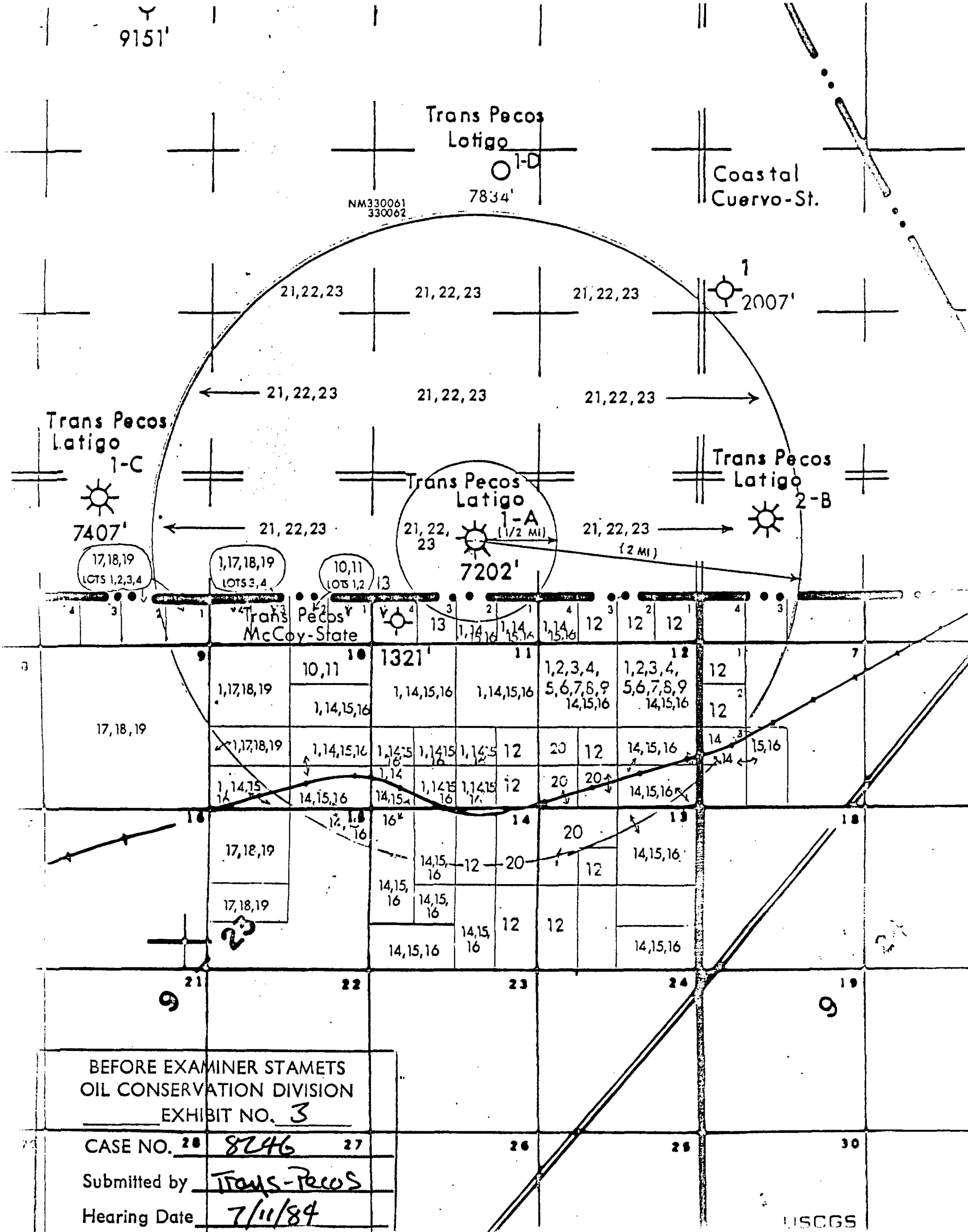


BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
EXHIBIT NO. 3

CASE NO. 8246

Submitted by Trans-Pecos

Hearing Date 7/11/84

EXHIBIT "A" to LEASE PLAT

FORM C-108, LATIGO RANCH 1-A
ENHANCED OIL RECOVERY PILOT

(Hydrocarbon Miscible Flooding)

1. Oil and Gas Lease from Dorothy Benton and Evelyn Benton, Lessors, to Leonard Minerals Company, Lessee, dated March 10, 1982, expiration date March 10, 1987, Recorded Bk. 46, Page 86, of the Miscellaneous Records Guadalupe County, New Mexico.

2. Oil and Gas Lease from Stanley Green, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 375, of the Miscellaneous Records Guadalupe County, New Mexico.

3. Oil and Gas Lease from Charles Green, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 220, of the Miscellaneous Records Guadalupe County, New Mexico.

4. Oil and Gas Lease from Edna Mick, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 218, of the Miscellaneous Records Guadalupe County, New Mexico.

5. Oil and Gas Lease from Lavada Kenney, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 371, of the Miscellaneous Records Guadalupe County, New Mexico.

6. Oil and Gas Lease from Helen Botkin, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 373, of the Miscellaneous Records Guadalupe County, New Mexico.

7. Oil and Gas Lease from Sidney A. Green, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 527, of the Miscellaneous Records Guadalupe County, New Mexico.

8. Oil and Gas Lease from Frances Owens, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 855, of the Miscellaneous Records Guadalupe County, New Mexico.

9. Oil and Gas Lease from Lawrence Green, Lessor, to Leonard Minerals Company, Lessee, dated June 22, 1982, expiration date June 22, 1987, Recorded Bk. 47, Page 760, of the Miscellaneous Records Guadalupe County, New Mexico.

10. Oil and Gas Lease from Zera G. Mollenhauer, Lessor, to Leonard Minerals Company, Lessee, dated February 8, 1982, expiration date February 8, 1987, Recorded Bk. 46, Page 84, of the Miscellaneous Records Guadalupe County, New Mexico.

11. Oil and Gas Lease from Robert Lee Mollenhauer, Lessor, to Leonard Minerals Company, Lessee, dated March 15, 1982, expiration date March 15, 1987, Recorded Bk. 46, Page 156, of the Miscellaneous Records Guadalupe County, New Mexico.

12. USA Lease No. NM 25979, dated November 23, 1976, expiration date December 1, 1986.

13. State of New Mexico Lease No. LG-4561, dated September 1, 1977, expiration date September 1, 1987.

14. Oil and Gas Lease from Madeleine Means, Lessor, to Jerry L. Hooper, Lessee, dated January 29, 1982, Recorded in Bk. 45, Page 890, of the Miscellaneous Records of Guadalupe County, New Mexico.

15. Oil and Gas Lease from Blanche Holbrook Williams, Lessor, to Jerry L. Hooper, Lessee, dated January 21, 1982, Recorded Bk. 45, Page 891, of the Miscellaneous Records Guadalupe County, New Mexico.

16. Oil and Gas Lease from Selma Holbrook, Lessor, to Jerry L. Hooper, Lessee, dated January 22, 1982, Recorded in Bk. 45, Page 881, of the Miscellaneous Records of Guadalupe County, New Mexico.

17. Oil and Gas Lease from Blanche Holbrook, Lessor, to Jerry L. Hooper, Lessee, dated January 21, 1982, Recorded in Bk. 46, Page 75, of the Miscellaneous Records of Guadalupe County, New Mexico.

18. Oil and Gas Lease from Madeleine Means, Lessor, to Jerry L. Hooper, Lessee, dated January 29, 1982, Recorded in Bk. 46, Page 81 of the Miscellaneous Records of Guadalupe County, New Mexico.

19. Oil and Gas Lease from Selma Holbrook, a widow, Lessor, to Jerry L. Hooper, Lessee, dated January 22, 1982, Recorded Bk. 46, Page 78, of the Miscellaneous Records of Guadalupe County, New Mexico.

20. Oil and Gas Lease from Walter E. Layton, et ux, Lessor, to A. C. Gray, Lessee, dated December 9, 1981, Recorded in Bk. 45, Page 15, of the Miscellaneous Records of Guadalupe County, New Mexico.

21. Oil and Gas Lease from Diamond "A" Cattle Company, Lessor, to Leland A. Hodges, Trustee, Lessee, dated December 14, 1979, Recorded in Bk. 41, Page 364, of the Miscellaneous Records of Guadalupe County, New Mexico.

22. Oil and Gas Lease from Diamond "A" Cattle Company, Lessor, to Leland A. Hodges, Trustee, Lessee, dated December 14, 1979, Recorded in Bk. 41, Page 354, of the Miscellaneous Records of Guadalupe County, New Mexico.

23. Oil and Gas Lease from Diamond "A" Cattle Company, Lessor, to Leland A. Hodges, Trustee, Lessee, dated December 14, 1979, Recorded in Bk. 41, Page 359, of the Miscellaneous Records of Guadalupe County, New Mexico.

