COPPER EAGLE 1-24 SUNCOR
SW SW 24-2N-2W (909)

COUNTY MARICOPA AREA LUKE LEASE NO. N/A

WELL NAME COPPER EAGLE GAS STORAGE LLC #1-24 SUNCOR DEVELOPMENT CO

LOCATION SW SW SEC 24 TWP 2N RANGE 2W FOOTAGE 330 FSL 330 FWL

ELEV 1064' GR _____ KB SPUD DATE _____ STATUS _____ COMP. DATE _____ TOTAL DEPTH 6052'

TA 3-7-02

CONTRACTOR NABORS DRILLING USA INC

CASING	IZE	DEPTH	CEMENT	LINER SIZE & DEPTH

DRILLED BY ROTARY _____

DRILLED BY CABLE TOOL _____

PRODUCTIVE RESERVOIR _____

INITIAL PRODUCTION _____

FORMATION TOPS	DEPTHS	SOURCE L.L.	SOURCE E.L.	REMARKS

ELECTRIC LOGS	PERFORATED INTERVALS	PROD. INTERVALS

SAMPLE LOG _____
SAMPLE DESCRP. _____
SAMPLE NO. _____
CORE ANALYSIS _____
DSTs _____

REMARKS _____

APP. TO PLUG _____
PLUGGING REP. _____
COMP. REPORT _____

WATER WELL ACCEPTED BY _____

BOND CO. CONTINENTAL CASUALTY COMPANY BOND NO. 929224112 DATE 10-31-01

BOND AMT. $ 10,000.00 CANCELLED _____ ORGANIZATION REPORT YES - 10/31/01

FILING RECEIPT 3111 LOC. PLAT YES WELL BOOK YES PLAT BOOK YES

API NO. 02-013-20027 DATE ISSUED 10/31/01 DEDICATION N/A - STRAT TEST

PERMIT NUMBER 909

(over)

SUNDRY NOTICES AND REPORTS ON WELLS

1. Name of Operator: Copper Eagle Gas Storage LLC
2. OIL WELL ☐ GAS WELL ☐ OTHER ☒ (Specify) Stratigraphic Test
3. Well Name: Suncor Development #1-24
   Location: 330 ft FWL & 330 ft FSL Sec 24 T-2N R-2W
   Sec. 24 Twp. 2N Rge. 2W County Maricopa, Arizona
4. Federal, State, or Indian Lease Number, or lessor's name if fee lease
   State Permit # 909
5. Field or Pool Name: Wildcat Luke/Glendale
6. Check Appropriate Box to Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	WEEKLY PROGRESS	☐
FRACTURE TREAT	☐	DIRECTIONAL DRILL	☐	FRACTURE TREATMENT	☐	REPAIRING WELL	☐
SHOOT OR ACIDIZE	☐	PERFORATE CASING	☐	SHOOTING OR ACIDIZING	☐	ALTER CASING	☐
REPAIR WELL	☐	CHANGE PLANS	☐			ABANDONMENT	☐
(OTHER)			☐	(OTHER) Temporary Abandonment			☒

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log, Form 4)

7. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.

1. Set 13 3/8" CIBP @ 3025' - Tagged
2. Spot 35 sacks Class H cement + 2% $CaCl_2$
   - mixed @ 16 ppg
3. Install dry hole tree.
   a. A blind flange w/ needle valve

8. I hereby certify that the foregoing is true and correct.

Signed [signature] Title Drilling Engineer Date 3-7-02

Permit No. 909

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Sundry Notice and Reports On Wells
File One Copy
Form No. 25

5/96

END OF WELL REPORT

COPPER EAGLE GAS STORAGE, LLC

SUNCOR DEVELOPMENT #1- 24
Luke Glendale Field
Maricopa County, AZ.

909

API# 02-013-20027

ARIZONA PERMIT #00909

OPERATOR: BRAMMER ENGINEERING
Shreveport, LA

By

Yousif Ahmed
Peter Weseman
Alan Wright
Daron Warkentin

Epoch Well Services, Inc.
New Iberia, LA

EPOCH

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1.0 Introduction

Suncor Development #1-24 was a wildcat well drilled for potential use as a way to dispose of brine associated with the development of several EPA Class III solution wells. The spud date for the Copper Eagle Gas Storage project was December 22, 2001.

The two primary goals of this well were:

1. Operational: To locate and characterize adequate and acceptable confining and injection zones.
2. Permitting: To characterize the hydrogeology of the upper, confining, and injection zones to the satisfaction of the regulatory agencies that must issue permits for the project.

All regulations set by the United States Environmental Protection Agency, the Arizona Department of Environmental Quality, and the Arizona Oil and Gas Conservation Commission were met or exceeded.

On December 20, 2001, Epoch Well Services Unit #23 was installed for use on the Copper Eagle Gas Storage wildcat project at the corner of Cotton Road and Indian School Road in section 24 – 2 North, 2 West. Mud logging commenced at a depth of 80 feet on December 22, 2001.

One wet cuttings sample and two dried samples were taken every 10 feet and shipped to the Oil and Gas Administrator of the Arizona Geological Survey. A chloride measurement was taken approximately every 20 feet, and hydrogen sulfide was continuously monitored along with all other typical functions of a mud logger.

Personnel:

Epoch:

Yousif Ahmed
Peter Weseman
Allan Wright
Daron Warkentin

Brammer Engineering:

Company Man: Charles Tucker
Drilling Engineer: Jim Lingafelter

2.0 Well Prognosis

1. Drill Rat Hole, set 80' of 24" conductor pipe.
2. Drill 12 1/4" hole to 3060' or 200' into the salt or a major chloride increase. Pull out of hole and pick up Smith Services 16" Hole Opener and open the hole to TD at 3060'.
   Note: This well will be drilled very near fresh water wells and it is imperative that all measures are taken to insure that the drilling fluids do not impact the fresh water zones.
3. Circulate and condition the hole and run electric logs including VSP.
4. Run 13 3/8" surface casing to 3060' and cement to the surface. Wait on cement for six hours before cutting pipe.
5. Nipple Up 13 5/8" 3000# X 13 3/8" SOW casing head. Nipple up 13 3/8' 5000 psi BOP's. Test rams and valves to 250 psi/ 5000 psi. Test annular to 250 psi/ 3000 psi.
6. Run Cement Bond Log (CBL).
7. Install wear bushing in casing head before drilling out surface casing.
8. Pick up 12 ¼" bit and bottom hole assembly (BHA). Test casing to 1000 psi. Drill FC and 20' of cement. Retest casing. Drill shoe and five feet of formation. Test casing shoe to leak off (estimated mud weight not to exceed 13 ppg). Squeeze and retest if necessary.
9. Change over Salt- saturated mud system and drill to 5730' or 50' into the Valley Fill Formation. Use mud motor and MWD survey to keep hole straight. Rig up all necessary hydrogen sulfide equipment before drilling out of the salt section.
10. Pull out of hole and run 9 5/8" casing to 5730' and cement to surface. Wait on cement for six hours before cutting pipe.
11. Nipple up 13 5/8" 3000 X 11" 5000# casing head. Nipple up 13 5/8" 5000 psi BOP's. Test rams and valves to 250 psi/ 5000 psi. Test annular to 250 psi/ 3000 psi.
12. Drill and core 8 ½" hole to Total Depth (TD) +/- 6940'.
13. Condition the hole and run electric logs including VSP.
14. Rig up and run Drill Stem Test (DST) to recover fluids from the open hole zone. Store recovered formation fluid in sealed plastic drums fro transport to laboratory.
15. Trip in hole and set retrievable packer at +/- 5800'. Inject filtered brine into open hole according to injection procedure. Record all pressures and rates.
16. Prepare to Plug and Abandon (P and A) well per Arizona State Oil and Gas regulations.

DRILLING SPECIFICATIONS

1. Run appropriate Bottom Hole Assembly. Discuss with Operations Supervisor.
2. Two TIW and one inside Gray BOP safety valves of appropriate sizes to be in open position on rig floor at all times.
3. Inspect, measure, and caliper all subsurface drilling tools prior to running in hole.
4. Design drill strings for 100,000# over pull and ensure that recommended torque valves along with proper makeup procedures are used.

5. Minimize casing wear by using smooth hard band or non-hard banded drill strings inside casing. Use DP rubbers (one every other joint) inside all casing strings.
6. Optimize hydraulics.
7. One of the objectives of this well is to detect and record the depths of all shallow fresh water zones, which may require drilling slightly under-balanced.
8. Record low pump pressures and rates each tower.
9. Insure that safety meetings are conducted daily with each crew.
10. Install hydrogen sulfide (H_2S) equipment 1000' before drilling the bottom of the salt. Train all Rig Personnel and provide H_2S equipment.

3.0 Summary of Daily Activities:

December 20, 2001:
Rig up rig floor, lines and set up pipe bins. Rig up lights around the rig.

December 21, 2001:
Drill rat hole (81'). Lay down heavy weight and 12 ¼". Install conductor. Mix up spud mud, pick up 10" drill collars and BHA.

December 22, 2001:
Spud well, drilling to 146'. Continued drilling to 642'.

December 23, 2001:
Drilling from 642' to 1077'. Took a survey at 1047'. Continued drilling to 1325'. Unplug air line to low drum. Drill from 1325' to 1574'. Survey at 1574' (1/4 DEG). Continued drilling to 2074'. Circulate and take a survey at 2074'. Resurvey and lubricate rig.

December 24, 2001:
Drilling from 2074' to 2603'. Circulate and take a survey at 2603' (1/2 DEG). Drilling from 2603' to 2793'.

December 25, 2001:
Drill to 2933'. Lost 400 PSI and 23000 weight. Pull out of hole (wet). Left in hole bit, hole opener, X- O, 3- 10" Drill collars, X-O, 2- 8" Drill collars, box twisted off. Wait on fishing tools. Pick up fishing tools, mix mud and trip in hole to 518'. Tight hole, pull out of hole. Repair mud pit.

December 26, 2001:
Trip in hole, could not get past 518'. Pull out of hole. Unplug over-shots jars. Redress to 11 ¾" Guide.

December 27, 2001:
Make up bit, bit sub, X-O and trip in hole to 447.02'. Attempt to circulate, no returns. Lost 76 barrels. Mix Lost Circulation Material and condition the mud; by pass the shakers. Run in hole to 2777' and circulate. Pull out of hole. Pick up fishing tools and trip in hole; circulate and work over fish and jar. Jar on fish.

December 28, 2001:
Jar on fish. Service rig; safety meeting with logger. Rig down logger and unscrew fish. Pull out of hole; down fishing tools; wash pipes; make up jars and BHA.

December 29, 2001:
Run in hole to 1000', circulate continue running in hole to 2777', top fish. Wash over top of fish, wash over fish to 2930'. Circulate and pull out of hole; down jars.

December 30, 2001:
Rig up to down 11 ¾"; wash pipe, down wash pipe. Make up fishing tool and BHA; Run in hole. Work over fish. Pull fish free, circulate and pull out of hole wet. No fish. Rig Down over shot. Make up fishing tool and run in hole. Work over fish. Pull out of hole with fish. Lay down fishing tools and 8" Drill Collar, break 12 ¼" and 16" hole opener. Replace cutters on opener and make up a new 12 ¼" bit and 16" hole opener. Make up Drill collars and run in hole.

December 31, 2001:
Run in hole to 1700' Ream from 1600' to 1700'. Run in hole to 2933'. Resume drilling from 2933'. Lost some mud. Add Lost Circulation Material. Drill to 3039'.

January 1, 2002:
Condition mud and add Lost Circulation material. Continue drilling from 3039' to 3045'. Circulate and pull out of hole for new bit # 3. Run in hole with bit # 3 (12 ¼") without the 16" hole opener.

January 2, 2001:
Continued drilling and survey from 3126' to 3376'.

January 3, 2001:
Continued drilling from 3376' to 3504'. Circulated bottoms up and pull out of hole to run in with the 16" hole opener.

January 4, 2002:
Run in hole with 16" hole opener and mud motor to open the hole from 3045' to 3504'.

January 5, 2002 – January 9, 2002:
Run E-logs and set casing. Epoch personnel put on standby.

January 10, 2002:
Start drilling from 3504' to 3659'. Slide drilling from 3509' to 3540'; rotate drilling from 3540' to 3607'; slide drilling from 3607' to 3659'. MWD failed, circulated and pulled out of hole. Cleaned mud tank and adjusted mud motor. Installed new probe and tested MWD. Ran in hole to 2908'. Slip and cut 100' of drilling line. Run in hole to 3659. Orient tools and drill from 3659' to 3680'.

January 11, 2002:
Continued drilling from 3680' to 4029'. Rotate drilling from 3680' to 3700'; slide drilling from 3700' to 3983'; rotate drilling from 3983' to 4029'.

January 12. 2002:
Drilled from 4029' to 4098'. Circulate bottoms up and pull out of hole wet. Pick up new bit # 4 RR (FDSS+G, SN: MG 5911), test MWD tool and run in hole. Continued rotate drilling to 4172'.

January 13, 2002:
Continued drilling from 4172' to 4774'. Rotate drilling from 4172' to 4208'; slide drilling from 4208' to 4270'; rotate drilling from 4270' to 4582'; slide drilling from 4582' to 4652'; rotate drilling from 4652' to 4717'; slide drilling from 4717' to 4774'.

January 14, 2002:
Drilling ahead from 4774' to 5255'. Slide drilling from 4910' to 5165'.

January 15,2002:
Continued drilling ahead from 5255' to 5373', slide drilling from 5291' to 5342'. Circulate bottoms up and pull out of hole. Waiting on core bit and core barrel.

January 16, 2002:
Pick up core bit and 60-ft core barrel and run in hole. Cut core #1 from 5373' to 5377'; recovered two feet (50% recovery). Lay down the 60-ft core barrel and pick up 30-ft core barrel; run in hole.

January 17, 2002:
Continued running in hole to 5375' and circulate; continued running in hole to 5377' and cut core #2 from 5377' to 5383'; recovered less than half foot of broken small pieces. Pick up new bit #5 (8 ½") and run in hole. Drill to 5405'.

January 18, 2002:
Continued drilling to 5567' and pulled out of hole. Lay down bit #5 and make up new bit #6 (8 ½"), pick up mud motor and survey tool and run in hole. Continued drilling from 5567' to 5594'. Slide drilling from 5579' to 5594'.

January 19, 2002:
Continued drilling from 5594' to 5874'. Slide drilling from 5594' to 5608', 5634' to 5643', 5674' to 5679', and from 5739' to 5759'.

January 20, 2002:
Continued drilling ahead from 5874' to total depth of 6052'.

4.0 Lithological Summary

80'-140'
Sand: clear, light red, reddish yellow, opaque and occasionally milky; very course to course grained; angular to sub angular; poorly sorted; trace red claystone and volcanics.

140'-210'
Sand: reddish yellow; clear; grading to hard calcareous and siliceous sandstone; trace red claystone with trace plant root.
Clay/ Claystone: red to brownish red; soft to moderately hard; sub blocky; non calcareous.

210'-300'
Sand: reddish yellow to translucent, clear; coarse to medium grain, some very coarse; angular to sub angular; poorly to moderately sorted; some dark volcanics.
Conglomerate sand: moderate brown, dusky red to medium dark gray; very coarse to medium grain; angular; poorly sorted; some igneous and tuff rock fragments.

300'-440'
Sand: translucent, clear to light brown; coarse to medium grain; angular to sub rounded; moderate to low sphericity; poorly to moderately sorted; predominantly quartz, some mica and igneous rock fragments.
Clay/ Claystone: reddish brown to brown, orange; mushy to tacky; smooth to silty texture; abundant black organic specks; dull earthy luster; no bedding observed; earthy fracture; moderately well hydrated; silty; grades to sand and gravel.

440'-760'
Sand: translucent, clear to light brown; coarse to medium grain; angular to sub rounded; moderate to low sphericity; poorly to moderately sorted; predominantly quartz, some mica and igneous rock fragments.
Sandstone: reddish brown to grayish red; fine to course grain; sub angular to sub rounded; fairly to poorly sorted; dominantly with argillaceous matrix; argillaceous and minor calcareous cement; massive with trace carbonaceous material; fair visual porosity.
Claystone: brownish red to grayish red; soft to moderately hard; massive cuttings habit; partially dispersive; occasionally with floating sand grains; slightly to non calcareous; trace plant roots; trace mica.

760'-1050'
Claystone: red to brick red, occasionally yellowish red to reddish orange; soft; partially dispersive; sticky; dominantly massive; locally becoming silty and grading to siltstone; micromicaceous; locally slightly to moderately calcareous; trace medium to fine sand.
Siltstone: grayish red to yellowish red to pale red; soft; blocky with irregular fractures; massive; slightly to non calcareous, locally moderately calcareous; occasionally grading to fine-medium grain calcareous sandstone; trace mica; trace carbonaceous material.

1050'-1510'
Anhydrite: clear, translucent, occasionally opaque, white; medium large crystals; soft; brittle; blocky with irregular fractures.
Claystone: red to reddish orange; soft to moderately firm; occasionally dispersive; blocky; massive; slightly to moderately calcareous; locally grading to siltstone.
Carbonaceous material: black to very dark gray; friable to slightly hard; crunchy to flexible; abundant with clay; thin platy sheets to specks; apparent random orientation; probable plant material.

1510'-1950'
Sandstone: white to pale orange-yellow with abundant black specks; predominantly quartz with feldspar and lithics; medium to coarse grain; angular to sub rounded; poorly sorted; hard; moderately to well cemented; calcite cement; grain supported with clay to no matrix; locally abundant mica grains, indicating metamorphic source rock; grades to calcareous clay with marl and anhydrite interbeds; lithic mafic fragments; occasional schist fragments.
Sand: white to clear; very coarse to fine grain, some pebbles; angular to sub rounded; moderately high to low sphericity; poorly sorted; predominantly quartz grains; trace glauconite; predominantly unconsolidated.
Clay/ claystone: pale red to medium tan; soft and mushy to tacky; trace black carbonaceous material; smooth to occasional silty texture; dull earthy luster; slightly to moderately calcareous.

1950'-2151'
Sand: light yellow to yellow pink, smoky, opaque, occasionally white, pinkish red and clear; very coarse to medium grain, dominantly very coarse, trace pebbly; angular to sub rounded; predominantly angular; moderately high to low sphericity; fairly to poorly sorted; predominantly quartz grains, trace lithic igneous rock fragments; trace pyroclastics; unconsolidated; trace reddish pink claystone.

2151'-2330'
Sandstone: off white; light pink; medium to very fine grain; friable to moderately hard; sub angular to sub rounded; fairly sorted; argillaceous and arenaceous matrix; fair to good visible porosity.
Sand: pale yellow, light pink, milky opaque and smoky; pebbly to medium grain, dominantly very coarse; angular to sub angular; frequently with abundant metamorphic and igneous rock fragments; locally grading to medium grain sandstone.

2330'-2770'
Sand: white to clear, black; very coarse to medium grain, predominantly coarse; angular to sub rounded; poorly sorted; predominantly quartz with igneous rock fragments.
Sandstone: clear to white; fine to coarse grain; angular to sub rounded; moderately high sphericity; moderately sorted; hard to firm friable; silica cemented; some igneous rock fragments.
Clay/ claystone: brick red to reddish brown to medium red; soft and mushy to slightly hard; massive to smooth to occasional silty texture; occasional embedded sand grains;

dull earthy luster, rare black specks, organic material; mostly dispersive; rare anhydrite tracers; slightly to moderately calcareous.

2770'-2933'
Sand: translucent to opaque, pale pink; pebbles to medium grain, predominantly very coarse; angular to sub rounded, predominantly angular; poorly sorted; quartz grains with black minerals and occasionally show polished surfaces (slickenside?), dominantly as a breccia.
Sand/ breccia: white to clear, black; very coarse to medium grain, some pebbles (1 – 10mm); angular to sub angular; poorly sorted; quartz grains with 10 to 30% interlocking quartz and black minerals grains.

2933'-3660'
Sand: clear, translucent to opaque, off white; very coarse to medium grain; angular to sub rounded, dominantly sub angular to angular; moderately sorted; frequently with hornblende and feldspar interlocks.
Sand/ granite wash/ volcanics and metamorphic rock fragments: abundant granitic rock with some volcanics and metamorphic; dominantly white to clear, black; very coarse to pebbles; angular to sub angular, some of the igneous rocks are sub angular to rounded; poorly sorted; some with kaolin coatings.
Granite wash/ conglomerate/ sand: a mixture of granitic, dioritic and volcanic rock fragments; dominantly white to clear, black; very coarse to pebbles; sub angular to sub rounded; poorly sorted; occasionally with weathered surface; occasionally with kaolin and partially altered feldspar grains; occasionally as silica sandstone with zero visible porosity; trace claystone.

3660'-3810'
Sand/kaolinite/rock fragments: pale reddish yellow to pale pinkish yellow, opaque; very coarse to medium grain; angular to rounded, dominantly sub angular; low to moderate high sphericity; moderately sorted; some rock fragments; trace to 20% white, soft kaolinite.
Claystone: pinkish red to pale red; soft; dominantly dispersive; occasionally coating quartz with red stain; massive; earthy luster; slightly calcareous; 10 to 20% kaolinite.

3810'-3960'
Claystone: grayish red to moderately brown; soft, mushy; dominantly dispersive; occasionally coating quartz with red stain; massive; earthy luster; slightly to very hydrated; slightly to moderately calcareous; grading to siltstone in part.
Sand: clear, translucent to opaque; fine to coarse grain; sub rounded; moderately to high sphericity; fairly sorted; unconsolidated; trace to 20% kaolinite.

3960'-4250'
Claystone: brick red, orange red; soft, mushy; partially dispersive; amorphous with occasional siltstone and kaolinite micro bedding; locally silty and grades into siltstone; non calcareous.

Sandstone: grayish brown, medium dark gray; fine to medium grain; rounded to sub angular; friable to moderately hard; moderate sphericity; argillaceous cement and locally calcareous; poor visible porosity; trace carbonaceous material; dominantly as silty sandstone and grades to siltstone.
Sand: opaque, clear to translucent; fine to very coarse grain; angular to sub rounded; low to moderately sphericity; poor sorted; unconsolidated; trace kaolinite.

4250'-4350'
Claystone: brownish red to reddish brown; soft; mushy; partially dispersive; moderately to well hydrated; amorphous; grades to siltstone; moderately calcareous; trace to 20% white, soft anhydrite; trace kaolinite.

4350'-4652'
Claystone: brick red to reddish gray to moderate brown; soft to firm; mushy to sticky; sub blocky when gray, sticky when red; silty to silty-gritty texture; dominantly as massive claystone; locally with alternating siltstone and sandstone microbeds; micromicaceous; non to slightly calcareous; trace carbonaceous material, occasional trace kaolinite.

4652'-4778'
Sandstone: light gray, brownish and reddish gray; very fine to medium grain; sub angular to sub rounded; fairly to well sorted; dominantly as matrix support sandstone; dominant argillaceous cement; locally slightly to moderately calcareous; dominantly as dirty sandstone with abundant mica and trace carbonaceous material.
Claystone: light gray, reddish gray, brownish gray; soft to moderately hard; irregular fracture; sub blocky; silty texture; frequently grades to light gray siltstone.

4778'-4980'
Siltstone: light gray, reddish gray; brittle; micromicaceous; locally moderately calcareous; trace carbonaceous material.
Claystone: moderate brown to reddish brown; soft to moderately hard; irregular fracture; sub blocky; silty texture; locally grading siltstone.

4980'-5340'
Siltstone: reddish gray, occasionally light gray; moderately firm to firm; brittle; abundant micromicaceous; smooth to slightly gritty texture; moderately calcareous; abundant carbonaceous material; trace to 20% anhydrite.
Salt: clear, opaque, gray to dark gray; occasionally mixed with other minerals and impurities; occurs as crystals when clear and pure.
Claystone: reddish gray, brownish gray; soft; sub blocky; massive, occasionally grading to salt rich claystone; 10% to trace salt.
Sand: clear, translucent, opaque, pale red; medium to coarse grained; sub rounded.

5340'-5372'
Granite wash/ Sand: white to olive, green gray, translucent to opaque; medium grain to pebbles; dominantly very coarse; angular to sub angular, dominantly angular; low to mod sphericity; top of diorite.

5372'-5377'
Diorite/ greenstone: Dark to light greenish black, light gray to very light gray, gray pink to moderate orange pink, black, predominately dark greenish black; dominantly basic; very hard, dense; unweathered; metamorphic, appears gneissic, some basaltic; interlocking very fine to medium grain crystals; slightly to moderately fractured; up to two inch quartz and calcite veins; some chlorite; trace micro-pyrite; trace magnetite; rare mica.

5377'-5383'
Volcanic/ basalt: Black, green black; very fine interlocking crystal grains; basaltic rock with micro quartz veins; trace calcite; trace pyrite; some iron oxides.

5383'-5520'
Basalt/ metamorphics: grayish black to greenish black to greenish gray; very fine to fine interlocking crystal grains; abundant quartz veins; abundant magnetite; trace calcite.

5520'-5725'
Quartz diorite: very light gray to gray black, some white and black; quartz grain material; very fine to medium; composition: 40% amphibole; 60% quartz and feldspar; trace mica; trace magnetite; trace kaolin.
Hornblende quartz diorite/metamorphics: dominantly dark black lustrous amphibolite with quartz clots; some quartz mica schist; trace biotite; trace quartz vein fragments; trace kaolin; trace pyrite; trace magnetite.
Metavolcanics: dark basaltic with diorite; with some weak foliation; trace biotite schist and amphibolites.

5725'-5780'
Quartz diorite: dark gray to white, black, dominantly medium dark gray to light gray; very fine to medium; composition: 40% amphibole, 60% quartz and feldspar; trace mica; trace magnetite.
Granodiorite: white to dark gray, black; very fine to medium; composition: 50% feldspar, 30% amphibole, 20% quartz; trace mica; trace magnetite.

5780'-6052'
Hornblende quartz diorite: dominantly dark black lustrous amphibolite with trace to minor quartz; black resinous luster; hornblende usually with preferred orientation; medium grain; jagged, angular cuttings; 60% amphibole, 40% feldspar and quartz; abundant magnetite; abundant chloritization; trace dark micas; some to moderate alteration of feldspars; trace pyrite; grades to quartz dominant rock with accessory biotite hornblende.

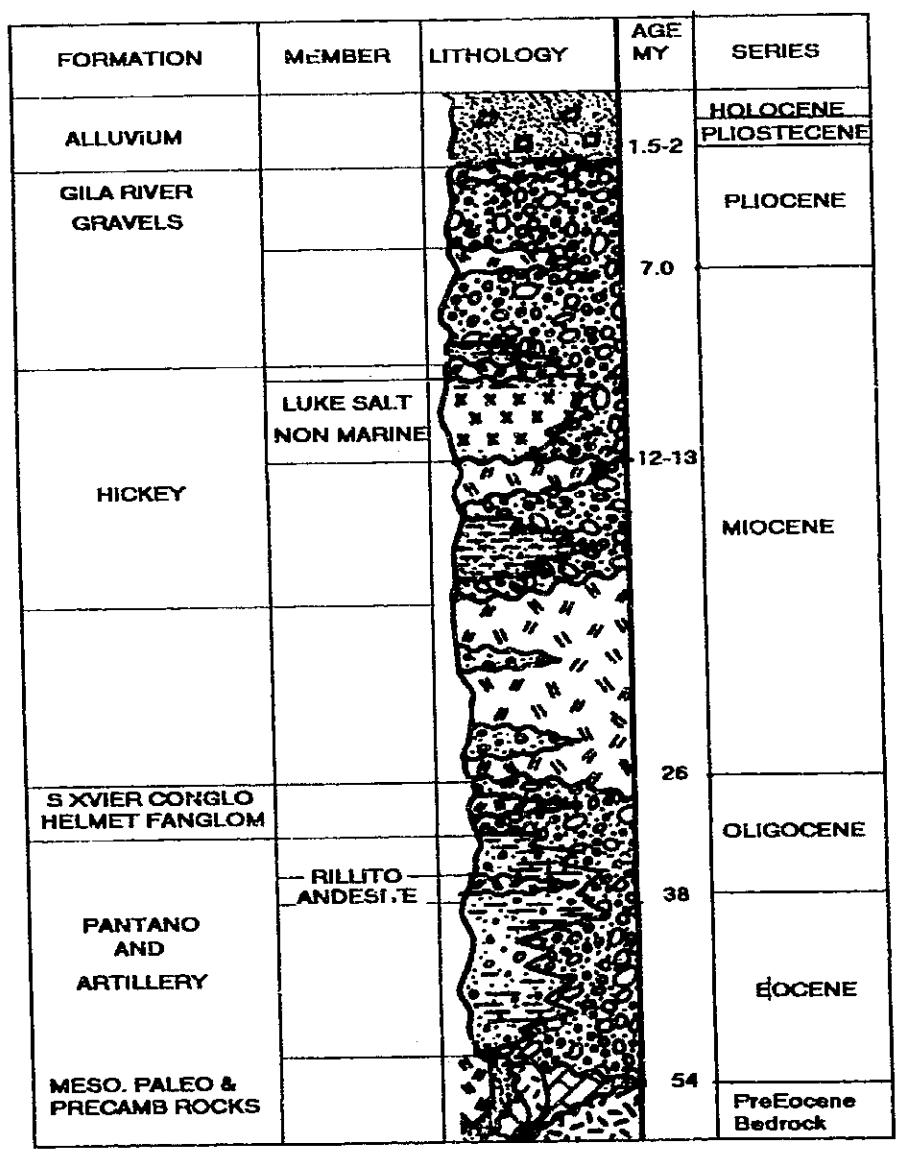
Chloritization: greenish gray; alteration of hornblende diorite; with associated alteration of feldspar (kaolin).
Metamorphics= quartz mica schist; trace garnet with shredded biotite or chlorite and hornblende; trace pyrite; strong linear fabric; trace vein quartz; with amphibole/ hornblende gneiss and hornblende diorite; strong kaolinization of feldspars.

5.0 Core Description

DEPTH	CORE#	RECOVERY	ROCK TYPE	REMARKS
5373'	1	50%	IGNEOUS	Dark green solid basic rock;
5374'				fine; mostly of mafic minerals
5375'				with some well developed qtz
5376'				and calcite veins. (diorite)
5377'	2	7%	VOLCANICS	Black, green black; fine
5378'				basaltic rock; with micro
5379'				qtz veins; tr calcite; pyrite
5380'				and some iron oxides.
5381'				
5382'				
5383'				

Geologists: *Yousif Ahmed; Peter Weseman*
Note: *Core #1 (5373' – 5377'); recovered 2 ft.*
Core #2 (5377' – 5383'); recovered less than half ft.

6.0 Stratigraph of Southwestern Arizona

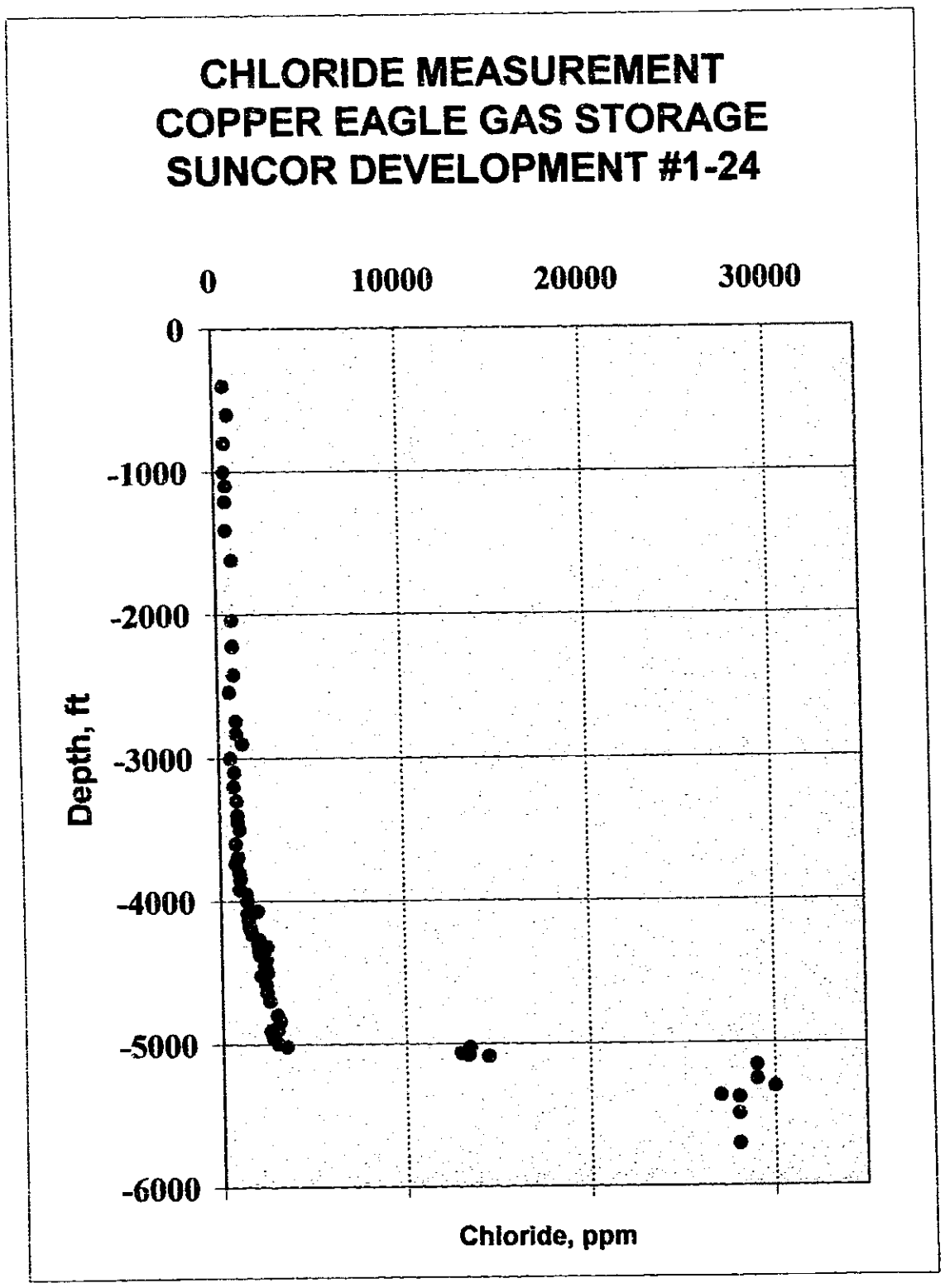


Composite stratigraphic column of southwestern Arizona. Modified after Eberly and Stanley (1978).

7.0 Chlorides

Depth, ft	Chlorides, ppm	Depth, ft	Chlorides, ppm	Depth, ft	Chlorides, ppm
400	400	**3850**	1090	**4890**	2950
600	800	**3920**	1050	**4900**	3000
800	600	**3950**	1400	**4910**	2620
1000	550	**4000**	1450	**4930**	2820
1100	650	**4070**	2000	**4960**	2750
1210	600	**4090**	1450	**5000**	3050
1410	600	**4130**	1500	**5020**	3500
1620	900	**4172**	1550	**5030**	13500
2040	850	**4190**	1600	**5070**	13000
2220	850	**4240**	1720	**5080**	13400
2420	900	**4270**	2050	**5090**	14500
2540	640	**4300**	2000	**5160**	29000
2740	1000	**4320**	2500	**5260**	29000
2830	1000	**4330**	2250	**5310**	30000
2900	1300	**4350**	2050	**5373**	27000
3000	650	**4380**	2100	**5383**	28000
3100	850	**4410**	2450	**5500**	28000
3200	805	**4450**	2350	**5710**	28000
3300	950	**4480**	2450		
3400	1000	**4500**	2500		
3450	990	**4520**	2150		
3500	1100	**4580**	2400		
3600	880	**4640**	2450		
3690	1000	**4700**	2600		
3740	850	**4800**	3000		
3800	1050	**4840**	3150		

8.0 Chloride Chart



9.0 Survey Data

Depth, ft	Drift	Azimuth	Quadrant	TVD, ft
3050	1.62	183.28	S03.28W	3047.75
3146	1.60	175.50	S04.50E	3145.71
3263	1.30	166.80	S13.20E	3262.67
3353	1.70	160.10	S19.90E	3354.64
3449	2.00	155.70	S24.30E	3448.59
3551	2.30	161.70	S18.30E	3550.52
3647	3.10	165.90	S14.10E	3646.42
3740	3.50	169.20	S10.80E	3739.26
3835	2.40	177.60	S02.40E	3834.13
3897	1.70	168.30	S11.70E	3896.09
3992	0.70	99.60	S80.40E	3991.08
4090	1.10	72.50	N72.50E	4089.06
4184	1.40	65.20	N65.20E	4183.04
4278	0.40	5.00	N05.00E	4277.03
4374	0.60	336.90	N23.10W	4373.03
4470	0.90	319.70	N40.30W	4469.02
4566	1.40	242.90	N17.10W	4565.00
4662	1.20	6.40	N06.40E	4660.97
4759	0.80	28.20	N28.20E	4757.96
4854	1.50	37.40	N37.40E	4852.94
4950	1.50	38.10	N38.10E	4948.91
5044	1.10	353.80	N06.20W	5042.89
5139	0.70	294.70	N65.30W	5137.88
5235	1.30	276.10	N83.90W	5233.86
5318	0.80	267.00	S87.00W	5316.85
5481	1.50	201.60	S21.60W	5479.82
5586	1.80	231.40	S51.40W	5584.78
5681	0.80	251.80	S71.80W	5679.75
5776	1.00	85.20	N85.20E	5774.75
5872	1.00	85.50	N85.50E	5870.73
5967	0.30	55.00	N55.00E	5965.73
6009	0.40	45.80	N45.80E	6007.73
6052	0.40	42.00	N42.00E	6050.72

10.0 Bit Record

Bit #	Type	Serial #	Size	Depth in, ft	Depth out, ft	Footage	Hours	Average ft/hr
1	FDSS+C	MH 8428	12 ¼"	80	2933	2853	22	131
2	FDSS+C	MH 2128	12 ¼"	2933	3045	113	20	6
3	F57	LW 8259	12 ¼"	3045	4098	1053	130	8
4	FDSS-G	MG 5911	12 ¼"	4098	5373	1275	38	34
Core	C-201	032244	8 ½"	5373	5383	10	12	1
5	F5900	MK 0760	8 ½"	5383	5567	184	12	16
6	F590D	MK 0759	8 ½"	5567	6052	485	41	12

11.0 List of Collected Samples:

a- Washed and dried samples:

Two sets (A and B)

Box #	Interval
1	80- 500'
2	500 – 900'
3	900 – 1240'
4	1240 – 1700'
5	1700 – 2100'
6	2100 – 2600'
7	2600 – 3150'
8	3150 – 3650'
9	3650 – 4100'
10	4100 – 4500'
11	4500 – 5000'
12	5000 – 5400'
13	5400 – 5920'
14	5920 – 6050'

b- Unwashed Samples:

One set of unwashed samples has been collected; covering the interval from 80' to 6050'. Total of nineteen boxes.

c- Core Samples:

One box containing core #1 (5373- 5377') and core #2 (5377- 5383')

CEMENT JOB REPORT

CUSTOMER Brammer Engineering Inc	DATE 06-JAN-02	F.R. # 243810114	SERV. SUPV. Ernest Winer
LEASE & WELL NAME COPPER EAGLE-SUNCOR DEVELOPMENT # 1	LOCATION SEC 24 T2N R2W		COUNTY-PARISH-BLOCK Maricopa Arizona
DISTRICT Farmington	DRILLING CONTRACTOR RIG # NABOR 477		TYPE OF JOB Surface

SIZE & TYPE OF PLUGS	LIST-CSG-HARDWARE	SACKS OF CEMENT	SLURRY WGT PPG	SLURRY YLD FT³	WATER GPS	PUMP TIME HR:MIN	Bbl SLURRY	Bbl MIX WATER
Cement Plug, Rubber, Top 13-3/8 in	Float Collar, Al Flap, 13-3/8 - 8rd							
	Guide Shoe, Cement Nose 13-3/8 in							
MATERIALS FURNISHED BY BJ								
Mud Clean II			8.5				20	
Premium Lite High Strenght FM		390	12.5	2.06	11.01	02:50	143	102.23
Fresh Water			8.34				5	
Type III		100	14.5	1.45	6.96		25.83	16.58
Water			8.34				453.7	
Mud			8.7				0	
Premium Lite High Strenght FM		400	12.5	2.06	11.01	02:50	146.8	104.95
Available Mix Water 1672 Bbl.	Available Displ. Fluid 1382 Bbl.				TOTAL		794.33	223.76

HOLE SIZE	% EXCESS	DEPTH	TBG-CSG-D.P. SIZE	WGT.	TYPE	DEPTH	GRADE	COLLAR DEPTHS SHOE	FLOAT	STAGE
16	15	3075	13.375	68	CSG	3075	J-55	3075	3031	1207

LAST CASING SIZE	WGT	TYPE	DEPTH	PKR-CMT RET-BR PL-LINER BRAND & TYPE	DEPTH	PERF. DEPTH TOP	BTM	TOP CONN SIZE	THREAD	WELL FLUID TYPE	WGT.
24	100.5	CSG	99					13.375	BTC	WATER BASED MUD	9

DISPL. VOLUME VOLUME	UOM	DISPL. FLUID TYPE	WGT.	CAL. PSI BUMP PLUG	CAL. MAX PSI TO REV.	OP. MAX SQ. PSI	MAX TBG PSI RATED	Operator	MAX CSG PSI RATED	Operator	MIX WATER SOURCE
453.7	BBLS	Water	8.34	504	420	2500			3450	2760	Rig Tank
		Mud	8.7								

EXPLANATION: TROUBLE SETTING TOOL, RUNNING CSG, ETC. PRIOR TO CEMENTING: Logs are questionable. (Less volume than true hole). 38 hours loggi ngs and running casing. well conditions questionable

TIME HR:MIN.	PRESSURE - PSI PIPE	ANNULUS	RATE BPM	Bbl. FLUID PUMPED	FLUID TYPE	EXPLANATION
						SAFETY MEETING: BJ CREW [X] CO. REP. [X]
						TEST LINES 3500 PSI
						CIRCULATING WELL - RIG [X] BJ [ ]
06:00	3500				H20	Pressure Test Lines
06:10	675		6		MUD CLEAI	Start Mud Clean II
06:14	670		6	20	MUD CLEAI	Start H20
06:15	785		6	5	H20	Start Lead Cement @ 12.5 (390 sks)
06:39	485		6	143	CEMENT	Start Tail Cement @ 14.5 (100 sks)
06:44	0		0	26	CEMENT	Shut Down / Drop Plug / Wash Pumps and Lines
06:45	443		9	0	H20	Start Displacement
07:42	850		4	456	H20	Shut Down Check Float (Held) Plug didn't Bump
07:58	0		0	0	H20	Drop Bomb Wait 6 Minutes
08:10	650		6	0	H20	Open Tool and Resume Circulation (1 BBls. Cement Return) (2 bbls)
08:35	0		0	130	H20	Shut Down and Swap to Rig Pump Circulate to 1200
12:00	3500			0	H20	Pressure Test Lines
12:06	285		6	0	MUDCLEAN	Start Mud Clean II
12:11	152		5	20	MUDCLEAN	Start H20
12:12	395		7	5	H20	Start Lead Cement @ 12.5 (400 sks)
12:31	430		7	147	CEMENT	Start Tail Cement @ 14.5 (100 sks)
12:35	0		0	26	CEMENT	Shut Down / Drop Plug / Wash Pumps and Lines
12:50	190		8	0	H20	Start Displacement
13:22	450		3.5	181	H20	Shut Down Bump Plug to 1100 Psi
13:23						15 Bbls Returns (20 bbls)

Circ out 2 bbls cmt 1st stage / 20 bbl 2nd stage (SLR)

(WO STAGE CEMENT JOB (

Prepared for	Mr. Charles Tucker	Well name	Wildcat Injection
Contractor	Nabors # 477	Location	Goodyear Az.
Prepared by	Hal Winters	Legal Description	

1st. Stage PPG IN HOLE 8.8

PPG DISP. 8.34

2nd. Stage PPG IN HOLE 8.8

PPG DISP. 8.34

Csg. I.D. 19.124

Csg. @ 80

Open Hole Feet 2995.33

Diameter 16

1207.2

D.V. 2.80

1210

From Shoe to DV 1868.13

Csg 1818.24
I.D. 12.415
O.D. 13.375

3028.24

F.C. 1.80

3029.84

Shoe Jt. 44.1
I.D. 12.4

3073.93

F.S. 1.4

Csg. @ 3075.33

Hole Depth 3200

1st. Stage PPG IN HOLE

Spacers 1st. Stage

Ahead BBLS.	Mud Flush BBLS.	Behind BBLS.
20.00	20.00	20.00

CEMENT DATA 1st. Stage

WEIGHT /PPG	YIELD (ft3/sx)	H2O / SACK	EXCESS %	TOTAL FT3	TOTAL BBLS.	SACKS
13.5	1.74	8.72	40.00%	1140	203	655

ADDITIVES 1st. Stage

CEMENT	ADDITIVE #1	ADDITIVE #2	ADDITIVE #3	ADDITIVE #4	ADDITIVE #5
class "B"					0

ADDITIVE #6	ADDITIVE #7	ADDITIVE #8	ADDITIVE #9
0	0	0	0

Spacers 2nd Stage

Ahead BBLS.	Mud Flush BBLS.	Behind BBLS.
10.00		

CEMENT DATA 2nd Stage

WEIGHT /PPG	YIELD (ft3/sx)	H2O / SACK	EXCESS %	TOTAL FT3	TOTAL BBLS.	SACKS
11.4	3.04	18.27	40.00%	746	133	245

ADDITIVES 2nd. Stage

CEMENT	ADDITIVE #1	ADDITIVE #2	ADDITIVE #3	ADDITIVE #4	ADDITIVE #5
class "B"					0

ADDITIVE #6	ADDITIVE #7	ADDITIVE #8	ADDITIVE #9
0	0	0	0

CASING DATA 1st. Stage

JOB TYPE	CASING RAN O.D.	CASING RAN I.D.	CASING CAPACITY LENGTH (ft)	CASING CAPACITY BBLS.	CASING CAPACITY CUBIC FT	SHOE TRACK LENGTH (ft)	SHOE TRACK BBLS.	SHOE TRACK CUBIC FT.
1st. Stage	13.38	12.415	3075.33	460.47	2585.35	47.09	7.05	39.59

Annular Volumes 1st. Stage

OPEN HOLE / CASING LENGTH (ft)	BBLS.	CUBIC FT	To Stage Collar LENGTH (ft)	BBLS.	CUBIC FT	CASING / CASING LENGTH (ft)	BBLS.	CUBIC FT
2995.33	224.37	1259.78	1868.13	139.94	785.69	80	14.52	81.52

DISPLACEMENT LENGTH & HYDROSTATIC 1st. Stage

CASING FEET	SHOE TRACK	TOTAL INSIDE FEET	TOTAL OUTSIDE FEET
3028.24	47.09	3075.33	3075
HYDROSTATIC PSI	HYDROSTATIC PSI	HYDROSTATIC PSI	HYDROSTATIC PSI
1313.29	33.06	1346.34	2050.32

1 st. Stage JOB

1st. Stage Cement

TOTAL FT3	TOTAL BBLS.	SACKS	DISPLACEMENT BBLS.	DIFFERENTIAL PSI	ABOVE DV
1140	202.96	655	453	794	63

1st. Stage Water Requirements

Water Ahead	Mud Flush	Water Behind	Water Cmt.	Water Disp.	Water Clnz.	Total
20.00	20.00	20.00	134.87	453.43	6.56	648

Results

TIME START MIX		PSI AFTER BUMP	
TIME START PUMP		TIME HOLD PSI	
TIME START DISP.		FLOATS HOLDING	YES ☐ NO ☐
TIME BUMP PLUG		CEMENT TO SURF	
AVG. RATE		DIFFERENTIAL PSI	
MAX RATE		LOST CIRCULATION	YES ☐ NO ☐
FINAL RATE		END PUMP TIME	
FINAL PSI BEFORE		DISP. BBLS	

NOTES

Annular Volumes 2nd. Stage

OPEN HOLE / CASING		CASING / CASING

Weatherford Completions

Tally with BHA

Lease Name: Goodyear Az. **Well #:** _____ **Date:** 1/4/02 **Rig #:** 477

Pipe Size: 13 3/8 **Weight:** 68 #/ft **Grade:** K-55 **Type Joint:** Buttress **Make:** _____

NO.					
Botton Hole Assembly					
1	1.40	1.40	36	44.51	1534.75
			37	42.31	1577.06
2	1.60	3.00	38	37.79	1614.85
			39	44.20	1658.05
			40	40.94	1699.99
			41	37.76	1737.75
			42	43.96	1781.71
			43	39.56	1821.27
			44	41.25	1862.52
			ST	2.80	1865.32
			45	44.00	1909.32
			46	38.94	1948.26
			47	44.47	1992.73
			48	43.53	2036.26
			49	44.12	2080.38
			50	43.87	2124.25
			51	44.04	2168.29
			52	41.57	2209.86
			53	40.81	2250.67
			54	43.18	2293.85
Ttl.		3.00	55	44.20	2338.05
			56	43.89	2381.94
1	44.16	47.16	57	44.21	2426.15
2	40.00	87.16	58	44.05	2470.20
3	44.17	131.33	59	44.15	2514.35
4	43.32	174.65	60	44.15	2558.50
5	39.64	214.29	61	42.04	2600.54
6	38.91	253.20	62	41.85	2642.39
7	44.11	297.31	63	44.32	2686.71
8	42.71	340.02	64	42.16	2728.87
9	41.01	381.03	65	43.87	2772.74
10	38.46	419.49	66	43.74	2816.48
11	44.26	463.75	67	42.64	2859.12
12	44.44	508.19	68	40.12	2899.24
13	43.41	551.60	69	44.25	2943.49
14	40.00	591.60	70	44.45	2987.94
15	46.60	638.20	71	44.31	3032.25
16	43.71	681.91	72	43.08	3075.33
17	43.35	725.26			
18	43.21	768.47			
19	43.63	812.10			
20	40.50	852.60			
21	44.18	896.78			
22	43.96	940.74			
23	44.16	984.90			
24	40.82	1025.72			
25	44.16	1069.88			
26	44.11	1113.99			
27	41.96	1155.95			
28	43.77	1199.72			
29	43.16	1242.88			
30	43.99	1286.87			
31	40.63	1327.50			
32	41.35	1368.85			
33	38.50	1407.35			
34	44.38	1451.73			
35	38.51	1490.24			

Nabors Industries, Inc.

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Rig Detail

Rig Number:	00477
Location:	CALIFORNIA
Land/Offshore:	Land
Sub-Type:	DRILLING
Manufacturer:	Continental Emsco D-2
HorsePower:	750
Hook Load:	350 Klbs.
Drill Depth Rating:	10,000 ft.
Workover Depth Rating:	
Pumps:	P100 OPI1000
Mast:	IDECO

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Full view mast

2 1000 hp mud pumps

MARICOPA AZ
SEC-24 T-2N R-2W PPTD: 7,000'
330' FWL & 330' FSL
DRILL CONTR: GL: 0.0' KB: 0.0'

12/08/2001 PO: Spreading rock on location.
Set traffic control road barriers up. Finished entry way to location. Started laying base ABC, grading & packing. Location level, graded and packed.
NOTE: No accidents reported.

12/09/2001 PO: Packing and grading location.
Finished packing and grading location, spreading rock & packing. Will spread top cover today. Set conductor Monday. Rig to be on location @ 11:00 AM.
NOTE: No accidents reported.

12/10/2001 PO: Repacking location.
Repacked location and wet down. Will finish topping and grading location today.
NOTE: No accidents reported.

12/11/2001 PO: Drlg conductor
Finished location. MIRU IADF. Drill 6' 60"& set cellar. SDFN. Will finish conductor today.
NOTE: No accidents reported.

12/12/2001 PO: Meeting w/drilling drews on location.
Drill 80' of 30" hole. PU and ran 80' of 24" conductor. Drilled rat and mouse hole. Cover and weld cap on 24". Clean up cuttings. RD and move off IADF unit.
NOTE: No accidents reported.
DRILLING & FORMATIONS

0-18'	Top soil
18-20'	Soft gravel
20-34'	Top soil
34-38'	Cobblestones & large rocks
38-42'	Tight sandstone
42-52'	Gravel, soft/medium hard
52-62'	Soft sand & gravel
62-72'	Gravel soft to hard
72-75'	Large dobbles/soft
75-80'	Soft sand to hard rock

12/13/2001 PO: Unloading trucks.
Unload haul trucks w/drilling eqpt. Set on side of location.

NOTE: Held pre-job safety meeting w/all crewmen, crane operators and truck drivers on wearing all PPEs, watching loads, using tag lines, no overhead lifts, trucks honking before backing (then only w/a flagman watching the back of the load). Crane operators watch only the oiler for signals. Keeping traffic on location to a minimum. Flag traffic on Cotton Lane when trucks exit location. Be safe first, report any injuries, use stop and think policy. Report any and all unsafe actions.

12/14/2001 PO: Unloading trucks.
Set substructure, unload trucks & set on location.
NOTE: Held pre-job safety meeting w/all crew men, crane operators & truck drivers.

---------- END OF REPORT ----------

DRILLING PROGRAM

COOPER EAGLE GAS STORAGE, L.L.C.
SUNCOR DEVELOPMENT # 1-24
STRATIGRAPHIC TEST WELL

MARICOPA COUNTY, ARIZONA
SEC 24 – T2N – R2W

PREPARED BY: JIM LINGAFELTER

10/29/01

BRAMMER ENGINEERING, INC.
333 TEXAS STREET, SUITE 1425
SHREVEPORT, LA 71101-5323
(318) 429-2345

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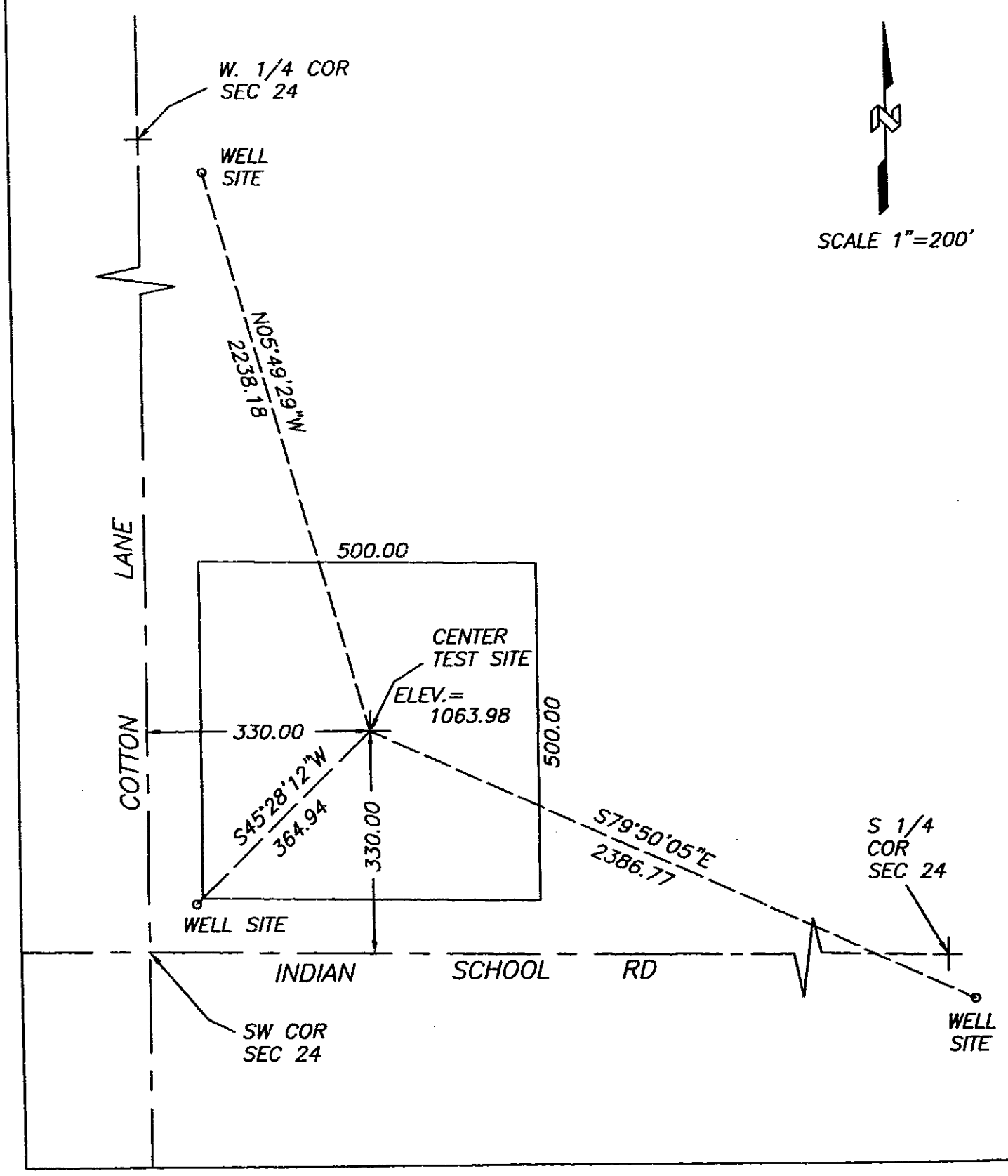
Arizona Public Service Company

SURVEY NOTES

MAX 75-1070-00042 P.E. _____ SW 1/4 SEC 24T 2NR 2W

W.A. _____ DATE 10/29/01 CREW: UBBEN-POLLOCK



WELL INFORMATION OVERVIEW

Operator:	Cooper Eagle Gas Storage, LLC	**Proposed TD:**	+/- 6940'
Well Name:	SunCor Development # 1-24		
Field:	Stratigraphic Test	**Serial No:**	To be furn. at a later date
Co/Ph, State:	Maricopa County, Arizona	**Elevations:**	
Surface Loc:	Sec. 24-T2N-R2W		
BHL:	Same, Vertical Hole	**Estimated Days:**	
		Surface:	6
Objectives:	Clastic-Valley Fill Stratigraphic Test	**Production Hole:**	31
		Total to TD:	37

Location Contractor: Unknown at this time

Drilling Contractor: Nabors Drilling

Contract Type: IADC Daywork

Conservation Agent: Steven L. Rauzi, Oil and Gas Program Administrator, Arizona Geological Survey. 416 W Congress, Suite 100, Tucson, Arizona 85701, 520-770-3500

NOTIFY AT SPUD, SETTING CASING, TESTING BOP'S AND P&A. Give 48-hrs notice.

Direction to Well: To Follow

Remarks: This will be permitted as a Stratigraphic test and will be drilled cored, logged, tested and plugged.

WELL INFORMATION OVERVIEW (Cont'd.)

