should be compared to the pressure gauges used to confirm adequate gauge resolution existed throughout the test. If the gauge resolution limit was reached, this timeframe should be identified to determine if radial flow was reached prior to reaching the resolution of the pressure gauge. Pressure data obtained after reaching the resolution of the gauge should be treated as suspect and may need to be discounted in the analysis.

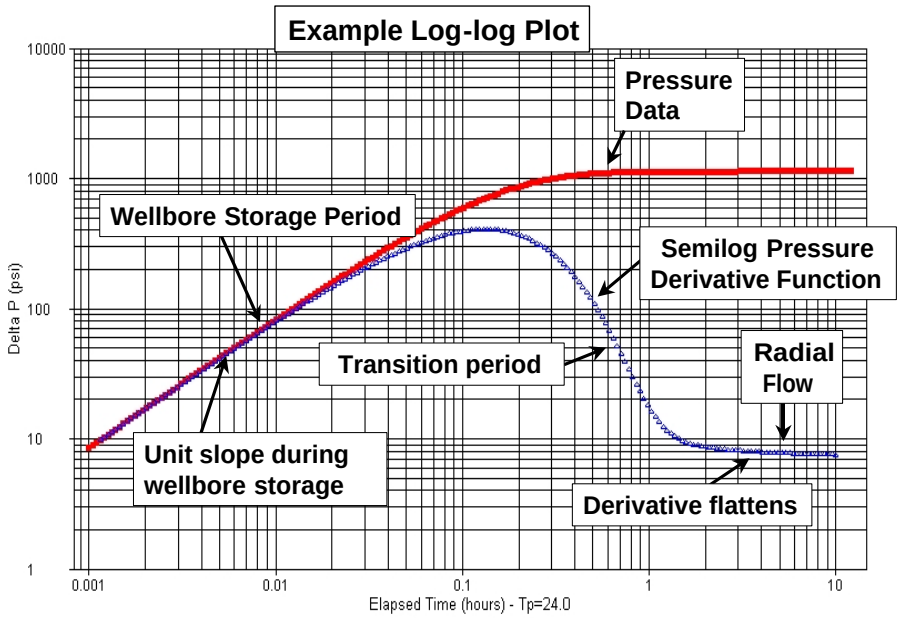
X **Falloff tests conducted in highly transmissive reservoirs** may be more sensitive to the temperature compensation mechanism of the gauge because the pressure buildup response evaluated is smaller. Region 6 has observed cases in which large temperature anomalies were not properly compensated for by the pressure gauge, resulting in erroneous pressure data and an incorrect analysis. For this reason, the Cartesian plot of the temperature data should be reviewed. **Any temperature anomalies should be noted to determine if they correspond to pressure anomalies.**

X Include the injection rate(s) of the test well 48 hours prior to shut-in on the Cartesian plot to illustrate the consistency of the injection rate prior to shut-in and to determine the appropriate time function to use on the log-log and semilog plots. (See Appendix, page A10 for time function selection)

Log-log Diagnostic Plot

X Plot the pressure and semilog derivative versus time on a log-log diagnostic plot. Use the appropriate time function based on the rate history of the injection period preceding the falloff. (See Appendix, page A-10 for time function selection) The log-log plot is used to identify the flow regimes present in the welltest.

An example log-log plot is shown below:



Identification of Test Flow Regimes

X Flow regimes are mathematical relationships between pressure, rate, and time. Flow regimes provide a visualization of what goes on in the reservoir. Individual flow regimes have characteristic slopes and a sequencing order on the log-log plot.

X Various flow regimes will be present during the falloff test, however, not all flow regimes are observed on every falloff test. The late time responses correlate to distances further from the test well. **The critical flow regime is radial flow from which all analysis calculations are performed.** During radial flow, the pressure responses recorded are representative of the reservoir, not the wellbore.

X The derivative function amplifies reservoir signatures by calculating a running slope of a designated plot. The derivative plot allows a more accurate determination of the radial flow portion of the test, in comparison with the old method of simply proceeding 1½ log cycles from the end of the unit slope line of the pressure curve.

X The derivative is usually based on the semilog plot, but it can also be calculated based on other plots such as a Cartesian plot, a square root of time plot, a quarter root of time plot, and the 1/square root of time plot. Each of these plots are used to identify specific flow regimes. If the flow regime characterized by a specialized plot is present then when the derivative calculated from that plot is displayed on the log-log plot, it will appear as a

"flat spot" during the portion of the falloff corresponding to the flow regime.

X **Typical flow regimes observed on the log-log plot** and their semilog derivative patterns are listed below:

Flow Regime	Semilog Derivative Pattern
Wellbore Storage	Unit slope
Radial Flow	Flat plateau
Linear Flow	Half slope
Bilinear Flow	Quarter slope
Partial Penetration	Negative half slope
Layering	Derivative trough
Dual Porosity	Derivative trough
Boundaries	Upswing followed by plateau
Constant Pressure	Sharp derivative plunge

Characteristics of Individual Test Flow Regimes

X **Wellbore Storage:**

1. Occurs during the early portion of the test and is caused by the well being shut-in at the surface instead of the sandface
2. Measured pressure responses are governed by well conditions and are not representative of reservoir behavior and are characterized by both the pressure and semilog derivative curves overlying a unit slope on the log-log plot
3. Wellbore skin or a low permeability reservoir results in a slower transfer of fluid from the well to the formation, extending the duration of the wellbore storage period
4. A wellbore storage dominated test is unanalyzable

X **Radial Flow:**

1. The pressure responses are from the reservoir, not the wellbore
2. The critical flow regime from which key reservoir parameters and completion conditions calculations are performed
3. Characterized by a flattening of the semilog plot derivative curve on the log-log plot and a straight line on the semilog plot

X **Spherical Flow:**

1. Identifies partial penetration of the injection interval at the wellbore
2. Characterized by the semilog derivative trending along a negative half slope on the log-log plot and a straight line on the 1/square root of time plot
3. The log-log plot derivative of the pressure vs 1/square root of time plot is flat

X **Linear Flow:**

1. May result from flow in a channel, parallel faults, or a highly conductive fracture
2. Characterized by a half slope on both the log-log plot pressure and semilog derivative curves with the derivative curve approximately 1/3 of a log cycle lower than the pressure curve and a straight line on the square root of time plot. 3. The log-log plot derivative of the pressure vs square root of time plot is flat

X **Hydraulically Fractured Well:**

1. Multiple flow regimes present including wellbore storage, fracture linear flow, bilinear flow, pseudo-linear flow, formation linear flow, and pseudo-radial flow
2. Fracture linear flow is usually hidden by wellbore storage
3. Bilinear flow results from simultaneous linear flows in the fracture and from the formation into the fracture, occurs in low conductivity fractures, and is characterized by a quarter slope on both the pressure and semilog derivative curves on the log-log plot and by a straight line on a pressure versus quarter root of time plot
4. Formation linear flow is identified by a half slope on both the pressure and semilog derivative curves on the log-log plot and by a straight line on a pressure versus square root of time plot
5. Psuedo-radial flow is analogous to radial flow in an unfractured well and is characterized by flattening of semilog derivative curve on the log-log plot and a straight line on a semilog pressure plot

X **Naturally Fractured Rock:**

1. The fracture system will be observed first on the falloff test followed by the total system consisting of the fractures and matrix.
2. The falloff analysis is complex. The characteristics of the semilog derivative trough on the log-log plot indicate the level of communication between the fractures and the matrix rock.

X **Layered Reservoir:**

1. Analysis of a layered system is complex because of the different flow regimes, skin factors or boundaries that may be present in each layer.
2. The falloff test objective is to get a total tranmissibility from the **whole reservoir system**.
3. Typically described as commingled (2 intervals with vertical separation) or crossflow (2 intervals with hydraulic vertical communication)

Semilog Plot

X The semilog plot is a plot of the pressure versus the log of time. There are typically four different semilog plots used in pressure transient and falloff testing analysis. After plotting the appropriate semilog plot, a straight line should be drawn through the points located within the equivalent radial flow portion of the plot identified from the log-log

plot.

X Each plot uses a different time function depending on the length and variation of the injection rate preceding the falloff. These plots can give different results for the same test, so it is important that the appropriate plot with the correct time function is used for the analysis. Determination of the appropriate time function is discussed below.

X The slope of the semilog straight line is then used to calculate the reservoir transmissibility - kh/μ, the completion condition of the well via the skin factor - s, and also the radius of investigation - r_i of the test.

Determination of the Appropriate Time Function for the Semilog Plot

The following four different semilog plots are used in pressure transient analysis:

1. Miller Dyes Hutchinson (MDH) Plot
2. Horner Plot
3. Agarwal Equivalent Time Plot
4. Superposition Time Plot

These plots can give different results for the same test. Use of the appropriate plot with the correct time function is critical for the analysis.

X The **MDH plot** is a semilog plot of pressure versus Δt, where Δt is the elapsed shut-in time of the falloff.

1. The MDH plot only applies to wells that reach psuedo-steady state during injection. Psuedo-steady state means the pressure response from the well has encountered all the boundaries around the well.
2. The MDH plot is only applicable to injection wells with a *very* long injection period at a constant rate. This plot is not recommended for use by EPA Region 6.

X The **Horner plot** is a semilog plot of pressure versus $(t_p+\Delta t)/\Delta t$. The Horner plot is only used for a falloff preceded by a single constant rate injection period.

1. The injection time, $t_p=V_p/q$ in hours, where V_p=injection volume since the last pressure equalization and q is the injection rate prior to shut-in for the falloff test. The injection volume is often taken as the cumulative injection since completion.

2. The Horner plot can result in significant analysis error if the injection rate varies prior to the falloff.

X The **Agarwal equivalent time plot** is a semilog plot of the pressure versus Agarwal equivalent time, Δt_e.

1. The Agarwal equivalent time function is similar to the Horner plot, but scales the falloff to make it look like an injectivity test.
2. It is used when the injection period is a short, constant rate compared to the length of the falloff period.
3. The Agarwal equivalent time is defined as: $\Delta t_e=\log(t_p\ \Delta t)/(t_p+\Delta t)$, where t_p is calculated the same as with the Horner plot.

X The **superposition time function** accounts for variable rate conditions preceding the falloff.

1. It is the most rigorous of all the time functions and is usually calculated using welltest software.
2. The use of the superposition time function requires the operator to accurately track the rate history. As a rule of thumb, at a minimum, the rate history for twice the length of the falloff test should be included in the analysis.

The determination of which time function is appropriate for the plotting the welltest on semilog and log-log plots depends on available rate information, injection period length, and software:

1. If there is not a rate history other than a single rate and cumulative injection, use a Horner time function
2. If the injection period is shorter than the falloff test and only a single rate is available, use the Agarwal equivalent time function
3. If you have a variable rate history use superposition when possible. As an alternative to superposition, use Agarwal equivalent time on the log-log plot to identify radial flow. The semilog plot can be plotted in either Horner or Agarwal time if radial flow is observed on the log-log plot.

Parameter Calculations and Considerations

X Transmissibility - The slope of the semilog straight line, m, is used to determine the transmissibility (kh/μ) parameter group from the following equation:

$$\frac{k \cdot h}{\mu} = \frac{162.6 \cdot q \cdot \mathbf{B}}{m}$$

where, q = injection rate, bpd (negative for injection)
B = formation volume factor, rvb/stb (Assumed to be 1 for formation fluid)
m = slope of the semilog straight line through the radial flow portion of the plot in psi/log cycle
k = permeability, md
h = thickness, ft (See Appendix, page A-15)
μ = viscosity, cp

X The viscosity, μ , is usually that of the formation fluid. However, if the waste plume size is massive, the radial flow portion of the test may remain within the waste plume. (See Appendix, page A-14)

1. The waste and formation fluid viscosity values usually are similar, however, if the wastestream has a significant viscosity difference, the size of the waste plume and distance to the radial flow period should be calculated.
2. The mobility, k/μ, differences between the fluids may be observed on the derivative curve.

X The permeability, k, can be obtained from the calculated transmissibility (kh/μ) by substituting the appropriate thickness, h, and viscosity, μ, values.

Skin Factor

X In theory, wellbore skin is treated as an infinitesimally thin sheath surrounding the wellbore, through which a pressure drop occurs due to either damage or stimulation. Industrial injection wells deal with a variety of waste streams that alter the near wellbore environment due to precipitation, fines migration, ion exchange, bacteriological processes, and other mechanisms. It is reasonable to expect that this alteration often exists as a zone surrounding the wellbore and not a skin. Therefore, at least in the case of industrial injection wells, the assumption that skin exists as a thin sheath is not always valid. This does not pose a serious problem to the correct interpretation of falloff testing except in the case of a large zone of alteration, or in the calculation of the flowing bottomhole pressure. Region 6 has seen instances in which large zones of alteration were suspected of being present.

X The skin factor is the measurement of the completion condition of the well. The skin factor is quantified by a positive value indicating a damaged completion and a negative value indicating a stimulated completion.

1. The magnitude of the positive value indicating a damaged completion is dictated by the transmissibility of the formation.
2. A negative value of -4 to -6 generally indicates a hydraulically fractured completion, whereas a negative value of -1 to -3 is typical of an acid stimulation in a sandstone reservoir.
3. The skin factor can be used to calculate the effective wellbore radius, r_{wa} also referred to the apparent wellbore radius. (See Appendix, page A-13)
4. The skin factor can also be used to correct the injection pressure for the effects of wellbore damage to get the actual reservoir pressure from the measured pressure.

X The skin factor is calculated from the following equation:

$$s = 1.1513\left[\frac{P_{1hr} - P_{wf}}{m} - \log\left(\frac{k \cdot t_p}{\left(t_p + 1\right)\cdot \phi \cdot \mu \cdot c_t \cdot r_w^2}\right) + 3.23\right]$$

where, s = skin factor, dimensionless

P_{1hr} = pressure intercept along the semilog straight line at a shut-in time of 1 hour, psi

P_{wf} = measured injection pressure prior to shut-in, psi

μ = appropriate viscosity at reservoir conditions, cp (See Appendix, page A-14)

m = slope of the semilog straight line, psi/cycle

k = permeability, md

φ = porosity, fraction

c_t = total compressibility, psi^{-1}

r_w = wellbore radius, feet

t_p = injection time, hours

Note that the term $t_p/(t_p + \Delta t)$, where Δt=1 hr, appears in the log term. This term is usually assumed to result in a negligible contribution and typically is taken as 1 for large t. However, for relatively short injection periods, as in the case of a drill stem test (DST), this term can be significant.

Radius of Investigation

X The radius of investigation, r_i, is the distance the pressure transient has moved into a formation following a rate change in a well.

X There are several equations that exist to calculate the radius of investigation. All the equations are square root equations based on cylindrical geometry, but each has its own coefficient that results in slightly different results, (See Oil and Gas Journal, Van Poollen, 1964).

X Use of the appropriate time is necessary to obtain a useful value of r_i. For a falloff time shorter than the injection period, use Agarwal equivalent time function, Δt_e, at the end of the falloff as the length of the injection period preceding the shut-in to calculate r_i.

X The following two equivalent equations for calculating r_i were taken from SPE Monograph 1, (Equation 11.2) and Well Testing by Lee (Equation 1.47), respectively:

$$r_i = \sqrt{0.00105\frac{k \cdot t}{\phi \cdot \mu \cdot c_t}} \equiv \sqrt{\frac{k \cdot t}{948 \cdot \phi \cdot \mu \cdot c_t}}$$

Effective Wellbore Radius

X The effective wellbore radius relates the wellbore radius and skin factor to show the effects of skin on wellbore size and consequently, injectivity.

X The effective wellbore radius is calculated from the following:

$$r_{wa} = r_w e^{-s}$$

X A negative skin will result in a larger effective wellbore radius and therefore a lower injection pressure.

Reservoir Injection Pressure Corrected for Skin Effects

X The pressure correction for wellbore skin effects, ΔP_{skin}, is calculated by the following:

$$\Delta P_{skin} = 0.868 \cdot m \cdot s$$

where, m = slope of the semilog straight line, psi/cycle
s = wellbore skin, dimensionless

X The adjusted injection pressure, P_{wfa} is calculated by subtracting the ΔP_{skin} from the measured injection pressure prior to shut-in, P_{wf}. This adjusted pressure is the calculated reservoir pressure prior to shutting in the well, $\Delta t=0$, and is determined by the following:

$$P_{wfa} = P_{wf} - \Delta P_{skin}$$

X From the previous equations, it can be seen that the adjusted bottomhole pressure is directly dependent on a single point, the last injection pressure recorded prior to shut-in. Therefore, an accurate recording of this pressure prior to shut-in is important. Anything that impacts the pressure response, e.g., rate change, near the shut-in of the well should be avoided.

Determination of the Appropriate Fluid Viscosity

X If the wastestream and formation fluid have similar viscosities, this process is not necessary.

X This is only needed in cases where the mobility ratios are extreme between the wastestream, $(k/\mu)_w$, and formation fluid, $(k/\mu)_f$. Depending on when the test reaches radial flow, these cases with extreme mobility differences could cause the derivative curve to change and level to another value. Eliminating alternative geologic causes, such as a sealing fault, multiple layers, dual porosity, etc., leads to the interpretation that this change may represent the boundary of the two fluid banks.

X First assume that the pressure transients were propagating through the formation fluid during the radial flow portion of the test, and then verify if this assumption is correct. This is generally a good strategy except for a few facilities with exceptionally long injection histories, and consequently, large waste plumes. The time for the pressure transient to exit the waste front is calculated. This time is then identified on both the log-log and semilog plots. The radial flow period is then compared to this time.

X The radial distance to the waste front can then be estimated volumetrically using the following equation:

$$r_{waste\ plume} = \sqrt{\frac{0.13368 \cdot V_{waste injected}}{\pi \cdot h \cdot \phi}}$$

where, $V_{waste\ injected}$ = cumulative waste injected into the completed interval, gal
$r_{waste\ plume}$ = estimated distance to waste front, ft
h = interval thickness, ft
φ = porosity, fraction

X The time necessary for a pressure transient to exit the waste front can be calculated using the following equation:

$$t_w = \frac{126.73 \cdot \mu_w \cdot c_t \cdot V_{waste injected}}{\pi \cdot k \cdot h}$$

where, t_w= time to exit waste front, hrs
$V_{waste\ injected}$ = cumulative waste injected into the completed interval, gal
h = interval thickness, ft
k = permeability, md
μ_w = viscosity of the historic waste plume at reservoir conditions, cp
c_t = total system compressibility, psi^{-1}

X The **time should be plotted on both the log-log and semilog plots** to see if this time corresponds to any changes in the derivative curve or semilog pressure plot. If the time estimated to exit the waste front occurs before the start of radial flow, the assumption that the pressure transients were propagating through the reservoir fluid during the radial flow period was correct. Therefore, the viscosity of the reservoir fluid is the appropriate viscosity to use in analyzing the well test. If not, the viscosity of the historic waste plume should be used in the calculations. If the mobility ratio is extreme between the wastestream and formation fluid, adequate information should be included in the report to verify the appropriate fluid viscosity was utilized in the analysis.

Reservoir Thickness

X The thickness used for determination of the permeability should be justified by the operator. The net thickness of the defined injection interval is not always appropriate.

X The permeability value is necessary for plume modeling, but the transmissibility value, kh/μ, can be used to calculate the pressure buildup in the reservoir without specifying values for each parameter value of k, h, and μ.

X Selecting an interval thickness is dependent on several factors such as whether or not the injection interval is composed of hydraulically isolated units or a single massive unit and wellbore conditions such as the depth to wellbore fill. When hydraulically isolated sands

are present, it may be helpful to define the amount of injection entering each interval by conducting a flow profile survey. Temperature logs can also be reviewed to evaluate the intervals receiving fluid. Cross-sections may provide a quick look at the continuity of the injection interval around the injection well.

X A copy of a SP/Gamma Ray well log over the injection interval, the depth to any fill, and the log and interpretation of available flow profile surveys run should be submitted with the falloff test to verify the reservoir thickness value assumed for the permeability calculation.

Use of Computer Software

X To analyze falloff tests, operators are encouraged to use well testing software. Most software has type curve matching capabilities. This feature allows the simulation of the entire falloff test results to the acquired pressure data. This type of analysis is particularly useful in the recognition of boundaries, or unusual reservoir characteristics, such as dual porosity. It should be noted that type curve matching is not considered a substitute, but is a compliment to the analysis.

X All data should be submitted on a CD-ROM with a label stating the name of the facility, the well number(s), and the date of the test(s). The label or READ.Me file should include the names of all the files contained on the CD, along with any necessary explanations of the information. The parameter units format (hh:mm:ss, hours, etc.) should be noted for the pressure file for synchronization to the submitted injection rate information. The file containing the gauge data analyzed in the report should be identified and consistent with the hard copy data included in the report. If the injection rate information for any well included in the analysis is greater than 10 entries, it should also be included electronically.

Common Sense Check

X After analyzing any test, always look at the results to see if they “make sense” based on the type of formation tested, known geology, previous test results, etc. Operators are ultimately responsible for conducting an analyzable test and the data submitted to the regulatory agency.

X If boundary conditions are observed on the test, review cross-sections or structure maps to confirm if the presence of a boundary is feasible. If so, the boundary should be considered in the AOR pressure buildup evaluation for the well.

X Anomalous data responses may be observed on the falloff test analysis. These data anomalies should be evaluated and explained. The analyst should investigate physical causes in addition to potential reservoir responses. These may include those relating to the well equipment, such as a leaking valve, or a channel, and those relating to the data

acquisition hardware such as a faulty gauge. An anomalous response can often be traced to a brief, but significant rate change in either the test well or an offset well.

X Anomalous data trends have also been caused by such things as ambient temperature changes in surface gauges or a faulty pressure gauge. Explanations for data trends may be facilitated through an examination of the backup pressure gauge data, or the temperature data. It is often helpful to qualitatively examine the pressure and/or temperature channels from both gauges. The pressure data should overlay during the falloff after being corrected for the difference in gauge depths. On occasion, abrupt temperature changes can be seen to correspond to trends in the pressure data. Although the source of the temperature changes may remain unexplainable, the apparent correlation of the temperature anomaly to the pressure anomaly can be sufficient reason to question the validity of the test and eliminate it from further analysis.

X The data that is obtained from pressure transient testing should be compared to permit parameters. Test derived transmissibilities and static pressures can confirm compliance with non-endangerment (Area Of Review) conditions.

APPENDIX F

EPA Region 9 Step Rate Test Procedure Guidelines

UIC Permit R9UIC-CA1-FY17-1R

Refer also to:

Society of Petroleum Engineers (SPE) Paper #16798, Systematic Design and Analysis of Step-Rate Tests to Determine Formation Parting Pressure

(This paper can be ordered from the SPE website.)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
DRINKING WATER PROTECTION
75 HAWTHORNE STREET
SAN FRANCISCO, CA 94105

STEP-RATE TEST PROCEDURE GUIDELINES

PURPOSE:

The purpose of the document is to provide guidelines for performing a Step-Rate Test (SRT). Test results shall be used by the EPA Region 9 (EPA) Underground Injection Control (UIC) offices to determine a Maximum Allowable Injection Pressure (MAIP) at the wellhead that will provide for the protection of underground sources of drinking water (USDW) at injections wells.

A detailed work plan proposal must be submitted to EPA for review and approval prior to the SRT being performed. The work plan must include detailed plans, supporting justifications and associated calculations for conducting the SRT. Refer to the Society of Petroleum Engineers ("SPE") paper 16798 for supporting test design and analysis guidance (1987, Society of Petroleum Engineers).

Dialogue is expected and encouraged during the actual development of the work plan. EPA will review the work plan proposal and will send written communications either to request clarification or changes to the proposed work, or grant approval of the proposed work. Once the SRT plan is approved, we require at least 30 days' notice in advance of SRT operations so we may schedule an EPA representative to witness the SRT.

Test results will be used by Region 9's Underground Injection Control permitting program to determine a Maximum Allowable Injection Pressure (MAIP) which is the surface pressure that correlates to (a) 80 percent of the bottom hole pressure (BHP) that represents the Formation Parting Pressure (FPP) of the permitted injection zone, or, (b) 80 percent of the maximum pressure applied during SRTs in which the FPP was not achieved. This determination serves to provide for the protection of the Underground Sources of Drinking Water (USDWs) as required by the regulations at 40 CFR §§ 146.12(e)(3) (fracture pressure) and 146.14(b)(3) (the anticipated maximum pressure and flow rate at which the permittee will operate).

SRT results must be documented and the test should be witnessed by an EPA inspector who can assist in approving real-time modifications.

RECOMMENDED TEST PROCEDURES:

1) The well should be shut in long enough prior to testing such that the BHP approximates static formation pressures.

2) It is important to use equipment that will be capable of accurately controlled pumping rates at varying amounts and exceeding the estimated Formation Parting Pressure (FPP) or alternately,

equipment that will exceed the operator's equipment limitations by 120%. Operator must also ensure that sufficient water will be available onsite to complete the SRT. The water used for the SRT may be the operator's permitted wastewater or other water with known specific gravity.

3) Measure and record test pressures with both down-hole and surface pressure recorders. Observe, record, and synchronize surface and BHP pressures, times, dates, and injection rates for each increment (step) of the test. The BHP behavior will be the basis for the determination of FPP. Surface pressures will also be observed to monitor pressure versus rate behavior during the SRT and to determine pressure losses due to friction and other factors that affect the MAIP.

4) The step intervals must be of equal duration and their duration must be of no less than the minimum 30 minutes. Engineering based justification of the planned duration for the steps is required. Steps must be sufficiently long to overcome well bore storage effects and achieve or clearly demonstrate a stabilized pressure (radial flow) at the end of each timed step.

5) The SRT should proceed continuously and uninterrupted, with minimally delayed transition between steps. The SRT must be planned to provide at least 3 to 5 steps before reaching the expected FPP and at least 3 additional steps after exceeding the FPP. Alternatively, the SRT must exceed the BHP that occurs at the operator's maximum equipment surface pressure limitation by at least 120 percent of that corresponding BHP.

6) Because a surface readout of the BHP is employed, the duration of the planned injection rate increments may be modified during the initial part of the test. This will allow, for instance, an initial determination whether modification of the subsequent rate increments may be necessary to obtain at least three BHP data points above the FPP or to adequately exceed the proposed operator's maximum equipment limitation before concluding the test. The well operator shall consult and receive approval from the onsite EPA inspector before any modifications to the plan are implemented during ongoing SRT operations.

7) After pumping stops, observe and record (a) the instantaneous shut-in pressure (ISIP) and (b) the injection zone's pressure fall-off decline for a sufficient time to allow a pressure transient analysis which shall be included in the operator's report. The length of time for pressure fall-off observation will be determined in consultation with EPA prior to conducting the SRT, but may be modified by EPA depending on the actual BHP fall-off behavior observed at the conclusion of the test.

APPENDIX G

Plugging and Abandonment Plans

WD-3 P&A Procedure

WD-6 and WD-7 P&A Proposed Procedure

UIC Permit R9UIC-CA1-FY17-1R

Exhibit 29

Abandonment Procedure for Existing Injection Well (WD-3) with Sand Control Liner

Note: Note: Notify DOGGR and EPA at least 60 days before scheduled abandonment. Submit a Notice of Intention to Abandon and obtain an Abandonment Permit from DOGGR prior to commencing abandonment activities. DOGGR and EPA to approve final abandonment procedure and witness abandonment work.

Referenced depths are below Rig Kelly bushing (RKB). RKB is approximately 13 feet above ground level.

1. MIRU coil tubing rig, portable tanks. Fill tank with fresh water. Remove wellhead, unload tubing, install & function test BOPE.

2. RIH and cut 5.5' injection tubing at 4,300' POOH and lay down 5.5" tubing and seal assembly.

3. RIH with 1.5" coil tubing string to 4,720' (**EPA to witness clean-out tag**).

4. Circulate clean the 3.5" (0.010G) 316L Stainless Steel Wire Wrapped Screen with perforated base pipe from 4,720' to 4,290'.

5. RIH and set 7" cement retainer at 4,290' – 10' above bottom hole completion assembly.

6. RIH with 1.5" coil tubing string and sting into 7" cement retainer. Begin to pump 56 ft^3 of Class G neat cement until sufficient back-pressure on the cement retainer bottom seal is obtained to close it.

7. Release CT from 7" cement retainer and pump 480 ft^3 of Class G neat cement slowing pull tubing up within the 7" injection casing based on displacement rate to 2,145' then SDFN

8. RIH, tag TOC (**EPA to witness**).

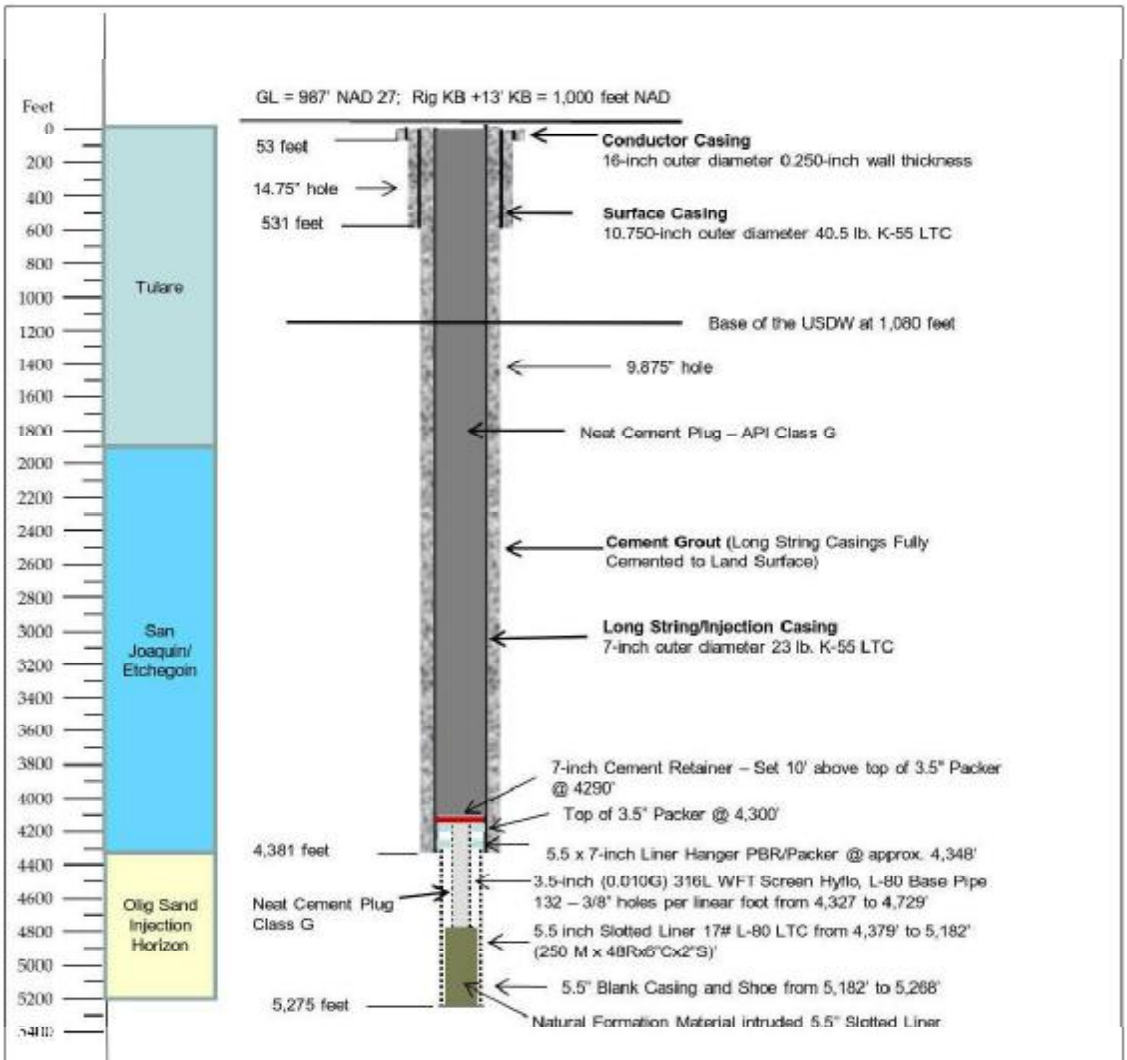
9. Move CT up 10' from TOC and pump 480 ft^3 of Class G neat cement slowing pull tubing up within the 7" injection casing based on displacement rate to surface.

10. Cut and retrieve 7" casing from 5' below surface.

11. Remove cellar. At ground level pour cement in all exposed annuli. Weld cap on well & install abandonment marker.

Notes:

BOPE = blowout preventer equipment
MIRU = move in and rig up
POOH = pull out of hole
RIH = run in hole
SDFN = shut down for night
TOC = top of cement



AECOM	CXA La Paloma Facility McKittrick, California	Plug and Abandonment Schematic Existing Well WD-3	Figure 1

Abandonment Procedure for Proposed New Injection Wells

Note: Notify DOGGR and EPA at least 60 days before scheduled abandonment. Submit a Notice of Intention to Abandon and obtain an Abandonment Permit from DOGGR prior to commencing abandonment activities. DOGGR and EPA to approve final abandonment procedure and witness abandonment work.

Referenced depths are below ground level.

1. MIRU coil tubing rig, portable tanks. Fill tank with fresh water. Remove wellhead, unload tubing, install & function test BOPE.

2. RIH and cut 5.5' injection tubing at 4,350' POOH and lay down 5.5" tubing and seal assembly.

3. RIH with 1.5" coil tubing to 5,300' (**EPA to witness clean-out tag**).

4. Circulate clean the 5.5" (0.010G) 316L Stainless Steel Wire Wrapped Screen with perforated base pipe from 5,300' to 4,340'.

5. RIH and set 7" cement retainer at 4,340' – 10' above bottom hole completion assembly.

6. RIH with 1.5" coil tubing string and sting into 7" cement retainer. Begin to pump 130 ft^3 of Class G neat cement until sufficient back-pressure on the cement retainer bottom seal is obtained to close it.

7. Release CT from 7" cement retainer and pump 485 ft^3 of Class G neat cement slowing pull tubing up within the 7" injection casing based on displacement rate to 2,170' then SDFN

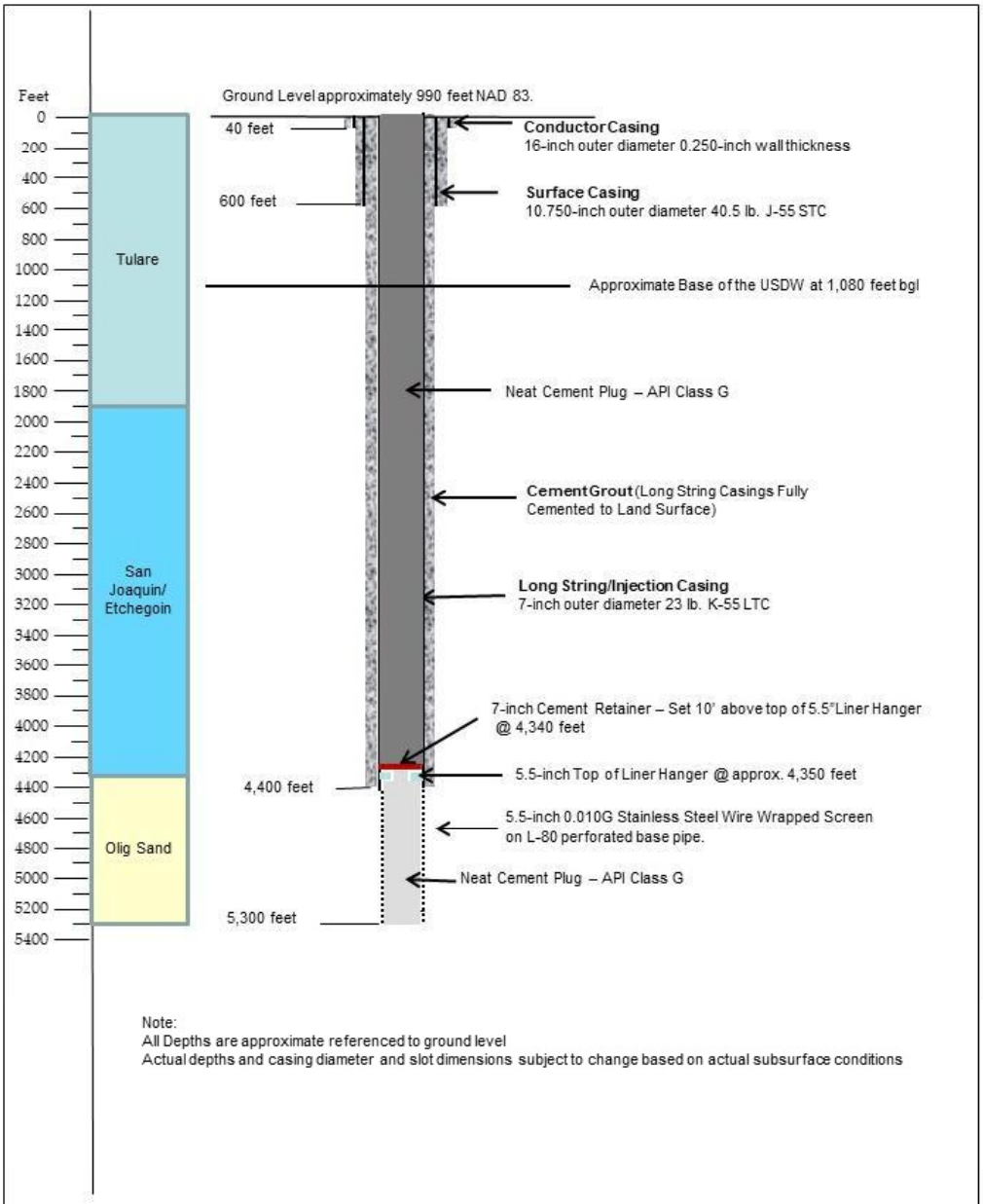
8. Wait on cement then RIH and tag TOC (EPA to witness).

9. Move CT up 10' from TOC and pump 485 ft^3 of Class G neat cement slowing pull tubing up within the 7" injection casing based on displacement rate to surface.

10. Cut and retrieve 7" casing from 5' below surface.

11. Remove cellar. At ground level pour cement in all exposed annuli. Weld cap on well & install abandonment marker

Notes:
BOPE – blowout preventer equipment
GL. – Ground Level
MIRU – move in and rig up
POOH – pull out of hole
RIH – run in hole
SDFN – shut down for night
TOC – top of cement



AECOM	CXA La Paloma Plant McKittrick, California	Plug and Abandonment Schematic Proposed Wells WD-6 & WD-7	Figure 2

APPENDIX H

Step Rate Test Report

WD-3 SRT Report, performed October 31, 2008

WD-3 SRT Addendum dated March 5, 2009

UIC Permit R9UIC-CA1-FY17-1R

La Paloma
Generating Plant

POB175 (Mail)
1760 W. Skyline Road (Deliveries)
McKittrick, CA 93251

661.762.6000
Fax: 661.762.6041

January 27, 2009

USEPA, Region IX
Water Division
Attn: Mr. Adam Freedman
Ground Water Office (Mail Code WTR-9)
75 Hawthorne Street
San Francisco, CA 94105-3901

Subject: UIC Well No. WD-3 Step Rate Test Report – October 31, 2008
UIC Permit No. CA10710001

Dear Mr. Freedman,

La Paloma Generating Company, LLC herewith submits the attached Step Rate Test (SRT) Report for UIC Well WD-3. The SRT conducted on October 31, 2008 was designed and analyzed in accordance with Society of Petroleum Engineering (SPE) Paper No. 16798 and UIC Permit No. CA10710001. Prior to the start of the test, the proposed SRT program was reviewed and approved by USEPA staff. We understand that following your review, the USEPA will prepare a letter and modifications to the UIC Permit.

Please call Zenis Walley at 661.762.6003 or Bill O'Braitis (URS) at 909.942.4114 if there are any questions or comments.

Sincerely,

Nick Park
Plant Manager
La Paloma Generating Plant

cc: w/ attachment Z. Walley P. Oseguera M. Wooten W. Riley
M. Fitzgerald (URS) B. O'Braitis (URS) D. Thompson (SJEC)
D. Patteson (CRWQCB) R. Thesken/R. Adams (DOGGR)
M. Dyas (CEC MS-2000)

w/o attachment T. Romesberg

File No. 704.04.08

UIC Well WD-3 Step Rate Test Report

October 31, 2008

On October 31, 2008, a Step Rate Test (SRT) was performed on La Paloma Generating Company injection well WD-3 to determine the formation fracture pressure and other hydraulic properties for the well. Eight injection rate steps were used: 1.1, 3.2, 4.0, 5.0, 6.0, 7.1, 8.1 and 9.0 barrels per minute (bbl/min) with each step lasting approximately 30 minutes except for the last step which ended at approximately 19 minutes duration. Following is a description of the method and the analysis of the SRT, conclusions and recommendations for operational injection pressures and rates.

Test Design

The test was designed around the anticipated injection rate for the disposal stream and the anticipated formation parting pressure (FPP), or fracture pressure for the top of the injection formation. The anticipated injection rate for the disposal stream was 320 gpm (7.3 bbl/min). The anticipated FPP was 3,156 psi calculated for the top of the injection formation (4,384 ft bgs) using a pressure gradient of 0.72 psi/ft. Formation permeability was estimated to be greater than 10 milidarcys (md).

Based on these design assumptions, the SRT was planned to have a 30 minute step increment, a starting injection rate of 1 bbl/min, and rate increases of 1 bbl/min progressing up through 8 or 9 bbl/min injection rate, depending on when fracture was observed.

The instrumentation used during the test consisted of downhole pressure transducers, digital flow meter, and surface pressure transducers. These surface pressure transducers were connected to the injection side and backside of the wellhead. The downhole pressure transducers included one wireline unit which reported downhole pressures to the surface real time (and was digitally recorded), and two in-hole data recorder units as redundant back up for during the SRT and to record shut-in pressure recovery overnight after the completion of the SRT. The surface instrumentation was part of the pump truck provided by BJ Services, Inc. These units (flow meter and pressure transducers) were connected to a digital recorder and provided real time data.

Field Test

Downhole gauges were set at 4,350 ft below ground surface (bgs) and the formation stabilized for a minimum of 1 hour. Downhole pressures were stable at approximately 1,430 psi for the stabilization period. Formation water was noted at 1,750 ft bgs during the insertion of the gauges. This equates to a static pressure gradient of 0.55 psi/ft for the water column and an overall formation static pressure gradient of 0.329 psi/ft. From this it was estimated a non-flowing static head to the surface would be approximately 2,392 psi (as measured at the transducers). The injection fluid was 3% KCl water.

Step 1 at 1 bbl/min showed stable downhole pressure after 10 minutes in at approximately 1,439 psi, and the step duration of 30 minutes was confirmed.

Step 1 to 2 bbl/min exhibited less than expected behavior in that roughly 10 minutes into this step, the well began to freely take on water (surface pressures dropped to 1 psi) and the pump rig could not maintain the rate at 2 bbl/min. During this step, power was not applied to the pump, and the injection rate increased under its own force to 3.3 bbl/min and stabilized for the remainder of this step. At this time, it was noted that the backside pressure (well annulus) was decreasing along with the injection string. Since the annulus was closed to the surface, it was concluded that fluctuations in the backside pressures would have minimal to no effect on the SRT data. The backside pressure continued to follow the injection pressure changes (surface pressures) throughout the duration of the test. On the following day (November 1, 2008), tests verified that pressure changes were related to an internal mechanical integrity issue.

The data from the Step 3 was apparently affected by the well behavior as the downhole pressures were lower at the end of this third step than at the end of the Step 2. Steps 4 through 8 generally behaved in a predictable manner, except the anticipated increase in downhole pressures were not seen. The maximum increase in downhole pressure seen through the end of the SRT was 49.63 psi.

The maximum downhole pressure recorded from the wireline transducer was 1,480.73 psi and occurred during the last step. Based on this pressure, the calculated maximum

formation pressure gradient is 0.34 psi/ft, which is well below the minimum expected fracture pressure gradient of 0.64 psi/ft for unconsolidated material (US EPA, TWG).

Surface (wellhead injection) pressures ranged between 1 psi to 222 psi during the SRT. The surface pressures measured during Step 9 (9 bbl/m) were between 122 and 177 psi. Head loss calculations were performed for the 2-inch diameter surface connection piping between the pump rig and the wellhead. The estimated connection pipe back pressure was approximately 100 psi at an injection rate of 8 bbl/min.

At the completion of the SRT the well was shut-in and the pressure response recorded. Although the downhole formation pressures quickly recovered close to static (pre-test) pressures, no obvious pressure drop relating to instantaneous shut in pressure (ISIP) was observed.

The anticipated surface wellhead pressures to achieve FPP were calculated. The calculation includes:

- friction head losses from wellhead to top of injection zone for the 5.5-inch injection liner of 76 ft H_2O,
- static formation head of - 4,340 ft H_2O, and
- the lower fracture gradient of 0.64 psi/ft for unconsolidated oil sands (6,416 ft H_2O).

The result of the calculation indicates that FPP may be achieved at a surface wellhead pressure of 930 psi. By applying a factor of safety of 80% to the calculated wellhead pressure, a conservative wellhead pressure to achieve FPP equates to 745 psi.

Methods

Conventional analysis of the SRT data was performed using methods presented in Society of Petroleum Engineers (SPE) publication 16798. This included the use of conventional and multi-rate analysis of the data. The conventional analysis assumes a steady-state Darcy flow into the injection well and, under ideal conditions, a simple plot of pressure verses rate will provide indication of FPP by a reduction in the slope of a best fit line through the end-of step data points. This reduction in slope relates to the opening of fractures which acts as additional fluid conductors. Although the fracture length continues to increase above the FPP, the plotting of a best fit line

through these points above FPP will extrapolate back to a pressure much higher than the static, or pretest pressure. If FPP is not reached during the SRT, this best fit line should extrapolate back to approximately the static, or pretest pressure.

Multi-rate pressure transient analysis is possible when continuous readout/recording devices are used and accurate injection rate data is available. This method is based on superposition (interpretation of overlapping data sets). SPE 16798 presents the Odeh and Jones method and Agarwal's method. These methods break down above FPP.

Additional Modeling

The components of observed drawdown in a pumping well was first described by Jacob (1947), and the step test was refined independently by Hantush (1964) and Bierschenk (1963) as consisting of two related components,

$$s = BQ + CQ^2,$$

where s is drawdown (units of length e.g., ft), Q is the pumping rate (units of volume flowrate e.g., ft^3/day), B is the aquifer loss coefficient (which increases with time — as predicted by the Theis solution) and C is the well loss coefficient (which is constant for a given flow rate).

The first term of the equation (BQ) describes the linear component of the drawdown; i.e., the part in which doubling the pumping rate doubles the drawdown.