CERTIFIED MAIL #P 364-737-019
RETURN RECEIPT REQUESTED

TRANS PECOS

June 13, 1984

State of New Mexico
Energy and Minerals Department
Oil Conservation Division
Post Office Box 2088
State Land Office Building
Santa Fe, New Mexico 87501

Attention: Roy Johnson

Re: Latigo Ranch 1-A
Enhanced Oil Recovery
Pilot Project
Guadalupe County, New Mexico

Gentlemen:

Submitted herewith is Trans Pecos Resources' Application for Authorization to Inject (Form C-108) regarding its recovery enhancement project on the Trans Pecos Latigo Ranch Wells.

Also enclosed by way of support is a copy of the "Dual Laterlog" Gamma Ray Log for the Trans Pecos Latigo Ranch #1-A Well and a copy of a report entitled "Mechanical Properties Under Triaxial Compressive Loading" compiled by Terra Tek Research and pertaining to the Trans Pecos Latigo Ranch No. 1-D Well.

Copies of this application have been mailed this day by certified mail to Diamond "A" Cattle Company, owner of the surface of the land upon which the 1-A Well is located and to all leasehold operators within one-half mile of the well location. As we are in receipt of the certified mail return receipts, same will be forwarded to your office.

Should you have any questions or require further documentation in this matter, please so advise the undersigned.

BEFORE EXAMINER STAMETS
OIL CONSERVATION DIVISION
EXHIBIT NO. 2
CASE NO. 8246
Submitted by TRANS-PECOS
Hearing Date 7/11/84

Yours very truly,

Robert G. McKinney
President

RGM:bls
Enclosure

CERTIFIED MAIL #
RETURN RECEIPT REQUESTED

June 12, 1984

Diamond "A" Cattle Company
P. O. Box 1000
Roswell, New Mexico 88204

Attention: Phil Helmig

Re: Latigo Ranch 1-A
Enhanced Oil Recovery Pilot
Project
Guadalupe County, New Mexico

Gentlemen:

Pursuant to Section XIV of State of New Mexico Energy and Minerals Department Form C-108, enclosed herewith is a copy of an Application for Authorization to Inject, regarding Trans Pecos Resources, Inc.'s Enhanced Oil Recovery Pilot Project on the Latigo Ranch 1-A Well.

Very truly yours,

Robert G. McKinney
President

RGM:bls
Enclosure

TRANS PECOS

CERTIFIED MAIL #P 364-737-020
RETURN RECEIPT REQUESTED

June 12, 1984

Jerry L. Hooper
P. O. Box 2086
Midland, Texas 79702

Re: Latigo Ranch 1-A
Enhanced Oil Recovery Pilot
Project
Guadalupe County, New Mexico

Dear Mr. Hooper:

Pursuant to Section XIV of State of New Mexico Energy and Minerals Department Form C-108, enclosed herewith is a copy of an Application for Authorization to Inject, regarding Trans Pecos Resources, Inc.'s Enhanced Oil Recovery Pilot Project on the Latigo Ranch 1-A Well.

Very truly yours,

Robert G. McKinney

RGM:bls
Enclosure

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: [X] Secondary Recovery [ ] Pressure Maintenance [ ] Disposal [ ] Storage
Application qualifies for administrative approval? [ ] yes [ ] no

II. Operator: Trans Pecos Resources, Inc.

Address: 800 Gessner, Suite 790, Houston, Texas 77024

Contact party: Jack J. Gawron Phone: (505) 472-5212

III. Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? [ ] yes [X] no Enhanced Oil Recovery Pilot (Hydrocarbon Miscible Flooding
If yes, give the Division order number authorizing the project _____.

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review. (See Exhibit "I", Attached)

* VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail. (See Exhibit "I" Attached)

VII. Attach data on the proposed operation, including: (See Exhibit "I" Attached)

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval. (See Exhibit "I" Attached)

IX. Describe the proposed stimulation program, if any. (See Exhibit "I" Attached)

* X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.) (See Exhibit "I" Attached)

* XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken. (See Exhibit "I" Attached)

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water. (See Exhibit "I" Attached)

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification (See Exhibit "I" Attached) (See Exhibit "I" Attache

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Robert G. McKinney Title President, Trans Pecos Resources

Signature: _____ Date: _____

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it ~~need not~~ be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal: 6-21-82 - Enclosed with C-105 for referenced well.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate Division district office.

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; location by Section, Township, and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells:

(3) the formation name and depth with expected maximum injection rates and pressures; and

(4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

INJECTION WELL DATA SHEET SIDE 1

Trans Pecos Resources, Inc.	Latigo Ranch Block "A"			
OPERATOR	LEASE			
1	1980 FNL, 1980 FEL	2	9N	23E
WELL NO.	FOOTAGE LOCATION	SECTION	TOWNSHIP	RANGE

Schematic

Tabular Data

Surface Casing

Size 325' 13 3/8 " Cemented with 250 sx.

TOC Surface feet determined by Returns

Hole size 17½"

Intermediate Casing

Size 3010' 8 5/8 " Cemented with 450 sx.

TOC 2000 feet determined by Sonic Log

Hole size 12¼"

Long string

Size 7187 5 1/2 " Cemented with 1200 sx.

TOC 4820 feet determined by CBL

Hole size 7 7/8"

Total depth 7202

Injection interval

6165 feet to 6203 feet

(perforated or open-hole, indicate which)

INJECTION WELL DATA SHEET -- SIDE 2

Tubing size 2 7/8 lined with N/A (material) set in a B.O.T. Husky M-1 (brand and model) packer at 6100 feet

(or describe any other casing-tubing seal).

Other Data

1. Name of the injection formation Pennsylvanian

2. Name of Field or Pool (if applicable) N/A

3. Is this a new well drilled for injection? /_/ Yes /X/ No

   If no, for what purpose was the well originally drilled? Oil and Gas (Wildcat)

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail (sacks of cement or bridge plug(s) used) 6293-97, 6362-66, 6657-66, 6676-84, 6719-24, 6736-44, 6756-60, 6874-78, 6904-08, 6938-42, 6959-69, 7088-98

   Arrow R.B.P. at 6250.

5. Give the depth to and name of any overlying and/or underlying oil or gas zones (pools) in this area. ABO 3118-4850, San Andres 1270-1710, Bernal 940-1270, Santa Rosa 444-940

EXHIBIT "I"

(Attached to and made a part of Application for Authorization to Inject)

V. Map prepared and attached to Exhibit II.

VI. There are no other wells in the area of review

VII. 1. 750 MCFPD average, 1 MMCFPD Max, Dry Natural Gas.

2. The system is closed.

3. 5000 psig average, 5500 Maximum.

4. Natural gas (Analysis attached) from Latigo Ranch B#2 (1680 FNL, 1904 FWL, S6, T9N, R24E)

5. N/A

VIII. See Below

IX. See procedure attached

X. See Below

XI. No water wells within 1 mile radius of injection well.

XII. Trans Pecos has made a study of all existing well control, seismic and geochemical data and has mapped the surface in the vicinity of the proposed injection well. Our conclusion is that no faulting exists within a reasonable drainage radius of the well (1320 feet) which might connect the injected formation with the deepest known aquifer containing fresh water: The Third Santa Rosa Sandstone at 910 feet. A copy of the DLL log composite on the #1 Block "A" Well is included with target perforations shown on the 5" portion of the log. Also included is a report prepared by Terra Tek Research dated October, 1983 which describes the mechanical properties of the target zone from cores of a nearby well.

Robert G. McKinney
President

MECHANICAL PROPERTIES UNDER TRIAXIAL COMPRESSIVE LOADING

Latigo Ranch Well "D" No. 1
Guadalupe County, New Mexico

Interim Report

Submitted to:

A. HOLDITCH & ASSOCIATES, INC.
3833 Texas Avenue, Suite 200
Bryan, Texas 77802

Attn: Mr. Bradley M. Robinson

TR 84-30
October 1983

TerraTek Research
UNIVERSITY RESEARCH PARK • 420 WAKARA WAY • SALT LAKE CITY, UTAH 84108 • (801) 584-2400

MECHANICAL PROPERTIES UNDER TRIAXIAL COMPRESSIVE LOADING

Latigo Ranch Well "D" No. 1
Guadalupe County, New Mexico

Interim Report

by

C. S. Muller
R. G. Van Buskirk

Submitted to:

S.A. HOLDITCH & ASSOCIATES, INC.
3833 Texas Avenue, Suite 200
Bryan, Texas 77802

Attn: Mr. Bradley M. Robinson

Submitted by:

TERRA TEK RESEARCH
University Research Park
420 Wakara Way
Salt Lake City, Utah 84108

TR 84-
October, 1983

TABLE OF CONTENTS

PROGRAM OBJECTIVES

A laboratory test program was performed to determine the mechanical properties of core samples taken from Latigo Ranch Well "D" No. 1. Fifteen samples underwent triaxial compression tests.