12/13

Hole Section (Meas. Depth)	Hole Size	Casing	Cement	Mud Weight (Lbs./gal.)
0 to 60'		20"X 0.375"	Grouted to surface	
0 to 3,060'	16"	13-3/8", 68#/ft, K-55 HC, ST&C	Premium Lite High Strength FM + 5% NaCl	8.8 – 10.1
3,060' to 5,730'	12-1/4"	10-3/4",40#/ft, J-55 , BTS & 51# K-55 HC, BTS	Premium Lite High Strength FM + 15.7 lbs/sk NACL + 0.5% FL-52	10.0-10.3
5,730' to 6,940'	8-1/2"	none	none	10.0-10.3

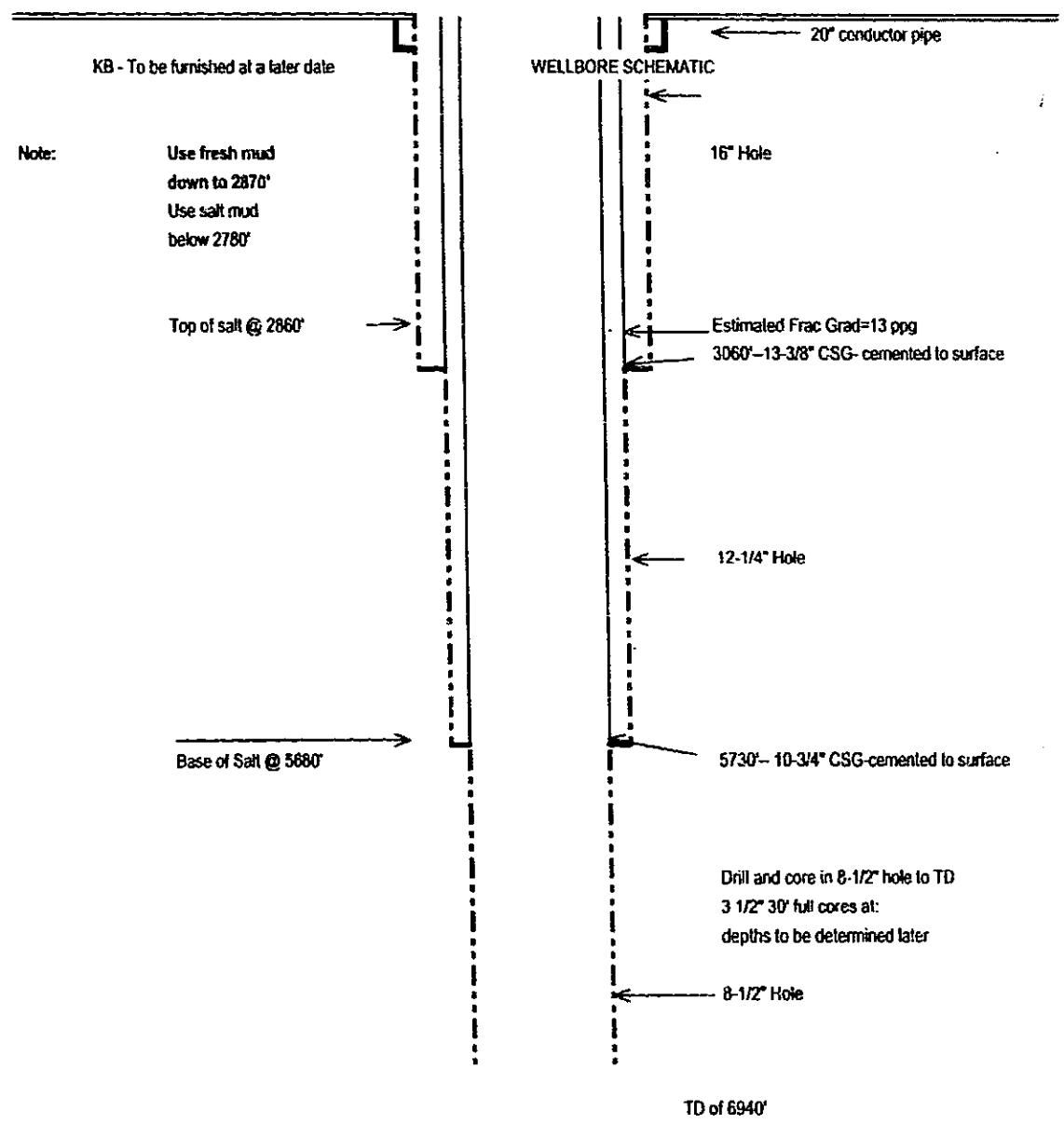
Formation	Estimated Top - TVD
Clastic and Valley Fill Sediments	0' to 2860'
Luke Basin Salt	2860' to 5730'
Clastic and Valley Fill Sediments	5730' to TD

INVOICES: All equipment and services should be billed to: Brammer Engineering, Inc.
333 Texas Street, Suite 1425
Shreveport, La 71101-5323

Rig Phone: Co. Representative To be determined
Mud Logger To be determined

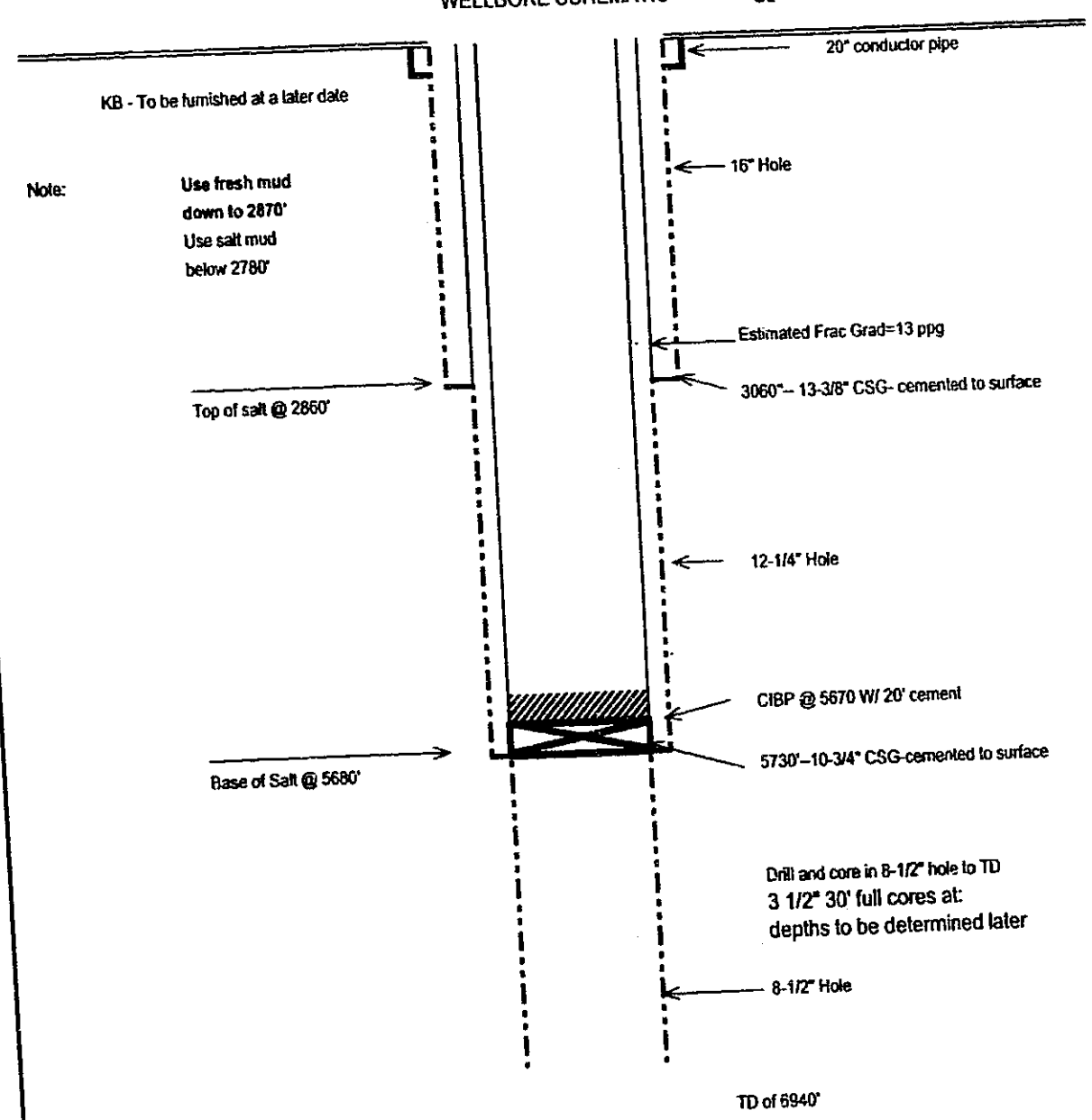
Copper Eagle Gas Storage, L.L.C.
SunCor # 1-24
Maricopa County, Arizona
.Luke-Glendale Field

WELLBORE SCHEMATIC

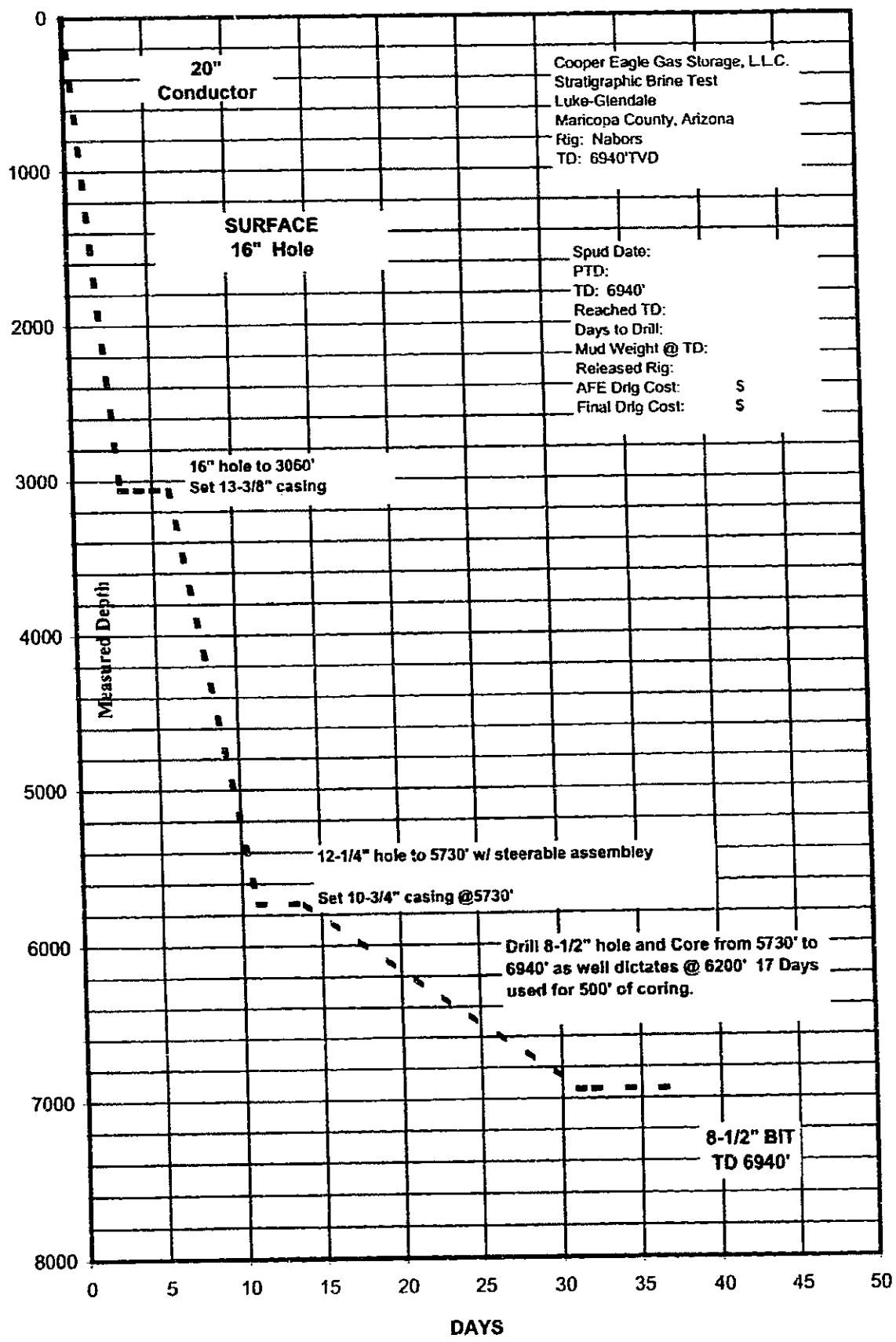


Copper Eagle Gas Storage, L.L.C.
SunCor # 1-24
Maricopa County, Arizona
.Luke-Glendale Field

WELLBORE SCHEMATIC **Plugged and Abandoned**



Copper Eagle Gas Storage, LLC
SunCor Development # 1-24



CHRONOLOGICAL PROGNOSIS

NOTE: See Details and Specifications Section for Additional Information and Instructions!

1. Drill Rat Hole, Set 60' of 20"conductor pipe
2. Move in and RU Nabors Rig # 329
3. Drill 16" hole to 3,060' or 200' into the salt or a major chloride increase.

NOTE: THIS WELL WILL BE DRILLED VERY NEAR FRESH WATER WELLS AND IT IS IMPERATIVE THAT ALL MEASURES ARE TAKEN TO INSURE THAT THE FRESH WATER ZONES ARE NOT IMPACTED BY DRILLING FLUIDS.

NOTE: There will be a 200' to 400' Anhydrite cap above the top of salt.
Expect top of salt at +/- 2860' **(However salt may be encountered earlier)**

4. Circ and condition hole to run electric logs and run all electric logs including VSP.
5. Run 13-3/8" surface casing to 3,060' and cement to surface. WOC 6 hrs before cutting pipe.
6. NU 13-5/8" 3000# X 13-3/8"SOW casing head. NU 13-5/8" 5000 psi BOP's. Test rams and valves to 250-psi/5000 psi. Test annular to 250-psi/3000 psi.
7. Run CBL (Cement Bond Log)
8. Install wear bushing in casing head before drilling out surface casing.
9. Clean out 13-3/8" casing to float collar with 12-1/4" bit. Test casing to 1000 psi. Drill FC and 20' of cement. Retest casing. Drill shoe and 5' of formation. Test casing shoe to leak off or not to exceed 13 ppg EMW. Squeeze and retest if necessary.
10. Change over to Salt-saturated mud system and drill to 5730' or 50' into Valley Fill Formation. Use steerable motor and MWD to keep hole straight. **Rig up all necessary H2S equipment before drilling out of the salt section.**
11. Circ and Condition mud to run electric logs. Run Logs
12. Run 10-3/4" casing to 5,730' and cement to surface. WOC 6 hrs before cutting pipe
13. NU 13-5/8" 3000# X 11" 5000# casing head. NU 13-5/8" 5000 psi BOP's. Test rams and valves to 250psi/5000psi. Test annular to 250psi/5000psi.
14. Run CBL
15. Drill and core 8-1/2" hole to TD +/- 6940',
16. Condition Hole and Run electric logs including VSP.
17. RU and Run DST to recover fluids from the open hole zone. Recovery and store recovered formation fluid in sealed plastic drums for transport to laboratory.

CHRONOLOGICAL PROGNOSIS (cont'd.)

18. TIH and set retrievable packer at +/- 5800'. Inject filtered brine into open hole according to injection test procedure. Record all pressures and rates.
19. Prepare to P & A well per Arizona O&G regulations
20. **REFER TO PROPOSED P & A WELLBORE SCHEMATIC.**

DRILLING SPECIFICATIONS

GENERAL INSTRUCTIONS:

1. Run appropriate BHA. Discuss with operations supervisor.
2. Two TIW and one inside Gray BOP safety valves of appropriate sizes to be in open position on rig floor at all times.
3. Inspect, measure, and caliper all subsurface drilling tools prior to running in hole.
4. Design drill strings for 100,000# over pull and ensure that recommended torque values along with proper makeup procedures are used.
5. Minimize casing wear by using smooth hard band or non-hard banded drill strings inside casing. Use DP rubbers (one every other joint) inside all casing strings.
6. Optimize hydraulics.
7. **One of the objectives of this test is to detect and record the depths of all shallow fresh water zones which may require drilling surface slightly underbalanced.**
8. Record slow pump pressures and rates each tower.
9. Insure that safety meetings are conducted daily with each crew.
10. Install H2S equipment 1000' before drilling below the salt. Train all Rig Personnel and provide H2S equipment.

BOP REQUIREMENTS

Hole Size	Number	Size	WP (psig)	Test Pressure (psig)	Configuration
16"	None Req.				
12 ¼" and 8 ½"	1 - Ann 2 - Ram	13 5/8"	5000 5000	250/3000 250/5000	Annular-Pipe-Blind

Instructions:

1. Test BOP's to above pressure when installed (with 3rd party) and every 14 days there after. Note all tests on IADC tower report.
2. Work rams on all trips. Record on morning report and IADC tower report.
3. Ensure that accumulator/closing units are checked daily.
4. Conduct BOP drills once per week with each crew as appropriate.

DEVIATION SURVEYS

Run Deviation Survey at 100' intervals, or as needed to keep hole straight.

MUD SPECIFICATIONS

Controlled by Operator. Use Inteq Drilling Fluids for mud & chemicals.
Maintain mud parameters as follows:

DEPTH (MD)	WEIGHT	VIS	W.L.	PV	Y.P.
0' - 3,060' (Fresh)	8.4 - 10.1	32-45	12-15	NC	20-25
3,060' - 5,680' (Salt)	10.0 - 10.3	32-45	8-12	8-10	8-12
5,680' - T.D. (Salt)	10.0 - 10.3	32-45	10-8	8-10	10-14

BIT SPECIFICATIONS

RECOMMENDED BIT PROGRAM:

No.	Size	IADC Code	Depth Out	Hrs	Cum Hrs	ROP Ft/Hr	WOB	RPM
1	16"	117	3060'	45	45	68	40 to 50	80/100
SET 13-3/8" CASING @ 3060'								
2	12-1/4"	FGSS+	5730'	50	95	59	30/40	80/100
SET 10-3/4" CASING @ 5730'								
3	8-1/2"	F10T	7000'	50	140	20	30/45	80/100

Note: Drilling hrs do not include coring time.

LOGGING SPECIFICATIONS

CUTTINGS: Every 10' from surface to TD (If interval below salt is not conventionally cored, cutting must be sampled every foot.)

Samples of all cuttings must be supplied to the AZ Oil and Gas Commission.

MUD LOGGER: Epoch—From Spud to TD

DRILLSTEM TEST: Schlumberger

CORES: 3-1/2" 60' Full cores below the base of the salt as needed

ELECTRIC LOGGING:

At 3060' or surface csg pt.
Triple Combo from TD to base of Conductor casing with VSP & Cement Bond Log

At 5730' or Protection csg pt. to Base of Surface Pipe
Triple Combo from TD to base of surface casing with LS Sonic & CBL

At 6940' or TD. To Base of Protection csg
Triple Combo from TD to base of protection casing & VSP

CASING SPECIFICATIONS

CONDUCTOR PIPE: (0' to 60')
20" x 0.375" Wall Grade B Line Pipe

SURFACE CASING: (0 TO 3060')
13-3/8" 68.00 #/ft K-55 HC ERW BTC (New, API, Prime)

PROTECTION CASING: (0' to 5930')
10-3/4" 51.00 #/ft J-55 ERW BTC (New , API, Prime)
10-3/4" 51.00 #/ft K-55 HC ERW BTC (New , API, Prime)

Running Instructions:

1. Visually inspect, strap, and number each joint. Compare strap to delivery ticket.
2. Remove thread protectors and clean threads if necessary.
3. Run float shoe and float collar one joint above shoe. Weld float shoe and float collar.
4. Run centralizers 5' above shoe, at float collar, at 1st collar above float collar, and at every other collar to surface.
5. Torque to API recommended values.
6. Use API-HP thread lubricant.
7. Tag bottom and check measurements. Pick up off bottom and circulate at least 1 1/2 casing volumes or two bottoms up minimum prior to cementing.
8. Reciprocate casing while circulating and cementing.
9. Hang string in full tension.
10. WOC 6 hrs. Monitor annulus while WOC.
11. Do 150 sx top job with fresh water cement

NOTE: Do not drill out or test casing for 12-hr minimum after cementing.

Testing Instructions:

1. Clean out casing with 8-1/2" bit to float collar.
2. Test casing to 1000 psi for 30 minutes.
3. Drill FC plus 20' of cement and retest casing to 1000 psi.
4. Drill out rest of shoe joint plus 5' of formation.
5. Circ hole clean and test shoe to 13 ppg EMW. If shoe fails to test, squeeze and retest.

CEMENT SPECIFICATIONS

SURFACE CASING:

Casing Size:	13-3/8"	Mud Weight:	10.3 ppg
Hole Size:	16"	Fillup:	Surface
Depth:	3060'	Excess:	Caliper plus 15%

Recommended Cement:

Cement Slurry: 1174 sks Premium Lite High Strength FM + 5% bwow Sodium Chloride
12.50 ppg 2.06 cf/sk 11.01 gps water

Top Out Slurry: Cl A + 2% CACL2

Instructions:

1. Reciprocate casing while circulating and cementing
2. Bump plug with 500 psi over circulating pressure.
3. Perform top job using 1" pipe, if necessary.
4. Hold casing in full tension until initial cement set up.
5. WOC 6 hrs before cutting csg.
6. WOC 12 hrs before drilling out.

PROTECTION CASING:

Casing Size:	10-3/4"	Mud Weight:	10.3 ppg
Hole Size:	12 1/4"	Fillup:	Surface
Depth:	5730'	Excess:	Caliper plus 15%

Recommended Cement:

Lead Slurry: 289 sacks Premium Lite High Strength FM + 15.7 lbs/sk Sodium Chloride + 0.5% bwoc FL-52
12.50 ppg 2.23 cf/sack 11.59 gps

Tail Slurry: 360 sacks Premium Lite High Strength FM + 15.7 lbs/sk Sodium Chloride + 0.5% bwoc FL-52
13.00 ppg 1.99 cf/sack 9.80 gps

CEMENT SPECIFICATIONS

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Casing Size:	13-3/8"	Mud Weight:	10.3 ppg
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PROTECTION CASING:

Casing Size:	10-3/4"	Mud Weight:	10.3 ppg
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Recommended Cement:

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12.50 ppg 2.23 cf/sack 11.59 gps

Tail Slurry: 360 sacks Premium Lite High Strength FM + 15.7 lbs/sk Sodium Chloride + 0.5% bwoc FL-52
13.00 ppg 1.99 cf/sack 9.80 gps

WELLHEAD SPECIFICATIONS

13-5/8" 3000# X 13-3/8" SOW casing head with one outlet with 2" 3000 psi ball valve

13-5/8" 3000# X 11" 5000 casing head with one outlet with 2" 3000 psi gate valve

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Jane Dee Hull
Governor

Larry D. Fellows
Director and State Geologist

MEMORANDUM TO FILE

DATE: October 26, 2001

FROM: Steven L. Rauzi
Oil and Gas Administrator

SUBJECT: Known and reasonably estimated freshwater aquifers in vicinity of Copper Eagle's proposed stratigraphic test located in:

SE SW Sec. 24, T. 2 N., R. 2 W., Maricopa County, Permit to Drill #909

Rick Herther, Basic Data Section, Arizona Department of Water Resources, provided the following information about the deepest water wells that are registered with the department in the vicinity of the proposed well.

Sec. 24, T. 2 N., R. 2 W. (Most registered to SunCor Development Company)

B(02-02)24bbb, 998 ft deep.
B(02-02)24cbb, 1007 ft deep.
B(02-02)24ccc, 1008 ft deep.
B(02-02)24dbb, 956 ft deep.
Plus several monitoring wells less than 100 ft deep.

Sec. 25, T. 2 N., R. 2 W.

B(02-02)25abb, 2000 ft deep, drilled 1966, registered to SunCor Development Company.

Sec. 19, T. 2 N., R. 1 W.

B(02-01)19cbb, 1220 ft deep, drilled 1954, registered to SunCor Development Company.

Copper Eagle's proposal to set 13 3/8" surface casing from the surface to the top of the salt or 3000' will be sufficient to protect the surface waters and all other reasonably estimated aquifers in the vicinity of the proposed well.

PERMIT TO DRILL

This constitutes the permission and authority from the

OIL AND GAS CONSERVATION COMMISSION,
STATE OF ARIZONA,

To: COPPER EAGLE GAS STORAGE LLC
(OPERATOR)

to drill a well to be known as

SUNCOR DEVELOPMENT #1-24
(WELL NAME)

located 330 FT FWL & 330 FT FSL

Section 24 Township 2N Range 2W, MARICOPA County, Arizona.

The N/A of said Section, Township and Range is dedicated to this well.

Said well is to be drilled substantially as outlined in the attached Application and must be drilled in full compliance with all applicable laws, statutes, rules and regulations of the State of Arizona.

Issued this 31 day of OCTOBER, ~~19~~ 2001.

OIL AND GAS CONSERVATION COMMISSION

By Steven L. Rauz
~~EXECUTIVE DIRECTOR~~
OIL & GAS ADMINISTRATOR

PERMIT 00909

RECEIPT NO. 3111

A.P.I. NO. 02-013-20027

State of Arizona
Oil & Gas Conservation Commission
Permit to Drill
FORM NO. 27

SAMPLES AND COPIES OF ALL TEST REPORTS AND LOGS ARE REQUIRED PURSUANT TO A.A.C. R12-7-121

APPLICATION TO DRILL ☒ RE-ENTER OLD WELL ☐

NAME OF COMPANY OR OPERATOR

Copper Eagle Gas Storage, LLC

Address	City	State	Phone Number
400 North 5th Street	Phoenix	AZ	(602) 250-3109

Drilling Contractor
Nabors Drilling USA Incorporated

Address 3919 Rosedale Hwy., Bakersfield, CA 93308

DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor	Well number	Elevation (ground)
Suncor Development Co.	#1-24	1064'

Nearest distance from proposed location to property or lease line:	Distance from proposed location to nearest drilling, completed or applied-for well on the same lease:
330 feet	N/A feet

Number of acres in lease	Number of wells on lease, including this well, completed in or drilling to this reservoir:
~~640 acres~~ N/A MR	1

If lease purchased with one or more wells drilled, from whom purchased: Name Address
N/A

Well location (give footage from section lines)	Section - township - range or block and survey	Dedication [A.A.C. R12-7-104(A)(3)]
330' FWL & 330' FSL	Sec 24 - T2N - R2W	N/A

Field and reservoir (if wildcat, so state)	County
Stratigraphic test	Maricopa

Distance in miles and direction from nearest town or post office

Proposed depth:	Rotary or cable tools	Approximate date work will start
7,500 feet	Rotary	November 26, 2001
Bond status Attached Amount $10,000.00	Organization Report On file Or attached XX	Filing Fee of $25.00 Attached XX

Remarks

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the General Manager of the Copper Eagle Gas Storage, LLC (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

API # 02-013-20027

Signature Matt Reid

Date 10/29/2001

Mail completed form to
Oil and Gas Program Administrator
Arizona Geological Survey
416 W. Congress, #100
Tucson, AZ 85701-1315

Permit Number: 909
Approval Date: 10-31-01
Approved By: Steven L. Rauch

NOTICE: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Application to Drill or Re-enter
File Two Copies

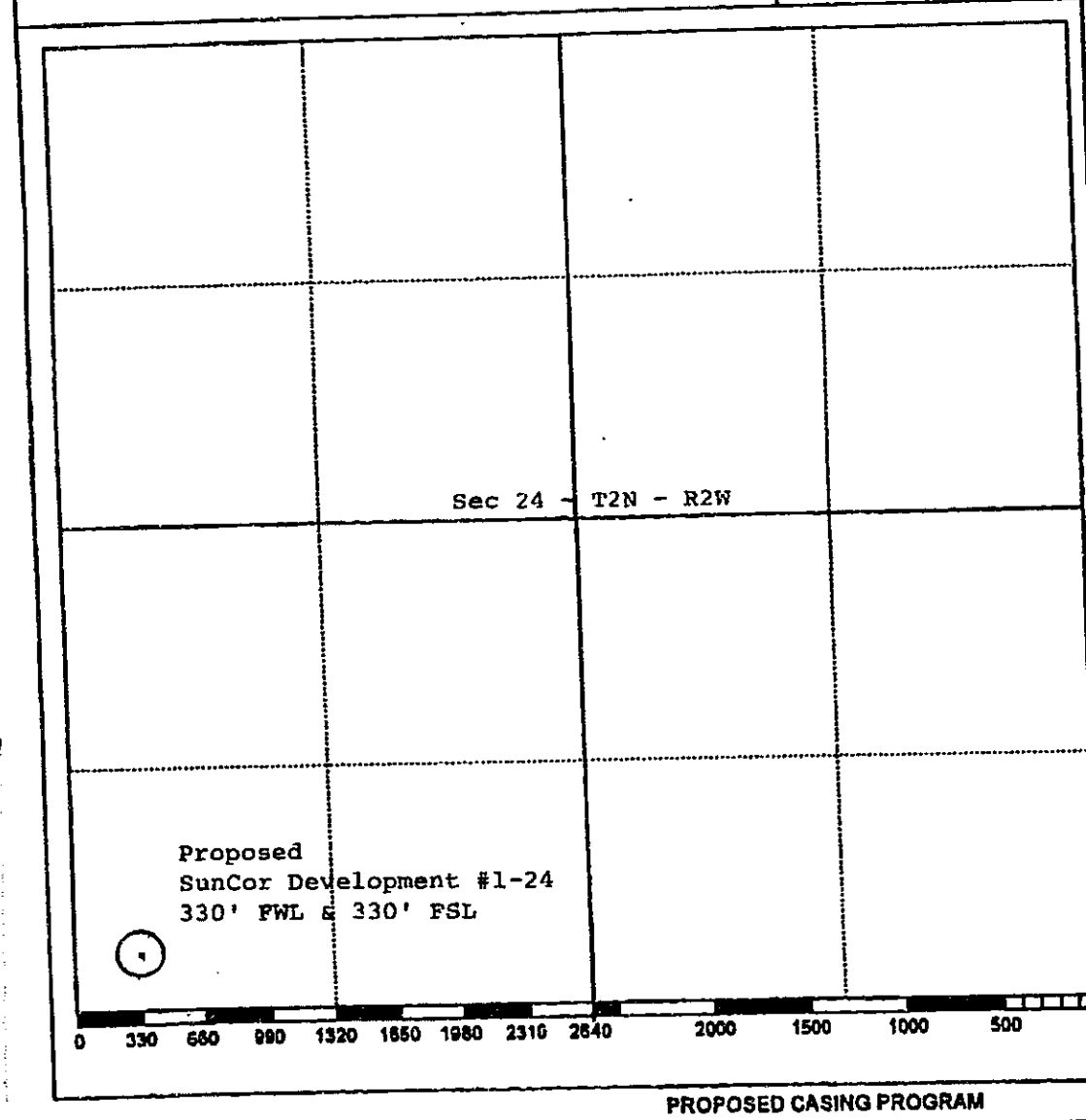
Form No. 3

8/96

(Complete Reverse Side)

1. Operator shall outline on the plat the acreage dedicated to the well in compliance with A.A.C. R12-7-107. This is a stratigraphic test and exempt from the spacing rules as per R12 - 7 - 128.
2. A registered surveyor shall show on the plat the location of the well and certify this information in the space provided.
3. ALL DISTANCES SHOWN ON THE PLAT MUST BE FROM THE OUTER BOUNDARIES OF THE SECTION.
4. Is the operator the only owner in the dedicated acreage outlined on the plat below? YES X NO ____
   Suncor is the owner and a member of the Copper Eagle Gas Storage, LLC.
5. If the answer to question four is "no", have the interests of all owners been consolidated by communitization agreement or otherwise?
   YES ____ NO ____ If answer is "yes", give type of consolidation ____
6. If the answer to question four is "no", list all the owners and their respective interests below:

Owner	Land Description
SunCor Development Company	Agriculturial / SunCor Fee Property



CERTIFICATION

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Matt Reid

Name: Matt Reid
Position: General Manager
Company: Copper Eagle Gas Storage, LLC
Date: October 29, 2001

I hereby certify that the well location shown on the plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my knowledge and belief.

REGISTERED LAND SURVEYOR CERTIFICATE NO. 16292 MICHAEL D. BRADER ARIZONA U.S.A.

Michael D. Brader

Date Surveyed: 10/26/01

Registered Land Surveyor: Michael D. Brader

Certificate No. LS-16292

PROPOSED CASING PROGRAM

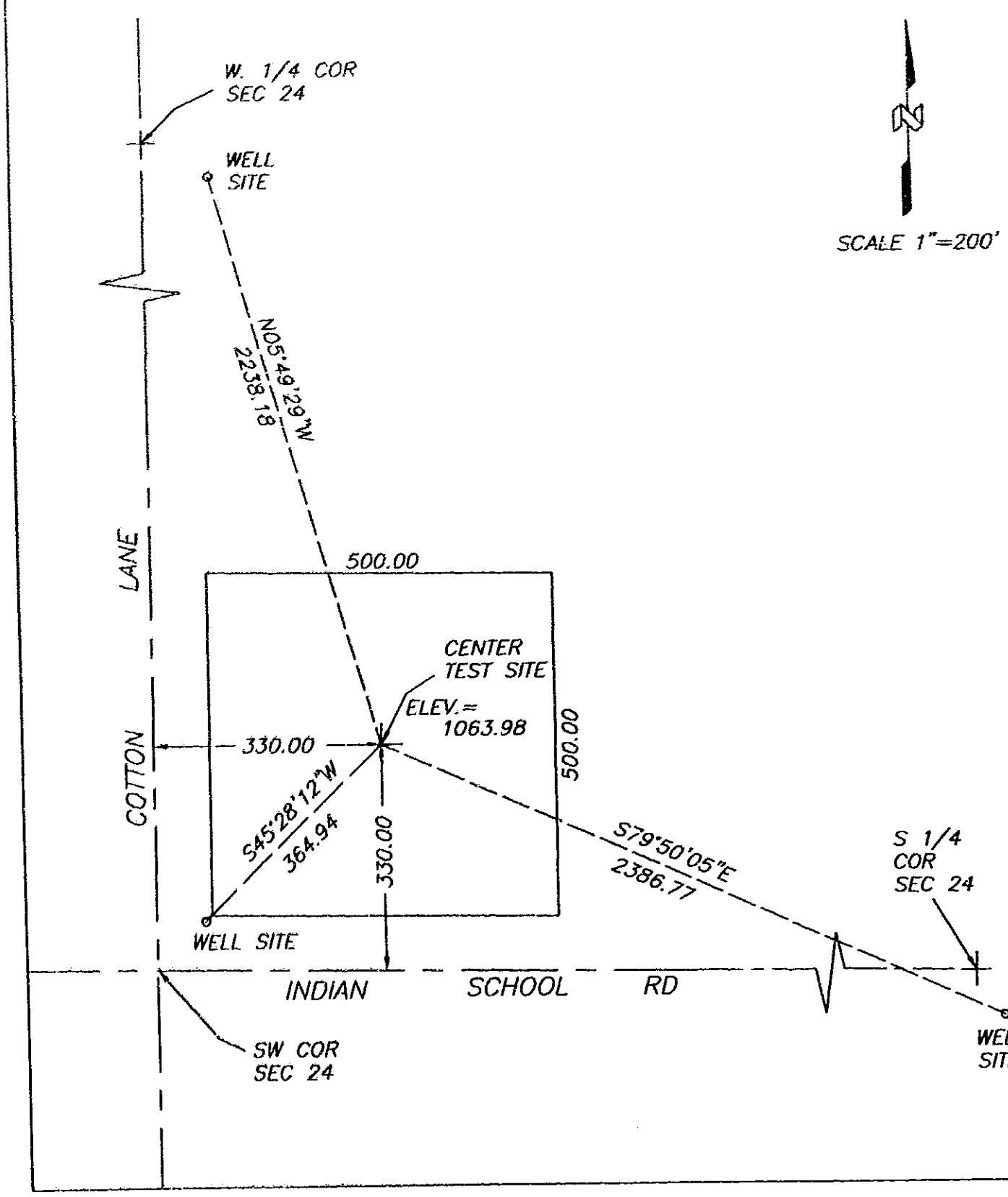
Size of Casing	Weight	Grade & Type	Top	Bottom	Cementing Depths	Sacks Cement	Type
20"	94#	B	0'	60'	0 - 60'	Redi-Mix	--
13 3/8"	68#	K-55 HC	0'	3060'	0 - 3060'	1174 sks	Prem.
10 3/4"	51#	J-55 & K-55	0'	6940'	0 - 6940'	649 sks	Prem.

'rizona Public Service Company

SURVEY NOTES

MAX 75-1070-00042 P.E. _____ SW 1/4 SEC 24T 2NR 2W

W.A. _____ DATE 10/29/01 CREW: UBBEN-POLLOCK

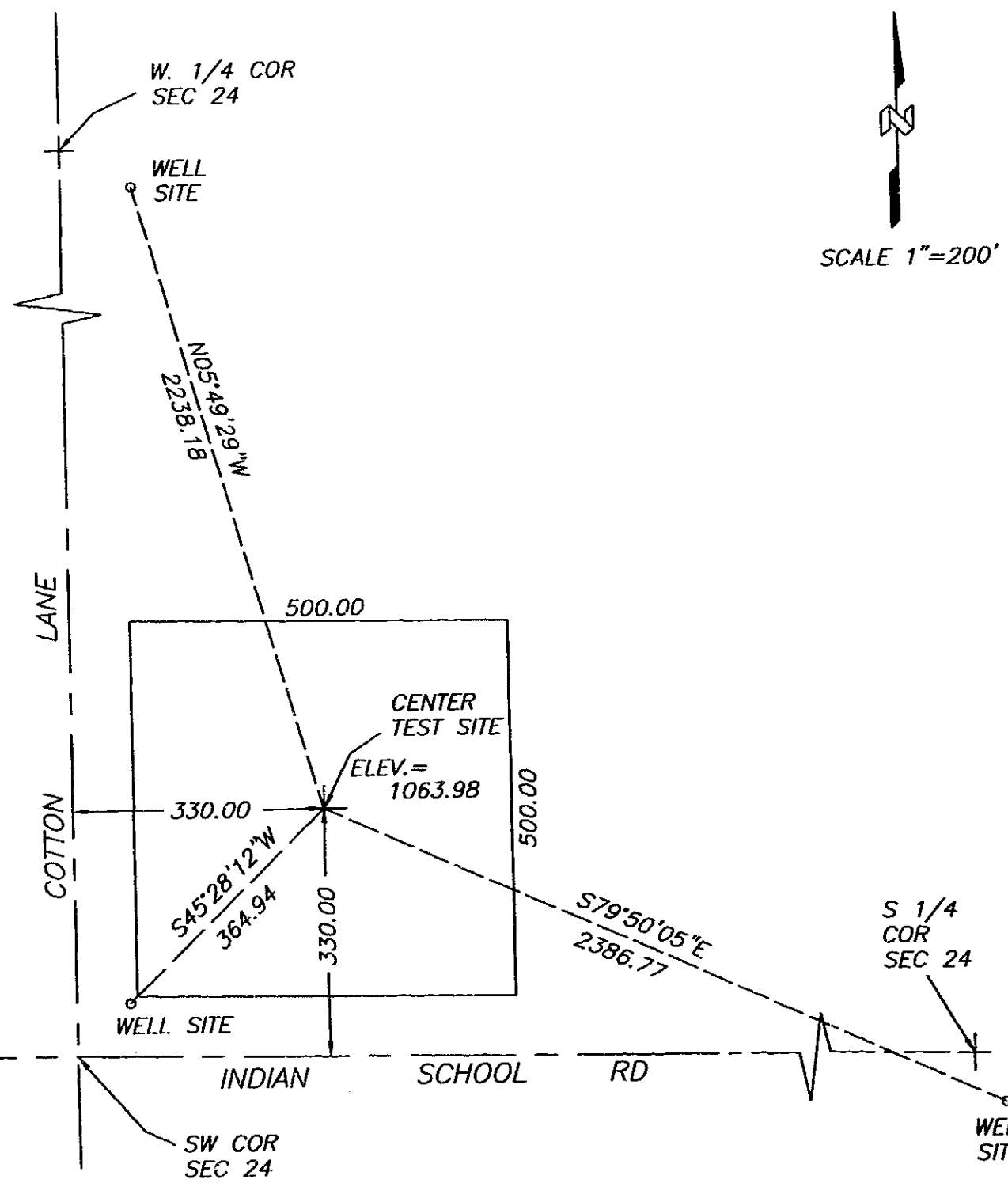


Arizona Public Service Company

SURVEY NOTES

MAX 75-1070-00042 P.E. _____ SW 1/4 SEC 24T 2NR 2W

W.A. _____ DATE 10/29/01 CREW: UBBEN-POLLOCK



RECEIPT Date October 31 ~~19~~ 2001 No. 3111

Received From Pinnacle West

Address 400 N 5th St, Phoenix AZ

Twenty five and no/100 Dollars $ 25.00

For Filing fee for Permit # 909

ACCOUNT			HOW PAID		
AMT. OF ACCOUNT			CASH		
AMT. PAID			CHECK	25	00
BALANCE DUE			MONEY ORDER		

By Steven L. Rainz

8K806 Rediform

ORGANIZATION REPORT

Full Name of the Company, Organization, or Individual
Copper Eagle Gas Storage, LLC

Mailing Address and Phone Number
400 N. 5th Street, MS 8974, Phoenix, AZ 85004 602-250-3109

Plan of Organization (State whether organization is a corporation, joint stock association, firm or partnership, or individual
Limited Liability Company

Purpose of Organization (State type of business in which engaged)
Underground Gas Storage

If a reorganiztion, give name and address of previous organization
Not Applicable

If a foreign corporation, give (1) State where incorporated	(2) Name and mailing address of state agent	(3) Date of permit to do business in state
Delaware	Corporation Trust Center 1209 Orange Street Wilmington, DE 19801	9/06/01

Principal Officers or Partners (If partnership) NAME	TITLE	MAILING ADDRESS
Matt Reid	General Manager	400 N. 5th Street, MS 8974 Phoenix, AZ 85004

DIRECTORS NAME	MAILING ADDRESS
Jeffery A. Ballew	401 Edwards St., Ste. 1300, Shreveport, LA 71120
Curt E. Brechtel	400 N. 5th St., 9th Fl., Phoenix, AZ 85004
David L. Hayden	401 Edwards St., Ste. 1300, Shreveport, LA 71120
Matthew J. Reid	400 N. 5th St., 9th Fl., Phoenix, AZ 85004

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the General Manager of the Copper Eagle Gas Storage, LLC (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Matt Reid
Signature

10/31/2001
Date

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Organization Report
File One Copy
Form No. 1
2/96

Mail completed form to:
Oil and Gas Program Administrator
Arizona Geological Survey
416 W. Congress., #100
Tucson, AZ 85701

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS

Bond Serial No. 929224112

That we: Copper Eagle Gas Storage LLC

of the County of Maricopa In the State of Arizona

as principal, and Continental Casualty Company

of Hartford, Connecticut

AUTHORIZED TO DO BUSINESS WITHIN THE STATE OF ARIZONA.

as surety, are held and firmly bound unto the State of Arizona and the Oil and Gas Conservation Commission, hereinafter referred to as the "Commission", in the penal sum of Ten Thousand Dollars and No/100 ($10,000.00) lawful money of the United States, for which payment, well and truly to be made, we bind ourselves, and each of us, and each of our heirs, executors, administrators or successors, and assigns jointly and severally, firmly by these presents.

The conditions of this obligation are that, whereas the above bounden principal proposes to drill a well or wells for oil, gas or stratigraphic purposes in and upon the following described land situated within the State, to-wit:

Martin J Rod

(May be used as blanket bond or for single well)

NOW, THEREFORE, if the above bounden principal shall comply with all the provisions of the Laws of this State and the rules, regulations and orders of the Commission, especially with reference to the requirements of A.R.S. § 27-516, providing for the proper drilling, casing and plugging of said well or wells, and filing with the Oil and Gas Conservation Commission all notices and records required by said Commission, then in the event said well or wells do not produce oil or gas in commercial quantities, or cease to produce oil or gas in commercial quantities, this obligation is void; otherwise it shall remain in full force and effect.

Whenever the principal shall be, and declared by the Oil and Gas Conservation Commission in violation of the Laws of this State and the rules, regulations and orders of the Commission, the surety shall promptly:

1. Remedy the violation by its own efforts, or
2. Obtain a bid or bids for submission to the Commission to remedy the violation, and upon determination by the Commission and the Surety of the lowest responsible bidder, arrange for a contract between such bidder and the Commission, and make available as work progresses sufficient funds to pay the cost of remedying the violation; but not exceeding, including other costs and damages for which the surety may be liable hereunder, the amount set forth in the first paragraph hereof.

Liability under this bond may not be terminated without written permission of this Commission.

WITNESS our hands and seals, this 24th day of October, 2001

Copper Eagle Gas Storage LLC

By: Martin J Rod

Principal

WITNESS our hands and seals, this 24th day of October, 2001

Continental Casualty Company

By: Lori L. Dawson

Surety

Lori L. Dawson, Attorney-in-Fact

(Surety, Resident Arizona Agent
If issued in a state other than Arizona)

(If the principal is a corporation, the bond should be executed by its duly authorized officers, with the seal of the corporation affixed. When principal or surety executes this bond by agent, power of attorney or other evidence of authority must accompany the bond.)

Approved
Date 10-31-01
STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
By: Steven L. Ross

STATE OF ARIZONA
OIL & GAS CONSERVATION COMMISSION
Bond
File Two Copies
Form No. 2

Permit No. 909

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That Continental Casualty Company, National Fire Insurance Company of Hartford, and American Casualty Company of Reading, Pennsylvania (herein called "the CNA Companies"), are duly organized and existing corporations having their principal offices in the City of Chicago, and State of Illinois, and that they do by virtue of the signatures and seals herein affixed hereby make, constitute and appoint

Mikal F. Cronin, Steven E. Minard, Michael D. Specht, William A. Ames, Deborah K. Anderson, Lori L. Dawson, Individually

of Phoenix, Arizona

their true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on their behalf bonds, undertakings and other obligatory instruments of similar nature

--- In Unlimited Amounts ---

and to bind them thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of their corporations and all the acts of said Attorney, pursuant to the authority hereby given is hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law and Resolutions, printed on the reverse hereof, duly adopted, as indicated, by the Boards of Directors of the corporations.

In Witness Whereof, the CNA Companies have caused these presents to be signed by their Vice President and their corporate seals to be hereto affixed on this 28th day of June, 2001.

CONTINENTAL CASUALTY COMPANY · CORPORATE SEAL · 1897

NATIONAL FIRE INSURANCE COMPANY OF HARTFORD

AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA · INCORPORATED · JULY 31, 1902

Continental Casualty Company
National Fire Insurance Company of Hartford
American Casualty Company of Reading, Pennsylvania

Michael Gengler — Group Vice President

State of Illinois, County of Cook, ss:

On this 28th day of June, 2001, before me personally came Michael Gengler to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Chicago, State of Illinois; that he is a Group Vice President of Continental Casualty Company, National Fire Insurance Company of Hartford, and American Casualty Company of Reading, Pennsylvania described in and which executed the above instrument; that he knows the seals of said corporations; that the seals affixed to the said instrument are such corporate seals; that they were so affixed pursuant to authority given by the Boards of Directors of said corporations and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporations.

"OFFICIAL SEAL"
DIANE FAULKNER
Notary Public, State of Illinois
My Commission Expires 9/17/01

My Commission Expires September 17, 2001

Diane Faulkner — Notary Public

CERTIFICATE

I, Mary A. Ribikawskis, Assistant Secretary of Continental Casualty Company, National Fire Insurance Company of Hartford, and American Casualty Company of Reading, Pennsylvania do hereby certify that the Power of Attorney herein above set forth is still in force, and further certify that the By-Law and Resolution of the Board of Directors of the corporations printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporations this 24th day of October, 2001.

CONTINENTAL CASUALTY COMPANY · CORPORATE SEAL · 1897

NATIONAL FIRE INSURANCE COMPANY OF HARTFORD

AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA · INCORPORATED · JULY 31, 1902

Continental Casualty Company
National Fire Insurance Company of Hartford
American Casualty Company of Reading, Pennsylvania

Mary A. Ribikawskis — Assistant Secretary

(Rev. 1/23/01)

Authorizing By-Laws and Resolutions

ADOPTED BY THE BOARD OF DIRECTORS OF CONTINENTAL CASUALTY COMPANY:

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the Board of Directors of the Company.

"Article IX—Execution of Documents

Section 3. Appointment of Attorney-in-fact. The Chairman of the Board of Directors, the President or any Executive, Senior or Group Vice President may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Company in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. Such attorneys-in-fact, subject to the limitations set forth in their respective certificates of authority, shall have full power to bind the Company by their signature and execution of any such instruments and to attach the seal of the Company thereto. The Chairman of the Board of Directors, the President or any Executive, Senior or Group Vice President or the Board of Directors, may, at any time, revoke all power and authority previously given to any attorney-in-fact."

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 17th day of February, 1993.

"Resolved, that the signature of the President or any Executive, Senior or Group Vice President and the seal of the Company may be affixed by facsimile on any power of attorney granted pursuant to Section 3 of Article IX of the By-Laws, and the signature of the Secretary or an Assistant Secretary and the seal of the Company may be affixed by facsimile to any certificate of any such power and any power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certified by certificate so executed and sealed shall, with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Company."

ADOPTED BY THE BOARD OF DIRECTORS OF AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA:

This Power of Attorney is made and executed pursuant to and by authority of the following By-Law duly adopted by the Board of Directors of the Company.

"Article VI—Execution of Obligations and Appointment of Attorney-in-Fact

Section 2. Appointment of Attorney-in-fact. The Chairman of the Board of Directors, the President or any Executive, Senior or Group Vice President may, from time to time, appoint by written certificates attorneys-in-fact to act in behalf of the Company in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. Such attorneys-in-fact, subject to the limitations set forth in their respective certificates of authority, shall have full power to bind the Company by their signature and execution of any such instruments and to attach the seal of the Company thereto. The President or any Executive, Senior or Group Vice President may at any time revoke all power and authority previously given to any attorney-in-fact."

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 17th day of February, 1993.

"Resolved, that the signature of the President or any Executive, Senior or Group Vice President and the seal of the Company may be affixed by facsimile on any power of attorney granted pursuant to Section 2 of Article VI of the By-Laws, and the signature of the Secretary or an Assistant Secretary and the seal of the Company may be affixed by facsimile to any certificate of any such power and any power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certified by certificate so executed and sealed shall, with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Company."

ADOPTED BY THE BOARD OF DIRECTORS OF NATIONAL FIRE INSURANCE COMPANY OF HARTFORD:

This Power of Attorney is made and executed pursuant to and by authority of the following Resolution duly adopted on February 17, 1993 by the Board of Directors of the Company.

"RESOLVED: That the President, an Executive Vice President, or any Senior or Group Vice President of the Corporation may, from time to time, appoint, by written certificates, Attorneys-in-Fact to act in behalf of the Corporation in the execution of policies of insurance, bonds, undertakings and other obligatory instruments of like nature. Such Attorney-in-Fact, subject to the limitations set forth in their respective certificates of authority, shall have full power to bind the Corporation by their signature and execution of any such instrument and to attach the seal of the Corporation thereto. The President, an Executive Vice President, any Senior or Group Vice President or the Board of Directors may at any time revoke all power and authority previously given to any Attorney-in-Fact."

This Power of Attorney is signed and sealed by facsimile under and by the authority of the following Resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 17th day of February, 1993.

"RESOLVED: That the signature of the President, an Executive Vice President or any Senior or Group Vice President and the seal of the Corporation may be affixed by facsimile on any power of attorney granted pursuant to the Resolution adopted by this Board of Directors on February 17, 1993 and the signature of a Secretary or an Assistant Secretary and the seal of the Corporation may be affixed by facsimile to any certificate of any such power, and any power or certificate bearing such facsimile signature and seal shall be valid and binding on the Corporation. Any such power so executed and sealed and certified by certificate so executed and sealed, shall with respect to any bond or undertaking to which it is attached, continue to be valid and binding on the Corporation."

Copper Eagle Gas Storage LLC

Suncor Development #1-24

909

Step Rate Test #1 + Falloff (5380 - 6062 ft)
0.5 days

Steps	Rate (gpm)	Rate (bpm)	Duration (min)	Cum. Volume (bbl)
1	20	0.5	30	14
2	40	1.0	30	43
3	80	1.9	30	100
4	160	3.8	30	214
5	240	5.7	30	386
6	320	7.6	30	614
7	400	9.5	30	900
Falloff	0	0.0	420	900

Step Rate Test #2 + Extended Injection + Falloff (5157 - 6062 ft)
2.5 days

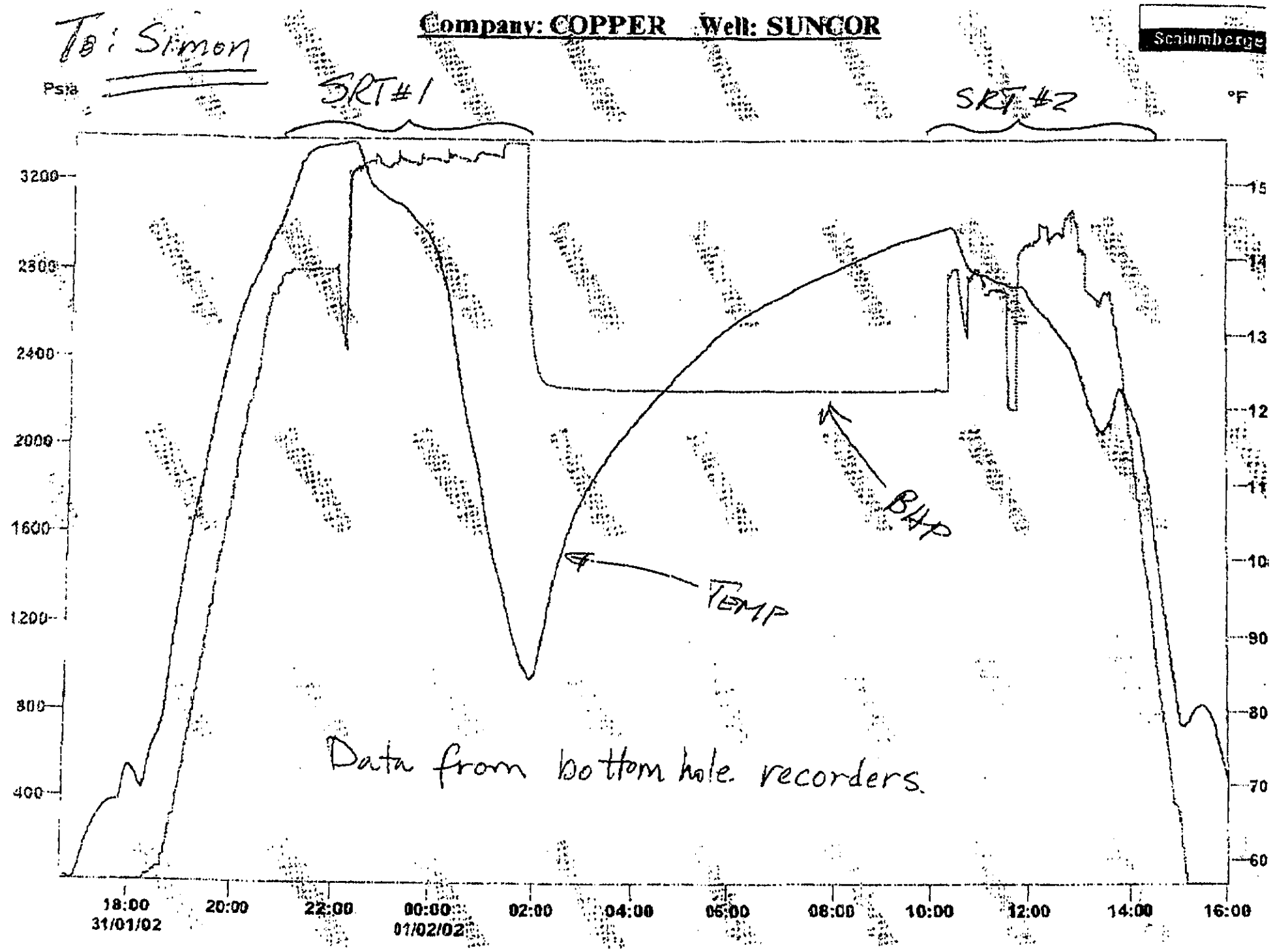
Steps	Rate (gpm)	Rate (bpm)	Duration (min)	Cum. Volume (bbl)
1	20	0.5	30	14
2	40	1.0	30	43
3	80	1.9	30	100
4	160	3.8	30	214
5	240	5.7	30	386
6	320	7.6	30	614
7	400	9.5	30	900
Extended Inj.	150	3.6	1230	5293
Falloff	0	0.0	2160	5293

Note:
-The extended injection rate could be increased if brine is available.
-Bottom hole and surface pressures should be recorded.

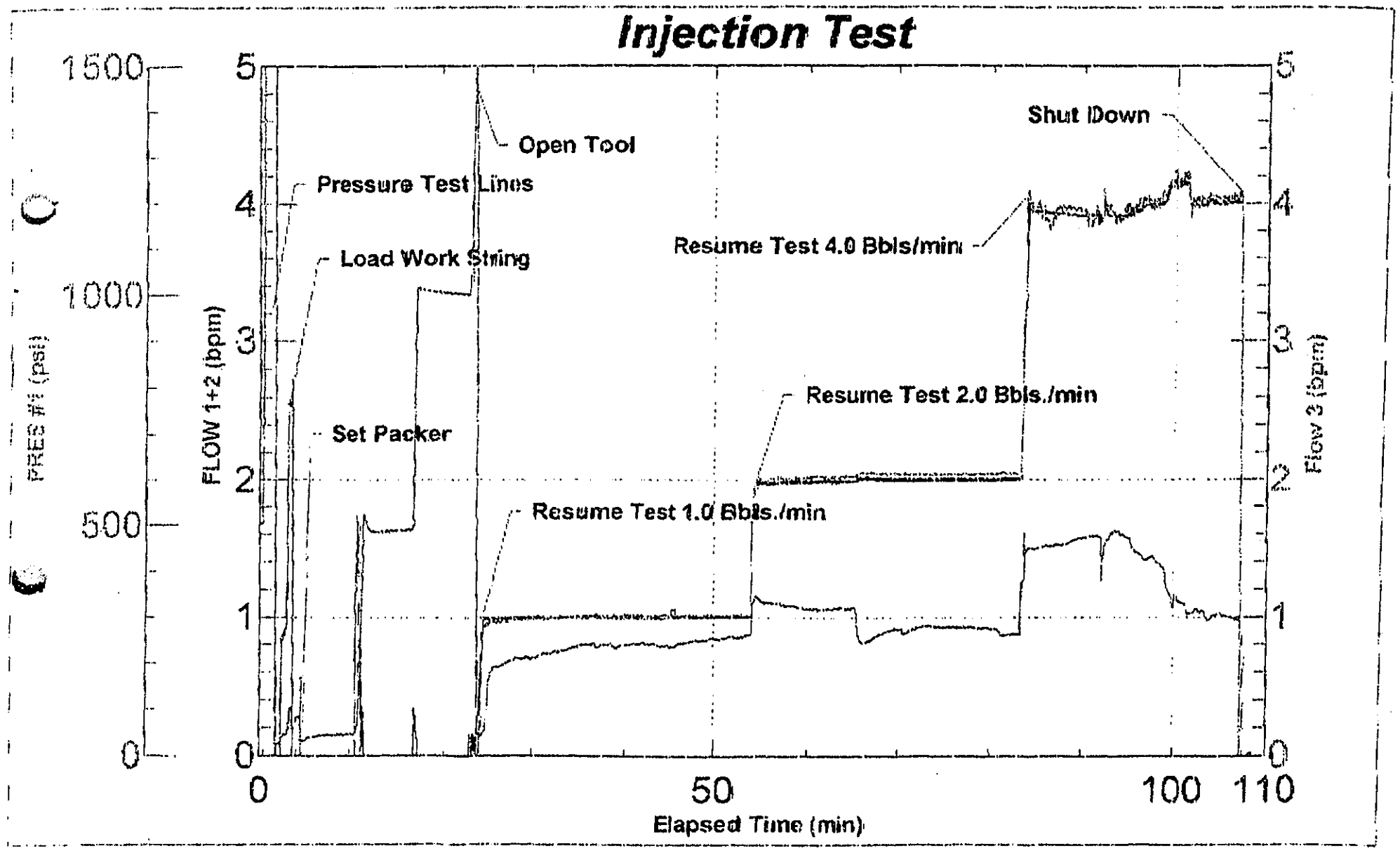
To: Simon

Company: COPPER Well: SUNCOR

Schlumberger

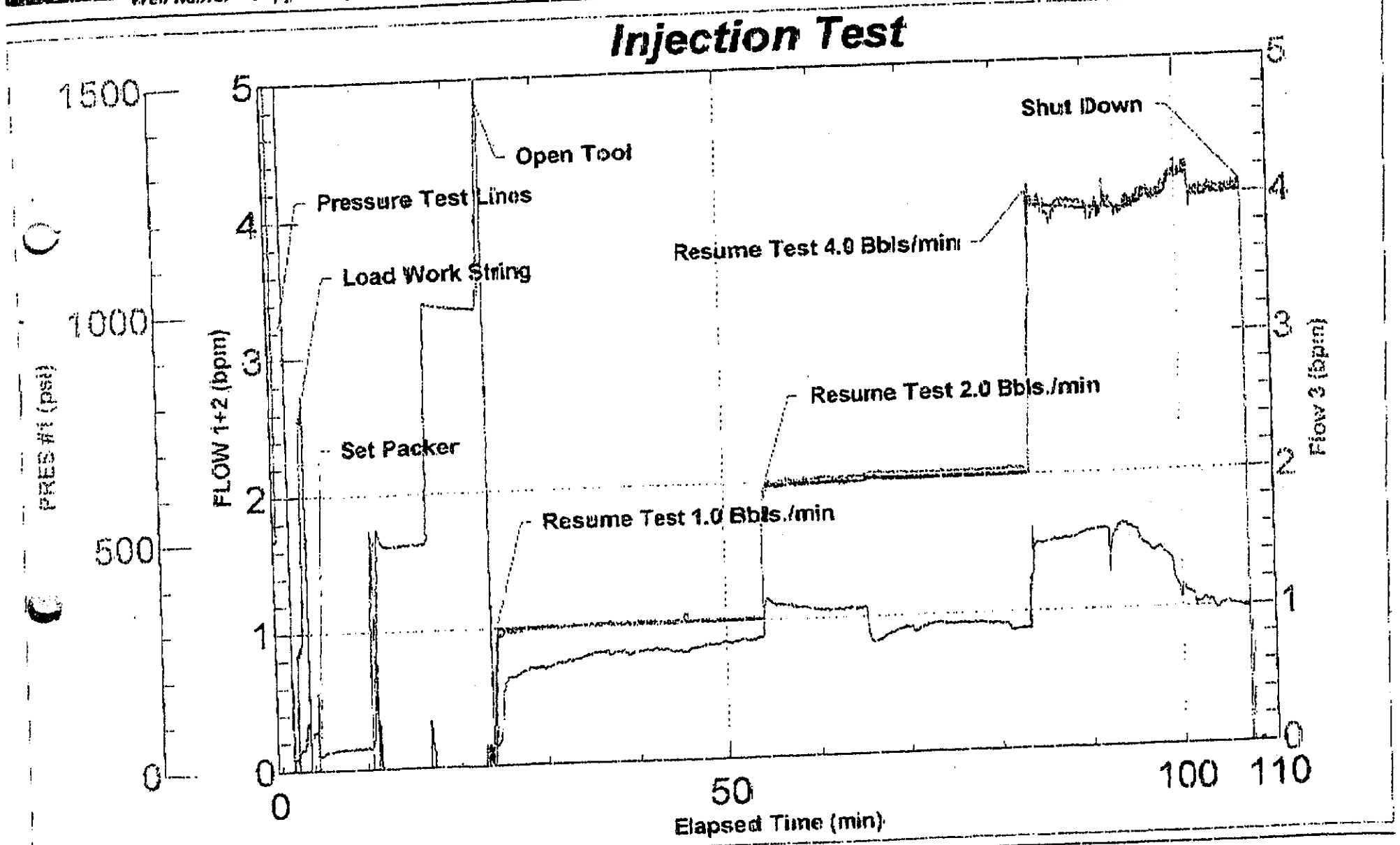


BJ Services JobMaster Program Version 2.60B1
Job Number: 243810126
Customer: Brammer Engineering
Well Name: Copper Eagle-Suncor Devel #1-24



BJ Services

BJ Services JobMaster Program Version 2.60B1
Job Number: 243810126
Customer: Brammer Engineering
Well Name: Copper Eagle-Suncor Devel #1-24



BJ Services

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
STEP RATE TEST	31-JAN-2002	HOBBS

WELL OWNER: COPPER EAGLE GAS STORAGE — SERVICE ORDER NUMBER: 7960585

REPORTS ADDRESS: 333 TEXAS STREET / SUITE 425 / SHREVEPORT, LA 71101-5319 ATTN:COPPER EAGLE GAS STORAGE

WELL NAME & NO.: SUNCOR DEVELOPMENT 1-24 — FIELD: LUKE-GLENDALE — LEASE:

LOCATION: 330SLx330WL — COUNTY: MARICOPA — STATE: ARIZONA

TEST NO. SRT #1 — TEST INTERVAL FROM 5390 FT TO 6052 FT = 662 FT

SURFACE DATA

DESCRIPTION	DATE	TIME OF DAY	PRESSURE
RE-SET PACKER	31-JAN	21:57	
PUMP PRESSURE		22:09	
SURFACE SHUT-IN	01-FEB	01:48	
SHUT-IN POINT		10:01	

EQUIPMENT SEQUENCE

COMPONENTS	OD	ID	LENGTH	DEPTH
PUMP-IN SWEDGE				
DRILL PIPE (16.6#)	4.50	3.826	4852.	4852
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.7850	516.9	5369
CROSS OVER SUB	6.0625	2.6875	1.45	5370
J-CIRC. VALVE	5.3125	2.6875	4.65	5375
RESETABLE PIP PACKER	10.4	2.375	5.00	5380
PIP BOTTOM ASSEMBLY	10.4	2.375	3.6	5384
CROSS OVER SUB	6.25	2.9375	2.00	5386
CROSS OVER SUB	6.9375	2.9375	0.96	5387
CROSS OVER SUB	6.375	3.00	2.00	5389
PERFORATED ANCHOR	5.75	3.000	13.98	5403
INSIDE RECORDER CARRIER	5.75	2.500	6.74	5409
INSIDE RECORDER CARRIER	5.75	2.785	5.52	5415
PERFORATED ANCHOR	5.75	3.000	1.00	5416
OUTSIDE RECORDER CARRIER	5.75	2.250	6.94	5423

909

RECOVERY DESCRIPTION	FEET	BBLS	OIL GRAVITY	RESISTIVITY	CHLORIDES

SERVICE ORDER NUMBER: 7960585

SCHLUMBERGER ENGINEER/TECHNICIAN: KIRK BEASLEY

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
STEP RATE TEST	31-JAN-2002	HOBBS

INSTRUMENT DATA

INSTRUMENT NO.	WTSR-995	WTSR-1762	WTSR-978		
CAPACITY (PSIG)	20000	20000	20000		
DEPTH	5409	5423	5415		
INSIDE-OUTSIDE	IN	OUT	IN		
CLOCK CAP	ELECTRONIC	ELECTRONIC	ELECTRONIC		
TEMPERATURE °F	157	158			
I. HYD. PSIG	2806	2809			
I. FLOW PSIG	2442-3379	2445-3385			
I.S.I. PSIG	2258	2263			
2nd FLOW PSIG					
2nd S.I. PSIG					
F. FLOW PSIG					
F.S.I. PSIG					
F. HYD. PSIG	3078	3083			

MUD DATA

MUD TYPE BRINE MUD WT 9.3 #/gal
VISCOSITY 34 WATER LOSS 6 CC
RESISTIVITY: OF MUD @ °F
RESISTIVITY: OF FILTRATE 0.135 @ 70 °F
CHLORIDES 32000 PPM
H2S DURING TEST PPM

WELL BORE DATA

FORMATION TESTED
NET PRODUCTIVE INTERVAL ft EST. POROSITY %
ELEVATION 1064 ft DEPTH MEASURED FROM GL
TOTAL MEASURED DEPTH 6052/6052 ft
O H SIZE 12.25 in
CASING SIZE 13.375 / 12.415
LINER SIZE
PERF INTERVAL FROM ft TO ft
SHOT DENSITY

CUSHION	LENGTH	AMOUNT	SURFACE PRESS	BOTTOM CHOKE SIZE
NONE				

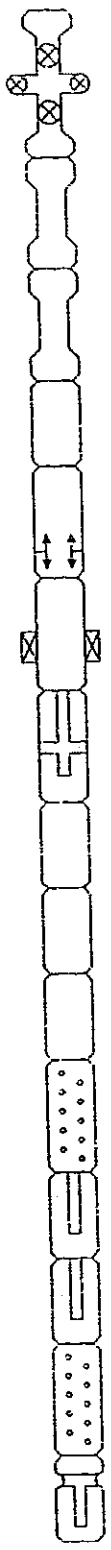
SAMPLER DATA

RECOVERY		RESISTIVITY		CHLORIDES
GAS	C.F.	RECOVERED WATER @	deg F	PPM
OIL	C.C.	RECOVERED MUD @	deg F	
WATER	C.C.	REC.MUD FILTRATE @	deg F	PPM
MUD	C.C.	PIT MUD @	deg F	
GRAVITY °API	°F	PIT MUD FILTRATE @	deg F	PPM
GOR	C.F./BBL	SAMPLER PRESSURE		

REMARKS: STEP RATE TEST #1. THANK YOU FOR USING SCHLUMBERGER.