The second term (CQ^2) describes what is often called the 'well losses', the non-linear component of the drawdown. To quantify this, it is necessary to pump the well at several different flow rates (commonly called *steps*).

To analyze this equation, both sides are divided by the discharge rate (Q), leaving s / Q on the left side, which is commonly referred to as *specific drawdown*. The right hand side of the equation becomes that of a straight line. Plotting the specific drawdown after a set amount of time (Δt) since the beginning of each step of the test (since drawdown will continue to increase with time) versus pumping rate should produce a straight line.

$$\frac{s}{Q} = B + CQ$$

Fitting a straight line through the observed data, the slope of the best fit line will be *C* (well losses) and the intercept of this line with $Q = 0$ will be *B* (aquifer losses). This process requires fitting an idealized model to real world data and seeing what parameters (B and C) most closely fit reality. The assumption is then made that these fitted parameters (the slope and intercept) best represent reality (given the assumptions that went into the model are true).

The relationship above is for fully penetrating wells in confined aquifers (the same assumptions used in the Theis solution for determining aquifer characteristics in an aquifer test). However, this solution works equally well for unconfined aquifers with about 20 percent of change in saturated thickness (transmissivity changes are not severe within a 20 percent change of thickness to effect results).

Often the *well efficiency* is determined from this sort of test, this is a percentage indicating the fraction of total observed drawdown in a pumping well which is due to aquifer losses (as opposed to being due to flow through the well screen and inside the borehole). A completely efficient well, with ideal well screen and where the water flows inside the well in a frictionless manner, would have 100% efficiency. If the well is less than 100% efficient, the amount of drawdown in the well does not reflect the drawdown that would occur solely from the aquifer.

Analysis

Analysis of the SRT data using the conventional pressure verses rate plots is presented in Figure 1. The best fit straight line through Steps 4 through 8 extrapolates back to the pretest pressure of 1,430 psi, indicating FPP was not reached at the formation face. The linear nature of the plot of Steps 4 through 8 suggest radial flow or quasi-radial flow conditions, although it should be noted the formation is exhibiting non-Darcy behavior.

Data from the first three steps appear to have been effected by the well pressure reversal which was seen in Steps 2 and 3, and have not been useful to the analysis. Steps 4 through 8 have provided useful data, within the limitations of the non-Darcy formation behavior as follows.

The downhole transducer was recording at a rate of 64 increments per minute. The pump flow rate, and surface pressures were recorded at a rate of 24 increments per

minute. The raw digital data from the downhole wireline transducer and the pump rig were reduced and time synchronized. This reduced data set contains 8 increments per minute. This data set was used for the multi-rate analysis and is included in Appendix A.

A comparison of pressure change (Δ P) verses cumulative injection volume is presented in Figure 2 and indicated, by the clear break in slope, that well bore fill-up was achieved in Step 3. This change in condition relates to the surface injection pressure rise observed after the uncontrolled rate increase occurred. Wellbore storage dominated data plots along a unit slope in this type of analysis. Steps 1, 2, and a portion of 3 are dominated by wellbore storage as indicated in this plot.

Multi-rate pressure transient analysis using the Odeh and Jones radial method is presented in Figure 3. Steps 3 through 6 show a downward shift in the data, with no shift evident between the final three steps (Steps 6 through 8). A downward shift to data observed on an Odeh and Jones plot followed by a discontinuation of this shift indicates the removal of skin damage. Skin damage causes a pressure drop in the near wellbore area reducing the pressure applied to the formation. Skin damage can be removed during higher injection rates. This is evidenced in Figure 1 by an apparent shift in the data points which also extrapolate back to the pretest pressure. Through the interpretation of these two graphs, it is possible to distinguish the removal of skin damage from exceeding FPP.

Table 1 shows the information for the step test. The duration times varied a bit (from about 19 to 33 minutes) but not enough to invalidate the results because the pressures stabilized before the end of the step. The next stage in the analysis is to calculate the s/Q values to plot against the Q values. Table 2 shows these values and figure 4 is the plot of s/Q versus Q for steps. It can be seen that the steps do not plot as a straight line. The most likely reason for this is that the geologic unit accepting the water does not meet the Theis assumptions.

If the specific capacities (Q/s) for the individual steps are calculated for the actual drawdown values (Table 3), the specific capacities range from 2.22 to 3.45 gpm/ft. But the highest values occurred at the highest injection rates, which leads one to conclude that the more pressure that is applied, the more the sediments are expanded to accept the water.

To determine the hydraulic conductivity value, an equation by Theis (1963) was used that takes into account the well radius and the duration of pumping. The equation has two parts – a constant:

$$C = -66-264 \log_{10}(3.73r^2 * 10^{-9})$$

and the full equation:

$$T' = Q/s(C-264 \log_{10}(5S*10^3)+264 \log_{10} t),$$

Where Q is in gpd, r is in ft, s is in ft, S is dimensionless, and t is in days.

Using the above equation, the specific capacity values from the step test, a storage coefficient of 0.0001, and the radius of the injection well – 5.5 inches, Table 3 shows the calculated specific capacity values for each of the steps. The results are opposite of most tests in that the latter steps with the higher pumping rates have larger specific capacities, meaning that the well losses are lower or that the well had developed during the test. For the above assumptions, the hydraulic conductivity values are estimated to range between 0.76 and 1.10 ft/d for the lowest and highest specific capacity values. Assuming an aquifer thickness equal to the length of the injection string of 803 ft (4,384 ft to 5,173 ft), transmissivity is estimated at 610 to 883 ft^2/d (using the equation T=bK).

Conclusions

Analysis of SRT data using conventional approach shows a strong extrapolation back to pretest (or static) pressures and indicates no fracture of the formation (all pressures appear to have been below formation parting pressure (FPP). The increase in specific capacity during the SRT indicates increased well efficiencies at larger flow rates and that the injection formation is depleted. A depleted reservoir formation is well below capacity for storage and is readily capable of holding additional fluids.

The calculated maximum vertical pressure gradient during the SRT was 0.34 psi/ft, which is roughly half the lower anticipated fracture gradient of 0.64 psi/ft for unconsolidated oil sands. An offset in the best-fit line indicated the removal of skin damage at higher flow rates. Radial flow, or quasi-radial flow conditions are suggested for Steps 4 through 8 based on the linear plot of these points.

Multi-rate analysis using pressure change (Δ P) and cumulative injection indicates well bore fill-up occurred during the latter part of the Step 3. This combined with the low downhole flowing pressures (when compared to predicted non-flowing head) demonstrate a depleted formation which is readily taking water.

Multi-rate pressure transient analysis using the Odeh & Jones method indicates the removal of skin damage during Steps 6 through 8 and demonstrates the initial downward offset to Steps 3 to 6 is not a function of exceeding FPP. This analysis did not readily provide formation flow capacity interpretation.

Data modeling provided analysis and interpretation of the specific capacity, hydraulic conductivity and an extrapolation to transmissivities observed through the test. Although, due to the nature of the test data, and the non-Darcy behavior exhibited, these formation values should be considered estimates, all of these values are within a plausible range for the formation type. During the SRT, specific capacity gradually increased during individual Steps (4 through 8). The increase indicates increased well efficiencies at larger flow rates (from 3.80 gal/min/ft during Step 4, to 3.94 gal/min/ft for Step 8), and is interpreted that the injection formation is depleted. The initiation of injection during the SRT appears to have stimulated the formation by opening up existing interstitial pathways within the formation.

The data do not allow for traditional hydraulic interpretation and calculation of aquifer properties, due to the fact that the apparent specific capacity of the receiving formation actually increased as the injection rates were increased. Increasing apparent specific capacity with increased flow rates has been observed in other wells in similar types of formations. It appears that as the well head pressure is increased with incremental volume rates the proportional volume/pressure (head) ration declines indicating that the formation is favorably adjusting to accommodate the increased pressure by hydraulically parting (separating) the bedding planes of the formation. This in turn decreases the flow friction and actually provides additional "storage" for injected water near the borehole. The highest injection pressures observed for this well are significantly below the pressures needed to fracture at the receiving zone's formation depth.

The surface pressures anticipated to achieve FPP were calculated conservatively. The calculation accounts for friction head losses from wellhead to top of injection zone for the 5.5 inch injection liner, static formation pressure, and the lower fracture gradient

of 0.64 psi/ft for unconsolidated oil sands results. The calculated result is an estimated wellhead pressure of 930 psi. If 80% is applied as a factor of safety, the conservatively estimated wellhead FPP equates to 745 psi.

The understanding of formation conditions includes the assumption that under continued injection conditions, the ability of the formation to accept the flow rates and injection pressures will change with time and the specific capacity is expected to stabilize.

Recommendations

We recommend that injection well WD-3 be permitted to operate conditionally with surface injection pressures that increase gradually and incrementally such that the injection formation's specific capacity will stabilize and allow for determination of a FPP. The initial pressure limit and subsequent incremental increased operating pressure limits to be identified will be considered action points for well/formation re-evaluation. The injection well would be permitted to operate as wellhead pressures increase beyond the action points conditional on timely notification of EPA, evaluation of the injection well/formation properties, and subsequent communication of the evaluation results with EPA.

The initial proposed wellhead injection operating pressure is 100 psi, with a transient peak startup pressure of 220 psi. Following evaluation, the operating pressures will be permitted to approach the conservative case 80% calculated FPP of 745 psi. If at this point the specific capacity of the injection formation has not stabilized, pressures would be permitted to increase while being closely monitored to a point where formation conditions are such that a FPP can be determined.

The injection well will be correctly instrumented with data recorders, and injection will be regularly monitored and reported to EPA. The evaluation of formation properties may include performance of periodic fall-off pressure tests, pressure transient analysis, or additional SRTs.

Initial maximum proposed injection rate is 8 bbl/min (336 gpm). This is based on the rate of the last full step in the SRT and the determination of "no FPP achieved". This rate selection provides a limited factor of safety and can be justified based on the stabilized pressure through the full step length.

References

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Hantush, Mahdi S., 1964. *Advances in Hydroscience*, chapter *Hydraulics of Wells*, pp 281-442. Academic Press.

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Theis, C.V., Brown, R.H., and Meyer, R.R., Estimating the transmissibility of aquifers from the specific capacity of wells. *in* Bentall, Ray, Methods of determining permeability, transmissibility, and drawdown, USGS Water-Supply Paper 1536-I, pp 331-340.

U.S. EPA, National UIC Technical Workgroup, Determination of Maximum Injection Pressure for Class I Wells, January 1994

TABLES

Injection well step test data					
Steps	Time, in min	PSI	Rate, in bbls/min	Head, in ft	Rate, in gal/min
1	32.75	9.85	1.2	22.75	50.4
2	29.88	27.41	3.3	63.32	138.6
3	29.50	26.93	4.0	62.21	168.0
4	30.25	31.25	5.0	72.19	210.0
5	30.62	32.74	6.0	75.63	252.0
6	29.25	38.39	7.0	88.68	294.0
7	29.88	43.53	8.1	105.17	340.2
8	18.87	47.99	9.1	110.86	382.2

Table 1

Data to Calculate s/Q			
Step	Head, in ft	Rate, in gal/min	s/Q, in ft/gal/min
1	22.75	50.4	0.4514
2	63.32	138.6	0.4569
3	62.21	168.0	0.3703
4	72.19	210.0	0.3438
5	75.63	252.0	0.3001
6	88.68	294.0	0.3016
7	105.17	340.2	0.3091
8	110.80	382.2	0.2901

Table 2

Data to Calculate Q/s			
Step	Head, in ft	Rate, in gal/min	Q/s, in gal/min/ft
1	22.75	50.4	2.22
2	63.32	138.6	2.19
3	62.21	168.0	2.70
4	72.19	210.0	2.91
5	75.63	252.0	3.33
6	88.68	294.0	3.31
7	105.17	340.2	3.23
8	110.80	382.2	3.45

Table 3

FIGURES

Figure 1 - Conventional Analysis P vs. Q Plot

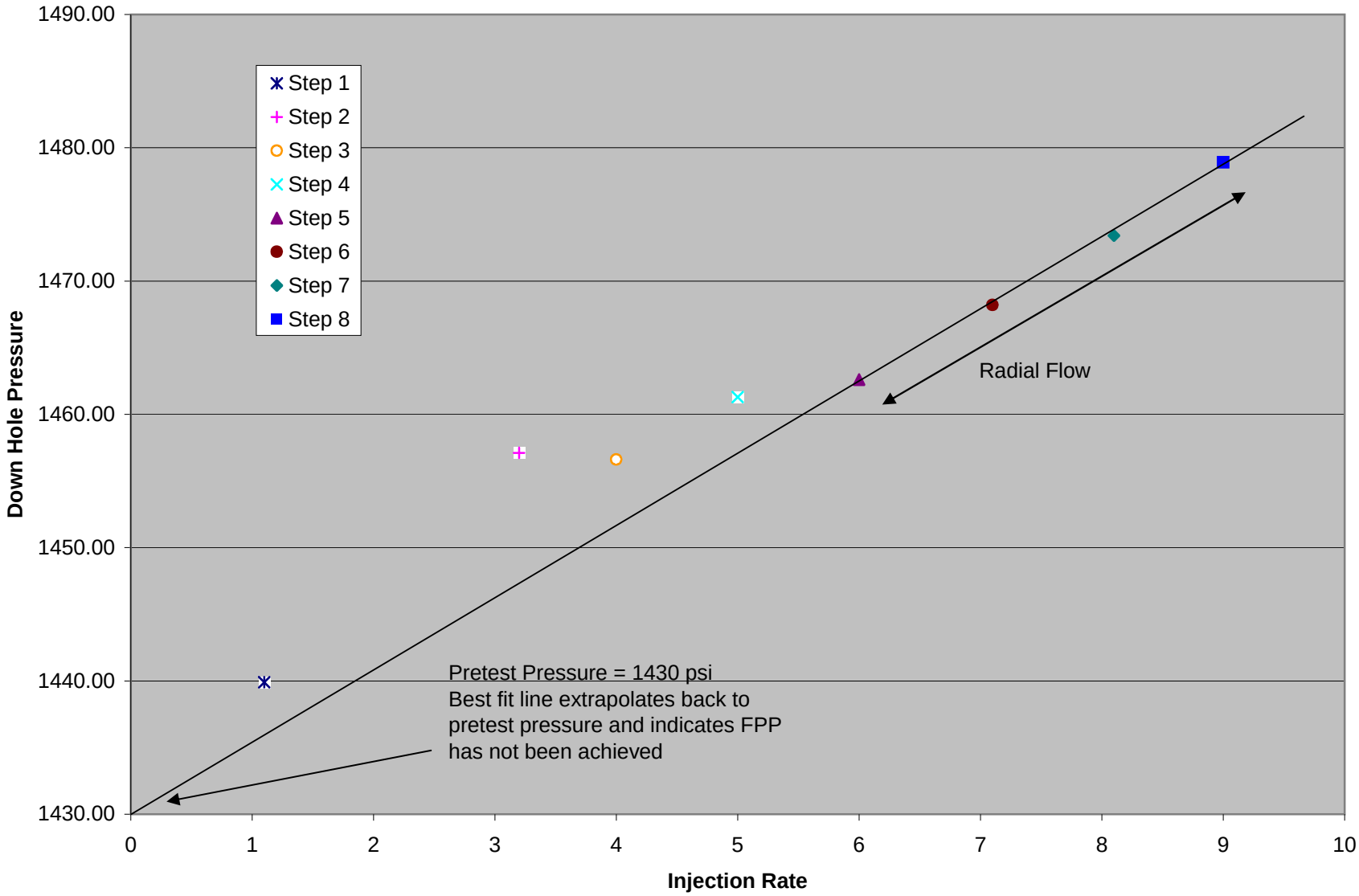


Figure 2 - Delta P vs Cumulative Injection (log-log)

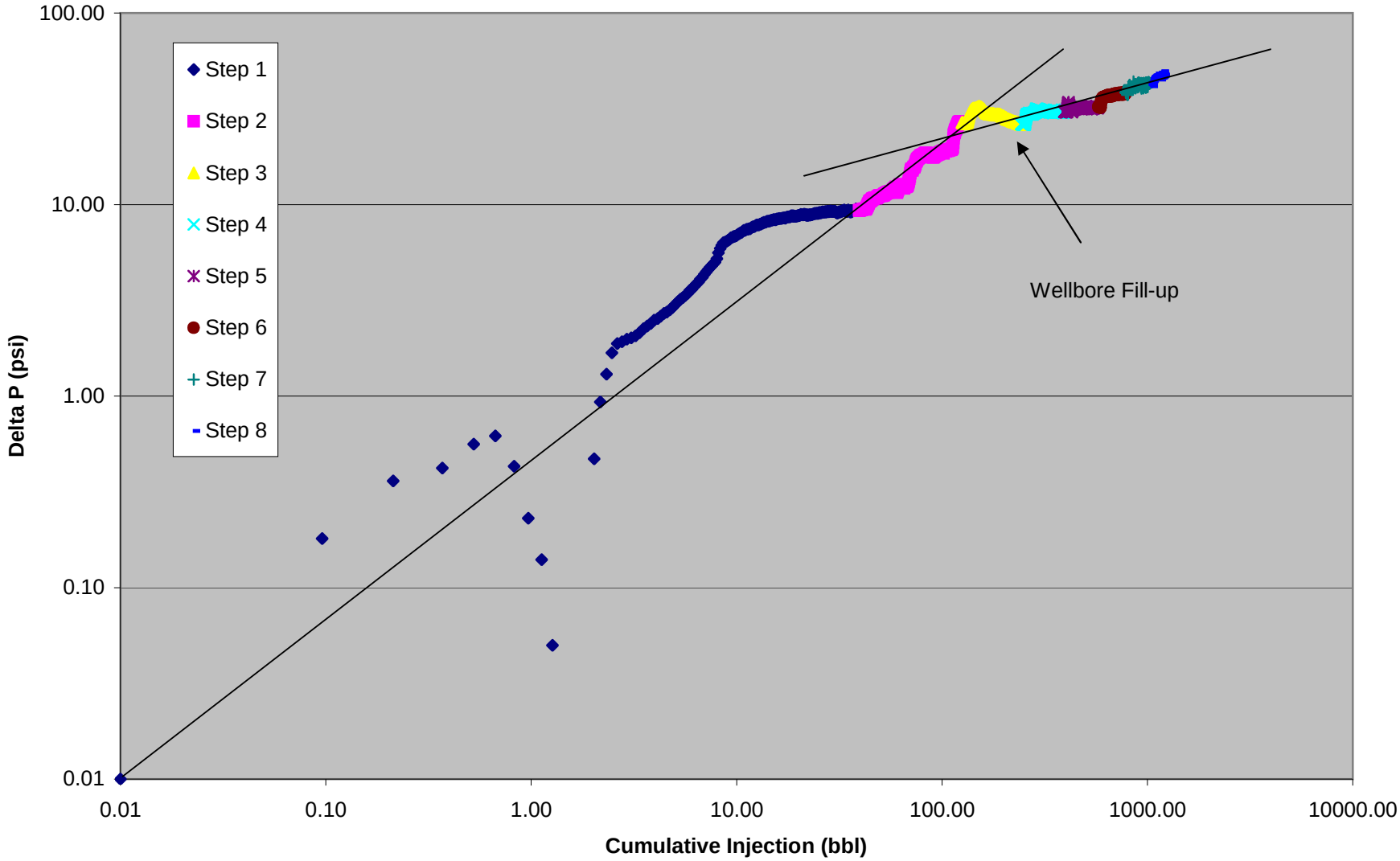
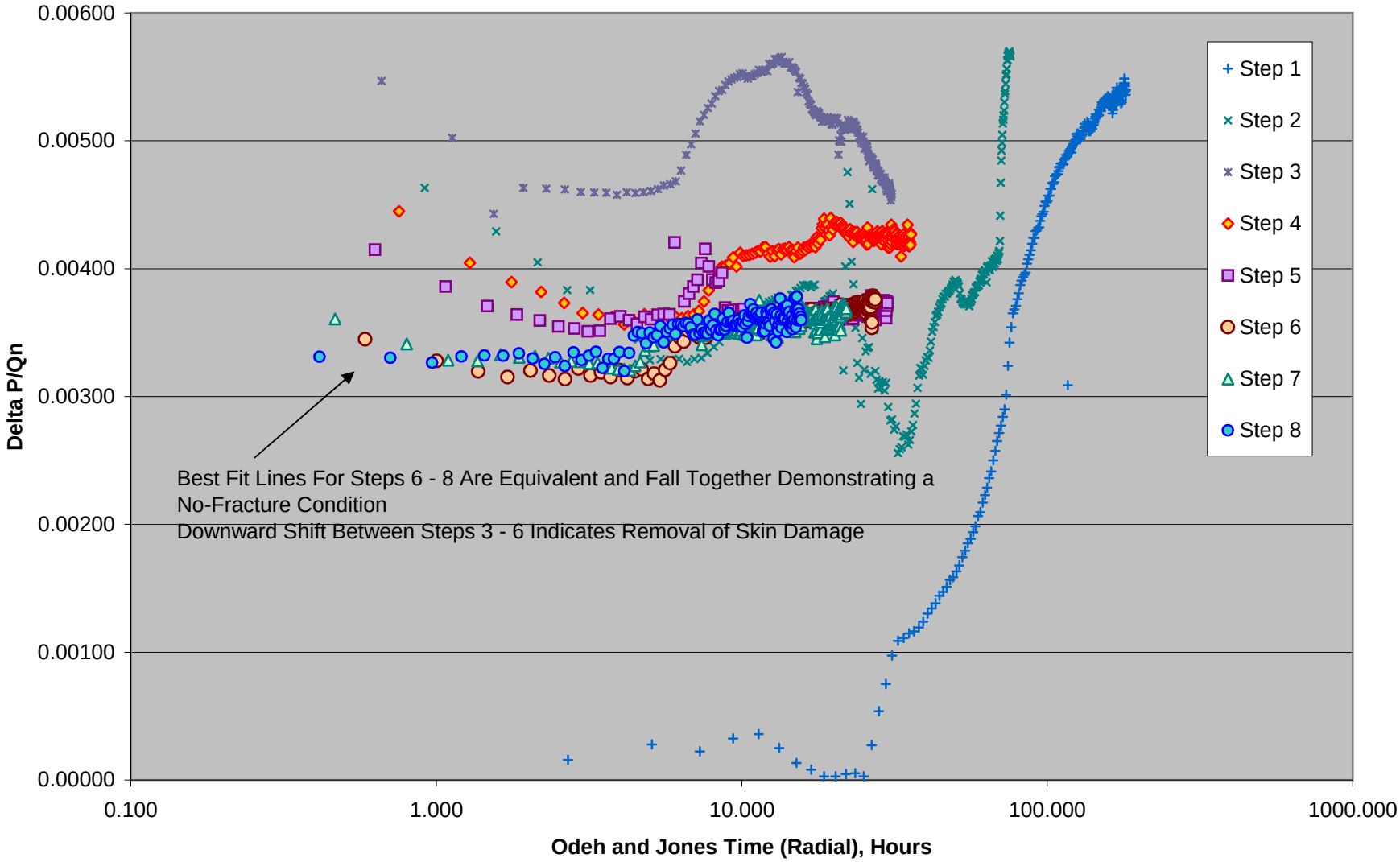


Figure 3 - Odeh and Jones Radial



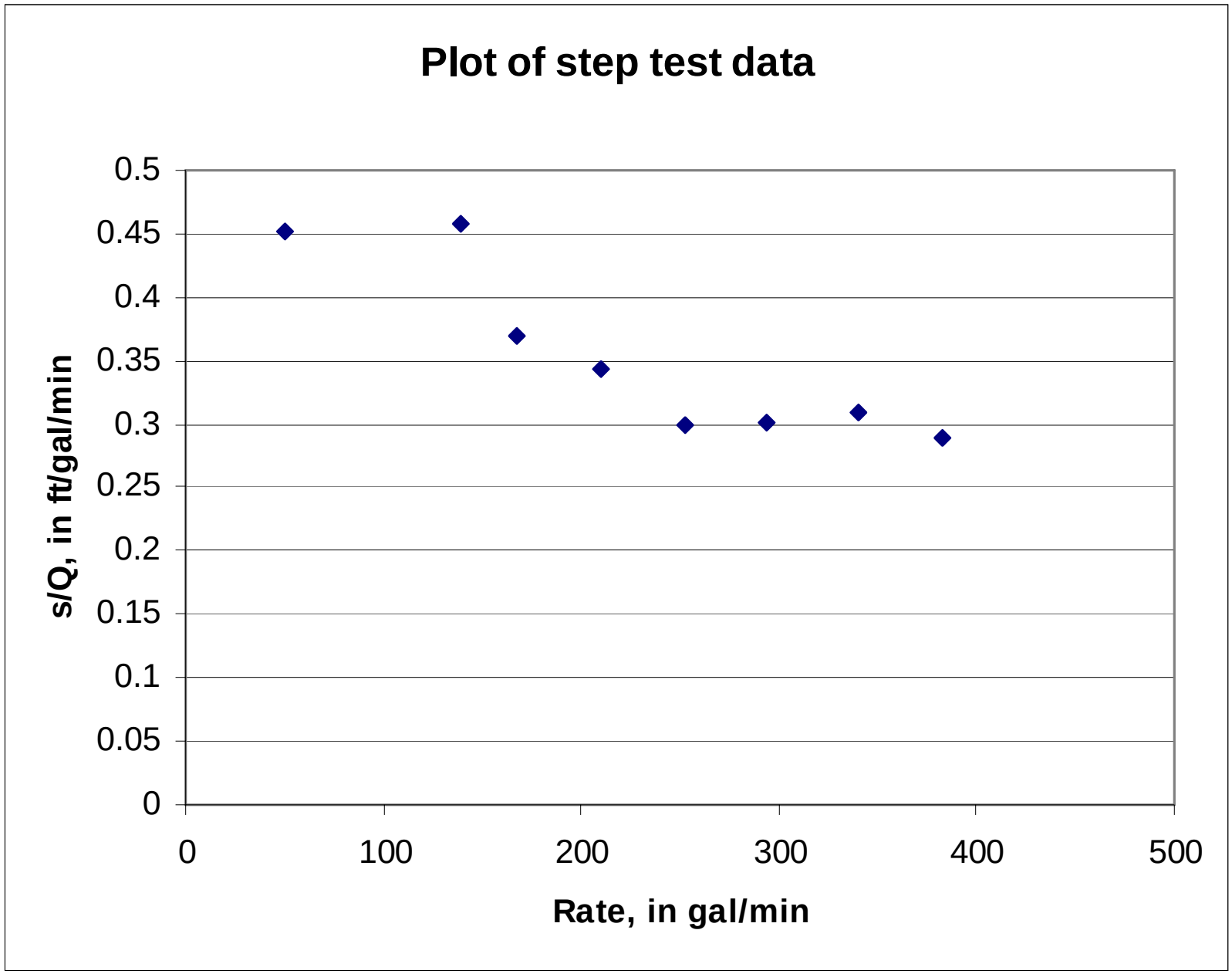


Figure 4 – Plot of steps 1 through 8.

APPENDIX A

REDUCED DATA SET

STEP RATE TEST – OCTOBER 31, 2008

UIC WELL – LPGC WD-3

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
0.00	1	Step 1	0.01	13.97	228	0.2	288	14.00	128.81	1431	152.93	0.01	0.01	0.00000		0.000	
0.12	1		0.12	14.10	228	0.8	1152	14.12	128.93	1431	152.93	0.18	0.10	0.00016	-2.699	0.002	2.699
0.25	1		0.25	14.22	228	0.9	1296	14.25	129.06	1431	152.93	0.36	0.21	0.00028	-5.079	0.004	5.079
0.37	1		0.37	14.35	228	1.3	1872	14.37	129.18	1431	152.93	0.42	0.37	0.00022	-7.289	0.006	7.289
0.50	1		0.50	14.48	228	1.2	1728	14.50	129.31	1431	152.93	0.56	0.53	0.00032	-9.368	0.008	9.368
0.62	1		0.62	14.61	228	1.2	1728	14.62	129.43	1431	152.93	0.62	0.67	0.00036	-11.354	0.010	11.354
0.75	1		0.75	14.74	228	1.2	1728	14.75	129.56	1431	152.93	0.43	0.83	0.00025	-13.257	0.013	13.257
0.87	1		0.87	14.87	228	1.2	1728	14.87	129.68	1431	152.94	0.23	0.97	0.00013	-15.096	0.015	15.096
1.00	1		1.00	15.00	228	1.2	1728	15.00	129.81	1431	152.94	0.14	1.13	0.00008	-16.874	0.017	16.874
1.12	1		1.12	15.12	203	1.2	1728	15.12	129.93	1431	152.94	0.05	1.27	0.00003	-18.603	0.019	18.603
1.25	1		1.25	15.25	228	1.2	1728	15.25	130.06	1430	152.94	-0.05	1.43	0.00003	-20.284	0.021	20.284
1.37	1		1.37	15.38	228	1.2	1728	15.37	130.18	1430	152.94	-0.08	1.57	0.00005	-21.926	0.023	21.926
1.50	1		1.50	15.51	228	1.2	1728	15.50	130.31	1430	152.94	-0.09	1.73	0.00005	-23.528	0.025	23.528
1.62	1		1.62	15.64	228	1.2	1728	15.62	130.43	1430	152.94	-0.05	1.87	0.00003	-25.096	0.027	25.096
1.75	1		1.75	15.77	228	1.2	1728	15.75	130.56	1431	152.94	0.47	2.03	0.00027	-26.631	0.029	26.631
1.87	1		1.87	15.85	228	1.2	1728	15.87	130.68	1431	152.94	0.93	2.17	0.00054	-28.138	0.031	28.138
2.00	1		2.00	15.98	228	1.2	1728	16.00	130.81	1432	152.94	1.30	2.33	0.00075	-29.615	0.033	29.615
2.12	1		2.12	16.11	203	1.2	1728	16.12	130.93	1432	152.94	1.68	2.47	0.00097	-31.067	0.035	31.067
2.25	1		2.25	16.24	228	1.2	1728	16.25	131.06	1432	152.94	1.88	2.63	0.00109	-32.493	0.038	32.493
2.37	1		2.37	16.37	203	1.2	1728	16.37	131.18	1432	152.94	1.92	2.77	0.00111	-33.896	0.040	33.896
2.50	1		2.50	16.50	228	1.2	1728	16.50	131.31	1433	152.94	1.98	2.93	0.00115	-35.276	0.042	35.276
2.62	1		2.62	16.63	203	1.2	1728	16.62	131.43	1433	152.94	2.01	3.07	0.00116	-36.636	0.044	36.636
2.75	1		2.75	16.76	203	1.2	1728	16.75	131.56	1433	152.94	2.06	3.23	0.00119	-37.975	0.046	37.975
2.87	1		2.87	16.88	203	1.2	1728	16.87	131.68	1433	152.94	2.14	3.37	0.00124	-39.295	0.048	39.295
3.00	1		3.00	17.01	203	1.2	1728	17.00	131.81	1433	152.94	2.25	3.53	0.00130	-40.596	0.050	40.596
3.12	1		3.12	17.14	203	1.2	1728	17.12	131.93	1433	152.94	2.32	3.67	0.00134	-41.880	0.052	41.880
3.25	1		3.25	17.27	203	1.2	1728	17.25	132.06	1433	152.94	2.39	3.83	0.00138	-43.146	0.054	43.146
3.37	1		3.37	17.36	203	1.2	1728	17.37	132.18	1433	152.94	2.49	3.97	0.00144	-44.397	0.056	44.397
3.50	1		3.50	17.49	203	1.2	1728	17.50	132.31	1433	152.93	2.54	4.13	0.00147	-45.631	0.058	45.631
3.62	1		3.62	17.62	203	1.2	1728	17.62	132.43	1433	152.92	2.61	4.27	0.00151	-46.850	0.060	46.850
3.75	1		3.75	17.74	203	1.2	1728	17.75	132.56	1433	152.93	2.70	4.43	0.00156	-48.055	0.063	48.055
3.87	1		3.87	17.87	203	1.2	1728	17.87	132.68	1433	152.92	2.74	4.57	0.00159	-49.245	0.065	49.245
4.00	1		4.00	18.00	203	1.2	1728	18.00	132.81	1433	152.91	2.82	4.73	0.00163	-50.421	0.067	50.421
4.12	1		4.12	18.13	203	1.2	1728	18.12	132.93	1433	152.91	2.90	4.87	0.00168	-51.584	0.069	51.584
4.25	1		4.25	18.26	203	1.2	1728	18.25	133.06	1434	152.9	3.01	5.03	0.00174	-52.734	0.071	52.734
4.37	1		4.37	18.35	203	1.2	1728	18.37	133.18	1434	152.89	3.10	5.17	0.00179	-53.872	0.073	53.872
4.50	1		4.50	18.48	203	1.2	1728	18.50	133.31	1434	152.89	3.20	5.33	0.00185	-54.997	0.075	54.997
4.62	1		4.62	18.60	203	1.2	1728	18.62	133.43	1434	152.88	3.26	5.47	0.00189	-56.110	0.077	56.110
4.75	1		4.75	18.73	203	1.2	1728	18.75	133.56	1434	152.87	3.35	5.63	0.00194	-57.212	0.079	57.212
4.87	1		4.87	18.86	203	1.2	1728	18.87	133.68	1434	152.86	3.43	5.77	0.00198	-58.302	0.081	58.302
5.00	1		5.00	18.99	203	1.2	1728	19.00	133.81	1434	152.85	3.57	5.93	0.00207	-59.382	0.083	59.382
5.12	1		5.12	19.12	203	1.2	1728	19.12	133.93	1434	152.84	3.62	6.07	0.00209	-60.450	0.085	60.450
5.25	1		5.25	19.25	203	1.2	1728	19.25	134.06	1434	152.83	3.75	6.23	0.00217	-61.508	0.088	61.508
5.37	1		5.37	19.38	203	1.2	1728	19.37	134.18	1434	152.81	3.85	6.37	0.00223	-62.557	0.090	62.557
5.50	1		5.50	19.51	203	1.2	1728	19.50	134.31	1434	152.81	3.95	6.53	0.00229	-63.594	0.092	63.594
5.62	1		5.62	19.63	203	1.2	1728	19.62	134.43	1435	152.8	4.08	6.67	0.00236	-64.623	0.094	64.623
5.75	1		5.75	19.76	203	1.2	1728	19.75	134.56	1435	152.78	4.17	6.83	0.00241	-65.641	0.096	65.641
5.87	1		5.87	19.85	203	1.2	1728	19.87	134.68	1435	152.77	4.32	6.97	0.00250	-66.651	0.098	66.651
6.00	1		6.00	19.98	203	1.2	1728	20.00	134.81	1435	152.76	4.45	7.13	0.00258	-67.651	0.100	67.651

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
6.12	1	6.12	20.10	203	1.2	1728	20.12	134.93	1435	152.73	4.58	7.27	0.00265	-68.642	0.102	68.642
6.25	1	6.25	20.23	203	1.2	1728	20.25	135.06	1435	152.73	4.69	7.43	0.00271	-69.624	0.104	69.624
6.37	1	6.37	20.36	203	1.2	1728	20.37	135.18	1435	152.7	4.79	7.57	0.00277	-70.598	0.106	70.598
6.50	1	6.50	20.49	203	1.2	1728	20.50	135.31	1435	152.68	4.91	7.73	0.00284	-71.564	0.108	71.564
6.62	1	6.62	20.62	203	1.2	1728	20.62	135.43	1436	152.67	5.01	7.87	0.00290	-72.521	0.110	72.521
6.75	1	6.75	20.75	203	1.2	1728	20.75	135.56	1436	152.65	5.21	8.03	0.00302	-73.470	0.113	73.470
6.87	1	6.87	20.88	203	1.2	1728	20.87	135.68	1436	152.63	5.60	8.17	0.00324	-74.411	0.115	74.411
7.00	1	7.00	21.00	203	1.2	1728	21.00	135.81	1436	152.62	5.91	8.33	0.00342	-75.344	0.117	75.344
7.12	1	7.12	21.13	203	1.2	1728	21.12	135.93	1437	152.59	6.12	8.47	0.00354	-76.270	0.119	76.270
7.25	1	7.25	21.26	203	1.2	1728	21.25	136.06	1437	152.58	6.31	8.63	0.00365	-77.188	0.121	77.188
7.37	1	7.37	21.35	203	1.2	1728	21.37	136.18	1437	152.56	6.36	8.77	0.00368	-78.098	0.123	78.098
7.50	1	7.50	21.48	203	1.2	1728	21.50	136.31	1437	152.54	6.41	8.93	0.00371	-79.001	0.125	79.001
7.62	1	7.62	21.61	203	1.2	1728	21.62	136.43	1437	152.51	6.50	9.07	0.00376	-79.898	0.127	79.898
7.75	1	7.75	21.73	203	1.2	1728	21.75	136.56	1437	152.49	6.58	9.23	0.00381	-80.786	0.129	80.786
7.87	1	7.87	21.86	203	1.2	1728	21.87	136.68	1437	152.46	6.69	9.37	0.00387	-81.669	0.131	81.669
8.00	1	8.00	21.99	203	1.2	1728	22.00	136.81	1437	152.44	6.75	9.53	0.00391	-82.544	0.133	82.544
8.12	1	8.12	22.12	203	1.2	1728	22.12	136.93	1437	152.41	6.80	9.67	0.00394	-83.412	0.135	83.412
8.25	1	8.25	22.25	203	1.2	1728	22.25	137.06	1437	152.39	6.83	9.83	0.00395	-84.274	0.138	84.274
8.37	1	8.37	22.38	177	1.2	1728	22.37	137.18	1437	152.36	6.86	9.97	0.00397	-85.129	0.140	85.129
8.50	1	8.50	22.51	203	1.2	1728	22.50	137.31	1438	152.34	6.98	10.13	0.00404	-85.978	0.142	85.978
8.62	1	8.62	22.64	177	1.2	1728	22.62	137.43	1438	152.31	7.04	10.27	0.00407	-86.821	0.144	86.821
8.75	1	8.75	22.77	203	1.2	1728	22.75	137.56	1438	152.28	7.10	10.43	0.00411	-87.657	0.146	87.657
8.87	1	8.87	22.85	203	1.2	1728	22.87	137.68	1438	152.25	7.16	10.57	0.00414	-88.487	0.148	88.487
9.00	1	9.00	22.98	177	1.2	1728	23.00	137.81	1438	152.22	7.25	10.73	0.00420	-89.311	0.150	89.311
9.12	1	9.12	23.11	177	1.2	1728	23.12	137.93	1438	152.19	7.33	10.87	0.00424	-90.129	0.152	90.129
9.25	1	9.25	23.24	203	1.2	1728	23.25	138.06	1438	152.16	7.33	11.03	0.00424	-90.941	0.154	90.941
9.37	1	9.37	23.37	177	1.2	1728	23.37	138.18	1438	152.13	7.42	11.17	0.00429	-91.748	0.156	91.748
9.50	1	9.50	23.50	177	1.2	1728	23.50	138.31	1438	152.09	7.43	11.33	0.00430	-92.548	0.158	92.548
9.62	1	9.62	23.63	203	1.2	1728	23.62	138.43	1438	152.06	7.46	11.47	0.00432	-93.343	0.160	93.343
9.75	1	9.75	23.75	177	1.2	1728	23.75	138.56	1438	152.03	7.47	11.63	0.00432	-94.132	0.163	94.132
9.87	1	9.87	23.88	177	1.2	1728	23.87	138.68	1438	151.99	7.56	11.77	0.00437	-94.916	0.165	94.916
10.00	1	10.00	24.01	203	1.2	1728	24.00	138.81	1438	151.95	7.62	11.93	0.00441	-95.694	0.167	95.694
10.12	1	10.12	24.14	203	1.2	1728	24.12	138.93	1438	151.92	7.65	12.07	0.00443	-96.467	0.169	96.467
10.25	1	10.25	24.27	203	1.2	1728	24.25	139.06	1438	151.89	7.68	12.23	0.00444	-97.235	0.171	97.235
10.38	1	10.38	24.36	203	1.2	1728	24.38	139.19	1438	151.85	7.76	12.38	0.00449	-97.996	0.173	97.996
10.50	1	10.50	24.49	177	1.2	1728	24.50	139.31	1438	151.82	7.82	12.53	0.00453	-98.753	0.175	98.753
10.62	1	10.62	24.62	203	1.2	1728	24.62	139.43	1438	151.79	7.81	12.67	0.00452	-99.505	0.177	99.505
10.75	1	10.75	24.74	203	1.2	1728	24.75	139.56	1438	151.74	7.83	12.83	0.00453	-100.252	0.179	100.252
10.87	1	10.87	24.87	203	1.2	1728	24.87	139.68	1438	151.7	7.90	12.97	0.00457	-100.994	0.181	100.994
11.00	1	11.00	25.00	203	1.2	1728	25.00	139.81	1438	151.66	7.90	13.13	0.00457	-101.731	0.183	101.731
11.12	1	11.12	25.13	177	1.2	1728	25.12	139.93	1439	151.63	7.99	13.27	0.00462	-102.463	0.185	102.463
11.25	1	11.25	25.26	203	1.2	1728	25.25	140.06	1439	151.59	7.99	13.43	0.00462	-103.190	0.188	103.190
11.37	1	11.37	25.39	177	1.2	1728	25.37	140.18	1439	151.55	8.07	13.57	0.00467	-103.912	0.190	103.912
11.50	1	11.50	25.52	177	1.2	1728	25.50	140.31	1439	151.52	8.06	13.73	0.00466	-104.630	0.192	104.630
11.62	1	11.62	25.61	177	1.2	1728	25.62	140.43	1439	151.47	8.08	13.87	0.00468	-105.343	0.194	105.343
11.75	1	11.75	25.73	203	1.2	1728	25.75	140.56	1439	151.43	8.16	14.03	0.00472	-106.051	0.196	106.051
11.87	1	11.87	25.86	177	1.2	1728	25.87	140.68	1439	151.39	8.17	14.17	0.00473	-106.755	0.198	106.755
12.00	1	12.00	25.99	177	1.2	1728	26.00	140.81	1439	151.36	8.19	14.33	0.00474	-107.453	0.200	107.453
12.12	1	12.12	26.12	203	1.2	1728	26.12	140.93	1439	151.31	8.19	14.47	0.00474	-108.148	0.202	108.148

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
12.25	1	12.25	26.25	177	1.2	1728	26.25	141.06	1439	151.28	8.23	14.63	0.00476	-108.838	0.204	108.838
12.37	1	12.37	26.38	177	1.2	1728	26.37	141.18	1439	151.23	8.28	14.77	0.00479	-109.524	0.206	109.524
12.50	1	12.50	26.51	203	1.2	1728	26.50	141.31	1439	151.2	8.29	14.93	0.00480	-110.205	0.208	110.205
12.63	1	12.63	26.63	177	1.2	1728	26.63	141.44	1439	151.15	8.33	15.08	0.00482	-110.882	0.211	110.882
12.75	1	12.75	26.76	177	1.2	1728	26.75	141.56	1439	151.11	8.34	15.23	0.00483	-111.555	0.213	111.555
12.88	1	12.88	26.89	177	1.2	1728	26.88	141.69	1439	151.07	8.32	15.38	0.00481	-112.223	0.215	112.223
13.00	1	13.00	27.02	203	1.2	1728	27.00	141.81	1439	151.03	8.32	15.53	0.00481	-112.887	0.217	112.887
13.12	1	13.12	27.11	177	1.2	1728	27.12	141.93	1439	150.99	8.39	15.67	0.00486	-113.547	0.219	113.547
13.25	1	13.25	27.24	177	1.2	1728	27.25	142.06	1439	150.96	8.39	15.83	0.00486	-114.203	0.221	114.203
13.37	1	13.37	27.37	177	1.2	1728	27.37	142.18	1439	150.91	8.41	15.97	0.00487	-114.855	0.223	114.855
13.50	1	13.50	27.49	177	1.2	1728	27.50	142.31	1439	150.87	8.45	16.13	0.00489	-115.503	0.225	115.503
13.62	1	13.62	27.62	177	1.2	1728	27.62	142.43	1439	150.83	8.44	16.27	0.00488	-116.147	0.227	116.147
13.75	1	13.75	27.75	177	1.9	2736	27.75	142.56	1439	150.79	8.45	16.52	0.00309	-116.787	0.229	116.787
13.87	1	13.87	27.88	177	1.2	1728	27.87	142.68	1439	150.74	8.47	16.66	0.00490	-117.423	0.231	117.423
14.00	1	14.00	28.01	177	1.2	1728	28.00	142.81	1439	150.71	8.51	16.82	0.00492	-118.055	0.233	118.055
14.12	1	14.12	28.14	177	1.2	1728	28.12	142.93	1439	150.67	8.50	16.96	0.00492	-118.683	0.235	118.683
14.25	1	14.25	28.27	203	1.2	1728	28.25	143.06	1439	150.63	8.53	17.12	0.00494	-119.308	0.238	119.308
14.37	1	14.37	28.35	203	1.2	1728	28.37	143.18	1439	150.58	8.48	17.26	0.00491	-119.928	0.240	119.928
14.50	1	14.50	28.48	203	1.2	1728	28.50	143.31	1439	150.55	8.55	17.42	0.00495	-120.545	0.242	120.545
14.63	1	14.63	28.61	177	1.2	1728	28.63	143.44	1439	150.5	8.57	17.57	0.00496	-121.158	0.244	121.158
14.75	1	14.75	28.74	177	1.2	1728	28.75	143.56	1439	150.47	8.60	17.72	0.00498	-121.767	0.246	121.767
14.87	1	14.87	28.87	177	1.2	1728	28.87	143.68	1439	150.43	8.60	17.86	0.00498	-122.373	0.248	122.373
15.00	1	15.00	29.00	177	1.2	1728	29.00	143.81	1439	150.39	8.64	18.02	0.00500	-122.975	0.250	122.975
15.13	1	15.13	29.13	177	1.2	1728	29.13	143.94	1439	150.34	8.61	18.17	0.00498	-123.574	0.252	123.574
15.25	1	15.25	29.26	177	1.2	1728	29.25	144.06	1439	150.31	8.66	18.32	0.00501	-124.168	0.254	124.168
15.38	1	15.38	29.38	177	1.2	1728	29.38	144.19	1439	150.26	8.73	18.47	0.00505	-124.760	0.256	124.760
15.50	1	15.50	29.51	177	1.2	1728	29.50	144.31	1439	150.24	8.70	18.62	0.00503	-125.347	0.258	125.347
15.62	1	15.62	29.64	177	1.2	1728	29.62	144.43	1439	150.19	8.74	18.76	0.00506	-125.932	0.260	125.932
15.75	1	15.75	29.77	177	1.2	1728	29.75	144.56	1439	150.16	8.67	18.92	0.00502	-126.513	0.263	126.513
15.87	1	15.87	29.86	177	1.2	1728	29.87	144.68	1439	150.11	8.72	19.06	0.00505	-127.090	0.265	127.090
16.00	1	16.00	29.98	177	1.2	1728	30.00	144.81	1439	150.08	8.67	19.22	0.00502	-127.664	0.267	127.664
16.12	1	16.12	30.11	177	1.2	1728	30.12	144.93	1439	150.05	8.66	19.36	0.00501	-128.235	0.269	128.235
16.25	1	16.25	30.24	177	1.2	1728	30.25	145.06	1439	150	8.68	19.52	0.00502	-128.802	0.271	128.802
16.37	1	16.37	30.37	177	1.2	1728	30.37	145.18	1439	149.97	8.72	19.66	0.00505	-129.367	0.273	129.367
16.50	1	16.50	30.50	177	1.2	1728	30.50	145.31	1439	149.92	8.71	19.82	0.00504	-129.927	0.275	129.927
16.62	1	16.62	30.63	177	1.2	1728	30.62	145.43	1439	149.89	8.77	19.96	0.00508	-130.485	0.277	130.485
16.75	1	16.75	30.76	177	1.2	1728	30.75	145.56	1439	149.85	8.73	20.12	0.00505	-131.039	0.279	131.039
16.87	1	16.87	30.89	177	1.2	1728	30.87	145.68	1439	149.81	8.77	20.26	0.00508	-131.590	0.281	131.590
17.00	1	17.00	31.02	177	1.2	1728	31.00	145.81	1439	149.78	8.82	20.42	0.00510	-132.138	0.283	132.138
17.12	1	17.12	31.14	177	1.2	1728	31.12	145.93	1439	149.73	8.87	20.56	0.00513	-132.682	0.285	132.682
17.25	1	17.25	31.27	177	1.2	1728	31.25	146.06	1439	149.7	8.82	20.72	0.00510	-133.224	0.288	133.224
17.38	1	17.38	31.36	177	1.2	1728	31.38	146.19	1439	149.67	8.84	20.87	0.00512	-133.762	0.290	133.762
17.50	1	17.50	31.49	177	1.2	1728	31.50	146.31	1439	149.63	8.82	21.02	0.00510	-134.297	0.292	134.297
17.63	1	17.63	31.62	177	1.2	1728	31.63	146.44	1439	149.59	8.83	21.17	0.00511	-134.829	0.294	134.829
17.75	1	17.75	31.75	177	1.2	1728	31.75	146.56	1439	149.56	8.90	21.32	0.00515	-135.358	0.296	135.358
17.88	1	17.88	31.88	177	1.2	1728	31.88	146.69	1439	149.52	8.84	21.47	0.00512	-135.883	0.298	135.883
18.00	1	18.00	32.01	177	1.2	1728	32.00	146.81	1439	149.49	8.88	21.62	0.00514	-136.406	0.300	136.406
18.13	1	18.13	32.14	177	1.2	1728	32.13	146.94	1439	149.45	8.83	21.77	0.00511	-136.926	0.302	136.926
18.25	1	18.25	32.26	177	1.2	1728	32.25	147.06	1439	149.42	8.77	21.92	0.00508	-137.443	0.304	137.443