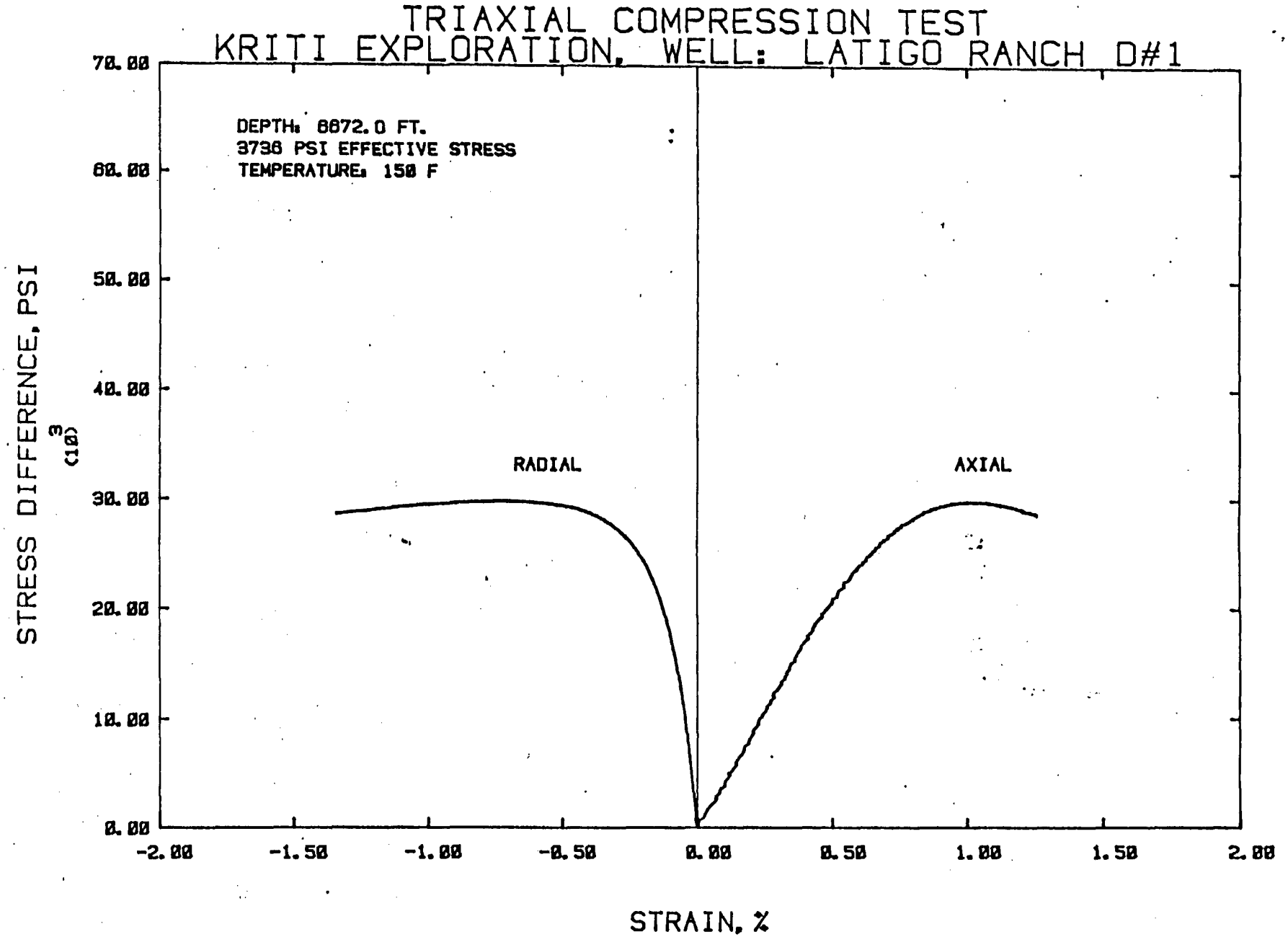
The objective of the tests was to determine the mechanical response of the core samples at simulated in situ conditions. The test matrix specified to achieve this objective is shown below.

Orientation:	Sample axis perpendicular to core axis.
Sample Preparation:	1 inch diameter x 2 inches long Ends ground flat and parallel
Test Conditions:	Tested dry (as-received), no pore fluid pressure (drained) Confining pressure applied to achieve an effective stress of 0.56 psi/ft (x sample footage) Strain Rate: Less than 1×10^{-4} in/in per second Temperature: 150°F (66°C)

Triaxial Compression Tests' Discussion

The triaxial compression test results are presented in Table 1. The test results show significant variation in the core material. Sample footages of 7181.0 and 7193.0 displayed the highest Young's modulus and maximum failure stresses of 61.7 and 62.7 ksi, respectively. Lowest failure stresses (24.0 to 25.0 ksi) were found at depths of 6687.7, 6779.0 and 7315.0 ft. The remaining depths had failure strengths in the range 28-44 ksi. As expected, elastic moduli of the samples increased proportional to the failure strengths of the samples. The range was between 3.7 and 10.7 $x10^6$ psi. Poisson's ratio varied from lows of 0.12 and 0.13 for depths of 6779.0 and 7316.0, respectively, to highs of 0.33 and 0.34 for depths of 6687.7 and 7200.0, respectively, with the average Poisson's ratio being 0.23.

The stress-strain and failure behavior of the samples tested varied over a wide range and were felt to be material-dependent. In general, samples with low porosities had higher moduli than the more porous samples. In addition, the low porosity samples tended to exhibit brittle failure; porous samples exhibited ductile failure.