SERVICE ORDER NUMBER:	7960585	SCHLUMBERGER ENGINEER/TECHNICIAN	KIRK BEASLEY

COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
PUMP-IN SWEDGE				0
DRILL PIPE (16.6#)	4.50	3.826	4852.	4852
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.7850	516.9	5368.9
CROSS OVER SUB	6.0625	2.6875	1.45	5370.35
J-CIRC. VALVE	5.3125	2.6875	4.65	5375
RESETABLE PIP PACKER	10.4	2.375	5.00	5380
PIP BOTTOM ASSEMBLY	10.4	2.375	3.6	5383.6
CROSS OVER SUB	6.25	2.9375	2.00	5385.6
CROSS OVER SUB	6.9375	2.9375	0.96	5386.56
CROSS OVER SUB	6.375	3.00	2.00	5388.56
PERFORATED ANCHOR	5.75	3.000	13.98	5402.54
INSIDE RECORDER CARRIER	5.75	2.500	6.74	5409.28
INSIDE RECORDER CARRIER	5.75	2.785	5.52	5414.8
PERFORATED ANCHOR	5.75	3.000	1.00	5415.8
OUTSIDE RECORDER CARRIER	5.75	2.250	6.94	5422.74

Report Number: 7960585
Test Number: SRT #1
Test Date: 31-JAN-2002

Schlumberger

REPORT NO. 7960585
PAGE NO. 1
TEST DATE: 31-JAN-2002

S T A R

Schlumberger Testing Data Report

Pressure Data Report

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE

WELL: SUNCOR DEVELOPMENT 1-24

TEST IDENTIFICATION

Test Type ..... STEP RATE TEST
Test No. ..... SRT #1
Formation .....
Test Interval (ft) ..... 5390 to 6052
Depth Reference ..... GL

WELL LOCATION

Field ..... LUKE-GLENDALE
County ..... MARICOPA
State ..... ARIZONA
Sec/Twn/Rng 330SLx330WL
Elevation (ft) 1064

HOLE CONDITIONS

Total Depth (MD/TVD) (ft) 6052/6052
Hole Size (in) 12.25
Casing/Liner I.D. (in) ..... 13.375 / 12.41
Perf'd Interval/Net Pay (ft)..
Shot Density/Diameter (in) ...

MUD PROPERTIES

Mud Type ..... BRINE
Mud Weight (lb/gal) 9.3
Mud Resistivity (ohm.m) .....
Filtrate Resistivity (ohm.m).. 0.135 @ 70F
Filtrate Chlorides (ppm) 32000

INITIAL TEST CONDITIONS

Initial Hydrostatic (psi) ....
Gas Cushion Type .....
Surface Pressure (psi) .....
Liquid Cushion Type .....
Cushion Length (ft) .....

TEST STRING CONFIGURATION

Pipe Length (ft)/I.D. (in) ... 5369 / 2.7850
Collar Length (ft)/I.D. (in).. 0 / 2.7850
Packer Depths (ft) 5380,
Bottomhole Choke Size (in) ...
Gauge Depth (ft)/Type 5409/WTSR-995

NET PIPE RECOVERY

Volume	Fluid Type	Properties

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties

Pressure: GOR:0 GLR:0

INTERPRETATION RESULTS

Model of Behavior .....
Fluid Type Used for Analysis..
Reservoir Pressure (psi) .....
Transmissibility (md.ft/cp) ..
Effective Permeability (md) ..
Skin Factor/Damage Ratio .....
Storativity Ratio, Omega .....
Interporos.Flow Coef.,Lambda..
Distance to an Anomaly (ft) ..
Radius of Investigation (ft)..
Potentiometric Surface (ft) ..

ROCK/FLUID/WELLBORE PROPERTIES

Oil Density (deg. API) .....
Basic Solids (%) .....
Gas Gravity .....
GOR (scf/STB) .....
Water Cut (%) .....
Viscosity (cp) .....
Total Compressibility (1/psi).
Porosity (%) .....
Reservoir Temperature (F) 157
Form.Vol.Factor (bbl/STB) ....

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

STEP RATE TEST #1. THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:7960585 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 2, 2-FEB-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	SEQUENCE OF EVENTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

DATE	TIME (HR:MIN)	DESCRIPTION	ET (MINS)	BHP (PSIA)	WHP (PSIG)
31-JAN	21:57	RE-SET PACKER	0		
	22:09	PUMP PRESSURE	12		
01-FEB	01:48	SURFACE SHUT-IN	231		
	10:01	SHUT-IN POINT	724		

SCHLUMBERGER

FORM# 11.00-102590

WELL TEST INTERPRETATION REPORT =:7960585 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 12, 2-FEB-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

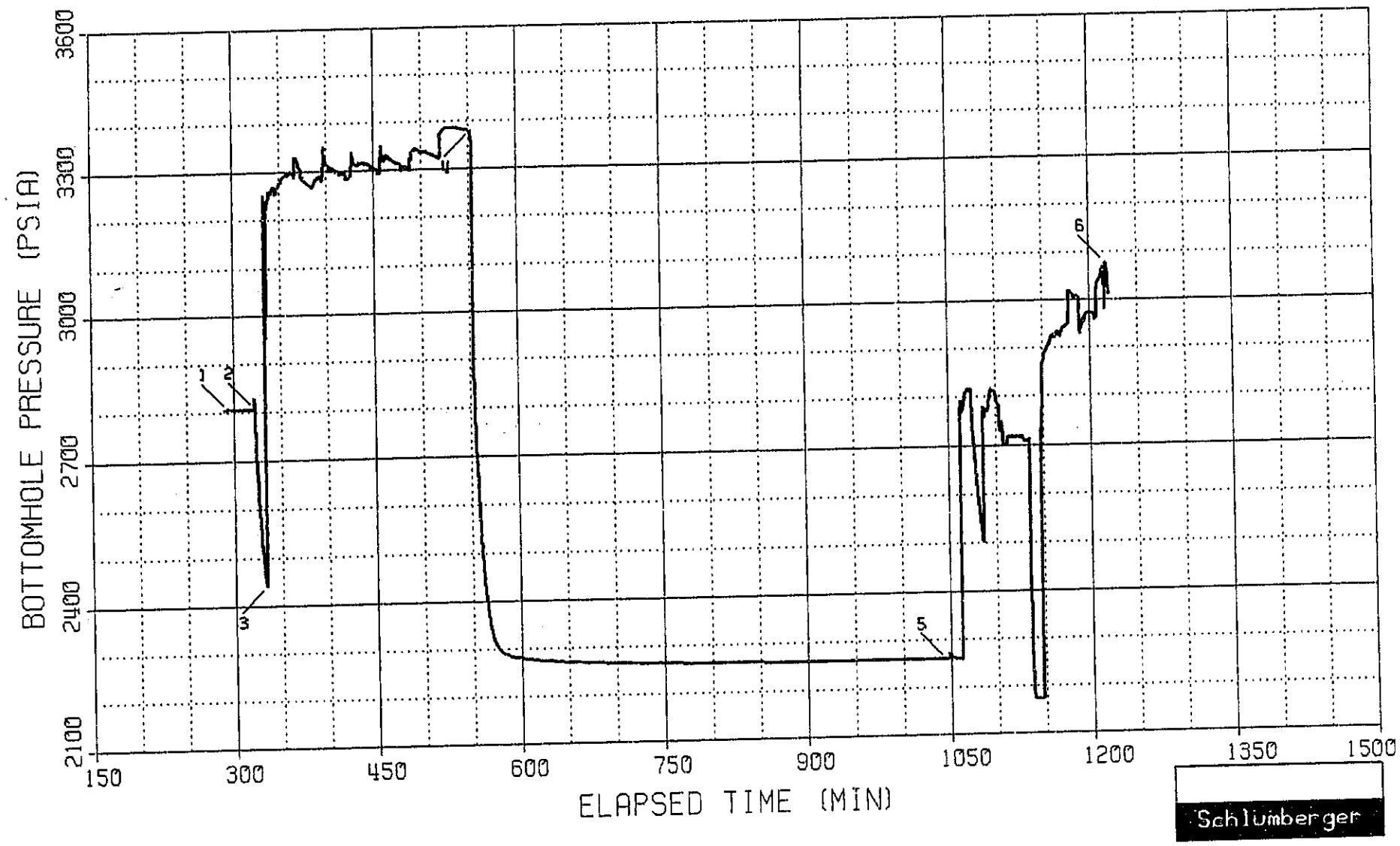
Any interpretations or recommendations are opinions and necessarily based on inferences and empirical factors and assumptions, which are not infallible. Accordingly, Schlumberger (Flopetrol Johnston) cannot and does not warrant the accuracy of correctness of any interpretation or measurement. Under no circumstances should any intepretation or measurement be relied upon as the sole basis for any drilling, completion, well treatment or production decision or any procedure involving risk to the safety of any drilling venture, drilling rig or its crew or any other individual. The Customer has full responsibility for all drilling, completion, well treatment, and production procedure, and all other activities relating to the drilling or production operation.

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960585
INSTRUMENT NO. WTSR-995
DEPTH : 5409 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

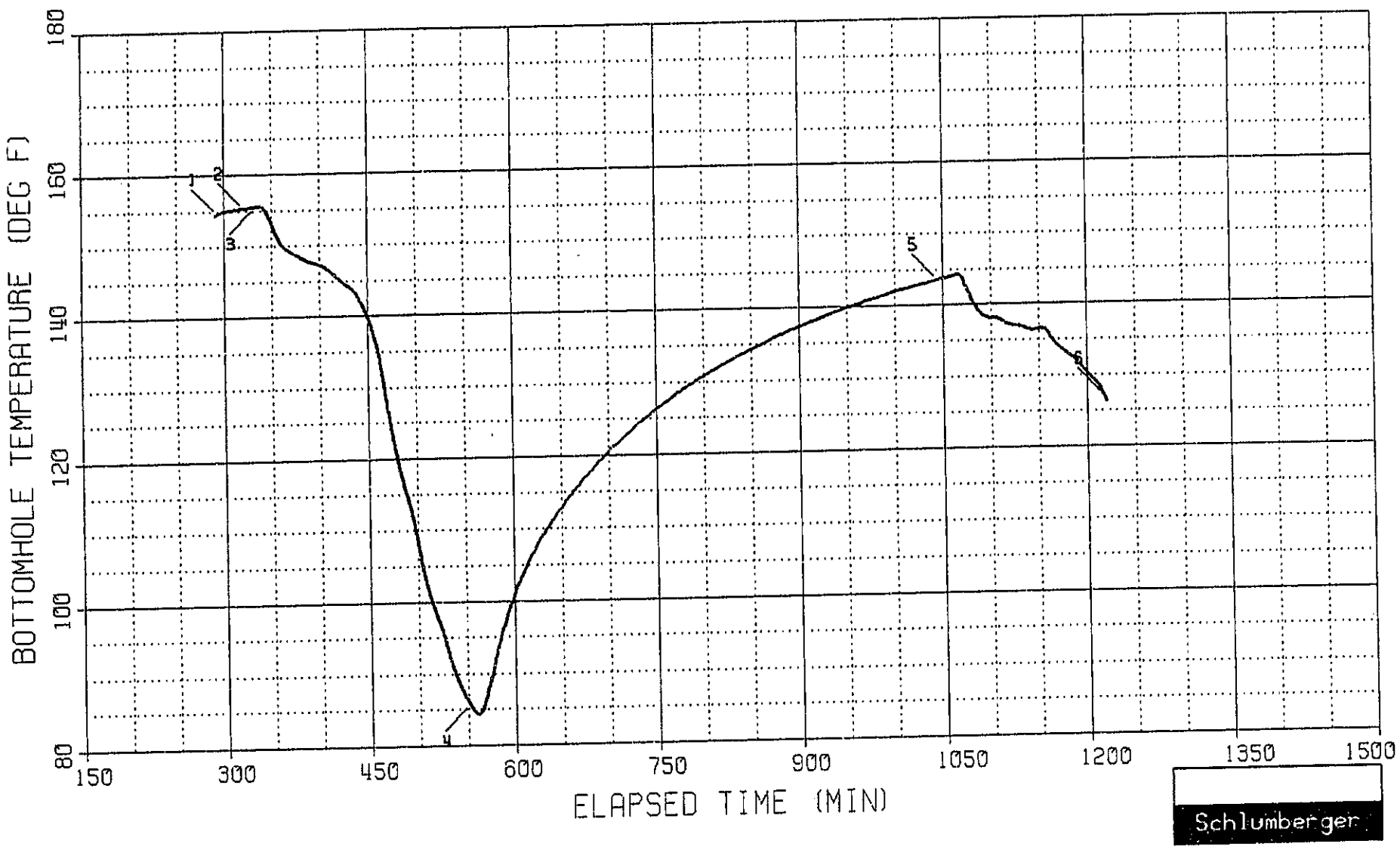


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960585
INSTRUMENT NO. WTSR-995
DEPTH : 5409 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Temperature Data



REPORT NO. 7960586
PAGE NO. 1
TEST DATE: 01-FEB-2002

S T A R

Schlumberger Testing Data Report

Pressure Data Report

909

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE	WELL: SUNCOR DEVELOPMENT 1-24
TEST IDENTIFICATION Test Type ..... STEP RATE TEST Test No. ..... SRT #2 Formation ..... Test Interval (ft) ..... 5156 to 6052 Depth Reference ..... GL	**WELL LOCATION** Field ..... LUKE-GLENDALE County ..... MARICOPA State ..... ARIZONA Sec/Twn/Rng ..... 330SLx330WL Elevation (ft) 1064
HOLE CONDITIONS Total Depth (MD/TVD) (ft) .... 6052/6052 Hole Size (in) ..... 12.25 Casing/Liner I.D. (in) ..... 13.375 / 12.41 Perf'd Interval/Net Pay (ft) .. Shot Density/Diameter (in) ...	**MUD PROPERTIES** Mud Type ..... BRINE Mud Weight (lb/gal) ..... 9.3 Mud Resistivity (ohm.m) ..... Filtrate Resistivity (ohm.m) .. 0.135 @ 70F Filtrate Chlorides (ppm) 32000
INITIAL TEST CONDITIONS Initial Hydrostatic (psi) .... Gas Cushion Type ..... Surface Pressure (psi) ..... Liquid Cushion Type ..... Cushion Length (ft)	**TEST STRING CONFIGURATION** Pipe Length (ft)/I.D. (in) ... 5144 / 2.7850 Collar Length (ft)/I.D. (in).. 0 / 2.7850 Packer Depths (ft) ..... 5156, Bottomhole Choke Size (in) ... Gauge Depth (ft)/Type 5186/WTSR-995

NET PIPE RECOVERY

Volume	Fluid Type	Properties

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties
Pressure:	GOR:0	GLR:0

INTERPRETATION RESULTS	ROCK/FLUID/WELLBORE PROPERTIES
Model of Behavior	Oil Density (deg. API) .....
Fluid Type Used for Analysis..	Basic Solids (%) .....
Reservoir Pressure (psi)	Gas Gravity .....
Transmissibility (md.ft/cp) ..	GOR (scf/STB) .....
Effective Permeability (md) ..	Water Cut (%) .....
Skin Factor/Damage Ratio	Viscosity (cp) .....
Storativity Ratio, Omega	Total Compressibility (1/psi).
Interporos.Flow Coef..Lambda..	Porosity (%) .....
Distance to an Anomaly (ft) ..	Reservoir Temperature (F) 126
Radius of Investigation (ft)..	Form.Vol.Factor (bbl/STB) ....
Potentiometric Surface (ft) ..	

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

THIS REPORT CONTAINS BOTTOMHOLE PRESSURE RESPONSE FROM SRT #2. THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:750000		PAGE: 12, 7-FEB-**
CLIENT : COPPER EAGLE GAS STORAGE		
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

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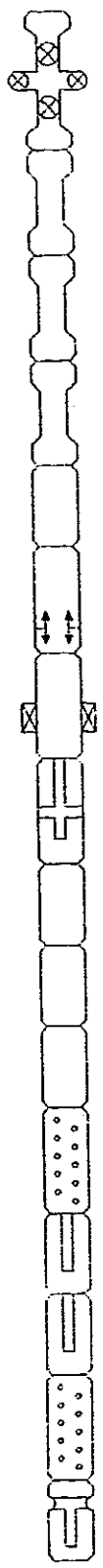
COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
PUMP-IN SWEDGE				0
DRILL PIPE (16.6#) 49 STANDS	4.50	3.826	4607.	4607
DRILL PIPE (16.6#) 1 SINGLE	4.50	3.826	20.0	4627
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.7850	516.9	5143.9
CROSS OVER SUB	6.0625	2.6875	1.45	5145.35
J-CIRC. VALVE	5.3125	2.6875	4.65	5150
RESETABLE PIP PACKER	10.4	2.375	6.00	5156
PIP BOTTOM ASSEMBLY	10.4	2.375	4.25	5160.25
CROSS OVER SUB	6.25	2.9375	2.00	5162.25
CROSS OVER SUB	6.9375	2.9375	0.96	5163.21
CROSS OVER SUB	6.375	3.00	2.00	5165.21
PERFORATED ANCHOR	5.75	3.000	13.98	5179.19
INSIDE RECORDER CARRIER	5.75	2.500	6.74	5185.93
INSIDE RECORDER CARRIER	5.75	2.785	5.52	5191.45
PERFORATED ANCHOR	5.75	3.000	1.00	5192.45
OUTSIDE RECORDER CARRIER	5.75	2.250	6.94	5199.39

Report Number: 7960586
Test Date: 01-FEB-2001
Note: All Depths to Bottom of Tool

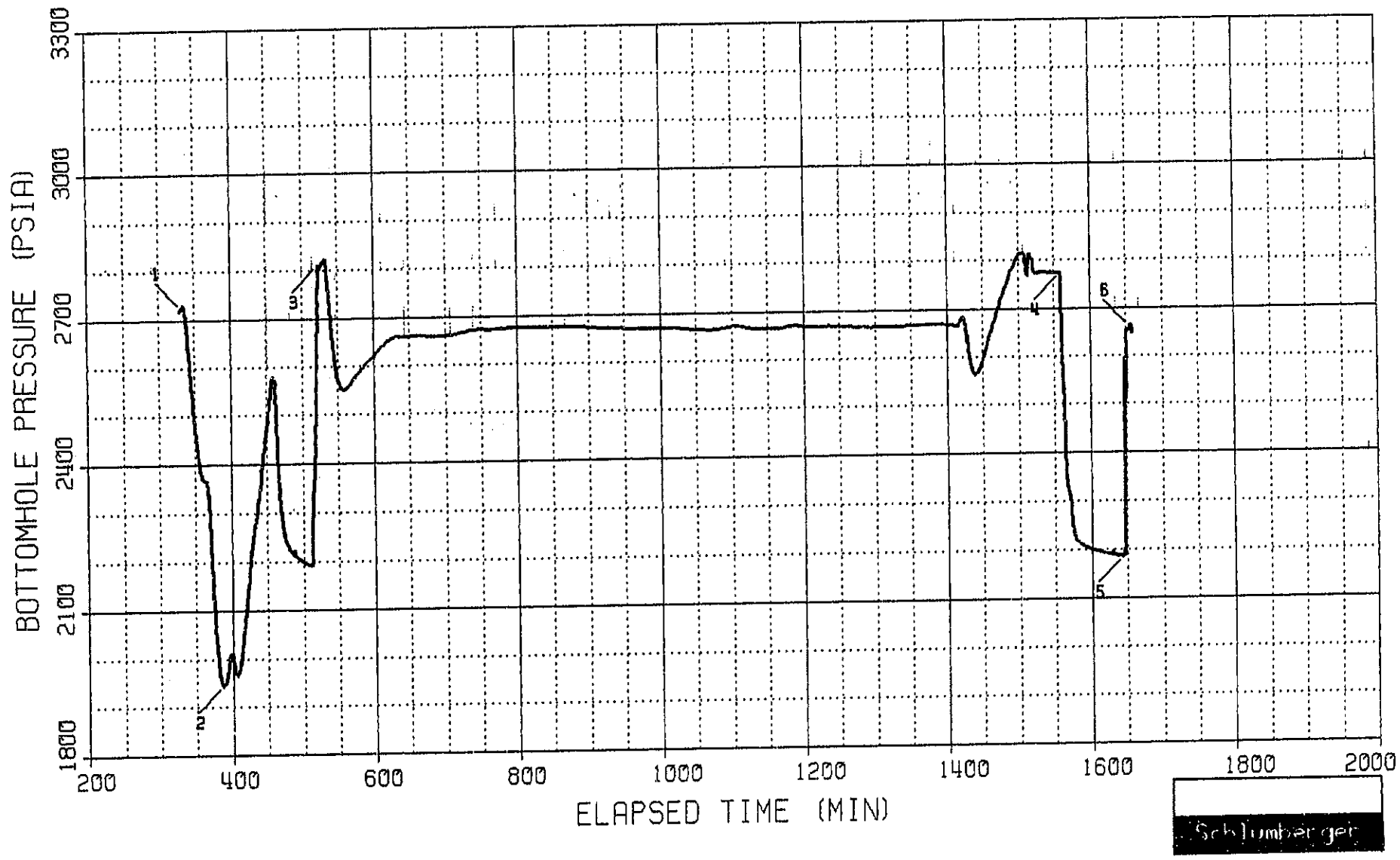
Schlumberger

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960586
INSTRUMENT NO. WTSR-995
DEPTH : 5186 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

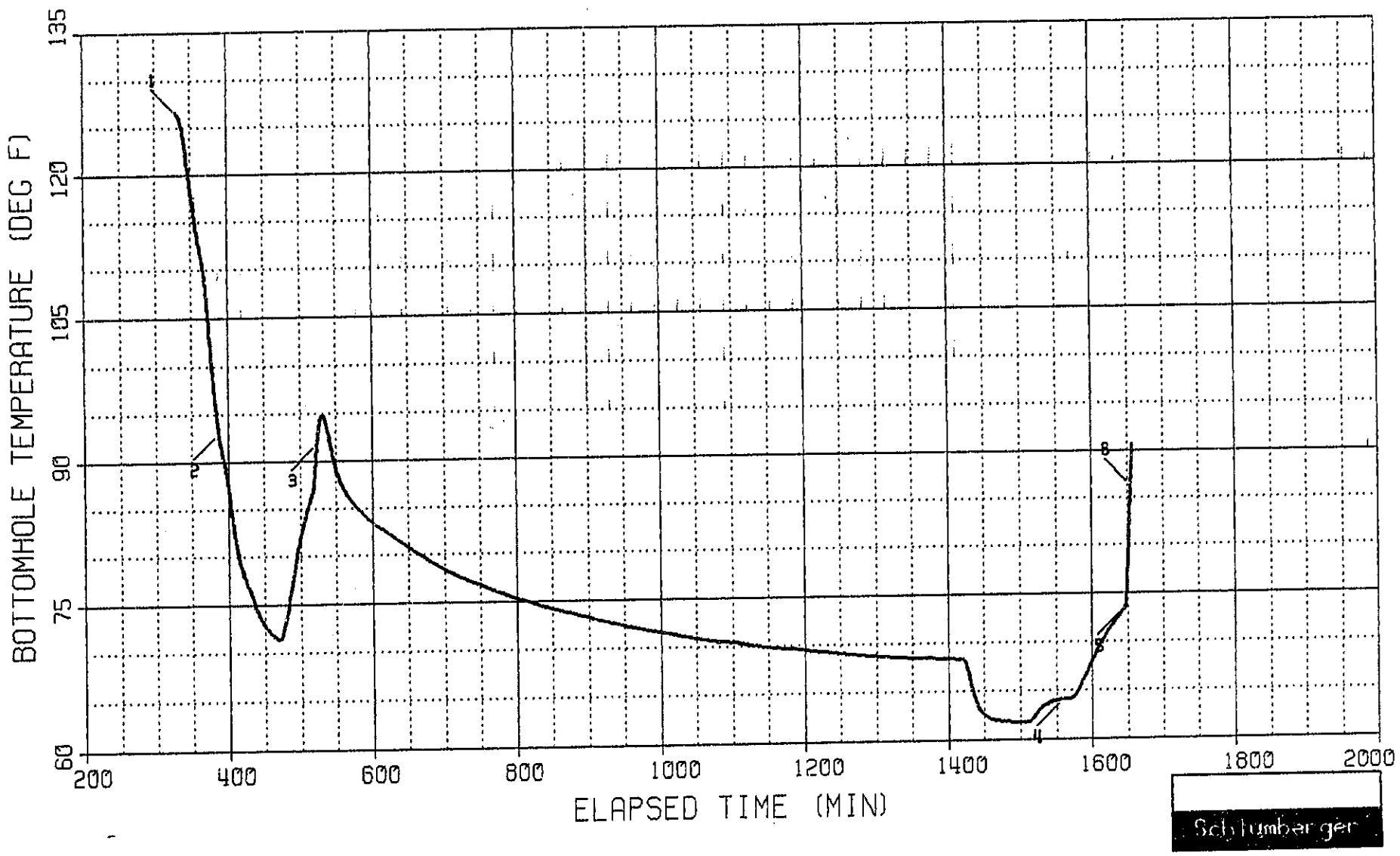


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960586
INSTRUMENT NO. WTSR-995
DEPTH : 5186 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Temperature Data



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** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960586
INSTRUMENT NO. WTSR-995

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 5186 FT

LABEL POINT INFORMATION
****

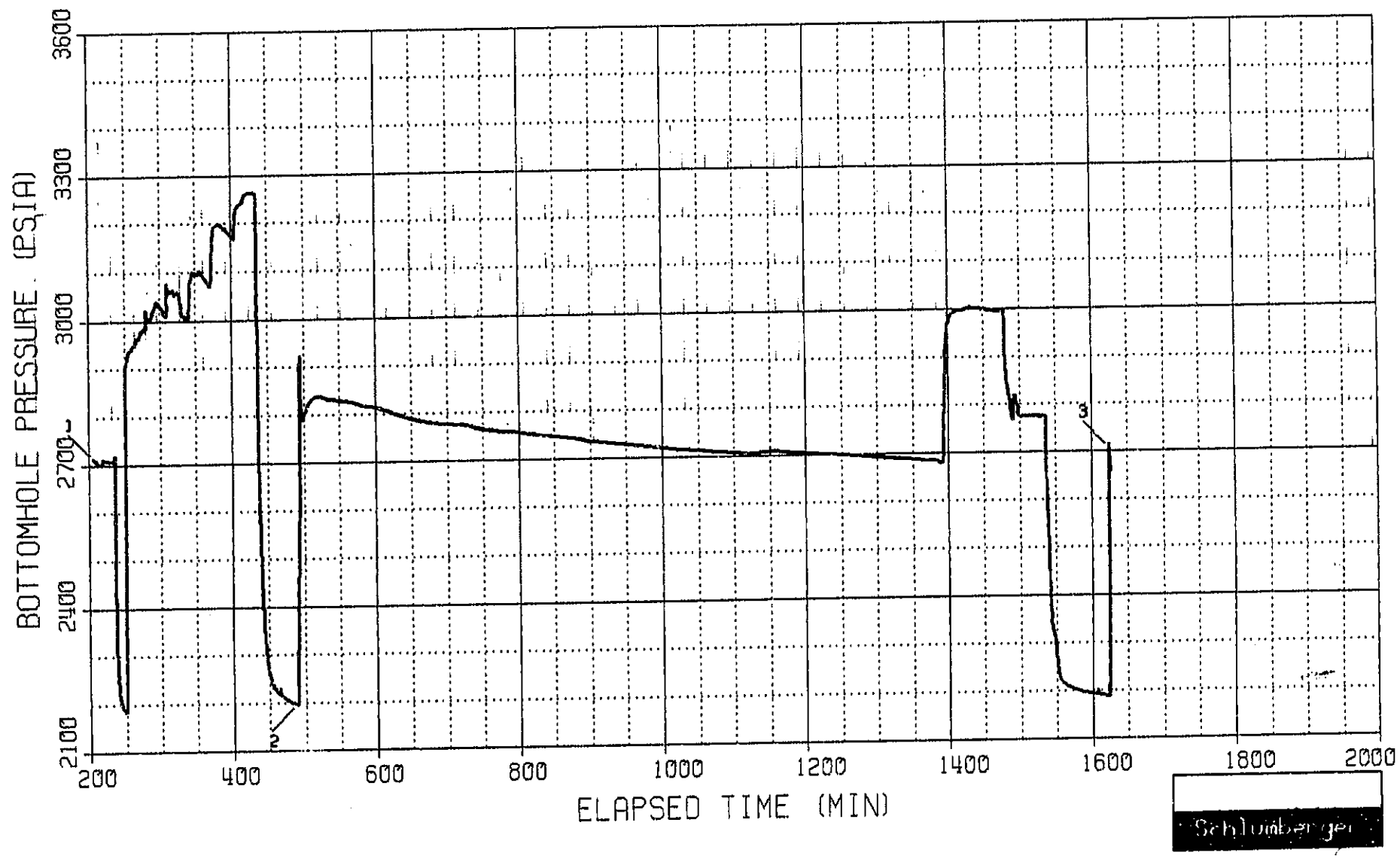
#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	21:50:51	1-FEB	HYDROSTATIC MUD	331.85	2723.60	126.39
2	22:46:11	1-FEB	FLOW POINT	387.18	1943.74	93.07
3	1:02:11	2-FEB	FLOW POINT	523.18	2810.15	91.80
4	18:17:55	2-FEB	FLOW POINT	1558.92	2774.15	64.02
5	19:43:31	2-FEB	FLOW POINT	1644.52	2187.19	73.24
6	19:54:11	2-FEB	HYDROSTATIC MUD	1655.18	2661.03	86.38

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960586
INSTRUMENT NO. WTSR-1762
DEPTH : 5199 FT
CAPACITY : 20000 PSI
PORT OPENING : OUTSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

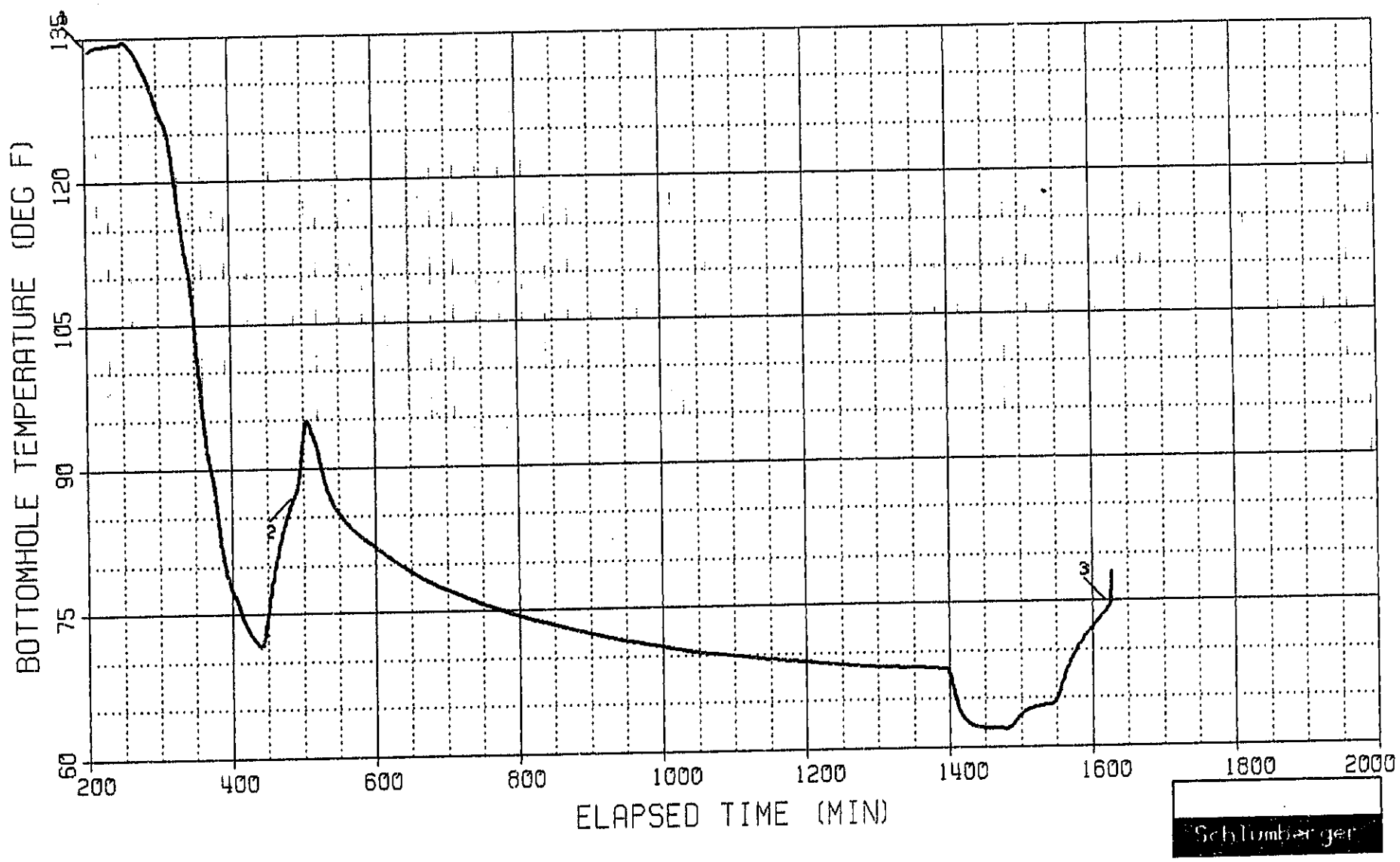


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960586
INSTRUMENT NO. WTSR-1762
DEPTH : 5199 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Temperature Data



****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960586
INSTRUMENT NO. WTSR-1762

RECORDER CAPACITY: 20000 PSI PORT OPENING: OUTSIDE DEPTH: 5199 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	20:08:05	1-FEB	HYDROSTATIC MUD	207.08	2712.02	133.72
2	0:49:33	2-FEB	FLOW POINT	488.55	2195.81	87.37
3	19:45:25	2-FEB	HYDROSTATIC MUD	1624.42	2707.64	74.53

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FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
STRADDLE DST	29-JAN-2002	HOBBS

WELL OWNER: COPPER EAGLE GAS STORAGE — SERVICE ORDER NUMBER: 7960583

REPORTS ADDRESS: 333 TEXAS STREET / SUITE 425 / SHREVEPORT, LA 71101-5319 ATTN:COPPER EAGLE GAS STORAGE

WELL NAME & NO.: SUNCOR DEVELOPMENT 1-24 — FIELD: LUKE-GLENDALE — LEASE:

LOCATION: 330SLx330WL — COUNTY: MARICOPA — STATE: ARIZONA

TEST NO FIVE — TEST INTERVAL FROM 4510 FT TO 4760 FT = 250 FT

SURFACE DATA

DESCRIPTION	DATE	TIME OF DAY	PRESSURE
OPEN TO BUBBLE HOSE ONLY	30-JAN		
SET PACKERS		04:19	
START FLOW		04:27	
BLOW DESCRIBED IN INCHES		04:28	6"
		04:35	8"
END FLOW & START SHUT-IN		04:38	9"
END SHUT-IN		06:04	0"
START FLOW, BUBBLES		06:08	
		06:09	4"
		06:12	6"
		06:27	7"
		07:08	7"
5 OUNCES		07:38	6"
END FLOW & START SHUT-IN		08:09	6"
END SHUT-IN		10:13	
PULLED LOOSE		10:18	
PULLED TO FLUID			

909

EQUIPMENT SEQUENCE

COMPONENTS	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				
DRILL PIPE (16.6#)	4.50	3.826	3879	3879
DRILL COLLARS	6.25	2.250	180.0	4059
CROSS OVER SUB	6.25	2.250	1.36	4060
HYDRAULIC JAR	6.25	2.000	11.69	4072
CROSS OVER SUB	6.125	3.000	1.84	4074
DRILL COLLARS	6.25	2.250	298.7	4373
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	4373
DRILL COLLARS	6.25	2.250	90.82	4464
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	4465
CROSS OVER SUB	6.00	2.438	0.94	4466
MFE	5.00	1.000	9.88	4476
MFE OH BYPASS	5.00	1.000	2.98	4479
CROSS OVER SUB	5.75	2.000	0.99	4480
INSIDE RECORDER CARRIER	5.75	3.000	6.74	4487
INSIDE RECORDER CARRIER	5.75	3.000	5.52	4492
CROSS OVER SUB	5.75	2.000	1.11	4493
D&C HYDRAULIC JAR	4.75	1.875	6.59	4500
UPPER STRADDLE BYPASS SUB	4.75	2.000	0.66	4501
SAFETY JOINT	4.75	2.500	2.01	4503
CROSS OVER SUB	6.00	2.50	1.02	4504
BOB-TAIL PACKER	11.125	1.750	6.36	4510
PERFORATED ANCHOR	5.75	3.000	31.4	4541
LOWER STRADDLE BYPASS SUB	5.75	0.000	0.64	4542
CROSS OVER SUB	6.125	2.500	1.47	4544
DRILL COLLARS	6.25	2.250	147.8	4691
HEAVY WEIGHT DRILL PIPE-2 JTS	4.50	2.750	61.24	4753
CROSS OVER SUB	6.125	2.500	1.39	4754
BOB TAIL PACKER	11.25	1.750	6.06	4760
PERFORATED ANCHOR	5.75	3.000	11.62	4772
OUTSIDE RECORDER CARRIER	5.75	3.000	6.28	4778
CROSS OVER SUB	6.00	2.313	0.87	4779
HEAVY WEIGHT DRILL PIPE	4.50	2.750	516.9	5296
Cross Over Sub	6.438	3.125	2.22	5298
DRILL COLLARS	8.00	3.000	88.2	5386
BIT SUB	7.938	2.750	2.91	5389
BIT	12.25	2.000	1.00	5390

RECOVERY DESCRIPTION	FEET	BBLS	OIL GRAVITY	RESISTIVITY	CHLORIDES
MUD FILTRATE	1128				
TOP				0.154 OHMS 60 °F	32000 PPM
MIDDLE				0.168 OHMS 60 °F	29000 PPM
BOTTOM				0.163 OHMS 60 °F	30000 PPM

SERVICE ORDER NUMBER: 7960583 — SCHLUMBERGER ENGINEER/TECHNICIAN KIRK BEASLEY

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
STRADDLE DST	29-JAN-2002	HOBBS

INSTRURMENT DATA

INSTRUMENT NO.	WTSR-995	WTSR-978	WTSR-1762		
CAPACITY(PSIG)	20000	20000	20000		
DEPTH	4487	4492	4779		
INSIDE-OUTSIDE	IN	IN	OUT		
CLOCK CAP	ELECTRONIC	ELECTRONIC	ELECTRONIC		
TEMPERATURE °F	152	152	165		
I. HYD. PSIG	2278	2285	2776		
I. FLOW PSIG	83-198	85-194	2785		
I.S.I. PSIG	1843	1839			
2nd FLOW PSIG					
2nd S.I. PSIG					
F. FLOW PSIG	279-637	258-633			
F.S.I. PSIG	1739	1735			
F. HYD. PSIG	2305	2302	2779		

MUD DATA

MUD TYPE	BRINE	MUD WT	3.3 #/gal
VISCOSITY	34	WATER LOSS	6 CC
RESISTIVITY: OF MUD	@ °F		
RESISTIVITY: OF FILTRATE	0.135 @ 70 °F		
CHLORIDES	32000 PPM		
H2S DURING TEST	PPM		

WELL BORE DATA

FORMATION TESTED	
NET PRODUCTIVE INTERVAL	ft EST. POROSITY %
ELEVATION	1064 ft DEPTH MEASURED FROM GL
TOTAL MEASURED DEPTH	6052/6052 ft
O H SIZE	12.25 in
CASING SIZE	13.375 / 12.415
LINER SIZE	
PERF INTERVAL FROM	ft TO ft
SHOT DENSITY	

CUSHION	LENGTH	AMOUNT	SURFACE PRESS	BOTTOM CHOKE SIZE
NONE				1.00

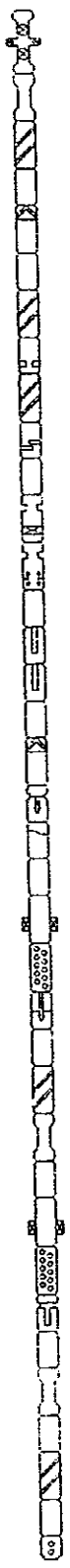
SAMPLER DATA

RECOVERY			RESISTIVITY			CHLORIDES	
GAS		C.F.	RECOVERED WATER	@	deg F		PPM
OIL		C.C.	RECOVERED MUD	@	deg F		
WATER		C.C.	REC.MUD FILTRATE 0.154	@ 60	deg F	32000	PPM
MUD	2500	C.C.	PIT MUD	@	deg F		
GRAVITY	°API	°F	PIT MUD FILTRATE 0.154	@ 60	deg F	32000	PPM
GOR		C.F./BBL	SAMPLER PRESSURE 6 psig				

REMARKS: THIS TEST WAS CONCLUSIVE. THE ZONE WAS ISOLATED WITH STRADDLE PACKERS AT 4510' & 4760'. THERE WERE NO DRILL PIPE LEAKS, THE ANNULUS REMAINED CONSTANT AND THE BOTTOM PACKER SEALED OFF THE LOWER FORMATION AS PROVED BY THE TATTLE-TAIL RECORDER. THE RECOVERY WAS 10.7 BARRELS OF MUD FILTRATE. THANK YOU FOR USING SCHLUMBERGER.

SERVICE ORDER NUMBER:	7960583	SCHLUMBERGER ENGINEER/TECHNICIAN	KIRK BEASLEY

COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				0
DRILL PIPE (16.6#)	4.50	3.826	3879	3879
DRILL COLLARS	6.25	2.250	180.0	4059
CROSS OVER SUB	6.25	2.250	1.36	4060.36
HYDRAULIC JAR	6.25	2.000	11.69	4072.05
CROSS OVER SUB	6.125	3.000	1.84	4073.89
DRILL COLLARS	6.25	2.250	298.7	4372.59
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	4373.42
DRILL COLLARS	6.25	2.250	90.82	4464.24
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	4465.2
CROSS OVER SUB	6.00	2.438	0.94	4466.14
MFE	5.00	1.000	9.88	4476.02
MFE OH BYPASS	5.00	1.000	2.98	4479
CROSS OVER SUB	5.75	2.000	0.99	4479.99
INSIDE RECORDER CARRIER	5.75	3.000	6.74	4486.73
INSIDE RECORDER CARRIER	5.75	3.000	5.52	4492.25
CROSS OVER SUB	5.75	2.000	1.11	4493.36
D&C HYDRAULIC JAR	4.75	1.875	6.59	4499.95
UPPER STRADDLE BYPASS SUB	4.75	2.000	0.66	4500.61
SAFETY JOINT	4.75	2.500	2.01	4502.62
CROSS OVER SUB	6.00	2.50	1.02	4503.64
BOB-TAIL PACKER	11.125	1.750	6.36	4510
PERFORATED ANCHOR	5.75	3.000	31.4	4541.4
LOWER STRADDLE BYPASS SUB	5.75	0.000	0.64	4542.04
CROSS OVER SUB	6.125	2.500	1.47	4543.51
DRILL COLLARS	6.25	2.250	147.8	4691.31
HEAVY WEIGHT DRILL PIPE-2 JTS	4.50	2.750	61.24	4752.55
CROSS OVER SUB	6.125	2.500	1.39	4753.94
BOB TAIL PACKER	11.25	1.750	6.06	4760
PERFORATED ANCHOR	5.75	3.000	11.62	4771.62
OUTSIDE RECORDER CARRIER	5.75	3.000	6.28	4777.9
CROSS OVER SUB	6.00	2.313	0.87	4778.77
HEAVY WEIGHT DRILL PIPE	4.50	2.750	516.9	5295.67
Cross Over Sub	6.438	3.125	2.22	5297.89
DRILL COLLARS	8.00	3.000	88.2	5386.09
BIT SUB	7.938	2.750	2.91	5389
BIT	12.25	2.000	1.00	5390

Report Number: 7960583
Test Number: FIVE
Test Date: 29-JAN-2002

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REPORT NO. 7960583
PAGE NO. 1
TEST DATE: 29-JAN-2002

S T A R

Schlumberger Testing Data Report

Pressure Data Report

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE	WELL: SUNCOR DEVELOPMENT 1-24
TEST IDENTIFICATION Test Type ..... STRADDLE DST Test No. ..... FIVE Formation ..... Test Interval (ft) ..... 4510 to 4760 Depth Reference ..... GL	**WELL LOCATION** Field ..... LUKE-GLENDALE County ..... MARICOPA State ..... ARIZONA Sec/Twn/Rng ..... 330SLx330WL Elevation (ft) 1064
HOLE CONDITIONS Total Depth (MD/TVD) (ft) .... 6052/6052 Hole Size (in) ..... 12.25 Casing/Liner I.D. (in) ..... 13.375 / 12.41 Perf'd Interval/Net Pay (ft).. Shot Density/Diameter (in) ...	**MUD PROPERTIES** Mud Type ..... BRINE Mud Weight (lb/gal) ..... 9.3 Mud Resistivity (ohm.m) ..... Filtrate Resistivity (ohm.m).. 0.135 @ 70F Filtrate Chlorides (ppm) 32000
INITIAL TEST CONDITIONS Initial Hydrostatic (psi) .... 2277.50 Gas Cushion Type ..... Surface Pressure (psi) ..... Liquid Cushion Type ..... Cushion Length (ft)	**TEST STRING CONFIGURATION** Pipe Length (ft)/I.D. (in) ... 4457 / 2.750 Collar Length (ft)/I.D. (in).. 806 / 3.000 Packer Depths (ft) ..... 4510,4760, Bottomhole Choke Size (in) ... 1.00 Gauge Depth (ft)/Type 4779/WTSR-1762

NET PIPE RECOVERY

Volume	Fluid Type	Properties
1128 ft	MUD FILTRATE	
	TOP	Rw0.154@60F 32000ppm
	MIDDLE	Rw0.168@60F 29000ppm
	BOTTOM	Rw0.163@60F 30000ppm

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties
2500 cc	Mud	Rw 0.154@60F 32000p
Pressure:6	GOR:0	GLR:0

INTERPRETATION RESULTS

Model of Behavior .....
Fluid Type Used for Analysis..
Reservoir Pressure (psi) .....
Transmissibility (md.ft/cp) ..
Effective Permeability (md) ..
Skin Factor/Damage Ratio .....
Storativity Ratio, Omega .....
Interporos.Flow Coef..Lambda..
Distance to an Anomaly (ft) ..
Radius of Investigation (ft)..
Potentiometric Surface (ft) ..

ROCK/FLUID/WELLBORE PROPERTIES

Oil Density (deg. API) .....
Basic Solids (%) .....
Gas Gravity .....
GOR (scf/STB) .....
Water Cut (%) .....
Viscosity (cp) .....
Total Compressibility (1/psi).
Porosity (%) .....
Reservoir Temperature (F) 152
Form.Vol.Factor (bbl/STB) ....