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
18.37	1	18.37	32.35	177	1.2	1728	32.37	147.18	1439	149.38	8.85	22.06	0.00512	-137.957	0.306	137.957
18.50	1	18.50	32.48	177	1.2	1728	32.50	147.31	1439	149.35	8.77	22.22	0.00508	-138.468	0.308	138.468
18.62	1	18.62	32.61	177	1.2	1728	32.62	147.43	1439	149.31	8.80	22.36	0.00509	-138.976	0.310	138.976
18.75	1	18.75	32.74	177	1.2	1728	32.75	147.56	1439	149.27	8.82	22.52	0.00510	-139.481	0.313	139.481
18.87	1	18.87	32.87	177	1.2	1728	32.87	147.68	1439	149.24	8.84	22.66	0.00512	-139.984	0.315	139.984
19.00	1	19.00	33.00	177	1.2	1728	33.00	147.81	1439	149.21	8.80	22.82	0.00509	-140.483	0.317	140.483
19.12	1	19.12	33.12	177	1.2	1728	33.12	147.93	1439	149.17	8.85	22.96	0.00512	-140.980	0.319	140.980
19.25	1	19.25	33.25	177	1.2	1728	33.25	148.06	1439	149.14	8.85	23.12	0.00512	-141.474	0.321	141.474
19.37	1	19.37	33.38	177	1.2	1728	33.37	148.18	1439	149.1	8.86	23.26	0.00513	-141.965	0.323	141.965
19.50	1	19.50	33.51	177	1.2	1728	33.50	148.31	1439	149.06	8.89	23.42	0.00514	-142.453	0.325	142.453
19.63	1	19.63	33.64	177	1.2	1728	33.63	148.44	1439	149.03	8.90	23.57	0.00515	-142.938	0.327	142.938
19.75	1	19.75	33.77	177	1.2	1728	33.75	148.56	1439	149	8.94	23.72	0.00517	-143.420	0.329	143.420
19.88	1	19.88	33.90	177	1.2	1728	33.88	148.69	1439	148.96	8.97	23.87	0.00519	-143.900	0.331	143.900
20.00	1	20.00	34.02	177	1.2	1728	34.00	148.81	1440	148.93	9.00	24.02	0.00521	-144.377	0.333	144.377
20.13	1	20.13	34.11	177	1.2	1728	34.13	148.94	1439	148.9	8.95	24.17	0.00518	-144.852	0.336	144.852
20.25	1	20.25	34.24	177	1.2	1728	34.25	149.06	1440	148.87	8.99	24.32	0.00520	-145.323	0.338	145.323
20.38	1	20.38	34.37	177	1.2	1728	34.38	149.19	1440	148.84	8.98	24.47	0.00520	-145.792	0.340	145.792
20.50	1	20.50	34.50	177	1.2	1728	34.50	149.31	1440	148.8	8.99	24.62	0.00520	-146.259	0.342	146.259
20.63	1	20.63	34.63	177	1.2	1728	34.63	149.44	1440	148.77	8.98	24.77	0.00520	-146.722	0.344	146.722
20.75	1	20.75	34.76	177	1.2	1728	34.75	149.56	1440	148.74	8.99	24.92	0.00520	-147.183	0.346	147.183
20.87	1	20.87	34.89	177	1.2	1728	34.87	149.68	1440	148.71	8.99	25.06	0.00520	-147.642	0.348	147.642
21.00	1	21.00	35.02	177	1.2	1728	35.00	149.81	1440	148.67	9.06	25.22	0.00524	-148.098	0.350	148.098
21.12	1	21.12	35.10	177	1.2	1728	35.12	149.93	1440	148.63	9.06	25.36	0.00524	-148.551	0.352	148.551
21.25	1	21.25	35.23	177	1.2	1728	35.25	150.06	1440	148.61	9.05	25.52	0.00524	-149.002	0.354	149.002
21.37	1	21.37	35.36	177	1.2	1728	35.37	150.18	1440	148.58	9.06	25.66	0.00524	-149.451	0.356	149.451
21.50	1	21.50	35.49	177	1.2	1728	35.50	150.31	1440	148.53	9.04	25.82	0.00523	-149.896	0.358	149.896
21.62	1	21.62	35.62	177	1.2	1728	35.62	150.43	1440	148.5	9.09	25.96	0.00526	-150.340	0.360	150.340
21.75	1	21.75	35.75	177	1.2	1728	35.75	150.56	1440	148.47	9.12	26.12	0.00528	-150.780	0.363	150.780
21.87	1	21.87	35.88	177	1.2	1728	35.87	150.68	1440	148.44	9.16	26.26	0.00530	-151.219	0.365	151.219
22.00	1	22.00	36.01	177	1.2	1728	36.00	150.81	1440	148.42	9.14	26.42	0.00529	-151.654	0.367	151.654
22.13	1	22.13	36.14	177	1.2	1728	36.13	150.94	1440	148.38	9.14	26.57	0.00529	-152.088	0.369	152.088
22.25	1	22.25	36.27	177	1.2	1728	36.25	151.06	1440	148.34	9.12	26.72	0.00528	-152.518	0.371	152.518
22.38	1	22.38	36.36	177	1.2	1728	36.38	151.19	1440	148.31	9.14	26.87	0.00529	-152.947	0.373	152.947
22.50	1	22.50	36.49	177	1.2	1728	36.50	151.31	1440	148.28	9.19	27.02	0.00532	-153.373	0.375	153.373
22.63	1	22.63	36.62	177	1.2	1728	36.63	151.44	1440	148.25	9.17	27.17	0.00531	-153.796	0.377	153.796
22.75	1	22.75	36.75	177	1.2	1728	36.75	151.56	1440	148.22	9.12	27.32	0.00528	-154.217	0.379	154.217
22.88	1	22.88	36.88	177	1.2	1728	36.88	151.69	1440	148.19	9.15	27.47	0.00530	-154.636	0.381	154.636
23.00	1	23.00	37.01	177	1.2	1728	37.00	151.81	1440	148.16	9.21	27.62	0.00533	-155.052	0.383	155.052
23.11	1	23.11	37.14	177	1.2	1728	37.11	151.92	1440	148.13	9.20	27.75	0.00532	-155.467	0.385	155.467
23.25	1	23.25	37.27	177	1.2	1728	37.25	152.06	1440	148.1	9.20	27.92	0.00532	-155.878	0.388	155.878
23.37	1	23.37	37.36	177	1.2	1728	37.37	152.18	1440	148.07	9.15	28.06	0.00530	-156.288	0.390	156.288
23.50	1	23.50	37.49	177	1.2	1728	37.50	152.31	1440	148.04	9.19	28.22	0.00532	-156.695	0.392	156.695
23.62	1	23.62	37.62	177	1.2	1728	37.62	152.43	1440	148	9.21	28.36	0.00533	-157.100	0.394	157.100
23.75	1	23.75	37.75	177	1.2	1728	37.75	152.56	1440	147.97	9.22	28.52	0.00534	-157.502	0.396	157.502
23.87	1	23.87	37.88	152	1.2	1728	37.87	152.68	1440	147.94	9.24	28.66	0.00535	-157.903	0.398	157.903
24.00	1	24.00	38.01	152	1.2	1728	38.00	152.81	1440	147.91	9.24	28.82	0.00535	-158.301	0.400	158.301
24.12	1	24.12	38.14	152	1.2	1728	38.12	152.93	1440	147.88	9.21	28.96	0.00533	-158.696	0.402	158.696
24.25	1	24.25	38.27	177	1.2	1728	38.25	153.06	1440	147.85	9.19	29.12	0.00532	-159.090	0.404	159.090
24.38	1	24.38	38.35	177	1.2	1728	38.38	153.19	1440	147.82	9.22	29.27	0.00534	-159.481	0.406	159.481

Reduced Data Set
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SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
24.50	1	24.50	38.48	177	1.2	1728	38.50	153.31	1440	147.79	9.20	29.42	0.00532	-159.870	0.408	159.870
24.63	1	24.63	38.61	177	1.2	1728	38.63	153.44	1440	147.76	9.20	29.57	0.00532	-160.257	0.411	160.257
24.75	1	24.75	38.74	152	1.2	1728	38.75	153.56	1440	147.72	9.20	29.72	0.00532	-160.641	0.413	160.641
24.88	1	24.88	38.87	152	1.2	1728	38.88	153.69	1440	147.7	9.21	29.87	0.00533	-161.024	0.415	161.024
25.00	1	25.00	39.00	177	1.2	1728	39.00	153.81	1440	147.67	9.20	30.02	0.00532	-161.404	0.417	161.404
25.11	1	25.11	39.13	152	1.2	1728	39.11	153.92	1440	147.64	9.20	30.15	0.00532	-161.782	0.419	161.782
25.25	1	25.25	39.26	177	1.2	1728	39.25	154.06	1440	147.62	9.15	30.32	0.00530	-162.158	0.421	162.158
25.38	1	25.38	39.39	152	1.2	1728	39.38	154.19	1440	147.58	9.09	30.47	0.00526	-162.532	0.423	162.532
25.50	1	25.50	39.52	152	1.2	1728	39.50	154.31	1440	147.55	9.08	30.62	0.00525	-162.903	0.425	162.903
25.63	1	25.63	39.61	177	1.2	1728	39.63	154.44	1440	147.52	9.08	30.77	0.00525	-163.273	0.427	163.273
25.75	1	25.75	39.74	177	1.2	1728	39.75	154.56	1440	147.49	9.01	30.92	0.00521	-163.640	0.429	163.640
25.87	1	25.87	39.87	152	1.2	1728	39.87	154.68	1440	147.46	9.06	31.06	0.00524	-164.005	0.431	164.005
26.00	1	26.00	40.00	152	1.2	1728	40.00	154.81	1440	147.43	9.06	31.22	0.00524	-164.368	0.433	164.368
26.12	1	26.12	40.13	152	1.2	1728	40.12	154.93	1440	147.4	9.11	31.36	0.00527	-164.730	0.435	164.730
26.25	1	26.25	40.26	177	1.2	1728	40.25	155.06	1440	147.38	9.15	31.52	0.00530	-165.089	0.438	165.089
26.37	1	26.37	40.39	177	1.2	1728	40.37	155.18	1440	147.34	9.14	31.66	0.00529	-165.446	0.440	165.446
26.50	1	26.50	40.52	177	1.2	1728	40.50	155.31	1440	147.31	9.16	31.82	0.00530	-165.801	0.442	165.801
26.62	1	26.62	40.64	177	1.2	1728	40.62	155.43	1440	147.29	9.17	31.96	0.00531	-166.154	0.444	166.154
26.75	1	26.75	40.77	177	1.2	1728	40.75	155.56	1440	147.26	9.15	32.12	0.00530	-166.504	0.446	166.504
26.88	1	26.88	40.86	152	1.2	1728	40.88	155.69	1440	147.22	9.20	32.27	0.00532	-166.853	0.448	166.853
27.00	1	27.00	40.99	152	1.2	1728	41.00	155.81	1440	147.2	9.23	32.42	0.00534	-167.200	0.450	167.200
27.13	1	27.13	41.12	152	1.2	1728	41.13	155.94	1440	147.17	9.22	32.57	0.00534	-167.545	0.452	167.545
27.25	1	27.25	41.25	152	1.2	1728	41.25	156.06	1440	147.14	9.25	32.72	0.00535	-167.887	0.454	167.887
27.38	1	27.38	41.38	177	1.2	1728	41.38	156.19	1440	147.11	9.30	32.87	0.00538	-168.228	0.456	168.228
27.50	1	27.50	41.51	177	1.2	1728	41.50	156.31	1440	147.08	9.27	33.02	0.00536	-168.567	0.458	168.567
27.63	1	27.63	41.64	152	1.2	1728	41.63	156.44	1440	147.06	9.28	33.17	0.00537	-168.904	0.461	168.904
27.75	1	27.75	41.77	152	1.2	1728	41.75	156.56	1440	147.03	9.36	33.32	0.00542	-169.239	0.463	169.239
27.86	1	27.86	41.86	177	1.2	1728	41.86	156.67	1440	147	9.32	33.45	0.00539	-169.572	0.464	169.572
28.00	1	28.00	41.99	152	1.2	1728	42.00	156.81	1440	146.97	9.32	33.62	0.00539	-169.903	0.467	169.903
28.13	1	28.13	42.12	152	1.2	1728	42.13	156.94	1440	146.95	9.26	33.77	0.00536	-170.232	0.469	170.232
28.25	1	28.25	42.25	152	1.2	1728	42.25	157.06	1440	146.91	9.22	33.92	0.00534	-170.559	0.471	170.559
28.38	1	28.38	42.38	152	1.2	1728	42.38	157.19	1440	146.89	9.22	34.07	0.00534	-170.884	0.473	170.884
28.50	1	28.50	42.50	177	1.2	1728	42.50	157.31	1440	146.86	9.18	34.22	0.00531	-171.207	0.475	171.207
28.62	1	28.62	42.63	152	1.2	1728	42.62	157.43	1440	146.83	9.21	34.36	0.00533	-171.529	0.477	171.529
28.75	1	28.75	42.76	152	1.2	1728	42.75	157.56	1440	146.81	9.18	34.52	0.00531	-171.848	0.479	171.848
28.87	1	28.87	42.89	152	1.2	1728	42.87	157.68	1440	146.78	9.25	34.66	0.00535	-172.166	0.481	172.166
29.00	1	29.00	43.02	152	1.2	1728	43.00	157.81	1440	146.75	9.32	34.82	0.00539	-172.482	0.483	172.482
29.13	1	29.13	43.11	152	1.2	1728	43.13	157.94	1440	146.73	9.36	34.97	0.00542	-172.796	0.486	172.796
29.25	1	29.25	43.24	152	1.2	1728	43.25	158.06	1440	146.7	9.32	35.12	0.00539	-173.108	0.488	173.108
29.38	1	29.38	43.37	152	1.2	1728	43.38	158.19	1440	146.67	9.30	35.27	0.00538	-173.418	0.490	173.418
29.50	1	29.50	43.50	152	1.2	1728	43.50	158.31	1440	146.63	9.25	35.42	0.00535	-173.726	0.492	173.726
29.63	1	29.63	43.63	152	1.2	1728	43.63	158.44	1440	146.61	9.27	35.57	0.00536	-174.032	0.494	174.032
29.75	1	29.75	43.76	152	1.2	1728	43.75	158.56	1440	146.58	9.17	35.72	0.00531	-174.337	0.496	174.337
29.88	1	29.88	43.89	152	1.2	1728	43.88	158.69	1440	146.55	9.14	35.87	0.00529	-174.640	0.498	174.640
30.00	1	30.00	44.02	152	1.2	1728	44.00	158.81	1440	146.53	9.18	36.02	0.00531	-174.941	0.500	174.941
30.13	1	30.13	44.10	152	1.2	1728	44.13	158.94	1440	146.5	9.19	36.17	0.00532	-175.240	0.502	175.240
30.25	1	30.25	44.24	152	1.2	1728	44.25	159.06	1440	146.47	9.16	36.32	0.00530	-175.537	0.504	175.537
30.37	1	30.37	44.37	152	1.2	1728	44.37	159.45	1440	146.39	9.31	36.46	0.00539	-175.833	0.506	175.833
30.50	1	30.50	44.49	152	1.2	1728	44.50	159.31	1440	146.42	9.28	36.62	0.00537	-176.127	0.508	176.127

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
30.63	1		30.63	44.62	152	1.2	1728	44.63	159.44	1440	146.4	9.30	36.77	0.00538	-176.419	0.511	176.419
30.75	1		30.75	44.75	152	1.2	1728	44.75	159.56	1440	146.37	9.31	36.92	0.00539	-176.709	0.513	176.709
30.88	1		30.88	44.88	177	1.2	1728	44.88	159.69	1440	146.34	9.29	37.07	0.00538	-176.998	0.515	176.998
31.00	1		31.00	45.01	152	1.2	1728	45.00	159.81	1440	146.31	9.30	37.22	0.00538	-177.285	0.517	177.285
31.12	1		31.12	45.14	127	1.2	1728	45.12	159.93	1440	146.28	9.29	37.36	0.00538	-177.570	0.519	177.570
31.25	1		31.25	45.27	152	1.2	1728	45.25	160.06	1440	146.27	9.30	37.52	0.00538	-177.853	0.521	177.853
31.37	1		31.37	45.36	152	1.2	1728	45.37	160.18	1440	146.24	9.34	37.66	0.00541	-178.135	0.523	178.135
31.50	1		31.50	45.49	152	1.2	1728	45.50	160.31	1440	146.21	9.39	37.82	0.00543	-178.415	0.525	178.415
31.63	1		31.63	45.62	152	1.2	1728	45.63	160.44	1440	146.19	9.42	37.97	0.00545	-178.693	0.527	178.693
31.75	1		31.75	45.75	152	1.2	1728	45.75	160.56	1440	146.16	9.48	38.12	0.00549	-178.969	0.529	178.969
31.88	1		31.88	45.88	152	1.2	1728	45.88	160.69	1440	146.13	9.48	38.27	0.00549	-179.244	0.531	179.244
32.00	1		32.00	46.01	152	1.2	1728	46.00	160.81	1440	146.11	9.42	38.42	0.00545	-179.517	0.533	179.517
32.13	1		32.13	46.14	152	1.2	1728	46.13	160.94	1440	146.09	9.41	38.57	0.00545	-179.788	0.536	179.788
32.25	1		32.25	46.27	152	1.2	1728	46.25	161.06	1440	146.05	9.38	38.72	0.00543	-180.057	0.538	180.057
32.38	1		32.38	46.36	152	1.2	1728	46.38	161.19	1440	146.03	9.31	38.87	0.00539	-180.325	0.540	180.325
32.50	1		32.50	46.49	152	1.2	1728	46.50	161.31	1440	146.01	9.32	39.02	0.00539	-180.592	0.542	180.592
32.63	1		32.63	46.62	152	1.2	1728	46.63	161.44	1440	145.98	9.26	39.17	0.00536	-180.856	0.544	180.856
32.75	1		32.75	46.75	152	1.2	1728	46.75	161.56	1440	145.95	9.33	39.32	0.00540	-181.119	0.546	181.119
32.88	2	Step 2	0.01	46.88	152	1.4	2016	46.88	161.69	1440	145.93	9.34	39.50	0.00463	-0.916	0.000	0.916
33.00	2		0.12	47.01	152	1.5	2160	47.00	161.81	1440	145.91	9.27	39.68	0.00429	-1.570	0.002	1.570
33.13	2		0.25	47.14	152	1.6	2304	47.13	161.94	1440	145.88	9.33	39.89	0.00405	-2.147	0.004	2.147
33.25	2		0.37	47.27	152	1.7	2448	47.25	162.06	1440	145.85	9.38	40.09	0.00383	-2.683	0.006	2.683
33.38	2		0.50	47.35	127	1.7	2448	47.38	162.19	1440	145.83	9.38	40.31	0.00383	-3.187	0.008	3.187
33.50	2		0.62	47.48	127	1.8	2592	47.50	162.31	1440	145.8	9.36	40.53	0.00361	-3.668	0.010	3.668
33.62	2		0.74	47.61	152	1.8	2592	47.62	162.43	1440	145.78	9.35	40.74	0.00361	-4.131	0.012	4.131
33.75	2		0.87	47.74	127	1.9	2736	47.75	162.56	1440	145.75	9.43	40.99	0.00345	-4.577	0.015	4.577
33.88	2		1.00	47.87	203	2	2880	47.88	162.69	1440	145.73	9.46	41.25	0.00328	-5.008	0.017	5.008
34.00	2		1.12	48.00	127	2	2880	48.00	162.81	1440	145.7	9.48	41.49	0.00329	-5.427	0.019	5.427
34.13	2		1.25	48.13	127	2	2880	48.13	162.94	1440	145.67	9.47	41.75	0.00329	-5.835	0.021	5.835
34.25	2		1.37	48.25	102	2	2880	48.25	163.06	1440	145.65	9.49	41.99	0.00330	-6.233	0.023	6.233
34.38	2		1.50	48.38	228	2	2880	48.38	163.19	1440	145.62	9.42	42.25	0.00327	-6.621	0.025	6.621
34.50	2		1.62	48.51	102	2	2880	48.50	163.31	1440	145.6	9.48	42.49	0.00329	-7.001	0.027	7.001
34.63	2		1.75	48.60	203	2	2880	48.63	163.44	1440	145.57	9.51	42.75	0.00330	-7.373	0.029	7.373
34.75	2		1.87	48.73	102	2	2880	48.75	163.56	1440	145.55	9.62	42.99	0.00334	-7.739	0.031	7.739
34.88	2		2.00	48.86	76	2	2880	48.88	163.69	1440	145.52	9.76	43.25	0.00339	-8.097	0.033	8.097
35.00	2		2.12	48.99	203	2	2880	49.00	163.81	1440	145.5	9.87	43.49	0.00343	-8.449	0.035	8.449
35.13	2		2.25	49.11	102	2	2880	49.13	163.94	1441	145.48	10.04	43.75	0.00349	-8.794	0.037	8.794
35.25	2		2.37	49.24	76	2	2880	49.25	164.06	1441	145.46	10.14	43.99	0.00352	-9.135	0.040	9.135
35.38	2		2.50	49.37	203	2	2880	49.38	164.19	1441	145.42	10.30	44.25	0.00358	-9.469	0.042	9.469
35.50	2		2.62	49.50	102	2	2880	49.50	164.31	1441	145.4	10.39	44.49	0.00361	-9.799	0.044	9.799
35.63	2		2.75	49.63	127	2	2880	49.63	164.44	1441	145.38	10.46	44.75	0.00363	-10.123	0.046	10.123
35.75	2		2.87	49.76	177	2	2880	49.75	164.56	1441	145.35	10.46	44.99	0.00363	-10.443	0.048	10.443
35.88	2		3.00	49.89	76	2	2880	49.88	164.69	1441	145.33	10.53	45.25	0.00366	-10.759	0.050	10.759
36.00	2		3.12	50.02	102	2	2880	50.00	164.81	1441	145.3	10.58	45.49	0.00367	-11.070	0.052	11.070
36.13	2		3.25	50.10	76	2	2880	50.13	164.94	1441	145.28	10.62	45.75	0.00369	-11.377	0.054	11.377
36.25	2		3.37	50.23	76	2	2880	50.25	165.06	1441	145.25	10.71	45.99	0.00372	-11.680	0.056	11.680
36.37	2		3.49	50.36	152	2	2880	50.37	165.18	1441	145.22	10.71	46.23	0.00372	-11.980	0.058	11.980
36.50	2		3.62	50.49	127	2	2880	50.50	165.31	1441	145.2	10.77	46.49	0.00374	-12.275	0.060	12.275
36.63	2		3.75	50.62	102	2	2880	50.63	165.44	1441	145.18	10.79	46.75	0.00375	-12.567	0.062	12.567

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	PRES TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
36.75	2	3.87	50.75	76	2	2880	50.75	165.56	1441	145.15	10.82	46.99	0.00376	-12.856	0.065	12.856
36.88	2	4.00	50.88	76	2	2880	50.88	165.69	1441	145.13	10.87	47.25	0.00377	-13.141	0.067	13.141
37.00	2	4.12	51.01	102	2	2880	51.00	165.81	1441	145.1	10.81	47.49	0.00375	-13.423	0.069	13.423
37.13	2	4.25	51.13	127	2	2880	51.13	165.94	1441	145.08	10.79	47.75	0.00375	-13.702	0.071	13.702
37.25	2	4.37	51.26	127	2	2880	51.25	166.06	1441	145.05	10.79	47.99	0.00375	-13.977	0.073	13.977
37.38	2	4.50	51.39	102	2	2880	51.38	166.19	1441	145.02	10.82	48.25	0.00376	-14.250	0.075	14.250
37.50	2	4.62	51.52	102	2	2880	51.50	166.31	1441	145	10.93	48.49	0.00380	-14.520	0.077	14.520
37.63	2	4.75	51.61	76	2	2880	51.63	166.44	1441	144.97	10.94	48.75	0.00380	-14.787	0.079	14.787
37.75	2	4.87	51.74	76	2	2880	51.75	166.56	1442	144.95	11.02	48.99	0.00383	-15.052	0.081	15.052
37.88	2	5.00	51.87	76	2	2880	51.88	166.69	1442	144.92	11.03	49.25	0.00383	-15.313	0.083	15.313
38.00	2	5.12	51.99	76	2	2880	52.00	166.81	1442	144.9	11.08	49.49	0.00385	-15.572	0.085	15.572
38.13	2	5.25	52.12	76	2	2880	52.13	166.94	1442	144.86	11.15	49.75	0.00387	-15.829	0.087	15.829
38.25	2	5.37	52.25	102	2	2880	52.25	167.06	1442	144.84	11.14	49.99	0.00387	-16.083	0.090	16.083
38.38	2	5.50	52.38	102	2	2880	52.38	167.19	1442	144.82	11.16	50.25	0.00388	-16.334	0.092	16.334
38.50	2	5.62	52.51	76	2	2880	52.50	167.31	1442	144.78	11.14	50.49	0.00387	-16.584	0.094	16.584
38.63	2	5.75	52.60	102	2	2880	52.63	167.44	1442	144.76	11.10	50.75	0.00385	-16.831	0.096	16.831
38.75	2	5.87	52.72	76	2	2880	52.75	167.56	1442	144.73	11.14	50.99	0.00387	-17.075	0.098	17.075
38.88	2	6.00	52.85	76	2	2880	52.88	167.69	1442	144.7	11.16	51.25	0.00388	-17.318	0.100	17.318
39.00	2	6.12	52.98	76	2.1	3024	53.00	167.81	1442	144.68	11.14	51.50	0.00368	-17.588	0.102	17.588
39.13	2	6.25	53.11	76	2.1	3024	53.13	167.94	1442	144.64	11.20	51.78	0.00370	-17.856	0.104	17.856
39.25	2	6.37	53.24	76	2.1	3024	53.25	168.06	1442	144.62	11.20	52.03	0.00370	-18.122	0.106	18.122
39.38	2	6.50	53.37	76	2.1	3024	53.38	168.19	1442	144.59	11.24	52.30	0.00372	-18.385	0.108	18.385
39.50	2	6.62	53.50	76	2.1	3024	53.50	168.31	1442	144.56	11.32	52.55	0.00374	-18.646	0.110	18.646
39.63	2	6.75	53.63	76	2.1	3024	53.63	168.44	1442	144.54	11.34	52.83	0.00375	-18.905	0.113	18.905
39.75	2	6.87	53.76	76	2.1	3024	53.75	168.56	1442	144.51	11.38	53.08	0.00376	-19.162	0.115	19.162
39.88	2	7.00	53.89	76	2.1	3024	53.88	168.69	1442	144.48	11.44	53.35	0.00378	-19.416	0.117	19.416
40.00	2	7.12	54.01	76	2.1	3024	54.00	168.81	1442	144.45	11.46	53.60	0.00379	-19.668	0.119	19.668
40.13	2	7.25	54.14	76	2.1	3024	54.13	168.94	1442	144.42	11.51	53.88	0.00381	-19.919	0.121	19.919
40.25	2	7.37	54.27	51	2.2	3168	54.25	169.06	1442	144.4	11.50	54.14	0.00363	-20.195	0.123	20.195
40.38	2	7.50	54.36	76	2.2	3168	54.38	169.19	1442	144.37	11.54	54.43	0.00364	-20.468	0.125	20.468
40.50	2	7.62	54.49	76	2.3	3312	54.50	169.31	1442	144.34	11.62	54.70	0.00351	-20.821	0.127	20.821
40.63	2	7.75	54.62	51	2.3	3312	54.63	169.44	1442	144.31	11.62	55.00	0.00351	-21.172	0.129	21.172
40.75	2	7.87	54.75	51	2.5	3600	54.75	169.56	1442	144.29	11.53	55.30	0.00320	-21.519	0.131	21.519
40.88	2	8.00	54.88	51	2	2880	54.88	169.69	1442	144.25	11.57	55.56	0.00402	-21.864	0.133	21.864
41.00	2	8.12	55.00	51	1.7	2448	55.00	169.81	1442	144.22	11.64	55.76	0.00475	-22.206	0.135	22.206
41.13	2	8.25	55.13	51	1.8	2592	55.13	169.94	1442	144.19	11.68	56.00	0.00451	-22.545	0.138	22.545
41.25	2	8.37	55.26	51	2	2880	55.25	170.06	1442	144.16	11.68	56.24	0.00406	-22.882	0.140	22.882
41.38	2	8.50	55.35	51	2.1	3024	55.38	170.19	1442	144.13	11.73	56.51	0.00388	-23.217	0.142	23.217
41.50	2	8.62	55.48	51	2.3	3312	55.50	170.31	1442	144.1	11.72	56.79	0.00354	-23.549	0.144	23.549
41.63	2	8.75	55.61	51	2.5	3600	55.63	170.44	1442	144.08	11.74	57.11	0.00326	-23.878	0.146	23.878
41.75	2	8.87	55.74	51	2.6	3744	55.75	170.56	1442	144.05	11.78	57.42	0.00315	-24.205	0.148	24.205
41.88	2	9.00	55.86	51	2.8	4032	55.88	170.69	1442	144.01	11.86	57.79	0.00294	-24.530	0.150	24.530
42.00	2	9.12	55.99	26	2.4	3456	56.00	170.81	1442	143.99	11.95	58.08	0.00346	-24.852	0.152	24.852
42.13	2	9.25	56.12	51	2.6	3744	56.13	170.94	1443	143.95	12.02	58.41	0.00321	-25.172	0.154	25.172
42.25	2	9.37	56.25	26	2.5	3600	56.25	171.06	1443	143.93	12.07	58.71	0.00335	-25.490	0.156	25.490
42.38	2	9.50	56.38	26	2.5	3600	56.38	171.19	1443	143.9	12.17	59.04	0.00338	-25.805	0.158	25.805
42.50	2	9.62	56.51	26	2.5	3600	56.50	171.31	1443	143.87	12.19	59.34	0.00339	-26.118	0.160	26.118
42.63	2	9.75	56.64	26	2.7	3888	56.63	171.44	1443	143.84	12.35	59.69	0.00318	-26.429	0.163	26.429
42.75	2	9.87	56.77	26	1.8	2592	56.75	171.56	1443	143.81	11.98	59.91	0.00462	-26.738	0.165	26.738

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
42.88	2	10.00	56.85	26	2.3	3312	56.88	171.69	1442	143.78	11.66	60.21	0.00352	-27.044	0.167	27.044
43.00	2	10.12	56.98	26	2.5	3600	57.00	171.81	1442	143.75	11.52	60.51	0.00320	-27.349	0.169	27.349
43.13	2	10.25	57.11	26	2.6	3744	57.13	171.94	1442	143.72	11.72	60.84	0.00313	-27.651	0.171	27.651
43.25	2	10.37	57.24	26	2.7	3888	57.25	172.06	1442	143.68	11.91	61.17	0.00306	-27.951	0.173	27.951
43.38	2	10.50	57.37	26	2.7	3888	57.38	172.19	1443	143.65	12.13	61.52	0.00312	-28.250	0.175	28.250
43.50	2	10.62	57.50	26	2.8	4032	57.50	172.31	1443	143.63	12.38	61.85	0.00307	-28.614	0.177	28.614
43.63	2	10.75	57.63	1	2.8	4032	57.63	172.44	1443	143.6	12.55	62.22	0.00311	-28.976	0.179	28.976
43.75	2	10.87	57.76	1	2.9	4176	57.75	172.56	1443	143.56	12.72	62.57	0.00305	-29.336	0.181	29.336
43.88	2	11.00	57.89	1	2.8	4032	57.88	172.69	1443	143.54	12.53	62.93	0.00311	-29.693	0.183	29.693
44.00	2	11.12	58.02	1	3	4320	58.00	172.81	1443	143.5	12.60	63.29	0.00292	-30.159	0.185	30.159
44.13	2	11.25	58.14	1	3.1	4464	58.13	172.94	1443	143.47	12.56	63.69	0.00281	-30.622	0.188	30.622
44.25	2	11.37	58.27	1	3.1	4464	58.25	173.06	1443	143.44	12.59	64.07	0.00282	-31.081	0.190	31.081
44.38	2	11.50	58.36	1	3.2	4608	58.38	173.19	1443	143.41	12.63	64.48	0.00274	-31.538	0.192	31.538
44.50	2	11.62	58.49	1	3.2	4608	58.50	173.31	1443	143.38	12.75	64.87	0.00277	-31.992	0.194	31.992
44.63	2	11.75	58.62	1	3.3	4752	58.63	173.44	1443	143.35	12.15	65.29	0.00256	-32.442	0.196	32.442
44.75	2	11.87	58.75	1	3.3	4752	58.75	173.56	1443	143.32	12.29	65.69	0.00259	-32.890	0.198	32.890
44.88	2	12.00	58.87	1	3.3	4752	58.88	173.69	1443	143.29	12.37	66.12	0.00260	-33.335	0.200	33.335
45.00	2	12.12	59.00	1	3.2	4608	59.00	173.81	1443	143.25	12.39	66.50	0.00269	-33.777	0.202	33.777
45.13	2	12.25	59.13	1	3.2	4608	59.13	173.94	1443	143.23	12.37	66.92	0.00268	-34.216	0.204	34.216
45.25	2	12.37	59.26	1	3.2	4608	59.25	174.06	1443	143.19	12.45	67.30	0.00270	-34.653	0.206	34.653
45.38	2	12.50	59.39	1	3.3	4752	59.38	174.19	1443	143.16	12.47	67.73	0.00262	-35.086	0.208	35.086
45.50	2	12.62	59.52	1	3.3	4752	59.50	174.31	1443	143.12	12.64	68.13	0.00266	-35.517	0.210	35.517
45.63	2	12.75	59.65	1	3.3	4752	59.63	174.44	1443	143.1	12.95	68.56	0.00273	-35.945	0.213	35.945
45.75	2	12.87	59.77	1	3.3	4752	59.75	174.56	1444	143.06	13.19	68.95	0.00278	-36.370	0.215	36.370
45.88	2	13.00	59.86	1	3.3	4752	59.88	174.69	1444	143.03	13.62	69.38	0.00287	-36.793	0.217	36.793
46.00	2	13.12	59.99	1	3.3	4752	60.00	174.81	1445	143	13.99	69.78	0.00294	-37.213	0.219	37.213
46.13	2	13.25	60.12	1	3.3	4752	60.13	174.94	1445	142.97	14.57	70.21	0.00307	-37.631	0.221	37.631
46.25	2	13.37	60.25	1	3.3	4752	60.25	175.06	1446	142.94	15.03	70.60	0.00316	-38.046	0.223	38.046
46.38	2	13.50	60.37	1	3.3	4752	60.38	175.19	1446	142.91	15.31	71.03	0.00322	-38.458	0.225	38.458
46.50	2	13.62	60.50	1	3.3	4752	60.50	175.31	1446	142.86	15.29	71.43	0.00322	-38.868	0.227	38.868
46.63	2	13.75	60.63	1	3.3	4752	60.63	175.44	1446	142.83	15.06	71.86	0.00317	-39.275	0.229	39.275
46.75	2	13.87	60.76	1	3.3	4752	60.75	175.56	1446	142.8	15.40	72.25	0.00324	-39.680	0.231	39.680
46.88	2	14.00	60.89	1	3.3	4752	60.88	175.69	1446	142.77	15.60	72.68	0.00328	-40.082	0.233	40.082
47.00	2	14.12	61.02	1	3.3	4752	61.00	175.81	1446	142.72	15.72	73.08	0.00331	-40.482	0.235	40.482
47.13	2	14.25	61.11	1	3.3	4752	61.13	175.94	1446	142.7	15.69	73.51	0.00330	-40.879	0.238	40.879
47.25	2	14.37	61.23	1	3.3	4752	61.25	176.06	1446	142.65	15.97	73.90	0.00336	-41.274	0.240	41.274
47.38	2	14.50	61.36	1	3.3	4752	61.38	176.19	1447	142.62	16.30	74.33	0.00343	-41.666	0.242	41.666
47.50	2	14.62	61.49	1	3.3	4752	61.50	176.31	1447	142.58	16.66	74.73	0.00351	-42.057	0.244	42.057
47.63	2	14.75	61.62	1	3.3	4752	61.63	176.44	1447	142.53	16.84	75.16	0.00354	-42.444	0.246	42.444
47.75	2	14.87	61.75	1	3.3	4752	61.75	176.56	1448	142.49	17.02	75.55	0.00358	-42.830	0.248	42.830
47.88	2	15.00	61.88	1	3.3	4752	61.88	176.69	1448	142.45	17.25	75.98	0.00363	-43.213	0.250	43.213
48.00	2	15.12	62.01	1	3.3	4752	62.00	176.81	1448	142.41	17.30	76.38	0.00364	-43.594	0.252	43.594
48.13	2	15.25	62.14	1	3.3	4752	62.13	176.94	1448	142.36	17.41	76.81	0.00366	-43.973	0.254	43.973
48.25	2	15.37	62.27	1	3.3	4752	62.25	177.06	1448	142.31	17.57	77.20	0.00370	-44.349	0.256	44.349
48.38	2	15.50	62.39	1	3.3	4752	62.38	177.19	1448	142.26	17.66	77.63	0.00372	-44.723	0.258	44.723
48.50	2	15.62	62.52	1	3.3	4752	62.50	177.31	1448	142.22	17.72	78.03	0.00373	-45.095	0.260	45.095
48.63	2	15.75	62.61	1	3.3	4752	62.63	177.44	1448	142.17	17.87	78.46	0.00376	-45.465	0.263	45.465
48.75	2	15.87	62.74	1	3.3	4752	62.75	177.56	1448	142.12	17.97	78.85	0.00378	-45.832	0.265	45.832
48.88	2	16.00	62.87	1	3.3	4752	62.88	177.69	1448	142.06	17.97	79.28	0.00378	-46.197	0.267	46.197

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
49.00	2	16.12	63.00	1	3.3	4752	63.00	177.81	1449	142.01	18.08	79.68	0.00380	-46.561	0.269	46.561
49.13	2	16.25	63.12	1	3.3	4752	63.13	177.94	1449	141.96	18.08	80.11	0.00380	-46.922	0.271	46.922
49.25	2	16.37	63.25	1	3.3	4752	63.25	178.06	1449	141.9	18.13	80.50	0.00382	-47.281	0.273	47.281
49.38	2	16.50	63.38	1	3.3	4752	63.38	178.19	1449	141.84	18.18	80.93	0.00383	-47.637	0.275	47.637
49.50	2	16.62	63.51	1	3.3	4752	63.50	178.31	1449	141.78	18.18	81.33	0.00383	-47.992	0.277	47.992
49.63	2	16.75	63.64	1	3.3	4752	63.63	178.44	1449	141.72	18.27	81.76	0.00384	-48.345	0.279	48.345
49.75	2	16.87	63.77	1	3.3	4752	63.75	178.56	1449	141.66	18.34	82.15	0.00386	-48.695	0.281	48.695
49.88	2	17.00	63.85	1	3.3	4752	63.88	178.69	1449	141.6	18.42	82.58	0.00388	-49.044	0.283	49.044
50.00	2	17.12	63.98	1	3.3	4752	64.00	178.81	1449	141.54	18.53	82.98	0.00390	-49.391	0.285	49.391
50.13	2	17.25	64.11	1	3.3	4752	64.13	178.94	1449	141.48	18.47	83.41	0.00389	-49.735	0.288	49.735
50.25	2	17.37	64.24	1	3.3	4752	64.25	179.06	1449	141.41	18.58	83.80	0.00391	-50.078	0.290	50.078
50.38	2	17.50	64.37	1	3.3	4752	64.38	179.19	1449	141.35	18.53	84.23	0.00390	-50.418	0.292	50.418
50.50	2	17.62	64.49	1	3.3	4752	64.50	179.31	1449	141.27	18.50	84.63	0.00389	-50.757	0.294	50.757
50.63	2	17.75	64.62	1	3.3	4752	64.63	179.44	1449	141.21	18.44	85.06	0.00388	-51.093	0.296	51.093
50.75	2	17.87	64.75	1	3.3	4752	64.75	179.56	1449	141.14	18.35	85.45	0.00386	-51.428	0.298	51.428
50.88	2	18.00	64.88	1	3.3	4752	64.88	179.69	1449	141.08	18.09	85.88	0.00381	-51.761	0.300	51.761
51.00	2	18.12	65.01	1	3.3	4752	65.00	179.81	1448	141	17.89	86.28	0.00376	-52.092	0.302	52.092
51.13	2	18.25	65.14	1	3.3	4752	65.13	179.94	1448	140.93	17.87	86.71	0.00376	-52.421	0.304	52.421
51.25	2	18.37	65.27	1	3.3	4752	65.25	180.06	1448	140.85	17.78	87.10	0.00374	-52.748	0.306	52.748
51.38	2	18.50	65.39	1	3.3	4752	65.38	180.19	1448	140.78	17.71	87.53	0.00373	-53.073	0.308	53.073
51.50	2	18.62	65.52	1	3.3	4752	65.50	180.31	1448	140.71	17.67	87.93	0.00372	-53.396	0.310	53.396
51.63	2	18.75	65.61	1	3.3	4752	65.63	180.44	1448	140.63	17.72	88.36	0.00373	-53.718	0.313	53.718
51.75	2	18.87	65.74	1	3.3	4752	65.75	180.56	1448	140.56	17.69	88.75	0.00372	-54.038	0.315	54.038
51.88	2	19.00	65.87	1	3.3	4752	65.88	180.69	1448	140.49	17.71	89.18	0.00373	-54.355	0.317	54.355
52.00	2	19.12	65.99	1	3.3	4752	66.00	180.81	1448	140.41	17.67	89.58	0.00372	-54.671	0.319	54.671
52.13	2	19.25	66.12	1	3.3	4752	66.13	180.94	1448	140.34	17.75	90.01	0.00374	-54.986	0.321	54.986
52.25	2	19.37	66.25	1	3.3	4752	66.25	181.06	1448	140.26	17.74	90.40	0.00373	-55.298	0.323	55.298
52.38	2	19.50	66.38	1	3.3	4752	66.38	181.19	1448	140.18	17.61	90.83	0.00371	-55.609	0.325	55.609
52.50	2	19.62	66.51	1	3.3	4752	66.50	181.31	1448	140.1	17.75	91.23	0.00374	-55.918	0.327	55.918
52.63	2	19.75	66.64	1	3.3	4752	66.63	181.44	1448	140.02	17.80	91.66	0.00375	-56.225	0.329	56.225
52.75	2	19.87	66.77	1	3.3	4752	66.75	181.56	1448	139.95	17.88	92.05	0.00376	-56.530	0.331	56.530
52.88	2	20.00	66.85	1	3.3	4752	66.88	181.69	1449	139.87	18.01	92.48	0.00379	-56.834	0.333	56.834
53.00	2	20.12	66.98	1	3.3	4752	67.00	181.81	1449	139.79	18.03	92.88	0.00379	-57.136	0.335	57.136
53.13	2	20.25	67.11	1	3.3	4752	67.13	181.94	1449	139.71	18.10	93.31	0.00381	-57.436	0.338	57.436
53.25	2	20.37	67.24	1	3.3	4752	67.25	182.06	1449	139.63	18.12	93.70	0.00381	-57.735	0.340	57.735
53.38	2	20.50	67.37	1	3.3	4752	67.38	182.19	1449	139.55	18.13	94.13	0.00382	-58.031	0.342	58.031
53.50	2	20.62	67.50	1	3.3	4752	67.50	182.31	1449	139.47	18.30	94.53	0.00385	-58.327	0.344	58.327
53.63	2	20.75	67.63	1	3.3	4752	67.63	182.44	1449	139.39	18.33	94.96	0.00386	-58.620	0.346	58.620
53.75	2	20.87	67.75	1	3.3	4752	67.75	182.56	1449	139.31	18.33	95.35	0.00386	-58.912	0.348	58.912
53.88	2	21.00	67.88	1	3.3	4752	67.88	182.69	1449	139.23	18.37	95.78	0.00387	-59.202	0.350	59.202
54.00	2	21.12	68.01	1	3.3	4752	68.00	182.81	1449	139.15	18.39	96.18	0.00387	-59.491	0.352	59.491
54.13	2	21.25	68.14	1	3.3	4752	68.13	182.94	1449	139.06	18.39	96.61	0.00387	-59.777	0.354	59.777
54.25	2	21.37	68.27	1	3.3	4752	68.25	183.06	1449	138.98	18.52	97.00	0.00390	-60.063	0.356	60.063
54.38	2	21.50	68.35	1	3.3	4752	68.38	183.19	1449	138.9	18.57	97.43	0.00391	-60.346	0.358	60.346
54.50	2	21.62	68.48	1	3.3	4752	68.50	183.31	1449	138.81	18.63	97.83	0.00392	-60.628	0.360	60.628
54.63	2	21.75	68.61	1	3.3	4752	68.63	183.44	1449	138.73	18.60	98.26	0.00391	-60.909	0.363	60.909
54.75	2	21.87	68.74	1	3.3	4752	68.75	183.56	1449	138.65	18.77	98.65	0.00395	-61.188	0.365	61.188
54.88	2	22.00	68.87	1	3.3	4752	68.88	183.69	1449	138.56	18.82	99.08	0.00396	-61.465	0.367	61.465
55.00	2	22.12	69.00	1	3.3	4752	69.00	183.81	1449	138.48	18.78	99.48	0.00395	-61.741	0.369	61.741