TerraTek Research

APPENDIX A

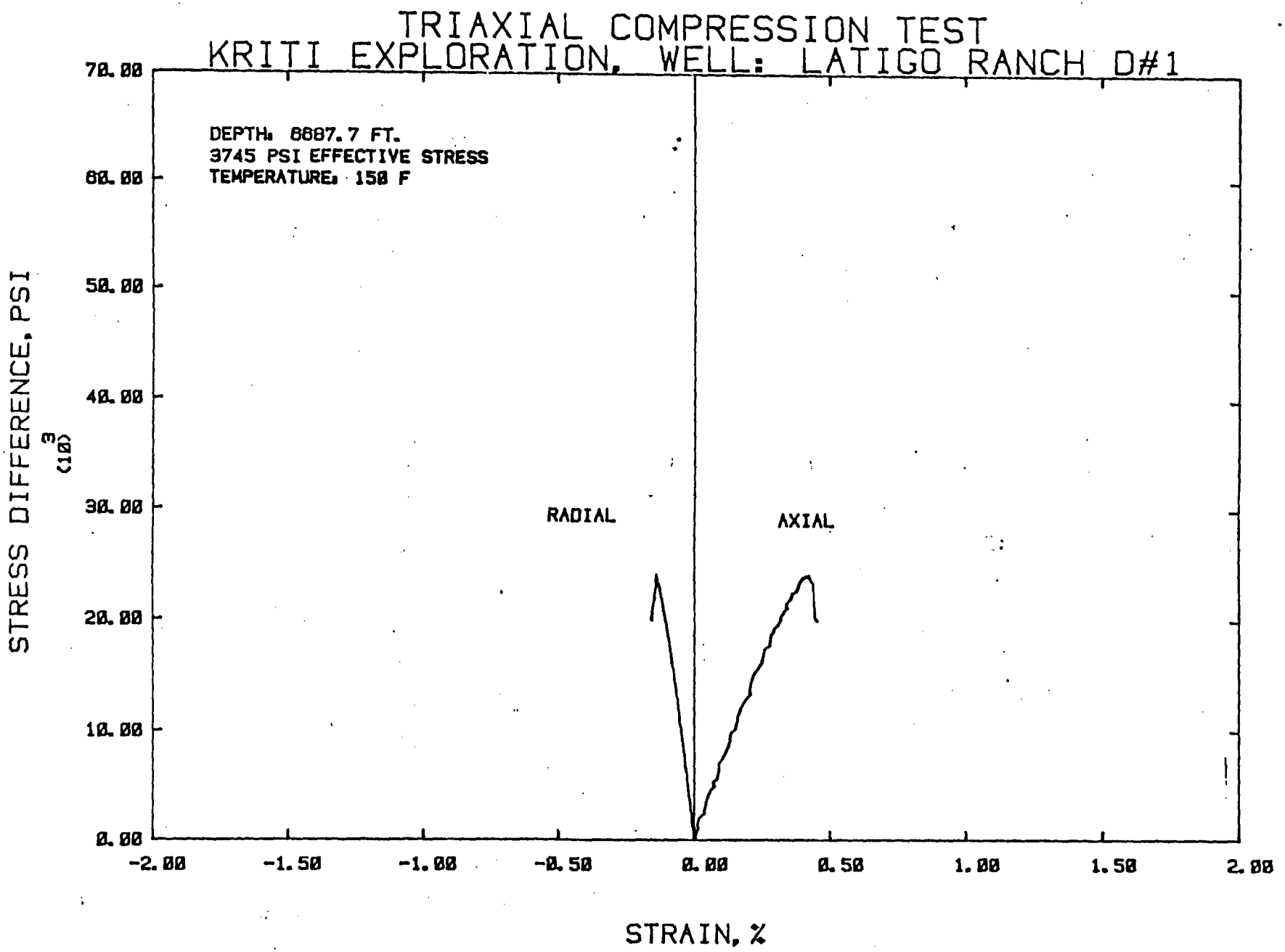
GRAPHS OF INDIVIDUAL TESTS

Table 1

Summary of Mechanical Test Data

Latigo Ranch Well "D" No. 1
Guadalupe County, New Mexico

Sample Depth (ft)	Effective Stress (psi)	Poisson's Ratio	Young's Modulus ($x10^6$ psi)	Max. Stress Difference at Failure (psi)
6672.0	3736	0.20	4.33	30,000
6687.7	3745	0.33	6.58	24,500
6779.0	3796	0.12	3.76	24,182
7122.0	3988	0.26	7.75	41,045
7142.0	4000	0.20	4.06	28,000
7163.0	4011	0.20	6.49	36,909
7181.0	4021	0.27	10.70	61,689
7193.0	4028	0.19	8.77	62,682
7200.0	4032	0.34	7.32	26,849
7273.0	4073	0.22	6.87	36,918
7290.0	4082	0.19	7.00	44,110
7295.0	4085	0.28	7.27	35,160
7309.5	4094	0.28	8.31	31,324
7315.0	4096	0.24	4.12	25,091
7316.0	4097	0.13	4.60	34,538



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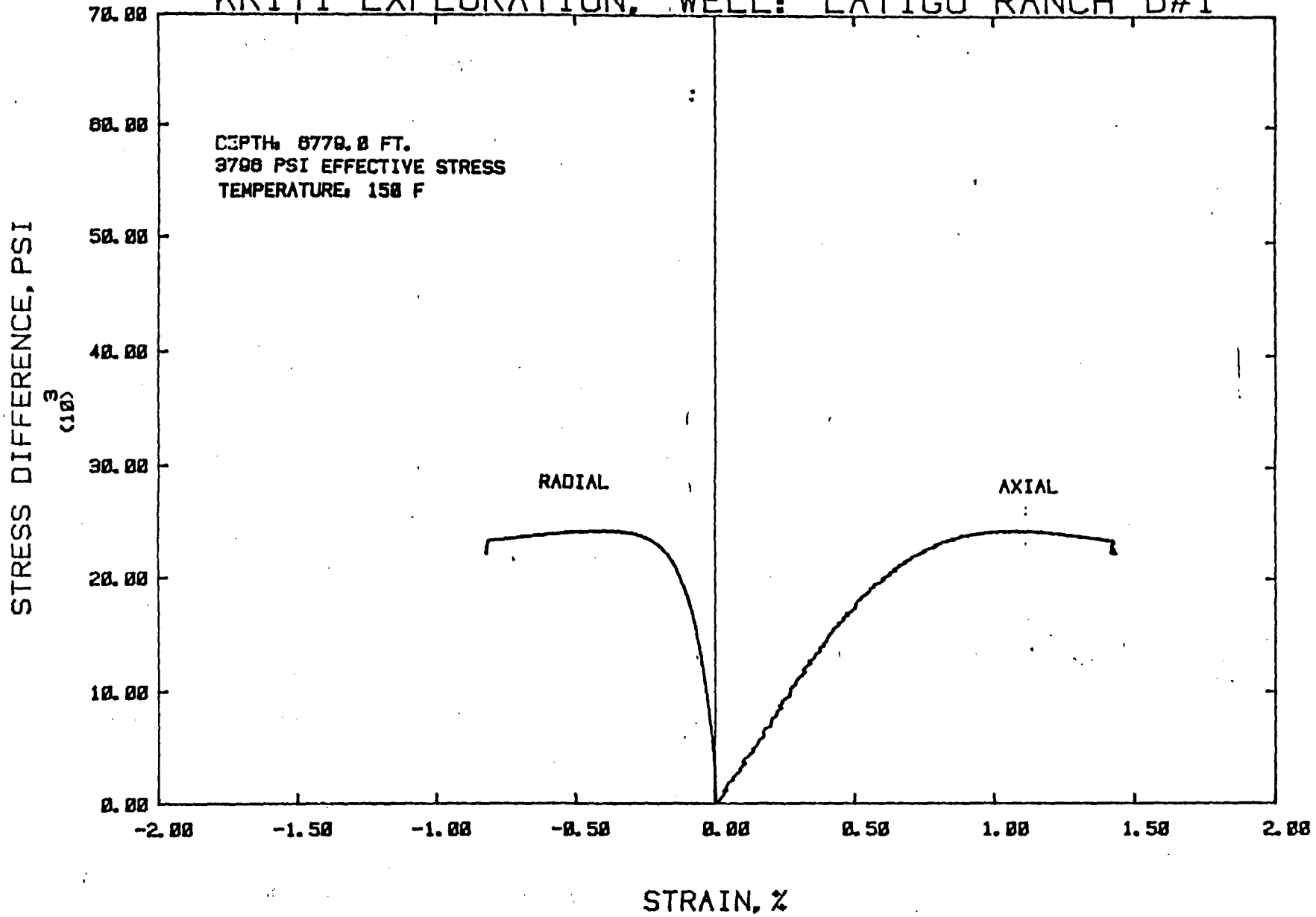
TRIAXIAL COMPRESSION TEST
KRITI EXPLORATION, WELL: LATIGO RANCH D#1



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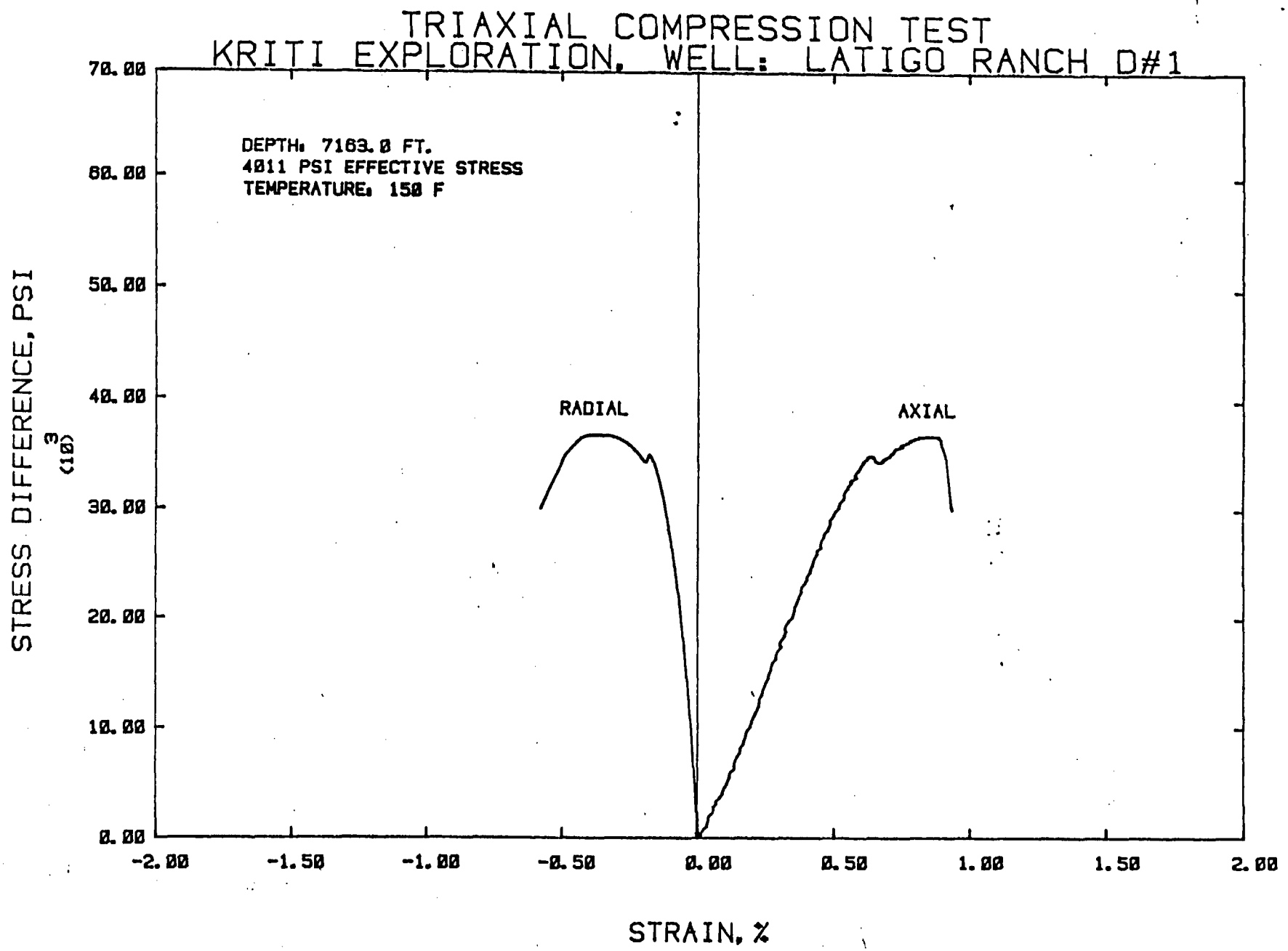