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

THIS TEST WAS CONCLUSIVE. THE ZONE WAS ISOLATED WITH STRADDLE PACKERS AT 4510' & 4760'. THERE WERE NO DRILL PIPE LEAKS. THE ANNULUS REMAINED CONSTANT AND THE BOTTOM PACKER SEALED OFF THE LOWER FORMATION AS PROVED BY THE TATTLE-TAIL RECORDER. THE RECOVERY WAS 10.7 BARRELS OF MUD FILTRATE. THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:7960583 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 2. 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	SEQUENCE OF EVENTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

DATE	TIME (HR:MIN)	DESCRIPTION	ET (MINS)	BHP (PSIA)	WHP (PSIG)
30-JAN		OPEN TO BUBBLE HOSE ONLY			
	04:19	SET PACKERS	-8		
	04:27	START FLOW	0	83	
	04:28	BLOW DESCRIBED IN INCHES	1		6"
	04:35		8		8"
	04:38	END FLOW & START SHUT-IN	11	198	9"
	06:04	END SHUT-IN	97	1843	0"
	06:08	START FLOW, BUBBLES	101	279	
	06:09		102		4"
	06:12		105		6"
	06:27		120		7"
	07:08		161		7"
	07:38	5 OUNCES	191		6"
	08:09	END FLOW & START SHUT-IN	222	637	6"
	10:13	END SHUT-IN	346	1739	
	10:18	PULLED LOOSE	351		
		PULLED TO FLUID			

WELL TEST INTERPRETATION REPORT #:7960583 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 12, 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

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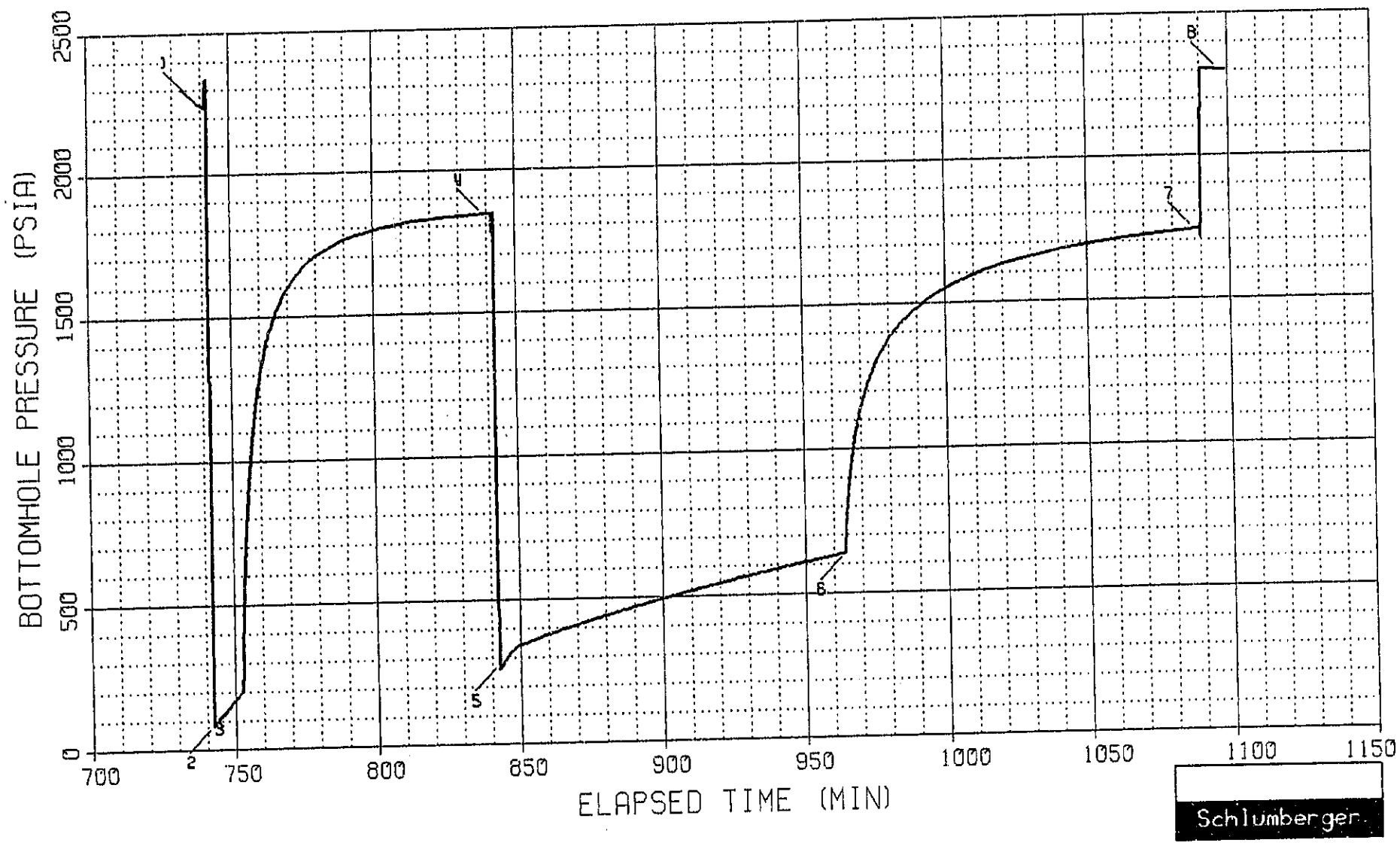
BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-995
DEPTH : 4487 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

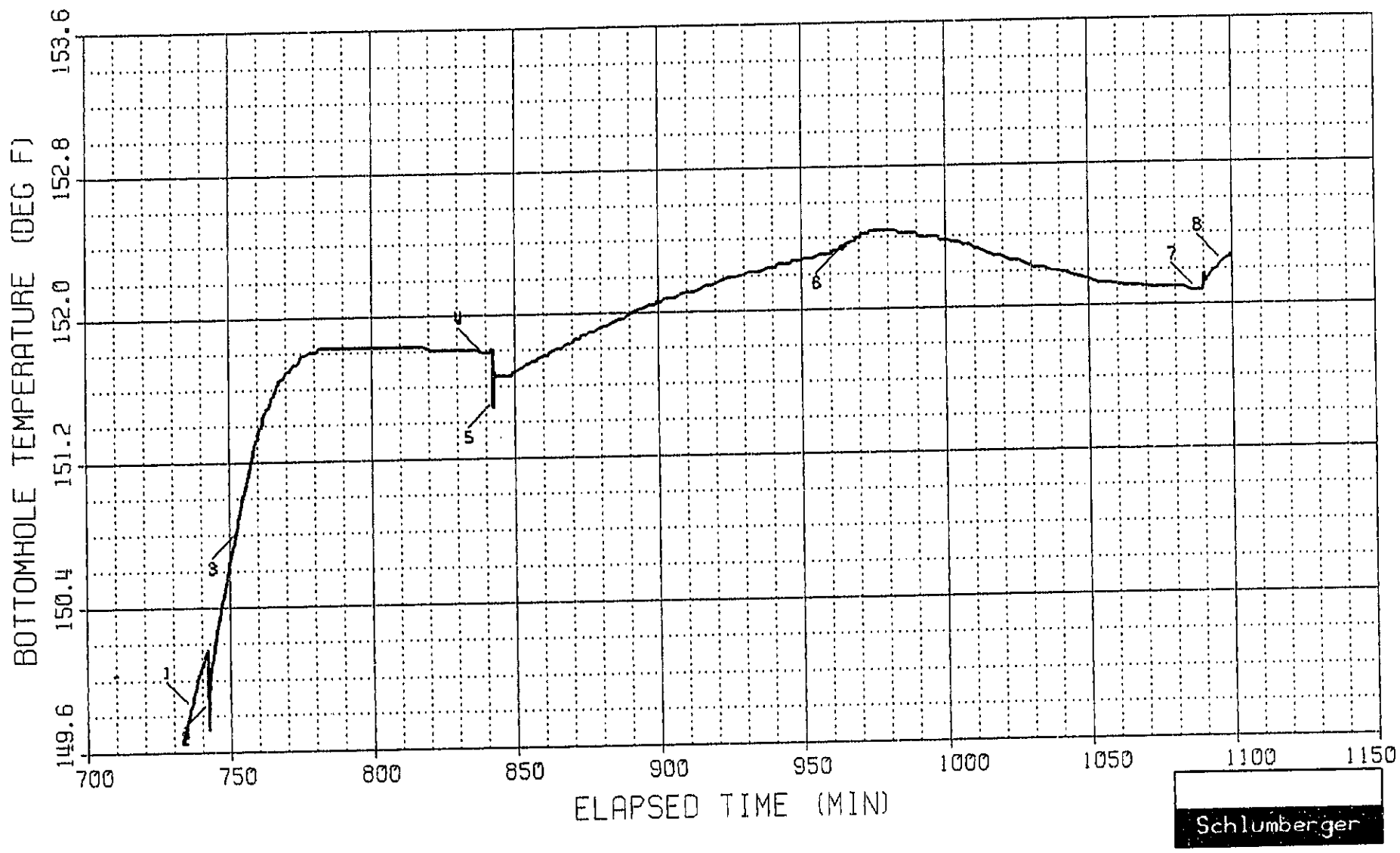


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-995
DEPTH : 4487 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

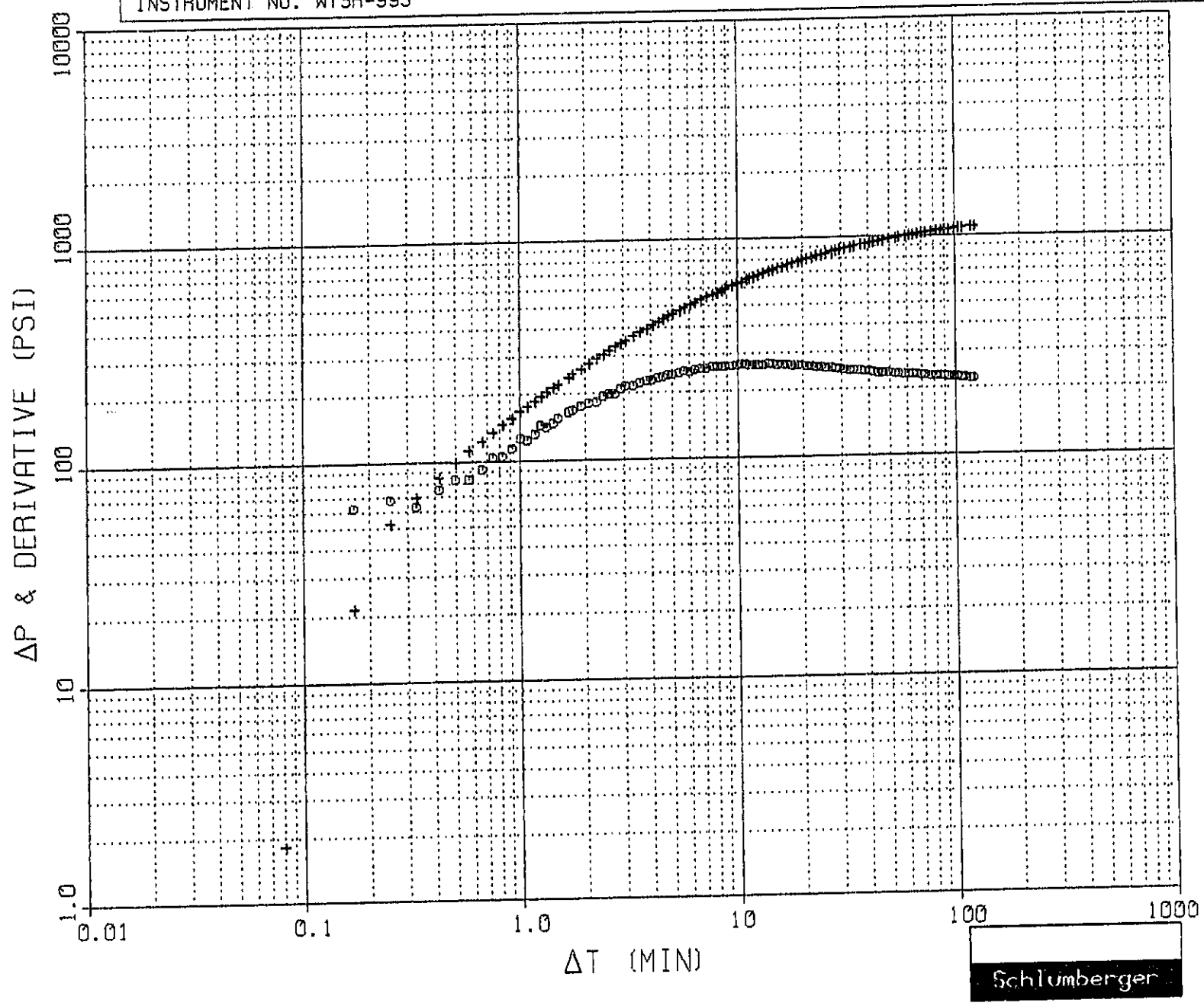
Electronic Temperature Data

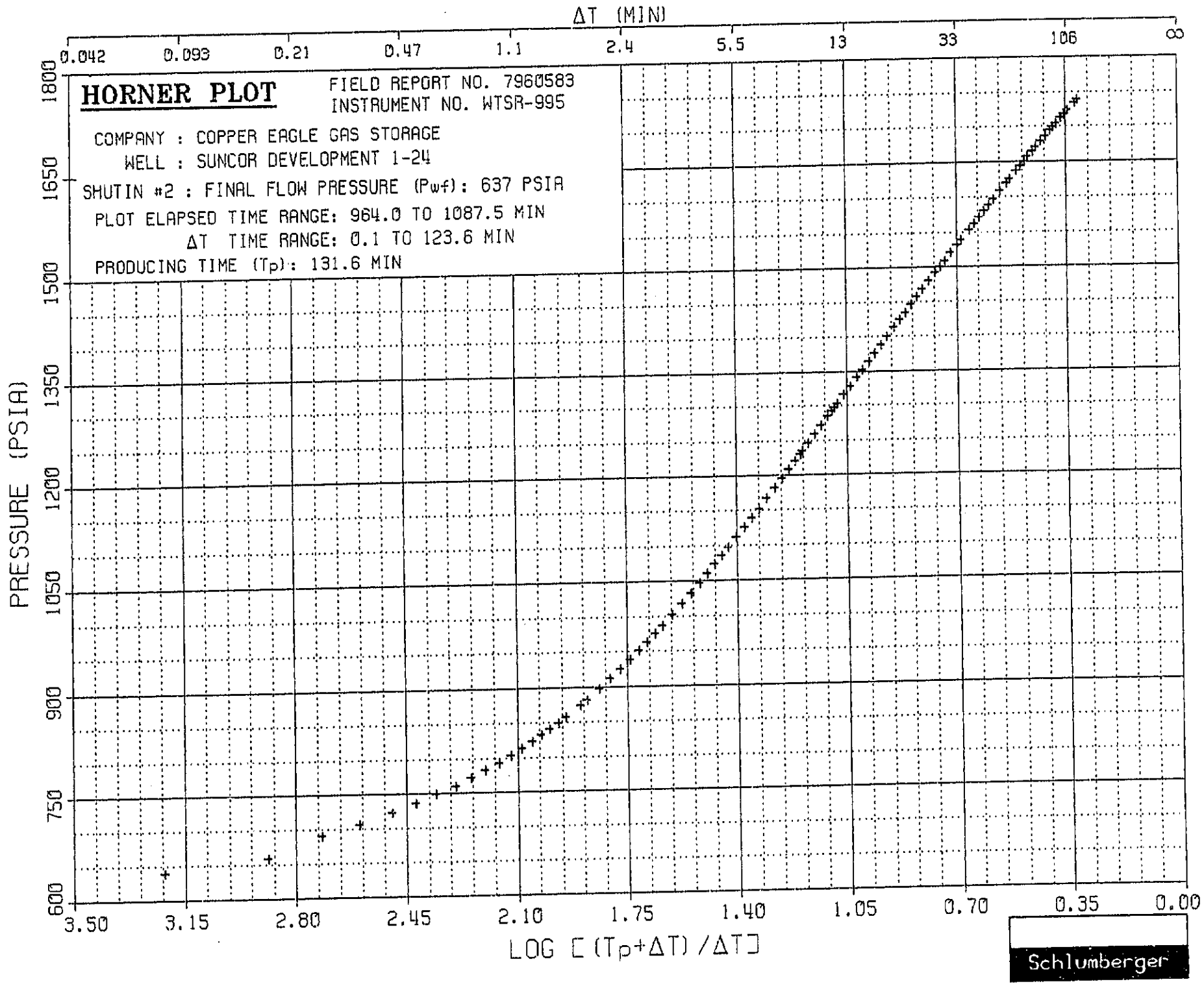


LOG LOG PLOT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-995

SHUTIN #2 : PRODUCING TIME (Tp): 131.6 MIN
FINAL FLOW PRESSURE (Pwf): 637 PSIA
PLOT ELAPSED TIME RANGE: 964.0 TO 1087.5 MIN
ΔT TIME RANGE: 0.1 TO 123.6 MIN




HORNER PLOT
FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-995
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 637 PSIA
PLOT ELAPSED TIME RANGE: 964.0 TO 1087.5 MIN
ΔT TIME RANGE: 0.1 TO 123.6 MIN
PRODUCING TIME (Tp): 131.6 MIN
ΔT (MIN)
0.042
0.093
0.21
0.47
1.1
2.4
5.5
13
33
106
∞
PRESSURE (PSIA)
1800
1650
1500
1350
1200
1050
900
750
600
3.50
3.15
2.80
2.45
2.10
1.75
1.40
1.05
0.70
0.35
0.00
LOG [(Tp+ΔT)/ΔT]
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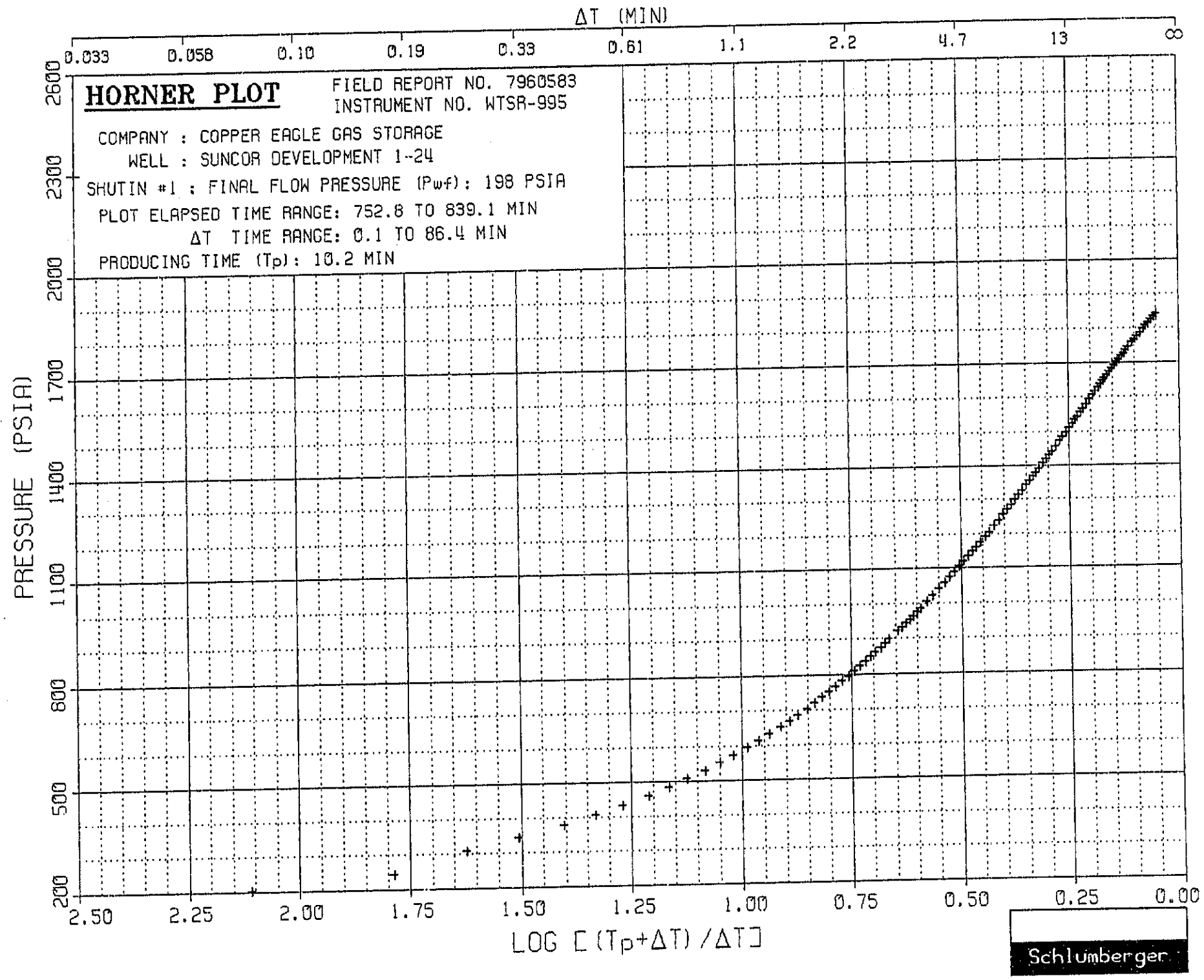

HORNER PLOT
FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-995
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 198 PSIA
PLOT ELAPSED TIME RANGE: 752.8 TO 839.1 MIN
ΔT TIME RANGE: 0.1 TO 86.4 MIN
PRODUCING TIME (Tp): 10.2 MIN
ΔT (MIN)
0.033
0.058
0.10
0.19
0.33
0.61
1.1
2.2
4.7
13
∞
PRESSURE (PSIA)
2600
2300
2000
1700
1400
1100
800
500
200
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-995

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 4487 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME, MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	4:21:12	30-JAN	HYDROSTATIC MUD	736.20	2277.50	149.85
2	4:27:27	30-JAN	START FLOW	742.45	83.09	149.88
3	4:37:42	30-JAN	END FLOW & START SHUT-IN	752.70	198.32	150.82
4	6:04:07	30-JAN	END SHUT-IN	839.12	1843.31	151.79
5	6:07:37	30-JAN	START FLOW	842.62	278.60	151.52
6	8:08:57	30-JAN	END FLOW & START SHUT-IN	963.95	637.34	152.35
7	10:12:32	30-JAN	END SHUT-IN	1087.53	1739.04	152.08
8	10:21:42	30-JAN	HYDROSTATIC MUD	1096.70	2305.20	152.24

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	742.45	752.70	10.25	83.09	198.32	83.09
2	842.62	963.95	121.33	278.60	637.34	278.60

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME, MIN	END ELAPSED TIME, MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	752.70	839.12	86.42	198.32	1843.31	198.32	10.25
2	963.95	1087.53	123.58	637.34	1739.04	637.34	131.58

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
4:27:27	30-JAN	742.45	0.00	149.88	83.09
4:37:42	30-JAN	752.70	10.25	150.82	198.32

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 198.32 PSIA
PRODUCING TIME = 10.25 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
4:37:42	30-JAN	752.70	0.00	150.82	198.32	0.00	
4:38:42	30-JAN	753.70	1.00	150.91	552.36	354.04	1.0512
4:39:42	30-JAN	754.70	2.00	151.00	766.75	568.43	0.7871
4:40:42	30-JAN	755.70	3.00	151.05	921.48	723.16	0.6451
4:41:42	30-JAN	756.70	4.00	151.12	1040.06	841.74	0.5518
4:42:42	30-JAN	757.70	5.00	151.20	1134.36	936.04	0.4843
4:43:42	30-JAN	758.70	6.00	151.27	1211.32	1013.00	0.4327
4:44:52	30-JAN	759.87	7.17	151.32	1284.99	1086.67	0.3855
4:45:57	30-JAN	760.95	8.25	151.39	1341.64	1143.32	0.3507
4:47:02	30-JAN	762.03	9.33	151.45	1389.54	1191.22	0.3219
4:48:07	30-JAN	763.12	10.42	151.48	1430.65	1232.33	0.2975
4:50:17	30-JAN	765.28	12.58	151.56	1497.25	1298.93	0.2588
4:52:32	30-JAN	767.53	14.83	151.65	1550.40	1352.08	0.2282
4:54:47	30-JAN	769.78	17.08	151.68	1592.51	1394.19	0.2042
4:57:02	30-JAN	772.03	19.33	151.72	1626.34	1428.02	0.1848
4:59:17	30-JAN	774.28	21.58	151.75	1654.06	1455.74	0.1688
5:02:02	30-JAN	777.03	24.33	151.79	1681.73	1483.41	0.1527
5:04:22	30-JAN	779.37	26.67	151.81	1701.02	1502.70	0.1412
5:06:47	30-JAN	781.78	29.08	151.83	1717.56	1519.24	0.1311
5:09:37	30-JAN	784.62	31.92	151.83	1734.86	1536.54	0.1209
5:14:42	30-JAN	789.70	37.00	151.83	1759.03	1560.71	0.1062
5:21:12	30-JAN	796.20	43.50	151.83	1781.55	1583.23	0.0919
5:27:57	30-JAN	802.95	50.25	151.83	1798.55	1600.23	0.0806
5:34:37	30-JAN	809.62	56.92	151.83	1811.39	1613.07	0.0719
5:42:47	30-JAN	817.78	65.08	151.83	1823.34	1625.02	0.0635
5:48:02	30-JAN	823.03	70.33	151.81	1829.35	1631.03	0.0591
5:56:42	30-JAN	831.70	79.00	151.81	1837.66	1639.34	0.0530
6:04:07	30-JAN	839.12	86.42	151.79	1843.31	1644.99	0.0487

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
6:07:37	30-JAN	842.62	0.00	151.52	278.60
6:22:37	30-JAN	857.62	15.00	151.74	370.29
6:37:42	30-JAN	872.70	30.08	151.86	418.23
6:53:02	30-JAN	888.03	45.41	151.97	462.37
7:08:12	30-JAN	903.20	60.58	152.08	501.95
7:23:52	30-JAN	918.87	76.25	152.15	539.84

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
7:39:22	30-JAN	934.37	91.75	152.22	574.86
7:54:57	30-JAN	949.95	107.33	152.28	608.65
8:08:57	30-JAN	963.95	121.33	152.35	637.34

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 637.34 PSIA
PRODUCING TIME = 131.58 MIN

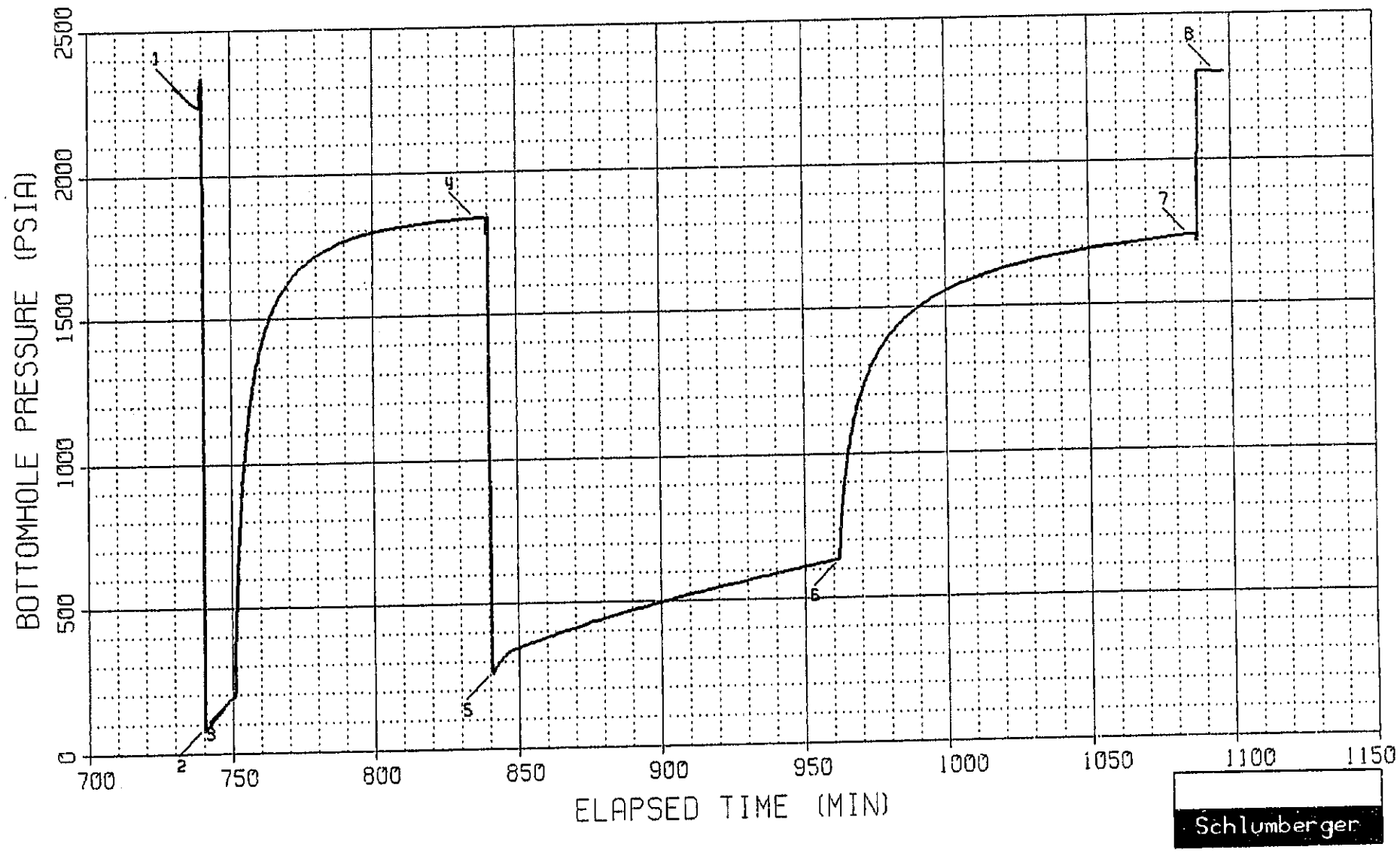
TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
8:08:57	30-JAN	963.95	0.00	152.35	637.34	0.00	
8:09:57	30-JAN	964.95	1.00	152.35	803.08	165.74	2.1225
8:11:02	30-JAN	966.03	2.08	152.37	911.62	274.28	1.8079
8:12:02	30-JAN	967.03	3.08	152.38	986.61	349.27	1.6407
8:13:02	30-JAN	968.03	4.08	152.38	1046.88	409.54	1.5218
8:14:02	30-JAN	969.03	5.08	152.40	1096.93	459.59	1.4298
8:15:02	30-JAN	970.03	6.08	152.40	1139.43	502.09	1.3549
8:16:12	30-JAN	971.20	7.25	152.42	1181.97	544.63	1.2821
8:17:27	30-JAN	972.45	8.50	152.42	1220.94	583.60	1.2170
8:18:52	30-JAN	973.87	9.92	152.44	1258.81	621.47	1.1542
8:19:57	30-JAN	974.95	11.00	152.44	1284.23	646.89	1.1127
8:22:07	30-JAN	977.12	13.17	152.44	1327.95	690.61	1.0410
8:24:17	30-JAN	979.28	15.33	152.44	1364.36	727.02	0.9815
8:26:47	30-JAN	981.78	17.83	152.44	1399.73	762.39	0.9232
8:28:47	30-JAN	983.78	19.83	152.42	1424.04	786.70	0.8828
8:30:52	30-JAN	985.87	21.92	152.42	1446.43	809.09	0.8453
8:33:07	30-JAN	988.12	24.17	152.42	1467.79	830.45	0.8092
8:35:57	30-JAN	990.95	27.00	152.40	1491.40	854.06	0.7689
8:38:22	30-JAN	993.37	29.42	152.40	1509.18	871.84	0.7382
8:41:52	30-JAN	996.87	32.92	152.40	1531.84	894.50	0.6987
8:47:27	30-JAN	1002.45	38.50	152.37	1562.10	924.76	0.6452
8:53:22	30-JAN	1008.37	44.42	152.35	1588.42	951.08	0.5979
8:58:42	30-JAN	1013.70	49.75	152.31	1608.40	971.06	0.5617
9:04:07	30-JAN	1019.12	55.17	152.29	1625.90	988.56	0.5296
9:10:37	30-JAN	1025.62	61.67	152.26	1643.99	1006.65	0.4960
9:15:57	30-JAN	1030.95	67.00	152.22	1656.93	1019.59	0.4719
9:22:22	30-JAN	1037.37	73.42	152.20	1670.74	1033.40	0.4459
9:30:32	30-JAN	1045.53	81.58	152.17	1685.99	1048.65	0.4171
9:38:52	30-JAN	1053.87	89.92	152.13	1699.44	1062.10	0.3915
9:48:22	30-JAN	1063.37	99.42	152.11	1712.67	1075.33	0.3661
9:57:02	30-JAN	1072.03	108.08	152.10	1723.23	1085.89	0.3459
10:07:47	30-JAN	1082.78	118.83	152.10	1734.67	1097.33	0.3237
10:12:32	30-JAN	1087.53	123.58	152.08	1739.04	1101.70	0.3149

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-978
DEPTH : 4492 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

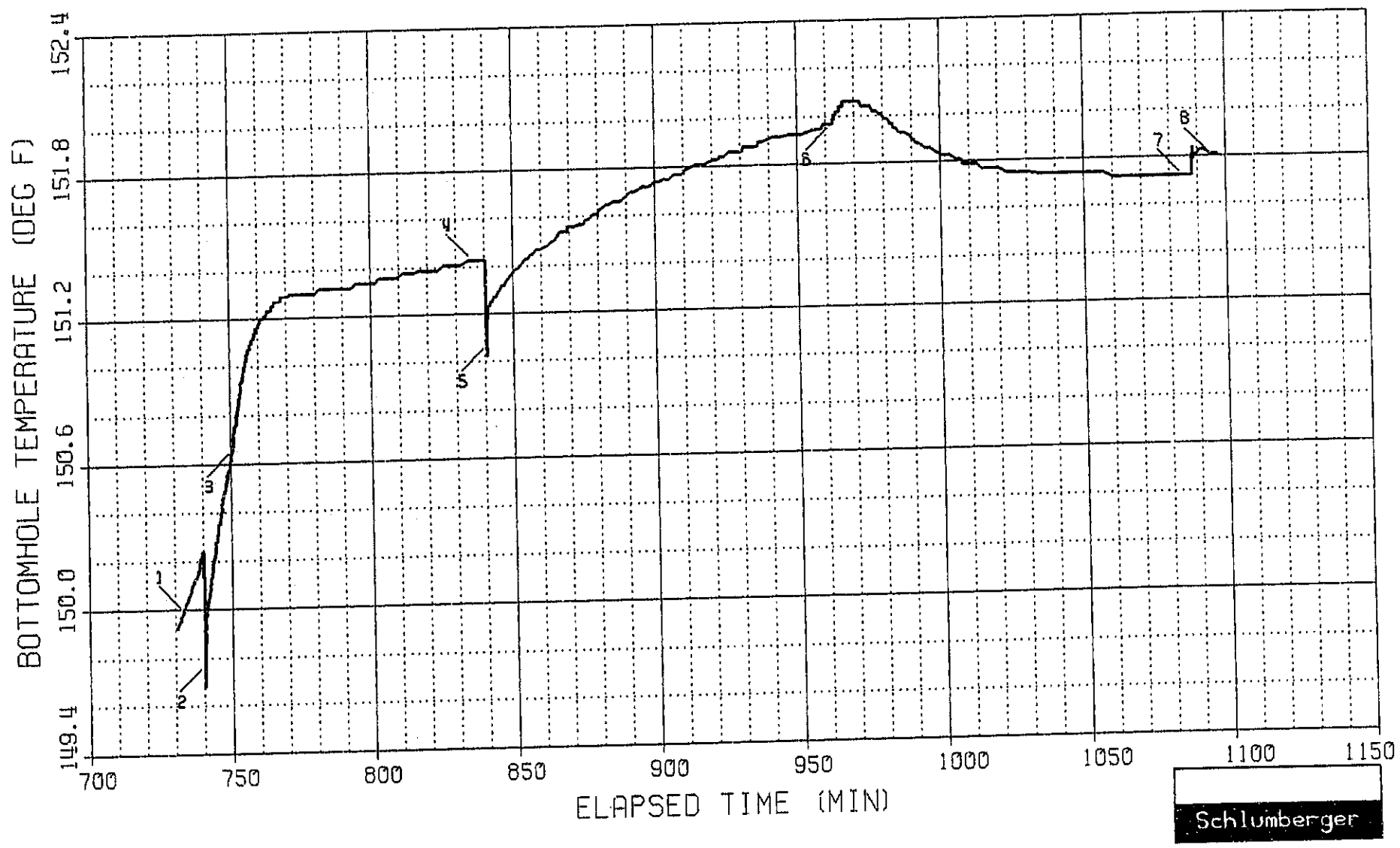


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-978
DEPTH : 4492 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

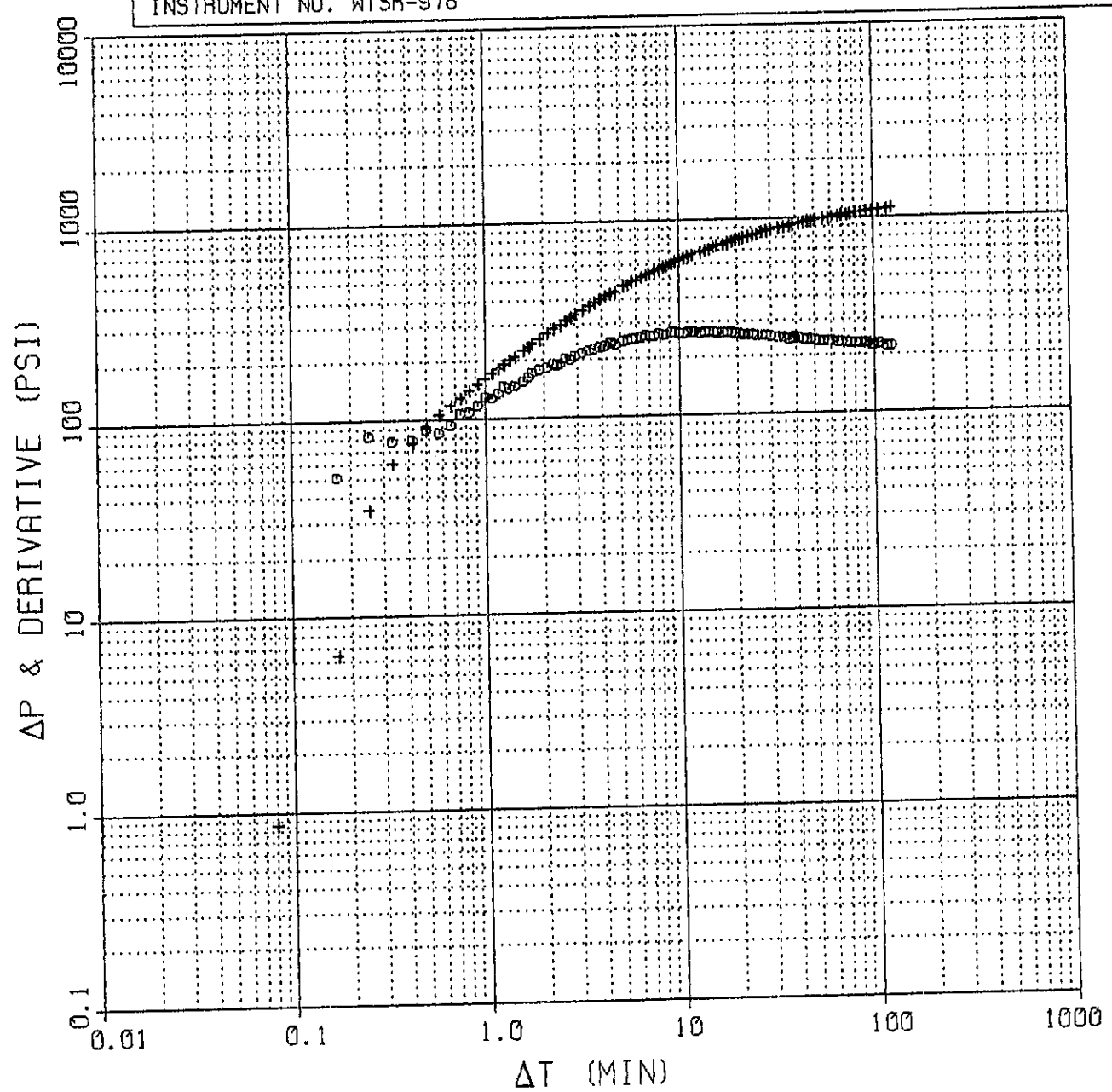
Electronic Temperature Data



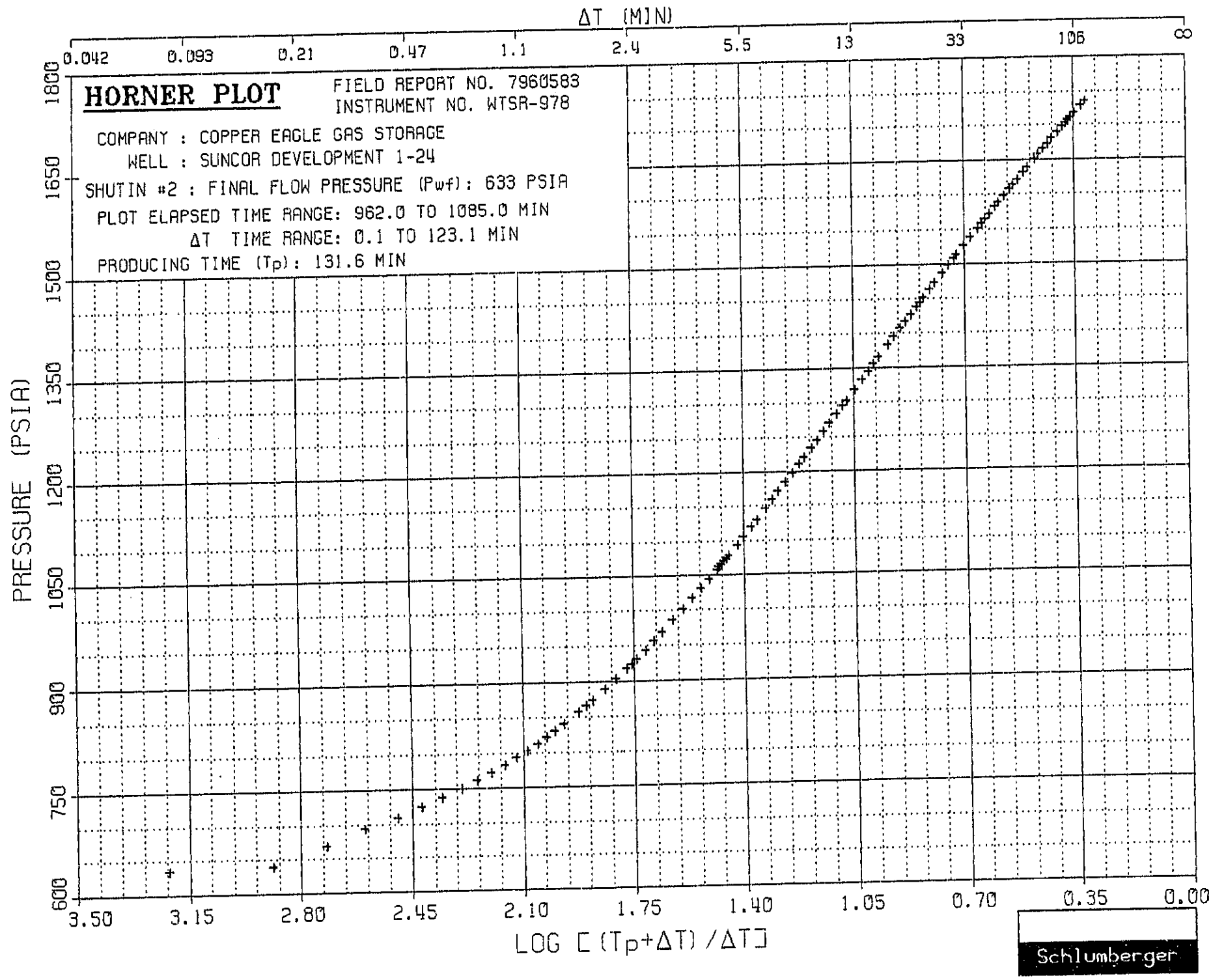
LOG LOG PLOT

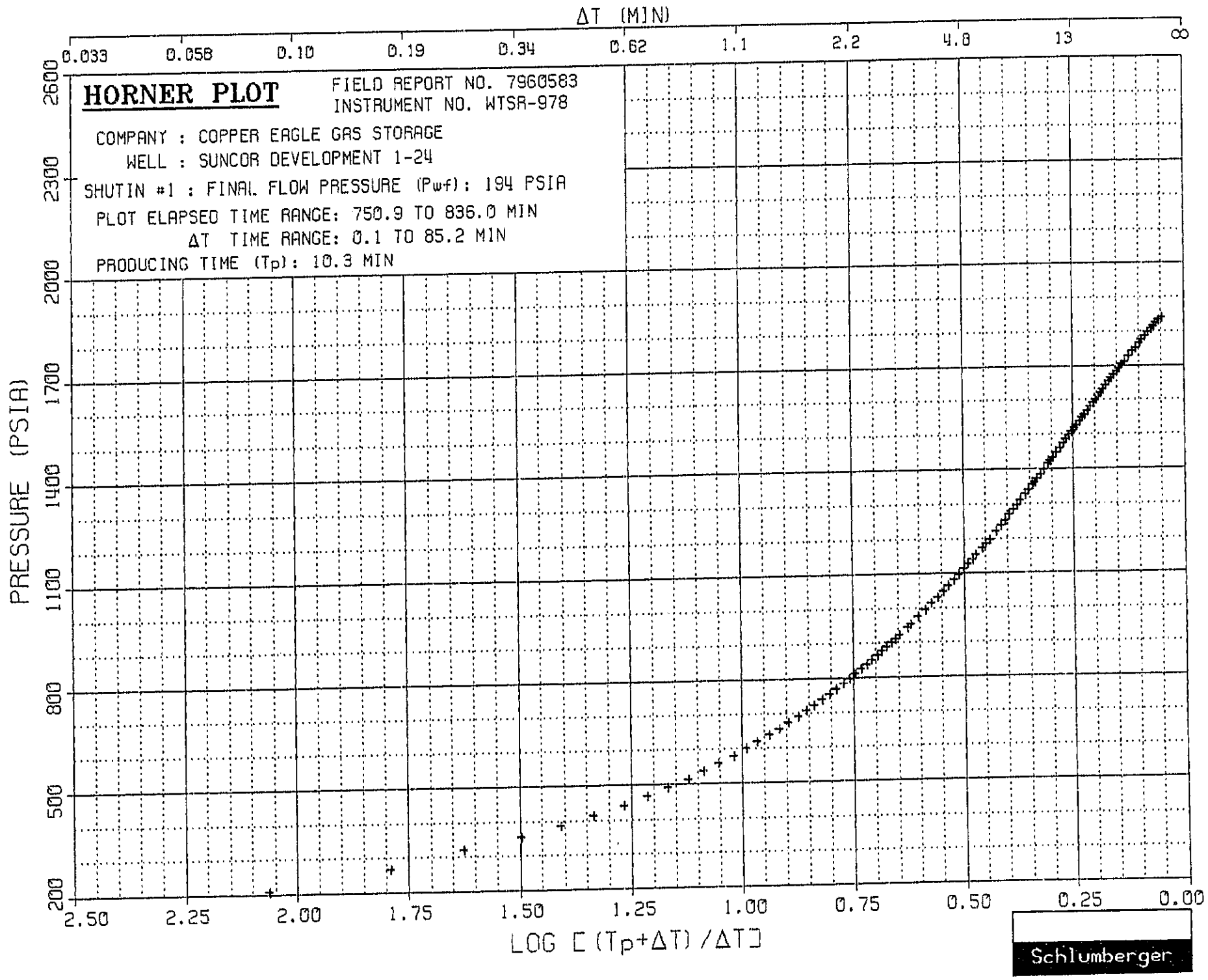
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-978

SHUTIN #2 : PRODUCING TIME (Tp): 131.6 MIN
FINAL FLOW PRESSURE (Pwf): 633 PSIA
PLOT ELAPSED TIME RANGE: 962.0 TO 1085.0 MIN
ΔT TIME RANGE: 0.1 TO 123.1 MIN



Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-978
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 633 PSIA
PLOT ELAPSED TIME RANGE: 962.0 TO 1085.0 MIN
ΔT TIME RANGE: 0.1 TO 123.1 MIN
PRODUCING TIME (Tp): 131.6 MIN
ΔT (MIN)
0.042
0.093
0.21
0.47
1.1
2.4
5.5
13
33
106
∞
PRESSURE (PSIA)
1800
1650
1500
1350
1200
1050
900
750
600
3.50
3.15
2.80
2.45
2.10
1.75
1.40
1.05
0.70
0.35
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-978
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 194 PSIA
PLOT ELAPSED TIME RANGE: 750.9 TO 836.0 MIN
ΔT TIME RANGE: 0.1 TO 85.2 MIN
PRODUCING TIME (Tp): 10.3 MIN
ΔT (MIN)
0.033
0.058
0.10
0.19
0.34
0.62
1.1
2.2
4.8
13
∞
PRESSURE (PSIA)
2600
2300
2000
1700
1400
1100
800
500
200
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-978

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 4492 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	4:20:12	30-JAN	HYDROSTATIC MUD	733.20	2285.37	149.99
2	4:27:27	30-JAN	START FLOW	740.45	85.49	149.77
3	4:37:47	30-JAN	END FLOW & START SHUT-IN	750.78	194.25	150.66
4	6:02:57	30-JAN	END SHUT-IN	835.95	1839.31	151.43
5	6:07:42	30-JAN	START FLOW	840.70	258.39	151.07
6	8:08:57	30-JAN	END FLOW & START SHUT-IN	961.95	633.29	151.97
7	10:12:02	30-JAN	END SHUT-IN	1085.03	1735.30	151.72
8	10:21:37	30-JAN	HYDROSTATIC MUD	1094.62	2302.15	151.81

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	740.45	750.78	10.33	85.49	194.25	85.49
2	840.70	961.95	121.25	258.39	633.29	258.39

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	750.78	835.95	85.17	194.25	1839.31	194.25	10.33
2	961.95	1085.03	123.08	633.29	1735.30	633.29	131.58

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
4:27:27	30-JAN	740.45	0.00	149.77	85.49
4:37:47	30-JAN	750.78	10.33	150.66	194.25

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 194.25 PSIA
PRODUCING TIME = 10.33 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
4:37:47	30-JAN	750.78	0.00	150.66	194.25	0.00	
4:38:47	30-JAN	751.78	1.00	150.76	557.49	363.24	1.0542
4:39:47	30-JAN	752.78	2.00	150.84	769.29	575.04	0.7899
4:40:47	30-JAN	753.78	3.00	150.91	922.55	728.30	0.6477
4:41:52	30-JAN	754.87	4.09	150.98	1048.72	854.47	0.5472
4:42:52	30-JAN	755.87	5.09	151.03	1140.68	946.43	0.4814
4:43:57	30-JAN	756.95	6.17	151.07	1221.58	1027.33	0.4272
4:44:57	30-JAN	757.95	7.17	151.11	1283.40	1089.15	0.3875
4:46:02	30-JAN	759.03	8.25	151.14	1339.76	1145.51	0.3526
4:47:02	30-JAN	760.03	9.25	151.16	1384.03	1189.78	0.3257
4:48:02	30-JAN	761.03	10.25	151.20	1422.44	1228.19	0.3027
4:50:22	30-JAN	763.37	12.59	151.23	1494.69	1300.44	0.2602
4:52:32	30-JAN	765.53	14.75	151.25	1546.10	1351.85	0.2305
4:54:52	30-JAN	767.87	17.09	151.27	1589.67	1395.42	0.2053
4:56:52	30-JAN	769.87	19.09	151.29	1620.04	1425.79	0.1878
4:59:27	30-JAN	772.45	21.67	151.30	1652.10	1457.85	0.1693
5:02:32	30-JAN	775.53	24.75	151.30	1682.54	1488.29	0.1515
5:04:32	30-JAN	777.53	26.75	151.30	1698.72	1504.47	0.1418
5:06:32	30-JAN	779.53	28.75	151.30	1712.30	1518.05	0.1333
5:08:52	30-JAN	781.87	31.09	151.32	1727.14	1532.89	0.1246
5:14:07	30-JAN	787.12	36.34	151.32	1753.18	1558.93	0.1087
5:19:27	30-JAN	792.45	41.67	151.32	1772.83	1578.58	0.0962
5:26:42	30-JAN	799.70	48.92	151.34	1792.60	1598.35	0.0832
5:34:02	30-JAN	807.03	56.25	151.36	1807.20	1612.95	0.0732
5:39:02	30-JAN	812.03	61.25	151.38	1815.10	1620.85	0.0677
5:45:47	30-JAN	818.78	68.00	151.39	1823.80	1629.55	0.0614
5:50:47	30-JAN	823.78	73.00	151.39	1829.13	1634.88	0.0575
5:56:07	30-JAN	829.12	78.34	151.41	1834.03	1639.78	0.0538
6:01:32	30-JAN	834.53	83.75	151.43	1838.25	1644.00	0.0505
6:02:57	30-JAN	835.95	85.17	151.43	1839.31	1645.06	0.0497

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
6:07:42	30-JAN	840.70	0.00	151.07	258.39
6:23:32	30-JAN	856.53	15.83	151.45	369.07
6:38:37	30-JAN	871.62	30.92	151.56	416.81
6:54:37	30-JAN	887.62	46.92	151.66	462.46

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
7:10:32	30-JAN	903.53	62.83	151.75	503.60
7:27:37	30-JAN	920.62	79.92	151.83	544.20
7:42:52	30-JAN	935.87	95.17	151.88	578.40
7:58:02	30-JAN	951.03	110.33	151.93	610.92
8:08:57	30-JAN	961.95	121.25	151.97	633.29

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 633.29 PSIA
PRODUCING TIME = 131.58 MIN

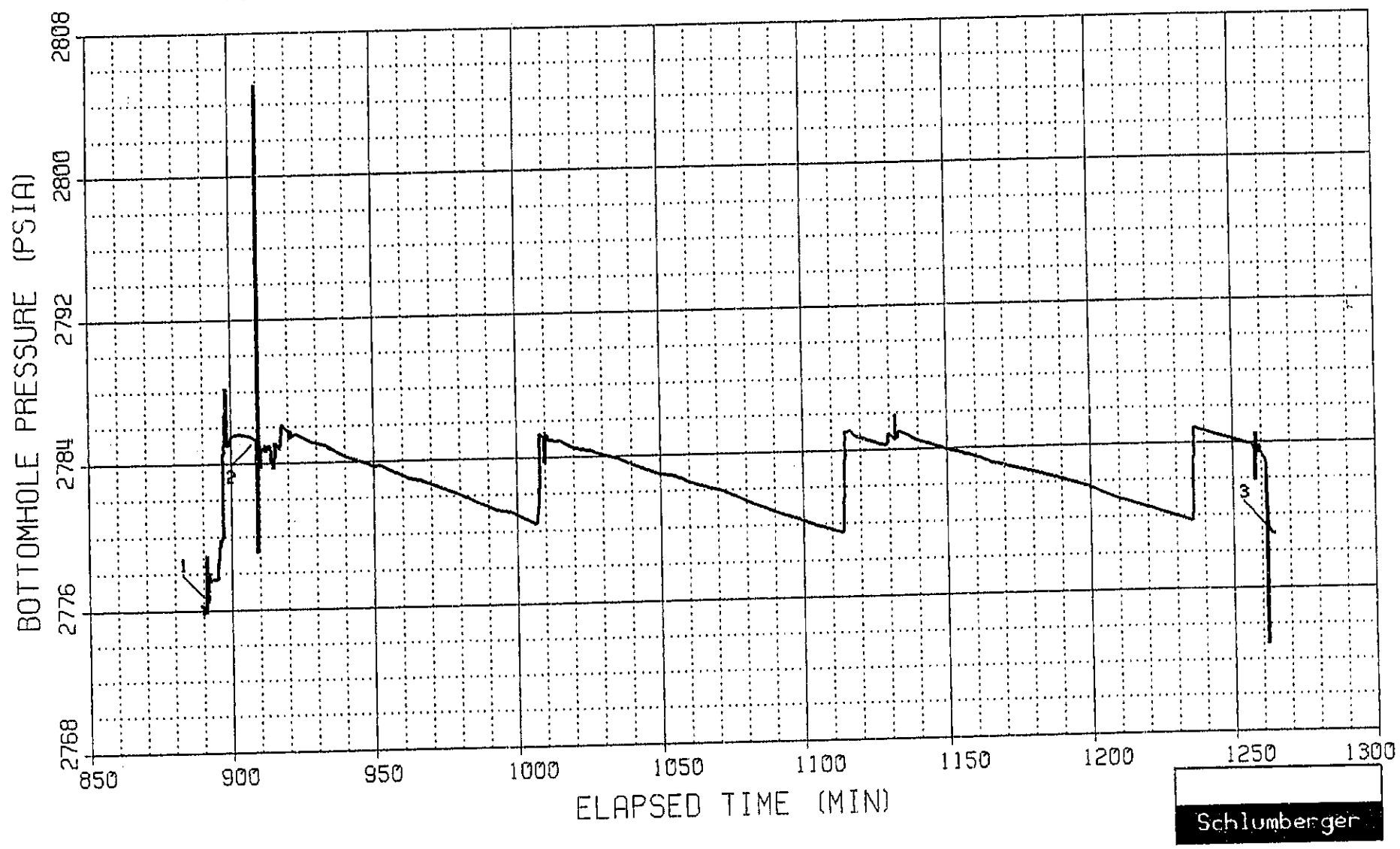
TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
8:08:57	30-JAN	961.95	0.00	151.97	633.29	0.00	
8:09:57	30-JAN	962.95	1.00	151.99	793.27	159.98	2.1225
8:11:02	30-JAN	964.03	2.08	152.02	903.57	270.28	1.8079
8:12:07	30-JAN	965.12	3.17	152.04	985.02	351.73	1.6285
8:13:07	30-JAN	966.12	4.17	152.04	1044.80	411.51	1.5126
8:14:07	30-JAN	967.12	5.17	152.06	1094.42	461.13	1.4224
8:15:22	30-JAN	968.37	6.42	152.06	1146.36	513.07	1.3323
8:16:27	30-JAN	969.45	7.50	152.06	1184.54	551.25	1.2682
8:17:37	30-JAN	970.62	8.67	152.06	1220.24	586.95	1.2089
8:19:02	30-JAN	972.03	10.08	152.06	1257.71	624.42	1.1478
8:21:02	30-JAN	974.03	12.08	152.04	1302.24	668.95	1.0753
8:23:22	30-JAN	976.37	14.42	152.02	1344.95	711.66	1.0054
8:25:52	30-JAN	978.87	16.92	152.01	1382.83	749.54	0.9433
8:27:52	30-JAN	980.87	18.92	151.99	1408.74	775.45	0.9006
8:30:27	30-JAN	983.45	21.50	151.97	1437.87	804.58	0.8525
8:33:02	30-JAN	986.03	24.08	151.93	1462.77	829.48	0.8105
8:35:52	30-JAN	988.87	26.92	151.92	1486.60	853.31	0.7700
8:38:57	30-JAN	991.95	30.00	151.88	1509.17	875.88	0.7313
8:46:02	30-JAN	999.03	37.08	151.84	1551.14	917.85	0.6579
8:52:47	30-JAN	1005.78	43.83	151.81	1582.29	949.00	0.6023
8:59:32	30-JAN	1012.53	50.58	151.79	1607.57	974.28	0.5565
9:04:57	30-JAN	1017.95	56.00	151.77	1624.73	991.44	0.5250
9:10:07	30-JAN	1023.12	61.17	151.75	1639.10	1005.81	0.4985
9:17:37	30-JAN	1030.62	68.67	151.75	1657.18	1023.89	0.4648
9:25:22	30-JAN	1038.37	76.42	151.74	1673.15	1039.86	0.4349
9:34:47	30-JAN	1047.78	85.83	151.74	1689.65	1056.36	0.4036
9:40:37	30-JAN	1053.62	91.67	151.74	1698.59	1065.30	0.3866
9:47:02	30-JAN	1060.03	98.08	151.72	1707.54	1074.25	0.3695
9:55:32	30-JAN	1068.53	106.58	151.72	1718.11	1084.82	0.3492
10:05:52	30-JAN	1078.87	116.92	151.72	1729.40	1096.11	0.3274
10:12:02	30-JAN	1085.03	123.08	151.72	1735.30	1102.01	0.3158

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-1762
DEPTH : 4779 FT
CAPACITY : 20000 PSI
PORT OPENING : OUTSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data below Bottom Straddle Packer

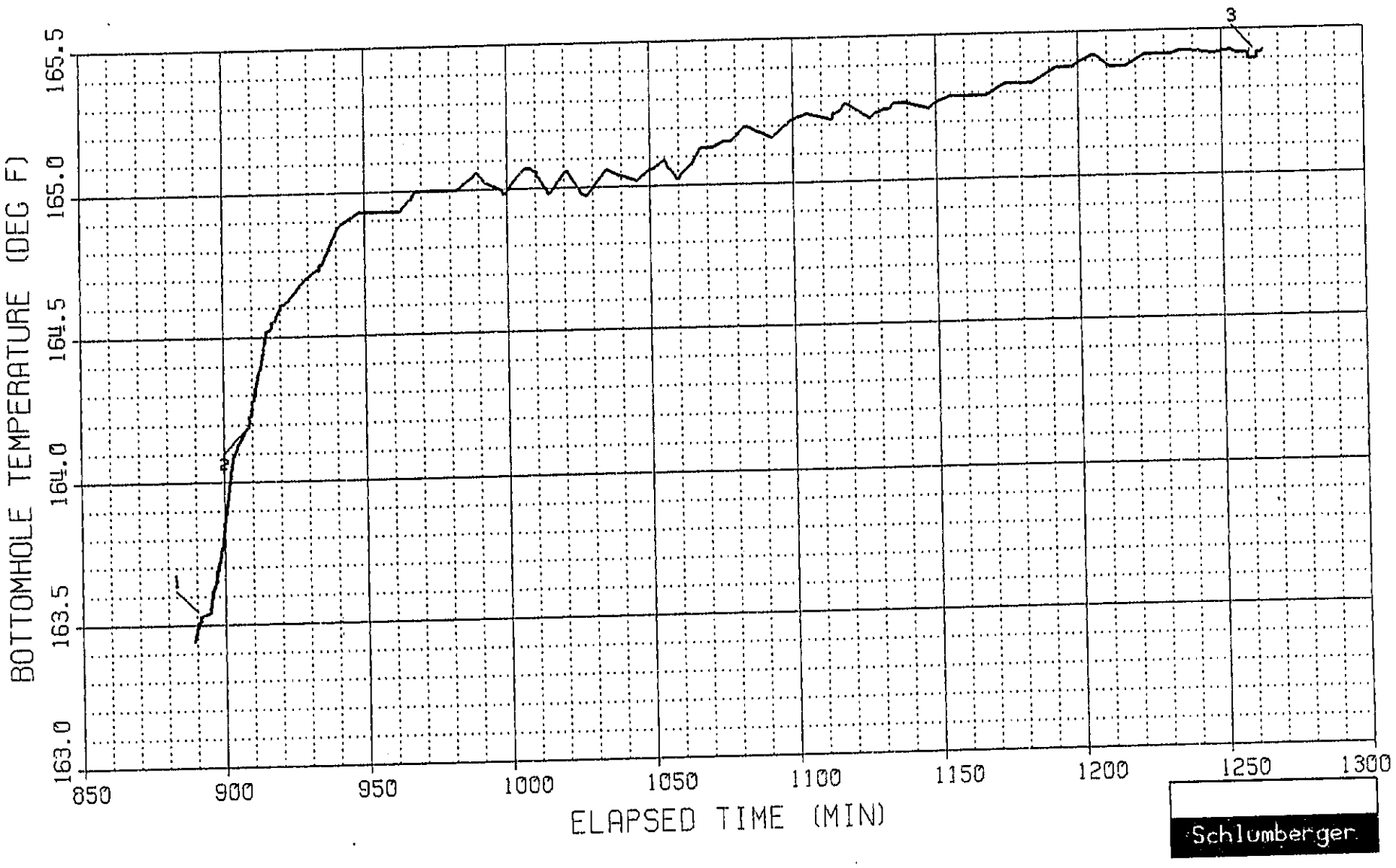


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-1762
DEPTH : 4779 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Temperature Data



****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960583
INSTRUMENT NO. WTSR-1762

RECORDER CAPACITY: 20000 PSI PORT OPENING: OUTSIDE DEPTH: 4779 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	4:08:37	30-JAN	HYDROSTATIC MUD	891.62	2776.49	163.53
2	4:25:37	30-JAN	FLOW POINT	908.62	2785.32	164.19
3	10:19:37	30-JAN	HYDROSTATIC MUD	1262.62	2779.24	165.42

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
STRADDLE DST	29-JAN-2002	HOBBS

WELL OWNER: COPPER EAGLE GAS STORAGE — SERVICE ORDER NUMBER: 7960582

REPORTS ADDRESS: 333 TEXAS STREET / SUITE 425 / SHREVEPORT, LA 71101-5319 ATTN:COPPER EAGLE GAS STORAGE

WELL NAME & NO.: SUNCOR DEVELOPMENT 1-24 — FIELD: LUKE-GLENDALE — LEASE:

LOCATION: 330SLx330WL — COUNTY: MARICOPA — STATE: ARIZONA

TEST NO. FOUR — TEST INTERVAL FROM 5270 FT TO 5380 FT = 110 FT

SURFACE DATA

DESCRIPTION	DATE	TIME OF DAY	PRESSURE
OPEN TO BUBBLE HOSE ONLY	29-JAN		
SET PACKER		01:26	
OPENED TOOL		01:28	
SEAT FAILED		01:28	
CLOSED TOOL		01:29	
RECYCLED TOOL		01:31	
RESET PACKER		01:32	
OPENED TOOL		01:33	
SEAT FAILED		01:34	
PULLED OUT OF HOLE		01:40	

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EQUIPMENT SEQUENCE

COMPONENTS	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				
DRILL PIPE (16.6#)	4.50	3.826	4028	4028
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.750	547.4	4575
CROSS OVER SUB	6.25	2.250	1.36	4577
HYDRAULIC JAR	6.25	2.000	11.69	4588
CROSS OVER SUB	6.125	3.000	1.84	4590
DRILL COLLARS	6.25	2.250	542.6	5133
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	5134
DRILL COLLARS	6.25	2.250	90.23	5224
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5225
CROSS OVER SUB	6.00	2.438	0.94	5226
MFE	5.00	1.000	9.88	5236
MFE OH BYPASS	5.00	1.000	2.98	5239
CROSS OVER SUB	5.75	2.000	0.99	5240
INSIDE RECORDER CARRIER	5.75	3.000	6.74	5246
INSIDE RECORDER CARRIER	5.75	3.000	5.52	5252
CROSS OVER SUB	5.75	2.000	1.11	5253
D&C HYDRAULIC JAR	4.75	1.875	6.59	5260
UPPER STRADDLE BYPASS SUB	4.75	2.000	0.66	5260
SAFETY JOINT	4.75	2.500	2.01	5262
CROSS OVER SUB	6.00	2.50	1.02	5263
BOB-TAIL PACKER	11.125	1.750	6.65	5270
PERFORATED ANCHOR	5.75	3.000	5.11	5275
LOWER STRADDLE BYPASS SUB	5.75	0.000	0.64	5276
CROSS OVER SUB	6.00	2.313	0.87	5277
DRILL COLLARS	6.25	2.250	89.43	5366
CROSS OVER SUB	6.125	2.500	1.39	5367
INSIDE RECORDER CARRIER	5.75	3.000	6.28	5374
BOB TAIL PACKER	11.25	1.750	6.28	5380
PERFORATED ANCHOR	5.75	3.000	2.40	5382
Cross Over Sub	6.125	2.500	1.47	5384
CROSS OVER SUB	6.438	3.125	2.22	5386
CROSS OVER SUB	7.938	2.750	2.91	5389
BIT	12.25	2.000	1.00	5390

RECOVERY DESCRIPTION	FEET	BBLS	OIL GRAVITY	RESISTIVITY	CHLORIDES
MUD					

SERVICE ORDER NUMBER: 7960582

SCHLUMBERGER ENGINEER/TECHNICIAN: KIRK BEASLEY

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
STRADDLE DST	29-JAN-2002	HOBBS

INSTRURMENT DATA

INSTRUMENT NO.	WTSR-976
CAPACITY(PSIG)	20000
DEPTH	5246
INSIDE-OUTSIDE	IN
CLOCK CAP	ELECTRONIC
TEMPERATURE °F	160
I. HYD. PSIG	2688
I. FLOW PSIG	
I.S.I. PSIG	
2nd FLOW PSIG	
2nd S.I. PSIG	
F. FLOW PSIG	
F.S.I. PSIG	
F. HYD. PSIG	2700

MUD DATA

MUD TYPE BRINE	MUD WT 9.3 #/gal
VISCOSITY 34	WATER LOSS 6 CC
RESISTIVITY: OF MUD	@ °F
RESISTIVITY: OF FILTRATE 0.135	@ 70 °F
CHLORIDES 32000	PPM
H2S DURING TEST	PPM

WELL BORE DATA

FORMATION TESTED	
NET PRODUCTIVE INTERVAL	ft EST. POROSITY %
ELEVATION 1064 ft	DEPTH MEASURED FROM GL
TOTAL MEASURED DEPTH	6052/6052 ft
O H SIZE	12.25 in
CASING SIZE	13.375 / 12.415
LINER SIZE	
PERF INTERVAL FROM	ft TO ft
SHOT DENSITY	

CUSHION	LENGTH	AMOUNT	SURFACE PRESS	BOTTOM CHOKE SIZE
NONE				1.00

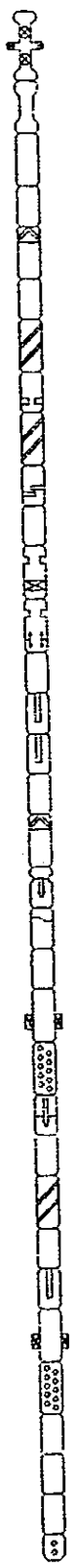
SAMPLER DATA

RECOVERY		RESISTIVITY		CHLORIDES
GAS	C.F.	RECOVERED WATER	@ deg F	PPM
OIL	C.C.	RECOVERED MUD	@ deg F	
WATER	C.C.	REC.MUD FILTRATE	@ deg F	PPM
MUD	C.C.	PIT MUD	@ deg F	
GRAVITY °API	°F	PIT MUD FILTRATE	@ deg F	PPM
GOR	C.F./BBL	SAMPLER PRESSURE		

REMARKS: THIS IS DST #4. THE PACKERS ON THIS STRADDLE TEST WERE POSITIONED AT 5270' & 5380'. THE TEST WAS ABORTED DUE TO PACKER SEAT FAILURE. THANK YOU FOR USING SCHLUMBERGER.