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Step Rate Test - October 31, 2008
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SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
55.13	2	22.25	69.13	1	3.3	4752	69.13	183.94	1449	138.39	18.79	99.91	0.00395	-62.015	0.371	62.015
55.25	2	22.37	69.25	1	3.3	4752	69.25	184.06	1449	138.3	18.89	100.30	0.00398	-62.288	0.373	62.288
55.38	2	22.50	69.38	1	3.3	4752	69.38	184.19	1449	138.22	18.95	100.73	0.00399	-62.559	0.375	62.559
55.50	2	22.62	69.51	1	3.3	4752	69.50	184.31	1449	138.13	18.88	101.13	0.00397	-62.828	0.377	62.828
55.63	2	22.75	69.64	1	3.3	4752	69.63	184.44	1449	138.05	18.89	101.56	0.00398	-63.096	0.379	63.096
55.75	2	22.87	69.77	1	3.3	4752	69.75	184.56	1449	137.96	18.50	101.95	0.00389	-63.363	0.381	63.363
55.88	2	23.00	69.86	1	3.3	4752	69.88	184.69	1450	137.87	19.06	102.38	0.00401	-63.628	0.383	63.628
56.00	2	23.12	69.98	1	3.3	4752	70.00	184.81	1450	137.78	19.11	102.78	0.00402	-63.891	0.385	63.891
56.13	2	23.25	70.11	1	3.3	4752	70.13	184.94	1450	137.7	19.09	103.21	0.00402	-64.154	0.388	64.154
56.25	2	23.37	70.24	1	3.3	4752	70.25	185.06	1449	137.6	18.96	103.60	0.00399	-64.414	0.390	64.414
56.38	2	23.50	70.37	1	3.3	4752	70.38	185.19	1450	137.52	19.02	104.03	0.00400	-64.673	0.392	64.673
56.50	2	23.62	70.50	1	3.3	4752	70.50	185.31	1449	137.42	18.96	104.43	0.00399	-64.931	0.394	64.931
56.63	2	23.75	70.63	1	3.3	4752	70.63	185.44	1450	137.34	19.10	104.86	0.00402	-65.187	0.396	65.187
56.75	2	23.87	70.76	1	3.3	4752	70.75	185.56	1450	137.25	19.13	105.25	0.00403	-65.442	0.398	65.442
56.88	2	24.00	70.89	1	3.3	4752	70.88	185.69	1450	137.16	19.14	105.68	0.00403	-65.695	0.400	65.695
57.00	2	24.12	71.02	1	3.3	4752	71.00	185.81	1450	137.07	19.28	106.08	0.00406	-65.947	0.402	65.947
57.13	2	24.25	71.15	1	3.3	4752	71.13	185.94	1450	136.97	19.07	106.51	0.00401	-66.197	0.404	66.197
57.25	2	24.37	71.27	1	3.3	4752	71.25	186.06	1450	136.88	19.15	106.90	0.00403	-66.446	0.406	66.446
57.38	2	24.50	71.36	1	3.3	4752	71.38	186.19	1450	136.78	19.24	107.33	0.00405	-66.694	0.408	66.694
57.50	2	24.62	71.49	1	3.3	4752	71.50	186.31	1450	136.7	19.23	107.73	0.00405	-66.940	0.410	66.940
57.63	2	24.75	71.62	1	3.3	4752	71.63	186.44	1450	136.6	19.34	108.16	0.00407	-67.185	0.413	67.185
57.75	2	24.87	71.75	1	3.3	4752	71.75	186.56	1450	136.51	19.20	108.55	0.00404	-67.428	0.415	67.428
57.88	2	25.00	71.87	1	3.3	4752	71.88	186.69	1450	136.42	19.35	108.98	0.00407	-67.670	0.417	67.670
58.00	2	25.12	72.00	1	3.3	4752	72.00	186.81	1450	136.32	19.39	109.38	0.00408	-67.911	0.419	67.911
58.13	2	25.25	72.13	1	3.3	4752	72.13	186.94	1450	136.23	19.30	109.81	0.00406	-68.150	0.421	68.150
58.25	2	25.37	72.26	1	3.3	4752	72.25	187.06	1450	136.13	19.30	110.20	0.00406	-68.388	0.423	68.388
58.38	2	25.50	72.39	1	3.3	4752	72.38	187.19	1450	136.04	19.49	110.63	0.00410	-68.624	0.425	68.624
58.50	2	25.62	72.52	1	3.3	4752	72.50	187.31	1450	135.94	19.47	111.03	0.00410	-68.859	0.427	68.859
58.63	2	25.75	72.60	1	3.3	4752	72.63	187.44	1450	135.84	19.36	111.46	0.00407	-69.093	0.429	69.093
58.75	2	25.87	72.73	1	3.3	4752	72.75	187.56	1450	135.76	19.58	111.85	0.00412	-69.326	0.431	69.326
58.88	2	26.00	72.86	1	3.3	4752	72.88	187.69	1450	135.66	19.65	112.28	0.00414	-69.557	0.433	69.557
59.00	2	26.12	72.99	1	3.3	4752	73.00	187.81	1450	135.57	19.67	112.68	0.00414	-69.787	0.435	69.787
59.13	2	26.25	73.12	1	3.3	4752	73.13	187.94	1451	135.47	20.04	113.11	0.00422	-70.015	0.438	70.015
59.25	2	26.37	73.25	1	3.3	4752	73.25	188.06	1452	135.37	20.98	113.50	0.00441	-70.242	0.440	70.242
59.38	2	26.50	73.38	1	3.3	4752	73.38	188.19	1453	135.29	22.20	113.93	0.00467	-70.468	0.442	70.468
59.50	2	26.62	73.51	1	3.3	4752	73.50	188.31	1454	135.19	23.03	114.33	0.00485	-70.693	0.444	70.693
59.63	2	26.75	73.64	1	3.3	4752	73.63	188.44	1454	135.11	23.40	114.76	0.00492	-70.916	0.446	70.916
59.75	2	26.87	73.77	1	3.3	4752	73.75	188.56	1454	135.02	23.69	115.15	0.00499	-71.138	0.448	71.138
59.88	2	27.00	73.85	1	3.3	4752	73.88	188.69	1455	134.94	23.98	115.58	0.00505	-71.359	0.450	71.359
60.00	2	27.12	73.98	1	3.3	4752	74.00	188.81	1455	134.85	24.40	115.98	0.00513	-71.578	0.452	71.578
60.13	2	27.25	74.11	1	3.3	4752	74.13	188.94	1455	134.78	24.54	116.41	0.00516	-71.796	0.454	71.796
60.25	2	27.37	74.24	1	3.3	4752	74.25	189.06	1455	134.69	24.70	116.80	0.00520	-72.013	0.456	72.013
60.38	2	27.50	74.37	1	3.3	4752	74.38	189.19	1455	134.62	24.88	117.23	0.00524	-72.229	0.458	72.229
60.50	2	27.62	74.50	1	3.3	4752	74.50	189.31	1456	134.53	25.20	117.63	0.00530	-72.443	0.460	72.443
60.63	2	27.75	74.63	1	3.3	4752	74.63	189.44	1456	134.46	25.51	118.06	0.00537	-72.656	0.463	72.656
60.75	2	27.87	74.76	1	3.3	4752	74.75	189.56	1456	134.38	25.60	118.45	0.00539	-72.868	0.465	72.868
60.88	2	28.00	74.89	1	3.3	4752	74.88	189.69	1456	134.31	25.88	118.88	0.00545	-73.079	0.467	73.079
61.00	2	28.12	75.01	1	3.3	4752	75.00	189.81	1457	134.23	26.19	119.28	0.00551	-73.288	0.469	73.288
61.13	2	28.25	75.14	1	3.3	4752	75.13	189.94	1457	134.15	26.23	119.71	0.00552	-73.496	0.471	73.496

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
61.25	2		28.37	75.27	1	3.3	4752	75.25	190.06	1457	134.08	26.43	120.10	0.00556	-73.703	0.473	73.703
61.38	2		28.50	75.36	1	3.3	4752	75.38	190.19	1457	134	26.74	120.53	0.00563	-73.909	0.475	73.909
61.50	2		28.62	75.49	1	3.3	4752	75.50	190.31	1457	133.92	26.77	120.93	0.00563	-74.114	0.477	74.114
61.63	2		28.75	75.61	1	3.3	4752	75.63	190.44	1457	133.85	26.91	121.36	0.00566	-74.317	0.479	74.317
61.75	2		28.87	75.74	1	3.3	4752	75.75	190.56	1457	133.77	26.95	121.75	0.00567	-74.519	0.481	74.519
61.88	2		29.00	75.87	1	3.3	4752	75.88	190.69	1458	133.69	27.02	122.18	0.00569	-74.720	0.483	74.720
62.00	2		29.12	76.00	1	3.3	4752	76.00	190.81	1457	133.61	26.97	122.58	0.00568	-74.920	0.485	74.920
62.13	2		29.25	76.13	1	3.3	4752	76.13	190.94	1458	133.53	27.09	123.01	0.00570	-75.119	0.488	75.119
62.25	2		29.37	76.26	1	3.3	4752	76.25	191.06	1458	133.45	27.04	123.40	0.00569	-75.316	0.490	75.316
62.38	2		29.50	76.39	1	3.3	4752	76.38	191.19	1458	133.38	26.98	123.83	0.00568	-75.512	0.492	75.512
62.50	2		29.62	76.51	1	3.3	4752	76.50	191.31	1457	133.29	26.94	124.23	0.00567	-75.707	0.494	75.707
62.63	2		29.75	76.64	1	3.3	4752	76.63	191.44	1457	133.21	26.89	124.66	0.00566	-75.901	0.496	75.901
62.75	3	Step 3	0.01	76.77	1	3.4	4896	76.75	191.56	1457	133.12	26.77	125.07	0.00547	-0.661	0.000	0.661
62.88	3		0.13	76.86	26	3.7	5328	76.88	191.69	1457	133.04	26.76	125.55	0.00502	-1.127	0.002	1.127
63.00	3		0.25	76.99	26	4.2	6048	77.00	191.81	1457	132.95	26.78	126.05	0.00443	-1.544	0.004	1.544
63.13	3		0.38	77.11	26	4	5760	77.13	191.94	1457	132.87	26.68	126.57	0.00463	-1.929	0.006	1.929
63.25	3		0.50	77.25	26	4	5760	77.25	192.06	1457	132.78	26.65	127.05	0.00463	-2.293	0.008	2.293
63.38	3		0.63	77.37	26	4	5760	77.38	192.19	1457	132.69	26.61	127.57	0.00462	-2.639	0.010	2.639
63.50	3		0.75	77.50	26	4	5760	77.50	192.31	1457	132.59	26.50	128.05	0.00460	-2.972	0.013	2.972
63.63	3		0.88	77.63	26	4	5760	77.63	192.44	1457	132.5	26.47	128.57	0.00460	-3.293	0.015	3.293
63.75	3		1.00	77.76	26	4	5760	77.75	192.56	1457	132.41	26.46	129.05	0.00459	-3.604	0.017	3.604
63.88	3		1.13	77.89	26	4	5760	77.88	192.69	1457	132.31	26.37	129.57	0.00458	-3.906	0.019	3.906
64.00	3		1.25	78.02	26	4	5760	78.00	192.81	1457	132.21	26.48	130.05	0.00460	-4.200	0.021	4.200
64.13	3		1.38	78.15	26	4	5760	78.13	192.94	1457	132.11	26.45	130.57	0.00459	-4.487	0.023	4.487
64.25	3		1.50	78.23	26	4	5760	78.25	193.06	1457	132.02	26.48	131.05	0.00460	-4.767	0.025	4.767
64.38	3		1.63	78.36	26	4	5760	78.38	193.19	1457	131.91	26.54	131.57	0.00461	-5.041	0.027	5.041
64.50	3		1.75	78.49	26	4	5760	78.50	193.31	1457	131.81	26.62	132.05	0.00462	-5.310	0.029	5.310
64.63	3		1.88	78.62	26	4	5760	78.63	193.44	1457	131.7	26.78	132.57	0.00465	-5.573	0.031	5.573
64.75	3		2.00	78.75	26	4	5760	78.75	193.56	1457	131.6	26.84	133.05	0.00466	-5.831	0.033	5.831
64.88	3		2.13	78.88	26	4	5760	78.88	193.69	1457	131.5	26.97	133.57	0.00468	-6.085	0.035	6.085
65.00	3		2.25	79.01	26	4	5760	79.00	193.81	1458	131.39	27.46	134.05	0.00477	-6.335	0.038	6.335
65.13	3		2.38	79.14	26	4	5760	79.13	193.94	1459	131.28	28.17	134.57	0.00489	-6.580	0.040	6.580
65.25	3		2.50	79.27	26	4	5760	79.25	194.06	1459	131.17	28.64	135.05	0.00497	-6.822	0.042	6.822
65.38	3		2.63	79.35	26	4	5760	79.38	194.19	1460	131.05	29.13	135.57	0.00506	-7.059	0.044	7.059
65.50	3		2.75	79.48	26	4	5760	79.50	194.31	1460	130.94	29.68	136.05	0.00515	-7.294	0.046	7.294
65.63	3		2.88	79.61	26	4	5760	79.63	194.44	1460	130.84	29.97	136.57	0.00520	-7.524	0.048	7.524
65.75	3		3.00	79.74	26	4	5760	79.75	194.56	1461	130.71	30.28	137.05	0.00526	-7.752	0.050	7.752
65.88	3		3.13	79.87	26	4	5760	79.88	194.69	1461	130.6	30.47	137.57	0.00529	-7.976	0.052	7.976
66.00	3		3.25	80.00	26	4	5760	80.00	194.81	1461	130.49	30.81	138.05	0.00535	-8.198	0.054	8.198
66.13	3		3.38	80.13	26	4	5760	80.13	194.94	1462	130.37	31.04	138.57	0.00539	-8.417	0.056	8.417
66.25	3		3.50	80.26	26	4	5760	80.25	195.06	1462	130.25	31.09	139.05	0.00540	-8.633	0.058	8.633
66.38	3		3.63	80.39	26	4	5760	80.38	195.19	1462	130.14	31.31	139.57	0.00544	-8.846	0.060	8.846
66.50	3		3.75	80.51	26	4	5760	80.50	195.31	1462	130.01	31.47	140.05	0.00546	-9.057	0.063	9.057
66.63	3		3.88	80.64	26	4	5760	80.63	195.44	1462	129.9	31.57	140.57	0.00548	-9.265	0.065	9.265
66.75	3		4.00	80.77	26	4	5760	80.75	195.56	1462	129.77	31.63	141.05	0.00549	-9.470	0.067	9.470
66.88	3		4.13	80.86	26	4	5760	80.88	195.69	1462	129.65	31.67	141.57	0.00550	-9.674	0.069	9.674
67.00	3		4.25	80.99	26	4	5760	81.00	195.81	1462	129.52	31.80	142.05	0.00552	-9.875	0.071	9.875
67.13	3		4.38	81.12	26	4	5760	81.13	195.94	1462	129.39	31.84	142.57	0.00553	-10.074	0.073	10.074
67.25	3		4.50	81.25	26	4	5760	81.25	196.06	1462	129.26	31.70	143.05	0.00550	-10.271	0.075	10.271

Reduced Data Set
Step Rate Test - October 31, 2008
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SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
67.38	3	4.63	81.38	26	4	5760	81.38	196.19	1462	129.13	31.60	143.57	0.00549	-10.466	0.077	10.466
67.50	3	4.75	81.51	26	4	5760	81.50	196.31	1462	129	31.71	144.05	0.00551	-10.658	0.079	10.658
67.63	3	4.88	81.63	26	4	5760	81.63	196.44	1462	128.86	31.71	144.57	0.00551	-10.849	0.081	10.849
67.75	3	5.00	81.76	26	4	5760	81.75	196.56	1462	128.72	31.80	145.05	0.00552	-11.038	0.083	11.038
67.88	3	5.13	81.89	26	4	5760	81.88	196.69	1462	128.58	31.86	145.57	0.00553	-11.225	0.085	11.225
68.00	3	5.25	82.02	26	4	5760	82.00	196.81	1463	128.44	32.00	146.05	0.00556	-11.410	0.088	11.410
68.13	3	5.38	82.11	26	4	5760	82.13	196.94	1462	128.3	31.89	146.57	0.00554	-11.593	0.090	11.593
68.25	3	5.50	82.24	26	4	5760	82.25	197.06	1462	128.16	31.97	147.05	0.00555	-11.775	0.092	11.775
68.38	3	5.63	82.37	26	4	5760	82.38	197.19	1463	128.01	32.00	147.57	0.00556	-11.955	0.094	11.955
68.50	3	5.75	82.49	26	4	5760	82.50	197.31	1462	127.86	31.94	148.05	0.00555	-12.133	0.096	12.133
68.63	3	5.88	82.62	26	4	5760	82.63	197.44	1463	127.71	32.27	148.57	0.00560	-12.309	0.098	12.309
68.75	3	6.00	82.75	26	4	5760	82.75	197.56	1463	127.57	32.23	149.05	0.00560	-12.484	0.100	12.484
68.88	3	6.13	82.88	26	4	5760	82.88	197.69	1463	127.42	32.29	149.57	0.00561	-12.658	0.102	12.658
69.00	3	6.25	83.01	26	4	5760	83.00	197.81	1463	127.26	32.48	150.05	0.00564	-12.830	0.104	12.830
69.13	3	6.38	83.14	26	4	5760	83.13	197.94	1463	127.11	32.48	150.57	0.00564	-13.000	0.106	13.000
69.25	3	6.50	83.27	26	4	5760	83.25	198.06	1463	126.95	32.35	151.05	0.00562	-13.169	0.108	13.169
69.38	3	6.63	83.36	26	4	5760	83.38	198.19	1463	126.79	32.53	151.57	0.00565	-13.336	0.111	13.336
69.50	3	6.75	83.49	26	4	5760	83.50	198.31	1463	126.65	32.57	152.05	0.00565	-13.502	0.113	13.502
69.63	3	6.88	83.61	26	4	5760	83.63	198.44	1463	126.48	32.35	152.57	0.00562	-13.667	0.115	13.667
69.75	3	7.00	83.74	26	4	5760	83.75	198.56	1463	126.33	32.29	153.05	0.00561	-13.830	0.117	13.830
69.88	3	7.13	83.87	26	4	5760	83.88	198.69	1463	126.17	32.29	153.57	0.00561	-13.992	0.119	13.992
70.00	3	7.25	84.00	26	4	5760	84.00	198.81	1463	126.01	32.27	154.05	0.00560	-14.153	0.121	14.153
70.13	3	7.38	84.13	26	4	5760	84.13	198.94	1463	125.84	32.36	154.57	0.00562	-14.312	0.123	14.312
70.25	3	7.50	84.26	26	4	5760	84.25	199.06	1463	125.68	32.11	155.05	0.00557	-14.470	0.125	14.470
70.38	3	7.63	84.39	26	4	5760	84.38	199.19	1463	125.51	32.11	155.57	0.00557	-14.627	0.127	14.627
70.50	3	7.75	84.52	26	4	5760	84.50	199.31	1463	125.35	32.07	156.05	0.00557	-14.782	0.129	14.782
70.63	3	7.88	84.60	26	4	5760	84.63	199.44	1462	125.17	31.97	156.57	0.00555	-14.937	0.131	14.937
70.75	3	8.00	84.73	26	4	5760	84.75	199.56	1462	125	31.90	157.05	0.00554	-15.090	0.133	15.090
70.88	3	8.13	84.86	26	4.1	5904	84.88	199.69	1462	124.83	31.77	157.58	0.00538	-15.242	0.136	15.242
71.00	3	8.25	84.99	26	4	5760	85.00	199.81	1462	124.65	31.65	158.06	0.00549	-15.393	0.138	15.393
71.13	3	8.38	85.12	26	4	5760	85.13	199.94	1462	124.47	31.60	158.58	0.00549	-15.542	0.140	15.542
71.25	3	8.50	85.25	26	4	5760	85.25	200.06	1462	124.29	31.41	159.06	0.00545	-15.691	0.142	15.691
71.38	3	8.63	85.38	26	4	5760	85.38	200.19	1462	124.1	31.38	159.58	0.00545	-15.838	0.144	15.838
71.50	3	8.75	85.51	26	4	5760	85.50	200.31	1462	123.92	31.24	160.06	0.00542	-15.984	0.146	15.984
71.63	3	8.88	85.64	26	4	5760	85.63	200.44	1462	123.72	31.14	160.58	0.00541	-16.130	0.148	16.130
71.75	3	9.00	85.76	26	4	5760	85.75	200.56	1462	123.54	30.99	161.06	0.00538	-16.274	0.150	16.274
71.88	3	9.13	85.89	26	4	5760	85.88	200.69	1461	123.34	30.89	161.58	0.00536	-16.417	0.152	16.417
72.00	3	9.25	86.02	26	4	5760	86.00	200.81	1461	123.16	30.58	162.06	0.00531	-16.559	0.154	16.559
72.13	3	9.38	86.11	26	4	5760	86.13	200.94	1461	122.95	30.48	162.58	0.00529	-16.700	0.156	16.700
72.25	3	9.50	86.24	26	4	5760	86.25	201.06	1461	122.75	30.42	163.06	0.00528	-16.840	0.158	16.840
72.38	3	9.63	86.37	26	4	5760	86.38	201.19	1461	122.55	30.23	163.58	0.00525	-16.979	0.161	16.979
72.50	3	9.75	86.50	26	4	5760	86.50	201.31	1461	122.35	30.17	164.06	0.00524	-17.117	0.163	17.117
72.63	3	9.88	86.62	26	4	5760	86.63	201.44	1461	122.15	30.10	164.58	0.00523	-17.254	0.165	17.254
72.75	3	10.00	86.75	26	4	5760	86.75	201.56	1461	121.95	30.02	165.06	0.00521	-17.390	0.167	17.390
72.88	3	10.13	86.88	26	4	5760	86.88	201.69	1460	121.74	29.95	165.58	0.00520	-17.526	0.169	17.526
73.00	3	10.25	87.01	26	4	5760	87.00	201.81	1461	121.53	30.14	166.06	0.00523	-17.660	0.171	17.660
73.13	3	10.38	87.14	26	4	5760	87.13	201.94	1461	121.32	30.08	166.58	0.00522	-17.793	0.173	17.793
73.25	3	10.50	87.27	26	4	5760	87.25	202.06	1461	121.11	30.01	167.06	0.00521	-17.926	0.175	17.926
73.38	3	10.63	87.36	26	4	5760	87.38	202.19	1460	120.9	29.89	167.58	0.00519	-18.057	0.177	18.057

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
73.50	3	10.75	87.49	26	4	5760	87.50	202.31	1460	120.69	29.85	168.06	0.00518	-18.188	0.179	18.188
73.63	3	10.88	87.62	26	4	5760	87.63	202.44	1460	120.47	29.66	168.58	0.00515	-18.318	0.181	18.318
73.75	3	11.00	87.75	26	4	5760	87.75	202.56	1460	120.26	29.82	169.06	0.00518	-18.447	0.183	18.447
73.88	3	11.13	87.88	26	4	5760	87.88	202.69	1460	120.05	29.70	169.58	0.00516	-18.575	0.186	18.575
74.00	3	11.25	88.00	26	4	5760	88.00	202.81	1460	119.83	29.80	170.06	0.00517	-18.702	0.188	18.702
74.13	3	11.38	88.13	26	4	5760	88.13	202.94	1460	119.63	29.77	170.58	0.00517	-18.828	0.190	18.828
74.25	3	11.50	88.26	26	4	5760	88.25	203.06	1460	119.41	29.80	171.06	0.00517	-18.954	0.192	18.954
74.38	3	11.63	88.39	26	4	5760	88.38	203.19	1460	119.2	29.87	171.58	0.00519	-19.079	0.194	19.079
74.50	3	11.75	88.52	26	4	5760	88.50	203.31	1460	118.99	29.77	172.06	0.00517	-19.202	0.196	19.202
74.63	3	11.88	88.65	26	4	5760	88.63	203.44	1460	118.77	29.67	172.58	0.00515	-19.326	0.198	19.326
74.75	3	12.00	88.78	26	4	5760	88.75	203.56	1460	118.56	29.71	173.06	0.00516	-19.448	0.200	19.448
74.88	3	12.13	88.86	26	4	5760	88.88	203.69	1460	118.35	29.77	173.58	0.00517	-19.569	0.202	19.569
75.00	3	12.25	88.99	26	4	5760	89.00	203.81	1460	118.14	29.55	174.06	0.00513	-19.690	0.204	19.690
75.13	3	12.38	89.12	26	4	5760	89.13	203.94	1460	117.93	29.52	174.58	0.00513	-19.810	0.206	19.810
75.25	3	12.50	89.25	26	4	5760	89.25	204.06	1460	117.73	29.76	175.06	0.00517	-19.929	0.208	19.929
75.38	3	12.63	89.38	26	4	5760	89.38	204.19	1460	117.51	29.76	175.58	0.00517	-20.048	0.211	20.048
75.50	3	12.75	89.51	26	4	5760	89.50	204.31	1460	117.3	29.82	176.06	0.00518	-20.165	0.213	20.165
75.63	3	12.88	89.64	26	4	5760	89.63	204.44	1460	117.09	29.80	176.58	0.00517	-20.282	0.215	20.282
75.75	3	13.00	89.76	26	4	5760	89.75	204.56	1460	116.89	29.75	177.06	0.00516	-20.399	0.217	20.399
75.88	3	13.13	89.89	26	4	5760	89.88	204.69	1460	116.69	29.81	177.58	0.00518	-20.514	0.219	20.514
76.00	3	13.25	90.02	26	4	5760	90.00	204.81	1460	116.48	29.57	178.06	0.00513	-20.629	0.221	20.629
76.13	3	13.38	90.11	26	4.2	6048	90.13	204.94	1460	116.28	29.58	178.61	0.00489	-20.743	0.223	20.743
76.25	3	13.50	90.24	26	4.1	5904	90.25	205.06	1460	116.07	29.54	179.10	0.00500	-20.856	0.225	20.856
76.38	3	13.63	90.37	26	4.1	5904	90.38	205.19	1460	115.87	29.48	179.63	0.00499	-20.969	0.227	20.969
76.50	3	13.75	90.50	26	4.1	5904	90.50	205.31	1460	115.66	29.77	180.13	0.00504	-21.081	0.229	21.081
76.63	3	13.88	90.62	26	4.1	5904	90.63	205.44	1460	115.47	29.48	180.66	0.00499	-21.192	0.231	21.192
76.75	3	14.00	90.75	26	4	5760	90.75	205.56	1460	115.26	29.42	181.14	0.00511	-21.303	0.233	21.303
76.88	3	14.13	90.88	26	4	5760	90.88	205.69	1460	115.06	29.39	181.66	0.00510	-21.413	0.236	21.413
77.00	3	14.25	91.01	26	4	5760	91.00	205.81	1460	114.87	29.49	182.14	0.00512	-21.522	0.238	21.522
77.13	3	14.38	91.14	26	4	5760	91.13	205.94	1460	114.67	29.51	182.66	0.00512	-21.630	0.240	21.630
77.25	3	14.50	91.27	26	4	5760	91.25	206.06	1460	114.48	29.29	183.14	0.00509	-21.738	0.242	21.738
77.38	3	14.63	91.36	26	4	5760	91.38	206.19	1460	114.28	29.34	183.66	0.00509	-21.846	0.244	21.846
77.50	3	14.75	91.49	26	4	5760	91.50	206.31	1460	114.09	29.34	184.14	0.00509	-21.952	0.246	21.952
77.63	3	14.88	91.61	26	4	5760	91.63	206.44	1460	113.89	29.39	184.66	0.00510	-22.058	0.248	22.058
77.75	3	15.00	91.74	26	4	5760	91.75	206.56	1460	113.7	29.49	185.14	0.00512	-22.164	0.250	22.164
77.88	3	15.13	91.87	26	4	5760	91.88	206.69	1460	113.51	29.74	185.66	0.00516	-22.268	0.252	22.268
78.00	3	15.25	92.00	26	4	5760	92.00	206.81	1460	113.32	29.68	186.14	0.00515	-22.372	0.254	22.372
78.13	3	15.38	92.13	26	4	5760	92.13	206.94	1460	113.13	29.66	186.66	0.00515	-22.476	0.256	22.476
78.25	3	15.50	92.26	26	4	5760	92.25	207.06	1460	112.94	29.62	187.14	0.00514	-22.579	0.258	22.579
78.38	3	15.63	92.35	26	4	5760	92.38	207.19	1460	112.76	29.40	187.66	0.00510	-22.681	0.261	22.681
78.50	3	15.75	92.47	26	4	5760	92.50	207.31	1460	112.58	29.33	188.14	0.00509	-22.783	0.263	22.783
78.63	3	15.88	92.60	26	4	5760	92.63	207.44	1460	112.39	29.36	188.66	0.00510	-22.884	0.265	22.884
78.75	3	16.00	92.73	26	4	5760	92.75	207.56	1460	112.21	29.42	189.14	0.00511	-22.984	0.267	22.984
78.88	3	16.13	92.86	26	4	5760	92.88	207.69	1460	112.03	29.61	189.66	0.00514	-23.084	0.269	23.084
79.00	3	16.25	92.99	26	4	5760	93.00	207.81	1460	111.85	29.67	190.14	0.00515	-23.183	0.271	23.183
79.13	3	16.38	93.12	26	4	5760	93.13	207.94	1460	111.67	29.60	190.66	0.00514	-23.282	0.273	23.282
79.25	3	16.50	93.25	26	4	5760	93.25	208.06	1460	111.5	29.49	191.14	0.00512	-23.380	0.275	23.380
79.38	3	16.63	93.38	26	4	5760	93.38	208.19	1460	111.31	29.45	191.66	0.00511	-23.478	0.277	23.478
79.50	3	16.75	93.51	26	4	5760	93.50	208.31	1460	111.14	29.50	192.14	0.00512	-23.575	0.279	23.575

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	PRES TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
79.63	3	16.88	93.64	26	4	5760	93.63	208.44	1460	110.96	29.46	192.66	0.00511	-23.671	0.281	23.671
79.75	3	17.00	93.77	26	4	5760	93.75	208.56	1460	110.79	29.33	193.14	0.00509	-23.767	0.283	23.767
79.88	3	17.13	93.90	26	4	5760	93.88	208.69	1460	110.62	29.29	193.66	0.00509	-23.862	0.286	23.862
80.00	3	17.25	94.02	26	4	5760	94.00	208.81	1460	110.45	29.30	194.14	0.00509	-23.957	0.288	23.957
80.13	3	17.38	94.11	26	4	5760	94.13	208.94	1460	110.27	29.18	194.66	0.00507	-24.051	0.290	24.051
80.25	3	17.50	94.24	26	4	5760	94.25	209.06	1459	110.11	28.94	195.14	0.00502	-24.145	0.292	24.145
80.38	3	17.63	94.37	26	4	5760	94.38	209.19	1459	109.94	28.95	195.66	0.00503	-24.238	0.294	24.238
80.50	3	17.75	94.50	26	4	5760	94.50	209.31	1459	109.77	28.93	196.14	0.00502	-24.330	0.296	24.330
80.63	3	17.88	94.63	26	4	5760	94.63	209.44	1459	109.61	28.91	196.66	0.00502	-24.422	0.298	24.422
80.75	3	18.00	94.76	26	4	5760	94.75	209.56	1460	109.44	29.01	197.14	0.00504	-24.514	0.300	24.514
80.88	3	18.13	94.88	26	4	5760	94.88	209.69	1459	109.28	28.83	197.66	0.00501	-24.605	0.302	24.605
81.00	3	18.25	95.01	26	4	5760	95.00	209.81	1459	109.12	28.69	198.14	0.00498	-24.695	0.304	24.695
81.13	3	18.38	95.14	26	4	5760	95.13	209.94	1459	108.96	28.74	198.66	0.00499	-24.785	0.306	24.785
81.25	3	18.50	95.27	26	4	5760	95.25	210.06	1459	108.79	28.96	199.14	0.00503	-24.875	0.308	24.875
81.38	3	18.63	95.36	26	4	5760	95.38	210.19	1460	108.64	28.98	199.66	0.00503	-24.963	0.311	24.963
81.50	3	18.75	95.49	26	4	5760	95.50	210.31	1459	108.49	28.78	200.14	0.00500	-25.052	0.313	25.052
81.63	3	18.88	95.61	26	4	5760	95.63	210.44	1459	108.33	28.65	200.66	0.00497	-25.140	0.315	25.140
81.75	3	19.00	95.74	26	4	5760	95.75	210.56	1459	108.17	28.46	201.14	0.00494	-25.227	0.317	25.227
81.88	3	19.13	95.87	26	4	5760	95.88	210.69	1459	108.02	28.49	201.66	0.00495	-25.314	0.319	25.314
82.00	3	19.25	96.00	26	4	5760	96.00	210.81	1459	107.87	28.44	202.14	0.00494	-25.400	0.321	25.400
82.13	3	19.38	96.13	26	4	5760	96.13	210.94	1459	107.72	28.47	202.66	0.00494	-25.486	0.323	25.486
82.25	3	19.50	96.26	26	4	5760	96.25	211.06	1459	107.56	28.62	203.14	0.00497	-25.572	0.325	25.572
82.38	3	19.63	96.39	26	4	5760	96.38	211.19	1459	107.41	28.59	203.66	0.00496	-25.657	0.327	25.657
82.50	3	19.75	96.52	26	4	5760	96.50	211.31	1459	107.27	28.51	204.14	0.00495	-25.741	0.329	25.741
82.63	3	19.88	96.65	26	4	5760	96.63	211.44	1459	107.12	28.37	204.66	0.00493	-25.825	0.331	25.825
82.75	3	20.00	96.78	26	4	5760	96.75	211.56	1459	106.97	28.22	205.14	0.00490	-25.909	0.333	25.909
82.88	3	20.13	96.91	26	4	5760	96.88	211.69	1459	106.82	28.16	205.66	0.00489	-25.992	0.336	25.992
83.00	3	20.25	97.03	26	4	5760	97.00	211.81	1459	106.68	28.08	206.14	0.00487	-26.074	0.338	26.074
83.13	3	20.38	97.12	26	4	5760	97.13	211.94	1458	106.54	27.88	206.66	0.00484	-26.156	0.340	26.156
83.25	3	20.50	97.25	26	4	5760	97.25	212.06	1458	106.4	27.91	207.14	0.00485	-26.238	0.342	26.238
83.38	3	20.63	97.38	26	4	5760	97.38	212.19	1459	106.26	28.05	207.66	0.00487	-26.319	0.344	26.319
83.50	3	20.75	97.51	26	4	5760	97.50	212.31	1458	106.12	27.97	208.14	0.00486	-26.400	0.346	26.400
83.63	3	20.88	97.64	26	4	5760	97.63	212.44	1459	105.98	28.06	208.66	0.00487	-26.480	0.348	26.480
83.75	3	21.00	97.77	26	4	5760	97.75	212.56	1459	105.85	28.04	209.14	0.00487	-26.560	0.350	26.560
83.88	3	21.13	97.89	26	4	5760	97.88	212.69	1458	105.7	27.96	209.66	0.00485	-26.639	0.352	26.639
84.00	3	21.25	98.02	26	4	5760	98.00	212.81	1459	105.57	27.99	210.14	0.00486	-26.718	0.354	26.718
84.13	3	21.38	98.11	26	4	5760	98.13	212.94	1458	105.44	27.93	210.66	0.00485	-26.796	0.356	26.796
84.25	3	21.50	98.24	26	4	5760	98.25	213.06	1458	105.3	27.78	211.14	0.00482	-26.874	0.358	26.874
84.38	3	21.63	98.37	26	4	5760	98.38	213.19	1458	105.18	27.72	211.66	0.00481	-26.952	0.361	26.952
84.50	3	21.75	98.50	26	4	5760	98.50	213.31	1458	105.04	27.59	212.14	0.00479	-27.029	0.363	27.029
84.63	3	21.88	98.63	26	4	5760	98.63	213.44	1458	104.91	27.68	212.66	0.00481	-27.106	0.365	27.106
84.75	3	22.00	98.75	26	4	5760	98.75	213.56	1458	104.78	27.63	213.14	0.00480	-27.182	0.367	27.182
84.88	3	22.13	98.88	26	4	5760	98.88	213.69	1458	104.65	27.69	213.66	0.00481	-27.258	0.369	27.258
85.00	3	22.25	99.01	26	4	5760	99.00	213.81	1458	104.53	27.69	214.14	0.00481	-27.333	0.371	27.333
85.13	3	22.38	99.10	26	4	5760	99.13	213.94	1458	104.4	27.78	214.66	0.00482	-27.408	0.373	27.408
85.25	3	22.50	99.23	26	4	5760	99.25	214.06	1458	104.28	27.72	215.14	0.00481	-27.483	0.375	27.483
85.38	3	22.63	99.36	26	4	5760	99.38	214.19	1458	104.16	27.62	215.66	0.00480	-27.557	0.377	27.557
85.50	3	22.75	99.49	26	4	5760	99.50	214.31	1458	104.03	27.51	216.14	0.00478	-27.630	0.379	27.630
85.63	3	22.88	99.62	26	4	5760	99.63	214.44	1458	103.91	27.45	216.66	0.00477	-27.704	0.381	27.704

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
85.75	3	23.00	99.74	26	4	5760	99.75	214.56	1458	103.79	27.44	217.14	0.00476	-27.776	0.383	27.776
85.88	3	23.13	99.87	26	4	5760	99.88	214.69	1458	103.66	27.42	217.66	0.00476	-27.849	0.386	27.849
86.00	3	23.25	100.00	26	4	5760	100.00	214.81	1458	103.54	27.25	218.14	0.00473	-27.921	0.388	27.921
86.13	3	23.38	100.13	26	4	5760	100.13	214.94	1458	103.42	27.46	218.66	0.00477	-27.993	0.390	27.993
86.25	3	23.50	100.26	26	4	5760	100.25	215.06	1458	103.31	27.39	219.14	0.00476	-28.064	0.392	28.064
86.38	3	23.63	100.39	26	4	5760	100.38	215.19	1458	103.19	27.27	219.66	0.00473	-28.135	0.394	28.135
86.50	3	23.75	100.52	26	4	5760	100.50	215.31	1458	103.07	27.22	220.14	0.00473	-28.205	0.396	28.205
86.63	3	23.88	100.61	26	4	5760	100.63	215.44	1458	102.97	27.28	220.66	0.00474	-28.275	0.398	28.275
86.75	3	24.00	100.74	26	4	5760	100.75	215.56	1458	102.85	27.26	221.14	0.00473	-28.345	0.400	28.345
86.88	3	24.13	100.86	26	4	5760	100.88	215.69	1458	102.73	27.29	221.66	0.00474	-28.414	0.402	28.414
87.00	3	24.25	100.99	26	4	5760	101.00	215.81	1458	102.62	27.31	222.14	0.00474	-28.483	0.404	28.483
87.13	3	24.38	101.12	26	4	5760	101.13	215.94	1458	102.52	27.09	222.66	0.00470	-28.551	0.406	28.551
87.25	3	24.50	101.25	26	4	5760	101.25	216.06	1458	102.4	27.05	223.14	0.00470	-28.619	0.408	28.619
87.38	3	24.63	101.38	26	4	5760	101.38	216.19	1458	102.29	27.07	223.66	0.00470	-28.687	0.411	28.687
87.50	3	24.75	101.51	26	4	5760	101.50	216.31	1458	102.18	27.12	224.14	0.00471	-28.754	0.413	28.754
87.63	3	24.88	101.64	26	4	5760	101.63	216.44	1458	102.08	27.15	224.66	0.00471	-28.821	0.415	28.821
87.75	3	25.00	101.77	26	4	5760	101.75	216.56	1458	101.97	26.99	225.14	0.00469	-28.888	0.417	28.888
87.88	3	25.13	101.86	26	4	5760	101.88	216.69	1458	101.86	27.12	225.66	0.00471	-28.954	0.419	28.954
88.00	3	25.25	101.99	26	4	5760	102.00	216.81	1458	101.76	27.12	226.14	0.00471	-29.020	0.421	29.020
88.13	3	25.38	102.11	26	4	5760	102.13	216.94	1457	101.66	26.95	226.66	0.00468	-29.085	0.423	29.085
88.25	3	25.50	102.24	26	4	5760	102.25	217.06	1457	101.55	26.96	227.14	0.00468	-29.150	0.425	29.150
88.38	3	25.63	102.37	26	4	5760	102.38	217.19	1458	101.46	26.98	227.66	0.00468	-29.215	0.427	29.215
88.50	3	25.75	102.50	26	4	5760	102.50	217.31	1458	101.35	27.15	228.14	0.00471	-29.279	0.429	29.279
88.63	3	25.88	102.63	26	4	5760	102.63	217.44	1458	101.25	27.03	228.66	0.00469	-29.343	0.431	29.343
88.75	3	26.00	102.76	26	4	5760	102.75	217.56	1457	101.15	26.94	229.14	0.00468	-29.406	0.433	29.406
88.88	3	26.13	102.89	26	4	5760	102.88	217.69	1457	101.05	26.95	229.66	0.00468	-29.470	0.436	29.470
89.00	3	26.25	103.02	26	4	5760	103.00	217.81	1457	100.95	26.85	230.14	0.00466	-29.533	0.438	29.533
89.13	3	26.38	103.11	26	4	5760	103.13	217.94	1457	100.86	26.90	230.66	0.00467	-29.595	0.440	29.595
89.25	3	26.50	103.24	26	4	5760	103.25	218.06	1457	100.76	26.90	231.14	0.00467	-29.657	0.442	29.657
89.38	3	26.63	103.37	26	4	5760	103.38	218.19	1457	100.67	26.77	231.66	0.00465	-29.719	0.444	29.719
89.50	3	26.75	103.49	26	4	5760	103.50	218.31	1457	100.58	26.64	232.14	0.00463	-29.780	0.446	29.780
89.63	3	26.88	103.62	26	4	5760	103.63	218.44	1457	100.48	26.59	232.66	0.00462	-29.841	0.448	29.841
89.75	3	27.00	103.75	26	4	5760	103.75	218.56	1457	100.38	26.53	233.14	0.00461	-29.902	0.450	29.902
89.88	3	27.13	103.88	26	4	5760	103.88	218.69	1457	100.29	26.60	233.66	0.00462	-29.962	0.452	29.962
90.00	3	27.25	104.01	26	4	5760	104.00	218.81	1457	100.2	26.66	234.14	0.00463	-30.022	0.454	30.022
90.13	3	27.38	104.14	26	4	5760	104.13	218.94	1457	100.11	26.54	234.66	0.00461	-30.082	0.456	30.082
90.25	3	27.50	104.27	26	4	5760	104.25	219.06	1457	100.02	26.70	235.14	0.00464	-30.141	0.458	30.141
90.38	3	27.63	104.36	26	4	5760	104.38	219.19	1457	99.93	26.86	235.66	0.00466	-30.200	0.461	30.200
90.50	3	27.75	104.49	26	4	5760	104.50	219.31	1457	99.84	26.80	236.14	0.00465	-30.259	0.463	30.259
90.63	3	27.88	104.62	26	4	5760	104.63	219.44	1457	99.75	26.89	236.66	0.00467	-30.317	0.465	30.317
90.75	3	28.00	104.75	26	4	5760	104.75	219.56	1457	99.67	26.80	237.14	0.00465	-30.375	0.467	30.375
90.88	3	28.13	104.88	26	4	5760	104.88	219.69	1457	99.57	26.77	237.66	0.00465	-30.432	0.469	30.432
91.00	3	28.25	105.01	26	4	5760	105.00	219.81	1457	99.49	26.69	238.14	0.00463	-30.490	0.471	30.490
91.13	3	28.38	105.13	26	4	5760	105.13	219.94	1457	99.41	26.62	238.66	0.00462	-30.547	0.473	30.547
91.25	3	28.50	105.26	26	4	5760	105.25	220.06	1457	99.33	26.43	239.14	0.00459	-30.603	0.475	30.603
91.38	3	28.63	105.39	26	4	5760	105.38	220.19	1457	99.23	26.60	239.66	0.00462	-30.659	0.477	30.659
91.50	3	28.75	105.52	26	4	5760	105.50	220.31	1457	99.16	26.49	240.14	0.00460	-30.715	0.479	30.715
91.63	3	28.88	105.61	26	4	5760	105.63	220.44	1457	99.07	26.11	240.66	0.00453	-30.771	0.481	30.771
91.75	3	29.00	105.74	26	4	5760	105.75	220.56	1457	98.99	26.28	241.14	0.00456	-30.826	0.483	30.826