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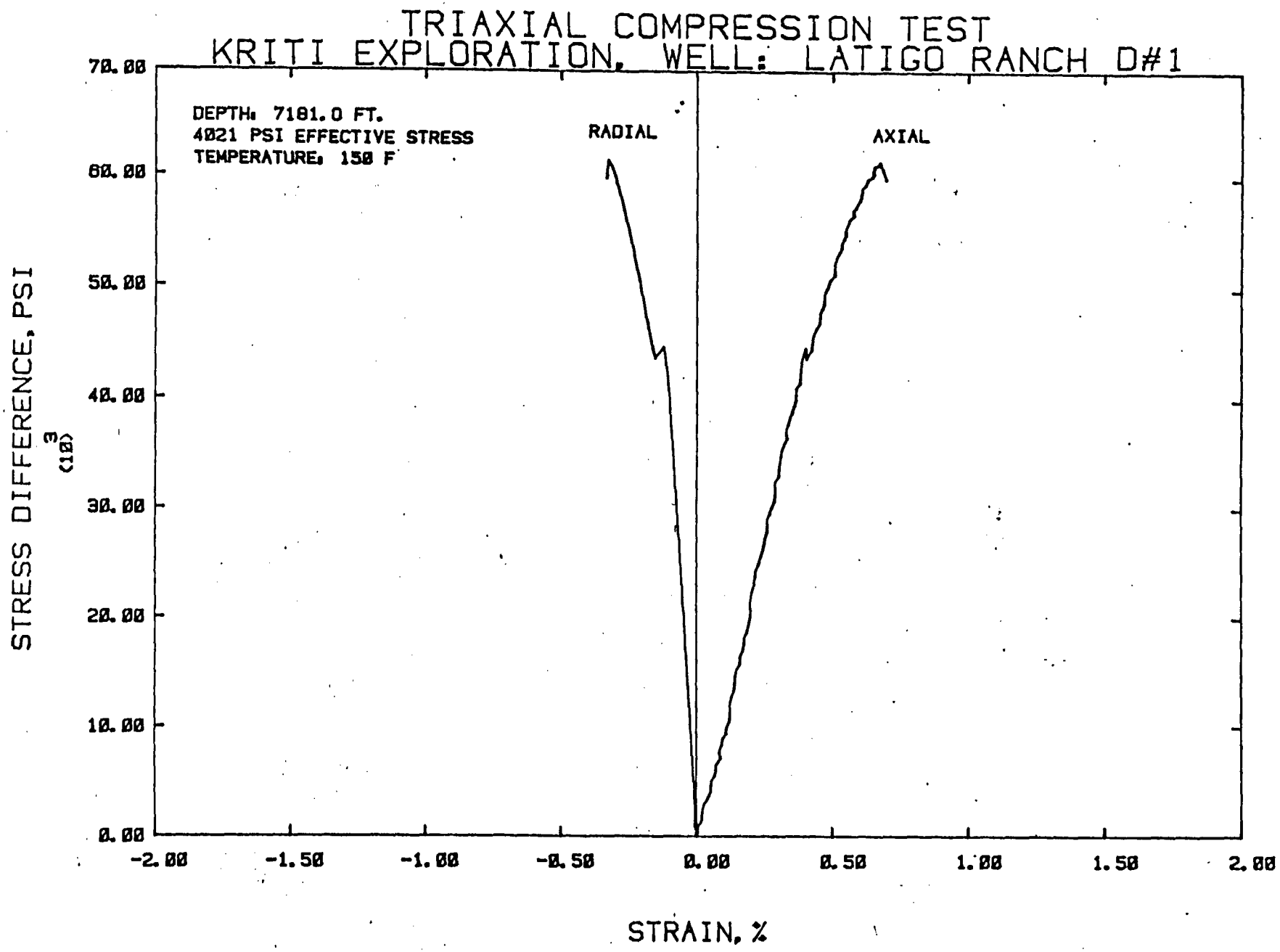
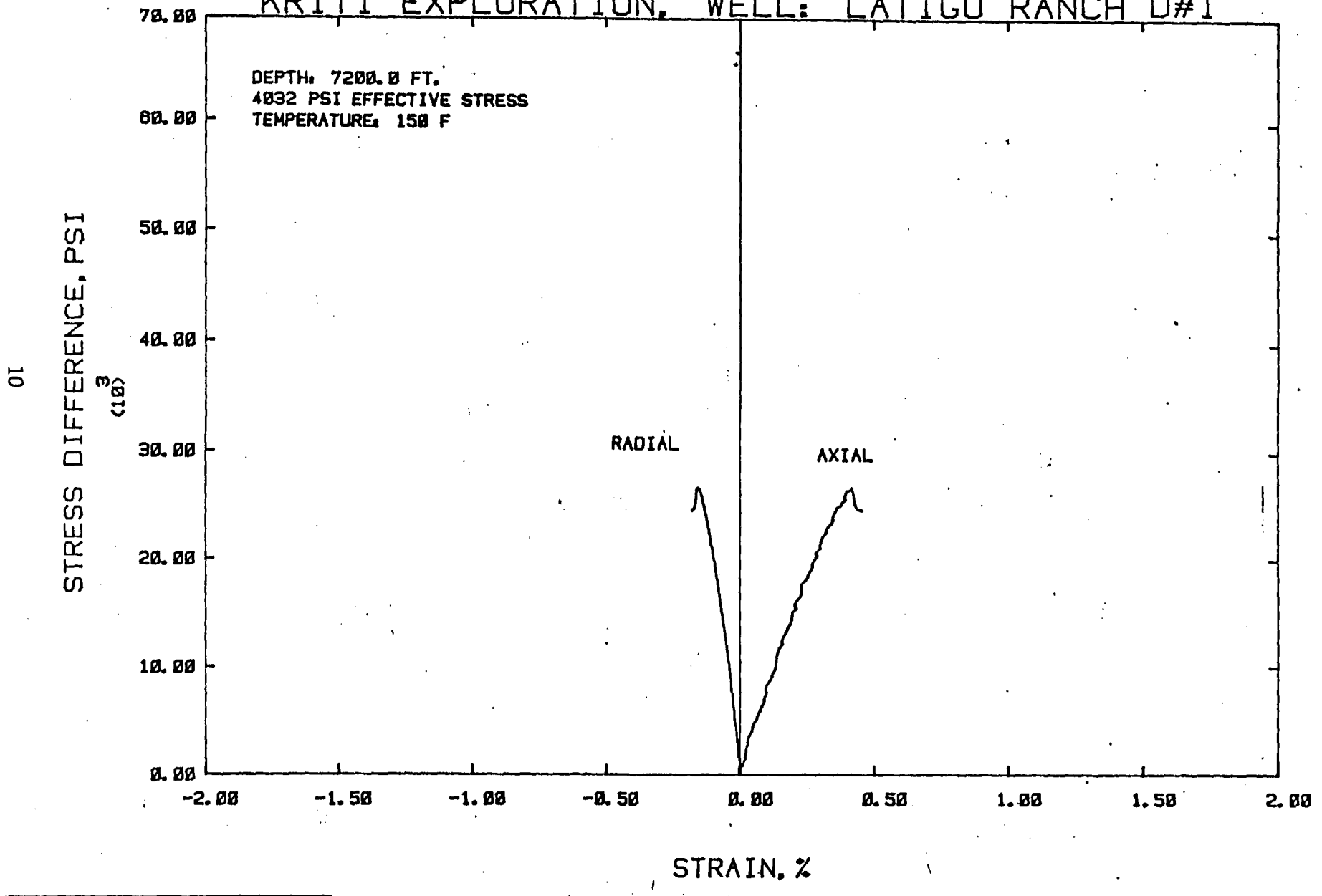