SERVICE ORDER NUMBER:	SCHLUMBERGER ENGINEER/TECHNICIAN
7960582	KIRK BEASLEY

COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				0
DRILL PIPE (16.6#)	4.50	3.826	4028	4028
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.750	547.4	4575.4
CROSS OVER SUB	6.25	2.250	1.36	4576.76
HYDRAULIC JAR	6.25	2.000	11.69	4588.45
CROSS OVER SUB	6.125	3.000	1.84	4590.29
DRILL COLLARS	6.25	2.250	542.6	5132.89
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	5133.72
DRILL COLLARS	6.25	2.250	90.23	5223.95
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5224.91
CROSS OVER SUB	6.00	2.438	0.94	5225.85
MFE	5.00	1.000	9.88	5235.73
MFE OH BYPASS	5.00	1.000	2.98	5238.71
CROSS OVER SUB	5.75	2.000	0.99	5239.7
INSIDE RECORDER CARRIER	5.75	3.000	6.74	5246.44
INSIDE RECORDER CARRIER	5.75	3.000	5.52	5251.96
CROSS OVER SUB	5.75	2.000	1.11	5253.07
D&C HYDRAULIC JAR	4.75	1.875	6.59	5259.66
UPPER STRADDLE BYPASS SUB	4.75	2.000	0.66	5260.32
SAFETY JOINT	4.75	2.500	2.01	5262.33
CROSS OVER SUB	6.00	2.50	1.02	5263.35
BOB-TAIL PACKER	11.125	1.750	6.65	5270
PERFORATED ANCHOR	5.75	3.000	5.11	5275.11
LOWER STRADDLE BYPASS SUB	5.75	0.000	0.64	5275.75
CROSS OVER SUB	6.00	2.313	0.87	5276.62
DRILL COLLARS	6.25	2.250	89.43	5366.05
CROSS OVER SUB	6.125	2.500	1.39	5367.44
INSIDE RECORDER CARRIER	5.75	3.000	6.28	5373.72
BOB TAIL PACKER	11.25	1.750	6.28	5380
PERFORATED ANCHOR	5.75	3.000	2.40	5382.4
Cross Over Sub	6.125	2.500	1.47	5383.87
CROSS OVER SUB	6.438	3.125	2.22	5386.09
CROSS OVER SUB	7.938	2.750	2.91	5389
BIT	12.25	2.000	1.00	5390

Report Number: 7960582
Test Date: 29-JAN-2002
Note: All Depths to Bottom of Tool

Schlumberger

REPORT NO.
7960582

PAGE NO. 1

TEST DATE:
29-JAN-2002

S T A R

Schlumberger Testing Data Report

Pressure Data Report

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE

WELL: SUNCOR DEVELOPMENT 1-24

TEST IDENTIFICATION

Test Type ..... STRADDLE DST
Test No. ..... FOUR
Formation .....
Test Interval (ft) ..... 5270 to 5380
Depth Reference ..... GL

WELL LOCATION

Field ..... LUKE-GLENDALE
County ..... MARICOPA
State ..... ARIZONA
Sec/Twn/Rng 330SLx330WL
Elevation (ft) 1064

HOLE CONDITIONS

Total Depth (MD/TVD) (ft) 6052/6052
Hole Size (in) 12.25
Casing/Liner I.D. (in) ..... 13.375 / 12.41
Perf'd Interval/Net Pay (ft)..
Shot Density/Diameter (in) ...

MUD PROPERTIES

Mud Type ..... BRINE
Mud Weight (lb/gal) 9.3
Mud Resistivity (ohm.m) .....
Filtrate Resistivity (ohm.m).. 0.135 @ 70F
Filtrate Chlorides (ppm) 32000

INITIAL TEST CONDITIONS

Initial Hydrostatic (psi) ....
Gas Cushion Type .....
Surface Pressure (psi) .....
Liquid Cushion Type .....
Cushion Length (ft) .....

TEST STRING CONFIGURATION

Pipe Length (ft)/I.D. (in) ... 4028 / 3.826
Collar Length (ft)/I.D. (in).. 722 / 2.250
Packer Depths (ft) 5270,5380,
Bottomhole Choke Size (in) ... 1.00
Gauge Depth (ft)/Type 5246/WTSR-976

NET PIPE RECOVERY

Volume	Fluid Type	Properties
	MUD	

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties

Pressure: GOR:0 GLR:0

INTERPRETATION RESULTS

Model of Behavior .....
Fluid Type Used for Analysis..
Reservoir Pressure (psi) .....
Transmissibility (md.ft/cp) ..
Effective Permeability (md) ..
Skin Factor/Damage Ratio .....
Storativity Ratio, Omega .....
Interporos.Flow Coef..Lambda..
Distance to an Anomaly (ft) ..
Radius of Investigation (ft)..
Potentiometric Surface (ft) ..

ROCK/FLUID/WELLBORE PROPERTIES

Oil Density (deg. API) .....
Basic Solids (%) .....
Gas Gravity .....
GOR (scf/STB) .....
Water Cut (%) .....
Viscosity (cp) .....
Total Compressibility (1/psi).
Porosity (%) .....
Reservoir Temperature (F) 160
Form.Vol.Factor (bbl/STB) ....

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

THIS IS DST #4. THE PACKERS ON THIS STRADDLE TEST WERE POSITIONED AT 5270' & 5380'. THE TEST WAS ABORTED DUE TO PACKER SEAT FAILURE. THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:7960582 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 2, 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	SEQUENCE OF EVENTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

DATE	TIME (HR:MIN)	DESCRIPTION	ET (MINS)	BHP (PSIA)	WHP (PSIG)
29-JAN		OPEN TO BUBBLE HOSE ONLY			
	01:26	SET PACKER	0		
	01:28	OPENED TOOL	2		
	01:28	SEAT FAILED	2		
	01:29	CLOSED TOOL	3		
	01:31	RECYCLED TOOL	5		
	01:32	RESET PACKER	6		
	01:33	OPENED TOOL	7		
	01:34	SEAT FAILED	8		
	01:40	PULLED OUT OF HOLE	14		

WELL TEST INTERPRETATION REPORT #:7960582 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 12. 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

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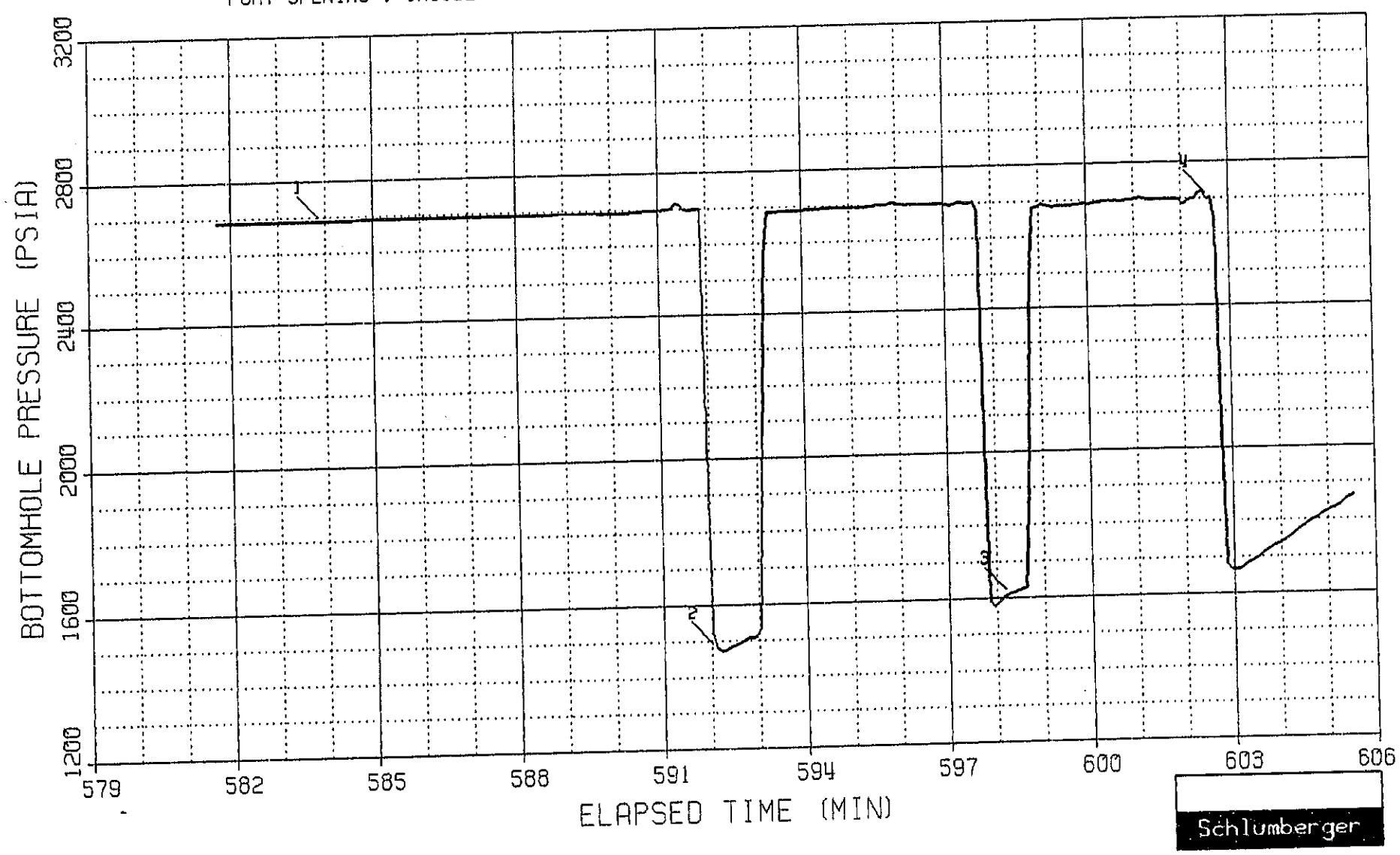
SCHLUMBERGER

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960582
INSTRUMENT NO. WTSR-978
DEPTH : 5246 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

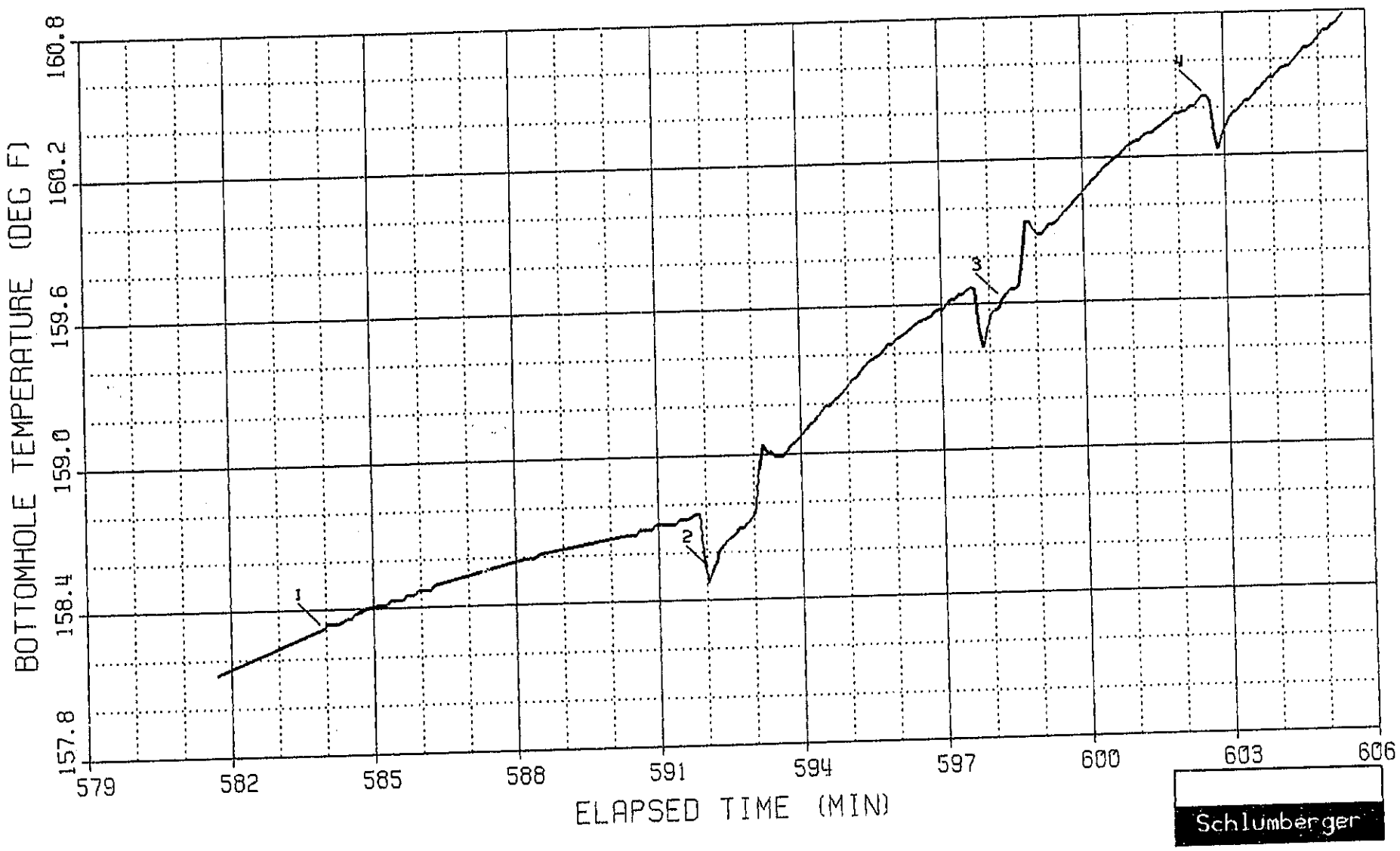


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960582
INSTRUMENT NO. WTSR-978
DEPTH : 5246 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Temperature Data



****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960582
INSTRUMENT NO. WTSR-978

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 5246 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	1:19:57	29-JAN	HYDROSTATIC MUD	583.95	2687.65	158.32
2	1:28:07	29-JAN	SEAT FAILED	592.12	1481.21	158.52
3	1:34:17	29-JAN	SEAT FAILED	598.28	1612.37	159.62
4	1:38:37	29-JAN	HYDROSTATIC MUD	602.62	2700.28	160.45

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
OPENHOLE DST	27-JAN-2002	HOBBS

WELL OWNER: COPPER EAGLE GAS STORAGE — SERVICE ORDER NUMBER: 7960580

REPORTS ADDRESS: 333 TEXAS STREET / SUITE 425 / SHREVEPORT, LA 71101-5319 ATTN:COPPER EAGLE GAS STORAGE

WELL NAME & NO.: SUNCOR DEVELOPMENT 1-24 — FIELD: LUKE-GLENDALE — LEASE:

LOCATION: 330SLx330WL — COUNTY: MARICOPA — STATE: ARIZONA

TEST NO. THREE — TEST INTERVAL FROM 5380 FT TO 6052 FT = 672 FT

SURFACE DATA

DESCRIPTION	DATE	TIME OF DAY	PRESSURE
OPEN TO BUBBLE HOSE ONLY	27-JAN		
SET PACKER		05:45	
START FLOW		05:47	
BOTTOM OF THE BUCKET		05:48	
PRESSURE DESCRIBED IN OZ.		05:50	12 oz
		05:54	22 oz
END FLOW & START SHUT-IN		05:55	28 oz
END SHUT-IN		07:27	
START FLOW, "BOB"		07:28	
PRESSURE DESCRIBED IN OZ.		07:32	26 oz
PRESSURE DESCRIBED IN PSI		07:37	3.4#
MAXIMUM SURFACE PRESSURE		07:52	6.2#
PRESSURE BEGINNING TO DROP		07:57	6.0#
		08:07	4.4#
FLOW SLOWING		08:12	3#
PRESSURE DESCRIBED IN OZ.		08:27	6 oz
NO FLOW, DEAD AGAIN		08:42	0
END FLOW & START SHUT-IN		09:28	0
END SHUT-IN		13:28	
PULLED LOOSE		13:33	

EQUIPMENT SEQUENCE

COMPONENTS	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				
DRILL PIPE (16.6#)	4.50	3.826	4048	4048
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.750	547.4	4595
CROSS OVER SUB	6.25	2.250	1.36	4597
HYDRAULIC JAR	6.25	2.000	11.69	4608
CROSS OVER SUB	6.125	3.000	1.84	4610
DRILL COLLARS	6.25	2.250	629.1	5239
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	5240
DRILL COLLARS	6.25	2.250	93.20	5333
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5334
CROSS OVER SUB	6.00	2.438	0.94	5335
MFE	5.00	1.000	9.88	5345
MFE OH BYPASS	5.00	1.000	2.98	5348
INSIDE RECORDER CARRIER	4.88	1.500	7.67	5356
INSIDE RECORDER CARRIER	4.88	1.500	7.77	5364
D&C HYDRAULIC JAR	4.75	1.875	6.59	5370
SAFETY JOINT	4.75	2.500	2.01	5372
CROSS OVER SUB	6.00	2.50	1.02	5373
BOB-TAIL PACKER	11.125	1.750	6.76	5380
PERFORATED ANCHOR	5.75	3.000	3.00	5383
CROSS OVER SUB	6.00	2.313	0.87	5384
CROSS OVER SUB	6.438	3.125	2.22	5386
BIT SUB	7.938	2.750	2.91	5389
BIT	12.25	2.000	1.00	5390

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RECOVERY DESCRIPTION	FEET	BBLS	OIL GRAVITY	RESISTIVITY	CHLORIDES
MUD FILTRATE	4431				
TOP				0.139 OHMS 60 °F	36000 PPM
MIDDLE				0.136 OHMS 60 °F	37000 PPM
BOTTOM				0.139 OHMS 60 °F	36000 PPM

SERVICE ORDER NUMBER: 7960580 — SCHLUMBERGER ENGINEER/TECHNICIAN: KIRK BEASLEY

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
OPENHOLE DST	27-JAN-2002	HOBBS

INSTRUMENT DATA

INSTRUMENT NO.	WTSR-995	WTSR-978	WTSR-1762		
CAPACITY(PSIG)	15000	15000	15000		
DEPTH	5356	5364			
INSIDE-OUTSIDE	IN	IN	OUT		
CLOCK CAP	ELECTRONIC	ELECTRONIC	ELECTRONIC		
TEMPERATURE °F	161	161			
I. HYD. PSIG	2732	2727			
I. FLOW PSIG	1110-1331	1184-1485			
I.S.I. PSIG	2239	2235			
2nd FLOW PSIG					
2nd S.I. PSIG					
F. FLOW PSIG	1148-2246	1148-2242			
F.S.I. PSIG	2247	2243			
F. HYD. PSIG	2736	2730			

MUD DATA

MUD TYPE BRINE MUD WT 9.3 #/gal
VISCOSITY 34 WATER LOSS 6 CC
RESISTIVITY: OF MUD @ °F
RESISTIVITY: OF FILTRATE 0.135 @ 70 °F
CHLORIDES 32000 PPM
H2S DURING TEST PPM

WELL BORE DATA

FORMATION TESTED
NET PRODUCTIVE INTERVAL ft EST. POROSITY %
ELEVATION 1064 ft DEPTH MEASURED FROM GL
TOTAL MEASURED DEPTH 6052/6052 ft
O H SIZE 12.25 in
CASING SIZE 13.375 / 12.415
LINER SIZE
PERF INTERVAL FROM ft TO ft
SHOT DENSITY

CUSHION	LENGTH	AMOUNT	SURFACE PRESS	BOTTOM CHOKE SIZE
NONE				1.00

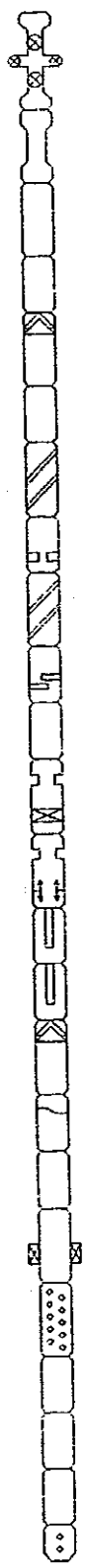
SAMPLER DATA

RECOVERY			RESISTIVITY			CHLORIDES	
GAS		C.F.	RECOVERED WATER	@	deg F		PPM
OIL		C.C.	RECOVERED MUD	@	deg F		
WATER		C.C.	REC.MUD FILTRATE 0.138	@ 60	deg F	36000	PPM
MUD	2500	C.C.	PIT MUD	@	deg F		
GRAVITY	°API	°F	PIT MUD FILTRATE 0.138	@ 60	deg F	36000	PPM
GOR		C.F./BBL	SAMPLER PRESSURE 62 psig				

REMARKS: THIS IS DST #3. THE WELL WAS EVALUATED FROM 5380' TO 6052'. THE TEST WAS CONCLUSIVE. THE RECOVERY WAS 52.5 BARRELS OF MUD. BOTH FLOWS & SHUTINS WERE OBTAINED BUT UNFOTUNATELY THE WELL DIED AGAIN DURING THE PRESCRIBED FLOW TIME. THE TEST WAS MECHANICALLY SUCCESSFUL. THE ANNULUS REMAINED CONSTANT DURING THE TEST & THERE WERE NO DRILL PIPE LEAKS. THERE WAS SOME PARTIAL PLUGGING DURING THE FLOWS, BUT IT DID NOT EFFECT THE TEST. THANK YOU FOR USING SCHLUMBERGER.

SERVICE ORDER NUMBER:	7960580	SCHLUMBERGER ENGINEER/TECHNICIAN	KIRK BEASLEY

COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				0
DRILL PIPE (16.6#)	4.50	3.826	4048	4048
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.750	547.4	4595.4
CROSS OVER SUB	6.25	2.250	1.36	4596.76
HYDRAULIC JAR	6.25	2.000	11.69	4608.45
CROSS OVER SUB	6.125	3.000	1.84	4610.29
DRILL COLLARS	6.25	2.250	629.1	5239.39
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	5240.22
DRILL COLLARS	6.25	2.250	93.20	5333.42
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5334.38
CROSS OVER SUB	6.00	2.438	0.94	5335.32
MFE	5.00	1.000	9.88	5345.2
MFE OH BYPASS	5.00	1.000	2.98	5348.18
INSIDE RECORDER CARRIER	4.88	1.500	7.67	5355.85
INSIDE RECORDER CARRIER	4.88	1.500	7.77	5363.62
D&C HYDRAULIC JAR	4.75	1.875	6.59	5370.21
SAFETY JOINT	4.75	2.500	2.01	5372.22
CROSS OVER SUB	6.00	2.50	1.02	5373.24
BOB-TAIL PACKER	11.125	1.750	6.76	5380
PERFORATED ANCHOR	5.75	3.000	3.00	5383
CROSS OVER SUB	6.00	2.313	0.87	5383.87
CROSS OVER SUB	6.438	3.125	2.22	5386.09
BIT SUB	7.938	2.750	2.91	5389
BIT	12.25	2.000	1.00	5390

Report Number: 7960580
Test Number: TWO
Test Date: 27-JAN-2002

Schlumberger

REPORT NO. 7960580
PAGE NO. 1
TEST DATE: 27-JAN-2002

S T A R

Schlumberger Testing Data Report

Pressure Data Report

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE

WELL: SUNCOR DEVELOPMENT 1-24

TEST IDENTIFICATION

Test Type ..... OPENHOLE DST
Test No. ..... THREE
Formation .....
Test Interval (ft) ..... 5380 to 6052
Depth Reference ..... GL

WELL LOCATION

Field ..... LUKE-GLENDALE
County ..... MARICOPA
State ..... ARIZONA
Sec/Twn/Rng 330SLx330WL
Elevation (ft) 1064

HOLE CONDITIONS

Total Depth (MD/TVD) (ft) 6052/6052
Hole Size (in) 12.25
Casing/Liner I.D. (in) ..... 13.375 / 12.41
Perf'd Interval/Net Pay (ft)..
Shot Density/Diameter (in) ...

MUD PROPERTIES

Mud Type ..... BRINE
Mud Weight (lb/gal) 9.3
Mud Resistivity (ohm.m) .....
Filtrate Resistivity (ohm.m).. 0.135 @ 70F
Filtrate Chlorides (ppm) 32000

INITIAL TEST CONDITIONS

Initial Hydrostatic (psi) 2732.12
Gas Cushion Type .....
Surface Pressure (psi) .....
Liquid Cushion Type .....
Cushion Length (ft) .....

TEST STRING CONFIGURATION

Pipe Length (ft)/I.D. (in) ... 4048 / 3.826
Collar Length (ft)/I.D. (in).. 722 / 2.250
Packer Depths (ft) 5380,
Bottomhole Choke Size (in) ... 1.00
Gauge Depth (ft)/Type 5356/WTSR-995

NET PIPE RECOVERY

Volume	Fluid Type	Properties
4431 ft	MUD FILTRATE	
	TOP	Rw0.139@60F 36000ppm
	MIDDLE	Rw0.136@60F 37000ppm
	BOTTOM	Rw0.139@60F 36000ppm

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties
2500 cc	Mud	Rw 0.138@60F 36000p
Pressure:62	GOR:0	GLR:0

INTERPRETATION RESULTS

Model of Behavior .....
Fluid Type Used for Analysis..
Reservoir Pressure (psi) .....
Transmissibility (md.ft/cp) ..
Effective Permeability (md) ..
Skin Factor/Damage Ratio .....
Storativity Ratio, Omega .....
Interporos.Flow Coef..Lambda..
Distance to an Anomaly (ft) ..
Radius of Investigation (ft)..
Potentiometric Surface (ft) ..

ROCK/FLUID/WELLBORE PROPERTIES

Oil Density (deg. API) .....
Basic Solids (%) .....
Gas Gravity .....
GOR (scf/STB) .....
Water Cut (%) .....
Viscosity (cp) .....
Total Compressibility (1/psi).
Porosity (%) .....
Reservoir Temperature (F) 161
Form.Vol.Factor (bbl/STB) ....

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

THIS IS DST #3. THE WELL WAS EVALUATED FROM 5380' TO 6052'. THE TEST WAS CONCLUSIVE. THE RECOVERY WAS 52.5 BARRELS OF MUD. BOTH FLOWS & SHUTINS WERE OBTAINED BUT UNFOTUNATELY THE WELL DIED AGAIN DURING THE PRESCRIBED FLOW TIME. THE TEST WAS MECHANICALLY SUCCESSFUL. THE ANNULUS REMAINED CONSTANT DURING THE TEST & THERE WERE NO DRILL PIPE LEAKS. THERE WAS SOME PARTIAL PLUGGING DURING THE FLOWS, BUT IT DID NOT EFFECT THE TEST. THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:7960580 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 2, 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	SEQUENCE OF EVENTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

DATE	TIME (HR:MIN)	DESCRIPTION	ET (MINS)	BHP (PSIA)	WHP (PSIG)
27-JAN		OPEN TO BUBBLE HOSE ONLY			
	05:45	SET PACKER	-2		
	05:47	START FLOW	0	1110	
	05:48	BOTTOM OF THE BUCKET	1		
	05:50	PRESSURE DESCRIBED IN OZ.	3		12 oz
	05:54		7		22 oz
	05:55	END FLOW & START SHUT-IN	8	1331	28 oz
	07:27	END SHUT-IN	100	2239	
	07:28	START FLOW, "BOB"	101	1148	
	07:32	PRESSURE DESCRIBED IN OZ.	105		26 oz
	07:37	PRESSURE DESCRIBED IN PSI	110		3.4#
	07:52	MAXIMUM SURFACE PRESSURE	125		6.2#
	07:57	PRESSURE BEGINNING TO DROP	130		6.0#
	08:07		140		4.4#
	08:12	FLOW SLOWING	145		3#
	08:27	PRESSURE DESCRIBED IN OZ.	160		6 oz
	08:42	NO FLOW, DEAD AGAIN	175		0
	09:28	END FLOW & START SHUT-IN	221	2246	0
	13:28	END SHUT-IN	461	2247	
	13:33	PULLED LOOSE	466		

WELL TEST INTERPRETATION REPORT =:7960580 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 12, 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

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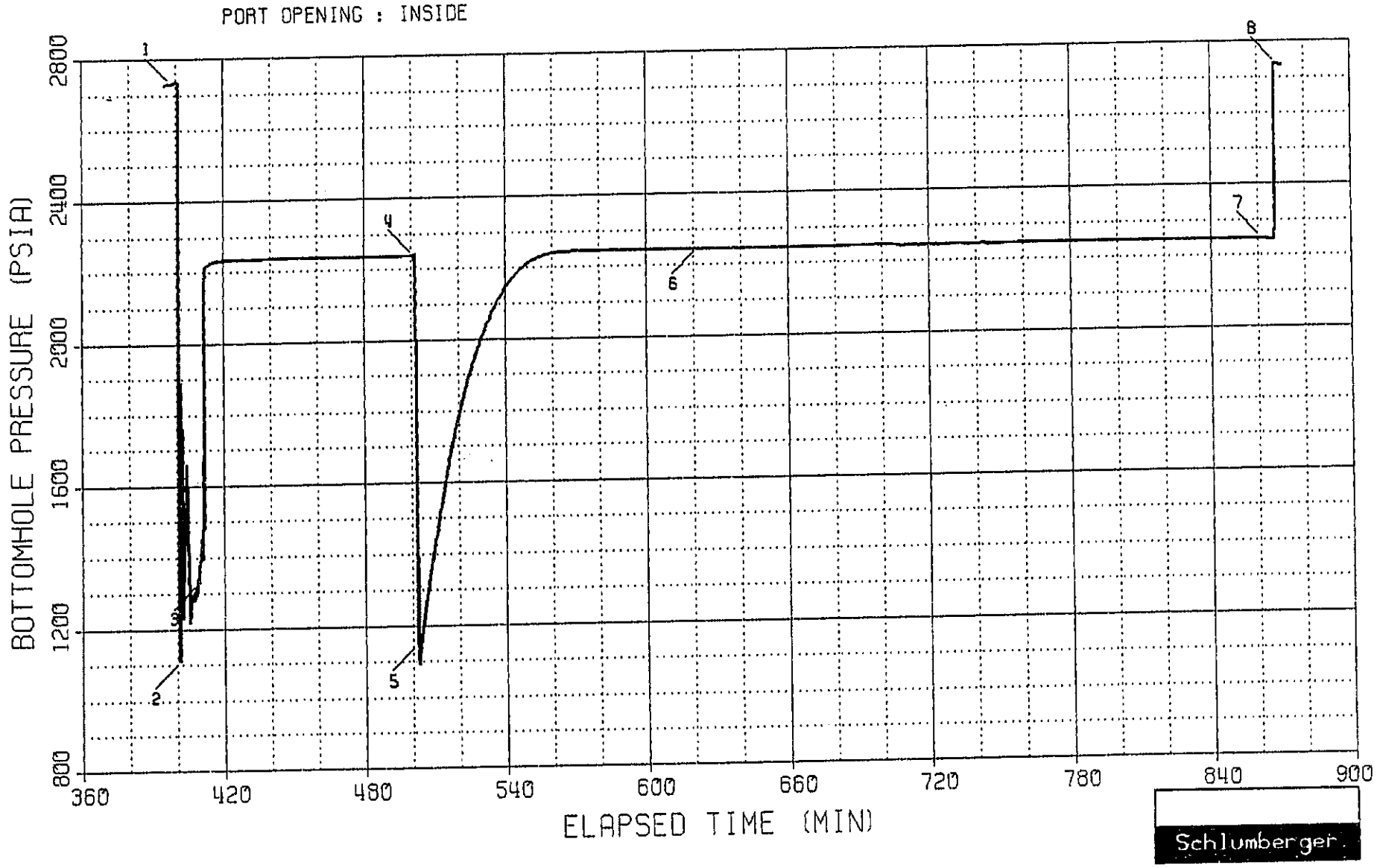
BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-995
DEPTH : 5356 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

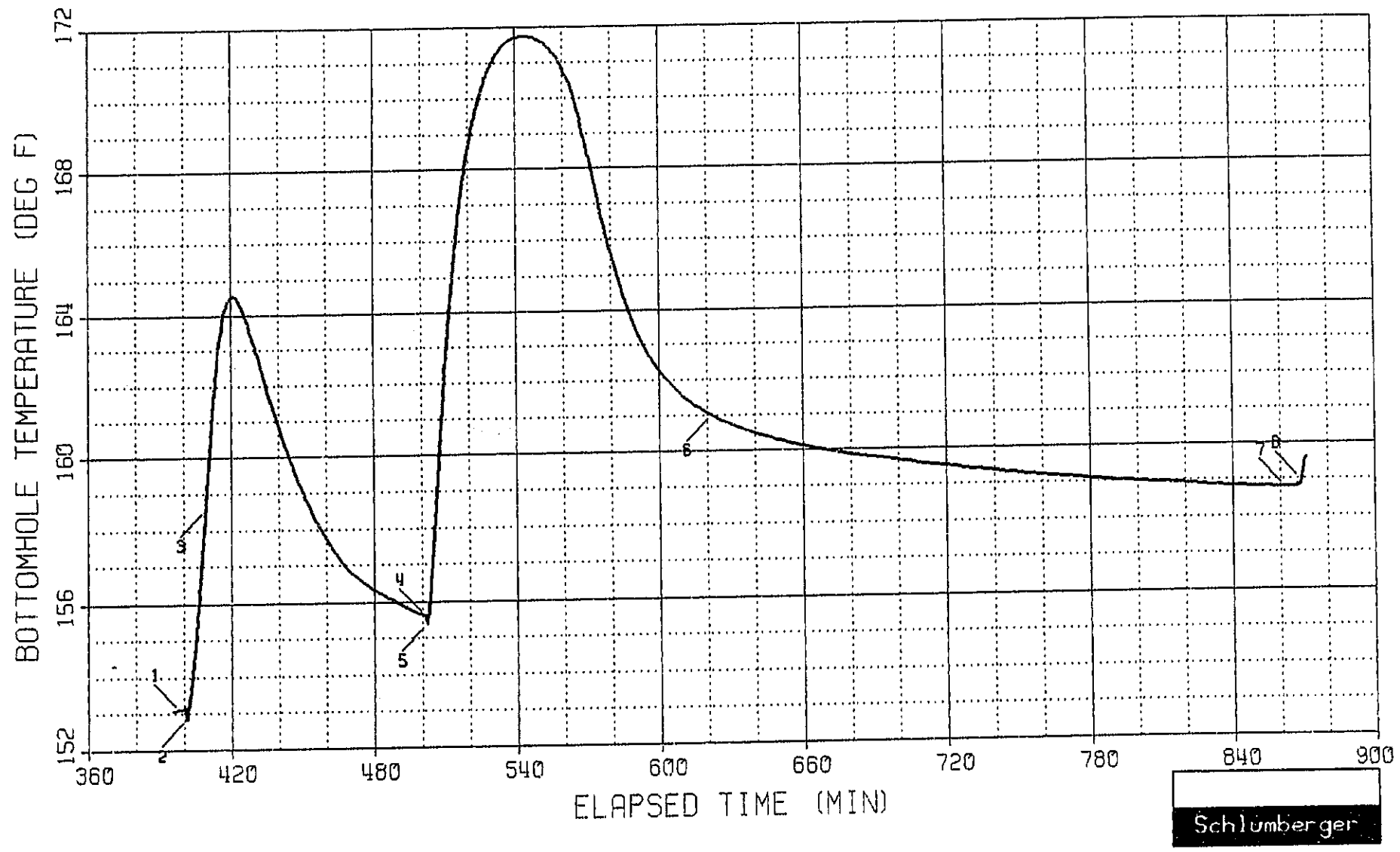


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-995
DEPTH : 5356 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

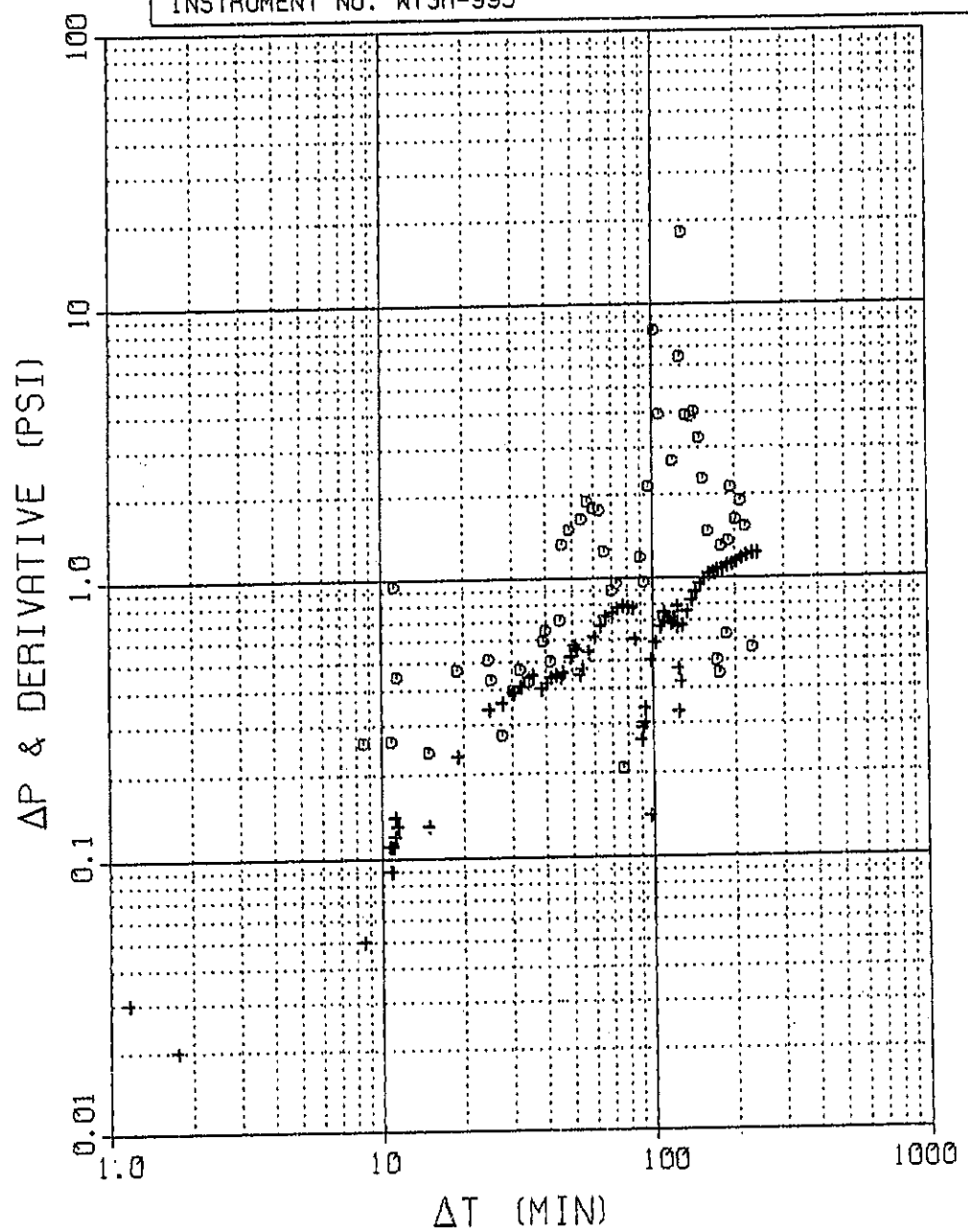
Electronic Temperature Data



LOG LOG PLOT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-995

SHUTIN #2 : PRODUCING TIME (Tp): 127.9 MIN
FINAL FLOW PRESSURE (Pwf): 2246 PSIA
PLOT ELAPSED TIME RANGE: 623.0 TO 862.0 MIN
ΔT TIME RANGE: 1.2 TO 240.2 MIN



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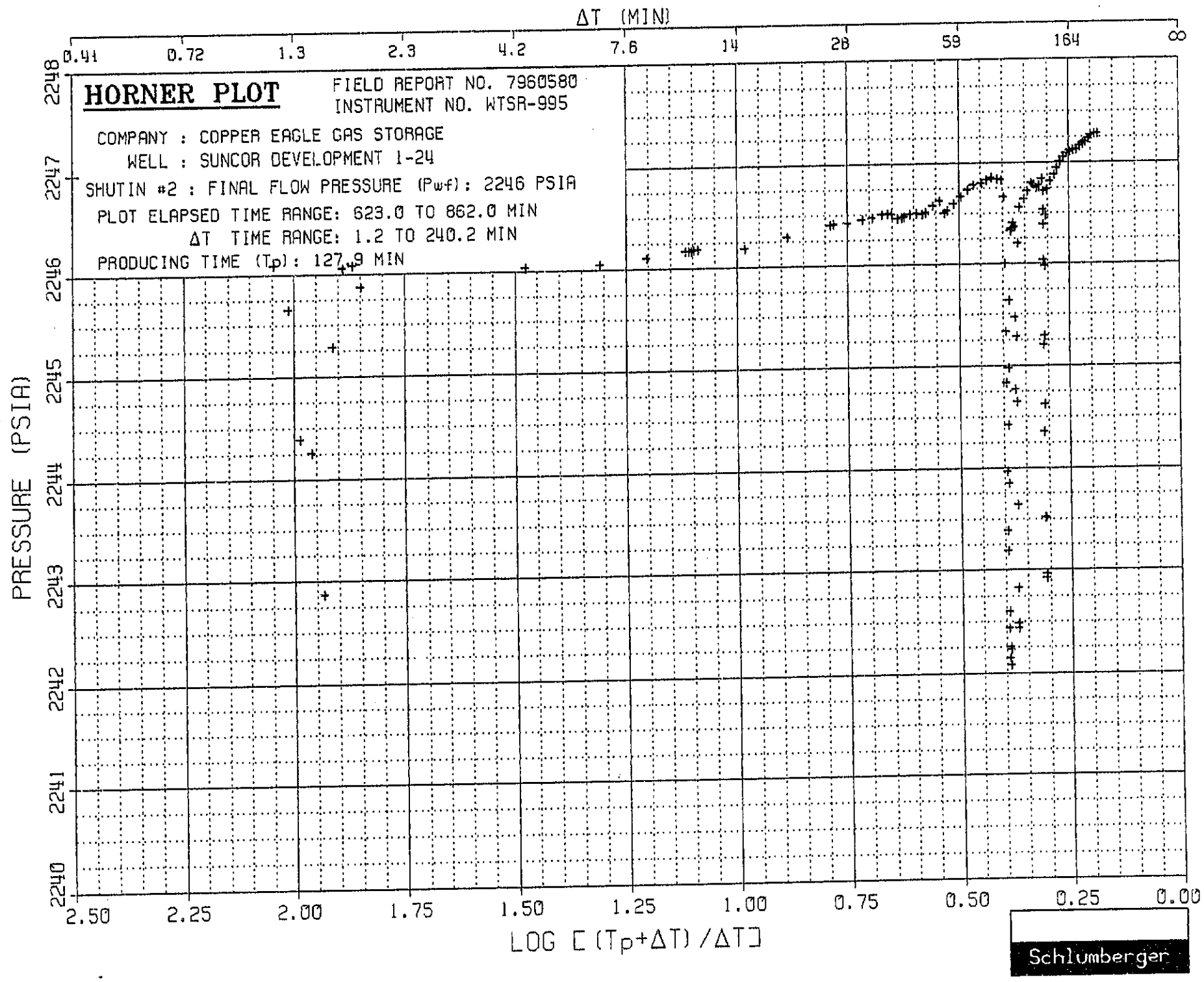
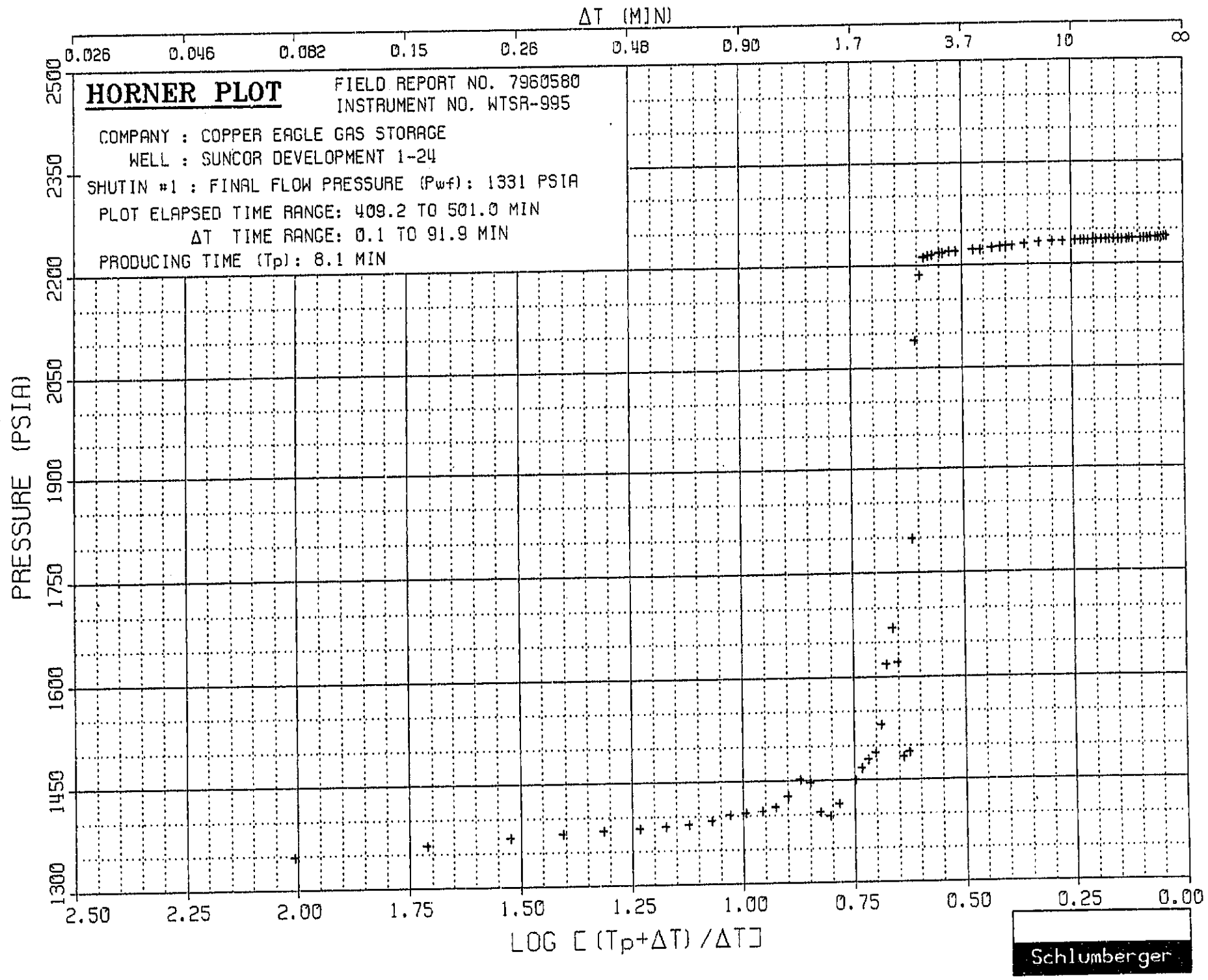

HORNER PLOT
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-995
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 2246 PSIA
PLOT ELAPSED TIME RANGE: 623.0 TO 862.0 MIN
ΔT TIME RANGE: 1.2 TO 240.2 MIN
PRODUCING TIME (Tp): 127.9 MIN
ΔT (MIN)
0.41
0.72
1.3
2.3
4.2
7.6
14
28
59
164
∞
PRESSURE (PSIA)
2248
2247
2246
2245
2244
2243
2242
2241
2240
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-995
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 1331 PSIA
PLOT ELAPSED TIME RANGE: 409.2 TO 501.0 MIN
ΔT TIME RANGE: 0.1 TO 91.9 MIN
PRODUCING TIME (Tp): 8.1 MIN
ΔT (MIN)
0.026
0.046
0.082
0.15
0.26
0.48
0.90
1.7
3.7
10
∞
PRESSURE (PSIA)
2500
2350
2200
2050
1900
1750
1600
1450
1300
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-995

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 5356 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	5:44:07	27-JAN	HYDROSTATIC MUD	398.12	2732.12	153.10
2	5:47:02	27-JAN	START FLOW	401.03	1110.37	152.85
3	5:55:07	27-JAN	END FLOW & START SHUT-IN	409.12	1331.00	158.59
4	7:27:02	27-JAN	END SHUT-IN	501.03	2238.89	155.62
5	7:28:02	27-JAN	START FLOW	502.03	1148.00	155.39
6	9:27:52	27-JAN	END FLOW & START SHUT-IN	621.87	2246.06	161.02
7	13:28:02	27-JAN	END SHUT-IN	862.03	2247.28	158.79
8	13:34:47	27-JAN	HYDROSTATIC MUD	868.78	2735.56	158.97

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	401.03	409.12	8.09	1110.37	1331.00	1110.37
2	502.03	621.87	119.84	1148.00	2246.06	1148.00

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	409.12	501.03	91.91	1331.00	2238.89	1331.00	8.09
2	621.87	862.03	240.16	2246.06	2247.28	2246.06	127.93

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
5:47:02	27-JAN	401.03	0.00	152.85	1110.37
5:55:07	27-JAN	409.12	8.09	158.59	1331.00

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 1331.00 PSIA
PRODUCING TIME = 8.09 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
5:55:07	27-JAN	409.12	0.00	158.59	1331.00	0.00	
5:56:07	27-JAN	410.12	1.00	159.49	1405.04	74.04	0.9586
5:57:07	27-JAN	411.12	2.00	160.38	1489.03	158.03	0.7029
5:58:07	27-JAN	412.12	3.00	161.28	2214.81	883.81	0.5678
5:59:12	27-JAN	413.20	4.08	162.10	2221.41	890.41	0.4746
6:00:12	27-JAN	414.20	5.08	162.77	2225.61	894.61	0.4137
6:01:27	27-JAN	415.45	6.33	163.45	2229.11	898.11	0.3576
6:02:32	27-JAN	416.53	7.41	163.89	2231.42	900.42	0.3205
6:04:27	27-JAN	418.45	9.33	164.37	2233.05	902.05	0.2712
6:05:52	27-JAN	419.87	10.75	164.53	2233.50	902.50	0.2437
6:07:52	27-JAN	421.87	12.75	164.52	2234.25	903.25	0.2134
6:10:27	27-JAN	424.45	15.33	164.23	2234.81	903.81	0.1840
6:12:37	27-JAN	426.62	17.50	163.85	2235.17	904.17	0.1650
6:15:32	27-JAN	429.53	20.41	163.20	2235.48	904.48	0.1450
6:18:47	27-JAN	432.78	23.66	162.43	2235.75	904.75	0.1277
6:22:17	27-JAN	436.28	27.16	161.62	2236.06	905.06	0.1132
6:27:57	27-JAN	441.95	32.83	160.43	2236.64	905.64	0.0957
6:34:47	27-JAN	448.78	39.66	159.26	2237.03	906.03	0.0806
6:41:57	27-JAN	455.95	46.83	158.22	2237.45	906.45	0.0692
6:48:02	27-JAN	462.03	52.91	157.51	2237.92	906.92	0.0618
6:53:42	27-JAN	467.70	58.58	156.99	2238.12	907.12	0.0562
6:59:22	27-JAN	473.37	64.25	156.65	2238.16	907.16	0.0515
7:05:52	27-JAN	479.87	70.75	156.34	2238.38	907.38	0.0470
7:11:22	27-JAN	485.37	76.25	156.15	2238.51	907.51	0.0438
7:17:12	27-JAN	491.20	82.08	155.93	2238.66	907.66	0.0408
7:23:07	27-JAN	497.12	88.00	155.73	2238.79	907.79	0.0382
7:27:02	27-JAN	501.03	91.91	155.62	2238.89	907.89	0.0366

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
7:28:02	27-JAN	502.03	0.00	155.39	1148.00
7:43:02	27-JAN	517.03	15.00	167.29	1699.13
7:58:27	27-JAN	532.45	30.42	171.27	2047.99
8:13:32	27-JAN	547.53	45.50	171.70	2200.87
8:28:37	27-JAN	562.62	60.59	170.46	2241.85
8:45:27	27-JAN	579.45	77.42	165.74	2245.09
9:00:27	27-JAN	594.45	92.42	162.88	2245.49

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
9:16:17	27-JAN	610.28	108.25	161.53	2245.84
9:27:52	27-JAN	621.87	119.84	161.02	2246.06

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 2246.06 PSIA
PRODUCING TIME = 127.93 MIN

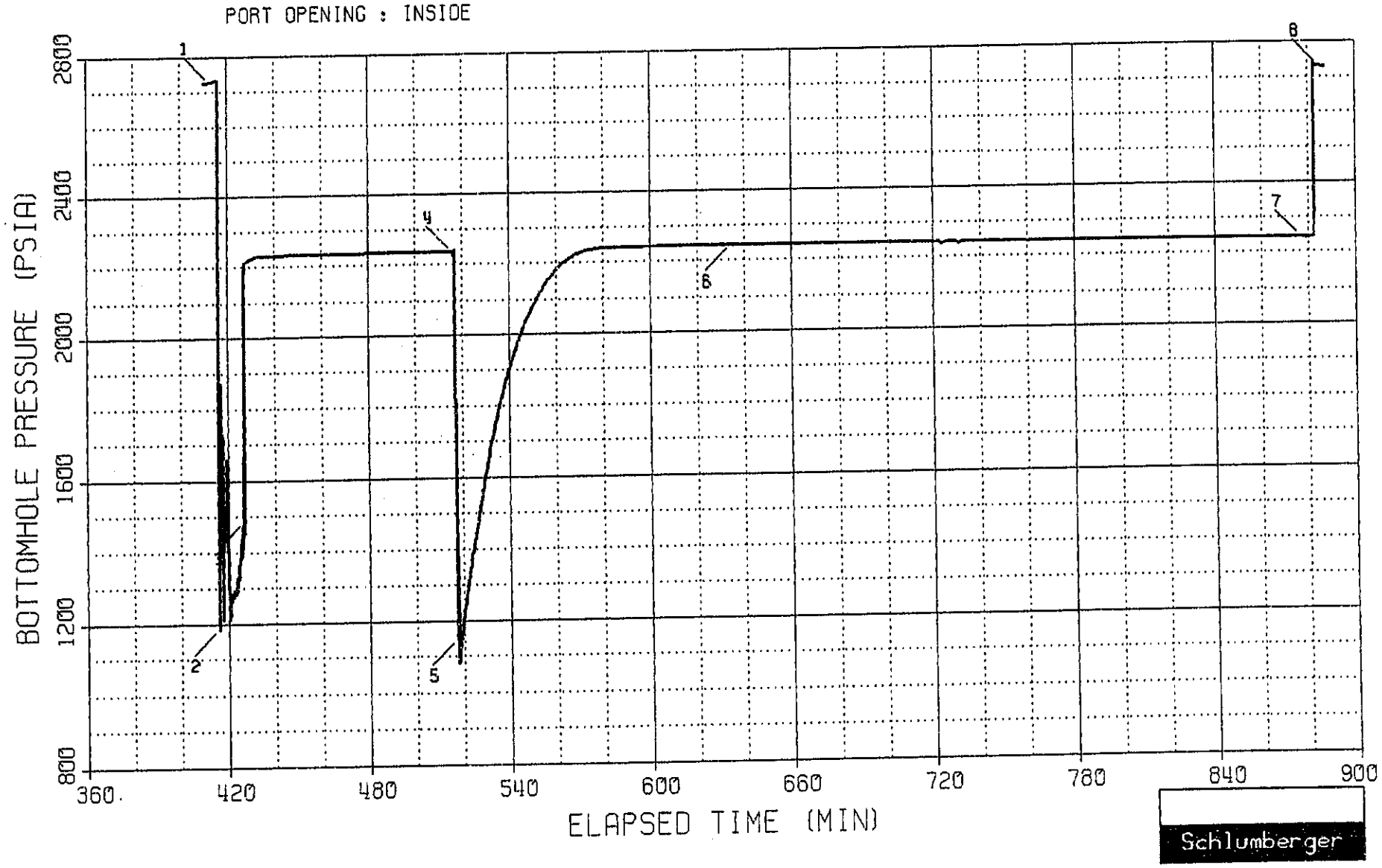
TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
9:27:52	27-JAN	621.87	0.00	161.02	2246.06	0.00	
9:29:02	27-JAN	623.03	1.16	160.97	2246.09	0.03	2.0464
9:32:17	27-JAN	626.28	4.41	160.86	2246.03	-0.03	1.4772
9:34:27	27-JAN	628.45	6.58	160.81	2246.05	-0.01	1.3105
9:36:22	27-JAN	630.37	8.50	160.74	2246.11	0.05	1.2055
9:38:27	27-JAN	632.45	10.58	160.68	2246.17	0.11	1.1170
9:42:42	27-JAN	636.70	14.83	160.57	2246.19	0.13	0.9835
9:46:52	27-JAN	640.87	19.00	160.48	2246.29	0.23	0.8884
9:52:37	27-JAN	646.62	24.75	160.36	2246.40	0.34	0.7902
9:55:32	27-JAN	649.53	27.66	160.30	2246.42	0.36	0.7501
9:58:07	27-JAN	652.12	30.25	160.25	2246.45	0.39	0.7184
10:03:37	27-JAN	657.62	35.75	160.16	2246.51	0.45	0.6607
10:09:32	27-JAN	663.53	41.66	160.07	2246.50	0.44	0.6097
10:16:52	27-JAN	670.87	49.00	159.96	2246.58	0.52	0.5576
10:22:02	27-JAN	676.03	54.16	159.91	2246.53	0.47	0.5266
10:28:07	27-JAN	682.12	60.25	159.84	2246.67	0.61	0.4946
10:33:57	27-JAN	687.95	66.08	159.78	2246.78	0.72	0.4678
10:41:22	27-JAN	695.37	73.50	159.73	2246.83	0.77	0.4378
10:48:02	27-JAN	702.03	80.16	159.66	2246.84	0.78	0.4143
10:53:27	27-JAN	707.45	85.58	159.62	2246.00	-0.06	0.3970
10:58:32	27-JAN	712.53	90.66	159.57	2246.35	0.29	0.3822
11:04:12	27-JAN	718.20	96.33	159.51	2246.20	0.14	0.3670
11:09:37	27-JAN	723.62	101.75	159.48	2246.64	0.58	0.3536
11:17:22	27-JAN	731.37	109.50	159.42	2246.80	0.74	0.3361
11:22:37	27-JAN	736.62	114.75	159.39	2246.75	0.69	0.3253
11:29:57	27-JAN	743.95	122.08	159.33	2246.84	0.78	0.3113
11:35:22	27-JAN	749.37	127.50	159.30	2246.73	0.67	0.3018
11:40:42	27-JAN	754.70	132.83	159.26	2246.81	0.75	0.2929
11:45:47	27-JAN	759.78	137.91	159.22	2246.88	0.82	0.2850
11:55:27	27-JAN	769.45	147.58	159.17	2247.01	0.95	0.2711
12:01:22	27-JAN	775.37	153.50	159.13	2247.05	0.99	0.2633
12:07:17	27-JAN	781.28	159.41	159.10	2247.09	1.03	0.2559
12:13:22	27-JAN	787.37	165.50	159.06	2247.10	1.04	0.2487
12:18:57	27-JAN	792.95	171.08	159.04	2247.12	1.06	0.2425
12:26:17	27-JAN	800.28	178.41	159.01	2247.13	1.07	0.2348
12:33:37	27-JAN	807.62	185.75	158.97	2247.16	1.10	0.2276
12:48:57	27-JAN	822.95	201.08	158.92	2247.20	1.14	0.2138
13:06:22	27-JAN	840.37	218.50	158.86	2247.26	1.20	0.2002
13:28:02	27-JAN	862.03	240.16	158.79	2247.28	1.22	0.1855

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-978
DEPTH : 5364 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