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
91.88	3		29.13	105.87	26	4	5760	105.88	220.69	1457	98.91	26.28	241.66	0.00456	-30.881	0.486	30.881
92.00	3		29.25	106.00	26	4	5760	106.00	220.81	1457	98.83	26.26	242.14	0.00456	-30.936	0.488	30.936
92.13	3		29.38	106.13	26	4	5760	106.13	220.94	1457	98.74	26.41	242.66	0.00459	-30.990	0.490	30.990
92.25	4	Step 4	0.01	106.26	26	4.1	5904	106.25	221.06	1457	98.67	26.26	243.15	0.00445	-0.756	0.000	0.756
92.38	4		0.13	106.39	26	4.5	6480	106.38	221.19	1457	98.59	26.22	243.74	0.00405	-1.288	0.002	1.288
92.50	4		0.25	106.52	26	4.7	6768	106.50	221.31	1457	98.51	26.36	244.30	0.00389	-1.765	0.004	1.765
92.63	4		0.38	106.61	26	4.8	6912	106.63	221.44	1457	98.43	26.39	244.92	0.00382	-2.204	0.006	2.204
92.75	4		0.50	106.73	26	4.9	7056	106.75	221.56	1457	98.35	26.33	245.51	0.00373	-2.620	0.008	2.620
92.88	4		0.63	106.86	26	5	7200	106.88	221.69	1457	98.28	26.30	246.16	0.00365	-3.016	0.010	3.016
93.00	4		0.75	106.99	51	5	7200	107.00	221.81	1457	98.2	26.22	246.76	0.00364	-3.396	0.013	3.396
93.13	4		0.88	107.12	51	5	7200	107.13	221.94	1457	98.13	26.07	247.41	0.00362	-3.763	0.015	3.763
93.25	4		1.00	107.25	51	5.1	7344	107.25	222.06	1457	98.05	26.18	248.02	0.00356	-4.119	0.017	4.119
93.38	4		1.13	107.38	51	5.1	7344	107.38	222.19	1457	97.98	26.32	248.69	0.00358	-4.464	0.019	4.464
93.50	4		1.25	107.51	51	5	7200	107.50	222.31	1457	97.9	26.23	249.29	0.00364	-4.800	0.021	4.800
93.63	4		1.38	107.64	51	5	7200	107.63	222.44	1457	97.83	26.14	249.94	0.00363	-5.128	0.023	5.128
93.75	4		1.50	107.77	51	5	7200	107.75	222.56	1457	97.76	26.11	250.54	0.00363	-5.448	0.025	5.448
93.88	4		1.63	107.85	51	5	7200	107.88	222.69	1457	97.69	26.05	251.19	0.00362	-5.761	0.027	5.761
94.00	4		1.75	107.98	51	5	7200	108.00	222.81	1457	97.62	26.10	251.79	0.00362	-6.068	0.029	6.068
94.13	4		1.88	108.11	51	5	7200	108.13	222.94	1457	97.54	26.01	252.44	0.00361	-6.369	0.031	6.369
94.25	4		2.00	108.24	51	5	7200	108.25	223.06	1457	97.47	26.12	253.04	0.00363	-6.665	0.033	6.665
94.38	4		2.13	108.37	51	5	7200	108.38	223.19	1457	97.4	26.21	253.69	0.00364	-6.954	0.035	6.954
94.50	4		2.25	108.50	51	5	7200	108.50	223.31	1457	97.33	26.41	254.29	0.00367	-7.240	0.038	7.240
94.63	4		2.38	108.63	51	5	7200	108.63	223.44	1457	97.27	26.95	254.94	0.00374	-7.520	0.040	7.520
94.75	4		2.50	108.76	51	5	7200	108.75	223.56	1458	97.2	27.58	255.54	0.00383	-7.796	0.042	7.796
94.88	4		2.63	108.89	51	5	7200	108.88	223.69	1458	97.13	27.96	256.19	0.00388	-8.068	0.044	8.068
95.00	4		2.75	109.01	51	5	7200	109.00	223.81	1459	97.06	28.44	256.79	0.00395	-8.335	0.046	8.335
95.13	4		2.88	109.14	51	5	7200	109.13	223.94	1459	97	28.91	257.44	0.00402	-8.599	0.048	8.599
95.25	4		3.00	109.27	51	5	7200	109.25	224.06	1459	96.93	28.97	258.04	0.00402	-8.859	0.050	8.859
95.38	4		3.13	109.36	26	5	7200	109.38	224.19	1460	96.87	29.10	258.69	0.00404	-9.116	0.052	9.116
95.50	4		3.25	109.49	51	5	7200	109.50	224.31	1460	96.8	29.43	259.29	0.00409	-9.369	0.054	9.369
95.63	4		3.38	109.62	51	5.1	7344	109.63	224.44	1460	96.74	29.51	259.95	0.00402	-9.619	0.056	9.619
95.75	4		3.50	109.75	51	5	7200	109.75	224.56	1460	96.67	29.70	260.55	0.00413	-9.866	0.058	9.866
95.88	4		3.63	109.88	51	5	7200	109.88	224.69	1460	96.61	29.52	261.20	0.00410	-10.109	0.060	10.109
96.00	4		3.75	110.01	51	5	7200	110.00	224.81	1460	96.54	29.55	261.80	0.00410	-10.350	0.063	10.350
96.13	4		3.88	110.14	51	5	7200	110.13	224.94	1460	96.47	29.58	262.45	0.00411	-10.588	0.065	10.588
96.25	4		4.00	110.27	51	5	7200	110.25	225.06	1460	96.41	29.64	263.05	0.00412	-10.823	0.067	10.823
96.38	4		4.13	110.35	51	5	7200	110.38	225.19	1460	96.35	29.69	263.70	0.00412	-11.056	0.069	11.056
96.50	4		4.25	110.48	51	5	7200	110.50	225.31	1460	96.28	29.79	264.30	0.00414	-11.286	0.071	11.286
96.63	4		4.38	110.61	51	5	7200	110.63	225.44	1460	96.22	29.77	264.95	0.00413	-11.513	0.073	11.513
96.75	4		4.50	110.74	51	5	7200	110.75	225.56	1461	96.15	29.98	265.55	0.00416	-11.738	0.075	11.738
96.88	4		4.63	110.87	51	5	7200	110.88	225.69	1461	96.08	30.01	266.20	0.00417	-11.961	0.077	11.961
97.00	4		4.75	111.00	51	5	7200	111.00	225.81	1460	96.02	29.65	266.80	0.00412	-12.181	0.079	12.181
97.13	4		4.88	111.13	51	5	7200	111.13	225.94	1460	95.96	29.48	267.45	0.00409	-12.399	0.081	12.399
97.25	4		5.00	111.26	51	5	7200	111.25	226.06	1460	95.89	29.78	268.05	0.00414	-12.615	0.083	12.615
97.38	4		5.13	111.38	51	5	7200	111.38	226.19	1460	95.83	29.50	268.70	0.00410	-12.828	0.085	12.828
97.50	4		5.25	111.52	51	5	7200	111.50	226.31	1460	95.76	29.84	269.30	0.00414	-13.040	0.088	13.040
97.63	4		5.38	111.60	51	5	7200	111.63	226.44	1460	95.69	29.90	269.95	0.00415	-13.249	0.090	13.249
97.75	4		5.50	111.73	26	5	7200	111.75	226.56	1460	95.62	29.61	270.55	0.00411	-13.457	0.092	13.457
97.88	4		5.63	111.86	26	5	7200	111.88	226.69	1460	95.56	29.90	271.20	0.00415	-13.662	0.094	13.662

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
98.00	4	5.75	111.99	51	5	7200	112.00	226.81	1460	95.5	29.92	271.80	0.00416	-13.866	0.096	13.866
98.13	4	5.88	112.12	51	5	7200	112.13	226.94	1460	95.43	29.84	272.45	0.00414	-14.068	0.098	14.068
98.25	4	6.00	112.25	51	5	7200	112.25	227.06	1461	95.36	30.02	273.05	0.00417	-14.268	0.100	14.268
98.38	4	6.13	112.38	51	5	7200	112.38	227.19	1460	95.3	29.82	273.70	0.00414	-14.466	0.102	14.466
98.50	4	6.25	112.51	51	5	7200	112.50	227.31	1460	95.23	29.85	274.30	0.00415	-14.663	0.104	14.663
98.63	4	6.38	112.64	51	5	7200	112.63	227.44	1460	95.16	29.45	274.95	0.00409	-14.857	0.106	14.857
98.75	4	6.50	112.76	51	5	7200	112.75	227.56	1460	95.1	29.80	275.55	0.00414	-15.050	0.108	15.050
98.88	4	6.63	112.89	51	5	7200	112.88	227.69	1461	95.04	29.99	276.20	0.00417	-15.242	0.111	15.242
99.00	4	6.75	113.02	51	5	7200	113.00	227.81	1460	94.96	29.63	276.80	0.00412	-15.431	0.113	15.431
99.13	4	6.88	113.11	51	5	7200	113.13	227.94	1460	94.89	29.67	277.45	0.00412	-15.619	0.115	15.619
99.25	4	7.00	113.24	51	5	7200	113.25	228.06	1460	94.83	29.79	278.05	0.00414	-15.806	0.117	15.806
99.38	4	7.13	113.37	51	5	7200	113.38	228.19	1461	94.77	29.99	278.70	0.00417	-15.991	0.119	15.991
99.50	4	7.25	113.50	51	5	7200	113.50	228.31	1460	94.7	29.85	279.30	0.00415	-16.175	0.121	16.175
99.63	4	7.38	113.62	51	5	7200	113.63	228.44	1461	94.63	30.04	279.95	0.00417	-16.357	0.123	16.357
99.75	4	7.50	113.75	51	5	7200	113.75	228.56	1461	94.56	30.00	280.55	0.00417	-16.537	0.125	16.537
99.88	4	7.63	113.88	51	5	7200	113.88	228.69	1461	94.5	30.14	281.20	0.00419	-16.716	0.127	16.716
100.00	4	7.75	114.01	51	5	7200	114.00	228.81	1461	94.43	30.06	281.80	0.00417	-16.894	0.129	16.894
100.13	4	7.88	114.14	51	5	7200	114.13	228.94	1461	94.36	30.19	282.45	0.00419	-17.070	0.131	17.070
100.25	4	8.00	114.27	26	5	7200	114.25	229.06	1461	94.3	30.11	283.05	0.00418	-17.245	0.133	17.245
100.38	4	8.13	114.36	51	5	7200	114.38	229.19	1461	94.24	30.02	283.70	0.00417	-17.419	0.136	17.419
100.50	4	8.25	114.49	51	5	7200	114.50	229.31	1461	94.17	30.56	284.30	0.00424	-17.591	0.138	17.591
100.63	4	8.38	114.62	51	5	7200	114.63	229.44	1461	94.1	30.22	284.95	0.00420	-17.762	0.140	17.762
100.75	4	8.50	114.75	51	5	7200	114.75	229.56	1461	94.04	30.50	285.55	0.00424	-17.932	0.142	17.932
100.88	4	8.63	114.88	51	5	7200	114.88	229.69	1461	93.97	30.42	286.20	0.00423	-18.101	0.144	18.101
101.00	4	8.75	115.01	51	5	7200	115.00	229.81	1462	93.91	31.07	286.80	0.00432	-18.268	0.146	18.268
101.13	4	8.88	115.14	51	5	7200	115.13	229.94	1462	93.85	31.31	287.45	0.00435	-18.434	0.148	18.434
101.25	4	9.00	115.26	51	5	7200	115.25	230.06	1462	93.78	31.61	288.05	0.00439	-18.599	0.150	18.599
101.38	4	9.13	115.39	51	5	7200	115.38	230.19	1462	93.71	31.09	288.70	0.00432	-18.762	0.152	18.762
101.50	4	9.25	115.52	51	5	7200	115.50	230.31	1462	93.66	31.28	289.30	0.00434	-18.924	0.154	18.924
101.63	4	9.38	115.61	51	5	7200	115.63	230.44	1462	93.58	31.27	289.95	0.00434	-19.086	0.156	19.086
101.75	4	9.50	115.74	51	5	7200	115.75	230.56	1461	93.53	30.95	290.55	0.00430	-19.246	0.158	19.246
101.88	4	9.63	115.87	51	5	7200	115.88	230.69	1461	93.46	30.68	291.20	0.00426	-19.405	0.161	19.405
102.00	4	9.75	116.00	51	5	7200	116.00	230.81	1462	93.4	31.65	291.80	0.00440	-19.562	0.163	19.562
102.13	4	9.88	116.13	26	5	7200	116.13	230.94	1462	93.34	31.16	292.45	0.00433	-19.719	0.165	19.719
102.25	4	10.00	116.25	51	5	7200	116.25	231.06	1462	93.28	31.00	293.05	0.00431	-19.875	0.167	19.875
102.38	4	10.13	116.38	51	5	7200	116.38	231.19	1462	93.22	31.37	293.70	0.00436	-20.029	0.169	20.029
102.50	4	10.25	116.51	51	5	7200	116.50	231.31	1462	93.15	31.26	294.30	0.00434	-20.183	0.171	20.183
102.63	4	10.38	116.64	51	5	7200	116.63	231.44	1462	93.1	31.42	294.95	0.00436	-20.335	0.173	20.335
102.75	4	10.50	116.77	51	5	7200	116.75	231.56	1462	93.03	31.42	295.55	0.00436	-20.487	0.175	20.487
102.88	4	10.63	116.86	51	5	7200	116.88	231.69	1462	92.97	31.29	296.20	0.00435	-20.637	0.177	20.637
103.00	4	10.75	116.99	26	5	7200	117.00	231.81	1462	92.91	31.21	296.80	0.00433	-20.786	0.179	20.786
103.13	4	10.88	117.12	51	5	7200	117.13	231.94	1462	92.85	31.35	297.45	0.00435	-20.935	0.181	20.935
103.25	4	11.00	117.25	51	5	7200	117.25	232.06	1462	92.79	31.38	298.05	0.00436	-21.082	0.183	21.082
103.38	4	11.13	117.37	51	5	7200	117.38	232.19	1462	92.73	31.06	298.70	0.00431	-21.228	0.186	21.228
103.50	4	11.25	117.50	26	5	7200	117.50	232.31	1462	92.67	31.23	299.30	0.00434	-21.374	0.188	21.374
103.63	4	11.38	117.63	51	5	7200	117.63	232.44	1462	92.61	31.13	299.95	0.00432	-21.518	0.190	21.518
103.75	4	11.50	117.76	51	5	7200	117.75	232.56	1462	92.56	31.02	300.55	0.00431	-21.662	0.192	21.662
103.88	4	11.63	117.89	51	5	7200	117.88	232.69	1461	92.5	30.81	301.20	0.00428	-21.804	0.194	21.804
104.00	4	11.75	118.02	26	5	7200	118.00	232.81	1461	92.44	30.90	301.80	0.00429	-21.946	0.196	21.946

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
104.13	4	11.88	118.11	51	5	7200	118.13	232.94	1461	92.38	30.87	302.45	0.00429	-22.086	0.198	22.086
104.25	4	12.00	118.24	51	5	7200	118.25	233.06	1461	92.33	30.78	303.05	0.00428	-22.226	0.200	22.226
104.38	4	12.13	118.37	51	5	7200	118.38	233.19	1461	92.27	30.60	303.70	0.00425	-22.365	0.202	22.365
104.50	4	12.25	118.50	51	5	7200	118.50	233.31	1462	92.21	30.99	304.30	0.00430	-22.503	0.204	22.503
104.63	4	12.38	118.62	51	5	7200	118.63	233.44	1462	92.16	31.02	304.95	0.00431	-22.640	0.206	22.640
104.75	4	12.50	118.75	51	5	7200	118.75	233.56	1461	92.1	30.77	305.55	0.00427	-22.776	0.208	22.776
104.88	4	12.63	118.88	51	5	7200	118.88	233.69	1461	92.04	30.81	306.20	0.00428	-22.912	0.211	22.912
105.00	4	12.75	119.01	51	5	7200	119.00	233.81	1461	91.99	30.90	306.80	0.00429	-23.046	0.213	23.046
105.13	4	12.88	119.14	51	5	7200	119.13	233.94	1461	91.93	30.31	307.45	0.00421	-23.180	0.215	23.180
105.25	4	13.00	119.27	51	5	7200	119.25	234.06	1461	91.88	30.84	308.05	0.00428	-23.313	0.217	23.313
105.38	4	13.13	119.36	51	5	7200	119.38	234.19	1461	91.82	30.86	308.70	0.00429	-23.445	0.219	23.445
105.50	4	13.25	119.49	51	5	7200	119.50	234.31	1461	91.78	30.73	309.30	0.00427	-23.576	0.221	23.576
105.63	4	13.38	119.62	26	5	7200	119.63	234.44	1461	91.71	30.84	309.95	0.00428	-23.706	0.223	23.706
105.75	4	13.50	119.75	51	5	7200	119.75	234.56	1461	91.66	30.87	310.55	0.00429	-23.836	0.225	23.836
105.88	4	13.63	119.88	51	5	7200	119.88	234.69	1461	91.61	30.54	311.20	0.00424	-23.964	0.227	23.964
106.00	4	13.75	120.01	51	5	7200	120.00	234.81	1461	91.56	30.60	311.80	0.00425	-24.092	0.229	24.092
106.13	4	13.88	120.13	51	5	7200	120.13	234.94	1461	91.5	30.68	312.45	0.00426	-24.220	0.231	24.220
106.25	4	14.00	120.26	51	5	7200	120.25	235.06	1461	91.45	30.60	313.05	0.00425	-24.346	0.233	24.346
106.38	4	14.13	120.39	51	5	7200	120.38	235.19	1461	91.4	30.55	313.70	0.00424	-24.472	0.236	24.472
106.50	4	14.25	120.52	51	5	7200	120.50	235.31	1461	91.35	30.64	314.30	0.00426	-24.596	0.238	24.596
106.63	4	14.38	120.61	51	5	7200	120.63	235.44	1461	91.3	30.50	314.95	0.00424	-24.721	0.240	24.721
106.75	4	14.50	120.74	51	5	7200	120.75	235.56	1461	91.25	30.57	315.55	0.00425	-24.844	0.242	24.844
106.88	4	14.63	120.87	51	5	7200	120.88	235.69	1461	91.2	30.54	316.20	0.00424	-24.967	0.244	24.967
107.00	4	14.75	121.00	51	5	7200	121.00	235.81	1461	91.15	30.76	316.80	0.00427	-25.088	0.246	25.088
107.13	4	14.88	121.13	51	5	7200	121.13	235.94	1461	91.1	30.63	317.45	0.00425	-25.209	0.248	25.209
107.25	4	15.00	121.25	26	5	7200	121.25	236.06	1461	91.06	30.38	318.05	0.00422	-25.330	0.250	25.330
107.38	4	15.13	121.38	51	5	7200	121.38	236.19	1461	91	30.64	318.70	0.00426	-25.450	0.252	25.450
107.50	4	15.25	121.51	51	5	7200	121.50	236.31	1461	90.96	30.40	319.30	0.00422	-25.569	0.254	25.569
107.63	4	15.38	121.64	26	5	7200	121.63	236.44	1461	90.9	30.16	319.95	0.00419	-25.687	0.256	25.687
107.75	4	15.50	121.77	51	5	7200	121.75	236.56	1462	90.86	31.12	320.55	0.00432	-25.804	0.258	25.804
107.88	4	15.63	121.86	51	5	7200	121.88	236.69	1461	90.81	30.19	321.20	0.00419	-25.921	0.261	25.921
108.00	4	15.75	121.99	51	5	7200	122.00	236.81	1461	90.76	30.62	321.80	0.00425	-26.037	0.263	26.037
108.13	4	15.88	122.12	51	5	7200	122.13	236.94	1461	90.72	30.62	322.45	0.00425	-26.153	0.265	26.153
108.25	4	16.00	122.25	51	5	7200	122.25	237.06	1461	90.67	30.68	323.05	0.00426	-26.268	0.267	26.268
108.38	4	16.13	122.37	51	5	7200	122.38	237.19	1461	90.62	30.62	323.70	0.00425	-26.382	0.269	26.382
108.50	4	16.25	122.50	51	5	7200	122.50	237.31	1461	90.58	30.55	324.30	0.00424	-26.495	0.271	26.495
108.63	4	16.38	122.63	51	5	7200	122.63	237.44	1461	90.53	30.66	324.95	0.00426	-26.608	0.273	26.608
108.75	4	16.50	122.76	26	5	7200	122.75	237.56	1461	90.48	30.68	325.55	0.00426	-26.720	0.275	26.720
108.88	4	16.63	122.89	51	5	7200	122.88	237.69	1461	90.44	30.76	326.20	0.00427	-26.832	0.277	26.832
109.00	4	16.75	123.02	51	5	7200	123.00	237.81	1461	90.4	30.72	326.80	0.00427	-26.942	0.279	26.942
109.13	4	16.88	123.11	51	5	7200	123.13	237.94	1461	90.36	30.36	327.45	0.00422	-27.053	0.281	27.053
109.25	4	17.00	123.24	51	5	7200	123.25	238.06	1461	90.31	30.44	328.05	0.00423	-27.162	0.283	27.162
109.38	4	17.13	123.37	51	5	7200	123.38	238.19	1461	90.27	30.49	328.70	0.00423	-27.271	0.286	27.271
109.50	4	17.25	123.49	51	5	7200	123.50	238.31	1461	90.22	30.72	329.30	0.00427	-27.379	0.288	27.379
109.63	4	17.38	123.62	51	5	7200	123.63	238.44	1461	90.19	30.72	329.95	0.00427	-27.487	0.290	27.487
109.75	4	17.50	123.75	26	5	7200	123.75	238.56	1461	90.14	30.58	330.55	0.00425	-27.594	0.292	27.594
109.88	4	17.63	123.88	26	5	7200	123.88	238.69	1461	90.1	30.66	331.20	0.00426	-27.700	0.294	27.700
110.00	4	17.75	124.01	51	5	7200	124.00	238.81	1461	90.05	30.90	331.80	0.00429	-27.806	0.296	27.806
110.13	4	17.88	124.14	26	5	7200	124.13	238.94	1461	90.02	30.73	332.45	0.00427	-27.911	0.298	27.911

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
110.25	4	18.00	124.27	51	5	7200	124.25	239.06	1461	89.98	30.44	333.05	0.00423	-28.016	0.300	28.016
110.38	4	18.13	124.36	51	5	7200	124.38	239.19	1461	89.93	30.62	333.70	0.00425	-28.120	0.302	28.120
110.50	4	18.25	124.48	51	5	7200	124.50	239.31	1461	89.89	30.33	334.30	0.00421	-28.223	0.304	28.223
110.63	4	18.38	124.61	51	5	7200	124.63	239.44	1461	89.86	30.35	334.95	0.00422	-28.326	0.306	28.326
110.75	4	18.50	124.74	51	5	7200	124.75	239.56	1461	89.81	30.44	335.55	0.00423	-28.428	0.308	28.428
110.88	4	18.63	124.87	26	5	7200	124.88	239.69	1461	89.78	30.61	336.20	0.00425	-28.530	0.311	28.530
111.00	4	18.75	125.00	51	5	7200	125.00	239.81	1461	89.74	30.18	336.80	0.00419	-28.631	0.313	28.631
111.13	4	18.88	125.13	51	5	7200	125.13	239.94	1461	89.69	30.47	337.45	0.00423	-28.731	0.315	28.731
111.25	4	19.00	125.26	51	5	7200	125.25	240.06	1461	89.66	30.92	338.05	0.00429	-28.831	0.317	28.831
111.38	4	19.13	125.39	51	5	7200	125.38	240.19	1461	89.62	30.55	338.70	0.00424	-28.930	0.319	28.930
111.50	4	19.25	125.52	51	5	7200	125.50	240.31	1461	89.58	30.74	339.30	0.00427	-29.029	0.321	29.029
111.63	4	19.38	125.60	51	5	7200	125.63	240.44	1461	89.55	30.66	339.95	0.00426	-29.127	0.323	29.127
111.75	4	19.50	125.73	26	5	7200	125.75	240.56	1461	89.51	30.55	340.55	0.00424	-29.225	0.325	29.225
111.88	4	19.63	125.86	51	5	7200	125.88	240.69	1461	89.47	30.50	341.20	0.00424	-29.322	0.327	29.322
112.00	4	19.75	125.99	51	5	7200	126.00	240.81	1461	89.43	30.55	341.80	0.00424	-29.418	0.329	29.418
112.13	4	19.88	126.12	51	5	7200	126.13	240.94	1461	89.4	30.27	342.45	0.00420	-29.514	0.331	29.514
112.25	4	20.00	126.25	26	5	7200	126.25	241.06	1461	89.35	30.50	343.05	0.00424	-29.610	0.333	29.610
112.38	4	20.13	126.38	51	5	7200	126.38	241.19	1461	89.33	30.80	343.70	0.00428	-29.705	0.336	29.705
112.50	4	20.25	126.51	26	5	7200	126.50	241.31	1461	89.29	30.80	344.30	0.00428	-29.799	0.338	29.799
112.63	4	20.38	126.64	26	5	7200	126.63	241.44	1461	89.25	30.73	344.95	0.00427	-29.893	0.340	29.893
112.75	4	20.50	126.76	51	5	7200	126.75	241.56	1461	89.21	30.62	345.55	0.00425	-29.986	0.342	29.986
112.88	4	20.63	126.89	51	5	7200	126.88	241.69	1461	89.18	30.73	346.20	0.00427	-30.079	0.344	30.079
113.00	4	20.75	127.02	26	5	7200	127.00	241.81	1461	89.15	29.98	346.80	0.00416	-30.171	0.346	30.171
113.13	4	20.88	127.11	51	5	7200	127.13	241.94	1461	89.11	30.08	347.45	0.00418	-30.263	0.348	30.263
113.25	4	21.00	127.24	51	5	7200	127.25	242.06	1461	89.08	30.19	348.05	0.00419	-30.354	0.350	30.354
113.38	4	21.13	127.37	51	5	7200	127.38	242.19	1461	89.04	30.17	348.70	0.00419	-30.444	0.352	30.444
113.50	4	21.25	127.50	51	5	7200	127.50	242.31	1461	89	29.98	349.30	0.00416	-30.535	0.354	30.535
113.63	4	21.38	127.63	26	5	7200	127.63	242.44	1461	88.97	30.18	349.95	0.00419	-30.624	0.356	30.624
113.75	4	21.50	127.76	26	5	7200	127.75	242.56	1461	88.94	30.59	350.55	0.00425	-30.713	0.358	30.713
113.88	4	21.63	127.88	26	5	7200	127.88	242.69	1461	88.9	30.62	351.20	0.00425	-30.802	0.361	30.802
114.00	4	21.75	128.01	51	5	7200	128.00	242.81	1462	88.88	31.28	351.80	0.00434	-30.890	0.363	30.890
114.13	4	21.88	128.14	51	5	7200	128.13	242.94	1461	88.84	30.30	352.45	0.00421	-30.978	0.365	30.978
114.25	4	22.00	128.27	51	5	7200	128.25	243.06	1461	88.81	30.56	353.05	0.00424	-31.065	0.367	31.065
114.38	4	22.13	128.36	51	5	7200	128.38	243.19	1461	88.78	30.79	353.70	0.00428	-31.152	0.369	31.152
114.50	4	22.25	128.49	51	5	7200	128.50	243.31	1461	88.74	30.84	354.30	0.00428	-31.238	0.371	31.238
114.63	4	22.38	128.62	51	5	7200	128.63	243.44	1461	88.71	30.74	354.95	0.00427	-31.323	0.373	31.323
114.75	4	22.50	128.75	51	5	7200	128.75	243.56	1462	88.68	31.01	355.55	0.00431	-31.409	0.375	31.409
114.88	4	22.63	128.88	51	5	7200	128.88	243.69	1461	88.64	30.94	356.20	0.00430	-31.493	0.377	31.493
115.00	4	22.75	129.01	26	5	7200	129.00	243.81	1461	88.61	30.95	356.80	0.00430	-31.578	0.379	31.578
115.13	4	22.88	129.14	51	5	7200	129.13	243.94	1461	88.59	30.92	357.45	0.00429	-31.661	0.381	31.661
115.25	4	23.00	129.26	51	5	7200	129.25	244.06	1461	88.56	30.63	358.05	0.00425	-31.745	0.383	31.745
115.38	4	23.13	129.39	26	5	7200	129.38	244.19	1461	88.52	30.67	358.70	0.00426	-31.827	0.386	31.827
115.50	4	23.25	129.52	26	5	7200	129.50	244.31	1461	88.49	30.74	359.30	0.00427	-31.910	0.388	31.910
115.63	4	23.38	129.61	51	5	7200	129.63	244.44	1461	88.47	30.41	359.95	0.00422	-31.992	0.390	31.992
115.75	4	23.50	129.74	51	5	7200	129.75	244.56	1461	88.43	30.73	360.55	0.00427	-32.073	0.392	32.073
115.88	4	23.63	129.87	51	5	7200	129.88	244.69	1461	88.4	30.49	361.20	0.00423	-32.154	0.394	32.154
116.00	4	23.75	130.00	51	5	7200	130.00	244.81	1461	88.37	30.19	361.80	0.00419	-32.234	0.396	32.234
116.13	4	23.88	130.13	51	5	7200	130.13	244.94	1461	88.34	30.45	362.45	0.00423	-32.314	0.398	32.314
116.25	4	24.00	130.26	51	5	7200	130.25	245.06	1461	88.3	30.54	363.05	0.00424	-32.394	0.400	32.394

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
116.38	4	24.13	130.38	51	5	7200	130.38	245.19	1461	88.28	30.45	363.70	0.00423	-32.473	0.402	32.473
116.50	4	24.25	130.51	51	5	7200	130.50	245.31	1461	88.25	30.31	364.30	0.00421	-32.552	0.404	32.552
116.63	4	24.38	130.64	51	5	7200	130.63	245.44	1461	88.22	30.62	364.95	0.00425	-32.630	0.406	32.630
116.75	4	24.50	130.77	51	5	7200	130.75	245.56	1461	88.19	30.36	365.55	0.00422	-32.708	0.408	32.708
116.88	4	24.63	130.86	51	5	7200	130.88	245.69	1461	88.16	30.17	366.20	0.00419	-32.785	0.411	32.785
117.00	4	24.75	130.99	26	5	7200	131.00	245.81	1461	88.14	30.39	366.80	0.00422	-32.862	0.413	32.862
117.13	4	24.88	131.12	26	5	7200	131.13	245.94	1461	88.1	30.31	367.45	0.00421	-32.939	0.415	32.939
117.25	4	25.00	131.24	51	5	7200	131.25	246.06	1461	88.07	30.41	368.05	0.00422	-33.015	0.417	33.015
117.38	4	25.13	131.37	51	5	7200	131.38	246.19	1461	88.05	30.57	368.70	0.00425	-33.090	0.419	33.090
117.50	4	25.25	131.50	51	5	7200	131.50	246.31	1461	88.02	30.35	369.30	0.00422	-33.165	0.421	33.165
117.63	4	25.38	131.63	51	5.1	7344	131.63	246.44	1461	87.99	30.08	369.96	0.00410	-33.240	0.423	33.240
117.75	4	25.50	131.76	26	5	7200	131.75	246.56	1461	87.97	30.38	370.56	0.00422	-33.314	0.425	33.314
117.88	4	25.63	131.89	26	5	7200	131.88	246.69	1461	87.95	30.27	371.21	0.00420	-33.388	0.427	33.388
118.00	4	25.75	132.02	51	5	7200	132.00	246.81	1461	87.92	30.49	371.81	0.00423	-33.462	0.429	33.462
118.13	4	25.88	132.11	51	5	7200	132.13	246.94	1461	87.89	30.35	372.46	0.00422	-33.535	0.431	33.535
118.25	4	26.00	132.23	26	5	7200	132.25	247.06	1461	87.86	30.51	373.06	0.00424	-33.607	0.433	33.607
118.38	4	26.13	132.36	51	5	7200	132.38	247.19	1461	87.84	30.18	373.71	0.00419	-33.680	0.436	33.680
118.50	4	26.25	132.49	51	5	7200	132.50	247.31	1461	87.8	30.30	374.31	0.00421	-33.751	0.438	33.751
118.63	4	26.38	132.62	26	5	7200	132.63	247.44	1461	87.78	30.31	374.96	0.00421	-33.823	0.440	33.823
118.75	4	26.50	132.75	51	5	7200	132.75	247.56	1461	87.76	30.74	375.56	0.00427	-33.894	0.442	33.894
118.88	4	26.63	132.88	26	5	7200	132.88	247.69	1461	87.73	30.53	376.21	0.00424	-33.964	0.444	33.964
119.00	4	26.75	133.01	51	5	7200	133.00	247.81	1461	87.71	30.08	376.81	0.00418	-34.035	0.446	34.035
119.13	4	26.88	133.14	51	5	7200	133.13	247.94	1461	87.68	30.25	377.46	0.00420	-34.104	0.448	34.104
119.25	4	27.00	133.27	51	5	7200	133.25	248.06	1461	87.66	30.42	378.06	0.00423	-34.174	0.450	34.174
119.38	4	27.13	133.36	51	5	7200	133.38	248.19	1461	87.63	30.51	378.71	0.00424	-34.243	0.452	34.243
119.50	4	27.25	133.48	26	5	7200	133.50	248.31	1461	87.61	30.44	379.31	0.00423	-34.311	0.454	34.311
119.63	4	27.38	133.61	51	5	7200	133.63	248.44	1461	87.58	30.50	379.96	0.00424	-34.379	0.456	34.379
119.75	4	27.50	133.74	51	5	7200	133.75	248.56	1461	87.57	30.34	380.56	0.00421	-34.447	0.458	34.447
119.88	4	27.63	133.87	26	5	7200	133.88	248.69	1461	87.54	30.31	381.21	0.00421	-34.514	0.461	34.514
120.00	4	27.75	134.00	26	5	7200	134.00	248.81	1461	87.51	30.18	381.81	0.00419	-34.581	0.463	34.581
120.13	4	27.88	134.13	51	5	7200	134.13	248.94	1461	87.49	30.33	382.46	0.00421	-34.648	0.465	34.648
120.25	4	28.00	134.26	51	5	7200	134.25	249.06	1461	87.47	30.66	383.06	0.00426	-34.714	0.467	34.714
120.38	4	28.13	134.39	51	5	7200	134.38	249.19	1461	87.45	30.52	383.71	0.00424	-34.780	0.469	34.780
120.50	4	28.25	134.52	51	5	7200	134.50	249.31	1461	87.42	30.35	384.31	0.00422	-34.845	0.471	34.845
120.63	4	28.38	134.65	51	5	7200	134.63	249.44	1462	87.4	31.28	384.96	0.00434	-34.910	0.473	34.910
120.75	4	28.50	134.78	51	5	7200	134.75	249.56	1461	87.38	30.42	385.56	0.00423	-34.975	0.475	34.975
120.88	4	28.63	134.86	51	5	7200	134.88	249.69	1461	87.36	30.37	386.21	0.00422	-35.039	0.477	35.039
121.00	4	28.75	134.99	26	5	7200	135.00	249.81	1461	87.33	30.60	386.81	0.00425	-35.103	0.479	35.103
121.13	4	28.88	135.12	51	5	7200	135.13	249.94	1461	87.31	30.56	387.46	0.00424	-35.167	0.481	35.167
121.25	4	29.00	135.25	51	5	7200	135.25	250.06	1461	87.28	30.26	388.06	0.00420	-35.230	0.483	35.230
121.38	4	29.13	135.38	51	5	7200	135.38	250.19	1461	87.27	30.05	388.71	0.00417	-35.293	0.486	35.293
121.50	4	29.25	135.51	51	5	7200	135.50	250.31	1461	87.25	30.34	389.31	0.00421	-35.355	0.488	35.355
121.63	4	29.38	135.64	51	5	7200	135.63	250.44	1461	87.23	30.32	389.96	0.00421	-35.417	0.490	35.417
121.75	4	29.50	135.77	51	5	7200	135.75	250.56	1461	87.21	30.27	390.56	0.00420	-35.479	0.492	35.479
121.88	4	29.63	135.85	51	5	7200	135.88	250.69	1461	87.19	30.19	391.21	0.00419	-35.540	0.494	35.540
122.00	4	29.75	135.98	51	5	7200	136.00	250.81	1461	87.16	30.27	391.81	0.00420	-35.601	0.496	35.601
122.13	4	29.88	136.11	51	5	7200	136.13	250.94	1461	87.14	30.13	392.46	0.00418	-35.661	0.498	35.661
122.25	4	30.00	136.24	26	5	7200	136.25	251.06	1461	87.12	30.79	393.06	0.00428	-35.722	0.500	35.722
122.38	4	30.13	136.37	51	5	7200	136.38	251.19	1461	87.1	30.73	393.71	0.00427	-35.782	0.502	35.782

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
122.50	5	Step 5	0.01	136.50	51	5.1	7344	136.50	251.31	1461	87.09	30.47	394.33	0.00415	-0.630	0.000	0.630
122.63	5		0.13	136.63	51	5.5	7920	136.63	251.44	1461	87.07	30.58	395.04	0.00386	-1.074	0.002	1.074
122.75	5		0.25	136.76	51	5.7	8208	136.75	251.56	1461	87.04	30.43	395.72	0.00371	-1.470	0.004	1.470
122.88	5		0.38	136.88	51	5.8	8352	136.88	251.69	1461	87.02	30.41	396.48	0.00364	-1.837	0.006	1.837
123.00	5		0.50	137.01	51	5.9	8496	137.00	251.81	1461	87.01	30.53	397.19	0.00359	-2.183	0.008	2.183
123.13	5		0.63	137.14	76	6	8640	137.13	251.94	1461	86.99	30.66	397.97	0.00355	-2.513	0.010	2.513
123.25	5		0.75	137.27	76	6	8640	137.25	252.06	1461	86.97	30.51	398.69	0.00353	-2.830	0.013	2.830
123.38	5		0.88	137.36	76	6	8640	137.38	252.19	1461	86.95	30.33	399.47	0.00351	-3.136	0.015	3.136
123.50	5		1.00	137.49	76	6	8640	137.50	252.31	1461	86.93	30.36	400.19	0.00351	-3.432	0.017	3.432
123.63	5		1.13	137.62	51	5.9	8496	137.63	252.44	1461	86.9	30.66	400.95	0.00361	-3.720	0.019	3.720
123.75	5		1.25	137.74	51	5.8	8352	137.75	252.56	1461	86.89	30.29	401.65	0.00363	-4.000	0.021	4.000
123.88	5		1.38	137.87	51	5.9	8496	137.88	252.69	1461	86.88	30.56	402.42	0.00360	-4.273	0.023	4.273
124.00	5		1.50	138.00	51	5.9	8496	138.00	252.81	1461	86.85	30.31	403.12	0.00357	-4.540	0.025	4.540
124.13	5		1.63	138.13	51	5.9	8496	138.13	252.94	1461	86.83	30.78	403.89	0.00362	-4.801	0.027	4.801
124.25	5		1.75	138.26	51	5.9	8496	138.25	253.06	1461	86.82	30.62	404.60	0.00360	-5.057	0.029	5.057
124.38	5		1.88	138.35	51	5.9	8496	138.38	253.19	1461	86.8	30.91	405.37	0.00364	-5.308	0.031	5.308
124.50	5		2.00	138.48	51	5.8	8352	138.50	253.31	1461	86.78	30.44	406.06	0.00364	-5.554	0.033	5.554
124.63	5		2.13	138.61	51	5.8	8352	138.63	253.44	1461	86.76	30.43	406.82	0.00364	-5.795	0.035	5.795
124.75	5		2.25	138.73	51	5.1	7344	138.75	253.56	1461	86.75	30.88	407.43	0.00420	-6.033	0.038	6.033
124.88	5		2.38	138.86	51	6.2	8928	138.88	253.69	1462	86.73	31.67	408.23	0.00355	-6.267	0.040	6.267
125.00	5		2.50	138.99	51	5.9	8496	139.00	253.81	1462	86.71	31.80	408.94	0.00374	-6.497	0.042	6.497
125.13	5		2.63	139.12	51	5.9	8496	139.13	253.94	1463	86.69	32.32	409.71	0.00380	-6.723	0.044	6.723
125.25	5		2.75	139.25	51	5.9	8496	139.25	254.06	1463	86.69	32.79	410.42	0.00386	-6.946	0.046	6.946
125.38	5		2.88	139.38	51	5.9	8496	139.38	254.19	1464	86.66	33.24	411.18	0.00391	-7.166	0.048	7.166
125.50	5		3.00	139.51	51	5.8	8352	139.50	254.31	1464	86.64	33.77	411.88	0.00404	-7.383	0.050	7.383
125.63	5		3.13	139.64	51	5.7	8208	139.63	254.44	1465	86.63	34.10	412.62	0.00415	-7.597	0.052	7.597
125.75	5		3.25	139.77	51	5.9	8496	139.75	254.56	1465	86.61	34.14	413.33	0.00402	-7.808	0.054	7.808
125.88	5		3.38	139.86	51	5.9	8496	139.88	254.69	1464	86.59	33.26	414.10	0.00391	-8.016	0.056	8.016
126.00	5		3.50	139.98	51	5.9	8496	140.00	254.81	1464	86.57	33.05	414.80	0.00389	-8.222	0.058	8.222
126.13	5		3.63	140.11	51	5.9	8496	140.13	254.94	1464	86.57	33.17	415.57	0.00390	-8.425	0.060	8.425
126.25	5		3.75	140.24	51	5.8	8352	140.25	255.06	1464	86.54	33.14	416.27	0.00397	-8.625	0.063	8.625
126.38	5		3.88	140.37	51	6.1	8784	140.38	255.19	1463	86.52	32.46	417.06	0.00370	-8.823	0.065	8.823
126.50	5		4.00	140.50	76	6.1	8784	140.50	255.31	1463	86.51	32.27	417.79	0.00367	-9.019	0.067	9.019
126.63	5		4.13	140.63	76	6.1	8784	140.63	255.44	1463	86.5	32.22	418.59	0.00367	-9.213	0.069	9.213
126.75	5		4.25	140.76	51	6	8640	140.75	255.56	1462	86.47	31.75	419.31	0.00367	-9.405	0.071	9.405
126.88	5		4.38	140.89	76	6.1	8784	140.88	255.69	1462	86.45	31.69	420.10	0.00361	-9.594	0.073	9.594
127.00	5		4.50	141.02	76	6	8640	141.00	255.81	1462	86.44	31.80	420.82	0.00368	-9.782	0.075	9.782
127.13	5		4.63	141.10	76	6	8640	141.13	255.94	1462	86.42	31.72	421.60	0.00367	-9.967	0.077	9.967
127.25	5		4.75	141.23	76	6	8640	141.25	256.06	1462	86.4	31.84	422.32	0.00369	-10.151	0.079	10.151
127.38	5		4.88	141.36	51	6	8640	141.38	256.19	1462	86.38	31.35	423.10	0.00363	-10.332	0.081	10.332
127.50	5		5.00	141.49	76	6	8640	141.50	256.31	1462	86.37	31.30	423.82	0.00362	-10.512	0.083	10.512
127.63	5		5.13	141.62	51	6	8640	141.63	256.44	1462	86.35	31.12	424.60	0.00360	-10.690	0.085	10.690
127.75	5		5.25	141.75	76	6	8640	141.75	256.56	1461	86.33	30.93	425.32	0.00358	-10.867	0.088	10.867
127.88	5		5.38	141.88	76	6	8640	141.88	256.69	1461	86.31	30.76	426.10	0.00356	-11.041	0.090	11.041
128.00	5		5.50	142.01	51	6	8640	142.00	256.81	1461	86.28	30.57	426.82	0.00354	-11.214	0.092	11.214
128.13	5		5.63	142.14	76	6.1	8784	142.13	256.94	1461	86.26	30.68	427.61	0.00349	-11.385	0.094	11.385
128.25	5		5.75	142.27	76	6	8640	142.25	257.06	1461	86.25	30.82	428.33	0.00357	-11.555	0.096	11.555
128.38	5		5.88	142.36	76	6	8640	142.38	257.19	1461	86.23	30.34	429.11	0.00351	-11.723	0.098	11.723
128.50	5		6.00	142.49	76	6	8640	142.50	257.31	1461	86.21	30.84	429.83	0.00357	-11.890	0.100	11.890