TerraTek Research

TRIAXIAL COMPRESSION TEST
KRITI EXPLORATION, WELL: LATIGO RANCH D#1



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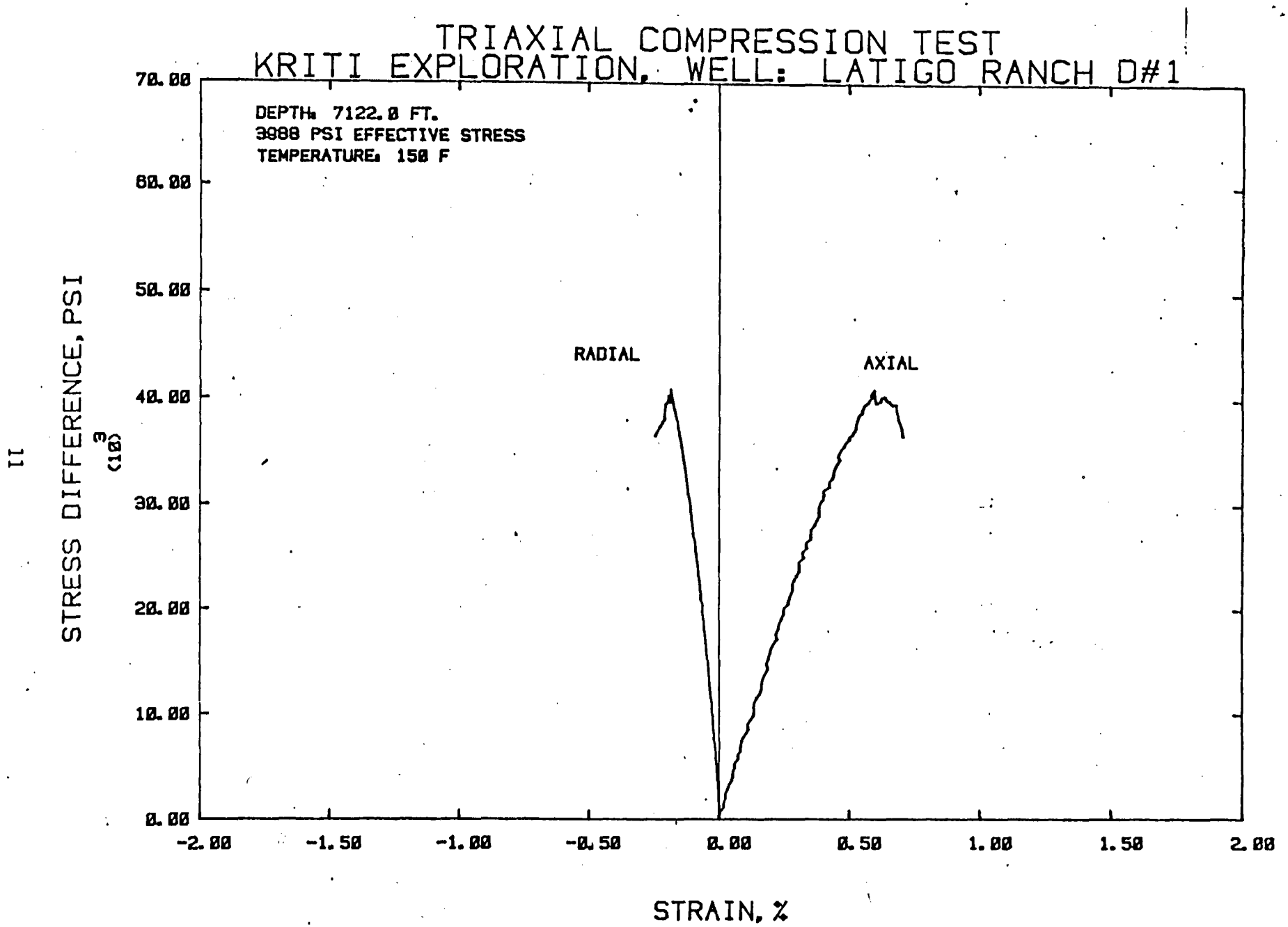

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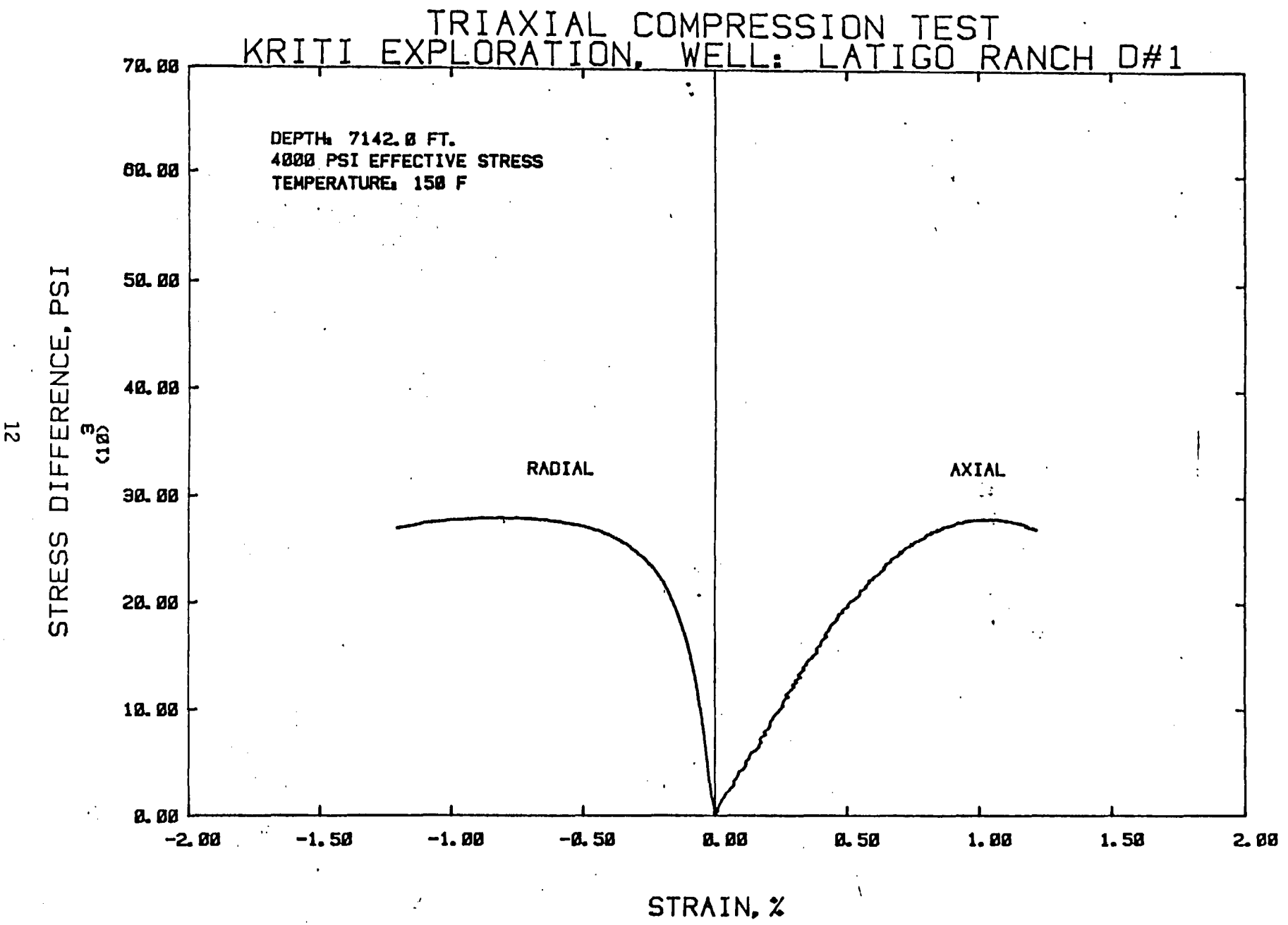
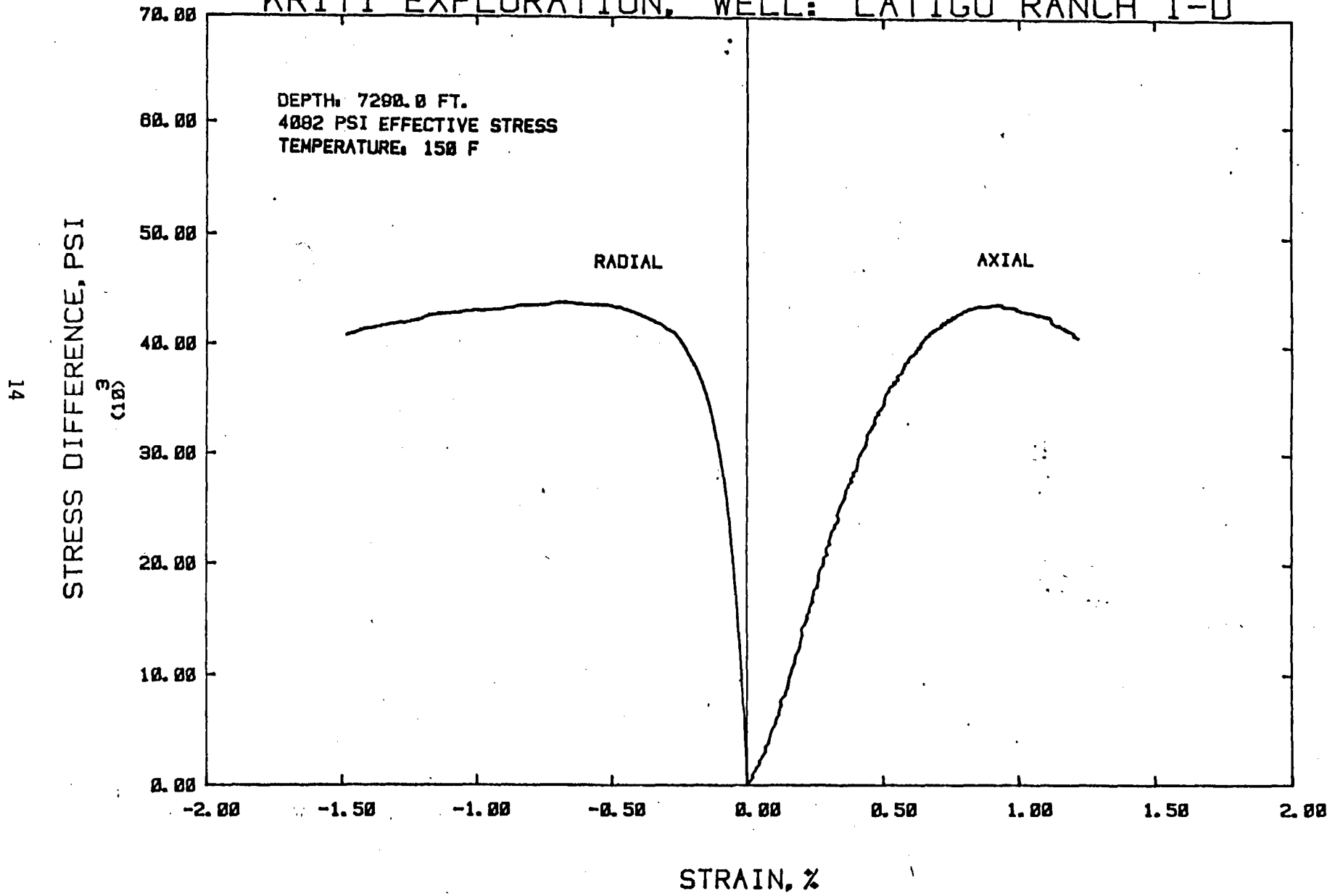