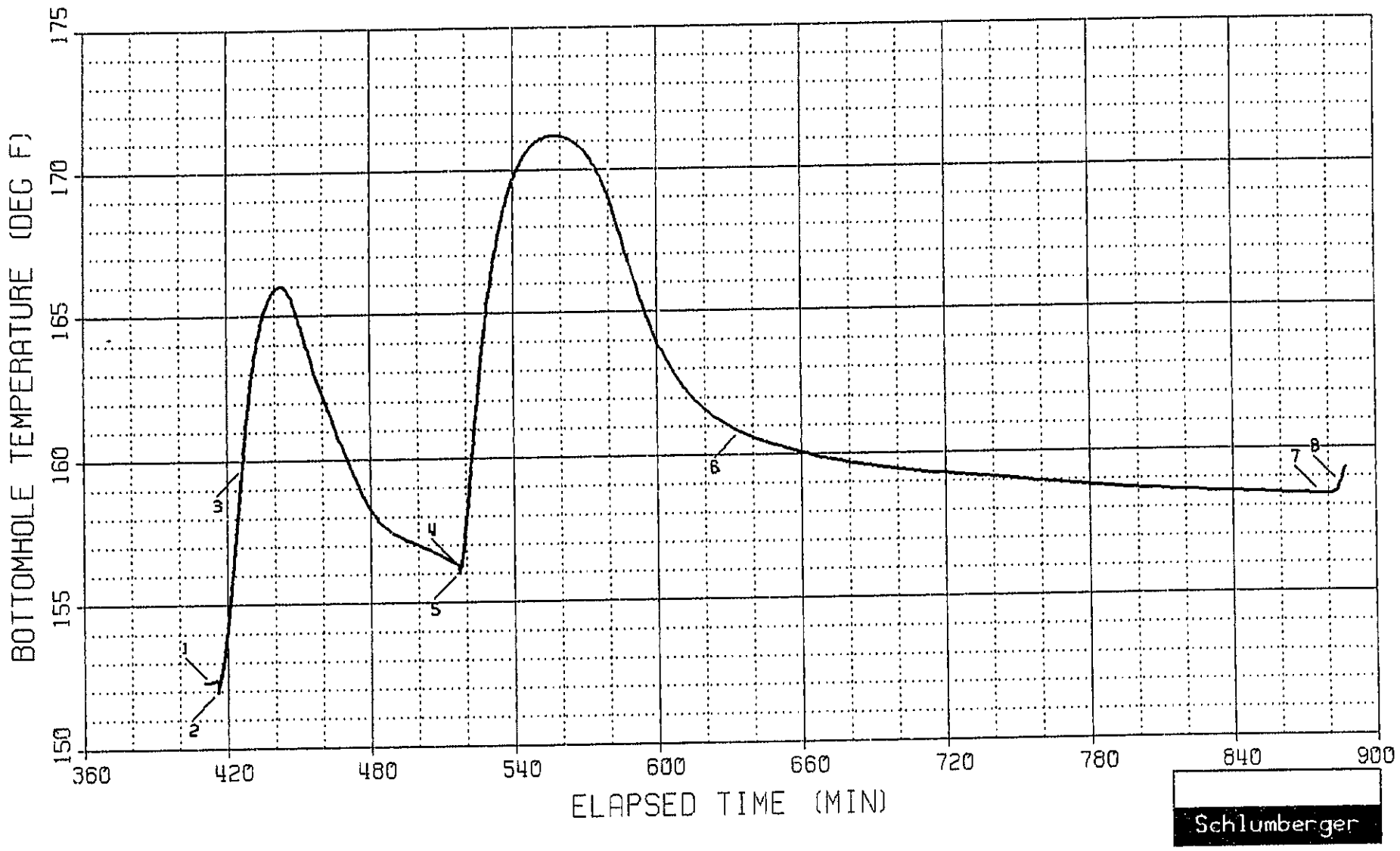


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-978
DEPTH : 5364 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

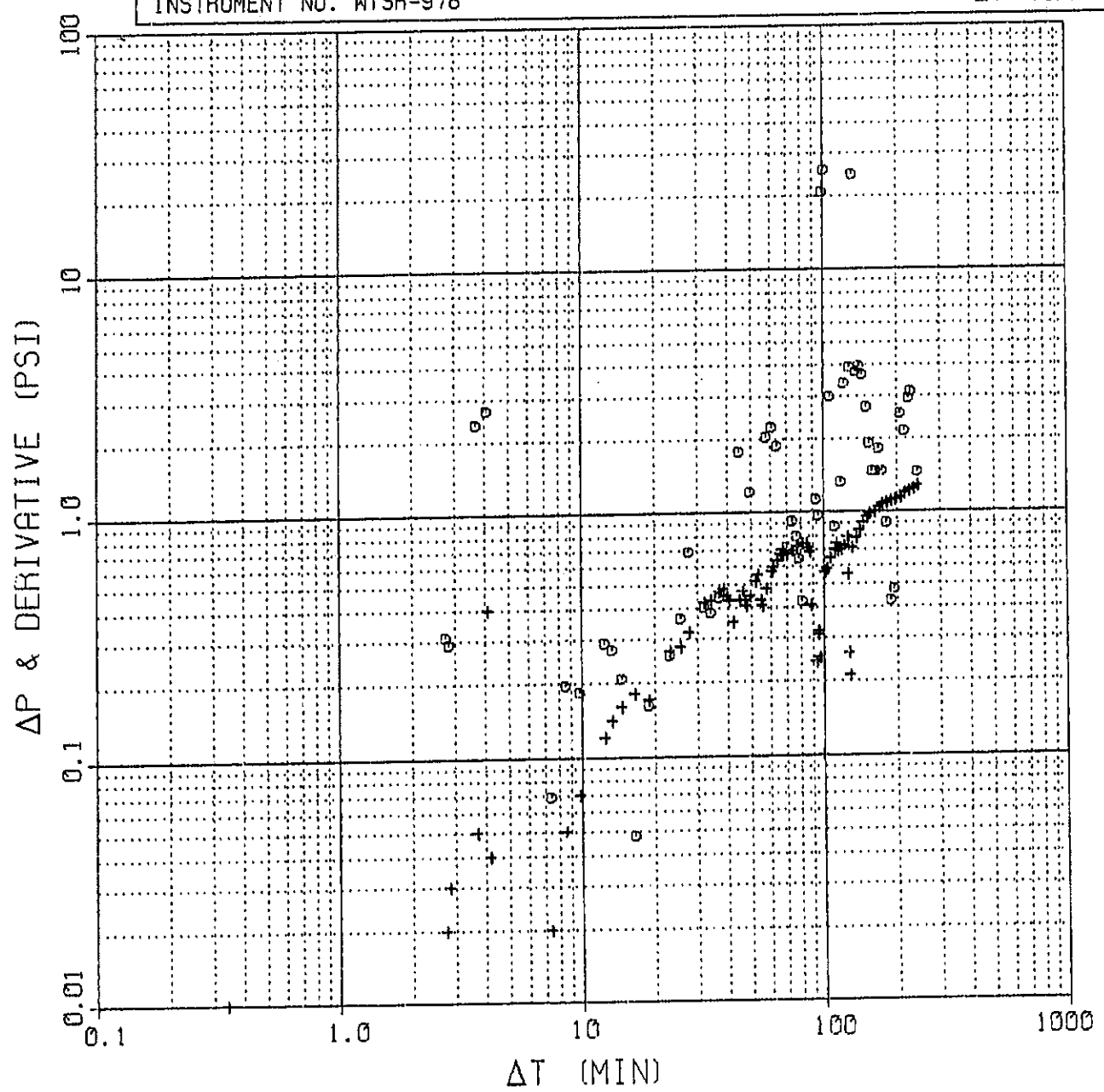
Electronic Temperature Data



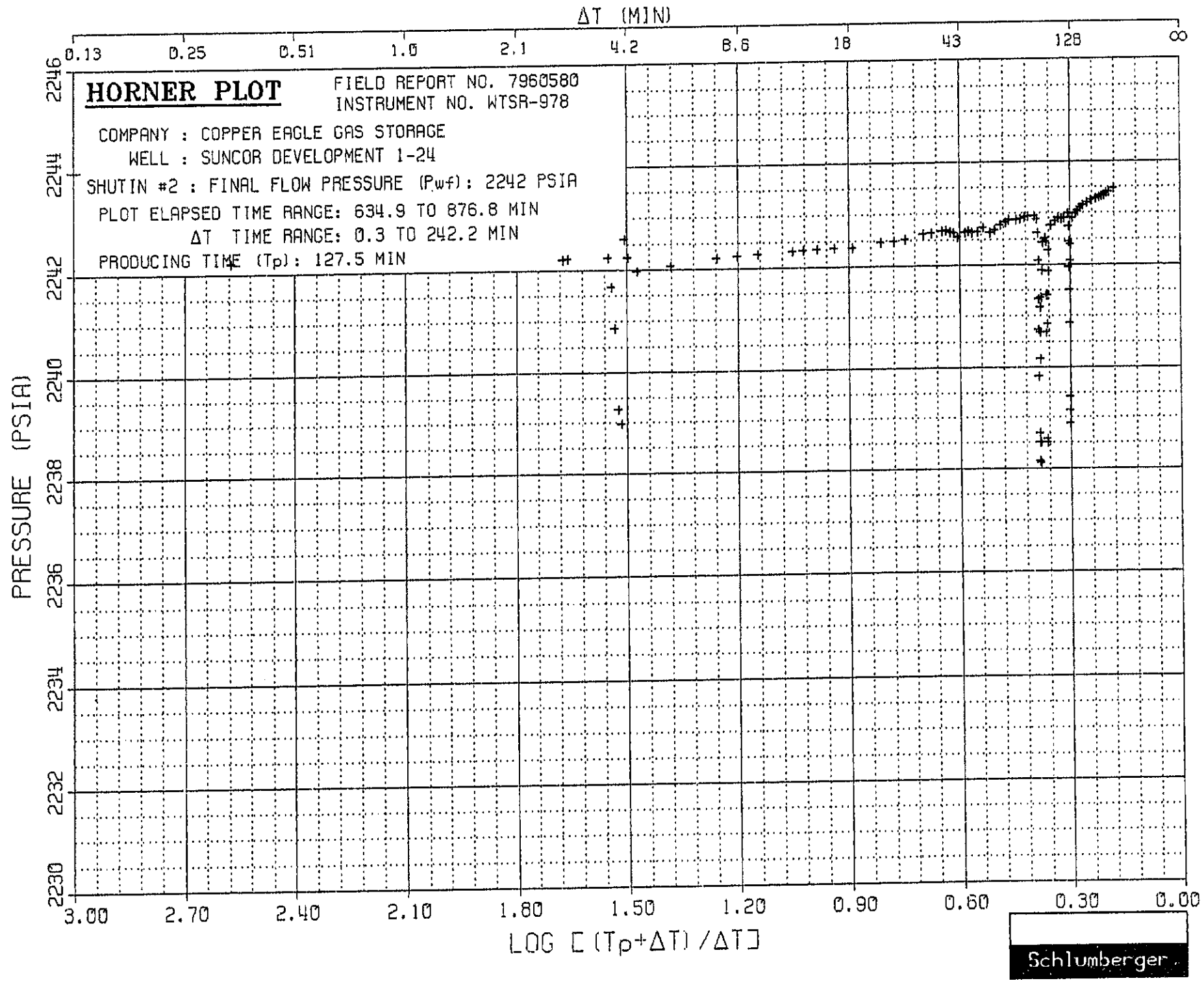
LOG LOG PLOT

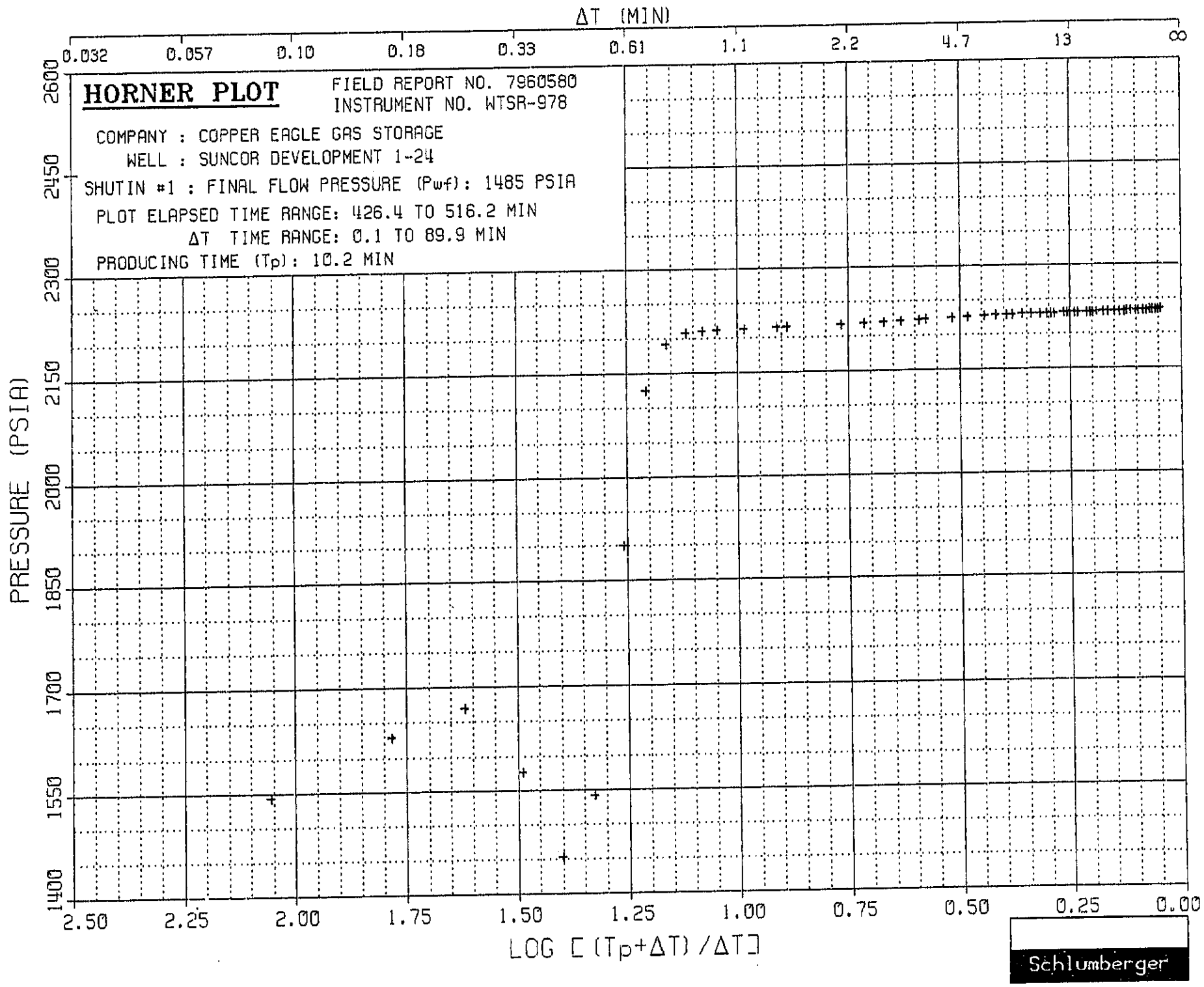
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-978

SHUTIN #2 : PRODUCING TIME (Tp): 127.5 MIN
FINAL FLOW PRESSURE (Pwf): 2242 PSIA
PLOT ELAPSED TIME RANGE: 634.9 TO 876.8 MIN
ΔT TIME RANGE: 0.3 TO 242.2 MIN



Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-978
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 2242 PSIA
PLOT ELAPSED TIME RANGE: 634.9 TO 876.8 MIN
ΔT TIME RANGE: 0.3 TO 242.2 MIN
PRODUCING TIME (Tp): 127.5 MIN
ΔT (MIN)
0.13
0.25
0.51
1.0
2.1
4.2
8.6
18
43
128
∞
PRESSURE (PSIA)
2246
2244
2242
2240
2238
2236
2234
2232
2230
3.00
2.70
2.40
2.10
1.80
1.50
1.20
0.90
0.60
0.30
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-978
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 1485 PSIA
PLOT ELAPSED TIME RANGE: 426.4 TO 516.2 MIN
ΔT TIME RANGE: 0.1 TO 89.9 MIN
PRODUCING TIME (Tp): 10.2 MIN
ΔT (MIN)
0.032
0.057
0.10
0.18
0.33
0.61
1.1
2.2
4.7
13
∞
PRESSURE (PSIA)
2600
2450
2300
2150
2000
1850
1700
1550
1400
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-978

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 5364 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	5:43:37	27-JAN	HYDROSTATIC MUD	412.62	2727.40	152.29
2	5:47:07	27-JAN	START FLOW	416.12	1184.11	151.93
3	5:57:17	27-JAN	END FLOW & START SHUT-IN	426.28	1484.97	159.73
4	7:27:12	27-JAN	END SHUT-IN	516.20	2234.66	156.31
5	7:28:12	27-JAN	START FLOW	517.20	1147.56	156.02
6	9:25:32	27-JAN	END FLOW & START SHUT-IN	634.53	2242.20	160.81
7	13:27:47	27-JAN	END SHUT-IN	876.78	2243.47	158.40
8	13:35:57	27-JAN	HYDROSTATIC MUD	884.95	2730.13	158.74

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	416.12	426.28	10.16	1184.11	1484.97	1184.11
2	517.20	634.53	117.33	1147.56	2242.20	1147.56

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	426.28	516.20	89.92	1484.97	2234.66	1484.97	10.16
2	634.53	876.78	242.25	2242.20	2243.47	2242.20	127.49

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
5:47:07	27-JAN	416.12	0.00	151.93	1184.11
5:57:17	27-JAN	426.28	10.16	159.73	1484.97

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 1484.97 PSIA
PRODUCING TIME = 10.16 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
5:57:17	27-JAN	426.28	0.00	159.73	1484.97	0.00	
5:58:17	27-JAN	427.28	1.00	160.66	2210.46	725.49	1.0477
5:59:22	27-JAN	428.37	2.09	161.51	2216.99	732.02	0.7680
6:00:22	27-JAN	429.37	3.09	162.23	2221.14	736.17	0.6323
6:01:42	27-JAN	430.70	4.42	163.06	2224.80	739.83	0.5183
6:02:57	27-JAN	431.95	5.67	163.72	2227.16	742.19	0.4459
6:04:07	27-JAN	433.12	6.84	164.25	2228.36	743.39	0.3954
6:05:07	27-JAN	434.12	7.84	164.64	2228.62	743.65	0.3610
6:06:37	27-JAN	435.62	9.34	165.11	2229.28	744.31	0.3197
6:07:42	27-JAN	436.70	10.42	165.36	2229.61	744.64	0.2956
6:09:47	27-JAN	438.78	12.50	165.76	2230.13	745.16	0.2583
6:13:17	27-JAN	442.28	16.00	165.99	2230.57	745.60	0.2135
6:15:42	27-JAN	444.70	18.42	165.90	2230.93	745.96	0.1908
6:19:12	27-JAN	448.20	21.92	165.27	2231.48	746.51	0.1654
6:21:37	27-JAN	450.62	24.34	164.62	2231.67	746.70	0.1515
6:23:57	27-JAN	452.95	26.67	163.99	2231.79	746.82	0.1402
6:26:32	27-JAN	455.53	29.25	163.29	2232.07	747.10	0.1295
6:28:32	27-JAN	457.53	31.25	162.77	2232.21	747.24	0.1223
6:35:32	27-JAN	464.53	38.25	161.26	2232.77	747.80	0.1023
6:40:42	27-JAN	469.70	43.42	160.16	2233.11	748.14	0.0913
6:48:02	27-JAN	477.03	50.75	158.74	2233.32	748.35	0.0793
6:54:22	27-JAN	483.37	57.09	157.89	2233.58	748.61	0.0711
6:59:57	27-JAN	488.95	62.67	157.46	2233.82	748.85	0.0653
7:05:47	27-JAN	494.78	68.50	157.19	2233.97	749.00	0.0601
7:11:07	27-JAN	500.12	73.84	156.99	2234.10	749.13	0.0560
7:16:07	27-JAN	505.12	78.84	156.81	2234.24	749.27	0.0526
7:22:22	27-JAN	511.37	85.09	156.52	2234.48	749.51	0.0490
7:27:12	27-JAN	516.20	89.92	156.31	2234.66	749.69	0.0465

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
7:28:12	27-JAN	517.20	0.00	156.02	1147.56
7:43:27	27-JAN	532.45	15.25	167.09	1700.86
7:58:37	27-JAN	547.62	30.42	170.82	2043.69
8:14:07	27-JAN	563.12	45.92	171.09	2199.26
8:30:02	27-JAN	579.03	61.83	169.21	2238.87
8:46:47	27-JAN	595.78	78.58	164.82	2241.32

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
9:02:22	27-JAN	611.37	94.17	162.36	2241.73
9:18:12	27-JAN	627.20	110.00	161.15	2242.13
9:25:32	27-JAN	634.53	117.33	160.81	2242.20

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 2242.20 PSIA
PRODUCING TIME = 127.49 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
9:25:32	27-JAN	634.53	0.00	160.81	2242.20	0.00	
9:28:17	27-JAN	637.28	2.75	160.70	2242.22	0.02	1.6754
9:29:17	27-JAN	638.28	3.75	160.66	2241.67	-0.53	1.5440
9:31:02	27-JAN	640.03	5.50	160.59	2242.06	-0.14	1.3835
9:32:57	27-JAN	641.95	7.42	160.54	2242.22	0.02	1.2596
9:34:02	27-JAN	643.03	8.50	160.50	2242.25	0.05	1.2041
9:35:17	27-JAN	644.28	9.75	160.47	2242.27	0.07	1.1485
9:37:52	27-JAN	646.87	12.34	160.38	2242.32	0.12	1.0543
9:40:07	27-JAN	649.12	14.59	160.32	2242.36	0.16	0.9885
9:44:17	27-JAN	653.28	18.75	160.23	2242.37	0.17	0.8921
9:48:37	27-JAN	657.62	23.09	160.12	2242.47	0.27	0.8143
9:51:02	27-JAN	660.03	25.50	160.07	2242.48	0.28	0.7781
9:53:17	27-JAN	662.28	27.75	160.02	2242.52	0.32	0.7477
9:57:27	27-JAN	666.45	31.92	159.91	2242.62	0.42	0.6985
10:02:32	27-JAN	671.53	37.00	159.82	2242.67	0.47	0.6479
10:07:32	27-JAN	676.53	42.00	159.75	2242.55	0.35	0.6059
10:12:47	27-JAN	681.78	47.25	159.66	2242.63	0.43	0.5680
10:17:57	27-JAN	686.95	52.42	159.60	2242.72	0.52	0.5356
10:23:32	27-JAN	692.53	58.00	159.53	2242.68	0.48	0.5049
10:29:32	27-JAN	698.53	64.00	159.46	2242.83	0.63	0.4760
10:36:07	27-JAN	705.12	70.59	159.40	2242.87	0.67	0.4481
10:42:27	27-JAN	711.45	76.92	159.33	2242.92	0.72	0.4245
10:49:52	27-JAN	718.87	84.34	159.28	2242.94	0.74	0.4000
10:55:02	27-JAN	724.03	89.50	159.24	2238.67	-3.53	0.3846
11:00:07	27-JAN	729.12	94.59	159.21	2242.52	0.32	0.3707
11:06:32	27-JAN	735.53	101.00	159.17	2242.76	0.56	0.3545
11:11:32	27-JAN	740.53	106.00	159.12	2242.84	0.64	0.3430
11:17:27	27-JAN	746.45	111.92	159.08	2242.94	0.74	0.3302
11:22:52	27-JAN	751.87	117.34	159.03	2242.90	0.70	0.3194
11:29:32	27-JAN	758.53	124.00	158.97	2242.99	0.79	0.3071
11:35:57	27-JAN	764.95	130.42	158.92	2242.91	0.71	0.2961
11:45:17	27-JAN	774.28	139.75	158.85	2243.04	0.84	0.2815
11:50:47	27-JAN	779.78	145.25	158.81	2243.12	0.92	0.2736
11:58:52	27-JAN	787.87	153.34	158.76	2243.18	0.98	0.2628
12:06:32	27-JAN	795.53	161.00	158.70	2243.20	1.00	0.2533
12:13:37	27-JAN	802.62	168.09	158.67	2243.24	1.04	0.2451
12:19:07	27-JAN	808.12	173.59	158.65	2243.27	1.07	0.2392
12:26:32	27-JAN	815.53	181.00	158.61	2243.28	1.08	0.2316
12:41:57	27-JAN	830.95	196.42	158.54	2243.32	1.12	0.2172
12:59:12	27-JAN	848.20	213.67	158.49	2243.39	1.19	0.2032

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 2242.20 PSIA
PRODUCING TIME = 127.49 MIN

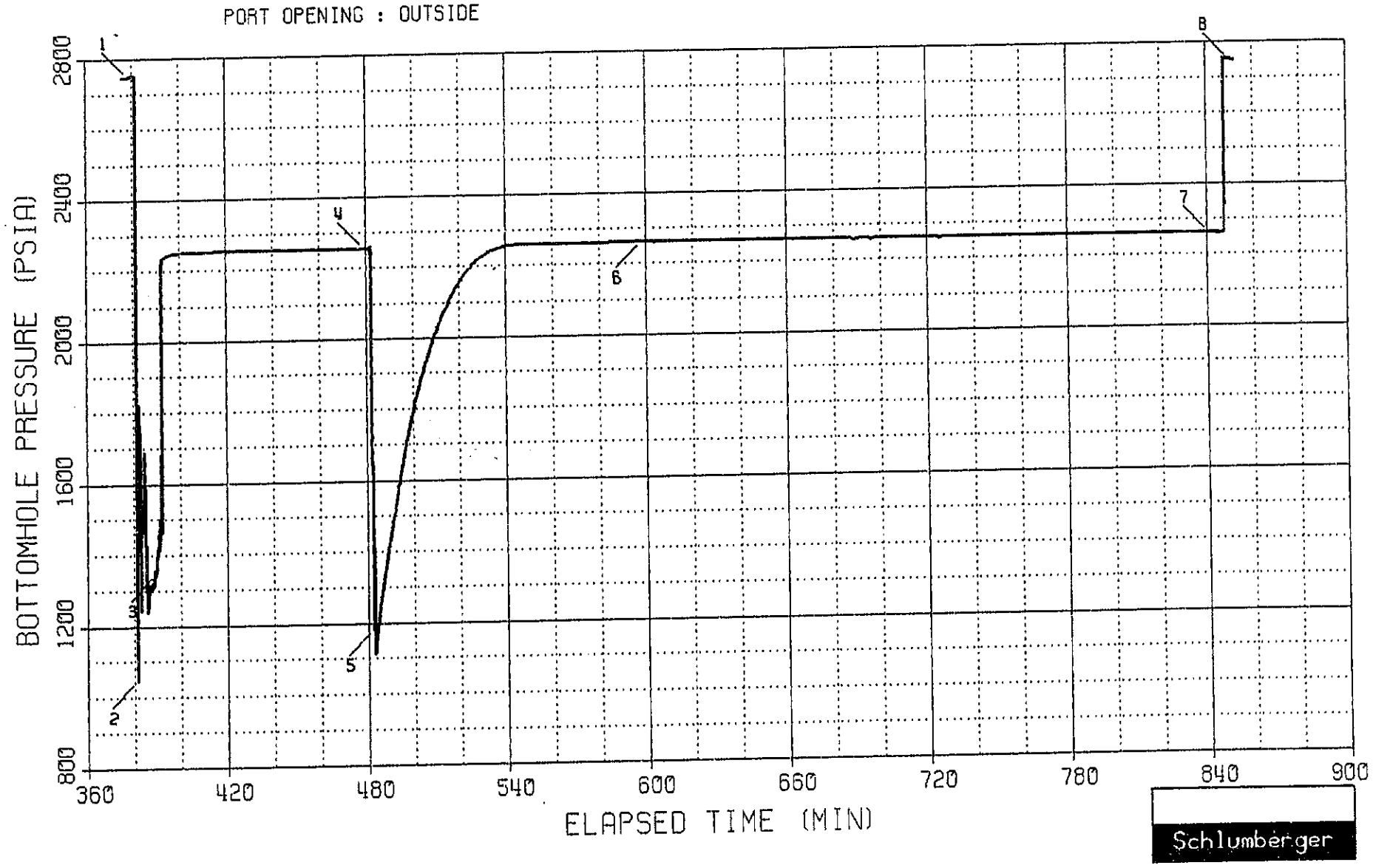
TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
13:18:37	27-JAN	867.62	233.09	158.43	2243.44	1.24	0.1895
13:27:47	27-JAN	876.78	242.25	158.40	2243.47	1.27	0.1836

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-1762
DEPTH : 5390 FT
CAPACITY : 20000 PSI
PORT OPENING : OUTSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

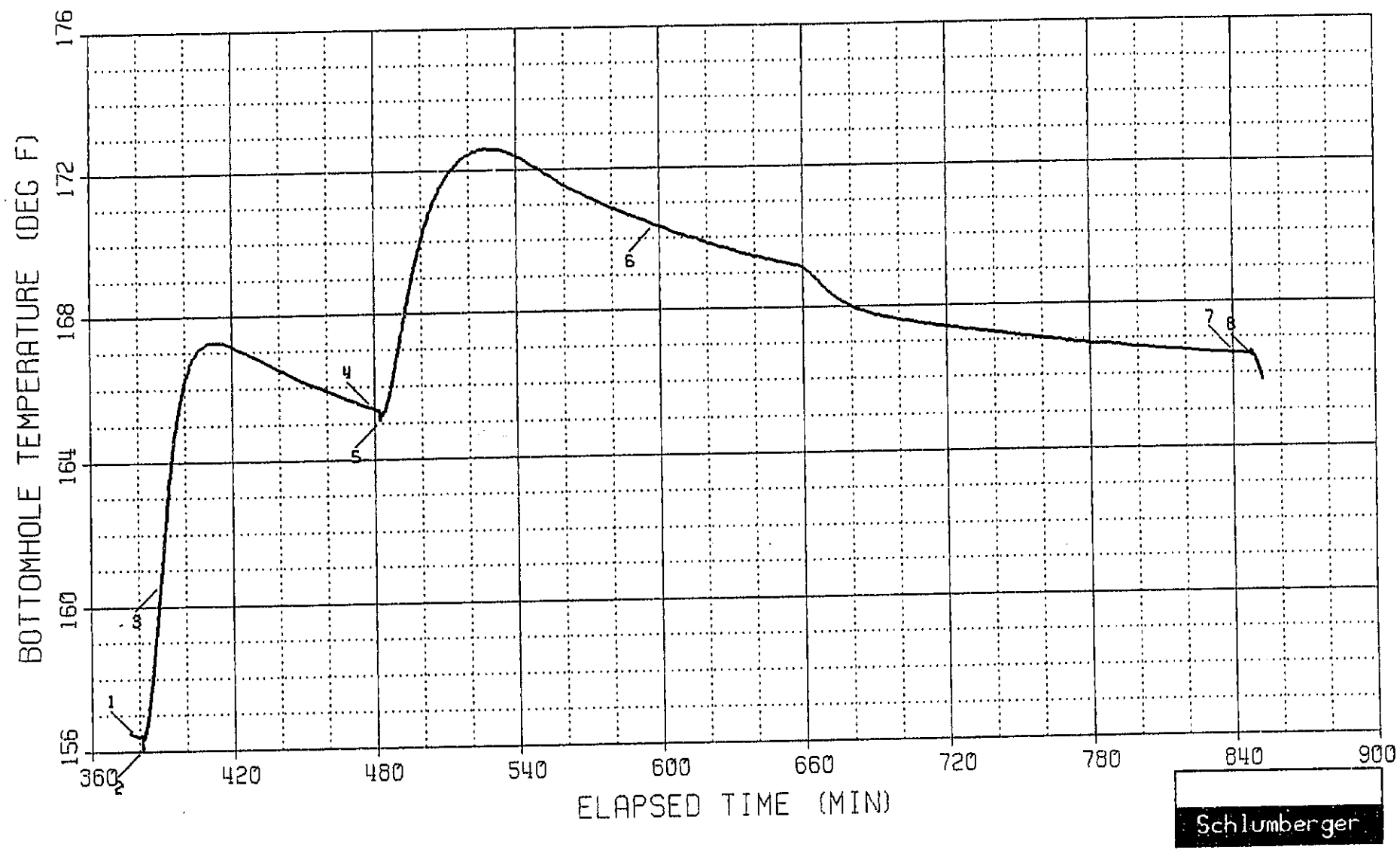


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-1762
DEPTH : 5390 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

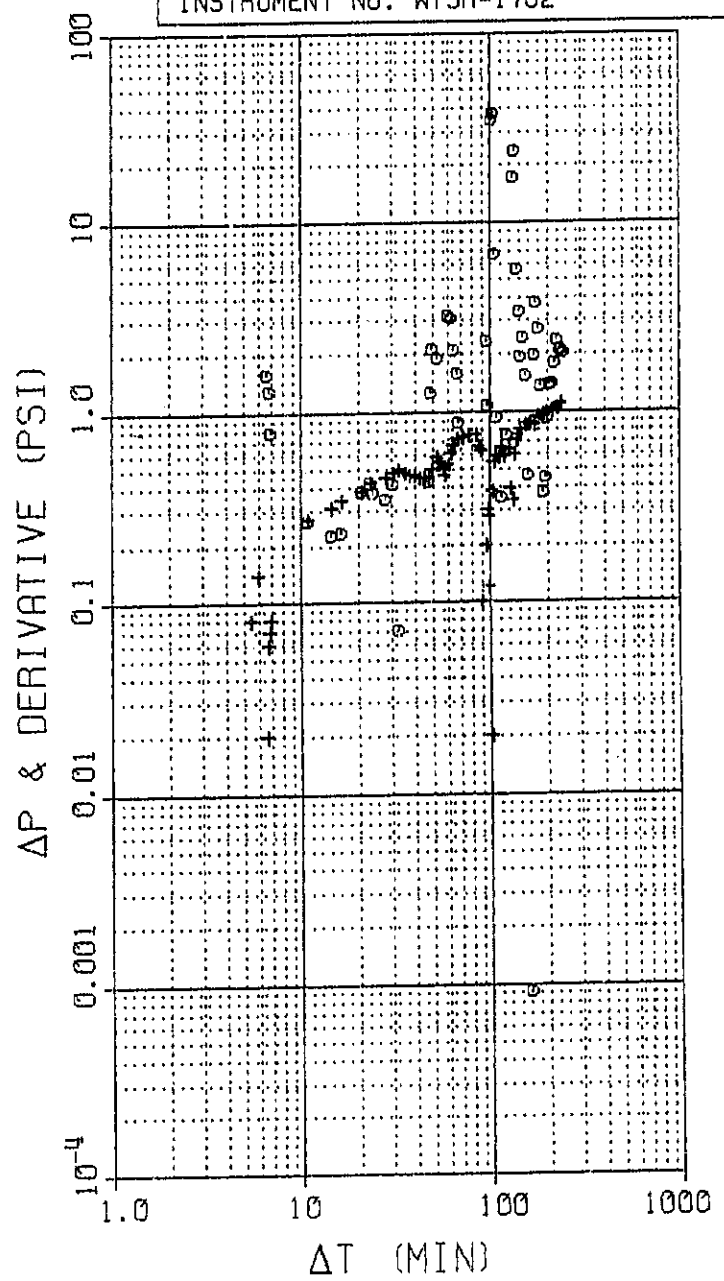
Electronic Temperature Data



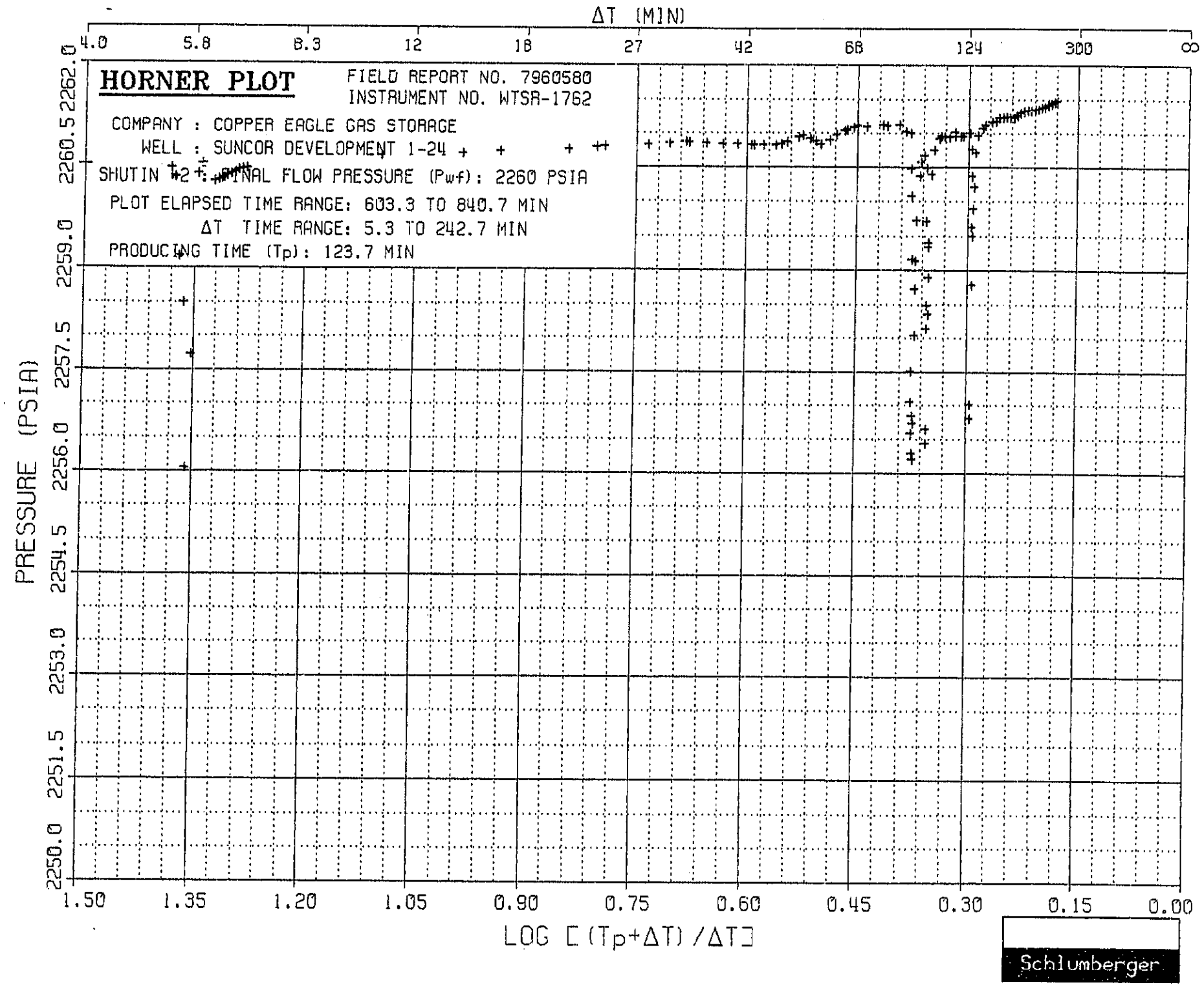
LOG LOG PLOT

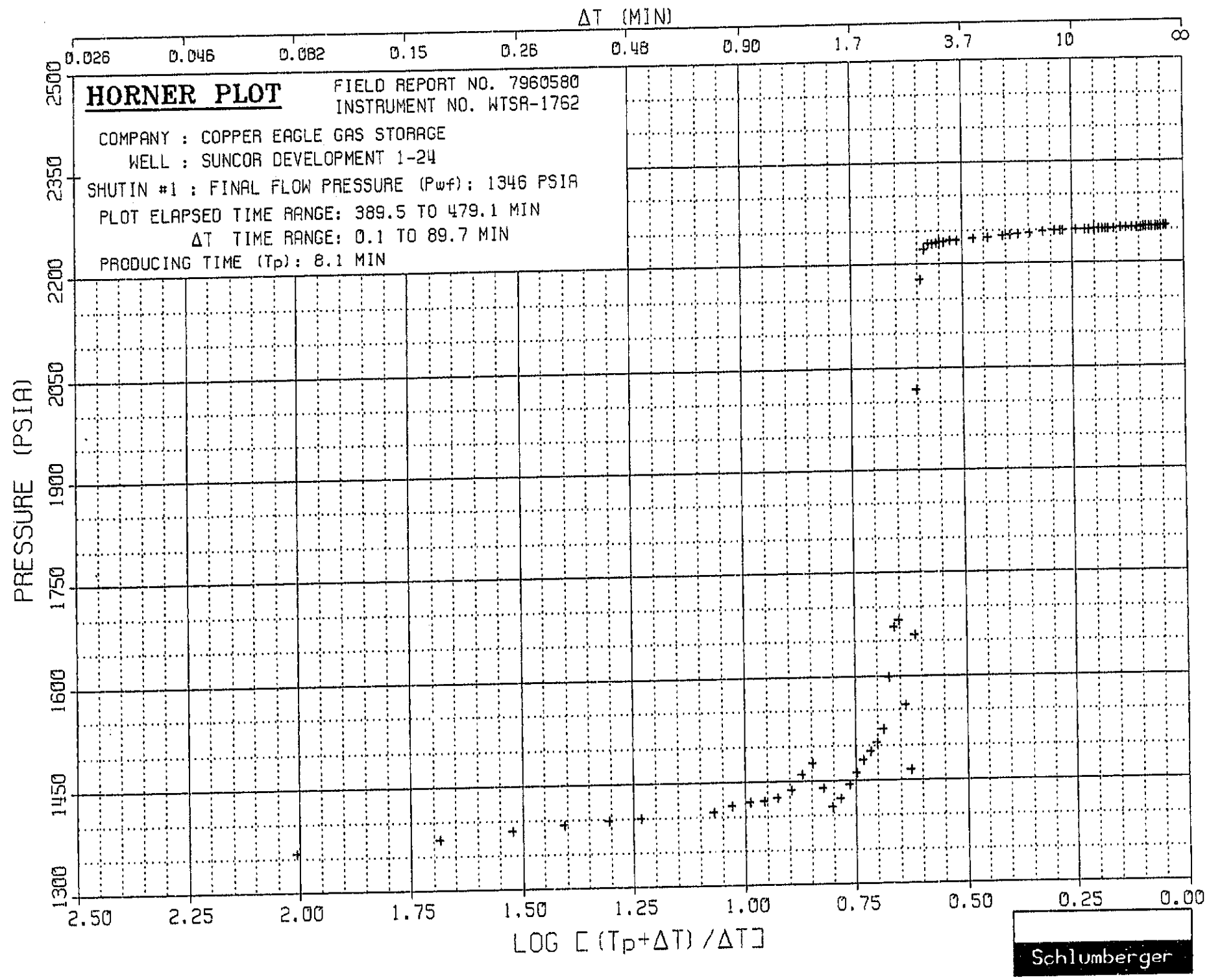
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-1762

SHUTIN #2 : PRODUCING TIME (Tp): 123.7 MIN
FINAL FLOW PRESSURE (Pwf): 2260 PSIA
PLOT ELAPSED TIME RANGE: 603.3 TO 840.7 MIN
ΔT TIME RANGE: 5.3 TO 242.7 MIN



Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-1762
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 2260 PSIA
PLOT ELAPSED TIME RANGE: 603.3 TO 840.7 MIN
ΔT TIME RANGE: 5.3 TO 242.7 MIN
PRODUCING TIME (Tp): 123.7 MIN
ΔT (MIN)
4.0
5.8
8.3
12
18
27
42
68
124
300
∞
PRESSURE (PSIA)
2262.0
2260.5
2259.0
2257.5
2256.0
2254.5
2253.0
2251.5
2250.0
1.50
1.35
1.20
1.05
0.90
0.75
0.60
0.45
0.30
0.15
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960580
INSTRUMENT NO. WTSR-1762
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 1346 PSIA
PLOT ELAPSED TIME RANGE: 389.5 TO 479.1 MIN
ΔT TIME RANGE: 0.1 TO 89.7 MIN
PRODUCING TIME (Tp): 8.1 MIN
ΔT (MIN)
0.026
0.046
0.082
0.15
0.26
0.48
0.90
1.7
3.7
10
∞
PRESSURE (PSIA)
2500
2350
2200
2050
1900
1750
1600
1450
1300
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960
INSTRUMENT NO. WTSR-1762

RECORDER CAPACITY: 20000 PSI PORT OPENING: OUTSIDE DEPTH: 5390 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	5:45:19	27-JAN	HYDROSTATIC MUD	378.32	2748.16	156.43
2	5:48:19	27-JAN	START FLOW	381.32	1044.56	156.04
3	5:56:24	27-JAN	END FLOW & START SHUT-IN	389.40	1346.16	160.63
4	7:26:09	27-JAN	END SHUT-IN	479.15	2254.69	165.42
5	7:29:19	27-JAN	START FLOW	482.32	1181.49	165.09
6	9:24:59	27-JAN	END FLOW & START SHUT-IN	597.98	2260.37	170.38
7	13:27:39	27-JAN	END SHUT-IN	840.65	2261.48	166.55
8	13:36:49	27-JAN	HYDROSTATIC MUD	849.82	2752.43	166.33

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	381.32	389.40	8.08	1044.56	1346.16	1044.56
2	482.32	597.98	115.66	1181.49	2260.37	1181.49

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	389.40	479.15	89.75	1346.16	2254.69	1346.16	8.08
2	597.98	840.65	242.67	2260.37	2261.48	2260.37	123.74

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
5:48:19	27-JAN	381.32	0.00	156.04	1044.56
5:56:24	27-JAN	389.40	8.08	160.63	1346.16

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 1346.16 PSIA
PRODUCING TIME = 8.08 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
5:56:24	27-JAN	389.40	0.00	160.63	1346.16	0.00	
5:57:24	27-JAN	390.40	1.00	161.37	1421.50	75.34	0.9581
5:58:24	27-JAN	391.40	2.00	162.10	1502.94	156.78	0.7024
5:59:24	27-JAN	392.40	3.00	162.90	2230.89	884.73	0.5674
6:00:29	27-JAN	393.48	4.08	163.56	2237.14	890.98	0.4743
6:01:34	27-JAN	394.57	5.17	164.21	2241.52	895.36	0.4087
6:02:59	27-JAN	395.98	6.58	164.89	2245.34	899.18	0.3479
6:04:04	27-JAN	397.07	7.67	165.34	2247.49	901.33	0.3125
6:05:24	27-JAN	398.40	9.00	165.81	2248.71	902.55	0.2782
6:07:09	27-JAN	400.15	10.75	166.26	2249.50	903.34	0.2434
6:09:09	27-JAN	402.15	12.75	166.64	2250.28	904.12	0.2132
6:11:44	27-JAN	404.73	15.33	166.96	2250.86	904.70	0.1839
6:14:49	27-JAN	407.82	18.42	167.18	2251.43	905.27	0.1580
6:16:59	27-JAN	409.98	20.58	167.27	2251.66	905.50	0.1438
6:19:19	27-JAN	412.32	22.92	167.29	2251.94	905.78	0.1311
6:22:29	27-JAN	415.48	26.08	167.27	2252.18	906.02	0.1172
6:25:14	27-JAN	418.23	28.83	167.22	2252.42	906.26	0.1073
6:28:24	27-JAN	421.40	32.00	167.13	2252.66	906.50	0.0978
6:33:24	27-JAN	426.40	37.00	166.96	2253.04	906.88	0.0858
6:40:39	27-JAN	433.65	44.25	166.71	2253.45	907.29	0.0728
6:46:39	27-JAN	439.65	50.25	166.50	2253.73	907.57	0.0648
6:52:49	27-JAN	445.82	56.42	166.30	2253.92	907.76	0.0581
6:59:49	27-JAN	452.82	63.42	166.08	2254.14	907.98	0.0521
7:09:24	27-JAN	462.40	73.00	165.83	2254.41	908.25	0.0456
7:15:04	27-JAN	468.07	78.67	165.69	2254.49	908.33	0.0425
7:20:14	27-JAN	473.23	83.83	165.54	2254.58	908.42	0.0400
7:25:19	27-JAN	478.32	88.92	165.43	2254.68	908.52	0.0378
7:26:09	27-JAN	479.15	89.75	165.42	2254.69	908.53	0.0374

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
7:29:19	27-JAN	482.32	0.00	165.09	1181.49
7:44:19	27-JAN	497.32	15.00	169.38	1714.67
7:59:44	27-JAN	512.73	30.41	172.02	2062.71
8:15:24	27-JAN	528.40	46.08	172.60	2218.51
8:31:44	27-JAN	544.73	62.41	172.22	2257.52
8:46:54	27-JAN	559.90	77.58	171.55	2259.54

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
9:02:29	27-JAN	575.48	93.16	171.01	2259.99
9:19:49	27-JAN	592.82	110.50	170.53	2260.29
9:24:59	27-JAN	597.98	115.66	170.38	2260.37

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 2260.37 PSIA
PRODUCING TIME = 123.74 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
9:24:59	27-JAN	597.98	0.00	170.38	2260.37	0.00	
9:30:19	27-JAN	603.32	5.34	170.26	2260.45	0.08	1.3833
9:31:19	27-JAN	604.32	6.34	170.22	2260.30	-0.07	1.3121
9:35:44	27-JAN	608.73	10.75	170.11	2260.64	0.27	1.0973
9:39:14	27-JAN	612.23	14.25	170.04	2260.68	0.31	0.9860
9:41:14	27-JAN	614.23	16.25	169.99	2260.71	0.34	0.9352
9:45:44	27-JAN	618.73	20.75	169.90	2260.75	0.38	0.8428
9:47:59	27-JAN	620.98	23.00	169.84	2260.79	0.42	0.8048
9:52:54	27-JAN	625.90	27.92	169.74	2260.82	0.45	0.7350
9:55:19	27-JAN	628.32	30.34	169.70	2260.85	0.48	0.7057
10:02:24	27-JAN	635.40	37.42	169.56	2260.83	0.46	0.6342
10:07:34	27-JAN	640.57	42.59	169.47	2260.82	0.45	0.5917
10:12:54	27-JAN	645.90	47.92	169.38	2260.83	0.46	0.5542
10:19:24	27-JAN	652.40	54.42	169.27	2260.92	0.55	0.5151
10:24:29	27-JAN	657.48	59.50	169.20	2260.90	0.53	0.4885
10:29:34	27-JAN	662.57	64.59	169.00	2261.05	0.68	0.4648
10:36:04	27-JAN	669.07	71.09	168.53	2261.10	0.73	0.4378
10:41:54	27-JAN	674.90	76.92	168.22	2261.13	0.76	0.4164
10:48:39	27-JAN	681.65	83.67	167.95	2261.13	0.76	0.3943
10:53:54	27-JAN	686.90	88.92	167.83	2261.00	0.63	0.3787
10:59:09	27-JAN	692.15	94.17	167.74	2260.57	0.20	0.3644
11:05:19	27-JAN	698.32	100.34	167.65	2260.39	0.02	0.3489
11:10:34	27-JAN	703.57	105.59	167.59	2260.96	0.59	0.3368
11:15:49	27-JAN	708.82	110.84	167.52	2260.95	0.58	0.3256
11:23:19	27-JAN	716.32	118.34	167.45	2260.96	0.59	0.3108
11:30:19	27-JAN	723.32	125.34	167.38	2261.01	0.64	0.2982
11:37:09	27-JAN	730.15	132.17	167.32	2260.97	0.60	0.2870
11:43:09	27-JAN	736.15	138.17	167.27	2261.13	0.76	0.2777
11:49:24	27-JAN	742.40	144.42	167.22	2261.17	0.80	0.2688
11:57:34	27-JAN	750.57	152.59	167.14	2261.23	0.86	0.2579
12:05:19	27-JAN	758.32	160.34	167.07	2261.24	0.87	0.2484
12:13:44	27-JAN	766.73	168.75	167.00	2261.23	0.86	0.2389
12:22:39	27-JAN	775.65	177.67	166.93	2261.31	0.94	0.2295
12:33:14	27-JAN	786.23	188.25	166.87	2261.34	0.97	0.2194
12:49:44	27-JAN	802.73	204.75	166.77	2261.36	0.99	0.2053
13:08:24	27-JAN	821.40	223.42	166.66	2261.42	1.05	0.1914
13:27:39	27-JAN	840.65	242.67	166.55	2261.48	1.11	0.1790

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
OPENHOLE DST	22-JAN-2002	HOBBS

WELL OWNER: COPPER EAGLE GAS STORAGE — SERVICE ORDER NUMBER: 7960578

REPORTS ADDRESS: 333 TEXAS STREET / SUITE 425 / SHREVEPORT, LA 71101-5319 ATTN:COPPER EAGLE GAS STORAGE

WELL NAME & NO.: SUNCOR DEVELOPMENT 1-24 — FIELD: LUKE-GLENDALE — LEASE:

LOCATION: 330SLx330WL — COUNTY: MARICOPA — STATE: ARIZONA

TEST NO. TWO — TEST INTERVAL FROM 5157 FT TO 6052 FT = 895 FT

SURFACE DATA

DESCRIPTION	DATE	TIME OF DAY	PRESSURE
OPEN TO BUBBLE HOSE ONLY	25-JAN		
SET PACKER		21:38	
START FLOW,"BOB" IN 30 SEC		12:40	
PRESSURE DESCRIBED IN OZ.		12:41	25 oz
PRESSURE DESCRIBED IN PSI		12:42	3.6#
		12:44	6#
CYCLED TOOL		12:50	
END FLOW & START SHUT-IN		12:51	12#
END SHUT-IN		14:21	0
START FLOW		14:23	
PRESSURE DESCRIBED IN OZ.		14:24	20 oz
PRESSURE DESCRIBED IN PSI		14:27	3.4#
		14:32	3.8#
PRESSURE DROPPING		14:37	2.4#
FLOW DYING TO OUNCES		14:47	6 oz
LOADING UP WITH WATER		14:52	4 oz
		15:12	2 oz
IT'S DEAD		15:18	0.00
END FLOW & START SHUT-IN		16:18	
END SHUT-IN		20:28	
PULLED LOOSE		20:30	

EQUIPMENT SEQUENCE

COMPONENTS	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				
DRILL PIPE (16.6#)	4.50	3.826	4006	4006
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.750	547.4	4553
CROSS OVER SUB	6.25	2.250	1.36	4555
HYDRAULIC JAR	6.25	2.000	11.69	4566
CROSS OVER SUB	6.125	3.000	1.84	4568
DRILL COLLARS	6.25	2.250	448.	5016
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	5017
DRILL COLLARS	6.25	2.250	93.70	5111
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5112
CROSS OVER SUB	6.00	2.438	0.94	5113
MFE	5.00	1.000	9.88	5123
MFE OH BYPASS	5.00	1.000	2.98	5126
INSIDE RECORDER CARRIER	4.88	1.500	7.67	5133
INSIDE RECORDER CARRIER	4.88	1.500	7.77	5141
D&C HYDRAULIC JAR	4.75	1.875	6.59	5148
SAFETY JOINT	4.75	2.500	2.01	5150
CROSS OVER SUB	6.00	2.50	1.02	5151
BOB-TAIL PACKER	11.125	1.750	6.36	5157
PERFORATED ANCHOR	5.75	3.000	28.45	5185
OUTSIDE RECORDER CARRIER	5.75	2.000	6.75	5192
CROSS OVER SUB	6.00	2.313	0.87	5193
DRILL COLLARS	6.25	2.250	180.8	5374
CROSS OVER SUB	6.438	3.125	2.22	5376
CROSS OVER SUB	7.938	2.750	2.91	5379
BIT	12.25	2.000	1.00	5380

909

RECOVERY DESCRIPTION	FEET	BBLS	OIL GRAVITY	RESISTIVITY	CHLORIDES
MUD FILTRATE	4158				
TOP				0.106 OHMS 70 °F	42000 PPM
MIDDLE				0.111 OHMS 70 °F	40000 PPM
BOTTOM				0.116 OHMS 70 °F	38000 PPM

SERVICE ORDER NUMBER: 7960578 — SCHLUMBERGER ENGINEER/TECHNICIAN: KIRK BEASLEY

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
OPENHOLE DST	22-JAN-2002	HOBBS

INSTRUMENT DATA

INSTRUMENT NO.	WTSR-995	WTSR-978	WTSR-1762		
CAPACITY (PSIG)	15000	15000	15000		
DEPTH	5141	5133	5192		
INSIDE-OUTSIDE	IN	IN	OUT		
CLOCK CAP	ELECTRONIC	ELECTRONIC	ELECTRONIC		
TEMPERATURE °F	151	151			
I. HYD. PSIG	2642	2646			
I. FLOW PSIG	1315-1860	1267-1862			
I.S.I. PSIG	2134	2138			
2nd FLOW PSIG					
2nd S.I. PSIG					
F. FLOW PSIG	1884-2137	1885-2141			
F.S.I. PSIG	2140	2143			
F. HYD. PSIG	2634	2636			

MUD DATA

MUD TYPE BRINE MUD WT 9.5 #/gal
VISCOSITY 35 WATER LOSS 8 CC
RESISTIVITY: OF MUD @ °F
RESISTIVITY: OF FILTRATE 0.143 @ 70 °F
CHLORIDES 30000 PPM
H2S DURING TEST PPM

WELL BORE DATA

FORMATION TESTED VALLEY FIELD
NET PRODUCTIVE INTERVAL ft EST. POROSITY %
ELEVATION 1064 ft DEPTH MEASURED FROM GL
TOTAL MEASURED DEPTH 6052/6052 ft
O H SIZE 12.25 in
CASING SIZE 13.375 / 12.415
LINER SIZE
PERF INTERVAL FROM ft TO ft
SHOT DENSITY

CUSHION	LENGTH	AMOUNT	SURFACE PRESS	BOTTOM CHOKE SIZE
NONE				1.00

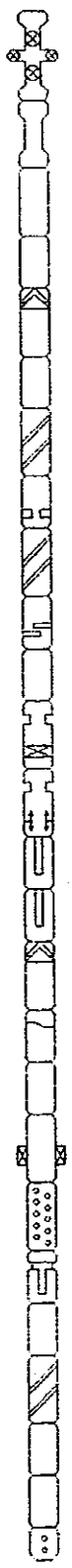
SAMPLER DATA

RECOVERY			RESISTIVITY			CHLORIDES	
GAS		C.F.	RECOVERED WATER	@	deg F		PPM
OIL		C.C.	RECOVERED MUD	@	deg F		
WATER		C.C.	REC.MUD FILTRATE 0.106	@ 70	deg F	42000	PPM
MUD	2500	C.C.	PIT MUD	@	deg F		
GRAVITY	°API	°F	PIT MUD FILTRATE 0.106	@ 70	deg F	42000	PPM
GOR		C.F./BBL	SAMPLER PRESSURE 28 psig				

REMARKS: THIS IS DST #2. THE WELL WAS EVALUATED FROM 5157' TO 6052'. THE TEST WAS CONCLUSIVE. THE RECOVERY WAS 50.3 BARRELS OF MUD. BOTH FLOWS & SHUTINS WERE OBTAINED BUT THE PIPE LOADED UP WITH FLUID ABOUT 1 HOUR INTO THE FINAL FLOW AND KILLED ITSELF. THE TEST WAS MECHANICALLY SUCCESSFUL. THE ANNULUS REMAINED CONSTANT DURING THE TEST & THERE WERE NO DRILL PIPE LEAKS. THANK YOU FOR USING SCHLUMBERGER.

SERVICE ORDER NUMBER:	7960578	SCHLUMBERGER ENGINEER/TECHNICIAN	KIRK BEASLEY

COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				0
DRILL PIPE (16.6#)	4.50	3.826	4006	4006
HEAVY WEIGHT DRILL PIPE (41#)	4.50	2.750	547.4	4553.4
CROSS OVER SUB	6.25	2.250	1.36	4554.76
HYDRAULIC JAR	6.25	2.000	11.69	4566.45
CROSS OVER SUB	6.125	3.000	1.84	4568.29
DRILL COLLARS	6.25	2.250	448.	5016.29
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	5017.12
DRILL COLLARS	6.25	2.250	93.70	5110.82
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5111.78
CROSS OVER SUB	6.00	2.438	0.94	5112.72
MFE	5.00	1.000	9.88	5122.6
MFE OH BYPASS	5.00	1.000	2.98	5125.58
INSIDE RECORDER CARRIER	4.88	1.500	7.67	5133.25
INSIDE RECORDER CARRIER	4.88	1.500	7.77	5141.02
D&C HYDRAULIC JAR	4.75	1.875	6.59	5147.61
SAFETY JOINT	4.75	2.500	2.01	5149.62
CROSS OVER SUB	6.00	2.50	1.02	5150.64
BOB-TAIL PACKER	11.125	1.750	6.36	5157
PERFORATED ANCHOR	5.75	3.000	28.45	5185.45
OUTSIDE RECORDER CARRIER	5.75	2.000	6.75	5192.2
CROSS OVER SUB	6.00	2.313	0.87	5193.07
DRILL COLLARS	6.25	2.250	180.8	5373.87
CROSS OVER SUB	6.438	3.125	2.22	5376.09
CROSS OVER SUB	7.938	2.750	2.91	5379
BIT	12.25	2.000	1.00	5380

Report Number: 7960578
Test Number: TWO
Test Date: 22-JAN-2002

Schlumberger

REPORT NO. 7960578
PAGE NO. 1
TEST DATE: 22-JAN-2002

S T A R

Schlumberger Testing Data Report

Pressure Data Report

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE

WELL: SUNCOR DEVELOPMENT 1-24

TEST IDENTIFICATION

Test Type ..... OPENHOLE DST
Test No. ..... TWO
Formation ..... VALLEY FIELD
Test Interval (ft) ..... 5157 to 6052
Depth Reference ..... GL

WELL LOCATION

Field ..... LUKE-GLENDALE
County ..... MARICOPA
State ..... ARIZONA
Sec/Twn/Rng 330SLx330WL
Elevation (ft) 1064

HOLE CONDITIONS

Total Depth (MD/TVD) (ft) 6052/6052
Hole Size (in) 12.25
Casing/Liner I.D. (in) ..... 13.375 / 12.41
Perf'd Interval/Net Pay (ft)..
Shot Density/Diameter (in) ...

MUD PROPERTIES

Mud Type ..... BRINE
Mud Weight (lb/gal) 9.5
Mud Resistivity (ohm.m) .....
Filtrate Resistivity (ohm.m).. 0.143 @ 70F
Filtrate Chlorides (ppm) 30000

INITIAL TEST CONDITIONS

Initial Hydrostatic (psi) 2642.00
Gas Cushion Type .....
Surface Pressure (psi) .....
Liquid Cushion Type .....
Cushion Length (ft) .....

TEST STRING CONFIGURATION

Pipe Length (ft)/I.D. (in) ... 4006 / 3.826
Collar Length (ft)/I.D. (in).. 722 / 2.250
Packer Depths (ft) 5157,
Bottomhole Choke Size (in) ... 1.00
Gauge Depth (ft)/Type 5141/WTSR-995

NET PIPE RECOVERY

Volume	Fluid Type	Properties
4158 ft	MUD FILTRATE	
	TOP	Rw0.106@70F 42000ppm
	MIDDLE	Rw0.111@70F 40000ppm
	BOTTOM	Rw0.116@70F 38000ppm

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties
2500 cc	Mud	Rw 0.106@70F 42000p
Pressure:28	GOR:0	GLR:0

INTERPRETATION RESULTS

Model of Behavior .....
Fluid Type Used for Analysis..
Reservoir Pressure (psi) .....
Transmissibility (md.ft/cp) ..
Effective Permeability (md) ..
Skin Factor/Damage Ratio .....
Storativity Ratio, Omega .....
Interporos.Flow Coef.,Lambda..
Distance to an Anomaly (ft) ..
Radius of Investigation (ft)..
Potentiometric Surface (ft) ..