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
128.63	5	6.13	142.61	76	6	8640	142.63	257.44	1461	86.19	30.61	430.61	0.00354	-12.055	0.102	12.055
128.75	5	6.25	142.74	76	6	8640	142.75	257.56	1461	86.16	30.93	431.33	0.00358	-12.219	0.104	12.219
128.88	5	6.38	142.87	76	6	8640	142.88	257.69	1462	86.14	31.28	432.11	0.00362	-12.381	0.106	12.381
129.00	5	6.50	143.00	76	6	8640	143.00	257.81	1462	86.12	31.33	432.83	0.00363	-12.542	0.108	12.542
129.13	5	6.63	143.13	76	6	8640	143.13	257.94	1462	86.1	31.35	433.61	0.00363	-12.701	0.111	12.701
129.25	5	6.75	143.26	76	6	8640	143.25	258.06	1462	86.08	31.44	434.33	0.00364	-12.859	0.113	12.859
129.38	5	6.88	143.39	76	6	8640	143.38	258.19	1462	86.06	31.19	435.11	0.00361	-13.016	0.115	13.016
129.50	5	7.00	143.52	51	6	8640	143.50	258.31	1462	86.04	31.10	435.83	0.00360	-13.172	0.117	13.172
129.63	5	7.13	143.60	51	6.1	8784	143.63	258.44	1462	86.02	31.80	436.62	0.00362	-13.326	0.119	13.326
129.75	5	7.25	143.73	76	6	8640	143.75	258.56	1462	86	31.37	437.34	0.00363	-13.479	0.121	13.479
129.88	5	7.38	143.86	76	6	8640	143.88	258.69	1462	85.98	31.21	438.12	0.00361	-13.631	0.123	13.631
130.00	5	7.50	143.99	51	6	8640	144.00	258.81	1462	85.95	31.36	438.84	0.00363	-13.781	0.125	13.781
130.13	5	7.63	144.12	51	6	8640	144.13	258.94	1462	85.93	31.61	439.62	0.00366	-13.930	0.127	13.930
130.25	5	7.75	144.25	51	6	8640	144.25	259.06	1462	85.9	31.47	440.34	0.00364	-14.078	0.129	14.078
130.38	5	7.88	144.38	76	6	8640	144.38	259.19	1462	85.88	31.67	441.12	0.00367	-14.225	0.131	14.225
130.50	5	8.00	144.51	76	6	8640	144.50	259.31	1462	85.87	31.62	441.84	0.00366	-14.371	0.133	14.371
130.63	5	8.13	144.64	51	6	8640	144.63	259.44	1462	85.84	31.70	442.62	0.00367	-14.516	0.136	14.516
130.75	5	8.25	144.76	76	6	8640	144.75	259.56	1462	85.82	31.71	443.34	0.00367	-14.660	0.138	14.660
130.88	5	8.38	144.89	76	6	8640	144.88	259.69	1462	85.81	31.35	444.12	0.00363	-14.802	0.140	14.802
131.00	5	8.50	145.02	51	6	8640	145.00	259.81	1462	85.78	31.56	444.84	0.00365	-14.943	0.142	14.943
131.13	5	8.63	145.11	76	6	8640	145.13	259.94	1462	85.76	31.82	445.62	0.00368	-15.084	0.144	15.084
131.25	5	8.75	145.24	76	6.1	8784	145.25	260.06	1462	85.74	31.78	446.36	0.00362	-15.223	0.146	15.223
131.38	5	8.88	145.37	51	6	8640	145.38	260.19	1462	85.71	31.79	447.14	0.00368	-15.361	0.148	15.361
131.50	5	9.00	145.50	51	6	8640	145.50	260.31	1462	85.69	31.79	447.86	0.00368	-15.499	0.150	15.499
131.63	5	9.13	145.63	76	6	8640	145.63	260.44	1462	85.67	31.82	448.64	0.00368	-15.635	0.152	15.635
131.75	5	9.25	145.76	76	6	8640	145.75	260.56	1462	85.64	31.54	449.36	0.00365	-15.770	0.154	15.770
131.88	5	9.38	145.89	51	6.1	8784	145.88	260.69	1462	85.62	31.65	450.15	0.00360	-15.905	0.156	15.905
132.00	5	9.50	146.02	76	6	8640	146.00	260.81	1462	85.6	31.83	450.87	0.00368	-16.038	0.158	16.038
132.13	5	9.63	146.10	76	6	8640	146.13	260.94	1462	85.58	31.82	451.65	0.00368	-16.171	0.161	16.171
132.25	5	9.75	146.23	76	6	8640	146.25	261.06	1462	85.56	31.59	452.37	0.00366	-16.302	0.163	16.302
132.38	5	9.88	146.36	51	6	8640	146.38	261.19	1462	85.54	31.63	453.15	0.00366	-16.433	0.165	16.433
132.50	5	10.00	146.49	51	6.1	8784	146.50	261.31	1462	85.52	31.69	453.88	0.00361	-16.562	0.167	16.562
132.63	5	10.13	146.62	76	6.1	8784	146.63	261.44	1463	85.5	32.14	454.67	0.00366	-16.691	0.169	16.691
132.75	5	10.25	146.75	51	6	8640	146.75	261.56	1462	85.48	31.83	455.39	0.00368	-16.819	0.171	16.819
132.88	5	10.38	146.88	76	6	8640	146.88	261.69	1462	85.45	31.89	456.17	0.00369	-16.946	0.173	16.946
133.00	5	10.50	147.01	76	6	8640	147.00	261.81	1462	85.43	31.77	456.89	0.00368	-17.072	0.175	17.072
133.13	5	10.63	147.14	76	6	8640	147.13	261.94	1462	85.41	31.74	457.67	0.00367	-17.197	0.177	17.197
133.25	5	10.75	147.27	51	6	8640	147.25	262.06	1462	85.38	31.83	458.39	0.00368	-17.322	0.179	17.322
133.38	5	10.88	147.35	76	6.1	8784	147.38	262.19	1462	85.37	31.70	459.19	0.00361	-17.445	0.181	17.445
133.50	5	11.00	147.48	76	6	8640	147.50	262.31	1462	85.34	31.80	459.91	0.00368	-17.568	0.183	17.568
133.63	5	11.13	147.61	51	6	8640	147.63	262.44	1462	85.32	31.83	460.69	0.00368	-17.690	0.186	17.690
133.75	5	11.25	147.74	76	6	8640	147.75	262.56	1462	85.3	31.78	461.41	0.00368	-17.811	0.188	17.811
133.88	5	11.38	147.87	76	6	8640	147.88	262.69	1462	85.28	31.75	462.19	0.00367	-17.932	0.190	17.932
134.00	5	11.50	148.00	51	6.1	8784	148.00	262.81	1462	85.26	31.73	462.92	0.00361	-18.051	0.192	18.051
134.13	5	11.63	148.13	51	6	8640	148.13	262.94	1462	85.24	31.69	463.70	0.00367	-18.170	0.194	18.170
134.25	5	11.75	148.25	51	6	8640	148.25	263.06	1462	85.22	31.69	464.42	0.00367	-18.288	0.196	18.288
134.38	5	11.88	148.38	51	6	8640	148.38	263.19	1462	85.19	31.72	465.20	0.00367	-18.405	0.198	18.405
134.50	5	12.00	148.51	76	6.1	8784	148.50	263.31	1462	85.17	31.62	465.93	0.00360	-18.522	0.200	18.522
134.63	5	12.13	148.60	76	6	8640	148.63	263.44	1462	85.15	31.96	466.71	0.00370	-18.637	0.202	18.637

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
134.75	5	12.25	148.73	76	6	8640	148.75	263.56	1462	85.13	31.80	467.43	0.00368	-18.752	0.204	18.752
134.88	5	12.38	148.86	51	6	8640	148.88	263.69	1462	85.11	31.94	468.21	0.00370	-18.867	0.206	18.867
135.00	5	12.50	148.99	51	6	8640	149.00	263.81	1463	85.09	32.00	468.93	0.00370	-18.980	0.208	18.980
135.13	5	12.63	149.12	76	6	8640	149.13	263.94	1463	85.07	32.00	469.71	0.00370	-19.093	0.211	19.093
135.25	5	12.75	149.25	76	6	8640	149.25	264.06	1462	85.05	31.72	470.43	0.00367	-19.205	0.213	19.205
135.38	5	12.88	149.37	51	6	8640	149.38	264.19	1463	85.03	31.98	471.21	0.00370	-19.317	0.215	19.317
135.50	5	13.00	149.50	76	6	8640	149.50	264.31	1462	85.01	31.71	471.93	0.00367	-19.427	0.217	19.427
135.63	5	13.13	149.63	51	6	8640	149.63	264.44	1462	84.98	31.78	472.71	0.00368	-19.537	0.219	19.537
135.75	5	13.25	149.76	76	6.1	8784	149.75	264.56	1462	84.96	31.77	473.44	0.00362	-19.647	0.221	19.647
135.88	5	13.38	149.89	76	6	8640	149.88	264.69	1462	84.94	31.88	474.22	0.00369	-19.755	0.223	19.755
136.00	5	13.50	150.02	76	6.1	8784	150.00	264.81	1462	84.93	31.93	474.96	0.00364	-19.863	0.225	19.863
136.13	5	13.63	150.11	76	6	8640	150.13	264.94	1463	84.91	32.33	475.74	0.00374	-19.970	0.227	19.970
136.25	5	13.75	150.24	76	6.1	8784	150.25	265.06	1462	84.89	31.71	476.47	0.00361	-20.077	0.229	20.077
136.38	5	13.88	150.36	51	6	8640	150.38	265.19	1462	84.86	31.67	477.25	0.00367	-20.183	0.231	20.183
136.50	5	14.00	150.49	76	6	8640	150.50	265.31	1462	84.84	31.91	477.97	0.00369	-20.288	0.233	20.288
136.63	5	14.13	150.62	51	6	8640	150.63	265.44	1462	84.82	31.88	478.75	0.00369	-20.393	0.236	20.393
136.75	5	14.25	150.75	51	6.1	8784	150.75	265.56	1462	84.8	31.91	479.48	0.00363	-20.497	0.238	20.497
136.88	5	14.38	150.88	51	6	8640	150.88	265.69	1462	84.79	31.80	480.26	0.00368	-20.600	0.240	20.600
137.00	5	14.50	151.01	76	6.1	8784	151.00	265.81	1462	84.77	31.85	480.99	0.00363	-20.703	0.242	20.703
137.13	5	14.63	151.14	51	6	8640	151.13	265.94	1462	84.75	31.56	481.77	0.00365	-20.805	0.244	20.805
137.25	5	14.75	151.27	76	6.1	8784	151.25	266.06	1462	84.73	31.63	482.50	0.00360	-20.907	0.246	20.907
137.38	5	14.88	151.35	76	6	8640	151.38	266.19	1462	84.7	31.95	483.28	0.00370	-21.008	0.248	21.008
137.50	5	15.00	151.48	76	6	8640	151.50	266.31	1463	84.69	32.08	484.00	0.00371	-21.108	0.250	21.108
137.63	5	15.13	151.61	51	6	8640	151.63	266.44	1462	84.67	31.73	484.78	0.00367	-21.208	0.252	21.208
137.75	5	15.25	151.74	51	6	8640	151.75	266.56	1462	84.65	31.65	485.50	0.00366	-21.307	0.254	21.307
137.88	5	15.38	151.87	51	6	8640	151.88	266.69	1462	84.63	31.94	486.28	0.00370	-21.406	0.256	21.406
138.00	5	15.50	152.00	51	6.1	8784	152.00	266.81	1463	84.61	32.02	487.02	0.00365	-21.504	0.258	21.504
138.13	5	15.63	152.13	51	6	8640	152.13	266.94	1462	84.59	31.92	487.80	0.00369	-21.601	0.261	21.601
138.25	5	15.75	152.26	51	6	8640	152.25	267.06	1462	84.58	31.92	488.52	0.00369	-21.698	0.263	21.698
138.38	5	15.88	152.39	76	6.1	8784	152.38	267.19	1463	84.56	32.10	489.31	0.00365	-21.794	0.265	21.794
138.50	5	16.00	152.51	51	6	8640	152.50	267.31	1462	84.54	31.45	490.03	0.00364	-21.890	0.267	21.890
138.63	5	16.13	152.60	51	6	8640	152.63	267.44	1463	84.53	31.98	490.81	0.00370	-21.985	0.269	21.985
138.75	5	16.25	152.73	76	6	8640	152.75	267.56	1463	84.51	32.00	491.53	0.00370	-22.079	0.271	22.079
138.88	5	16.38	152.86	76	6	8640	152.88	267.69	1463	84.49	32.08	492.31	0.00371	-22.173	0.273	22.173
139.00	5	16.50	152.99	51	6.1	8784	153.00	267.81	1462	84.46	31.87	493.04	0.00363	-22.267	0.275	22.267
139.13	5	16.63	153.12	51	6	8640	153.13	267.94	1463	84.45	32.15	493.82	0.00372	-22.360	0.277	22.360
139.25	5	16.75	153.25	76	6	8640	153.25	268.06	1462	84.44	31.84	494.54	0.00369	-22.452	0.279	22.452
139.38	5	16.88	153.38	51	6	8640	153.38	268.19	1462	84.42	31.95	495.32	0.00370	-22.544	0.281	22.544
139.50	5	17.00	153.51	51	6	8640	153.50	268.31	1462	84.4	31.81	496.04	0.00368	-22.635	0.283	22.635
139.63	5	17.13	153.64	51	6	8640	153.63	268.44	1463	84.38	32.06	496.82	0.00371	-22.726	0.286	22.726
139.75	5	17.25	153.77	76	6	8640	153.75	268.56	1462	84.37	31.89	497.54	0.00369	-22.816	0.288	22.816
139.88	5	17.38	153.85	51	6	8640	153.88	268.69	1463	84.34	32.15	498.32	0.00372	-22.906	0.290	22.906
140.00	5	17.50	153.98	76	6	8640	154.00	268.81	1462	84.33	31.90	499.04	0.00369	-22.995	0.292	22.995
140.13	5	17.63	154.11	76	6.1	8784	154.13	268.94	1462	84.31	31.67	499.83	0.00361	-23.084	0.294	23.084
140.25	5	17.75	154.24	51	6.1	8784	154.25	269.06	1462	84.3	31.71	500.57	0.00361	-23.172	0.296	23.172
140.38	5	17.88	154.37	51	6	8640	154.38	269.19	1462	84.27	31.67	501.35	0.00367	-23.259	0.298	23.259
140.50	5	18.00	154.50	51	6	8640	154.50	269.31	1462	84.26	31.70	502.07	0.00367	-23.346	0.300	23.346
140.63	5	18.13	154.63	76	6.1	8784	154.63	269.44	1463	84.24	32.02	502.86	0.00365	-23.433	0.302	23.433
140.75	5	18.25	154.76	51	6	8640	154.75	269.56	1463	84.23	32.18	503.58	0.00372	-23.519	0.304	23.519

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
140.88	5	18.38	154.89	51	6	8640	154.88	269.69	1463	84.21	32.00	504.36	0.00370	-23.605	0.306	23.605
141.00	5	18.50	155.02	51	6.1	8784	155.00	269.81	1463	84.2	32.01	505.09	0.00364	-23.690	0.308	23.690
141.13	5	18.63	155.10	76	6	8640	155.13	269.94	1463	84.18	32.20	505.87	0.00373	-23.775	0.311	23.775
141.25	5	18.75	155.23	51	6	8640	155.25	270.06	1462	84.16	31.89	506.59	0.00369	-23.859	0.313	23.859
141.38	5	18.88	155.36	51	6.1	8784	155.38	270.19	1463	84.14	32.32	507.38	0.00368	-23.943	0.315	23.943
141.50	5	19.00	155.49	76	6	8640	155.50	270.31	1462	84.13	31.90	508.10	0.00369	-24.026	0.317	24.026
141.63	5	19.13	155.62	76	6	8640	155.63	270.44	1463	84.11	32.00	508.88	0.00370	-24.109	0.319	24.109
141.75	5	19.25	155.75	51	6	8640	155.75	270.56	1463	84.09	32.19	509.60	0.00373	-24.191	0.321	24.191
141.88	5	19.38	155.88	76	6.1	8784	155.88	270.69	1463	84.09	32.22	510.40	0.00367	-24.273	0.323	24.273
142.00	5	19.50	156.01	76	6.1	8784	156.00	270.81	1462	84.06	31.92	511.13	0.00363	-24.354	0.325	24.354
142.13	5	19.63	156.14	51	6.1	8784	156.13	270.94	1463	84.05	32.12	511.92	0.00366	-24.435	0.327	24.435
142.25	5	19.75	156.27	51	6	8640	156.25	271.06	1463	84.04	32.02	512.64	0.00371	-24.515	0.329	24.515
142.38	5	19.88	156.39	51	6.1	8784	156.38	271.19	1463	84.01	32.07	513.43	0.00365	-24.595	0.331	24.595
142.50	5	20.00	156.48	51	6.1	8784	156.50	271.31	1463	84.01	32.20	514.17	0.00367	-24.675	0.333	24.675
142.63	5	20.13	156.61	51	6	8640	156.63	271.44	1463	83.99	31.98	514.95	0.00370	-24.754	0.336	24.754
142.75	5	20.25	156.74	51	6.1	8784	156.75	271.56	1463	83.98	32.05	515.68	0.00365	-24.832	0.338	24.832
142.88	5	20.38	156.87	76	6	8640	156.88	271.69	1463	83.96	32.27	516.46	0.00373	-24.911	0.340	24.911
143.00	5	20.50	157.00	51	6	8640	157.00	271.81	1462	83.94	31.95	517.18	0.00370	-24.988	0.342	24.988
143.13	5	20.63	157.13	51	6	8640	157.13	271.94	1463	83.93	32.37	517.96	0.00375	-25.066	0.344	25.066
143.25	5	20.75	157.26	76	6	8640	157.25	272.06	1463	83.92	31.98	518.68	0.00370	-25.142	0.346	25.142
143.38	5	20.88	157.39	51	6	8640	157.38	272.19	1463	83.9	32.12	519.46	0.00372	-25.219	0.348	25.219
143.50	5	21.00	157.52	51	6	8640	157.50	272.31	1463	83.89	32.13	520.18	0.00372	-25.295	0.350	25.295
143.63	5	21.13	157.61	51	6	8640	157.63	272.44	1462	83.87	31.92	520.96	0.00369	-25.370	0.352	25.370
143.75	5	21.25	157.73	51	6	8640	157.75	272.56	1463	83.86	32.27	521.68	0.00373	-25.446	0.354	25.446
143.88	5	21.38	157.86	51	6.1	8784	157.88	272.69	1462	83.84	31.94	522.47	0.00364	-25.520	0.356	25.520
144.00	5	21.50	157.99	51	6.1	8784	158.00	272.81	1463	83.83	32.11	523.20	0.00366	-25.595	0.358	25.595
144.13	5	21.63	158.12	51	6	8640	158.13	272.94	1463	83.81	32.23	523.98	0.00373	-25.668	0.361	25.668
144.25	5	21.75	158.25	76	6	8640	158.25	273.06	1463	83.8	32.15	524.70	0.00372	-25.742	0.363	25.742
144.38	5	21.88	158.38	51	6	8640	158.38	273.19	1463	83.79	32.10	525.48	0.00372	-25.815	0.365	25.815
144.50	5	22.00	158.51	51	6.1	8784	158.50	273.31	1462	83.78	31.83	526.22	0.00362	-25.887	0.367	25.887
144.63	5	22.13	158.64	51	6	8640	158.63	273.44	1463	83.76	32.37	527.00	0.00375	-25.960	0.369	25.960
144.75	5	22.25	158.77	51	6.1	8784	158.75	273.56	1462	83.75	31.85	527.73	0.00363	-26.031	0.371	26.031
144.88	5	22.38	158.86	51	6	8640	158.88	273.69	1462	83.73	31.88	528.51	0.00369	-26.103	0.373	26.103
145.00	5	22.50	158.99	51	6.1	8784	159.00	273.81	1463	83.72	32.09	529.24	0.00365	-26.174	0.375	26.174
145.13	5	22.63	159.11	51	6.1	8784	159.13	273.94	1463	83.71	32.24	530.03	0.00367	-26.244	0.377	26.244
145.25	5	22.75	159.24	51	6.1	8784	159.25	274.06	1463	83.7	32.22	530.76	0.00367	-26.315	0.379	26.315
145.38	5	22.88	159.37	76	6	8640	159.38	274.19	1462	83.68	31.92	531.54	0.00369	-26.384	0.381	26.384
145.50	5	23.00	159.50	51	6	8640	159.50	274.31	1463	83.67	32.07	532.26	0.00371	-26.454	0.383	26.454
145.63	5	23.13	159.63	51	6	8640	159.63	274.44	1463	83.66	32.11	533.04	0.00372	-26.523	0.386	26.523
145.75	5	23.25	159.76	76	6	8640	159.75	274.56	1463	83.65	32.74	533.76	0.00379	-26.591	0.388	26.591
145.88	5	23.38	159.89	51	6	8640	159.88	274.69	1463	83.64	32.25	534.54	0.00373	-26.660	0.390	26.660
146.00	5	23.50	160.02	51	6.1	8784	160.00	274.81	1463	83.63	32.18	535.28	0.00366	-26.727	0.392	26.727
146.13	5	23.63	160.11	51	6	8640	160.13	274.94	1462	83.61	31.36	536.06	0.00363	-26.795	0.394	26.795
146.25	5	23.75	160.23	51	6	8640	160.25	275.06	1462	83.6	31.62	536.78	0.00366	-26.862	0.396	26.862
146.38	5	23.88	160.36	51	6	8640	160.38	275.19	1463	83.59	32.20	537.56	0.00373	-26.929	0.398	26.929
146.50	5	24.00	160.49	51	6	8640	160.50	275.31	1463	83.58	32.10	538.28	0.00372	-26.995	0.400	26.995
146.63	5	24.13	160.62	76	6	8640	160.63	275.44	1462	83.57	31.89	539.06	0.00369	-27.061	0.402	27.061
146.75	5	24.25	160.75	51	6	8640	160.75	275.56	1463	83.56	32.11	539.78	0.00372	-27.126	0.404	27.126
146.88	5	24.38	160.88	51	6	8640	160.88	275.69	1463	83.54	32.17	540.56	0.00372	-27.192	0.406	27.192

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
147.00	5	24.50	161.01	51	6	8640	161.00	275.81	1462	83.54	31.91	541.28	0.00369	-27.257	0.408	27.257
147.13	5	24.63	161.14	51	6	8640	161.13	275.94	1462	83.52	31.93	542.06	0.00370	-27.321	0.411	27.321
147.25	5	24.75	161.27	51	6	8640	161.25	276.06	1463	83.52	32.20	542.78	0.00373	-27.385	0.413	27.385
147.38	5	24.88	161.36	51	6	8640	161.38	276.19	1463	83.5	32.12	543.56	0.00372	-27.449	0.415	27.449
147.50	5	25.00	161.49	51	6.1	8784	161.50	276.31	1462	83.5	31.60	544.29	0.00360	-27.512	0.417	27.512
147.63	5	25.13	161.62	76	6	8640	161.63	276.44	1463	83.48	32.10	545.07	0.00372	-27.575	0.419	27.575
147.75	5	25.25	161.75	51	6	8640	161.75	276.56	1463	83.47	32.29	545.79	0.00374	-27.638	0.421	27.638
147.88	5	25.38	161.88	51	6	8640	161.88	276.69	1463	83.47	32.12	546.57	0.00372	-27.700	0.423	27.700
148.00	5	25.50	162.01	76	6	8640	162.00	276.81	1462	83.45	31.87	547.29	0.00369	-27.762	0.425	27.762
148.13	5	25.63	162.14	51	6	8640	162.13	276.94	1463	83.44	32.07	548.07	0.00371	-27.824	0.427	27.824
148.25	5	25.75	162.27	51	6	8640	162.25	277.06	1463	83.43	32.13	548.79	0.00372	-27.885	0.429	27.885
148.38	5	25.88	162.39	76	6	8640	162.38	277.19	1463	83.43	32.06	549.57	0.00371	-27.946	0.431	27.946
148.50	5	26.00	162.48	76	6.1	8784	162.50	277.31	1463	83.42	32.12	550.30	0.00366	-28.006	0.433	28.006
148.63	5	26.13	162.61	51	6	8640	162.63	277.44	1462	83.4	31.72	551.08	0.00367	-28.066	0.436	28.066
148.75	5	26.25	162.74	51	6	8640	162.75	277.56	1462	83.4	31.97	551.80	0.00370	-28.126	0.438	28.126
148.88	5	26.38	162.87	51	6	8640	162.88	277.69	1462	83.39	31.93	552.58	0.00370	-28.186	0.440	28.186
149.00	5	26.50	163.00	51	6	8640	163.00	277.81	1463	83.38	32.18	553.30	0.00372	-28.245	0.442	28.245
149.13	5	26.63	163.13	51	6.1	8784	163.13	277.94	1463	83.37	32.34	554.09	0.00368	-28.304	0.444	28.304
149.25	5	26.75	163.25	51	6	8640	163.25	278.06	1463	83.36	32.22	554.81	0.00373	-28.362	0.446	28.362
149.38	5	26.88	163.38	51	6	8640	163.38	278.19	1463	83.35	32.27	555.59	0.00373	-28.420	0.448	28.420
149.50	5	27.00	163.51	51	6	8640	163.50	278.31	1463	83.34	32.05	556.31	0.00371	-28.478	0.450	28.478
149.63	5	27.13	163.64	51	6	8640	163.63	278.44	1463	83.33	32.39	557.09	0.00375	-28.535	0.452	28.535
149.75	5	27.25	163.77	76	6.1	8784	163.75	278.56	1463	83.33	32.31	557.83	0.00368	-28.593	0.454	28.593
149.88	5	27.38	163.86	51	6	8640	163.88	278.69	1463	83.32	32.34	558.61	0.00374	-28.649	0.456	28.649
150.00	5	27.50	163.99	51	6	8640	164.00	278.81	1463	83.31	32.30	559.33	0.00374	-28.706	0.458	28.706
150.13	5	27.63	164.12	51	6	8640	164.13	278.94	1463	83.31	32.15	560.11	0.00372	-28.762	0.461	28.762
150.25	5	27.75	164.24	51	6.1	8784	164.25	279.06	1463	83.28	32.22	560.84	0.00367	-28.818	0.463	28.818
150.38	5	27.88	164.38	51	6	8640	164.38	279.19	1463	83.28	32.15	561.62	0.00372	-28.873	0.465	28.873
150.50	5	28.00	164.51	51	6	8640	164.50	279.31	1463	83.27	32.39	562.34	0.00375	-28.928	0.467	28.928
150.63	5	28.13	164.63	51	6	8640	164.63	279.44	1463	83.27	32.17	563.12	0.00372	-28.983	0.469	28.983
150.75	5	28.25	164.76	76	6	8640	164.75	279.56	1463	83.26	32.24	563.84	0.00373	-29.038	0.471	29.038
150.88	5	28.38	164.89	51	6	8640	164.88	279.69	1463	83.25	32.09	564.62	0.00371	-29.092	0.473	29.092
151.00	5	28.50	165.02	51	6	8640	165.00	279.81	1462	83.24	31.90	565.34	0.00369	-29.146	0.475	29.146
151.13	5	28.63	165.11	51	6	8640	165.13	279.94	1463	83.23	32.15	566.12	0.00372	-29.199	0.477	29.199
151.25	5	28.75	165.24	51	6	8640	165.25	280.06	1463	83.23	32.41	566.84	0.00375	-29.253	0.479	29.253
151.38	5	28.88	165.37	51	6.1	8784	165.38	280.19	1463	83.21	32.19	567.63	0.00366	-29.306	0.481	29.306
151.50	5	29.00	165.50	51	6.1	8784	165.50	280.31	1463	83.21	32.20	568.36	0.00367	-29.358	0.483	29.358
151.63	5	29.13	165.63	51	6.1	8784	165.63	280.44	1463	83.2	32.15	569.16	0.00366	-29.411	0.486	29.411
151.75	5	29.25	165.76	51	6.1	8784	165.75	280.56	1463	83.19	32.11	569.89	0.00366	-29.463	0.488	29.463
151.88	5	29.38	165.89	51	6.1	8784	165.88	280.69	1462	83.18	31.96	570.68	0.00364	-29.514	0.490	29.514
152.00	5	29.50	166.01	51	6.1	8784	166.00	280.81	1463	83.18	32.33	571.41	0.00368	-29.566	0.492	29.566
152.13	5	29.63	166.14	51	6	8640	166.13	280.94	1463	83.17	32.08	572.19	0.00371	-29.617	0.494	29.617
152.25	5	29.75	166.27	51	6.1	8784	166.25	281.06	1462	83.16	31.73	572.92	0.00361	-29.667	0.496	29.667
152.38	5	29.88	166.36	51	6	8640	166.38	281.19	1463	83.15	32.02	573.70	0.00371	-29.718	0.498	29.718
152.50	5	30.00	166.49	51	6.1	8784	166.50	281.31	1463	83.14	32.25	574.44	0.00367	-29.768	0.500	29.768
152.63	5	30.13	166.62	51	6	8640	166.63	281.44	1463	83.14	32.34	575.22	0.00374	-29.818	0.502	29.818
152.75	5	30.25	166.75	51	6	8640	166.75	281.56	1463	83.12	32.28	575.94	0.00374	-29.868	0.504	29.868
152.88	5	30.38	166.88	51	6	8640	166.88	281.69	1463	83.12	32.04	576.72	0.00371	-29.917	0.506	29.917
153.00	5	30.50	167.01	51	6	8640	167.00	281.81	1463	83.11	32.22	577.44	0.00373	-29.966	0.508	29.966

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
153.13	6	Step 6	0.01	167.14	76	6.5	9360	167.13	281.94	1463	83.1	32.26	578.28	0.00345	-0.585	0.000	0.585
153.25	6		0.12	167.27	76	6.9	9936	167.25	282.06	1463	83.1	32.57	579.11	0.00328	-1.003	0.002	1.003
153.38	6		0.25	167.35	76	7	10080	167.38	282.19	1463	83.09	32.22	580.02	0.00320	-1.372	0.004	1.372
153.50	6		0.37	167.48	76	7.1	10224	167.50	282.31	1463	83.08	32.21	580.87	0.00315	-1.715	0.006	1.715
153.63	6		0.50	167.61	102	7	10080	167.63	282.44	1463	83.07	32.27	581.78	0.00320	-2.037	0.008	2.037
153.75	6		0.62	167.74	76	7.1	10224	167.75	282.56	1463	83.07	32.34	582.63	0.00316	-2.344	0.010	2.344
153.88	6		0.75	167.87	102	7.1	10224	167.88	282.69	1463	83.06	32.06	583.56	0.00314	-2.639	0.013	2.639
154.00	6		0.87	168.00	76	7	10080	168.00	282.81	1463	83.05	32.44	584.40	0.00322	-2.924	0.015	2.924
154.13	6		1.00	168.13	102	7.1	10224	168.13	282.94	1463	83.05	32.34	585.32	0.00316	-3.200	0.017	3.200
154.25	6		1.12	168.26	76	7	10080	168.25	283.06	1463	83.04	32.13	586.16	0.00319	-3.467	0.019	3.467
154.38	6		1.25	168.39	102	7.1	10224	168.38	283.19	1463	83.03	32.21	587.08	0.00315	-3.728	0.021	3.728
154.50	6		1.37	168.52	76	7	10080	168.50	283.31	1463	83.03	32.32	587.92	0.00321	-3.982	0.023	3.982
154.63	6		1.50	168.60	76	7.1	10224	168.63	283.44	1463	83.02	32.13	588.85	0.00314	-4.230	0.025	4.230
154.75	6		1.62	168.73	76	7	10080	168.75	283.56	1463	83.01	32.22	589.69	0.00320	-4.473	0.027	4.473
154.88	6		1.75	168.86	76	7	10080	168.88	283.69	1463	83	32.37	590.60	0.00321	-4.711	0.029	4.711
155.00	6		1.87	169.00	102	7.1	10224	169.00	283.81	1463	83	32.07	591.45	0.00314	-4.945	0.031	4.945
155.13	6		2.00	169.13	76	7	10080	169.13	283.94	1463	82.99	32.02	592.36	0.00318	-5.174	0.033	5.174
155.25	6		2.12	169.25	102	7.1	10224	169.25	284.06	1462	82.98	31.95	593.21	0.00313	-5.398	0.035	5.398
155.38	6		2.25	169.38	76	7.1	10224	169.38	284.19	1463	82.98	32.80	594.13	0.00321	-5.619	0.038	5.619
155.50	6		2.37	169.51	76	7.1	10224	169.50	284.31	1464	82.98	33.33	594.98	0.00326	-5.837	0.040	5.837
155.63	6		2.50	169.60	76	7	10080	169.63	284.44	1465	82.97	34.20	595.89	0.00339	-6.051	0.042	6.051
155.75	6		2.62	169.73	102	7	10080	169.75	284.56	1465	82.96	34.92	596.73	0.00346	-6.261	0.044	6.261
155.88	6		2.75	169.86	76	7.1	10224	169.88	284.69	1466	82.96	35.06	597.66	0.00343	-6.469	0.046	6.469
156.00	6		2.87	169.99	102	7	10080	170.00	284.81	1466	82.94	35.44	598.50	0.00352	-6.673	0.048	6.673
156.13	6		3.00	170.12	76	7	10080	170.13	284.94	1466	82.94	35.50	599.41	0.00352	-6.875	0.050	6.875
156.25	6		3.12	170.25	102	7.1	10224	170.25	285.06	1466	82.93	35.60	600.26	0.00348	-7.074	0.052	7.074
156.38	6		3.25	170.38	76	7.1	10224	170.38	285.19	1466	82.93	35.39	601.18	0.00346	-7.270	0.054	7.270
156.50	6		3.37	170.51	76	7.1	10224	170.50	285.31	1466	82.92	35.38	602.03	0.00346	-7.464	0.056	7.464
156.63	6		3.50	170.60	76	7.1	10224	170.63	285.44	1466	82.91	35.36	602.96	0.00346	-7.655	0.058	7.655
156.75	6		3.62	170.73	76	7	10080	170.75	285.56	1466	82.91	35.55	603.80	0.00353	-7.844	0.060	7.844
156.88	6		3.75	170.85	102	7.1	10224	170.88	285.69	1466	82.9	35.95	604.72	0.00352	-8.030	0.063	8.030
157.00	6		3.87	170.98	102	7.1	10224	171.00	285.81	1467	82.89	35.99	605.57	0.00352	-8.215	0.065	8.215
157.13	6		4.00	171.11	102	7.1	10224	171.13	285.94	1466	82.89	35.90	606.50	0.00351	-8.397	0.067	8.397
157.25	6		4.12	171.24	76	7.1	10224	171.25	286.06	1467	82.88	36.22	607.35	0.00354	-8.577	0.069	8.577
157.38	6		4.25	171.37	76	7	10080	171.38	286.19	1467	82.87	36.08	608.26	0.00358	-8.755	0.071	8.755
157.50	6		4.37	171.50	76	7.1	10224	171.50	286.31	1467	82.86	36.33	609.11	0.00355	-8.932	0.073	8.932
157.63	6		4.50	171.63	102	7.1	10224	171.63	286.44	1467	82.86	36.39	610.03	0.00356	-9.106	0.075	9.106
157.75	6		4.62	171.76	102	7.1	10224	171.75	286.56	1466	82.84	35.88	610.88	0.00351	-9.278	0.077	9.278
157.88	6		4.75	171.89	76	7	10080	171.88	286.69	1466	82.84	35.84	611.79	0.00356	-9.449	0.079	9.449
158.00	6		4.87	172.02	76	7.1	10224	172.00	286.81	1466	82.83	35.84	612.65	0.00351	-9.618	0.081	9.618
158.13	6		5.00	172.11	76	7.1	10224	172.13	286.94	1467	82.82	36.12	613.57	0.00353	-9.785	0.083	9.785
158.25	6		5.12	172.24	76	7	10080	172.25	287.06	1467	82.81	36.36	614.41	0.00361	-9.951	0.085	9.951
158.38	6		5.25	172.37	76	7.1	10224	172.38	287.19	1467	82.81	36.47	615.33	0.00357	-10.115	0.088	10.115
158.50	6		5.37	172.50	102	7	10080	172.50	287.31	1467	82.8	36.39	616.17	0.00361	-10.277	0.090	10.277
158.63	6		5.50	172.63	76	7	10080	172.63	287.44	1467	82.79	36.33	617.08	0.00360	-10.438	0.092	10.438
158.75	6		5.62	172.75	102	7.1	10224	172.75	287.56	1467	82.78	36.03	617.93	0.00352	-10.597	0.094	10.597
158.88	6		5.75	172.88	76	7.1	10224	172.88	287.69	1467	82.77	36.42	618.86	0.00356	-10.755	0.096	10.755
159.00	6		5.87	173.01	76	7.1	10224	173.00	287.81	1467	82.76	36.32	619.71	0.00355	-10.912	0.098	10.912
159.13	6		6.00	173.14	76	7	10080	173.13	287.94	1467	82.75	36.30	620.62	0.00360	-11.066	0.100	11.066

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SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
159.25	6	6.12	173.27	76	7.1	10224	173.25	288.06	1467	82.74	36.57	621.47	0.00358	-11.220	0.102	11.220
159.38	6	6.25	173.36	102	7.1	10224	173.38	288.19	1467	82.73	36.24	622.39	0.00354	-11.372	0.104	11.372
159.50	6	6.37	173.49	76	7.1	10224	173.50	288.31	1467	82.72	36.53	623.25	0.00357	-11.523	0.106	11.523
159.63	6	6.50	173.62	76	7	10080	173.63	288.44	1467	82.71	36.50	624.16	0.00362	-11.673	0.108	11.673
159.75	6	6.62	173.75	76	7.1	10224	173.75	288.56	1467	82.7	36.50	625.01	0.00357	-11.821	0.110	11.821
159.88	6	6.75	173.87	102	7	10080	173.88	288.69	1467	82.69	36.55	625.92	0.00363	-11.968	0.113	11.968
160.00	6	6.87	174.00	76	7	10080	174.00	288.81	1467	82.68	36.70	626.76	0.00364	-12.114	0.115	12.114
160.13	6	7.00	174.13	76	7.1	10224	174.13	288.94	1467	82.67	36.74	627.68	0.00359	-12.258	0.117	12.258
160.25	6	7.12	174.26	102	7.1	10224	174.25	289.06	1467	82.66	36.58	628.53	0.00358	-12.402	0.119	12.402
160.38	6	7.25	174.39	76	7	10080	174.38	289.19	1467	82.65	36.86	629.44	0.00366	-12.544	0.121	12.544
160.50	6	7.37	174.52	76	7	10080	174.50	289.31	1467	82.64	36.61	630.28	0.00363	-12.685	0.123	12.685
160.63	6	7.50	174.61	76	7	10080	174.63	289.44	1467	82.63	36.39	631.19	0.00361	-12.825	0.125	12.825
160.75	6	7.62	174.74	76	7	10080	174.75	289.56	1467	82.61	36.75	632.03	0.00365	-12.964	0.127	12.964
160.88	6	7.75	174.87	102	7.1	10224	174.88	289.69	1467	82.6	36.53	632.96	0.00357	-13.102	0.129	13.102
161.00	6	7.87	175.00	102	7.1	10224	175.00	289.81	1467	82.6	36.68	633.81	0.00359	-13.238	0.131	13.238
161.13	6	8.00	175.13	76	7	10080	175.13	289.94	1467	82.58	36.67	634.72	0.00364	-13.374	0.133	13.374
161.25	6	8.12	175.26	76	7.1	10224	175.25	290.06	1467	82.57	36.70	635.57	0.00359	-13.508	0.135	13.508
161.38	6	8.25	175.39	76	7	10080	175.38	290.19	1468	82.56	37.00	636.48	0.00367	-13.642	0.138	13.642
161.50	6	8.37	175.52	76	7	10080	175.50	290.31	1467	82.55	36.81	637.32	0.00365	-13.774	0.140	13.774
161.63	6	8.50	175.60	76	7.1	10224	175.63	290.44	1467	82.54	36.97	638.24	0.00362	-13.906	0.142	13.906
161.75	6	8.62	175.73	102	7	10080	175.75	290.56	1467	82.53	36.81	639.08	0.00365	-14.036	0.144	14.036
161.88	6	8.75	175.86	102	7	10080	175.88	290.69	1467	82.52	36.62	639.99	0.00363	-14.166	0.146	14.166
162.00	6	8.87	175.99	76	7.1	10224	176.00	290.81	1467	82.51	36.73	640.85	0.00359	-14.295	0.148	14.295
162.13	6	9.00	176.12	102	7	10080	176.13	290.94	1467	82.5	36.82	641.76	0.00365	-14.422	0.150	14.422
162.25	6	9.12	176.25	76	7	10080	176.25	291.06	1468	82.49	37.07	642.60	0.00368	-14.549	0.152	14.549
162.38	6	9.25	176.38	102	7.1	10224	176.38	291.19	1468	82.47	36.99	643.52	0.00362	-14.675	0.154	14.675
162.50	6	9.37	176.51	76	7.1	10224	176.50	291.31	1468	82.46	37.24	644.37	0.00364	-14.800	0.156	14.800
162.63	6	9.50	176.60	102	7	10080	176.63	291.44	1468	82.45	37.09	645.28	0.00368	-14.924	0.158	14.924
162.75	6	9.62	176.73	76	7.1	10224	176.75	291.56	1467	82.44	36.96	646.13	0.00362	-15.047	0.160	15.047
162.88	6	9.75	176.85	76	7.1	10224	176.88	291.69	1468	82.42	37.15	647.06	0.00363	-15.169	0.163	15.169
163.00	6	9.87	176.98	76	7.1	10224	177.00	291.81	1468	82.42	37.03	647.91	0.00362	-15.291	0.165	15.291
163.13	6	10.00	177.11	76	7.1	10224	177.13	291.94	1467	82.4	36.84	648.83	0.00360	-15.411	0.167	15.411
163.25	6	10.12	177.24	102	7.1	10224	177.25	292.06	1467	82.39	36.96	649.68	0.00362	-15.531	0.169	15.531
163.38	6	10.25	177.37	76	7	10080	177.38	292.19	1468	82.37	36.98	650.59	0.00367	-15.650	0.171	15.650
163.50	6	10.37	177.50	76	7.1	10224	177.50	292.31	1467	82.37	36.94	651.44	0.00361	-15.768	0.173	15.768
163.63	6	10.50	177.63	76	7.1	10224	177.63	292.44	1467	82.36	36.57	652.37	0.00358	-15.885	0.175	15.885
163.75	6	10.62	177.76	76	7.1	10224	177.75	292.56	1467	82.34	36.94	653.22	0.00361	-16.002	0.177	16.002
163.88	6	10.75	177.89	76	7.1	10224	177.88	292.69	1468	82.34	37.04	654.14	0.00362	-16.117	0.179	16.117
164.00	6	10.87	178.02	76	7.1	10224	178.00	292.81	1467	82.32	36.69	654.99	0.00359	-16.232	0.181	16.232
164.13	6	11.00	178.11	102	7.1	10224	178.13	292.94	1467	82.31	36.82	655.92	0.00360	-16.347	0.183	16.347
164.25	6	11.12	178.24	76	7.1	10224	178.25	293.06	1467	82.3	36.93	656.77	0.00361	-16.460	0.185	16.460
164.38	6	11.25	178.37	102	7.1	10224	178.38	293.19	1468	82.29	37.15	657.69	0.00363	-16.573	0.188	16.573
164.50	6	11.37	178.50	76	7.1	10224	178.50	293.31	1467	82.27	36.73	658.54	0.00359	-16.685	0.190	16.685
164.63	6	11.50	178.63	76	7.1	10224	178.63	293.44	1467	82.27	36.70	659.47	0.00359	-16.796	0.192	16.796
164.75	6	11.62	178.76	76	7	10080	178.75	293.56	1468	82.25	37.10	660.31	0.00368	-16.906	0.194	16.906
164.88	6	11.75	178.88	76	7.1	10224	178.88	293.69	1467	82.24	36.82	661.23	0.00360	-17.016	0.196	17.016
165.00	6	11.87	179.01	76	7.1	10224	179.00	293.81	1468	82.23	37.18	662.08	0.00364	-17.125	0.198	17.125
165.13	6	12.00	179.14	76	7.1	10224	179.13	293.94	1467	82.22	36.95	663.01	0.00361	-17.233	0.200	17.233
165.25	6	12.12	179.27	76	7.1	10224	179.25	294.06	1467	82.21	36.73	663.86	0.00359	-17.341	0.202	17.341

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
165.38	6	12.25	179.36	76	7.1	10224	179.38	294.19	1467	82.2	36.75	664.78	0.00359	-17.448	0.204	17.448
165.50	6	12.37	179.49	76	7.1	10224	179.50	294.31	1467	82.19	36.92	665.63	0.00361	-17.554	0.206	17.554
165.63	6	12.50	179.62	76	7.1	10224	179.63	294.44	1467	82.18	36.94	666.56	0.00361	-17.659	0.208	17.659
165.75	6	12.62	179.75	76	7	10080	179.75	294.56	1467	82.16	36.94	667.40	0.00366	-17.764	0.210	17.764
165.88	6	12.75	179.88	76	7.1	10224	179.88	294.69	1468	82.16	37.17	668.32	0.00364	-17.869	0.213	17.869
166.00	6	12.87	180.01	76	7.1	10224	180.00	294.81	1468	82.14	37.03	669.17	0.00362	-17.972	0.215	17.972
166.13	6	13.00	180.14	76	7.1	10224	180.13	294.94	1467	82.13	36.75	670.09	0.00359	-18.075	0.217	18.075
166.25	6	13.12	180.27	76	7.1	10224	180.25	295.06	1468	82.12	37.28	670.95	0.00365	-18.177	0.219	18.177
166.38	6	13.25	180.39	76	7.1	10224	180.38	295.19	1468	82.11	37.19	671.87	0.00364	-18.279	0.221	18.279
166.50	6	13.37	180.53	76	7.1	10224	180.50	295.31	1467	82.1	36.65	672.72	0.00358	-18.380	0.223	18.380
166.63	6	13.50	180.61	76	7.1	10224	180.63	295.44	1468	82.09	37.35	673.64	0.00365	-18.480	0.225	18.480
166.75	6	13.62	180.74	102	7.1	10224	180.75	295.56	1468	82.08	37.19	674.50	0.00364	-18.580	0.227	18.580
166.88	6	13.75	180.87	76	7.1	10224	180.88	295.69	1468	82.07	37.14	675.42	0.00363	-18.679	0.229	18.679
167.00	6	13.87	181.00	76	7.1	10224	181.00	295.81	1468	82.06	37.18	676.27	0.00364	-18.778	0.231	18.778
167.13	6	14.00	181.13	76	7.1	10224	181.13	295.94	1468	82.05	37.24	677.19	0.00364	-18.876	0.233	18.876
167.25	6	14.12	181.26	76	7.1	10224	181.25	296.06	1468	82.04	37.15	678.05	0.00363	-18.973	0.235	18.973
167.38	6	14.25	181.39	102	7.1	10224	181.38	296.19	1468	82.03	37.55	678.97	0.00367	-19.070	0.238	19.070
167.50	6	14.37	181.52	76	7.1	10224	181.50	296.31	1468	82.02	37.60	679.82	0.00368	-19.166	0.240	19.166
167.63	6	14.50	181.60	102	7.1	10224	181.63	296.44	1468	82.01	37.51	680.74	0.00367	-19.262	0.242	19.262
167.75	6	14.62	181.73	76	7.1	10224	181.75	296.56	1468	81.99	37.65	681.60	0.00368	-19.357	0.244	19.357
167.88	6	14.75	181.86	102	7.1	10224	181.88	296.69	1468	81.99	37.30	682.52	0.00365	-19.451	0.246	19.451
168.00	6	14.87	181.99	76	7.1	10224	182.00	296.81	1467	81.98	36.95	683.37	0.00361	-19.545	0.248	19.545
168.13	6	15.00	182.12	76	7.1	10224	182.13	296.94	1467	81.97	36.97	684.29	0.00362	-19.638	0.250	19.638
168.25	6	15.12	182.25	102	7.1	10224	182.25	297.06	1468	81.96	37.46	685.15	0.00366	-19.731	0.252	19.731
168.38	6	15.25	182.38	76	7.1	10224	182.38	297.19	1468	81.95	36.99	686.07	0.00362	-19.823	0.254	19.823
168.50	6	15.37	182.51	102	7.1	10224	182.50	297.31	1468	81.94	37.42	686.92	0.00366	-19.915	0.256	19.915
168.63	6	15.50	182.60	76	7.1	10224	182.63	297.44	1468	81.93	37.37	687.84	0.00366	-20.006	0.258	20.006
168.75	6	15.62	182.73	76	7.1	10224	182.75	297.56	1468	81.92	37.44	688.70	0.00366	-20.096	0.260	20.096
168.88	6	15.75	182.86	76	7.1	10224	182.88	297.69	1468	81.91	37.42	689.62	0.00366	-20.186	0.263	20.186
169.00	6	15.87	182.99	102	7.1	10224	183.00	297.81	1468	81.9	37.68	690.47	0.00369	-20.276	0.265	20.276
169.13	6	16.00	183.12	102	7.1	10224	183.13	297.94	1468	81.9	37.56	691.39	0.00367	-20.365	0.267	20.365
169.25	6	16.12	183.25	102	7.1	10224	183.25	298.06	1468	81.88	37.56	692.25	0.00367	-20.453	0.269	20.453
169.38	6	16.25	183.38	76	7.1	10224	183.38	298.19	1468	81.88	37.58	693.17	0.00368	-20.541	0.271	20.541
169.50	6	16.37	183.51	102	7.1	10224	183.50	298.31	1468	81.87	37.70	694.02	0.00369	-20.628	0.273	20.628
169.63	6	16.50	183.64	102	7.1	10224	183.63	298.44	1468	81.85	37.31	694.94	0.00365	-20.715	0.275	20.715
169.75	6	16.62	183.77	102	7.1	10224	183.75	298.56	1468	81.85	37.66	695.80	0.00368	-20.802	0.277	20.802
169.88	6	16.75	183.85	76	7.1	10224	183.88	298.69	1468	81.83	37.53	696.72	0.00367	-20.887	0.279	20.887
170.00	6	16.87	183.98	76	7.1	10224	184.00	298.81	1468	81.83	37.73	697.57	0.00369	-20.973	0.281	20.973
170.13	6	17.00	184.11	76	7.1	10224	184.13	298.94	1468	81.82	37.89	698.49	0.00371	-21.058	0.283	21.058
170.25	6	17.12	184.24	102	7.1	10224	184.25	299.06	1469	81.81	38.00	699.35	0.00372	-21.142	0.285	21.142
170.38	6	17.25	184.37	76	7.1	10224	184.38	299.19	1468	81.8	37.60	700.27	0.00368	-21.226	0.288	21.226
170.50	6	17.37	184.50	102	7.1	10224	184.50	299.31	1468	81.79	37.51	701.12	0.00367	-21.309	0.290	21.309
170.63	6	17.50	184.63	76	7.1	10224	184.63	299.44	1468	81.78	37.66	702.04	0.00368	-21.392	0.292	21.392
170.75	6	17.62	184.76	76	7.1	10224	184.75	299.56	1468	81.77	37.42	702.90	0.00366	-21.475	0.294	21.475
170.88	6	17.75	184.89	102	7.1	10224	184.88	299.69	1468	81.76	37.37	703.82	0.00366	-21.557	0.296	21.557
171.00	6	17.87	185.02	76	7.1	10224	185.00	299.81	1468	81.76	37.72	704.67	0.00369	-21.638	0.298	21.638
171.13	6	18.00	185.11	102	7.1	10224	185.13	299.94	1468	81.75	37.45	705.59	0.00366	-21.719	0.300	21.719
171.25	6	18.12	185.24	76	7.1	10224	185.25	300.06	1468	81.74	37.70	706.45	0.00369	-21.800	0.302	21.800
171.38	6	18.25	185.37	102	7.1	10224	185.38	300.19	1468	81.74	37.77	707.37	0.00369	-21.880	0.304	21.880