TerraTek Research

TRIAXIAL COMPRESSION TEST
KRITI EXPLORATION, WELL: LATIGO RANCH 1-D



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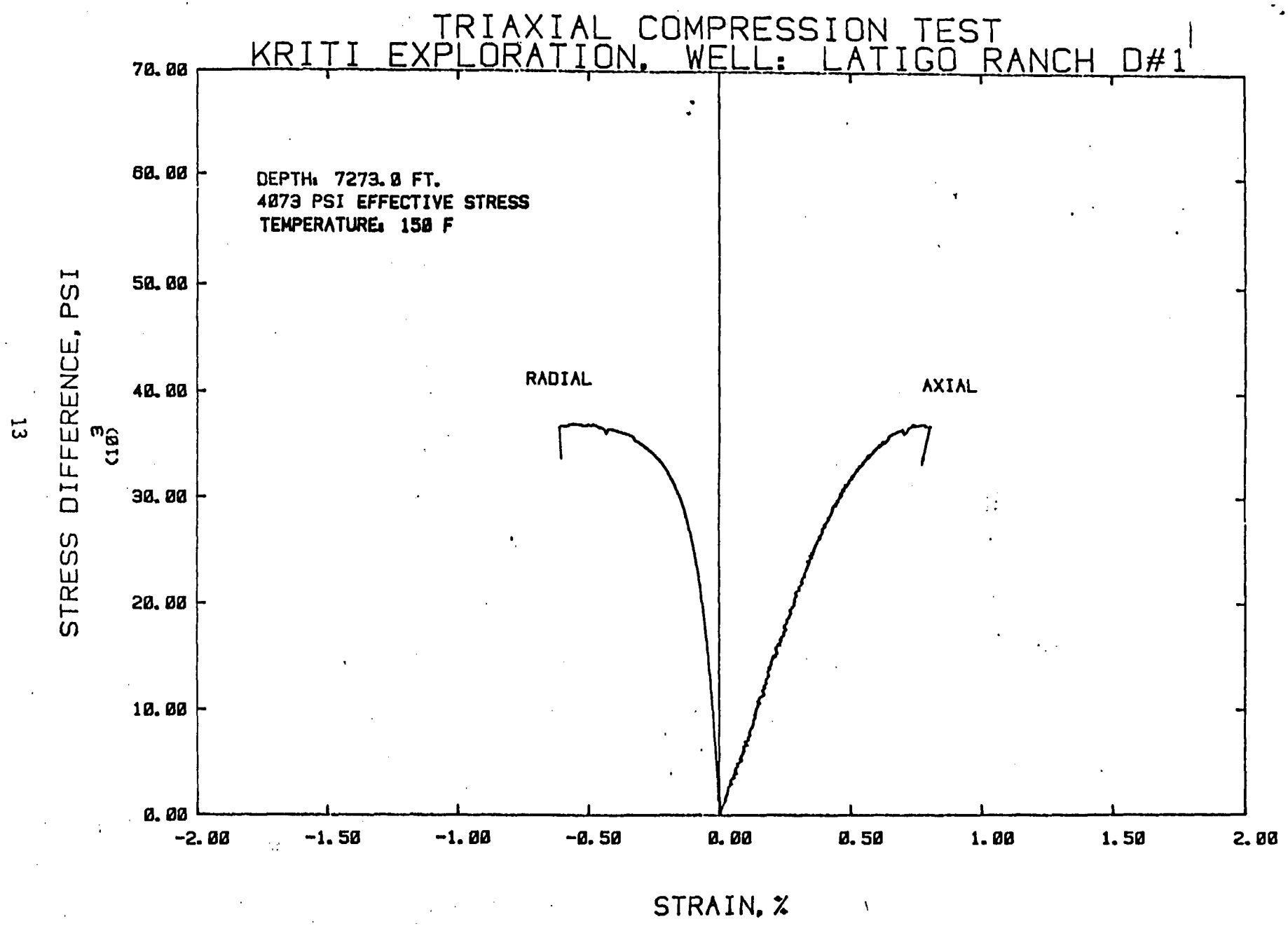

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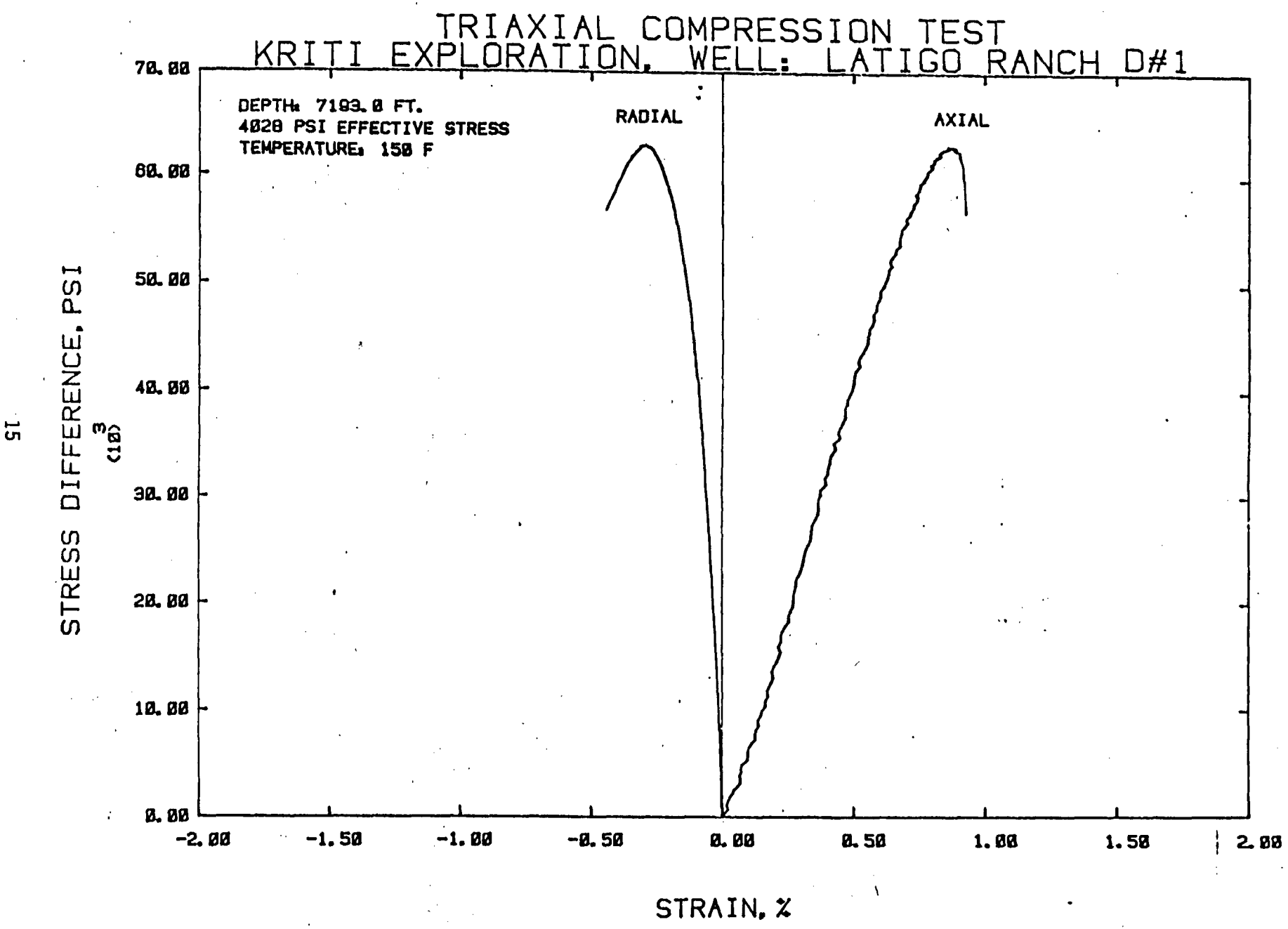