ROCK/FLUID/WELLBORE PROPERTIES

Oil Density (deg. API) .....
Basic Solids (%) .....
Gas Gravity .....
GOR (scf/STB) .....
Water Cut (%) .....
Viscosity (cp) .....
Total Compressibility (1/psi).
Porosity (%) .....
Reservoir Temperature (F) 151
Form.Vol.Factor (bbl/STB) ....

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

THIS IS DST #2. THE WELL WAS EVALUATED FROM 5157' TO 6052'. THE TEST WAS CONCLUSIVE. THE RECOVERY WAS 50.3 BARRELS OF MUD. BOTH FLOWS & SHUTINS WERE OBTAINED BUT THE PIPE LOADED UP WITH FLUID ABOUT 1 HOUR INTO THE FINAL FLOW AND KILLED ITSELF. THE TEST WAS MECHANICALLY SUCCESSFUL. THE ANNULUS REMAINED CONSTANT DURING THE TEST & THERE WERE NO DRILL PIPE LEAKS.
THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:7980578 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 2. 27-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	SEQUENCE OF EVENTS	FIELD:LUKE-GLENDALE ZONE :VALLEY FIELD WELL :SUNCOR 1-24 LOCATION:330SL×330WL

DATE	TIME (HR:MIN)	DESCRIPTION	ET (MINS)	BHP (PSIA)	WHP (PSIG)
25-JAN		OPEN TO BUBBLE HOSE ONLY			
	21:38	SET PACKER	538		
	12:40	START FLOW."BOB" IN 30 SEC	0	1315	
	12:41	PRESSURE DESCRIBED IN OZ.	1		25 oz
	12:42	PRESSURE DESCRIBED IN PSI	2		3.6#
	12:44		4		6#
	12:50	CYCLED TOOL	10		
	12:51	END FLOW & START SHUT-IN	11	1860	12#
	14:21	END SHUT-IN	101	2134	0
	14:23	START FLOW	103	1884	
	14:24	PRESSURE DESCRIBED IN OZ.	104		20 oz
	14:27	PRESSURE DESCRIBED IN PSI	107		3.4#
	14:32		112		3.8#
	14:37	PRESSURE DROPPING	117		2.4#
	14:47	FLOW DYING TO OUNCES	127		6 oz
	14:52	LOADING UP WITH WATER	132		4 oz
	15:12		152		2 oz
	15:18	IT'S DEAD	158		0.00
	16:18	END FLOW & START SHUT-IN	218	2137	
	20:28	END SHUT-IN	468	2140	
	20:30	PULLED LOOSE	470		

WELL TEST INTERPRETATION REPORT #:7960578 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 12, 27-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE :VALLEY FIELD WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

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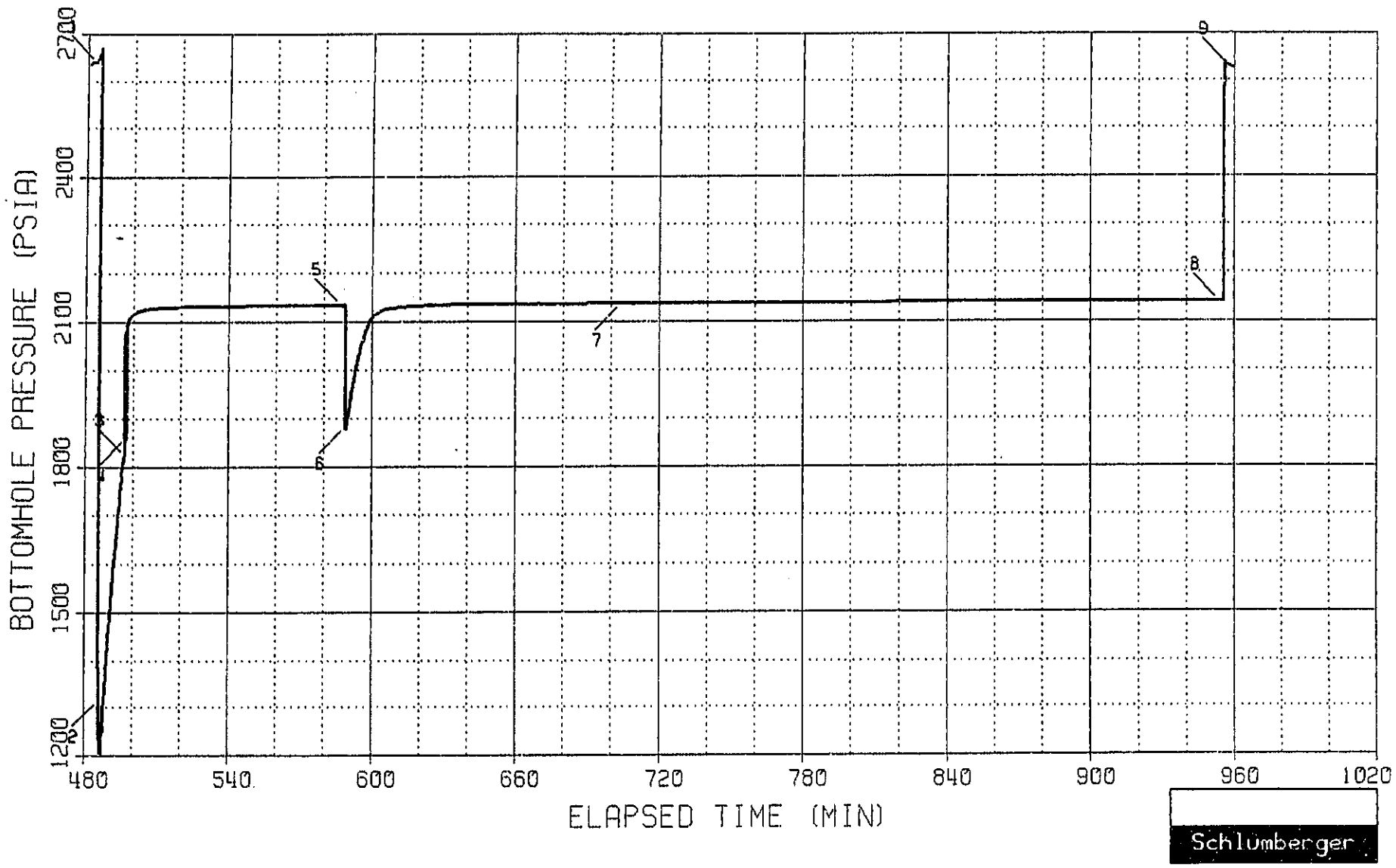
BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-995
DEPTH : 5141 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

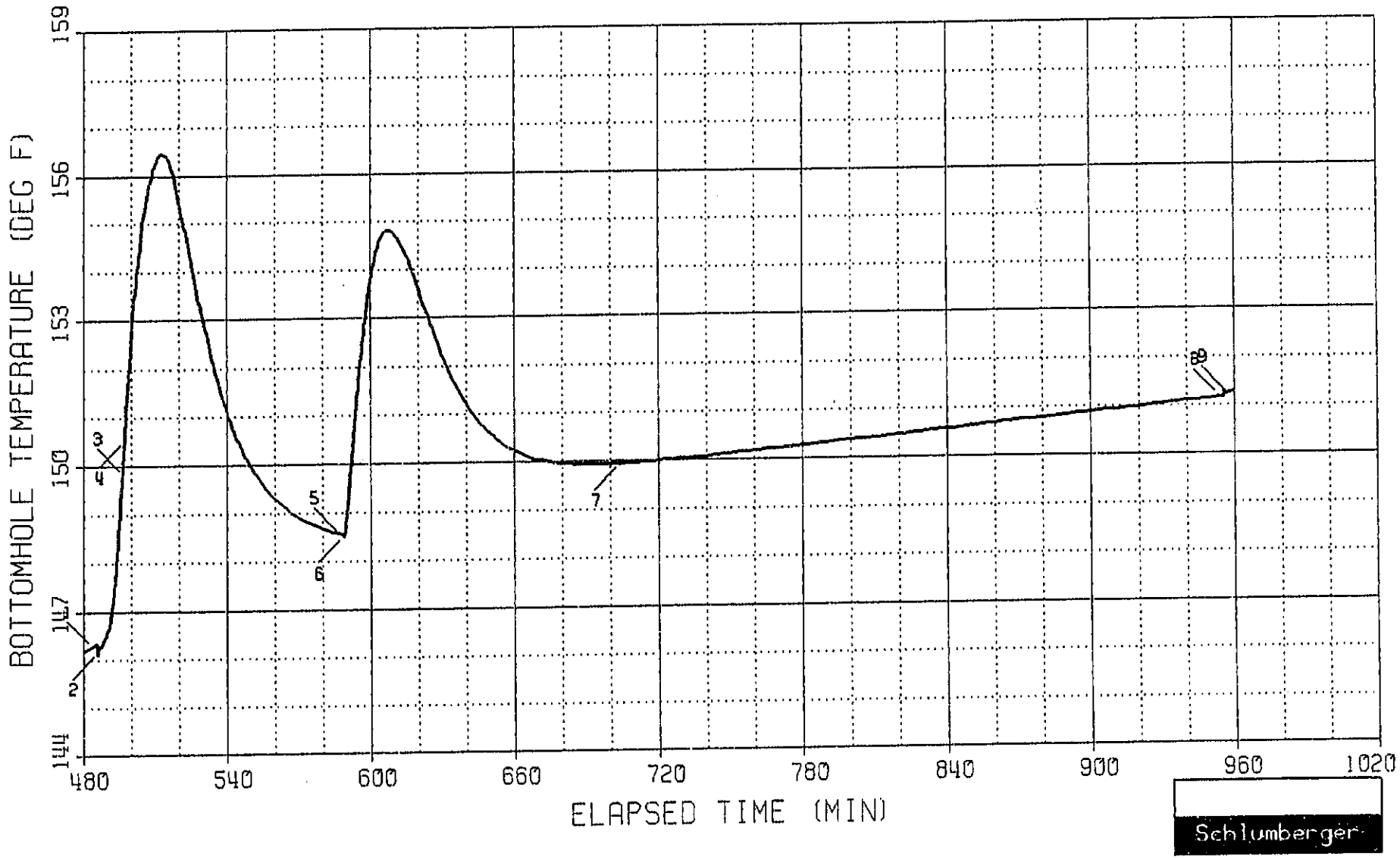


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-995
DEPTH : 5141 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

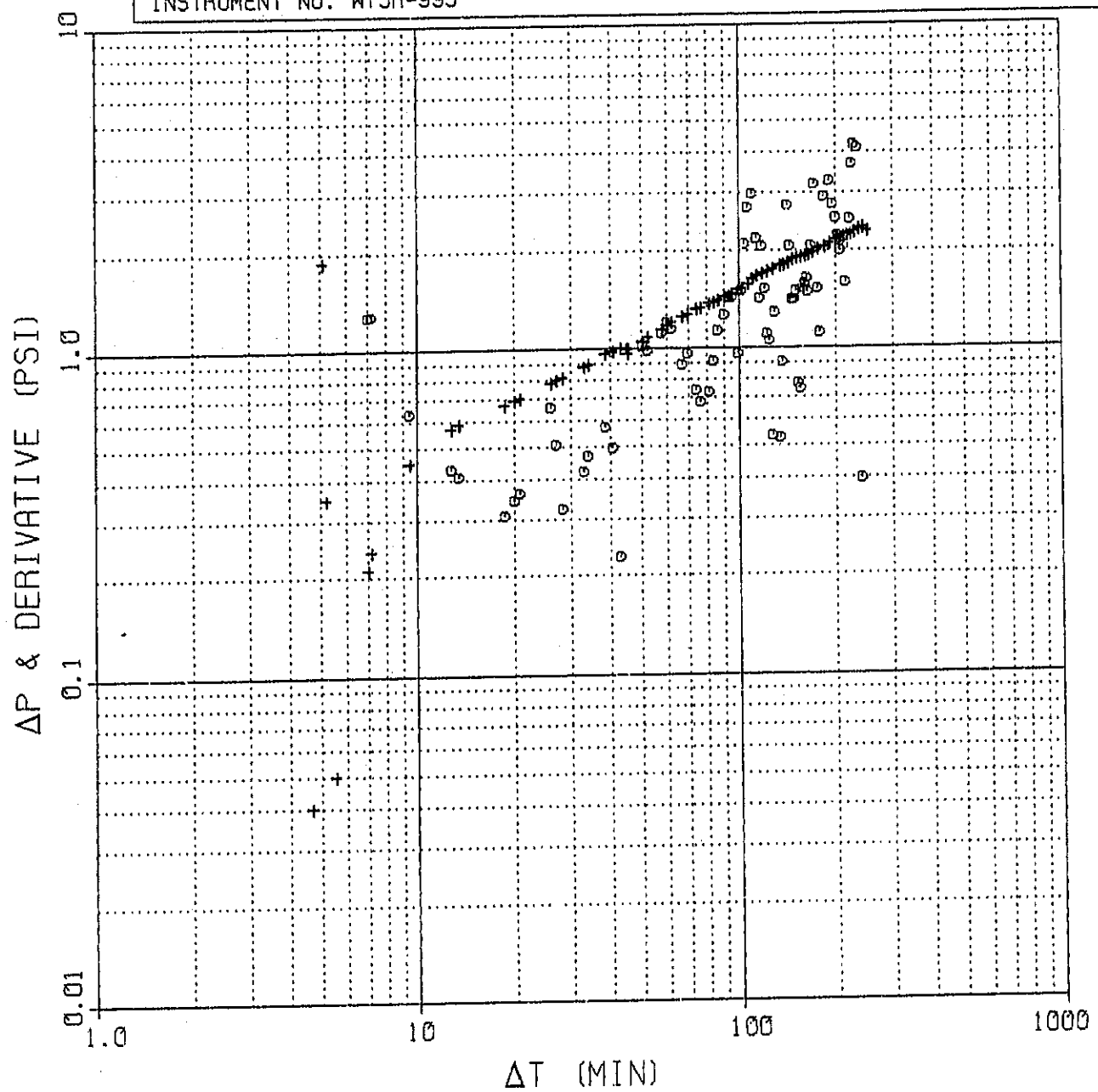
Electronic Temperature Data



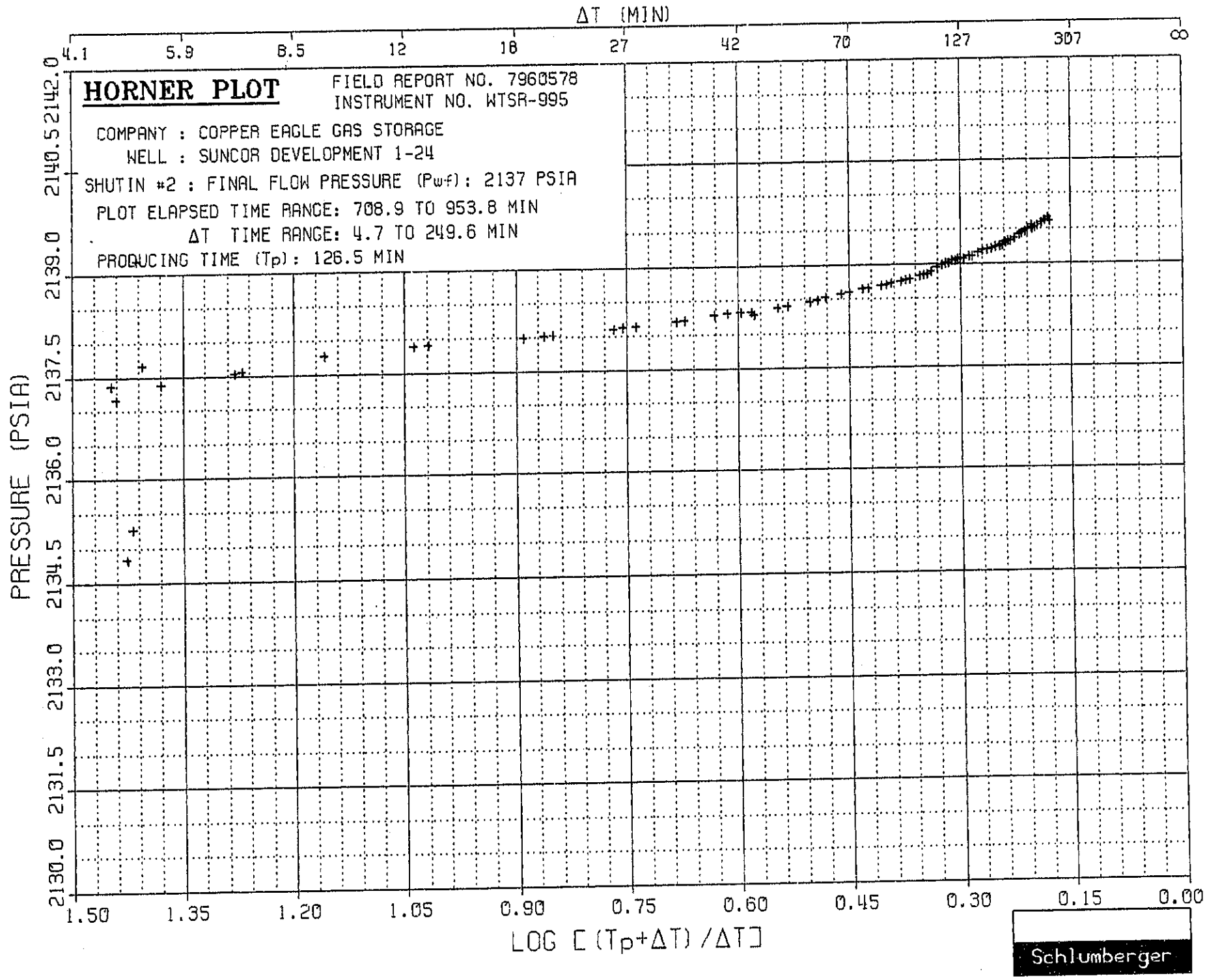
LOG LOG PLOT

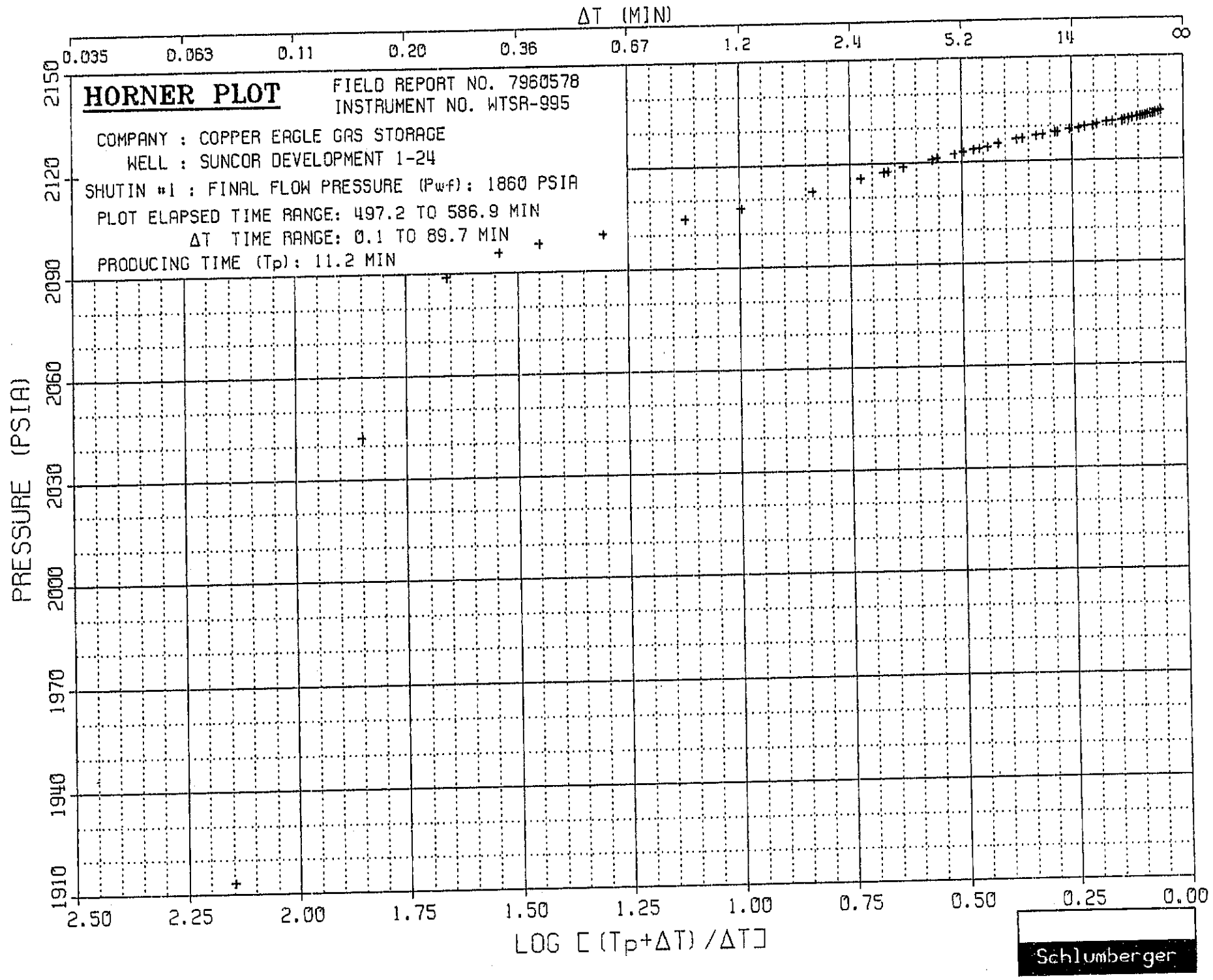
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-995

SHUTIN #2 : PRODUCING TIME (T_p): 126.5 MIN
FINAL FLOW PRESSURE (P_{wf}): 2137 PSIA
PLOT ELAPSED TIME RANGE: 708.9 TO 953.8 MIN
ΔT TIME RANGE: 4.7 TO 249.6 MIN



Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-995
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 2137 PSIA
PLOT ELAPSED TIME RANGE: 708.9 TO 953.8 MIN
ΔT TIME RANGE: 4.7 TO 249.6 MIN
PRODUCING TIME (Tp): 126.5 MIN
ΔT (MIN)
4.1
5.9
8.5
12
18
27
42
70
127
307
∞
PRESSURE (PSIA)
2142.0
2140.5
2139.0
2137.5
2136.0
2134.5
2133.0
2131.5
2130.0
1.50
1.35
1.20
1.05
0.90
0.75
0.60
0.45
0.30
0.15
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-995
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 1860 PSIA
PLOT ELAPSED TIME RANGE: 497.2 TO 586.9 MIN
ΔT TIME RANGE: 0.1 TO 89.7 MIN
PRODUCING TIME (Tp): 11.2 MIN
ΔT (MIN)
0.035
0.063
0.11
0.20
0.36
0.67
1.2
2.4
5.2
14
∞
PRESSURE (PSIA)
2150
2120
2090
2060
2030
2000
1970
1940
1910
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-995

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 5141 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	12:37:27	25-JAN	HYDROSTATIC MUD	483.45	2642.00	146.28
2	12:39:57	25-JAN	START FLOW	485.95	1314.95	146.16
3	12:50:17	25-JAN	CYCLED TOOL	496.28	1823.75	149.83
4	12:51:07	25-JAN	END FLOW & START SHUT-IN	497.12	1860.15	150.53
5	14:20:52	25-JAN	END SHUT-IN	586.87	2134.21	148.57
6	14:22:52	25-JAN	START FLOW	588.87	1883.50	148.51
7	16:18:12	25-JAN	END FLOW & START SHUT-IN	704.20	2137.32	149.94
8	20:27:47	25-JAN	END SHUT-IN	953.78	2139.60	151.18
9	20:31:12	25-JAN	HYDROSTATIC MUD	957.20	2633.68	151.23

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	485.95	497.12	11.17	1314.95	1860.15	1314.95
2	588.87	704.20	115.33	1883.50	2137.32	1883.50

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	497.12	586.87	89.75	1860.15	2134.21	1860.15	11.17
2	704.20	953.78	249.58	2137.32	2139.60	2137.32	126.50

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
12:39:57	25-JAN	485.95	0.00	146.16	1314.95
12:51:07	25-JAN	497.12	11.17	150.53	1860.15

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 1860.15 PSIA
PRODUCING TIME = 11.17 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
12:51:07	25-JAN	497.12	0.00	150.53	1860.15	0.00	
12:52:22	25-JAN	498.37	1.25	151.50	2107.30	247.15	0.9972
12:53:42	25-JAN	499.70	2.58	152.46	2115.50	255.35	0.7267
12:55:17	25-JAN	501.28	4.16	153.45	2120.78	260.63	0.5664
12:56:22	25-JAN	502.37	5.25	154.00	2122.79	262.64	0.4952
12:57:27	25-JAN	503.45	6.33	154.51	2124.41	264.26	0.4416
12:59:12	25-JAN	505.20	8.08	155.17	2126.42	266.27	0.3770
13:00:52	25-JAN	506.87	9.75	155.66	2127.41	267.26	0.3316
13:02:52	25-JAN	508.87	11.75	156.09	2128.35	268.20	0.2902
13:05:02	25-JAN	511.03	13.91	156.38	2129.07	268.92	0.2560
13:07:47	25-JAN	513.78	16.66	156.45	2129.86	269.71	0.2228
13:09:47	25-JAN	515.78	18.66	156.33	2130.15	270.00	0.2037
13:13:47	25-JAN	519.78	22.66	155.48	2130.98	270.83	0.1740
13:16:17	25-JAN	522.28	25.16	154.89	2131.21	271.06	0.1596
13:20:57	25-JAN	526.95	29.83	153.72	2131.64	271.49	0.1381
13:23:47	25-JAN	529.78	32.66	153.07	2131.85	271.70	0.1278
13:29:27	25-JAN	535.45	38.33	151.88	2132.34	272.19	0.1111
13:35:12	25-JAN	541.20	44.08	150.94	2132.65	272.50	0.0981
13:40:27	25-JAN	546.45	49.33	150.30	2132.94	272.79	0.0886
13:45:52	25-JAN	551.87	54.75	149.81	2133.25	273.10	0.0806
13:52:32	25-JAN	558.53	61.41	149.38	2133.48	273.33	0.0726
13:58:17	25-JAN	564.28	67.16	149.13	2133.63	273.48	0.0668
14:04:07	25-JAN	570.12	73.00	148.89	2133.82	273.67	0.0618
14:10:47	25-JAN	576.78	79.66	148.75	2134.00	273.85	0.0570
14:16:02	25-JAN	582.03	84.91	148.64	2134.14	273.99	0.0537
14:20:52	25-JAN	586.87	89.75	148.57	2134.21	274.06	0.0509

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
14:22:52	25-JAN	588.87	0.00	148.51	1883.50
14:37:52	25-JAN	603.87	15.00	154.62	2122.10
14:54:27	25-JAN	620.45	31.58	153.54	2132.81
15:10:27	25-JAN	636.45	47.58	151.54	2135.23
15:26:47	25-JAN	652.78	63.91	150.46	2136.06
15:42:47	25-JAN	668.78	79.91	150.04	2136.64
16:01:02	25-JAN	687.03	98.16	149.94	2136.91
16:18:12	25-JAN	704.20	115.33	149.94	2137.32

FIELD REPORT # 7960578 INSTRUMENT # WTSR-995

TEST PHASE: SHUTIN PERIOD # 2 FINAL FLOW PRESSURE = 2137.32 PSIA
PRODUCING TIME = 126.50 MIN

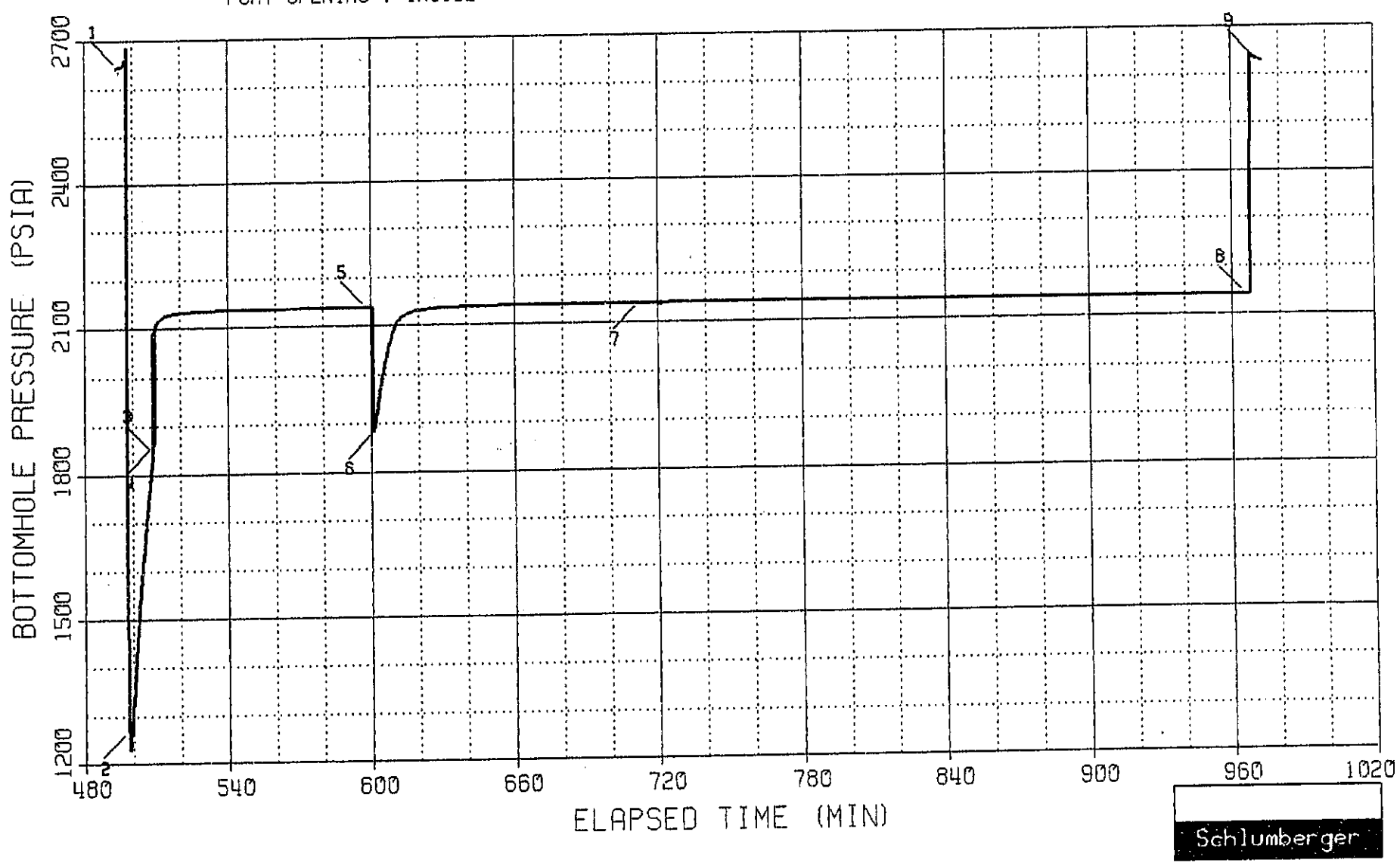
TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
16:18:12	25-JAN	704.20	0.00	149.94	2137.32	0.00	
16:22:52	25-JAN	708.87	4.67	149.95	2137.36	0.04	1.4485
16:25:12	25-JAN	711.20	7.00	149.95	2137.53	0.21	1.2804
16:27:37	25-JAN	713.62	9.42	149.97	2137.77	0.45	1.1592
16:30:57	25-JAN	716.95	12.75	149.97	2137.89	0.57	1.0383
16:36:52	25-JAN	722.87	18.67	150.01	2137.99	0.67	0.8907
16:38:57	25-JAN	724.95	20.75	150.01	2138.02	0.70	0.8510
16:44:12	25-JAN	730.20	26.00	150.03	2138.10	0.78	0.7683
16:46:27	25-JAN	732.45	28.25	150.04	2138.13	0.81	0.7386
16:51:12	25-JAN	737.20	33.00	150.06	2138.20	0.88	0.6842
16:56:37	25-JAN	742.62	38.42	150.08	2138.28	0.96	0.6327
17:03:02	25-JAN	749.03	44.83	150.12	2138.32	1.00	0.5823
17:08:22	25-JAN	754.37	50.17	150.15	2138.37	1.05	0.5467
17:15:52	25-JAN	761.87	57.67	150.17	2138.46	1.14	0.5043
17:24:57	25-JAN	770.95	66.75	150.22	2138.57	1.25	0.4617
17:32:07	25-JAN	778.12	73.92	150.26	2138.64	1.32	0.4332
17:39:27	25-JAN	785.45	81.25	150.30	2138.69	1.37	0.4077
17:48:37	25-JAN	794.62	90.42	150.35	2138.75	1.43	0.3800
17:58:07	25-JAN	804.12	99.92	150.39	2138.83	1.51	0.3553
18:04:57	25-JAN	810.95	106.75	150.42	2138.89	1.57	0.3395
18:11:47	25-JAN	817.78	113.58	150.46	2138.99	1.67	0.3251
18:17:17	25-JAN	823.28	119.08	150.49	2139.04	1.72	0.3144
18:23:07	25-JAN	829.12	124.92	150.51	2139.07	1.75	0.3038
18:32:32	25-JAN	838.53	134.33	150.57	2139.11	1.79	0.2882
18:40:12	25-JAN	846.20	142.00	150.60	2139.16	1.84	0.2767
18:46:57	25-JAN	852.95	148.75	150.64	2139.20	1.88	0.2673
18:53:37	25-JAN	859.62	155.42	150.67	2139.22	1.90	0.2586
19:00:32	25-JAN	866.53	162.33	150.71	2139.25	1.93	0.2502
19:05:52	25-JAN	871.87	167.67	150.75	2139.27	1.95	0.2441
19:13:32	25-JAN	879.53	175.33	150.78	2139.33	2.01	0.2359
19:21:47	25-JAN	887.78	183.58	150.82	2139.36	2.04	0.2276
19:38:07	25-JAN	904.12	199.92	150.91	2139.46	2.14	0.2129
19:55:02	25-JAN	921.03	216.83	151.00	2139.52	2.20	0.1996
20:11:47	25-JAN	937.78	233.58	151.09	2139.61	2.29	0.1880
20:27:47	25-JAN	953.78	249.58	151.18	2139.60	2.28	0.1781

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-978
DEPTH : 5133 FT
CAPACITY : 20000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

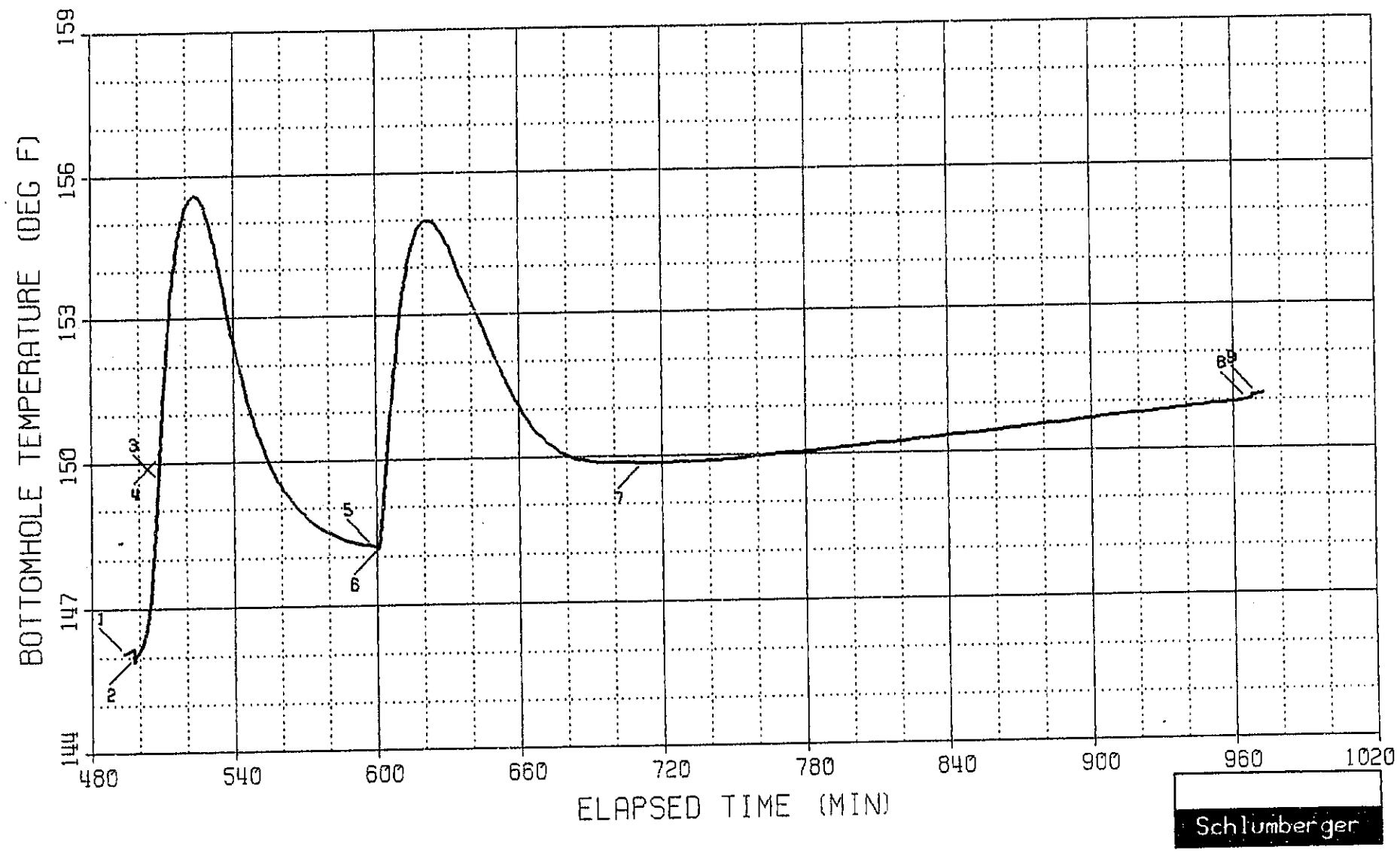


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-978
DEPTH : 5133 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

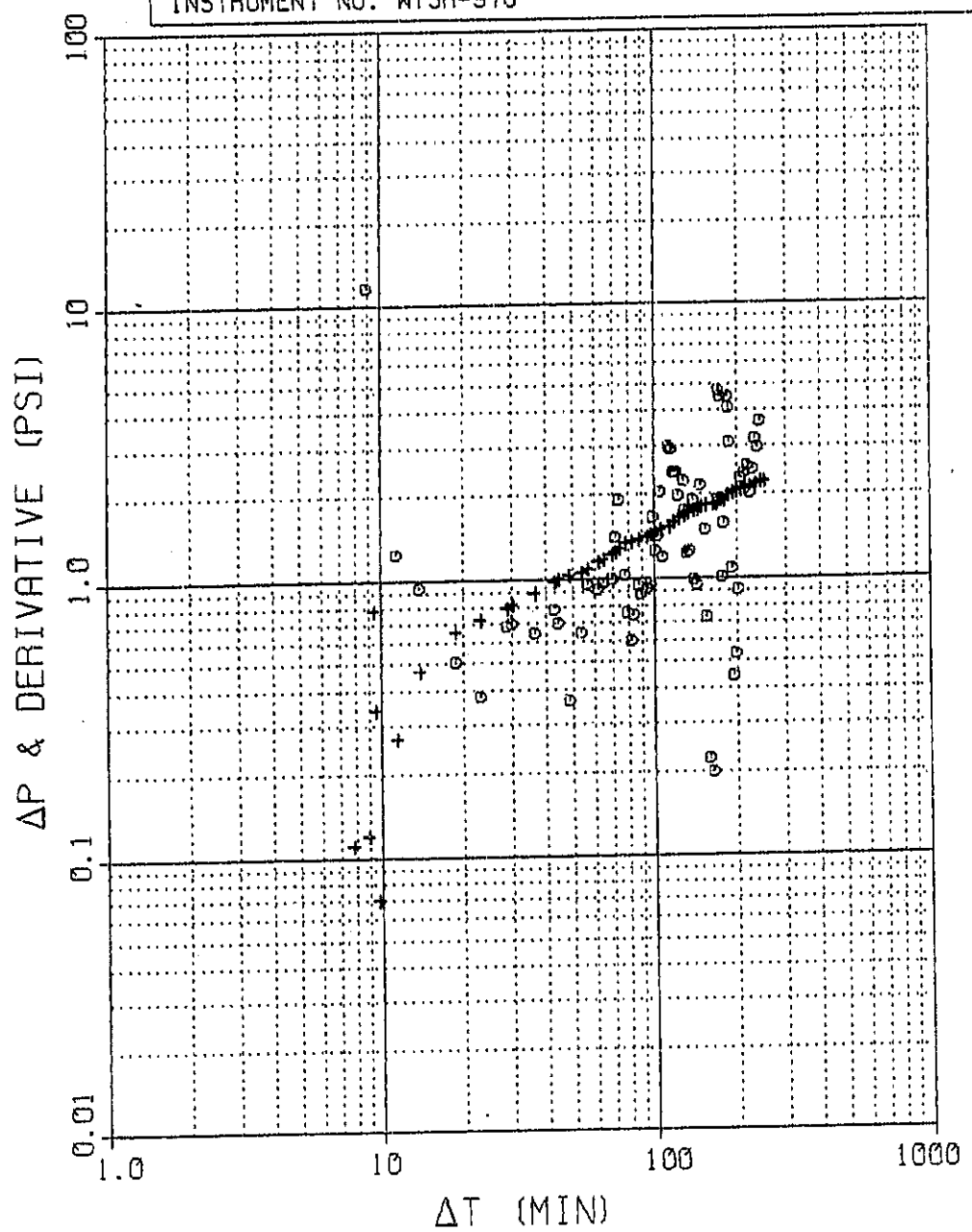
Electronic Temperature Data



LOG LOG PLOT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-978

SHUTIN #2 : PRODUCING TIME (Tp): 121.7 MIN
FINAL FLOW PRESSURE (Pwf): 2141 PSIA
PLOT ELAPSED TIME RANGE: 719.8 TO 965.5 MIN
ΔT TIME RANGE: 7.7 TO 253.5 MIN



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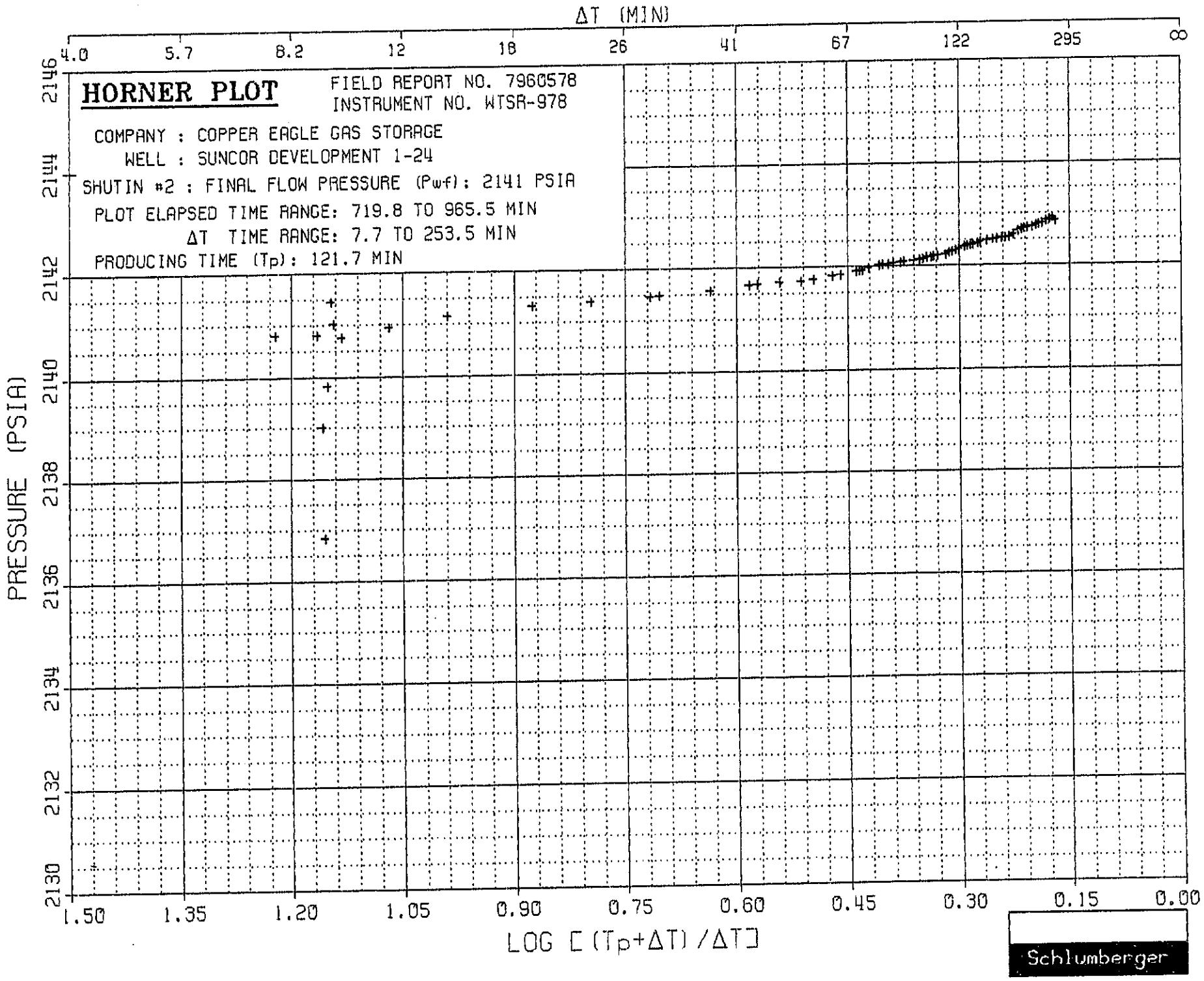
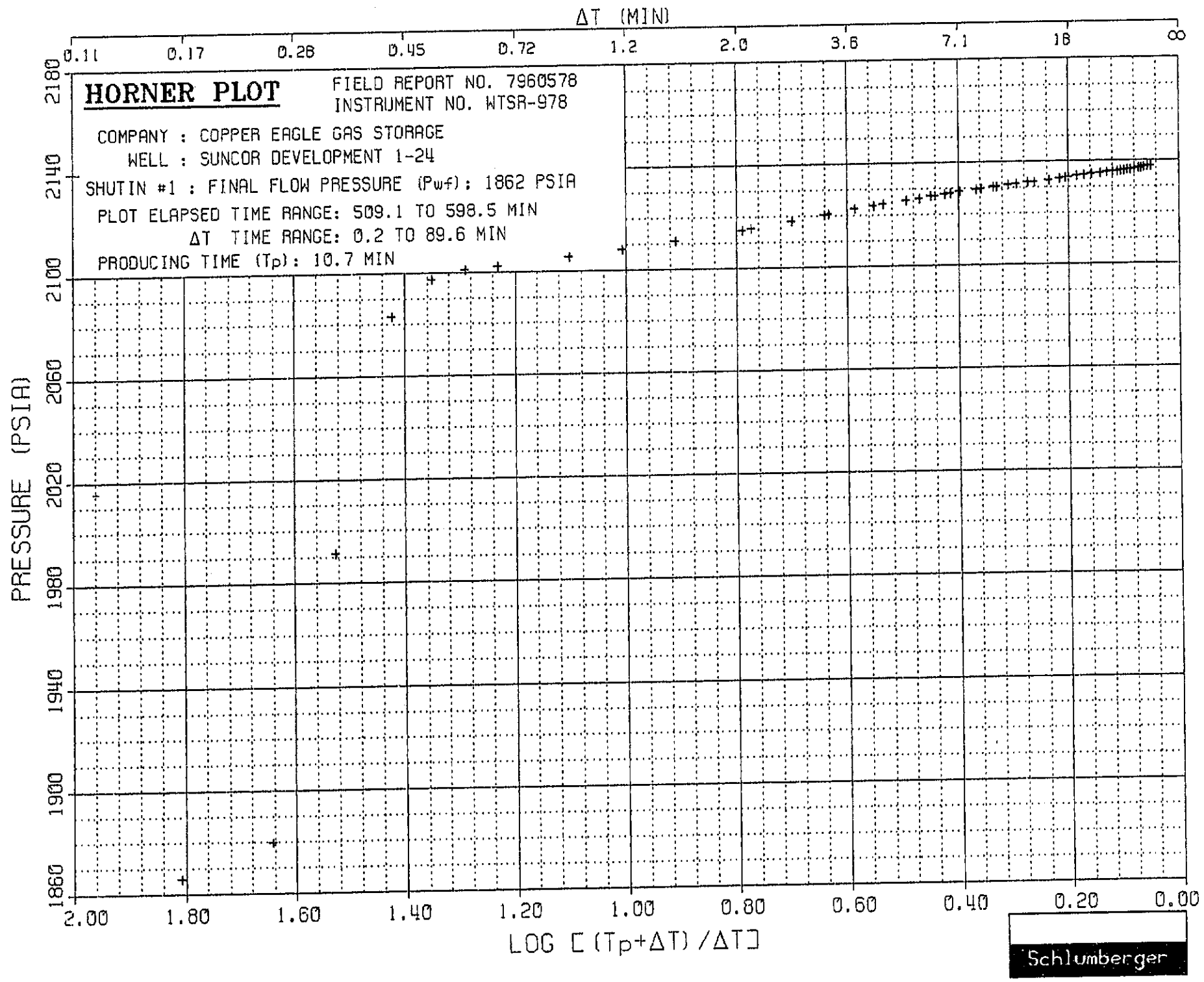

HORNER PLOT
FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-978
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #2 : FINAL FLOW PRESSURE (Pwf): 2141 PSIA
PLOT ELAPSED TIME RANGE: 719.8 TO 965.5 MIN
ΔT TIME RANGE: 7.7 TO 253.5 MIN
PRODUCING TIME (Tp): 121.7 MIN
ΔT (MIN)
4.0
5.7
8.2
12
18
26
41
67
122
295
∞
PRESSURE (PSIA)
2146
2144
2142
2140
2138
2136
2134
2132
2130
1.50
1.35
1.20
1.05
0.90
0.75
0.60
0.45
0.30
0.15
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger


HORNER PLOT
FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-978
COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24
SHUTIN #1 : FINAL FLOW PRESSURE (Pwf): 1862 PSIA
PLOT ELAPSED TIME RANGE: 509.1 TO 598.5 MIN
ΔT TIME RANGE: 0.2 TO 89.6 MIN
PRODUCING TIME (Tp): 10.7 MIN
ΔT (MIN)
0.11
0.17
0.28
0.45
0.72
1.2
2.0
3.6
7.1
18
∞
PRESSURE (PSIA)
2180
2140
2100
2060
2020
1980
1940
1900
1860
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
LOG [(Tp+ΔT)/ΔT]
Schlumberger

****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960578
INSTRUMENT NO. WTSR-978

RECORDER CAPACITY: 20000 PSI PORT OPENING: INSIDE DEPTH: 5133 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	12:36:12	25-JAN	HYDROSTATIC MUD	494.20	2646.07	146.08
2	12:40:12	25-JAN	START FLOW	498.20	1266.91	145.99
3	12:50:22	25-JAN	CYCLED TOOL	508.37	1846.66	149.65
4	12:50:57	25-JAN	END FLOW & START SHUT-IN	508.95	1862.27	150.12
5	14:20:32	25-JAN	END SHUT-IN	598.53	2137.78	148.21
6	14:23:02	25-JAN	START FLOW	601.03	1884.68	148.19
7	16:14:02	25-JAN	END FLOW & START SHUT-IN	712.03	2140.68	149.86
8	20:27:32	25-JAN	END SHUT-IN	965.53	2142.86	151.00
9	20:32:02	25-JAN	HYDROSTATIC MUD	970.03	2635.56	151.11

SUMMARY OF FLOW PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	INITIAL PRESSURE PSIA
1	498.20	508.95	10.75	1266.91	1862.27	1266.91
2	601.03	712.03	111.00	1884.68	2140.68	1884.68

SUMMARY OF SHUTIN PERIODS
****

PERIOD	START ELAPSED TIME,MIN	END ELAPSED TIME,MIN	DURATION MIN	START PRESSURE PSIA	END PRESSURE PSIA	FINAL FLOW PRESSURE PSIA	PRODUCING TIME, MIN
1	508.95	598.53	89.58	1862.27	2137.78	1862.27	10.75
2	712.03	965.53	253.50	2140.68	2142.86	2140.68	121.75

TEST PHASE: FLOW PERIOD # 1

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
12:40:12	25-JAN	498.20	0.00	145.99	1266.91
12:50:57	25-JAN	508.95	10.75	150.12	1862.27

TEST PHASE: SHUTIN PERIOD # 1

FINAL FLOW PRESSURE = 1862.27 PSIA
PRODUCING TIME = 10.75 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
12:50:57	25-JAN	508.95	0.00	150.12	1862.27	0.00	
12:52:07	25-JAN	510.12	1.17	151.09	2108.19	245.92	1.0081
12:53:07	25-JAN	511.12	2.17	151.84	2115.46	253.19	0.7748
12:54:07	25-JAN	512.12	3.17	152.53	2120.41	258.14	0.6426
12:55:07	25-JAN	513.12	4.17	153.12	2123.61	261.34	0.5536
12:56:27	25-JAN	514.45	5.50	153.81	2126.21	263.94	0.4705
12:57:27	25-JAN	515.45	6.50	154.22	2127.70	265.43	0.4239
12:59:02	25-JAN	517.03	8.08	154.74	2129.49	267.22	0.3674
13:00:07	25-JAN	518.12	9.17	154.99	2130.28	268.01	0.3369
13:01:17	25-JAN	519.28	10.33	155.21	2130.95	268.68	0.3098
13:03:52	25-JAN	521.87	12.92	155.53	2131.95	269.68	0.2629
13:05:52	25-JAN	523.87	14.92	155.59	2132.71	270.44	0.2357
13:08:32	25-JAN	526.53	17.58	155.46	2133.47	271.20	0.2072
13:11:07	25-JAN	529.12	20.17	155.10	2134.05	271.78	0.1855
13:13:27	25-JAN	531.45	22.50	154.62	2134.49	272.22	0.1696
13:15:32	25-JAN	533.53	24.58	154.11	2134.77	272.50	0.1576
13:18:22	25-JAN	536.37	27.42	153.39	2135.07	272.80	0.1437
13:21:37	25-JAN	539.62	30.67	152.58	2135.34	273.07	0.1305
13:27:17	25-JAN	545.28	36.33	151.38	2135.86	273.59	0.1126
13:32:37	25-JAN	550.62	41.67	150.51	2136.20	273.93	0.0997
13:39:07	25-JAN	557.12	48.17	149.74	2136.53	274.26	0.0875
13:48:52	25-JAN	566.87	57.92	149.00	2137.00	274.73	0.0739
13:55:57	25-JAN	573.95	65.00	148.68	2137.20	274.93	0.0665
14:02:37	25-JAN	580.62	71.67	148.48	2137.34	275.07	0.0607
14:08:12	25-JAN	586.20	77.25	148.35	2137.54	275.27	0.0566
14:13:37	25-JAN	591.62	82.67	148.28	2137.69	275.42	0.0531
14:20:32	25-JAN	598.53	89.58	148.21	2137.78	275.51	0.0492

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
14:23:02	25-JAN	601.03	0.00	148.19	1884.68
14:38:22	25-JAN	616.37	15.34	154.63	2126.14
14:55:17	25-JAN	633.28	32.25	154.09	2136.27
15:12:12	25-JAN	650.20	49.17	152.08	2138.74
15:29:52	25-JAN	667.87	66.84	150.49	2139.72
15:46:02	25-JAN	684.03	83.00	149.95	2139.99
16:01:02	25-JAN	699.03	98.00	149.88	2140.32

TEST PHASE: FLOW PERIOD # 2

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA
16:14:02	25-JAN	712.03	111.00	149.86	2140.68

TEST PHASE: SHUTIN PERIOD # 2

FINAL FLOW PRESSURE = 2140.68 PSIA
PRODUCING TIME = 121.75 MIN

TIME OF DAY HH:MM:SS	DATE DD-MMM	ELAPSED TIME,MIN	DELTA TIME,MIN	BOT HOLE TEMP. DEG F	BOT HOLE PRESSURE PSIA	DELTA P PSI	LOG HORNER TIME
16:14:02	25-JAN	712.03	0.00	149.86	2140.68	0.00	
16:21:47	25-JAN	719.78	7.75	149.86	2140.79	0.11	1.2230
16:22:57	25-JAN	720.95	8.92	149.86	2140.80	0.12	1.1658
16:25:22	25-JAN	723.37	11.34	149.86	2140.95	0.27	1.0695
16:27:52	25-JAN	725.87	13.84	149.88	2141.15	0.47	0.9911
16:32:42	25-JAN	730.70	18.67	149.88	2141.33	0.65	0.8763
16:37:07	25-JAN	735.12	23.09	149.88	2141.40	0.72	0.7975
16:42:57	25-JAN	740.95	28.92	149.90	2141.47	0.79	0.7168
16:50:37	25-JAN	748.62	36.59	149.92	2141.57	0.89	0.6362
16:56:57	25-JAN	754.95	42.92	149.94	2141.66	0.98	0.5840
17:02:52	25-JAN	760.87	48.84	149.97	2141.71	1.03	0.5432
17:07:52	25-JAN	765.87	53.84	149.99	2141.73	1.05	0.5134
17:16:07	25-JAN	774.12	62.09	150.03	2141.83	1.15	0.4714
17:23:27	25-JAN	781.45	69.42	150.06	2141.91	1.23	0.4399
17:31:57	25-JAN	789.95	77.92	150.10	2142.02	1.34	0.4087
17:38:02	25-JAN	796.03	84.00	150.13	2142.05	1.37	0.3891
17:47:32	25-JAN	805.53	93.50	150.17	2142.10	1.42	0.3621
17:52:37	25-JAN	810.62	98.59	150.21	2142.13	1.45	0.3493
17:58:37	25-JAN	816.62	104.59	150.22	2142.18	1.50	0.3353
18:06:22	25-JAN	824.37	112.34	150.26	2142.22	1.54	0.3188
18:13:22	25-JAN	831.37	119.34	150.30	2142.31	1.63	0.3054
18:20:37	25-JAN	838.62	126.59	150.33	2142.37	1.69	0.2926
18:27:17	25-JAN	845.28	133.25	150.37	2142.41	1.73	0.2819
18:34:12	25-JAN	852.20	140.17	150.40	2142.45	1.77	0.2715
18:40:07	25-JAN	858.12	146.09	150.44	2142.48	1.80	0.2633
18:46:42	25-JAN	864.70	152.67	150.48	2142.51	1.83	0.2547
18:56:27	25-JAN	874.45	162.42	150.53	2142.53	1.85	0.2429
19:02:17	25-JAN	880.28	168.25	150.55	2142.53	1.85	0.2364
19:07:37	25-JAN	885.62	173.59	150.58	2142.58	1.90	0.2308
19:12:37	25-JAN	890.62	178.59	150.60	2142.59	1.91	0.2258
19:18:02	25-JAN	896.03	184.00	150.64	2142.66	1.98	0.2205
19:34:42	25-JAN	912.70	200.67	150.73	2142.72	2.04	0.2059
19:51:47	25-JAN	929.78	217.75	150.82	2142.79	2.11	0.1929
20:08:32	25-JAN	946.53	234.50	150.89	2142.85	2.17	0.1816
20:25:12	25-JAN	963.20	251.17	150.98	2142.90	2.22	0.1716
20:27:32	25-JAN	965.53	253.50	151.00	2142.86	2.18	0.1703

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
OPENHOLE DST	24-JAN-2001	HOBBS

WELL OWNER: COPPER EAGLE GAS STORAGE — SERVICE ORDER NUMBER: 7960575

REPORTS ADDRESS: 333 TEXAS STREET / SUITE 425 / SHREVEPORT, LA 71101-5319 ATTN:COPPER EAGLE GAS STORAGE

WELL NAME & NO.: SUNCOR DEVELOPMENT 1-24 — FIELD: LUKE-GLENDALE — LEASE:

LOCATION: 330SLx330WL — COUNTY: MARICOPA — STATE: ARIZONA

TEST NO ONE — TEST INTERVAL FROM 5156 FT TO 5364 FT = 208 FT

SURFACE DATA

DESCRIPTION	DATE	TIME OF DAY	PRESSURE
PIPE STICKING			
COULD NOT GET IN HOLE			

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EQUIPMENT SEQUENCE

COMPONENTS	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				
DRILL PIPE (16.6#)	4.50	3.826	4019	4019
HEAVY WEIGHT DRILL PIPE	4.50	2.500	547.4	4566
DRILL COLLARS	6.25	2.250	355.	4921
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	4922
DRILL COLLARS	6.25	2.250	93.22	5015
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5016
DRILL COLLARS	6.25	2.250	93.71	5110
CROSS OVER SUB	6.00	2.438	0.94	5111
MFE	5.00	1.000	9.88	5121
MFE OH BYPASS	5.00	1.000	2.98	5124
INSIDE RECORDER CARRIER	4.88	1.500	7.67	5132
INSIDE RECORDER CARRIER	4.88	1.500	7.77	5139
D&C HYDRAULIC JAR	4.75	1.875	6.59	5146
UPPER STRADDLE BYPASS SUB	4.75	1.250	0.66	5147
SAFETY JOINT	4.75	2.500	2.01	5149
CROSS OVER SUB	6.00	2.50	1.02	5150
BOB-TAIL PACKER	11.125	1.750	6.36	5156
PERFORATED ANCHOR	5.75	3.000	10.99	5167
LOWER STRADDLE BYPASS SUB	5.75	0.000	0.64	5168
CROSS OVER SUB	6.125	2.500	1.47	5169
DRILL COLLARS	6.25	2.250	180.8	5350
CROSS OVER SUB	6.125	2.500	1.39	5351
INSIDE RECORDER CARRIER	5.75	3.000	6.75	5358
BOB-TAIL PACKER	11.25	1.750	5.96	5364
PERFORATED ANCHOR	5.75	3.000	2.72	5367
OUTSIDE RECORDER CARRIER	5.75	3.000	6.28	5373
CROSS OVER SUB	6.00	2.313	0.87	5374
CROSS OVER SUB	6.438	3.125	2.22	5376
CROSS OVER SUB	7.938	2.750	2.91	5379
BIT	12.25	2.000	1.00	5380

RECOVERY DESCRIPTION	FEET	BBLS	OIL GRAVITY	RESISTIVITY	CHLORIDES

SERVICE ORDER NUMBER: 7960575 — SCHLUMBERGER ENGINEER/TECHNICIAN KIRK BEASLEY

Schlumberger

FIELD REPORT

TYPE OF SERVICE	DATE	DISTRICT
OPENHOLE DST	24-JAN-2001	HOBBS

INSTRUMENT DATA

INSTRUMENT NO.	WTSR-978				
CAPACITY(PSIG)	15000				
DEPTH	5132				
INSIDE-OUTSIDE	IN				
CLOCK CAP	ELECTRONIC				
TEMPERATURE °F	145				
I. HYD. PSIG	2463				
I. FLOW PSIG					
I.S.I. PSIG					
2nd FLOW PSIG					
2nd S.I. PSIG					
F. FLOW PSIG					
F.S.I. PSIG					
F. HYD. PSIG	2450				

MUD DATA

MUD TYPE BRINE MUD WT 10.3 #/gal

VISCOSITY 43 WATER LOSS 14 CC

RESISTIVITY: OF MUD @ °F

RESISTIVITY: OF FILTRATE 0.113 @ 70 °F

CHLORIDES 39000 PPM

H2S DURING TEST PPM

WELL BORE DATA

FORMATION TESTED

NET PRODUCTIVE INTERVAL ft EST. POROSITY %

ELEVATION 1064 ft DEPTH MEASURED FROM GL

TOTAL MEASURED DEPTH 6052/6052 ft

O H SIZE 12.25 in

CASING SIZE

LINER SIZE

PERF INTERVAL FROM ft TO ft

SHOT DENSITY

CUSHION	LENGTH	AMOUNT	SURFACE PRESS	BOTTOM CHOKE SIZE
NONE				1.00

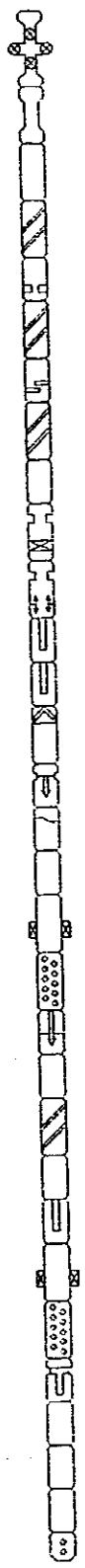
SAMPLER DATA

RECOVERY			RESISTIVITY			CHLORIDES
GAS		C.F.	RECOVERED WATER	@	deg F	PPM
OIL		C.C.	RECOVERED MUD	@	deg F	
WATER		C.C.	REC.MUD FILTRATE	@	deg F	PPM
MUD		C.C.	PIT MUD	@	deg F	
GRAVITY	°API	°F	PIT MUD FILTRATE	@	deg F	PPM
GOR		C.F./BBL	SAMPLER PRESSURE			

REMARKS: THIS IS DST #1. DUE TO THE HOLE CONDITIONS WE WERE UNABLE TO GET TO BOTTOM. THE PACKERS WERE NEVER SET THE TOOL WAS NOT OPENED. PLEASE DIRECT ANY QUESTIONS ABOUT THIS TEST TO THE HOBBS TESTING DISTRICT AT (505) 393-4107. THANK YOU FOR USING SCHLUMBERGER.