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
171.50	6	18.37	185.50	76	7.1	10224	185.50	300.31	1468	81.72	37.58	708.22	0.00368	-21.959	0.306	21.959
171.63	6	18.50	185.63	76	7.1	10224	185.63	300.44	1468	81.71	37.64	709.14	0.00368	-22.039	0.308	22.039
171.75	6	18.62	185.76	102	7.1	10224	185.75	300.56	1468	81.7	37.49	710.00	0.00367	-22.117	0.310	22.117
171.88	6	18.75	185.89	76	7.1	10224	185.88	300.69	1468	81.7	37.34	710.92	0.00365	-22.196	0.313	22.196
172.00	6	18.87	186.01	102	7.1	10224	186.00	300.81	1468	81.69	37.95	711.77	0.00371	-22.273	0.315	22.273
172.13	6	19.00	186.14	76	7.1	10224	186.13	300.94	1468	81.68	37.65	712.69	0.00368	-22.351	0.317	22.351
172.25	6	19.12	186.27	102	7.1	10224	186.25	301.06	1468	81.67	37.39	713.55	0.00366	-22.428	0.319	22.428
172.38	6	19.25	186.36	76	7.1	10224	186.38	301.19	1468	81.67	37.38	714.47	0.00366	-22.504	0.321	22.504
172.50	6	19.37	186.49	102	7.1	10224	186.50	301.31	1468	81.65	37.28	715.32	0.00365	-22.580	0.323	22.580
172.63	6	19.50	186.62	76	7.1	10224	186.63	301.44	1468	81.65	37.23	716.24	0.00364	-22.656	0.325	22.656
172.75	6	19.62	186.75	102	7.1	10224	186.75	301.56	1468	81.64	37.91	717.10	0.00371	-22.731	0.327	22.731
172.88	6	19.75	186.88	76	7.1	10224	186.88	301.69	1468	81.63	37.44	718.02	0.00366	-22.806	0.329	22.806
173.00	6	19.87	187.01	76	7.1	10224	187.00	301.81	1468	81.62	37.69	718.87	0.00369	-22.880	0.331	22.880
173.13	6	20.00	187.14	76	7.1	10224	187.13	301.94	1468	81.62	37.90	719.79	0.00371	-22.954	0.333	22.954
173.25	6	20.12	187.27	76	7.1	10224	187.25	302.06	1468	81.6	37.64	720.65	0.00368	-23.028	0.335	23.028
173.38	6	20.25	187.40	76	7.1	10224	187.38	302.19	1468	81.6	37.32	721.57	0.00365	-23.101	0.338	23.101
173.50	6	20.37	187.53	76	7.1	10224	187.50	302.31	1468	81.6	37.66	722.42	0.00368	-23.173	0.340	23.173
173.63	6	20.50	187.61	102	7.1	10224	187.63	302.44	1468	81.59	37.35	723.34	0.00365	-23.246	0.342	23.246
173.75	6	20.62	187.74	76	7.1	10224	187.75	302.56	1468	81.57	37.54	724.20	0.00367	-23.318	0.344	23.318
173.88	6	20.75	187.87	102	7.1	10224	187.88	302.69	1468	81.57	37.51	725.12	0.00367	-23.389	0.346	23.389
174.00	6	20.87	188.00	76	7.1	10224	188.00	302.81	1468	81.57	37.85	725.97	0.00370	-23.460	0.348	23.460
174.13	6	21.00	188.13	102	7.1	10224	188.13	302.94	1468	81.56	37.81	726.89	0.00370	-23.531	0.350	23.531
174.25	6	21.12	188.26	76	7.1	10224	188.25	303.06	1468	81.55	37.47	727.75	0.00366	-23.601	0.352	23.601
174.38	6	21.25	188.35	102	7.1	10224	188.38	303.19	1469	81.55	38.16	728.67	0.00373	-23.671	0.354	23.671
174.50	6	21.37	188.48	76	7.1	10224	188.50	303.31	1468	81.53	37.87	729.52	0.00370	-23.740	0.356	23.740
174.63	6	21.50	188.61	102	7.1	10224	188.63	303.44	1468	81.53	37.64	730.44	0.00368	-23.809	0.358	23.809
174.75	6	21.62	188.74	76	7.1	10224	188.75	303.56	1468	81.53	37.86	731.30	0.00370	-23.878	0.360	23.878
174.88	6	21.75	188.87	76	7.1	10224	188.88	303.69	1468	81.52	37.85	732.22	0.00370	-23.946	0.363	23.946
175.00	6	21.87	189.00	102	7.1	10224	189.00	303.81	1469	81.52	38.16	733.07	0.00373	-24.014	0.365	24.014
175.13	6	22.00	189.13	76	7.1	10224	189.13	303.94	1468	81.5	37.78	733.99	0.00370	-24.082	0.367	24.082
175.25	6	22.12	189.26	76	7.1	10224	189.25	304.06	1468	81.5	37.60	734.85	0.00368	-24.149	0.369	24.149
175.38	6	22.25	189.39	76	7.1	10224	189.38	304.19	1468	81.49	37.69	735.77	0.00369	-24.216	0.371	24.216
175.50	6	22.37	189.52	102	7.1	10224	189.50	304.31	1468	81.49	37.95	736.62	0.00371	-24.282	0.373	24.282
175.63	6	22.50	189.60	76	7.1	10224	189.63	304.44	1469	81.48	38.06	737.54	0.00372	-24.348	0.375	24.348
175.75	6	22.62	189.73	102	7.1	10224	189.75	304.56	1468	81.48	37.58	738.40	0.00368	-24.414	0.377	24.414
175.88	6	22.75	189.86	76	7.1	10224	189.88	304.69	1468	81.47	37.68	739.32	0.00369	-24.479	0.379	24.479
176.00	6	22.87	189.99	76	7.1	10224	190.00	304.81	1468	81.46	37.77	740.17	0.00369	-24.544	0.381	24.544
176.13	6	23.00	190.12	76	7.1	10224	190.13	304.94	1468	81.46	37.90	741.09	0.00371	-24.608	0.383	24.608
176.25	6	23.12	190.25	102	7.1	10224	190.25	305.06	1469	81.46	37.99	741.95	0.00372	-24.672	0.385	24.672
176.38	6	23.25	190.38	102	7.1	10224	190.38	305.19	1468	81.45	37.90	742.87	0.00371	-24.736	0.388	24.736
176.50	6	23.37	190.51	76	7.1	10224	190.50	305.31	1468	81.44	37.91	743.72	0.00371	-24.800	0.390	24.800
176.63	6	23.50	190.64	76	7.1	10224	190.63	305.44	1468	81.44	37.69	744.64	0.00369	-24.863	0.392	24.863
176.75	6	23.62	190.77	76	7.1	10224	190.75	305.56	1468	81.43	37.67	745.50	0.00368	-24.925	0.394	24.925
176.88	6	23.75	190.86	76	7.1	10224	190.88	305.69	1469	81.43	38.06	746.42	0.00372	-24.988	0.396	24.988
177.00	6	23.87	190.99	76	7.1	10224	191.00	305.81	1468	81.43	37.75	747.27	0.00369	-25.050	0.398	25.050
177.13	6	24.00	191.12	76	7.1	10224	191.13	305.94	1468	81.41	37.53	748.19	0.00367	-25.112	0.400	25.112
177.25	6	24.12	191.24	102	7.1	10224	191.25	306.06	1468	81.41	37.85	749.05	0.00370	-25.173	0.402	25.173
177.38	6	24.25	191.37	76	7.1	10224	191.38	306.19	1468	81.41	37.83	749.97	0.00370	-25.234	0.404	25.234
177.50	6	24.37	191.50	102	7.1	10224	191.50	306.31	1468	81.41	37.93	750.82	0.00371	-25.294	0.406	25.294

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
177.63	6		24.50	191.63	76	7.2	10368	191.63	306.44	1469	81.39	38.23	751.76	0.00369	-25.355	0.408	25.355
177.75	6		24.62	191.76	102	7.1	10224	191.75	306.56	1468	81.39	37.79	752.61	0.00370	-25.415	0.410	25.415
177.88	6		24.75	191.89	76	7.1	10224	191.88	306.69	1469	81.39	38.35	753.53	0.00375	-25.474	0.413	25.474
178.00	6		24.87	192.02	102	7.1	10224	192.00	306.81	1468	81.39	37.91	754.38	0.00371	-25.533	0.415	25.533
178.13	6		25.00	192.11	76	7.1	10224	192.13	306.94	1468	81.38	37.32	755.31	0.00365	-25.592	0.417	25.592
178.25	6		25.12	192.24	102	7.1	10224	192.25	307.06	1468	81.37	37.74	756.16	0.00369	-25.651	0.419	25.651
178.38	6		25.25	192.37	76	7.1	10224	192.38	307.19	1468	81.37	37.77	757.08	0.00369	-25.709	0.421	25.709
178.50	6		25.37	192.50	102	7.1	10224	192.50	307.31	1468	81.36	37.59	757.93	0.00368	-25.767	0.423	25.767
178.63	6		25.50	192.63	76	7.1	10224	192.63	307.44	1469	81.36	38.05	758.86	0.00372	-25.825	0.425	25.825
178.75	6		25.62	192.76	76	7.1	10224	192.75	307.56	1469	81.36	38.03	759.71	0.00372	-25.882	0.427	25.882
178.88	6		25.75	192.89	102	7.1	10224	192.88	307.69	1468	81.36	37.71	760.63	0.00369	-25.939	0.429	25.939
179.00	6		25.87	193.02	76	7.1	10224	193.00	307.81	1468	81.35	37.93	761.48	0.00371	-25.995	0.431	25.995
179.13	6		26.00	193.10	76	7.1	10224	193.13	307.94	1469	81.34	38.26	762.41	0.00374	-26.052	0.433	26.052
179.25	6		26.12	193.23	76	7.1	10224	193.25	308.06	1469	81.34	38.45	763.26	0.00376	-26.108	0.435	26.108
179.38	6		26.25	193.36	102	7.1	10224	193.38	308.19	1469	81.34	38.23	764.18	0.00374	-26.163	0.438	26.163
179.50	6		26.37	193.49	76	7.1	10224	193.50	308.31	1469	81.33	38.15	765.03	0.00373	-26.219	0.440	26.219
179.63	6		26.50	193.62	76	7.1	10224	193.63	308.44	1469	81.33	38.00	765.96	0.00372	-26.274	0.442	26.274
179.75	6		26.62	193.75	76	7.1	10224	193.75	308.56	1469	81.32	38.01	766.81	0.00372	-26.328	0.444	26.328
179.88	6		26.75	193.88	102	7.1	10224	193.88	308.69	1469	81.32	38.15	767.73	0.00373	-26.383	0.446	26.383
180.00	6		26.87	194.01	76	7.1	10224	194.00	308.81	1468	81.32	37.76	768.58	0.00369	-26.437	0.448	26.437
180.13	6		27.00	194.14	102	7.1	10224	194.13	308.94	1468	81.32	37.77	769.51	0.00369	-26.490	0.450	26.490
180.25	6		27.12	194.27	76	7.3	10512	194.25	309.06	1468	81.31	37.85	770.38	0.00360	-26.544	0.452	26.544
180.38	6		27.25	194.36	102	7.3	10512	194.38	309.19	1468	81.3	37.69	771.33	0.00359	-26.597	0.454	26.597
180.50	6		27.37	194.49	102	7.3	10512	194.50	309.31	1468	81.3	37.69	772.21	0.00359	-26.650	0.456	26.650
180.63	6		27.50	194.62	76	7.4	10656	194.63	309.44	1468	81.29	37.67	773.17	0.00354	-26.702	0.458	26.702
180.75	6		27.62	194.75	102	7.3	10512	194.75	309.56	1468	81.29	37.61	774.05	0.00358	-26.754	0.460	26.754
180.88	6		27.75	194.88	76	7	10080	194.88	309.69	1468	81.29	37.70	774.96	0.00374	-26.806	0.463	26.806
181.00	6		27.87	195.01	76	7	10080	195.00	309.81	1469	81.28	38.11	775.80	0.00378	-26.858	0.465	26.858
181.13	6		28.00	195.14	76	7	10080	195.13	309.94	1469	81.29	38.18	776.71	0.00379	-26.909	0.467	26.909
181.25	6		28.12	195.26	76	7	10080	195.25	310.06	1469	81.28	38.10	777.55	0.00378	-26.960	0.469	26.960
181.38	6		28.25	195.35	76	7	10080	195.38	310.19	1468	81.27	37.95	778.46	0.00376	-27.011	0.471	27.011
181.50	6		28.37	195.48	76	7	10080	195.50	310.31	1468	81.27	37.92	779.30	0.00376	-27.061	0.473	27.061
181.63	6		28.50	195.61	76	7	10080	195.63	310.44	1469	81.27	38.06	780.21	0.00378	-27.111	0.475	27.111
181.75	6		28.62	195.74	76	7	10080	195.75	310.56	1468	81.27	37.76	781.05	0.00375	-27.161	0.477	27.161
181.88	6		28.75	195.87	76	7	10080	195.88	310.69	1468	81.27	37.81	781.96	0.00375	-27.211	0.479	27.211
182.00	6		28.87	196.00	76	7	10080	196.00	310.81	1469	81.25	38.00	782.80	0.00377	-27.260	0.481	27.260
182.13	6		29.00	196.13	76	7	10080	196.13	310.94	1468	81.25	37.65	783.71	0.00374	-27.309	0.483	27.309
182.25	6		29.12	196.26	76	7	10080	196.25	311.06	1468	81.25	37.87	784.55	0.00376	-27.357	0.485	27.357
182.38	7	Step 7	0.01	196.39	127	7.4	10656	196.38	311.19	1469	81.25	38.42	785.51	0.00361	-0.466	0.000	0.466
182.50	7		0.12	196.52	127	7.8	11232	196.50	311.31	1469	81.25	38.32	786.44	0.00341	-0.800	0.002	0.800
182.63	7		0.25	196.65	76	8.1	11664	196.63	311.44	1469	81.24	38.30	787.50	0.00328	-1.093	0.004	1.093
182.75	7		0.37	196.78	152	8.1	11664	196.75	311.56	1469	81.24	38.24	788.47	0.00328	-1.366	0.006	1.366
182.88	7		0.50	196.86	152	8.1	11664	196.88	311.69	1469	81.23	38.83	789.52	0.00333	-1.623	0.008	1.623
183.00	7		0.62	196.99	51	8.1	11664	197.00	311.81	1469	81.23	38.57	790.49	0.00331	-1.868	0.010	1.868
183.13	7		0.75	197.12	152	8.1	11664	197.13	311.94	1469	81.23	38.68	791.55	0.00332	-2.103	0.013	2.103
183.25	7		0.87	197.25	152	8.1	11664	197.25	312.06	1469	81.22	38.49	792.52	0.00330	-2.330	0.015	2.330
183.38	7		1.00	197.38	102	8.1	11664	197.38	312.19	1469	81.22	38.14	793.57	0.00327	-2.550	0.017	2.550
183.50	7		1.12	197.51	127	8.1	11664	197.50	312.31	1469	81.22	38.22	794.54	0.00328	-2.763	0.019	2.763
183.63	7		1.25	197.60	76	8.1	11664	197.63	312.44	1469	81.22	38.16	795.60	0.00327	-2.971	0.021	2.971

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
183.75	7	1.37	197.73	102	8.1	11664	197.75	312.56	1469	81.22	38.01	796.57	0.00326	-3.173	0.023	3.173
183.88	7	1.50	197.85	152	8.1	11664	197.88	312.69	1469	81.21	38.07	797.62	0.00326	-3.371	0.025	3.371
184.00	7	1.62	197.98	102	8.1	11664	198.00	312.81	1468	81.21	37.86	798.59	0.00325	-3.565	0.027	3.565
184.13	7	1.75	198.11	102	8.1	11664	198.13	312.94	1468	81.21	37.57	799.65	0.00322	-3.754	0.029	3.754
184.25	7	1.87	198.24	127	8.1	11664	198.25	313.06	1468	81.2	37.45	800.62	0.00321	-3.940	0.031	3.940
184.38	7	2.00	198.37	152	8.1	11664	198.38	313.19	1468	81.2	37.49	801.67	0.00321	-4.123	0.033	4.123
184.50	7	2.12	198.50	76	8.1	11664	198.50	313.31	1468	81.2	37.39	802.64	0.00321	-4.302	0.035	4.302
184.63	7	2.25	198.63	76	8.1	11664	198.63	313.44	1468	81.2	37.78	803.70	0.00324	-4.478	0.038	4.478
184.75	7	2.37	198.76	152	8.1	11664	198.75	313.56	1469	81.2	38.13	804.67	0.00327	-4.651	0.040	4.651
184.88	7	2.50	198.89	76	8.1	11664	198.88	313.69	1470	81.19	39.19	805.72	0.00336	-4.822	0.042	4.822
185.00	7	2.62	199.02	76	8.1	11664	199.00	313.81	1470	81.18	39.63	806.69	0.00340	-4.989	0.044	4.989
185.13	7	2.75	199.11	51	8.1	11664	199.13	313.94	1470	81.18	39.64	807.75	0.00340	-5.155	0.046	5.155
185.25	7	2.87	199.24	76	8.1	11664	199.25	314.06	1471	81.18	40.51	808.72	0.00347	-5.318	0.048	5.318
185.38	7	3.00	199.37	152	8.1	11664	199.38	314.19	1471	81.18	40.29	809.77	0.00345	-5.478	0.050	5.478
185.50	7	3.12	199.50	76	8.1	11664	199.50	314.31	1471	81.18	40.60	810.74	0.00348	-5.637	0.052	5.637
185.63	7	3.25	199.63	51	8.1	11664	199.63	314.44	1471	81.18	40.68	811.80	0.00349	-5.793	0.054	5.793
185.75	7	3.37	199.76	127	8.1	11664	199.75	314.56	1471	81.17	40.89	812.77	0.00351	-5.948	0.056	5.948
185.88	7	3.50	199.88	152	8.1	11664	199.88	314.69	1472	81.17	41.10	813.82	0.00352	-6.100	0.058	6.100
186.00	7	3.62	200.01	76	8.1	11664	200.00	314.81	1472	81.16	41.49	814.79	0.00356	-6.250	0.060	6.250
186.13	7	3.75	200.14	51	8.1	11664	200.13	314.94	1472	81.15	41.44	815.85	0.00355	-6.399	0.063	6.399
186.25	7	3.87	200.27	127	8.1	11664	200.25	315.06	1472	81.15	41.71	816.82	0.00358	-6.546	0.065	6.546
186.38	7	4.00	200.36	102	8.1	11664	200.38	315.19	1472	81.15	41.52	817.87	0.00356	-6.691	0.067	6.691
186.50	7	4.12	200.49	127	8.1	11664	200.50	315.31	1472	81.15	41.39	818.84	0.00355	-6.835	0.069	6.835
186.63	7	4.25	200.62	127	8.1	11664	200.63	315.44	1472	81.15	41.77	819.90	0.00358	-6.977	0.071	6.977
186.75	7	4.37	200.75	76	8.1	11664	200.75	315.56	1473	81.14	42.01	820.87	0.00360	-7.117	0.073	7.117
186.88	7	4.50	200.88	127	8.1	11664	200.88	315.69	1472	81.14	41.83	821.92	0.00359	-7.256	0.075	7.256
187.00	7	4.62	201.01	51	8.1	11664	201.00	315.81	1470	81.14	39.72	822.89	0.00341	-7.394	0.077	7.394
187.13	7	4.75	201.14	76	8.1	11664	201.13	315.94	1471	81.13	40.54	823.95	0.00348	-7.530	0.079	7.530
187.25	7	4.87	201.27	152	8.1	11664	201.25	316.06	1471	81.13	40.70	824.92	0.00349	-7.664	0.081	7.664
187.38	7	5.00	201.35	127	8	11520	201.38	316.19	1471	81.13	40.93	825.96	0.00355	-7.797	0.083	7.797
187.50	7	5.12	201.48	127	8.1	11664	201.50	316.31	1471	81.12	40.75	826.93	0.00349	-7.929	0.085	7.929
187.63	7	5.25	201.61	152	8.1	11664	201.63	316.44	1472	81.12	41.08	827.98	0.00352	-8.060	0.088	8.060
187.75	7	5.37	201.74	127	8.1	11664	201.75	316.56	1472	81.11	41.13	828.96	0.00353	-8.189	0.090	8.189
187.88	7	5.50	201.87	152	8.1	11664	201.88	316.69	1471	81.11	40.75	830.01	0.00349	-8.318	0.092	8.318
188.00	7	5.62	202.00	127	8.1	11664	202.00	316.81	1471	81.11	40.89	830.98	0.00351	-8.445	0.094	8.445
188.13	7	5.75	202.13	76	8	11520	202.13	316.94	1471	81.1	40.93	832.02	0.00355	-8.570	0.096	8.570
188.25	7	5.87	202.26	76	8	11520	202.25	317.06	1471	81.1	40.86	832.98	0.00355	-8.695	0.098	8.695
188.38	7	6.00	202.35	152	8.1	11664	202.38	317.19	1471	81.09	40.72	834.03	0.00349	-8.818	0.100	8.818
188.50	7	6.12	202.47	152	8.1	11664	202.50	317.31	1472	81.08	41.11	835.01	0.00352	-8.941	0.102	8.941
188.63	7	6.25	202.60	177	8.1	11664	202.63	317.44	1471	81.08	40.84	836.06	0.00350	-9.062	0.104	9.062
188.75	7	6.37	202.73	152	8.1	11664	202.75	317.56	1471	81.08	40.96	837.03	0.00351	-9.182	0.106	9.182
188.88	7	6.50	202.86	152	8.1	11664	202.88	317.69	1471	81.06	40.88	838.08	0.00350	-9.301	0.108	9.301
189.00	7	6.62	202.99	152	8.1	11664	203.00	317.81	1471	81.06	40.93	839.06	0.00351	-9.420	0.110	9.420
189.13	7	6.75	203.12	102	8.1	11664	203.13	317.94	1471	81.06	40.81	840.11	0.00350	-9.537	0.113	9.537
189.25	7	6.87	203.25	152	8.1	11664	203.25	318.06	1472	81.05	41.06	841.08	0.00352	-9.653	0.115	9.653
189.38	7	7.00	203.38	127	8.1	11664	203.38	318.19	1471	81.04	40.74	842.13	0.00349	-9.768	0.117	9.768
189.50	7	7.12	203.51	76	8.1	11664	203.50	318.31	1471	81.04	40.76	843.11	0.00349	-9.882	0.119	9.882
189.63	7	7.25	203.60	152	8.1	11664	203.63	318.44	1472	81.03	41.03	844.16	0.00352	-9.996	0.121	9.996
189.75	7	7.37	203.73	152	8.1	11664	203.75	318.56	1471	81.02	40.69	845.13	0.00349	-10.108	0.123	10.108

Reduced Data Set
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SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
189.88	7	7.50	203.85	152	8.1	11664	203.88	318.69	1471	81.02	40.82	846.18	0.00350	-10.220	0.125	10.220
190.00	7	7.62	203.98	152	8.1	11664	204.00	318.81	1471	81.01	40.60	847.16	0.00348	-10.330	0.127	10.330
190.13	7	7.75	204.11	102	8.1	11664	204.13	318.94	1471	81.01	40.69	848.21	0.00349	-10.440	0.129	10.440
190.25	7	7.87	204.24	152	8.1	11664	204.25	319.06	1471	81	40.95	849.18	0.00351	-10.549	0.131	10.549
190.38	7	8.00	204.37	102	8.1	11664	204.38	319.19	1472	80.99	41.17	850.23	0.00353	-10.657	0.133	10.657
190.50	7	8.12	204.50	152	8.1	11664	204.50	319.31	1472	80.99	40.98	851.21	0.00351	-10.764	0.135	10.764
190.63	7	8.25	204.63	102	8.1	11664	204.63	319.44	1472	80.99	41.03	852.26	0.00352	-10.871	0.138	10.871
190.75	7	8.37	204.76	76	8.1	11664	204.75	319.56	1472	80.98	41.28	853.23	0.00354	-10.976	0.140	10.976
190.88	7	8.50	204.85	127	8.1	11664	204.88	319.69	1472	80.97	41.15	854.28	0.00353	-11.081	0.142	11.081
191.00	7	8.62	204.98	152	8.1	11664	205.00	319.81	1471	80.96	40.62	855.26	0.00348	-11.185	0.144	11.185
191.13	7	8.75	205.11	102	8.1	11664	205.13	319.94	1472	80.95	41.24	856.31	0.00354	-11.288	0.146	11.288
191.25	7	8.87	205.24	127	8.1	11664	205.25	320.06	1474	80.94	43.78	857.28	0.00375	-11.391	0.148	11.391
191.38	7	9.00	205.37	76	8.1	11664	205.38	320.19	1473	80.94	42.18	858.33	0.00362	-11.492	0.150	11.492
191.50	7	9.12	205.50	51	8.1	11664	205.50	320.31	1472	80.93	41.04	859.31	0.00352	-11.593	0.152	11.593
191.63	7	9.25	205.63	76	8.1	11664	205.63	320.44	1472	80.92	41.07	860.36	0.00352	-11.694	0.154	11.694
191.75	7	9.37	205.76	76	8.1	11664	205.75	320.56	1472	80.92	41.66	861.33	0.00357	-11.793	0.156	11.793
191.88	7	9.50	205.89	76	8.1	11664	205.88	320.69	1472	80.92	41.14	862.38	0.00353	-11.892	0.158	11.892
192.00	7	9.62	206.02	102	8.1	11664	206.00	320.81	1472	80.9	41.11	863.36	0.00352	-11.990	0.160	11.990
192.13	7	9.75	206.10	76	8.1	11664	206.13	320.94	1473	80.9	42.35	864.41	0.00363	-12.088	0.163	12.088
192.25	7	9.87	206.23	102	8.1	11664	206.25	321.06	1472	80.89	41.81	865.38	0.00358	-12.184	0.165	12.184
192.38	7	10.00	206.36	76	8.1	11664	206.38	321.19	1472	80.89	41.63	866.43	0.00357	-12.281	0.167	12.281
192.50	7	10.12	206.49	76	8.1	11664	206.50	321.31	1472	80.88	41.67	867.41	0.00357	-12.376	0.169	12.376
192.63	7	10.25	206.62	51	8.1	11664	206.63	321.44	1472	80.87	41.19	868.46	0.00353	-12.471	0.171	12.471
192.75	7	10.37	206.75	102	8.1	11664	206.75	321.56	1471	80.87	40.62	869.43	0.00348	-12.565	0.173	12.565
192.88	7	10.50	206.88	152	8.1	11664	206.88	321.69	1472	80.85	41.47	870.48	0.00356	-12.658	0.175	12.658
193.00	7	10.62	207.01	127	8.1	11664	207.00	321.81	1473	80.85	42.42	871.46	0.00364	-12.751	0.177	12.751
193.13	7	10.75	207.14	127	8.1	11664	207.13	321.94	1473	80.85	42.04	872.51	0.00360	-12.843	0.179	12.843
193.25	7	10.87	207.27	152	8.1	11664	207.25	322.06	1472	80.84	41.84	873.48	0.00359	-12.935	0.181	12.935
193.38	7	11.00	207.36	102	8.1	11664	207.38	322.19	1472	80.82	41.60	874.53	0.00357	-13.026	0.183	13.026
193.50	7	11.12	207.49	76	8.1	11664	207.50	322.31	1471	80.82	40.40	875.51	0.00346	-13.116	0.185	13.116
193.63	7	11.25	207.61	127	8.1	11664	207.63	322.44	1472	80.81	41.43	876.56	0.00355	-13.206	0.188	13.206
193.75	7	11.37	207.74	152	8.1	11664	207.75	322.56	1472	80.8	41.90	877.53	0.00359	-13.295	0.190	13.295
193.88	7	11.50	207.87	127	8.1	11664	207.88	322.69	1473	80.8	42.28	878.58	0.00362	-13.384	0.192	13.384
194.00	7	11.62	208.00	152	8.1	11664	208.00	322.81	1473	80.79	42.39	879.56	0.00363	-13.472	0.194	13.472
194.13	7	11.75	208.13	177	8.1	11664	208.13	322.94	1472	80.78	41.60	880.61	0.00357	-13.559	0.196	13.559
194.25	7	11.87	208.26	152	8.1	11664	208.25	323.06	1472	80.78	41.51	881.58	0.00356	-13.646	0.198	13.646
194.38	7	12.00	208.39	102	8.1	11664	208.38	323.19	1472	80.77	41.64	882.63	0.00357	-13.732	0.200	13.732
194.50	7	12.12	208.52	152	8.1	11664	208.50	323.31	1472	80.76	41.55	883.61	0.00356	-13.818	0.202	13.818
194.63	7	12.25	208.61	152	8.1	11664	208.63	323.44	1472	80.75	41.46	884.66	0.00355	-13.903	0.204	13.903
194.75	7	12.37	208.74	152	8.1	11664	208.75	323.56	1472	80.75	41.59	885.63	0.00357	-13.988	0.206	13.988
194.88	7	12.50	208.87	152	8.1	11664	208.88	323.69	1472	80.74	41.56	886.68	0.00356	-14.072	0.208	14.072
195.00	7	12.62	209.00	152	8.1	11664	209.00	323.81	1472	80.73	41.75	887.66	0.00358	-14.156	0.210	14.156
195.13	7	12.75	209.12	152	8.1	11664	209.13	323.94	1472	80.73	41.72	888.71	0.00358	-14.239	0.213	14.239
195.25	7	12.87	209.25	76	8.1	11664	209.25	324.06	1472	80.72	41.63	889.68	0.00357	-14.321	0.215	14.321
195.38	7	13.00	209.38	127	8.1	11664	209.38	324.19	1472	80.71	41.93	890.73	0.00359	-14.403	0.217	14.403
195.50	7	13.12	209.51	102	8.1	11664	209.50	324.31	1473	80.71	41.98	891.71	0.00360	-14.485	0.219	14.485
195.63	7	13.25	209.60	152	8.1	11664	209.63	324.44	1472	80.7	41.41	892.76	0.00355	-14.566	0.221	14.566
195.75	7	13.37	209.73	152	8.1	11664	209.75	324.56	1472	80.68	41.20	893.73	0.00353	-14.646	0.223	14.646
195.88	7	13.50	209.86	127	8.1	11664	209.88	324.69	1473	80.68	42.58	894.78	0.00365	-14.726	0.225	14.726

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
196.00	7	13.62	209.99	127	8.1	11664	210.00	324.81	1473	80.68	42.25	895.76	0.00362	-14.806	0.227	14.806
196.13	7	13.75	210.12	127	8.1	11664	210.13	324.94	1472	80.67	40.98	896.81	0.00351	-14.885	0.229	14.885
196.25	7	13.87	210.25	51	8.1	11664	210.25	325.06	1471	80.66	40.88	897.78	0.00350	-14.963	0.231	14.963
196.38	7	14.00	210.38	76	8.1	11664	210.38	325.19	1472	80.66	41.52	898.83	0.00356	-15.041	0.233	15.041
196.50	7	14.12	210.51	51	8.1	11664	210.50	325.31	1472	80.65	41.81	899.81	0.00358	-15.119	0.235	15.119
196.63	7	14.25	210.60	102	8.1	11664	210.63	325.44	1472	80.64	41.82	900.86	0.00359	-15.196	0.238	15.196
196.75	7	14.37	210.72	76	8.1	11664	210.75	325.56	1473	80.64	42.59	901.83	0.00365	-15.273	0.240	15.273
196.88	7	14.50	210.85	76	8.1	11664	210.88	325.69	1474	80.63	43.06	902.88	0.00369	-15.349	0.242	15.349
197.00	7	14.62	210.98	51	8.1	11664	211.00	325.81	1472	80.62	41.19	903.86	0.00353	-15.424	0.244	15.424
197.13	7	14.75	211.11	51	8.1	11664	211.13	325.94	1474	80.61	43.02	904.91	0.00369	-15.500	0.246	15.500
197.25	7	14.87	211.24	102	8.1	11664	211.25	326.06	1473	80.61	42.67	905.88	0.00366	-15.574	0.248	15.574
197.38	7	15.00	211.37	51	8.1	11664	211.38	326.19	1472	80.6	41.45	906.93	0.00355	-15.649	0.250	15.649
197.50	7	15.12	211.50	76	8.1	11664	211.50	326.31	1473	80.59	42.87	907.91	0.00368	-15.723	0.252	15.723
197.63	7	15.25	211.63	152	8.1	11664	211.63	326.44	1474	80.59	43.20	908.96	0.00370	-15.796	0.254	15.796
197.75	7	15.37	211.76	127	8.1	11664	211.75	326.56	1474	80.59	43.00	909.93	0.00369	-15.869	0.256	15.869
197.88	7	15.50	211.89	152	8.1	11664	211.88	326.69	1473	80.57	42.94	910.98	0.00368	-15.942	0.258	15.942
198.00	7	15.62	212.02	152	8.1	11664	212.00	326.81	1473	80.57	42.91	911.96	0.00368	-16.014	0.260	16.014
198.13	7	15.75	212.11	76	8.1	11664	212.13	326.94	1473	80.57	42.54	913.01	0.00365	-16.086	0.263	16.086
198.25	7	15.87	212.24	127	8.1	11664	212.25	327.06	1473	80.56	42.62	913.98	0.00365	-16.157	0.265	16.157
198.38	7	16.00	212.37	102	8.1	11664	212.38	327.19	1473	80.54	42.61	915.03	0.00365	-16.228	0.267	16.228
198.50	7	16.12	212.50	127	8.1	11664	212.50	327.31	1473	80.54	42.79	916.01	0.00367	-16.298	0.269	16.298
198.63	7	16.25	212.62	127	8.1	11664	212.63	327.44	1473	80.53	42.48	917.06	0.00364	-16.368	0.271	16.368
198.75	7	16.37	212.75	152	8.1	11664	212.75	327.56	1473	80.53	42.43	918.03	0.00364	-16.438	0.273	16.438
198.88	7	16.50	212.88	152	8.1	11664	212.88	327.69	1473	80.52	42.66	919.08	0.00366	-16.507	0.275	16.507
199.00	7	16.62	213.01	152	8.1	11664	213.00	327.81	1473	80.51	42.30	920.06	0.00363	-16.576	0.277	16.576
199.13	7	16.75	213.14	127	8.1	11664	213.13	327.94	1473	80.5	42.44	921.11	0.00364	-16.644	0.279	16.644
199.25	7	16.87	213.27	152	8.1	11664	213.25	328.06	1473	80.5	42.36	922.08	0.00363	-16.712	0.281	16.712
199.38	7	17.00	213.36	152	8.1	11664	213.38	328.19	1473	80.5	42.54	923.13	0.00365	-16.780	0.283	16.780
199.50	7	17.12	213.49	152	8.1	11664	213.50	328.31	1473	80.49	42.33	924.11	0.00363	-16.847	0.285	16.847
199.63	7	17.25	213.62	127	8.1	11664	213.63	328.44	1472	80.48	41.95	925.16	0.00360	-16.914	0.288	16.914
199.75	7	17.37	213.75	152	8.1	11664	213.75	328.56	1473	80.47	42.65	926.13	0.00366	-16.981	0.290	16.981
199.88	7	17.50	213.88	102	8.1	11664	213.88	328.69	1473	80.47	42.65	927.18	0.00366	-17.047	0.292	17.047
200.00	7	17.62	214.01	152	8.1	11664	214.00	328.81	1473	80.46	42.52	928.16	0.00365	-17.112	0.294	17.112
200.13	7	17.75	214.14	76	8.1	11664	214.13	328.94	1473	80.46	42.03	929.21	0.00360	-17.178	0.296	17.178
200.25	7	17.87	214.27	76	8.1	11664	214.25	329.06	1473	80.45	42.13	930.18	0.00361	-17.243	0.298	17.243
200.38	7	18.00	214.36	152	8.1	11664	214.38	329.19	1471	80.44	40.87	931.23	0.00350	-17.307	0.300	17.307
200.50	7	18.12	214.49	102	8.1	11664	214.50	329.31	1472	80.43	41.68	932.21	0.00357	-17.371	0.302	17.371
200.63	7	18.25	214.62	76	8.1	11664	214.63	329.44	1473	80.43	42.97	933.26	0.00368	-17.435	0.304	17.435
200.75	7	18.37	214.75	102	8.1	11664	214.75	329.56	1473	80.43	42.26	934.23	0.00362	-17.499	0.306	17.499
200.88	7	18.50	214.88	76	8.1	11664	214.88	329.69	1472	80.41	41.08	935.28	0.00352	-17.562	0.308	17.562
201.00	7	18.62	215.01	76	8.1	11664	215.00	329.81	1471	80.4	40.26	936.26	0.00345	-17.624	0.310	17.624
201.13	7	18.75	215.14	102	8.1	11664	215.13	329.94	1472	80.4	41.97	937.31	0.00360	-17.687	0.313	17.687
201.25	7	18.87	215.26	152	8.1	11664	215.25	330.06	1471	80.4	40.80	938.28	0.00350	-17.749	0.315	17.749
201.38	7	19.00	215.39	127	8.1	11664	215.38	330.19	1473	80.39	42.43	939.33	0.00364	-17.810	0.317	17.810
201.50	7	19.12	215.52	152	8.1	11664	215.50	330.31	1473	80.38	42.39	940.31	0.00363	-17.872	0.319	17.872
201.63	7	19.25	215.61	102	8.1	11664	215.63	330.44	1473	80.38	42.49	941.36	0.00364	-17.933	0.321	17.933
201.75	7	19.37	215.74	76	8.1	11664	215.75	330.56	1473	80.37	42.11	942.33	0.00361	-17.993	0.323	17.993
201.88	7	19.50	215.87	127	8.1	11664	215.88	330.69	1472	80.36	41.54	943.38	0.00356	-18.054	0.325	18.054
202.00	7	19.62	216.00	152	8.1	11664	216.00	330.81	1472	80.36	41.07	944.36	0.00352	-18.113	0.327	18.113

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
202.13	7	19.75	216.13	152	8.1	11664	216.13	330.94	1472	80.35	41.77	945.41	0.00358	-18.173	0.329	18.173
202.25	7	19.87	216.26	152	8.1	11664	216.25	331.06	1473	80.35	42.03	946.38	0.00360	-18.232	0.331	18.232
202.38	7	20.00	216.39	127	8.1	11664	216.38	331.19	1473	80.34	42.85	947.43	0.00367	-18.291	0.333	18.291
202.50	7	20.12	216.52	152	8.1	11664	216.50	331.31	1473	80.34	42.48	948.41	0.00364	-18.350	0.335	18.350
202.63	7	20.25	216.65	127	8.1	11664	216.63	331.44	1473	80.33	42.02	949.46	0.00360	-18.408	0.338	18.408
202.75	7	20.37	216.74	152	8.1	11664	216.75	331.56	1473	80.33	42.12	950.43	0.00361	-18.466	0.340	18.466
202.88	7	20.50	216.86	152	8.1	11664	216.88	331.69	1473	80.32	42.03	951.48	0.00360	-18.524	0.342	18.524
203.00	7	20.62	216.99	152	8.1	11664	217.00	331.81	1473	80.31	42.19	952.46	0.00362	-18.581	0.344	18.581
203.13	7	20.75	217.12	152	8.1	11664	217.13	331.94	1473	80.31	42.04	953.51	0.00360	-18.638	0.346	18.638
203.25	7	20.87	217.25	127	8.1	11664	217.25	332.06	1471	80.31	40.44	954.48	0.00347	-18.694	0.348	18.694
203.38	7	21.00	217.38	152	8.1	11664	217.38	332.19	1473	80.29	42.46	955.53	0.00364	-18.751	0.350	18.751
203.50	7	21.12	217.51	127	8.1	11664	217.50	332.31	1472	80.29	41.17	956.51	0.00353	-18.807	0.352	18.807
203.63	7	21.25	217.64	76	8.1	11664	217.63	332.44	1473	80.29	42.36	957.56	0.00363	-18.862	0.354	18.862
203.75	7	21.37	217.77	102	8.1	11664	217.75	332.56	1473	80.29	42.10	958.53	0.00361	-18.918	0.356	18.918
203.88	7	21.50	217.90	51	8.1	11664	217.88	332.69	1472	80.28	41.16	959.58	0.00353	-18.973	0.358	18.973
204.00	7	21.62	217.99	127	8.1	11664	218.00	332.81	1474	80.27	43.04	960.56	0.00369	-19.027	0.360	19.027
204.13	7	21.75	218.12	152	8.1	11664	218.13	332.94	1474	80.27	42.99	961.61	0.00369	-19.082	0.363	19.082
204.25	7	21.87	218.25	76	8.1	11664	218.25	333.06	1473	80.27	42.23	962.58	0.00362	-19.136	0.365	19.136
204.38	7	22.00	218.38	51	8.1	11664	218.38	333.19	1472	80.26	41.12	963.63	0.00353	-19.190	0.367	19.190
204.50	7	22.12	218.51	76	8.1	11664	218.50	333.31	1473	80.25	42.21	964.61	0.00362	-19.243	0.369	19.243
204.63	7	22.25	218.64	51	8.1	11664	218.63	333.44	1473	80.24	42.01	965.66	0.00360	-19.296	0.371	19.296
204.75	7	22.37	218.77	76	8.1	11664	218.75	333.56	1472	80.24	41.13	966.63	0.00353	-19.349	0.373	19.349
204.88	7	22.50	218.85	152	8.1	11664	218.88	333.69	1472	80.24	41.37	967.68	0.00355	-19.402	0.375	19.402
205.00	7	22.62	218.98	102	8.1	11664	219.00	333.81	1472	80.24	41.50	968.66	0.00356	-19.454	0.377	19.454
205.13	7	22.75	219.11	102	8.1	11664	219.13	333.94	1473	80.23	42.39	969.71	0.00363	-19.506	0.379	19.506
205.25	7	22.87	219.24	76	8.1	11664	219.25	334.06	1473	80.22	42.46	970.68	0.00364	-19.558	0.381	19.558
205.38	7	23.00	219.37	76	8.1	11664	219.38	334.19	1472	80.22	41.34	971.73	0.00354	-19.609	0.383	19.609
205.50	7	23.12	219.50	76	8.1	11664	219.50	334.31	1472	80.22	41.28	972.71	0.00354	-19.660	0.385	19.660
205.63	7	23.25	219.63	127	8.1	11664	219.63	334.44	1472	80.22	41.75	973.76	0.00358	-19.711	0.388	19.711
205.75	7	23.37	219.76	152	8.1	11664	219.75	334.56	1473	80.21	42.02	974.73	0.00360	-19.762	0.390	19.762
205.88	7	23.50	219.89	127	8.1	11664	219.88	334.69	1472	80.2	41.73	975.78	0.00358	-19.812	0.392	19.812
206.00	7	23.62	220.02	152	8.1	11664	220.00	334.81	1473	80.2	42.05	976.76	0.00361	-19.862	0.394	19.862
206.13	7	23.75	220.11	76	8.1	11664	220.13	334.94	1472	80.2	41.67	977.81	0.00357	-19.912	0.396	19.912
206.25	7	23.87	220.24	127	8.1	11664	220.25	335.06	1472	80.2	41.55	978.78	0.00356	-19.961	0.398	19.961
206.38	7	24.00	220.36	152	8.1	11664	220.38	335.19	1473	80.19	42.29	979.83	0.00363	-20.010	0.400	20.010
206.50	7	24.12	220.50	127	8.1	11664	220.50	335.31	1474	80.18	43.11	980.81	0.00370	-20.059	0.402	20.059
206.63	7	24.25	220.63	177	8.1	11664	220.63	335.44	1473	80.18	42.21	981.86	0.00362	-20.108	0.404	20.108
206.75	7	24.37	220.75	152	8.1	11664	220.75	335.56	1472	80.18	41.47	982.83	0.00356	-20.156	0.406	20.156
206.88	7	24.50	220.88	152	8.1	11664	220.88	335.69	1471	80.18	40.60	983.88	0.00348	-20.204	0.408	20.204
207.00	7	24.62	221.01	152	8.1	11664	221.00	335.81	1474	80.17	43.27	984.86	0.00371	-20.252	0.410	20.252
207.13	7	24.75	221.14	152	8.1	11664	221.13	335.94	1473	80.17	42.93	985.91	0.00368	-20.299	0.413	20.299
207.25	7	24.87	221.27	102	8.1	11664	221.25	336.06	1472	80.17	41.59	986.88	0.00357	-20.347	0.415	20.347
207.38	7	25.00	221.36	152	8.1	11664	221.38	336.19	1473	80.17	42.45	987.93	0.00364	-20.393	0.417	20.393
207.50	7	25.12	221.49	152	8.1	11664	221.50	336.31	1474	80.16	43.15	988.91	0.00370	-20.440	0.419	20.440
207.63	7	25.25	221.62	127	8.1	11664	221.63	336.44	1473	80.15	42.00	989.96	0.00360	-20.487	0.421	20.487
207.75	7	25.37	221.75	102	8.1	11664	221.75	336.56	1473	80.15	42.43	990.93	0.00364	-20.533	0.423	20.533
207.88	7	25.50	221.88	127	8.1	11664	221.88	336.69	1473	80.15	42.67	991.98	0.00366	-20.579	0.425	20.579
208.00	7	25.62	222.01	76	8.1	11664	222.00	336.81	1473	80.14	42.64	992.96	0.00366	-20.624	0.427	20.624
208.13	7	25.75	222.14	51	8.1	11664	222.13	336.94	1472	80.15	41.60	994.01	0.00357	-20.670	0.429	20.670

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number		Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
208.25	7		25.87	222.27	51	8.1	11664	222.25	337.06	1472	80.14	41.09	994.98	0.00352	-20.715	0.431	20.715
208.38	7		26.00	222.36	76	8.1	11664	222.38	337.19	1472	80.13	41.39	996.03	0.00355	-20.759	0.433	20.759
208.50	7		26.12	222.49	76	8.1	11664	222.50	337.31	1473	80.13	42.97	997.01	0.00368	-20.804	0.435	20.804
208.63	7		26.25	222.62	76	8.1	11664	222.63	337.44	1472	80.13	41.58	998.06	0.00356	-20.848	0.438	20.848
208.75	7		26.37	222.75	76	8.1	11664	222.75	337.56	1473	80.13	42.82	999.03	0.00367	-20.892	0.440	20.892
208.88	7		26.50	222.88	76	8.1	11664	222.88	337.69	1472	80.13	41.44	1000.08	0.00355	-20.936	0.442	20.936
209.00	7		26.62	223.01	76	8.1	11664	223.00	337.81	1474	80.13	43.08	1001.06	0.00369	-20.980	0.444	20.980
209.13	7		26.75	223.14	76	8.1	11664	223.13	337.94	1473	80.12	42.58	1002.11	0.00365	-21.023	0.446	21.023
209.25	7		26.87	223.27	127	8.1	11664	223.25	338.06	1473	80.12	42.25	1003.08	0.00362	-21.066	0.448	21.066
209.38	7		27.00	223.35	51	8.1	11664	223.38	338.19	1472	80.11	41.02	1004.13	0.00352	-21.109	0.450	21.109
209.50	7		27.12	223.48	76	8.1	11664	223.50	338.31	1474	80.12	43.29	1005.11	0.00371	-21.152	0.452	21.152
209.63	7		27.25	223.61	76	8.1	11664	223.63	338.44	1474	80.11	43.30	1006.16	0.00371	-21.194	0.454	21.194
209.75	7		27.37	223.74	102	8.1	11664	223.75	338.56	1474	80.1	43.23	1007.13	0.00371	-21.236	0.456	21.236
209.88	7		27.50	223.87	76	8.1	11664	223.88	338.69	1473	80.1	42.50	1008.18	0.00364	-21.278	0.458	21.278
210.00	7		27.62	224.00	127	8.1	11664	224.00	338.81	1474	80.1	43.12	1009.16	0.00370	-21.319	0.460	21.319
210.13	7		27.75	224.13	152	8.1	11664	224.13	338.94	1474	80.1	43.17	1010.21	0.00370	-21.361	0.463	21.361
210.25	7		27.87	224.26	152	8.1	11664	224.25	339.06	1473	80.1	42.83	1011.18	0.00367	-21.402	0.465	21.402
210.38	7		28.00	224.39	152	8.1	11664	224.38	339.19	1473	80.1	42.92	1012.23	0.00368	-21.443	0.467	21.443
210.50	7		28.12	224.52	127	8.1	11664	224.50	339.31	1474	80.1	43.45	1013.21	0.00373	-21.483	0.469	21.483
210.63	7		28.25	224.61	102	8.1	11664	224.63	339.44	1474	80.1	43.34	1014.26	0.00372	-21.524	0.471	21.524
210.75	7		28.37	224.74	152	8.1	11664	224.75	339.56	1473	80.1	42.85	1015.23	0.00367	-21.564	0.473	21.564
210.88	7		28.50	224.87	177	8.1	11664	224.88	339.69	1474	80.1	43.21	1016.28	0.00370	-21.604	0.475	21.604
211.00	7		28.62	225.00	152	8.1	11664	225.00	339.81	1474	80.09	43.42	1017.26	0.00372	-21.644	0.477	21.644
211.13	7		28.75	225.13	152	8.1	11664	225.13	339.94	1474	80.09	43.19	1018.31	0.00370	-21.683	0.479	21.683
211.25	7		28.87	225.26	177	8.1	11664	225.25	340.06	1474	80.09	43.20	1019.28	0.00370	-21.722	0.481	21.722
211.38	7		29.00	225.34	127	8.1	11664	225.38	340.19	1474	80.09	43.18	1020.33	0.00370	-21.761	0.483	21.761
211.50	7		29.12	225.47	177	8.1	11664	225.50	340.31	1474	80.09	43.15	1021.31	0.00370	-21.800	0.485	21.800
211.63	7		29.25	225.60	152	8.1	11664	225.63	340.44	1473	80.08	42.91	1022.36	0.00368	-21.839	0.488	21.839
211.75	7		29.37	225.73	152	8.1	11664	225.75	340.56	1473	80.08	42.89	1023.33	0.00368	-21.877	0.490	21.877
211.88	7		29.50	225.86	152	8.1	11664	225.88	340.69	1473	80.08	42.84	1024.38	0.00367	-21.915	0.492	21.915
212.00	7		29.62	225.99	102	8.1	11664	226.00	340.81	1473	80.08	42.67	1025.36	0.00366	-21.953	0.494	21.953
212.13	7		29.75	226.12	102	8.1	11664	226.13	340.94	1474	80.08	43.01	1026.41	0.00369	-21.990	0.496	21.990
212.25	8	Step 8	0.01	226.25	152	8.9	12816	226.25	341.06	1473	80.08	42.43	1027.48	0.00331	-0.415	0.000	0.415
212.38	8		0.13	226.38	152	9	12960	226.38	341.19	1473	80.08	42.79	1028.65	0.00330	-0.708	0.002	0.708
212.50	8		0.25	226.51	177	9.1	13104	226.50	341.31	1473	80.08	42.77	1029.74	0.00326	-0.970	0.004	0.970
212.63	8		0.38	226.64	152	9	12960	226.63	341.44	1473	80.07	42.94	1030.91	0.00331	-1.211	0.006	1.211
212.75	8		0.50	226.77	152	9	12960	226.75	341.56	1474	80.08	43.02	1031.99	0.00332	-1.440	0.008	1.440
212.88	8		0.63	226.86	152	9	12960	226.88	341.69	1474	80.08	43.01	1033.16	0.00332	-1.657	0.010	1.657
213.00	8		0.75	226.99	127	9	12960	227.00	341.81	1474	80.08	43.24	1034.24	0.00334	-1.866	0.013	1.866
213.13	8		0.88	227.12	177	9	12960	227.13	341.94	1473	80.07	42.72	1035.41	0.00330	-2.068	0.015	2.068
213.25	8		1.00	227.25	152	9.1	13104	227.25	342.06	1473	80.07	42.64	1036.50	0.00325	-2.263	0.017	2.263
213.38	8		1.13	227.38	127	9	12960	227.38	342.19	1473	80.07	42.85	1037.67	0.00331	-2.453	0.019	2.453
213.50	8		1.25	227.51	152	9	12960	227.50	342.31	1472	80.07	41.95	1038.75	0.00324	-2.637	0.021	2.637
213.63	8		1.38	227.64	177	9	12960	227.63	342.44	1474	80.06	43.35	1039.92	0.00334	-2.817	0.023	2.817
213.75	8		1.50	227.77	177	9	12960	227.75	342.56	1473	80.07	42.55	1041.00	0.00328	-2.993	0.025	2.993
213.88	8		1.63	227.85	152	9.1	13104	227.88	342.69	1474	80.06	43.48	1042.18	0.00332	-3.166	0.027	3.166
214.00	8		1.75	227.98	177	9.1	13104	228.00	342.81	1474	80.06	43.89	1043.28	0.00335	-3.334	0.029	3.334
214.13	8		1.88	228.11	177	9.1	13104	228.13	342.94	1473	80.06	42.22	1044.46	0.00322	-3.500	0.031	3.500
214.25	8		2.00	228.24	152	9	12960	228.25	343.06	1473	80.06	42.70	1045.54	0.00329	-3.662	0.033	3.662

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
214.38	8	2.13	228.37	152	9.1	13104	228.38	343.19	1474	80.06	43.16	1046.72	0.00329	-3.821	0.035	3.821
214.50	8	2.25	228.50	177	9	12960	228.50	343.31	1474	80.06	43.37	1047.80	0.00335	-3.978	0.038	3.978
214.63	8	2.38	228.63	177	9	12960	228.63	343.44	1472	80.06	41.43	1048.97	0.00320	-4.132	0.040	4.132
214.75	8	2.50	228.76	152	9.1	13104	228.75	343.56	1474	80.06	43.77	1050.06	0.00334	-4.284	0.042	4.284
214.88	8	2.63	228.89	152	9	12960	228.88	343.69	1476	80.06	45.03	1051.23	0.00347	-4.433	0.044	4.433
215.00	8	2.75	229.02	152	9	12960	229.00	343.81	1476	80.06	45.42	1052.31	0.00350	-4.580	0.046	4.580
215.13	8	2.88	229.11	152	9	12960	229.13	343.94	1476	80.06	45.28	1053.48	0.00349	-4.725	0.048	4.725
215.25	8	3.00	229.23	127	9	12960	229.25	344.06	1475	80.06	44.27	1054.56	0.00342	-4.868	0.050	4.868
215.38	8	3.13	229.36	152	9	12960	229.38	344.19	1476	80.06	45.35	1055.73	0.00350	-5.009	0.052	5.009
215.50	8	3.25	229.49	152	9	12960	229.50	344.31	1475	80.06	44.85	1056.81	0.00346	-5.148	0.054	5.148
215.63	8	3.38	229.62	152	9	12960	229.63	344.44	1476	80.06	45.09	1057.98	0.00348	-5.285	0.056	5.285
215.75	8	3.50	229.75	152	9	12960	229.75	344.56	1477	80.06	46.00	1059.06	0.00355	-5.421	0.058	5.421
215.88	8	3.63	229.88	177	9	12960	229.88	344.69	1475	80.06	44.36	1060.23	0.00342	-5.555	0.060	5.555
216.00	8	3.75	230.01	152	9.1	13104	230.00	344.81	1476	80.06	45.94	1061.33	0.00351	-5.687	0.063	5.687
216.13	8	3.88	230.14	152	9	12960	230.13	344.94	1476	80.06	45.77	1062.50	0.00353	-5.818	0.065	5.818
216.25	8	4.00	230.27	152	9	12960	230.25	345.06	1477	80.05	46.13	1063.58	0.00356	-5.947	0.067	5.947
216.38	8	4.13	230.36	177	9	12960	230.38	345.19	1476	80.05	45.21	1064.75	0.00349	-6.075	0.069	6.075
216.50	8	4.25	230.49	152	9	12960	230.50	345.31	1477	80.05	46.21	1065.83	0.00357	-6.201	0.071	6.201
216.63	8	4.38	230.62	177	9	12960	230.63	345.44	1477	80.05	46.21	1067.00	0.00357	-6.326	0.073	6.326
216.75	8	4.50	230.75	177	9	12960	230.75	345.56	1477	80.05	46.00	1068.08	0.00355	-6.450	0.075	6.450
216.88	8	4.63	230.88	177	9	12960	230.88	345.69	1477	80.04	46.31	1069.25	0.00357	-6.572	0.077	6.572
217.00	8	4.75	231.01	152	9	12960	231.00	345.81	1477	80.04	46.27	1070.33	0.00357	-6.693	0.079	6.693
217.13	8	4.88	231.14	152	9.1	13104	231.13	345.94	1477	80.04	46.40	1071.51	0.00354	-6.813	0.081	6.813
217.25	8	5.00	231.27	152	9	12960	231.25	346.06	1476	80.04	45.13	1072.59	0.00348	-6.931	0.083	6.931
217.38	8	5.13	231.35	152	9	12960	231.38	346.19	1476	80.04	45.15	1073.76	0.00348	-7.049	0.085	7.049
217.50	8	5.25	231.48	177	9	12960	231.50	346.31	1477	80.04	46.70	1074.84	0.00360	-7.165	0.088	7.165
217.63	8	5.38	231.61	152	9	12960	231.63	346.44	1476	80.03	45.30	1076.01	0.00350	-7.280	0.090	7.280
217.75	8	5.50	231.74	152	9	12960	231.75	346.56	1476	80.03	45.69	1077.09	0.00353	-7.394	0.092	7.394
217.88	8	5.63	231.87	152	9	12960	231.88	346.69	1476	80.03	45.33	1078.26	0.00350	-7.507	0.094	7.507
218.00	8	5.75	232.00	177	9	12960	232.00	346.81	1476	80.03	45.39	1079.34	0.00350	-7.619	0.096	7.619
218.13	8	5.88	232.13	152	9.1	13104	232.13	346.94	1476	80.03	45.75	1080.52	0.00349	-7.730	0.098	7.730
218.25	8	6.00	232.26	152	9	12960	232.25	347.06	1477	80.03	46.57	1081.60	0.00359	-7.840	0.100	7.840
218.38	8	6.13	232.35	152	9	12960	232.38	347.19	1476	80.02	45.63	1082.77	0.00352	-7.948	0.102	7.948
218.50	8	6.25	232.48	152	9.1	13104	232.50	347.31	1477	80.02	46.60	1083.86	0.00356	-8.056	0.104	8.056
218.63	8	6.38	232.61	177	9	12960	232.63	347.44	1478	80.02	47.23	1085.03	0.00364	-8.163	0.106	8.163
218.75	8	6.50	232.74	152	9	12960	232.75	347.56	1476	80.01	45.58	1086.11	0.00352	-8.269	0.108	8.269
218.88	8	6.63	232.87	127	9.1	13104	232.88	347.69	1476	80.01	45.58	1087.30	0.00348	-8.374	0.111	8.374
219.00	8	6.75	233.00	177	9	12960	233.00	347.81	1476	80.01	45.65	1088.38	0.00352	-8.479	0.113	8.479
219.13	8	6.88	233.13	177	9.1	13104	233.13	347.94	1477	80.01	46.17	1089.56	0.00352	-8.582	0.115	8.582
219.25	8	7.00	233.26	127	9	12960	233.25	348.06	1477	80	46.76	1090.64	0.00361	-8.685	0.117	8.685
219.38	8	7.13	233.39	152	9	12960	233.38	348.19	1476	80	45.67	1091.81	0.00352	-8.786	0.119	8.786
219.50	8	7.25	233.52	177	9.1	13104	233.50	348.31	1477	79.99	46.55	1092.90	0.00355	-8.887	0.121	8.887
219.63	8	7.38	233.61	152	9	12960	233.63	348.44	1477	79.99	46.42	1094.07	0.00358	-8.987	0.123	8.987
219.75	8	7.50	233.73	177	9	12960	233.75	348.56	1478	79.99	47.33	1095.15	0.00365	-9.086	0.125	9.086
219.88	8	7.63	233.86	177	9	12960	233.88	348.69	1477	79.99	46.32	1096.32	0.00357	-9.185	0.127	9.185
220.00	8	7.75	233.99	152	9	12960	234.00	348.81	1477	79.98	46.49	1097.40	0.00359	-9.282	0.129	9.282
220.13	8	7.88	234.12	177	9	12960	234.13	348.94	1477	79.97	46.56	1098.57	0.00359	-9.379	0.131	9.379
220.25	8	8.00	234.25	177	9	12960	234.25	349.06	1477	79.97	46.03	1099.65	0.00355	-9.476	0.133	9.476
220.38	8	8.13	234.38	152	9	12960	234.38	349.19	1477	79.96	46.23	1100.82	0.00357	-9.571	0.136	9.571

Reduced Data Set
Step Rate Test - October 31, 2008
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UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
220.50	8	8.25	234.51	152	9	12960	234.50	349.31	1477	79.96	46.10	1101.90	0.00356	-9.666	0.138	9.666
220.63	8	8.38	234.64	177	9.1	13104	234.63	349.44	1478	79.96	47.16	1103.08	0.00360	-9.760	0.140	9.760
220.75	8	8.50	234.77	177	9	12960	234.75	349.56	1477	79.96	46.28	1104.16	0.00357	-9.853	0.142	9.853
220.88	8	8.63	234.86	127	9	12960	234.88	349.69	1477	79.95	46.03	1105.33	0.00355	-9.945	0.144	9.945
221.00	8	8.75	234.99	152	9	12960	235.00	349.81	1476	79.94	45.93	1106.41	0.00354	-10.037	0.146	10.037
221.13	8	8.88	235.12	152	9	12960	235.13	349.94	1477	79.94	46.46	1107.58	0.00358	-10.128	0.148	10.128
221.25	8	9.00	235.25	127	9	12960	235.25	350.06	1478	79.94	47.07	1108.66	0.00363	-10.219	0.150	10.219
221.38	8	9.13	235.38	177	9	12960	235.38	350.19	1477	79.93	46.23	1109.83	0.00357	-10.309	0.152	10.309
221.50	8	9.25	235.51	177	9.1	13104	235.50	350.31	1476	79.93	45.34	1110.93	0.00346	-10.398	0.154	10.398
221.63	8	9.38	235.64	127	9.1	13104	235.63	350.44	1478	79.92	47.03	1112.11	0.00359	-10.487	0.156	10.487
221.75	8	9.50	235.77	177	9	12960	235.75	350.56	1478	79.92	47.02	1113.19	0.00363	-10.575	0.158	10.575
221.88	8	9.63	235.85	152	9	12960	235.88	350.69	1479	79.91	48.23	1114.36	0.00372	-10.662	0.161	10.662
222.00	8	9.75	235.98	177	9.1	13104	236.00	350.81	1478	79.91	47.83	1115.45	0.00365	-10.749	0.163	10.749
222.13	8	9.88	236.11	152	9.1	13104	236.13	350.94	1479	79.91	48.00	1116.63	0.00366	-10.835	0.165	10.835
222.25	8	10.00	236.24	152	9	12960	236.25	351.06	1478	79.89	47.70	1117.71	0.00368	-10.920	0.167	10.920
222.38	8	10.13	236.37	152	9.1	13104	236.38	351.19	1478	79.89	47.53	1118.90	0.00363	-11.005	0.169	11.005
222.50	8	10.25	236.50	177	9.1	13104	236.50	351.31	1478	79.89	47.29	1119.99	0.00361	-11.089	0.171	11.089
222.63	8	10.38	236.63	177	9	12960	236.63	351.44	1478	79.88	47.35	1121.16	0.00365	-11.173	0.173	11.173
222.75	8	10.50	236.76	152	9.1	13104	236.75	351.56	1478	79.88	47.45	1122.25	0.00362	-11.256	0.175	11.256
222.88	8	10.63	236.89	152	9.1	13104	236.88	351.69	1478	79.87	47.35	1123.43	0.00361	-11.339	0.177	11.339
223.00	8	10.75	237.02	127	9.1	13104	237.00	351.81	1478	79.87	47.35	1124.53	0.00361	-11.421	0.179	11.421
223.13	8	10.88	237.11	177	9	12960	237.13	351.94	1478	79.87	47.01	1125.70	0.00363	-11.503	0.181	11.503
223.25	8	11.00	237.24	127	9	12960	237.25	352.06	1478	79.86	47.35	1126.78	0.00365	-11.583	0.183	11.583
223.38	8	11.13	237.37	152	9.1	13104	237.38	352.19	1477	79.85	46.93	1127.96	0.00358	-11.664	0.186	11.664
223.50	8	11.25	237.50	127	9	12960	237.50	352.31	1476	79.85	45.43	1129.04	0.00351	-11.744	0.188	11.744
223.63	8	11.38	237.63	177	9	12960	237.63	352.44	1477	79.85	46.36	1130.21	0.00358	-11.823	0.190	11.823
223.75	8	11.50	237.76	177	9	12960	237.75	352.56	1476	79.84	45.49	1131.29	0.00351	-11.902	0.192	11.902
223.88	8	11.63	237.89	152	9	12960	237.88	352.69	1477	79.83	46.28	1132.46	0.00357	-11.980	0.194	11.980
224.00	8	11.75	238.02	152	9	12960	238.00	352.81	1478	79.83	47.38	1133.54	0.00366	-12.058	0.196	12.058
224.13	8	11.88	238.11	152	9	12960	238.13	352.94	1478	79.82	47.14	1134.71	0.00364	-12.135	0.198	12.135
224.25	8	12.00	238.24	127	9	12960	238.25	353.06	1477	79.82	46.53	1135.79	0.00359	-12.212	0.200	12.212
224.38	8	12.13	238.37	152	9	12960	238.38	353.19	1477	79.81	46.40	1136.96	0.00358	-12.288	0.202	12.288
224.50	8	12.25	238.50	177	9	12960	238.50	353.31	1477	79.81	46.04	1138.04	0.00355	-12.364	0.204	12.364
224.63	8	12.38	238.62	152	9	12960	238.63	353.44	1478	79.8	47.54	1139.21	0.00367	-12.440	0.206	12.440
224.75	8	12.50	238.75	177	9	12960	238.75	353.56	1478	79.8	47.71	1140.29	0.00368	-12.514	0.208	12.514
224.88	8	12.63	238.88	177	9	12960	238.88	353.69	1478	79.79	47.19	1141.46	0.00364	-12.589	0.211	12.589
225.00	8	12.75	239.01	152	9	12960	239.00	353.81	1478	79.79	47.09	1142.54	0.00363	-12.663	0.213	12.663
225.13	8	12.88	239.10	152	9.1	13104	239.13	353.94	1476	79.78	45.20	1143.72	0.00345	-12.736	0.215	12.736
225.25	8	13.00	239.23	177	9	12960	239.25	354.06	1478	79.78	47.37	1144.80	0.00366	-12.809	0.217	12.809
225.38	8	13.13	239.36	152	9.1	13104	239.38	354.19	1478	79.78	47.06	1145.99	0.00359	-12.882	0.219	12.882
225.50	8	13.25	239.49	152	9.1	13104	239.50	354.31	1475	79.78	44.86	1147.08	0.00342	-12.954	0.221	12.954
225.63	8	13.38	239.62	152	9	12960	239.63	354.44	1478	79.76	47.20	1148.25	0.00364	-13.025	0.223	13.025
225.75	8	13.50	239.75	152	9.1	13104	239.75	354.56	1477	79.76	46.34	1149.34	0.00354	-13.097	0.225	13.097
225.88	8	13.63	239.88	152	9	12960	239.88	354.69	1476	79.75	45.50	1150.51	0.00351	-13.167	0.227	13.167
226.00	8	13.75	240.01	177	9.1	13104	240.00	354.81	1477	79.75	46.70	1151.60	0.00356	-13.238	0.229	13.238
226.13	8	13.88	240.14	177	9.1	13104	240.13	354.94	1478	79.75	47.17	1152.78	0.00360	-13.307	0.231	13.307
226.25	8	14.00	240.27	127	9	12960	240.25	355.06	1479	79.75	48.81	1153.86	0.00377	-13.377	0.233	13.377
226.38	8	14.13	240.36	127	9	12960	240.38	355.19	1478	79.75	47.06	1155.03	0.00363	-13.446	0.236	13.446
226.50	8	14.25	240.49	152	9.1	13104	240.50	355.31	1477	79.73	46.36	1156.13	0.00354	-13.515	0.238	13.515

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
226.63	8	14.38	240.62	177	9	12960	240.63	355.44	1477	79.73	46.65	1157.30	0.00360	-13.583	0.240	13.583
226.75	8	14.50	240.75	152	9.1	13104	240.75	355.56	1478	79.73	47.23	1158.39	0.00360	-13.651	0.242	13.651
226.88	8	14.63	240.88	152	9.1	13104	240.88	355.69	1478	79.73	47.36	1159.57	0.00361	-13.718	0.244	13.718
227.00	8	14.75	241.01	152	9.1	13104	241.00	355.81	1479	79.73	48.45	1160.66	0.00370	-13.785	0.246	13.785
227.13	8	14.88	241.14	127	9	12960	241.13	355.94	1477	79.72	46.76	1161.83	0.00361	-13.851	0.248	13.851
227.25	8	15.00	241.27	177	9.1	13104	241.25	356.06	1479	79.72	48.32	1162.93	0.00369	-13.918	0.250	13.918
227.38	8	15.13	241.36	152	9	12960	241.38	356.19	1478	79.71	47.78	1164.10	0.00369	-13.983	0.252	13.983
227.50	8	15.25	241.49	152	9.1	13104	241.50	356.31	1476	79.71	45.92	1165.19	0.00350	-14.049	0.254	14.049
227.63	8	15.38	241.62	127	9	12960	241.63	356.44	1479	79.71	48.10	1166.36	0.00371	-14.114	0.256	14.114
227.75	8	15.50	241.75	152	9	12960	241.75	356.56	1477	79.71	46.53	1167.44	0.00359	-14.178	0.258	14.178
227.88	8	15.63	241.88	177	9	12960	241.88	356.69	1478	79.71	47.14	1168.61	0.00364	-14.242	0.261	14.242
228.00	8	15.75	242.01	152	9.1	13104	242.00	356.81	1478	79.71	47.97	1169.70	0.00366	-14.306	0.263	14.306
228.13	8	15.88	242.14	152	9.1	13104	242.13	356.94	1477	79.7	46.59	1170.88	0.00356	-14.370	0.265	14.370
228.25	8	16.00	242.27	152	9.1	13104	242.25	357.06	1477	79.7	46.56	1171.97	0.00355	-14.433	0.267	14.433
228.38	8	16.13	242.35	177	9.1	13104	242.38	357.19	1477	79.7	46.39	1173.16	0.00354	-14.495	0.269	14.495
228.50	8	16.25	242.48	152	9.1	13104	242.50	357.31	1477	79.69	46.47	1174.25	0.00355	-14.558	0.271	14.558
228.63	8	16.38	242.61	152	9	12960	242.63	357.44	1478	79.69	47.06	1175.42	0.00363	-14.620	0.273	14.620
228.75	8	16.50	242.74	177	9.1	13104	242.75	357.56	1477	79.69	46.20	1176.51	0.00353	-14.681	0.275	14.681
228.88	8	16.63	242.87	152	9.1	13104	242.88	357.69	1477	79.68	46.70	1177.69	0.00356	-14.743	0.277	14.743
229.00	8	16.75	243.00	152	9.1	13104	243.00	357.81	1478	79.68	47.09	1178.79	0.00359	-14.803	0.279	14.803
229.13	8	16.88	243.13	177	9.1	13104	243.13	357.94	1478	79.68	47.22	1179.97	0.00360	-14.864	0.281	14.864
229.25	8	17.00	243.26	152	9.1	13104	243.25	358.06	1480	79.68	49.41	1181.06	0.00377	-14.924	0.283	14.924
229.38	8	17.13	243.39	177	9.1	13104	243.38	358.19	1479	79.68	48.17	1182.24	0.00368	-14.984	0.286	14.984
229.50	8	17.25	243.52	177	9.1	13104	243.50	358.31	1477	79.68	46.41	1183.34	0.00354	-15.044	0.288	15.044
229.63	8	17.38	243.61	177	9.1	13104	243.63	358.44	1479	79.68	48.25	1184.52	0.00368	-15.103	0.290	15.103
229.75	8	17.50	243.74	127	9.1	13104	243.75	358.56	1480	79.68	49.54	1185.61	0.00378	-15.161	0.292	15.161
229.88	8	17.63	243.87	152	9.1	13104	243.88	358.69	1478	79.68	47.13	1186.79	0.00360	-15.220	0.294	15.220
230.00	8	17.75	244.00	152	9	12960	244.00	358.81	1478	79.67	47.09	1187.87	0.00363	-15.278	0.296	15.278
230.13	8	17.88	244.13	127	9.1	13104	244.13	358.94	1479	79.67	48.26	1189.06	0.00368	-15.336	0.298	15.336
230.25	8	18.00	244.26	177	9.1	13104	244.25	359.06	1478	79.67	47.66	1190.15	0.00364	-15.393	0.300	15.393
230.38	8	18.13	244.39	177	9.1	13104	244.38	359.19	1478	79.67	47.82	1191.33	0.00365	-15.450	0.302	15.450
230.50	8	18.25	244.52	152	9.1	13104	244.50	359.31	1478	79.66	47.11	1192.42	0.00360	-15.507	0.304	15.507
230.63	8	18.38	244.61	177	9.1	13104	244.63	359.44	1478	79.67	47.35	1193.61	0.00361	-15.564	0.306	15.564
230.75	8	18.50	244.74	152	9.1	13104	244.75	359.56	1478	79.67	47.46	1194.70	0.00362	-15.620	0.308	15.620
230.88	8	18.63	244.87	152	9.1	13104	244.88	359.69	1478	79.67	47.15	1195.88	0.00360	-15.676	0.311	15.676
231.00	8	18.75	245.00	329	2	2880	245.00	359.81	1478	79.67	47.47	1196.12		-15.731	0.313	15.731
231.13			245.04	278	0	0	245.13	359.94	1477	79.66	46.80					
231.25			245.08	278	0	0	245.25	360.06	1478	79.66	47.92					
231.38							245.38	360.19	1479	79.66	48.53					
231.50							245.50	360.31	1478	79.66	47.10					
231.63							245.63	360.44	1478	79.66	47.74					
231.75							245.75	360.56	1478	79.66	47.31					
231.88							245.88	360.69	1478	79.66	47.47					
232.00							246.00	360.81	1477	79.66	46.44					
232.13							246.13	360.94	1478	79.66	47.03					
232.25							246.25	361.06	1478	79.66	47.19					
232.38							246.38	361.19	1479	79.66	48.42					
232.50							246.50	361.31	1477	79.66	46.83					
232.63							246.63	361.44	1477	79.66	46.97					

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
232.75							246.75	361.56	1479	79.66	48.33					
232.88							246.88	361.69	1478	79.66	47.62					
233.00							247.00	361.81	1477	79.66	46.97					
233.13							247.13	361.94	1478	79.66	47.27					
233.25							247.25	362.06	1478	79.66	47.26					
233.38							247.38	362.19	1475	79.66	44.66					
233.50							247.50	362.31	1471	79.66	40.17					
233.63							247.63	362.44	1466	79.67	35.70					
233.75							247.75	362.56	1462	79.66	31.57					
233.88							247.88	362.69	1458	79.66	27.88					
234.00							248.00	362.81	1455	79.67	24.73					
234.13							248.13	362.94	1452	79.66	21.69					
234.25							248.25	363.06	1450	79.67	19.05					
234.38							248.38	363.19	1447	79.67	16.67					
234.50							248.50	363.31	1445	79.67	14.62					
234.63							248.63	363.44	1443	79.67	12.89					
234.75							248.75	363.56	1442	79.67	11.53					
234.88							248.88	363.69	1441	79.68	10.35					
235.00							249.00	363.81	1440	79.68	9.53					
235.13							249.13	363.94	1439	79.68	8.76					
235.25							249.25	364.06	1439	79.68	8.20					
235.38							249.38	364.19	1438	79.68	7.80					
235.50							249.50	364.31	1438	79.69	7.47					
235.63							249.63	364.44	1438	79.7	7.20					
235.75							249.75	364.56	1437	79.7	6.90					
235.88							249.88	364.69	1437	79.71	6.24					
236.00							250.00	364.81	1437	79.71	6.19					
236.13							250.13	364.94	1436	79.72	5.95					
236.25							250.25	365.06	1436	79.72	5.67					
236.38							250.38	365.19	1436	79.73	5.36					
236.50							250.50	365.31	1436	79.73	5.13					
236.63							250.63	365.44	1435	79.74	4.83					
236.75							250.75	365.56	1435	79.75	4.54					
236.88							250.88	365.69	1435	79.76	4.38					
237.00							251.00	365.81	1435	79.76	4.25					
237.13							251.13	365.94	1435	79.77	4.09					
237.25							251.25	366.06	1434	79.78	3.83					
237.38							251.38	366.19	1434	79.79	3.77					
237.50							251.50	366.31	1434	79.8	3.67					
237.63							251.63	366.44	1434	79.81	3.60					
237.75							251.75	366.56	1434	79.82	3.52					
237.88							251.88	366.69	1434	79.82	3.45					
238.00							252.00	366.81	1434	79.84	3.43					
238.13							252.13	366.94	1434	79.85	3.38					
238.25							252.25	367.06	1434	79.86	3.38					
238.38							252.38	367.19	1434	79.87	3.36					
238.50							252.50	367.31	1434	79.87	3.33					
238.63							252.63	367.44	1434	79.89	3.29					
238.75							252.75	367.56	1434	79.9	3.31					

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
238.88							252.88	367.69	1434	79.91	3.31					
239.00							253.00	367.81	1434	79.92	3.27					
239.13							253.13	367.94	1434	79.93	3.31					
239.25							253.25	368.06	1434	79.94	3.20					
239.38							253.38	368.19	1434	79.96	3.26					
239.50							253.50	368.31	1434	79.96	3.19					
239.63							253.63	368.44	1434	79.97	3.20					
239.75							253.75	368.56	1434	79.99	3.18					
239.88							253.88	368.69	1434	79.99	3.24					
240.00							254.00	368.81	1434	80.01	3.18					
240.13							254.13	368.94	1434	80.02	3.17					
240.25							254.25	369.06	1434	80.03	3.18					
240.38							254.38	369.19	1434	80.04	3.19					
240.50							254.50	369.31	1434	80.05	3.19					
240.63							254.63	369.44	1434	80.06	3.19					
240.75							254.75	369.56	1434	80.07	3.18					
240.88							254.88	369.69	1434	80.08	3.20					
241.00							255.00	369.81	1434	80.09	3.20					
241.13							255.13	369.94	1434	80.1	3.19					
241.25							255.25	370.06	1434	80.11	3.19					
241.38							255.38	370.19	1434	80.13	3.22					
241.50							255.50	370.31	1434	80.13	3.22					
241.63							255.63	370.44	1434	80.15	3.22					
241.75							255.75	370.56	1434	80.15	3.16					
241.88							255.88	370.69	1434	80.17	3.22					
242.00							256.00	370.81	1434	80.17	3.21					
242.13							256.13	370.94	1434	80.19	3.28					
242.25							256.25	371.06	1434	80.2	3.20					
242.38							256.38	371.19	1434	80.21	3.20					
242.50							256.50	371.31	1434	80.22	3.23					
242.63							256.63	371.44	1434	80.23	3.25					
242.75							256.75	371.56	1434	80.24	3.20					
242.88							256.88	371.69	1434	80.25	3.18					
243.00							257.00	371.81	1434	80.26	3.15					
243.13							257.13	371.94	1434	80.27	3.20					
243.25							257.25	372.06	1434	80.29	3.18					
243.38							257.38	372.19	1434	80.29	3.16					
243.50							257.50	372.31	1434	80.31	3.16					
243.63							257.63	372.44	1434	80.31	3.18					
243.75							257.75	372.56	1434	80.32	3.15					
243.88							257.88	372.69	1434	80.33	3.18					
244.00							258.00	372.81	1434	80.34	3.25					
244.13							258.13	372.94	1434	80.35	3.18					
244.25							258.25	373.06	1434	80.36	3.15					
244.38							258.38	373.19	1434	80.37	3.17					
244.50							258.50	373.31	1434	80.38	3.12					
244.63							258.63	373.44	1434	80.39	3.16					
244.75							258.75	373.56	1434	80.4	3.16					
244.88							258.88	373.69	1434	80.41	3.10					

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
245.00							259.00	373.81	1434	80.42	3.16					
245.13							259.13	373.94	1434	80.43	3.15					
245.25							259.25	374.06	1434	80.44	3.09					
245.38							259.38	374.19	1434	80.45	3.07					
245.50							259.50	374.31	1434	80.46	3.11					
245.63							259.63	374.44	1434	80.47	3.09					
245.75							259.75	374.56	1434	80.48	3.08					
245.88							259.88	374.69	1434	80.48	3.08					
246.00							260.00	374.81	1434	80.5	3.06					
246.13							260.13	374.94	1434	80.51	3.07					
246.25							260.25	375.06	1434	80.52	3.05					
246.38							260.38	375.19	1434	80.53	3.03					
246.50							260.50	375.31	1434	80.54	3.03					
246.63							260.63	375.44	1434	80.55	3.02					
246.75							260.75	375.56	1434	80.57	3.01					
246.88							260.88	375.69	1434	80.57	2.98					
247.00							261.00	375.81	1434	80.59	2.98					
247.13							261.13	375.94	1434	80.59	2.98					
247.25							261.25	376.06	1433	80.61	2.94					
247.38							261.38	376.19	1433	80.62	2.93					
247.50							261.50	376.31	1433	80.63	2.92					
247.63							261.63	376.44	1433	80.64	2.92					
247.75							261.75	376.56	1433	80.65	2.89					
247.88							261.88	376.69	1433	80.66	2.96					
248.00							262.00	376.81	1433	80.68	2.91					
248.13							262.13	376.94	1433	80.69	2.91					
248.25							262.25	377.06	1433	80.7	2.93					
248.38							262.38	377.19	1433	80.72	2.82					
248.50							262.50	377.31	1433	80.72	2.89					
248.63							262.63	377.44	1433	80.73	2.89					
248.75							262.75	377.56	1433	80.75	2.82					
248.88							262.88	377.69	1433	80.76	2.85					
249.00							263.00	377.81	1433	80.78	2.81					
249.13							263.13	377.94	1433	80.79	2.75					
249.25							263.25	378.06	1433	80.8	2.77					
249.38							263.38	378.19	1433	80.82	2.73					
249.50							263.50	378.31	1433	80.83	2.75					
249.63							263.63	378.44	1433	80.85	2.72					
249.75							263.75	378.56	1433	80.85	2.72					
249.88							263.88	378.69	1433	80.87	2.75					
250.00							264.00	378.81	1433	80.89	2.67					
250.13							264.13	378.94	1433	80.9	2.67					
250.25							264.25	379.06	1433	80.92	2.68					
250.38							264.38	379.19	1433	80.93	2.67					
250.50							264.50	379.31	1433	80.94	2.63					
250.63							264.63	379.44	1433	80.97	2.62					
250.75							264.75	379.56	1433	80.98	2.63					
250.88							264.88	379.69	1433	80.99	2.59					
251.00							265.00	379.81	1433	81.01	2.59					

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
251.13							265.13	379.94	1433	81.03	2.57					
251.25							265.25	380.06	1433	81.05	2.55					
251.38							265.38	380.19	1433	81.06	2.53					
251.50							265.50	380.31	1433	81.08	2.54					
251.63							265.63	380.44	1433	81.1	2.54					
251.75							265.75	380.56	1433	81.11	2.50					
251.88							265.88	380.69	1433	81.13	2.50					
252.00							266.00	380.81	1433	81.15	2.47					
252.13							266.13	380.94	1433	81.17	2.44					
252.25							266.25	381.06	1433	81.19	2.39					
252.38							266.38	381.19	1433	81.2	2.43					
252.50							266.50	381.31	1433	81.22	2.40					
252.63							266.63	381.44	1433	81.24	2.41					
252.75							266.75	381.56	1433	81.26	2.41					
252.88							266.88	381.69	1433	81.28	2.39					
253.00							267.00	381.81	1433	81.3	2.38					
253.13							267.13	381.94	1433	81.32	2.36					
253.25							267.25	382.06	1433	81.34	2.34					
253.38							267.38	382.19	1433	81.36	2.35					
253.50							267.50	382.31	1433	81.38	2.40					
253.63							267.63	382.44	1433	81.4	2.33					
253.75							267.75	382.56	1433	81.42	2.31					
253.88							267.88	382.69	1433	81.43	2.34					
254.00							268.00	382.81	1433	81.46	2.30					
254.13							268.13	382.94	1433	81.48	2.27					
254.25							268.25	383.06	1433	81.5	2.28					
254.38							268.38	383.19	1433	81.53	2.24					
254.50							268.50	383.31	1433	81.55	2.26					
254.63							268.63	383.44	1433	81.57	2.26					
254.75							268.75	383.56	1433	81.6	2.21					
254.88							268.88	383.69	1433	81.62	2.23					
255.00							269.00	383.81	1433	81.64	2.18					
255.13							269.13	383.94	1433	81.66	2.17					
255.25							269.25	384.06	1433	81.69	2.19					
255.38							269.38	384.19	1433	81.71	2.17					
255.50							269.50	384.31	1433	81.73	2.15					
255.63							269.63	384.44	1433	81.75	2.19					
255.75							269.75	384.56	1433	81.78	2.16					
255.88							269.88	384.69	1433	81.8	2.19					
256.00							270.00	384.81	1433	81.82	2.15					
256.13							270.13	384.94	1433	81.85	2.11					
256.25							270.25	385.06	1433	81.87	2.10					
256.38							270.38	385.19	1433	81.89	2.09					
256.50							270.50	385.31	1433	81.92	2.10					
256.63							270.63	385.44	1433	81.93	2.11					
256.75							270.75	385.56	1433	81.96	2.10					
256.88							270.88	385.69	1433	81.99	2.10					
257.00							271.00	385.81	1433	82.01	2.08					
257.13							271.13	385.94	1433	82.03	2.07					

Reduced Data Set
Step Rate Test - October 31, 2008
La Paloma Generating Company
UIC Well WD-3

SRT ELAPSED TIME	Step Number	Step Duration	Elapsed Time (min)	Pressure 1 (psi)	Disch Rate (bpm)	Disch Rate (bpD)	Time Sync to EOT	TIME (min)	PRES (psi)	TEMP (F)	Delta P	Cum Injection Vol (bbl)	(Pi-Pwf)/Qn	Odeh Jones Time Radial	Test Hours	O&J
257.25							271.25	386.06	1433	82.06	2.07					
257.38							271.38	386.19	1433	82.09	2.02					
257.51							271.51	386.32	1433	82.1	2.06					
257.63							271.63	386.44	1433	82.13	2.07					
257.76							271.76	386.57	1433	82.16	2.04					
257.77							271.77	386.58	1433	82.16	2.04					
257.79							271.79	386.6	1433	82.16	2.04					

La Paloma Generating Plant
La Paloma Generating Company, LLC

POB175 (Mail)
1760 W. Skyline Road (Deliveries)
McKittrick, CA 93251

661.762.6000
661.762.6041 Fax

March 5, 2009

USEPA, Region IX
Water Division
Attn: Mr. Adam Freedman
Ground Water Office (Mail Code WTR-9)
75 Hawthorne Street
San Francisco, CA 94105-3901

Subject: Step Rate Test Addendum Report
UIC Permit No. CA10710001: Well WD-3

Dear Mr. Freedman,

La Paloma Generating Company, LLC submits the attached Addendum to the Step Rate Test (SRT) Report for UIC Well WD-3. The SRT conducted on October 31, 2008 was designed and analyzed in accordance with Society of Petroleum Engineering (SPE) Paper No. 16798 and UIC Permit No. CA10710001. This addendum is being submitted in response to recent discussions between USEPA and URS regarding the SRT Report submitted on January 26, 2009. The attached addendum presents revised operating surface pressures and downhole pressure calculations. Additionally, an approach is presented for evaluation of formation dynamics and performance of a SRT as downhole injection pressures increase.

La Paloma Generating Company, LLC proposes a maximum downhole injection pressure of 2,222 psi (equivalent to maximum surface injection pressure of 408 psi), and a permitted injection rate of 8-9 bbls/min. The maximum downhole injection pressure of 2,222 psi may be exceeded with USEPA approval, if evaluations indicate that formation parting pressure is not imminent.

Please call Bill O'Braitis at 909.942.4114, Zenis Walley at 661.762.6003, or me at 661.762.6047 if there are any questions.

Sincerely,

Nick Park
Plant Manager
La Paloma Generating Plant

cc: w/ attachment Z. Walley P. Oseguera M. Wooten W.Riley
M. Fitzgerald (URS) B. O'Braitis (URS) D. Thompson (SJEC)
D. Patterson (CRWQCB) R.Thesken/R.Adams (DOGGR)
M. Dyas (CEC MS-2000)
w/o attachment T. Romesberg

File No. 704.04.08

Injection Pressure Evaluation

Operational pressures are anticipated to rise as the well transitions from depleted to recharged. The initial proposed wellhead injection operating pressure is 100 psi with a transient peak startup pressure of 220 psi. To monitor this pressure transition and to evaluate when the formation is behaving according to Darcy assumptions, the injection pressures for the well will be evaluated as they increase in 100 psi increments. As the surface injection pressures approach each 100 psi increment, USEPA will be notified and the injection pressure buildup curve will be evaluated. Shortly after initial notification of threshold approach, a brief evaluation report will be submitted to USEPA. This report will include an electronic data file containing the wellhead surface data (including pressure, temperature, and flow rate data). Following evaluation, the operating wellhead pressures will be permitted to approach the conservative case 80% calculated formation parting pressure (FPP). An additional Step Rate Test will be performed when the well is exhibiting Darcy conditions and 1) injection pressures indicate that FFP is imminent, or 2) when the surface injection pressure reaches 770 psi.

Maximum Downhole Injection Pressure

A maximum downhole injection pressure of 2,222 psi for well WD-3 is proposed. This is based on a depth of 4,340 ft for top of injection zone. The conservative case FPP calculation uses a fracture gradient of 0.64 psi/ft, well injection liner friction losses based on an injection rate of 8 bbl/min, and full water column formation pressure (weight of the injection water). The maximum downhole injection pressure is equivalent to a wellhead surface injection pressure of 408 psi at an injection rate of 8 bbl/min.

The proposed maximum downhole injection pressure of 2,222 psi is 80% of the calculated maximum downhole pressure:

• 80% maximum top of formation pressure (calculated using a fracture pressure gradient of 0.64 psi/ft at 4,340 ft)	2,777.60 X 80% = 2,222.08 psi +2,222.08 psi
• friction losses, 4330 ft of 4.804 inch I.D. and 10 ft of 2.992 inch I.D.	+64.47 psi
• formation static pressure at 4,340 ft.	-1,878.79 psi
• Operational surface pressure	407.76 psi

This value is based on a conservative fracture pressure gradient because FPP was not achieved during the SRT:

- Top of injection zone: 4,340 ft
- Calculated top of formation FPP (conservative case estimate): 2,778 psi
- FPP at wellhead surface: 963 psi
- 80% of wellhead surface FPP: 770 psi. This will be the trigger point for additional Step Rate Testing (providing the well is exhibiting Darcy conditions)
- Maximum operating downhole pressure, top of injection zone (80% of calculated FPP): 2,222 psi
- Maximum operating wellhead pressure (80% of top of formation FPP): 408 psi
- Injection liner friction losses at 8 bbl/min: 64 psi
- Anticipated injection water weight: 0.433 psi/ft