SERVICE ORDER NUMBER:	7960575	SCHLUMBERGER ENGINEER/TECHNICIAN	KIRK BEASLEY

COPPER EAGLE GAS STORAGE
SUNCOR DEVELOPMENT 1-24
TOOL STRING SCHEMATIC



TOOL DESCRIPTION	OD	ID	LENGTH	DEPTH
SURFACE FLOWHEAD				0
DRILL PIPE (16.6#)	4.50	3.826	4019	4019
HEAVY WEIGHT DRILL PIPE	4.50	2.500	547.4	4566.4
DRILL COLLARS	6.25	2.250	355.	4921.4
PUMPOUT DISK REVERSING VALVE	6.25	3.250	0.83	4922.23
DRILL COLLARS	6.25	2.250	93.22	5015.45
BREAKOFF PIN REVERSING VALVE	6.25	3.000	0.96	5016.41
DRILL COLLARS	6.25	2.250	93.71	5110.12
CROSS OVER SUB	6.00	2.438	0.94	5111.06
MFE	5.00	1.000	9.88	5120.94
MFE OH BYPASS	5.00	1.000	2.98	5123.92
INSIDE RECORDER CARRIER	4.88	1.500	7.67	5131.59
INSIDE RECORDER CARRIER	4.88	1.500	7.77	5139.36
D&C HYDRAULIC JAR	4.75	1.875	6.59	5145.95
UPPER STRADDLE BYPASS SUB	4.75	1.250	0.66	5146.61
SAFETY JOINT	4.75	2.500	2.01	5148.62
CROSS OVER SUB	6.00	2.50	1.02	5149.64
BOB-TAIL PACKER	11.125	1.750	6.36	5156
PERFORATED ANCHOR	5.75	3.000	10.99	5166.99
LOWER STRADDLE BYPASS SUB	5.75	0.000	0.64	5167.63
CROSS OVER SUB	6.125	2.500	1.47	5169.1
DRILL COLLARS	6.25	2.250	180.8	5349.9
CROSS OVER SUB	6.125	2.500	1.39	5351.29
INSIDE RECORDER CARRIER	5.75	3.000	6.75	5358.04
BOB-TAIL PACKER	11.25	1.750	5.96	5364
PERFORATED ANCHOR	5.75	3.000	2.72	5366.72
OUTSIDE RECORDER CARRIER	5.75	3.000	6.28	5373
CROSS OVER SUB	6.00	2.313	0.87	5373.87
CROSS OVER SUB	6.438	3.125	2.22	5376.09
CROSS OVER SUB	7.938	2.750	2.91	5379
BIT	12.25	2.000	1.00	5380

Report Number: 7960575
Test Number: ONE
Test Date: 24-JAN-2001

Schlumberger

REPORT NO. 7960575
PAGE NO. 1
TEST DATE: 24-JAN-2001

S T A R

Schlumberger Testing Data Report

Pressure Data Report

Schlumberger

COMPANY: COPPER EAGLE GAS STORAGE	WELL: SUNCOR DEVELOPMENT 1-24
TEST IDENTIFICATION Test Type ..... OPENHOLE DST Test No. ..... ONE Formation ..... Test Interval (ft) ..... 5156 to 5364 Depth Reference ..... GL	**WELL LOCATION** Field ..... LUKE-GLENDALE County ..... MARICOPA State ..... ARIZONA Sec/Twn/Rng ..... 330SLx330WL Elevation (ft) 1064
HOLE CONDITIONS Total Depth (MD/TVD) (ft) .... 6052/6052 Hole Size (in) ..... 12.25 Casing/Liner I.D. (in) ..... Perf'd Interval/Net Pay (ft).. Shot Density/Diameter (in) ...	**MUD PROPERTIES** Mud Type ..... BRINE Mud Weight (lb/gal) ..... 10.3 Mud Resistivity (ohm.m) ..... Filtrate Resistivity (ohm.m).. 0.113 @ 70F Filtrate Chlorides (ppm) 39000
INITIAL TEST CONDITIONS Initial Hydrostatic (psi) .... Gas Cushion Type ..... Surface Pressure (psi) ..... Liquid Cushion Type ..... Cushion Length (ft)	**TEST STRING CONFIGURATION** Pipe Length (ft)/I.D. (in) ... 4019 / 3.826 Collar Length (ft)/I.D. (in).. 723 / 2.250 Packer Depths (ft) ..... 5156,5364, Bottomhole Choke Size (in) ... 1.00 Gauge Depth (ft)/Type 5132/WTSR-978

NET PIPE RECOVERY

Volume	Fluid Type	Properties

NET SAMPLE CHAMBER RECOVERY

Volume	Fluid Type	Properties
Pressure:	GOR: 0	GLR: 0

INTERPRETATION RESULTS

Model of Behavior .....
Fluid Type Used for Analysis..
Reservoir Pressure (psi) .....
Transmissibility (md.ft/cp) ..
Effective Permeability (md) ..
Skin Factor/Damage Ratio .....
Storativity Ratio, Omega .....
Interporos.Flow Coef..Lambda..
Distance to an Anomaly (ft) ..
Radius of Investigation (ft)..
Potentiometric Surface (ft) ..

ROCK/FLUID/WELLBORE PROPERTIES

Oil Density (deg. API) .....
Basic Solids (%) .....
Gas Gravity .....
GOR (scf/STB) .....
Water Cut (%) .....
Viscosity (cp) .....
Total Compressibility (1/psi).
Porosity (%) .....
Reservoir Temperature (F) 145
Form.Vol.Factor (bbl/STB) ....

PRODUCTION RATE DURING TEST: Data Report

COMMENTS:

THIS IS DST #1. DUE TO THE HOLE CONDITIONS WE WERE UNABLE TO GET TO BOTTOM. THE PACKERS WERE NEVER SET THE TOOL WAS NOT OPENED. PLEASE DIRECT ANY QUESTIONS ABOUT THIS TEST TO THE HOBBS TESTING DISTRICT AT (505) 393-4107. THANK YOU FOR USING SCHLUMBERGER.

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WELL TEST INTERPRETATION REPORT #:7960575 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 2, 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	SEQUENCE OF EVENTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

DATE	TIME (HR:MIN)	DESCRIPTION	ET (MINS)	BHP (PSIA)	WHP (PSIG)
		PIPE STICKING COULD NOT GET IN HOLE			

WELL TEST INTERPRETATION REPORT #:7960575 CLIENT : COPPER EAGLE GAS STORAGE		PAGE: 12. 31-JAN-**
REGION :CENTRAL DISTRICT:HOBBS BASE :MIDLAND ENGINEER:KIRK BEASLEY	DISTRIBUTION OF REPORTS	FIELD:LUKE-GLENDALE ZONE : WELL :SUNCOR 1-24 LOCATION:330SL×330WL

SCHLUMBERGER has sent copies of this report to the following:

BRAMMER ENGINEERING
333 TEXAS STREET
SUITE 425
SHREVEPORT, LA 71101
Attn: COPPER EAGLE GAS STORAGE
(2 copies)

Any interpretations or recommendations are opinions and necessarily based on inferences and empirical factors and assumptions, which are not infallible. Accordingly, Schlumberger (Flopetrol Johnston) cannot and does not warrant the accuracy of correctness of any interpretation or measurement. Under no circumstances should any intepretation or measurement be relied upon as the sole basis for any drilling, completion, well treatment or production decision or any procedure involving risk to the safety of any drilling venture, drilling rig or its crew or any other individual. The Customer has full responsibility for all drilling, completion, well treatment, and production procedure, and all other activities relating to the drilling or production operation.

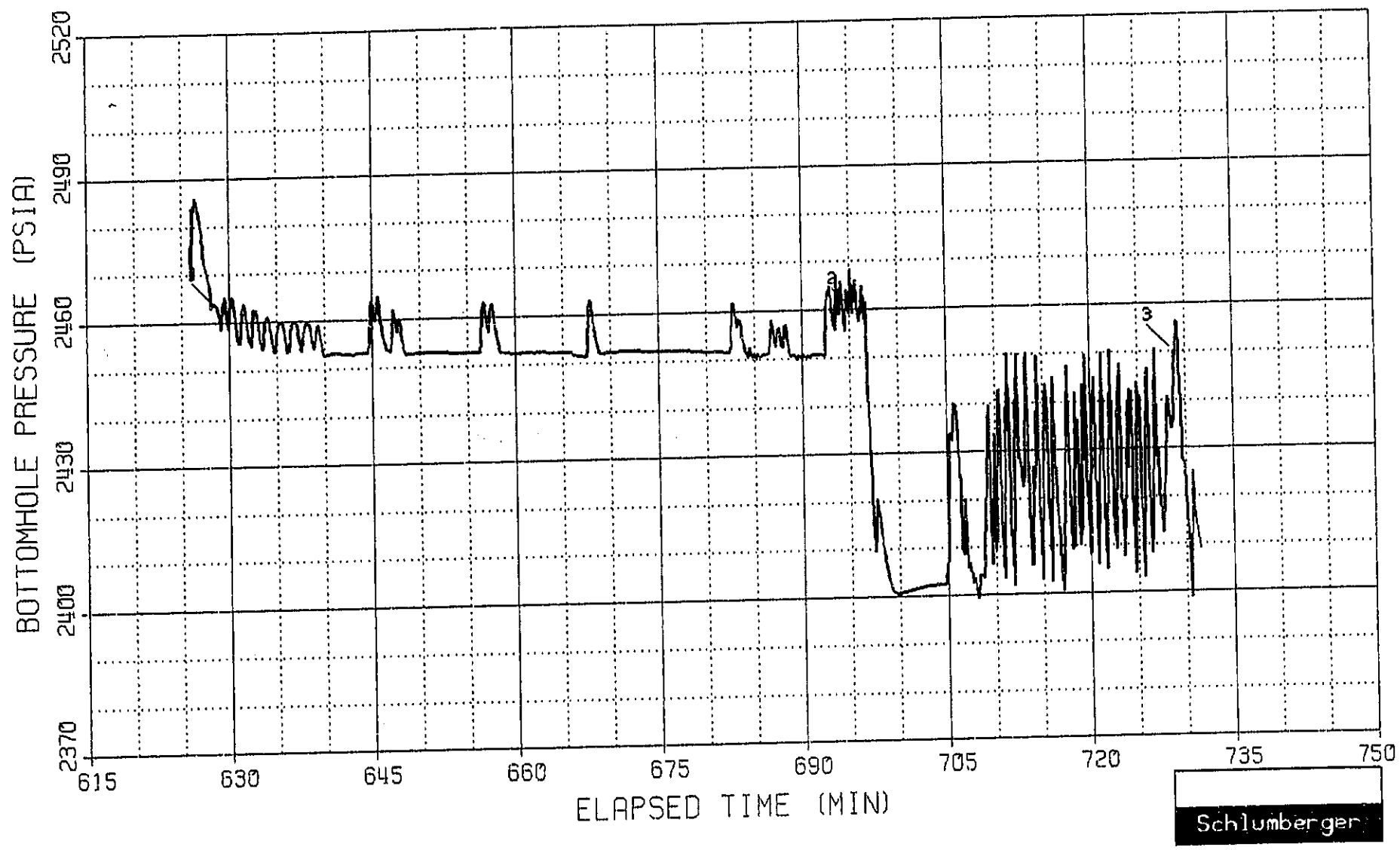
SCHLUMBERGER

BOTTOMHOLE PRESSURE LOG

FIELD REPORT NO. 7960575
INSTRUMENT NO. WTSR-978
DEPTH : 5132 FT
CAPACITY : 15000 PSI
PORT OPENING : INSIDE

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Pressure Data

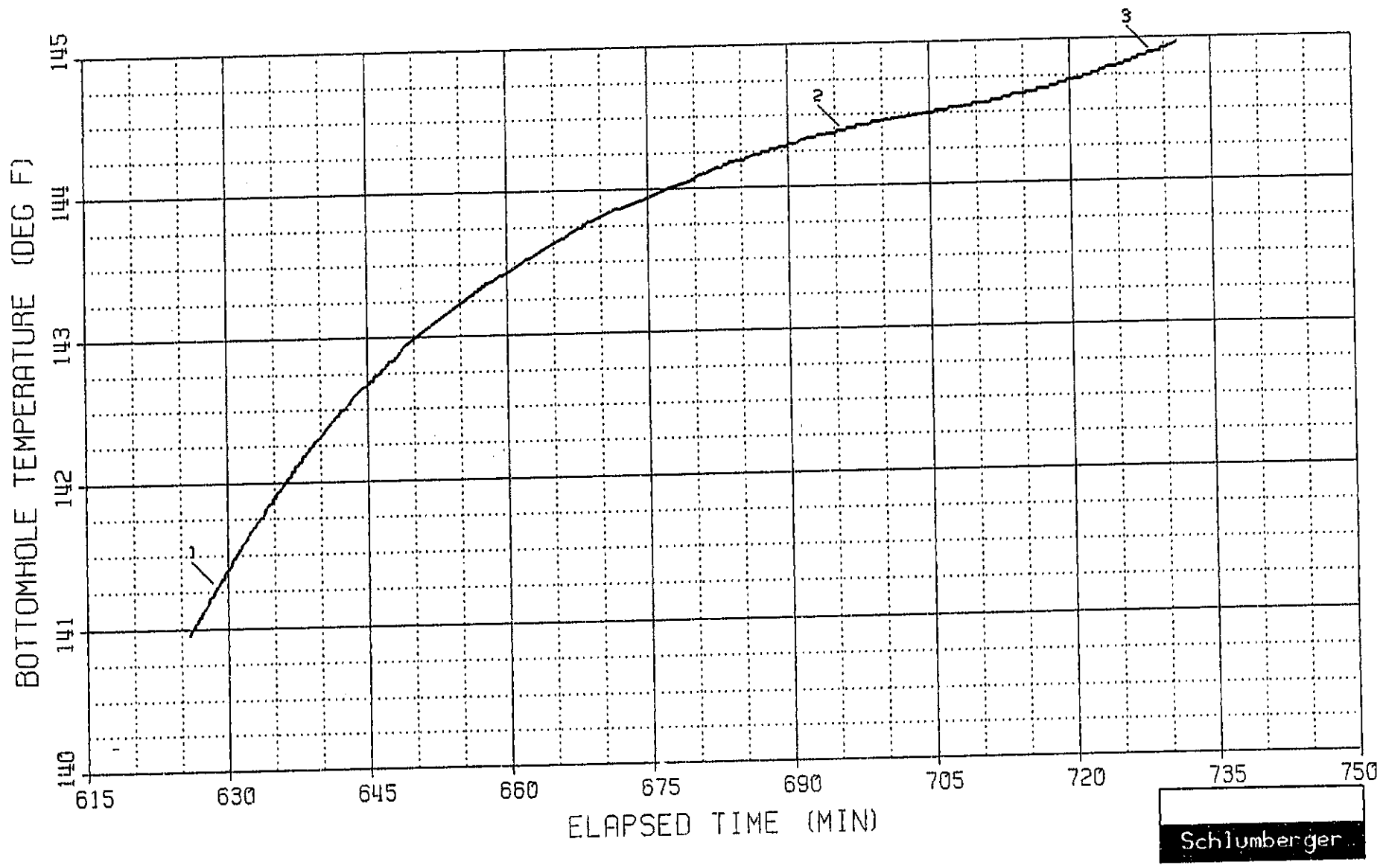


BOTTOMHOLE TEMPERATURE LOG

FIELD REPORT NO. 7960575
INSTRUMENT NO. WTSR-978
DEPTH : 5132 FT

COMPANY : COPPER EAGLE GAS STORAGE
WELL : SUNCOR DEVELOPMENT 1-24

Electronic Temperature Data



****
** WELL TEST DATA PRINTOUT **
****

COMPANY: COPPER EAGLE GAS STORAGE
WELL: SUNCOR DEVELOPMENT 1-24

FIELD REPORT NO. 7960575
INSTRUMENT NO. WTSR-978

RECORDER CAPACITY: 15000 PSI PORT OPENING: INSIDE DEPTH: 5132 FT

LABEL POINT INFORMATION
****

#	TIME OF DAY HH:MM:SS	DATE DD-MMM	EXPLANATION	ELAPSED TIME,MIN	BOT HOLE PRESSURE PSIA	BOT HOLE TEMP. DEG F
1	3:47:49	24-JAN	HYDROSTATIC MUD	628.82	2462.89	141.28
2	4:54:53	24-JAN	PULLED LOOSE	695.88	2459.00	144.39
3	5:27:49	24-JAN	HYDROSTATIC MUD	728.82	2450.08	144.90

Subject: Fw: Schlumberger well logs for Copper Eagle
Date: Tue, 9 Apr 2002 09:39:21 -0500
From: "Hayden, David" <David.Hayden@ElPaso.com>
To: "'steve.rauzi@azgs.az.gov'" <steve.rauzi@azgs.az.gov>

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Steve:

You should receive these tomorrow morning. I am enroute to Washington, D.C. but if you need anything else please let us know.

Thanks

Thanks,

David Hayden
Sent from my BlackBerry Wireless Handheld (www.BlackBerry.net)

-----Original Message-----
From: Smith, Julie P. <Julie.P.Smith@ElPaso.com>
To: Hayden, David <David.Hayden@ElPaso.com>
Sent: Tue Apr 09 09:24:18 2002
Subject: Schlumberger well logs for Copper Eagle

Well logs were just received from Schlumberger on Copper Eagle. One of the each of the following logs has been included in the package to Steve Rauzi.

Borehole Compensated Digital Sonic Tool Gamma Ray Log
Platform Express Microcylindrically Focused Log
Platform Express Array Induction Gamma Ray / Caliper Log
Platform Express Triple Litho-Density Compensated Neutron Log

Thanks,

Julie P. Smith
Crystal Gas Storage, Inc.
401 Edwards Street, Suite 1300
Shreveport, LA
Phone (318) 677-5513
Fax (318) 677-5515

****
This email and any files transmitted with it from the ElPaso Corporation are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.
****

Subject: Re: #1-24 hole
Date: Thu, 04 Apr 2002 13:31:35 -0700
From: Steve Rauzi <steve.rauzi@azgs.az.gov>
Organization: Arizona Geological Survey
To: "Hayden, David" <David.Hayden@ElPaso.com>

909

I think I have them - field reports for tests nos. 1, 2, 3, 4, and 5. SRT # 1 and #2. SLR

"Hayden, David" wrote:

> Steve:
>
> I have requested a complete copies of the entire suite of suite logs that
> were run during Run 1 and Run 2 (surface run and TD run) from Schlumberger
> and they were supposed to have shipped them to me yesterday. I will turn
> copies to you as soon as I get them. Sorry this has taken so long! I was
> also going to include a copy of the DST data. Do you still need it also?
>
> Thanks
>
> -----Original Message-----
> From: Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]
> Sent: Thursday, April 04, 2002 1:43 PM
> To: Hayden, David
> Subject: #1-24 hole
>
> Dave, I received the wireline logs (sonic and lithodensity-compensated
> neutron) to 3509 ft, mudlog, and test data. We still need logs run in
> the lower part of the hole - 3500 to 6052 ft. Thanks. Steve
>
> ***
> This email and any files transmitted with it from the ElPaso
> Corporation are confidential and intended solely for the
> use of the individual or entity to whom they are addressed.
> If you have received this email in error please notify the
> sender.
> ***

Subject: Suncor 1-24
Date: Fri, 22 Mar 2002 12:32:06 -0600
From: "Hayden, David" <David.Hayden@ElPaso.com>
To: "Steve Rauzi (E-mail)" <steve.rauzi@azgs.az.gov>

file 909

Steve:

I have not forgotten the logs and test data. I did not have a complete set of all of the logs to so rather than piece mill I requested several complete sets from Schlumberger. They were to be shipped yesterday so I should have them early next week at which time I will forward your logs. Hope all is going well. With all of the Desert Crossing activity planned near Kingman you must be keeping busy! Have a great weekend and I will talk to yo soon.

Thanks,

David L. Hayden
Crystal Gas Storage an El Paso company
401 Edwards Street, Suite 1300
Shreveport, LA 71101
ph: (318) 677-5511
fax: (318) 677-5515

****
This email and any files transmitted with it from the ElPaso Corporation are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.
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Subject: RE: Data from #1-24
Date: Tue, 5 Mar 2002 13:10:22 -0600
From: "Hayden, David" <David.Hayden@ElPaso.com>
To: 'Steve Rauzi' <steve.rauzi@azgs.az.gov>

Steve:

Sorry about that. I have forwarded your message to Brammer who will get you the Sudry notice and plugging info. I will forward you a set of the logs and DST info.

David

-----Original Message-----
From: Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]
Sent: Tuesday, March 05, 2002 11:54 AM
To: Hayden, David
Subject: Data from #1-24

Hi Dave,

It's been about a month since the #1-24 was TA. We've received the samples but have not yet received the wireline logs, DST, or other test data. We also need a Sundry Notice describing the location of the down-hole plug, amount of cement spotted, and nature of the wellhead at the surface. This information and the data should be forwarded to us soon as possible. We also look forward to archiving the remnant salt core from the #1-2 well. I look forward to hearing from you soon.

Steve

****
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****

1-28-02 Dave Hayden

Still running DSTs

Does State have max Vol or rate limit on inj test? = Not OGCC

Packer on BHA limits rate to ~ 400 gpm

Design 5 Steprate: Start @ 100 gpm, 200, 300, 400, 500

Pump 30 min on each step.

If all goes well then inject @ 100 gpm for 24 hrs.

= determine distant boundaries to injection zone.

~ 3400 bbls over period of test.

= Don't see problem = short duration = fluid compatable w/ Fm.

[call & check Texas requirement - Dave Triana + Fernando Deleon]

Ran 3 DSTs + preparing to run 4th. + 3rd.

① base salt (5157) to td (6052) = good indication p+p, flows

② top Volcanics (5390) - td (6052) = pretty good results

③ Sand section between Salt (5157) + Volc (5390) =

④ Sand section above Salt

Step rate tests

① 5390 - td

② 5157 - td

Depending on DST ④ POH RIH for limited step-rate test

If results favorable then 24 hr injection test.

Dave Triana (TRRC - 1-28-02) typically step tests of short duration.

~ 15 min per step.

24 hr @ 100 gpm no problem since of short duration.

not like trying to dispose of illegal fluid.

Can't use drill mud = disposal.

Preferably fluid compatible with formation - i.e. salt wtr.

Fernando Deleon (TRRC - UIC) No max on vol of fluid but pressure limited to .5 psi/ft

1-25-02 Charles Tucker

Bottling up cores & samples to send down.
Hotshot bringing them down today – will call if gets lost.
Still trying to get DST.
Mud got out of whack & trying to get packer set.

Samples and core arrive early afternoon. = Sample # 1896

Subject: Suncor status
Date: Tue, 22 Jan 2002 17:15:16 -0500
From: haydend@imcingular.com (david hayden)
To: steve.rauzi@azgs.az.gov
CC: mjreid@apsc.com

Steve:
Currently logging. Logging should be complete around midnight.

Tomorrow will be time to perform DST and injection test(s) based on logging results. I am on location and will drop you another update tomorrow morning.

David Hayden

1-23-02 Dave Hayden called ~ 9:00a.m.

Have finished logging
Conditioning hole
Will run stratal pack DST 10-90-120-240 (late today or tonight)
Run step-rate test if DST shows p+p.
Have washed + dry sample on loc.
~2 ft core = only cut 4 ft because cut rate 4 hrs per ft
= green dense rock w/ quartz veins = possibly a boulder
~600 ft basalt then granite @ TD.
Calculating new velocity functions with VSP data.

1-14-02 Charles Tucker

@ 4944' drilling + no salt
Mud motor stalling, esp. after drlg sand stringers
Some little anhydrite stringers
Cl^- up to 3000 ppm
Drlg rate varying from 38'/hr to 19'/hr
Plan to drill $12\frac{1}{4}$" hole to 5730' then reduce to $8\frac{1}{2}$" hole

---

Plan on El Mirage hole 48" / 36" / hang 20" = thinks
20" / $13\frac{3}{8}$" / hang $8\frac{5}{8}$" would do the job.

Phone lines down so no emails of mud log.
Brammer hand coming out to spell Charles for ~3 days
Charles sounded like he was coming down with cold.

1-19-02 Dave Hayden

Found fault @ 5030'
Drld couple hundred feet below fault
Cored + appeared to be coring dark green - black boulder
2nd core recovered rubble
POH + RIH with bit
Drilling ahead

COPPER EAGLE
Fax Cover Sheet

To:	Steve Rauzi	**Date:**	January 8, 2002
Company:	AZ Oil & Gas Commission	**Phone:**	520 770-3500
Department:		**Fax:**	520 770-3505
From:	Matt Reid	**Phone:**	606 250-3109
Department:	APS	**Fax:**	602 250-3628
Subject:	Articles re: CEGS SunCor 1-24	**Total pages including this sheet:**	4

Comments:

Steve:

I have attached a copy of two articles from the "West Valley View" regarding the Stratigraphic test. One article was published on 12/19 and the second on 1/2/2002. I thought you might like a copy in case you haven't already seen these.

If you have any questions please give me a call.

The weekly newspaper of Avondale, Buckeye, Goodyear, Litchfield Park & Tolleson, AZ 50¢ January 2, 2002

Schools to get federal money

y Darryl Henning
ssociate editor

Congress passed a sweeping ducational bill last week that xpands the federal government's ole in and gives states more money for education, as well as ghtens the level of assessment of udent performances nationwide.

The bill authorizes the spending f $26.5 billion in fiscal year 2002 for K-12 education — about $8 billion more than in FY2001, and $4 billion more than President Bush asked for.

Among its provisions, the legislation:

• provides $1 billion over the next five years— three times the amount currently allocated — to improve students' reading skills, with a goal of ensuring every student can read by third grade;

• requires states ensure that all teachers are qualified to teach in their subject areas within four years;

• implements third- through eighth-grade testing in reading and math in the 2005-06 school year;

• mandates states use federal funds for tutoring and other ways to improve their students' test scores in poor-performing scho districts;

• establishes a 12-year timeta for closing gaps in reading and math proficiencies between wealthy and poor students and white and minority students;

• requires schools to test their limited English-proficient stude for proficiency after three conse

(See Schools on page A.

View photo by Melanie Brown

New landmark

A tractor passes next to a field in front of the drilling site on the corner of Indian School Road and Cotton Lane on Dec. 27.

Drilling rig appears overnight

View report

No — it's not an oil well being drilled at the corner of Cotton Lane and Indian School Road, even though it may resemble one.

A drilling rig, collateral equipment, job trailers and work crews appeared seemingly overnight in late December at the site. However, it's actually a stratographic test being conducted on the parcel, part of exploratory research contracted for by Pinnacle West Energy and related to the possible placement of a natural gas storage facility in the West Valley.

Pinnacle West announced plans last January for conducting a feasibility study for placing a natural gas storage facility in a salt cavern near the Morton Salt facility at Dysart Road and Glendale Avenue. Core samples were taken last year from that site, and periodically from other sites along Cotton Lane for comparison.

According to the drilling site manager, the project will take an estimated 27 days to complete, or until about mid January, if all goes as expected. Then the drilling and collateral equipment and work crews will disappear seemingly just as quickly as they appeared, he said.

LP woman find husband's body

View report

A Litchfield Park woman found her elderly husband dead in their backyard pool Dec. 26.

Marti English found her husban Paul Stanley English, facedown in their pool around 6 p.m. at 996 E. Acacia Circle in Litchfield Park.

Authorities are still looking into how he died, but foul play is not su pected at this time, Avondale polic Lt. David Wright said.

The man was reported to be in h 80s.

Marti English, who operates an electrolysis business in Litchfield Park, was taken to an area hospital after hurting her back trying to pul her husband from the water. Her c dition was not immediately known

Burning body found by road near Buckey

View report

Authorities are investigating an unidentified body found bound and burning Sunday night east of Buck eye.

The body was found around 7:3 p.m. after a passing motorist report what he thought was a small brush fire just southeast of MC 85 and Jackrabbit Trail.

"When he approached, he realiz it's not a brush fire, it's actually a body that's on fire," said Bill Knigi of the Maricopa County Sheriff's Office.

Investigators found the body had been bound and were still investig ing Monday morning. No informa- tion on the victim, including wheth the body was male or female, was immediately available.

p. A 10

WEST VALLEY VIEW
AVONDALE, AZ
WEEKLY 35,000
DEC 19 2001

ARIZONA CLIPPING SERVICE
1600 RM

Arizona Clipping Service
49 East Thomas Road, Suite 216
Phoenix, AZ 85012-3105

Natural gas storage plans bogged down in red tape

by Darryl Henning
associate editor

Last January, Pinnacle West Energy announced it was about to conduct a study on the feasibility of putting an underground natural gas storage facility in a salt cavern on a 30-acre site near the Morton Salt facility at Glendale Avenue and Dysart Road in the West Valley.

All of February was spent getting drilling core samples and plugging up the hole. Several months now have elapsed, and while the results of that study have not yet been released, Pinnacle West spokeswoman Sherry Foote said that company officials are closely analyzing the results.

"There are many different components been to be laid out in front of us," she said recently. "We're analyzing all sorts of factors."

When the plan was first announced, Pinnacle West declared that if the decision was made to go forward with the project, cavern development could begin as early as June 2002. While declining to confirm that date, Foote did say that if the feasibility decision were positive, "it [storage facility] still would start next year."

A checkerboard of regulatory approvals is needed before a natural gas storage facility can be put in a West Valley salt cavern.

Corporation Commission not involved

The first inquiry made was to the Arizona Corporation Commission, which regulates the state's utilities, including the natural gas industry. Rate setting and oversight of pipeline safety are but a few of its duties.

"The commission regulates the utility side; but it's not involved" in the drilling and storage side, said Heather Murphy, spokeswoman for the ACC's Utilities Division, who referred the reporter to the state's Department of Environmental Quality, Department of Mines and Mineral Resources and Arizona Geological Survey.

Ken Phillips of the Department of Mines and Mineral Resources said he thought the site being studied would be perfect for such a storage facility.

"This is the deepest salt deposit in the state," Phillips said, referring to the area at Glendale Avenue and Dysart Road, where the Morton Salt facility sits. "It's 20 cubic miles. A cubic mile is one mile wide by one mile long by one mile deep."

Additionally, it's well over 1,000 feet down to the top of the cavern, he said, and a liquefied petroleum gas storage facility is nearby that's been there for 20 years.

"It's uniquely stable," Phillips said, referring to salt cavern storage of the natural gas. "I don't believe there's ever been a report of any coming to the surface but of a cavern. Liquid gases will not dissolve salt. It's a very stable environment."

As far as development of an underground natural gas storage facility, however, his department would not be involved in the regulatory process, Phillips said.

"ADEQ would be involved with water quality issues, and maybe the ACC for pipeline safety, though it's more geology safety than pipeline safety," he said. "You want to talk with Steve Ranzi of the Oil and Gas Commission at the Arizona Geological Survey."

A call next to ADEQ spokesman Kurt Maurer required some research to see just what involvement his department might have with such a project.

"We'd have to issue an aquifer protection permit for the storage facility once it was operational," Maurer said in a subsequent phone call.

Oil and Gas Commission would inspect project

Visiting the Arizona Geological Survey's Web site (www.azgs.state.az.us) and Ranzi, administrator for Survey's Oil and Gas Commission, tapped a veritable mother lode of pertinent information.

The commission's Web page on AGS' Web site confirmed that Pinnacle West (through its subsidiary, SunCor Development Co., owner of the site being studied) had applied for and received a drilling permit to perform a stratigraphic test in the Luke salt deposit earlier this year.

"They drilled down 4,900 to 5,000 feet. It's a deep cavern," Ranzi said. "The top of the cavern is about 3,000 feet into the salt."

Arizona Administrative Code §12-7-103 required the company to file a $10,000 performance bond with the commission, Ranzi said. And per the code section, the

(See Gas, page A11)

Gas

(From page [illegible])

[illegible] well was conditioned upon the driller's faithful performance, "to drill each well in a manner to prevent waste, plug each dry or abandoned well, repair each well causing waste or pollution and maintain and restore the well site."

If Pinnacle West does decide to proceed with developing its proposed natural gas storage facility, it will have to file a separate application for an injection well permit with the Oil and Gas Commission.

"The Oil and Gas Commission has to make sure the [illegible] in compliance with the rules," Ranzi said, citing the Arizona Administrative Code §12-7-175 and 176. "There's a whole bunch of things they have to do."

AAC §12-7-176 requires a permit applicant to file with its application:

- A detailed plat showing the location of each proposed injection well and the location and status of all wells within one-half mile of the proposed well
- A detailed geologic study
- A detailed engineering study
- A detailed inspection plan
- Proof of notification to neighboring operators and surface owners within one-half mile of the proposed well
- Supplementary data as required by AAC §12-7-180 for storage-well projects
- Any additional information that the commission may determine is necessary to adequately clarify the information submitted above.

"I go over the application and materials and make sure they're in accordance with the rules," he said. "Then I make a recommendation to the commission."

A hearing before the Oil and Gas Commission is then scheduled and a notice of hearing issued.

"All adjacent landowners are notified," Ranzi said.

The commission normally takes matters under submission, issuing its decision soon thereafter.

"And then if approved, we make inspections [illegible] of course," Ranzi added.

In fact, AAC §12-7-182C provides for two inspections annually.

"Each operator of a storage well shall conduct semiannual safety inspections of the operator's facility ... [and] notify the Commission at least 5 days before an inspection to allow a representative of the Commission to witness the inspection," according to the code.

Additionally, a full written report on the inspection procedures and results then must be filed with the Oil and Gas Commission within five days following the inspection.

Facility to serve large region

The proposed West Valley natural gas storage facility project is the joint project of Pinnacle West Crystal Gas Storage Inc., an affiliate of El Paso Energy Corp., and Gaz de France, an international natural gas storage developer.

There are about 400 underground natural gas storage projects in the United States, 27 of which are salt cavern projects similar to the one under consideration by Pinnacle West. None currently exists in Arizona.

Depleted reservoirs and aquifers are the most common type of natural gas storage, but salt caverns are becoming more common. Salt caverns are formed by injecting water into a salt deposit to dissolve the salt, and then pumping out the brine until the cavern reaches a pre-determined depth.

"Customarily, the storage cavern is 1,000 feet tall and about 180 feet in diameter," Pinnacle West spokesman Alan Bonnell told the *View* earlier this year. "The gas would be stored about 2,000 feet below the surface of the ground."

The salt in the salt cavern is naturally sealing, providing an additional security feature to such storage. And there's no danger of explosion.

"There's no oxygen underground, so it can't explode," Bonnell said. "Physically, the natural gas is less dense than propane or butane — even air. And if it escaped into the air, it would dissipate almost immediately."

The storage facility would serve as a regional alternative to gas storage facilities in other states. In addition to offering a reliable, quick-response supply buffer during periods of high seasonal demand, it also would provide a source of natural gas for turbines at power plants currently under construction in western Maricopa County.

The cavern also could serve other natural gas [illegible] in the Southwest United States. The proposed location is about two miles from an existing, major natural gas transmission system.

Darryl Herring can be reached by e-mail at dherring@westvalleyview.com.

West Valley View

December 19, 2001

Natural gas storage plans bogged down in red tape

by Darryl Henning
Associate Editor

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West Valley View: December 19, 2001

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Darryl Henning can be reached by e-mail at dhenning@westvalleyview.com.

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1-2-02 Matt Reid & Curt Brechtel called

Drilling @ 3217' in granit-like fm. Chlorides ~ 800 ppm

Drilling in City of Goodyear ∴ need

County requirement

(1) Permit for temporary electrical generation (30 days max)

(2) " " blasting - considered during fishing operation

(3) " and additional sign for storing hazardous materials

= 1st well within City limits so breaking new ground

City permit requirements all seem reasonable.

Plan to switch over to electric power within 30 days

1-3-02 Charles Tucker calls (623-853-9253)

At 3507' & never did hit salt - Solid granite from 2792'

Plan to set $13\frac{3}{8}$" to ~3045' & cmt & nipple up bope

Underream 12¼" hole to ± 3045'

Open hole logs sometime tomorrow ~ noon

1-4-02 Charles Tucker ~ 5 pm

Going in hole with logs

est. run CSG and cmt Sunday - 2 stage

CSG shoe ~ 3070' D.V. tool ~ 1204'

C2 Emsco drawworks 2000 hp., Fallview mast.

2 1000 hp pumps, 3 generators

Subject: RE: Copper Eagle Gas Storage - Disposal Well Site
Date: Wed, 2 Jan 2002 12:35:59 -0700
From: james.young@wgint.com (James E Young)
To: "Steve Rauzi" <steve.rauzi@azgs.az.gov>

Steven,

Thank you for this information!

Jim

-----Original Message-----
From: Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]
Sent: Wednesday, January 02, 2002 12:36 PM
To: James E Young
Subject: Re: Copper Eagle Gas Storage - Disposal Well Site

Mr. Young,

Copper Eagle is drilling a stratigraphic test near Luke AFB in sw sw 24-2n-2w.
It is not a brine disposal well. The purpose of the hole is to obtain subsurface geological information. Oil and gas activity in Arizona is summarized on our web site at http://www.azgs.az.gov/.

Steven L. Rauzi
Oil and Gas Administrator

James E Young wrote:

> *Mr. Rauzi,*
>
> *I am trying to find the location of the Copper Eagle Gas Storage brine*
> *disposal well (somewhere by Luke AFB). Where can I find this information* on
> *the AZ web site.*
>
> *Regards,*
> *James E. Young*
> *james.young@wgint.com*

Subject: RE: CEGS SunCor 1-24
Date: Fri, 21 Dec 2001 09:34:47 -0600
From: "Hayden, David" <David.Hayden@ElPaso.com>
To: 'Steve Rauzi' <steve.rauzi@azgs.az.gov>

Steve:

I just received word from the rig that they plan to spud sometime today. We anticipate setting surface +/- 3000' but could encounter top of salt around 2200' so timing for setting surface pipe is being estimated to occur around next Wednesday or Thursday.

We will be logging the surface hole with a full suite of open hole logs and then running a velocity survey before setting surface pipe. 48 hours after setting surface we will be running a Cement Bond Log.

It will be Monday before the phone company has a line installed but we can be reached via cell phones:

My cell number is (318) 458-4766
Jim Lingafelter the drilling supervisor here in Shreveport is (318) 347-2799
Charles Tucker the drilling supervisor at the rig is (318) 464-0575

Please feel free to call any of us at any time. We will all be on call all weekend and through the holidays. I plan to be on location when we log.

Have a great Holiday!!

David

-----Original Message-----
From: Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]
Sent: Friday, December 21, 2001 8:53 AM
To: Hayden, David
Subject: CEGS SunCor 1-24

Dave, What's the outlook for your hole? I'll be in the office unitl about 2 pm today but I plan to be out of town next week. Is there a number at the rig? I may call you sometime next week. Steve

****
This email and any files transmitted with it from the ElPaso Corporation are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the sender.
****

12-17-01 Matt Reid
Equipment on site, substructure erected
Pre-spud mtg today.
May spud by Tuesday - Thurs, Friday at latest.
Site more exposed than last - closer to road.
More curiousity visitors but no complaints

12-20-01 Martin Zeleznick, EPA San Francisco 415-972-3543
Called to introduce self + coordinate CEGS Stat test.
plans to witness SRT. prefers 8 step vs. 5 step. = more points.
Disposal capability make or break for the project.

12-21-01 Charles Tucker called
Rigged up + try to Spud in today.
his phone 623-535-8469 (current #)

Matt Reid called - latest report to spud in this evening
expect to be running loss Christmas day.

12-23-01 Spud hole midnight 12-23-01

12-31-01 Visited location Sunday 12-30-01. Pulled washover tool and fish to surface. Lost fish (twisted off ~ 3 joints above collars) ± 12-25-01.

Subject: Copper Eagle - SunCor 1-24 Activity Report
Date: Fri, 14 Dec 2001 15:12:05 -0600
From: "Hayden, David" <David.Hayden@ElPaso.com>
To: "Steve Rauzi (E-mail)" <steve.rauzi@azgs.az.gov>

Steve:

Thought you may like an update. Have a great weekend!

<<SUNCOR1-24.txt>>

Thanks,

David L. Hayden
Crystal Gas Storage, Inc. an El Paso Company
401 Edwards St., Suite 1300
Shreveport, LA 71101
Tel.: (318) 677-5511
Fax: (318) 677-5515

****
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****

SUNCOR1-24.txt	**Name:** SUNCOR1-24.txt **Type:** Plain Text (text/plain) **Encoding:** quoted-printable

Subject: SunCor #1-24
Date: Thu, 13 Dec 2001 16:22:19 -0600
From: "Hayden, David" <David.Hayden@ElPaso.com>
To: "Steve Rauzi (E-mail)" <steve.rauzi@azgs.az.gov>

Steve:

Wanted to give you an update on our progress. Location is complete, conductor casing has been set (using a water well rig) and Nabors Drlling is currently in the process of moving in and rigging up the drilling rig. MI/RU should continue through the weekend with a pre-spud meeting planned for Monday morning followed by a safety meeting. Current estimate for spud is Tuesday or Wednesday morning. Best guess at this point for running surface casing is Friday or Saturday, December 21/22. I will keep you posted on our progress and the rig has orders to provide you with the required notifications. Charles Tucker is the wellsite drilling supervisor (same individual that was on the Suncor #1-2).

Thanks,

David L. Hayden
Crystal Gas Storage, Inc. an El Paso Company
401 Edwards St., Suite 1300
Shreveport, LA 71101
Tel.: (318) 677-5511
Fax: (318) 677-5515

****
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****

Subject: RE: Forms
Date: Mon, 3 Dec 2001 10:23:38 -0700
From: "Reid, Matthew J(Z78047)" <MJREID@apsc.com>
To: "'Steve Rauzi'" <steve.rauzi@azgs.az.gov>

Thanks for the help Steve. It looks like we will not be moving the drill site afterall. I will let you know ASAP when we have a 1st draft schedule for the drilling.

Matt

-----Original Message-----
From: Steve Rauzi [mailto:steve.rauzi@azgs.az.gov]
Sent: Friday, November 30, 2001 10:26 AM
To: Reid, Matthew J(Z78047)
Subject: Forms

Matt, I've attached clean APD and Sundry forms for your use. Steve

97 FERC ¶ 62, 193
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Copper Eagle Gas Storage L. L. C. Docket No. CP02-8-000

ORDER GRANTING PETITION FOR EXEMPTION
OF TEMPORARY ACT OR OPERATION

(Issued November 30, 2001)

This order grants, subject to certain conditions, the authority requested by Copper Eagle Gas Storage L. L. C. (Copper Eagle) on October 17, 2001, as supplemented on November 8, 2001, in the above referenced docket.

PROPOSA 11-30-01

Cop Matt Reid + Curt Brechtel tules of
Practice ar s Act
(NGA), ar Move location ~300' to north GA for
the sole p = okay per R12-7-105)
determine osal during
the devel Send Amended APD in Rewrite will ricopa
County, Issue new APD

C tion 2(6) of
the NG rganized
under tl ed by
APACS Holdings, L. L. C. PACS
Holdings are SunCor Development Company (SunCor) nergy
Corporation.

Specifically, Copper Eagle proposes to drill a 7,000-foot-deep stratigraphic test well into the sub-salt strata located in Section 24, Township 2 North, Range 2 West, Maricopa County, Arizona. Copper Eagle states that the test well will enable it to obtain geological and physical characteristics of the sub-surface strata. The results will determine whether brine, produced during the solution mining of a salt cavern, can be disposed of safely through deep well injection. The data obtained from this test well are

[1] 18 CFR § 385.207 (2000).

97 FERC ¶ 62, 193
UNITED STATES OF AMERICA
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(Issued November 30, 2001)

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PROPOSAL/DISCUSSION:

Copper Eagle filed a petition under Rule 207(a)(5) of the Commission's Rules of Practice and Procedure[1] requesting, under Section 7(c) (1)(B) of the Natural Gas Act (NGA), an exemption from the certificate requirements of Section 7(c) of the NGA for the sole purpose of drilling a stratigraphic test well. The test results will help to determine the feasibility of utilizing deep injection as the method of brine disposal during the development of a natural gas storage cavern in the Luke Salt deposit in Maricopa County, Arizona.

Copper Eagle is not a "natural gas company" within the meaning of section 2(6) of the NGA and holds no Section 7 certificates. Copper Eagle is a corporation organized under the laws of the State of Arizona and is a limited liability company formed by APACS Holdings, L. L. C. and Crystal Gas Storage, Inc.. The members of APACS Holdings are SunCor Development Company (SunCor) and Pinnacle West Energy Corporation.

Specifically, Copper Eagle proposes to drill a 7,000-foot-deep stratigraphic test well into the sub-salt strata located in Section 24, Township 2 North, Range 2 West, Maricopa County, Arizona. Copper Eagle states that the test well will enable it to obtain geological and physical characteristics of the sub-surface strata. The results will determine whether brine, produced during the solution mining of a salt cavern, can be disposed of safely through deep well injection. The data obtained from this test well are

[1] 18 CFR § 385.207 (2000).

needed for the necessary regulatory approvals for brine disposal should Copper Eagle proceed with the development of a natural gas storage facility.

INTERVENTIONS:

Notice of Copper Eagle's petition was published in the Federal Register on November 2, 2001 (66 Fed. Reg. 55648). No motions to intervene or to protest the petition were filed.

ENVIRONMENTAL:

Copper Eagle states that it will comply with the environmental requirements of the Arizona Oil and Gas Conservation Commission (AOGCC) and any applicable environmental requirements of 18 CFR § 157.206 (b), as modified by Order No. 603.[2] Therefore, granting the exemption for drilling the test well should have limited surficial environmental impact. The AOGCC has specific regulations governing the drilling of a well, surface casing requirements, and plug and abandonment procedures for the protection of groundwater. Copper Eagle has received a permit to drill from the AOGCC.

FINDINGS:

At a hearing held on the issue date noted above, all evidence, including the petition and supplement thereto, submitted in support of the authorization sought herein, became part of the record in this proceeding.

Copper Eagle's proposal is subject to the certificate requirements of section 7 of the NGA because it involves the potential development of storage facilities for natural gas transported in interstate commerce. Section 7(c)(1)(B), however, provides that "the Commission may . . . exempt from the requirements of this section temporary acts or operations ... ." Previously, the Commission granted this type of exemption to SunCor,

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[2]Order No. 603, Revision of Existing Regulations Under Part 157 and Related Sections of the Commission's Regulations Under the Natural Gas Act, FERC Stats & Regs., ¶ 31,073 (1999).

a Copper Eagle member, to drill a test well in the Luke salt deposit for the purpose of determining the feasibility of developing the site as a gas storage facility.[3]

Copper Eagle states that its purpose in drilling the proposed test well is to determine the feasibility of brine disposal. Without such a test well, Copper Eagle cannot make an informed business and engineering decision as to developing a natural gas storage facility near this site. As Copper Eagle is not currently a natural gas company, there are no existing jurisdictional facilities, current storage services, or customers that might be affected.

Copper Eagle will bear the full costs of drilling the well. The construction and testing will be temporary in nature in order to determine the feasibility of brine disposal needed for the possible storage project. No service will be rendered. The exemption shall be used solely for drilling the well, obtaining the necessary geological and engineering data, and abandoning the well. Under these circumstances, the test-related activities constitute a temporary act or operation within the meaning of section 7(c)(1)(B) that may be exempted from the certificate requirements of section 7 of the NGA. Further, Copper Eagle's proposed temporary act warrants an exemption from the certificate requirements of section 7(c) of the NGA. Issuance of the exemption, however, is without prejudice to any decision the Commission may make in regard to any application Copper Eagle may file for authorization for a storage project at the site.

Pursuant to 18 CFR § 375.308, it is ordered that:

(A) Upon the terms and conditions of this order and pursuant to Section 7(c)(1)(B) of the NGA, Copper Eagle is granted an exemption from the certificate requirements to install facilities to test the feasibility of using deep injection for the disposal of brine, as described above and more fully in Copper Eagle's petition.

(B) Copper Eagle shall notify the Commission within ten days of beginning the drilling described above and within ten days of the end of drilling.

(C) The test well shall be used solely for the testing purposes described above.

---

[3] See SunCor Development Company, 94 FERC ¶ 61,077 (2001).

(D) The exemption granted in Ordering Paragraph (A) is effective upon issuance of this order.

(E) The authorized drilling and testing activities shall be completed within one year of the date of this order.

(F) Copper Eagle shall comply with the requirements of section 157.206(b) of the Commission regulations in implementing the authorized drilling and testing activities.

(G) This order constitutes final agency action. Requests for rehearing by the Commission my be filed within 30 days of the date of issuance of this order pursuant to 18 C.F. R. § 385.713.

Robert J. Cupina
Deputy Director
Office of Energy Projects

Stratigraphic test near Phoenix projected to 7500 ft

COPPER EAGLE Gas Storage LLC, Phoenix, will drill a 7500-ft stratigraphic test in south-central Arizona on the western outskirts of the greater Phoenix metropolitan area.

The 1-24 SunCor Development Co-Fee, Maricopa County, is under contract to Nabors Drilling USA Inc and is expected to get under way later this month.

SunCor, a wholly owned subsidiary of Pinnacle West Capital Corp—among other things the holding company for Arizona Public Service, Arizona's largest electric utility—is a Phoenix-based real estate developer.

Approximately six miles to the northeast, SunCor early this year drilled an approximate 5250-ft stratigraphic test at the 1-2 SunCor Development Co in se sw 2-2n-1w. The latter well was drilled on undeveloped acreage adjacent to an industrial area just east of Luke Air Force Base (RMRR 1-10-01). Nabors' Rig #164 drilled the venture, which was expected to be drilled into the Miocene Luke salt deposit. No details have been disclosed.

Five other wells previously were drilled in section 2-2n-1w, primarily LPG-storage/utility and salt solution-mining wells. Total depths range from 3200 to 4503 ft.

Two miles northeast of the 1-24 SunCor Development Co-Fee, Bob James Drilling & Exploration in 1988 completed the 1-19 SunCor, ne ne 19-2n-1w, as a 4000-ft dry hole. The latter well drilled into Miocene salt at a depth of 1716 ft.

In 1992, Arrowhead Resources (USA) Ltd completed a 6650-ft dry hole at the 32-23 SunCor-Melange, sw ne 23-2n-1w, a little more than five miles east of the new stratigraphic probe. That wildcat, which had been set up to penetrate volcanics, encountered a water aquifer at a depth of 400-600 ft.

Kaler acquires only parcel at Nebraska state lease sale

KALER OIL Co, Gainesville, Texas, was the successful bidder for the sole tract offered at an oil and gas lease sale held by the Nebraska Board of Educational Lands and Funds on Tuesday, October 30, in Lincoln (RMRR 10-12-01).

Kaler bid $540.52, or $2.00 an acre, for the 270.26-acre parcel, which comprises the bed of the Republican River to the ordinary high-water mark as it lies in sections 27, 28, 31, 32 and 33 of 2n-36w, and section 6-1n-36w, Dundy County. The lease will be for a primary term of five years with a one-sixth royalty and annual delay rentals of $2.00 per acre.

Post-it® Fax Note 7671	Date 11-29-01	# of pages ▶ 1
To Bruce Russell	From Steve Ranzi	
Co./Dept. PB KBB	Co. AZGS	
Phone #	Phone # 520-770-3500	
Fax # 281-589-5865	Fax #	

Jane Dee Hull
Governor

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Larry D. Fellows
Director and State Geologist

November 1, 2001

Mr. David R. Smith
County Administrative Officer
301 W. Jefferson
Phoenix, AZ 85003

Re: Copper Eagle Gas Storage LLC #1-24 Suncor Development Co.
SW SW Sec. 24, T. 2 N., R. 2 W.
State Permit #909

Dear Mr. Smith:

I have enclosed a copy of an approved drilling application for your information. The Arizona Oil and Gas Conservation Commission has a policy to keep county government informed about proposed exploration and stratigraphic drilling in a county. The referenced well is a stratigraphic test. It is being drilled for the sole purpose of obtaining subsurface geological information.

The Commission issues a "Permit to Drill" under A.R.S. § 27-513. The Commission approves an application after it has determined that a well is in compliance with applicable law (A.R.S. § 27-516) and rules (12 A.A.C. 7), which safeguard the public health and safety, correlative rights, and subsurface resources.

Please let me know if we may be of further assistance.

Sincerely,

Steven L. Rauzi
Oil and Gas Administrator

Enclosure

c: J. Dale Nations, Chairman, Oil and Gas Conservation Commission
Larry D. Fellows, Director and State Geologist

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Jane Dee Hull
Governor

Larry D. Fellows
Director and State Geologist

November 1, 2001

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County Administrative Officer
301 W. Jefferson
Phoenix, AZ 85003

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Sincerely,

Steven L. Rauzi

Steven L. Rauzi
Oil and Gas Administrator

Enclosure

c J. Dale Nations, Chairman, Oil and Gas Conservation Commission
Larry D. Fellows, Director and State Geologist

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Jane Dee Hull
Governor

Larry D. Fellows
Director and State Geologist

October 31, 2001

Mr. Matt Reid
Copper Eagle Gas Storage LLC
400 North 5th Street
Phoenix AZ 85004

Re: Copper Eagle Gas Storage LLC #1-24 Suncor Development
SW SW Sec. 24, T. 2 N., R. 2 W.
State Permit #909

Dear Mr. Reid:

I have attached an approved copy of your Application to Drill, Permit to Drill #909; and filing fee receipt #3111. A copy of the Permit to Drill should be posted in a conspicuous place at the well site during drilling operations.

This permit is issued on the condition that you conduct operations in compliance with all applicable rules as outlined in your drilling prognosis and that you notify me at least 24 hours before you:

1) move in the drilling rig and commence drilling operations;
2) run and cement surface casing; and
3) nipple up and test the BOPE before drilling out of the surface casing.

I have enclosed several Sundry Notices (Form 25) for you to provide this office with a weekly summary of wellsite activity (drilling, running casing, coring, testing, logging, etc.). Please record water encountered on the separate "Report of Water Encountered During Drilling" form. Samples are required.

This office will hold all information confidential under R12-7-121.

Sincerely,

Steven L. Rauzi

Steven L. Rauzi
Oil & Gas Administrator

Enclosures

Subject: FW: Updated and Revised Drilling Prognosis
Date: Mon, 29 Oct 2001 15:13:42 -0700
From: "Reid, Matthew J(Z78047)" <MJREID@apsc.com>
To: "Steve Rauzi (E-mail)" <rauzi_steve@pop.state.az.us>

Steve:

I have enclosed the latest draft of the drilling prognosis for the Copper Eagle Stratigraphic Test...FYI. I am currently planning on traveling to Tucson on Wed with all the permit information. I expect to have all the portions of the permit completed tomorrow. Once I have everything ready, I update you on the time I expect to be in Tucson.

Thanks, Matt

-----Original Message-----
From: Hayden, David [mailto:David.Hayden@elpaso.com]
Sent: Monday, October 29, 2001 10:00 AM
To: Reid, Matthew J(Z78047); Ballew, Jeff; Jim Lingafelter (E-mail)
Subject: Updated and Revised Drilling Prognosis

Discovered some minor typos. This should be the final subject to the insertion of a well plat.

<<Stratigraphic Injection Well Program.DOC>>

Thanks,

David L. Hayden
Crystal Gas Storage, Inc. an El Paso Company
401 Edwards St., Suite 1300
Shreveport, LA 71101
Tel.: (318) 677-5511
Fax: (318) 677-5515

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****

Stratigraphic Injection Well Program.DOC	**Name:** Stratigraphic Injection Well Program.DOC **Type:** WINWORD File (application/msword) **Encoding:** base64

State of Arizona
Arizona Geological Survey
416 W. Congress, Suite 100
Tucson, Arizona 85701
(520) 770-3500

Jane Dee Hull
Governor

Larry D. Fellows
Director and State Geologist

MEMORANDUM TO FILE

DATE: October 26, 2001

FROM: SLR Steven L. Rauzi
Oil and Gas Administrator

SUBJECT: Known and reasonably estimated freshwater aquifers in vicinity of Copper Eagle's proposed stratigraphic test located in:

SW SW Sec. 24, T. 2 N., R. 2 W., Maricopa County, Permit to Drill #909

Rick Herther, Basic Data Section, Arizona Department of Water Resources, provided the following information about the deepest water wells that are registered with the department in the vicinity of the proposed well.

Sec. 24, T. 2 N., R. 2 W. (Most registered to SunCor Development Company)

B(02-02)24bbb, 998 ft deep.
B(02-02)24cbb, 1007 ft deep.
B(02-02)24ccc, 1008 ft deep.
B(02-02)24dbb, 956 ft deep.
Plus several monitoring wells less than 100 ft deep.

Sec. 25, T. 2 N., R. 2 W.

B(02-02)25abb, 2000 ft deep, drilled 1966, registered to SunCor Development Company.

Sec. 19, T. 2 N., R. 1 W.

B(02-01)19cbb, 1220 ft deep, drilled 1954, registered to SunCor Development Company.

Copper Eagle's proposal to set 13 3/8" surface casing from the surface to the top of the salt or 3000' will be sufficient to protect the surface waters and all other reasonably estimated aquifers in the vicinity of the proposed well.