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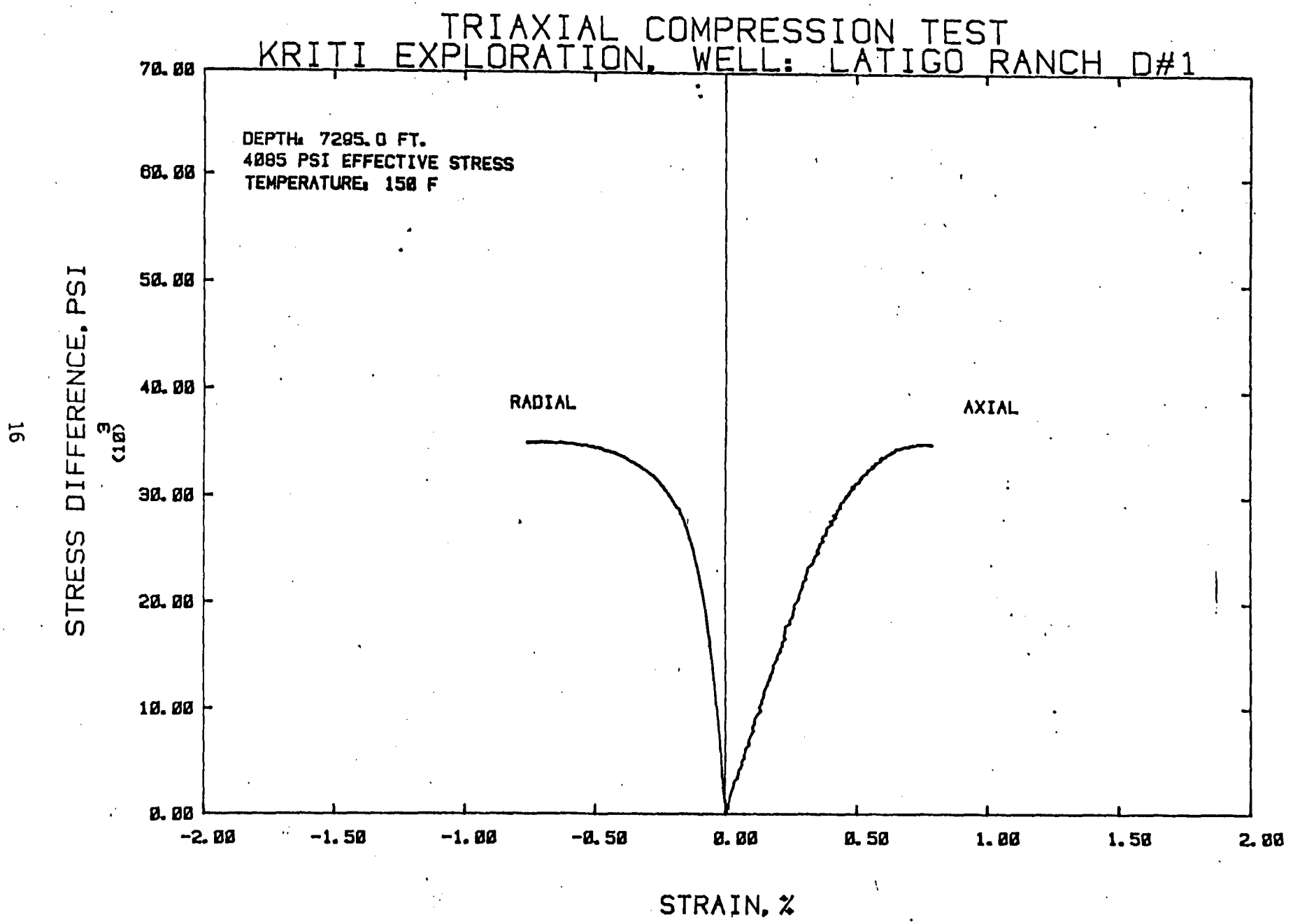

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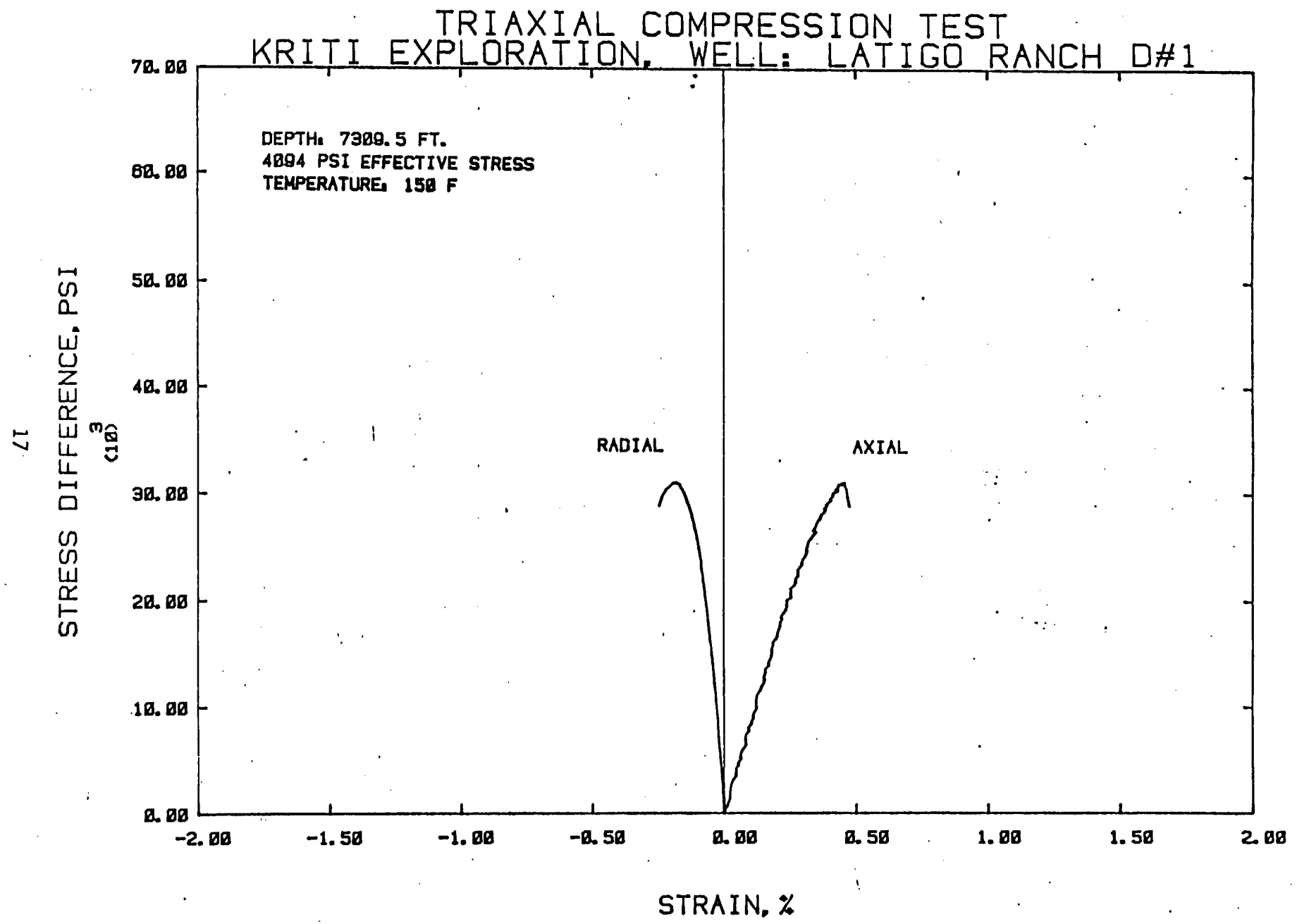

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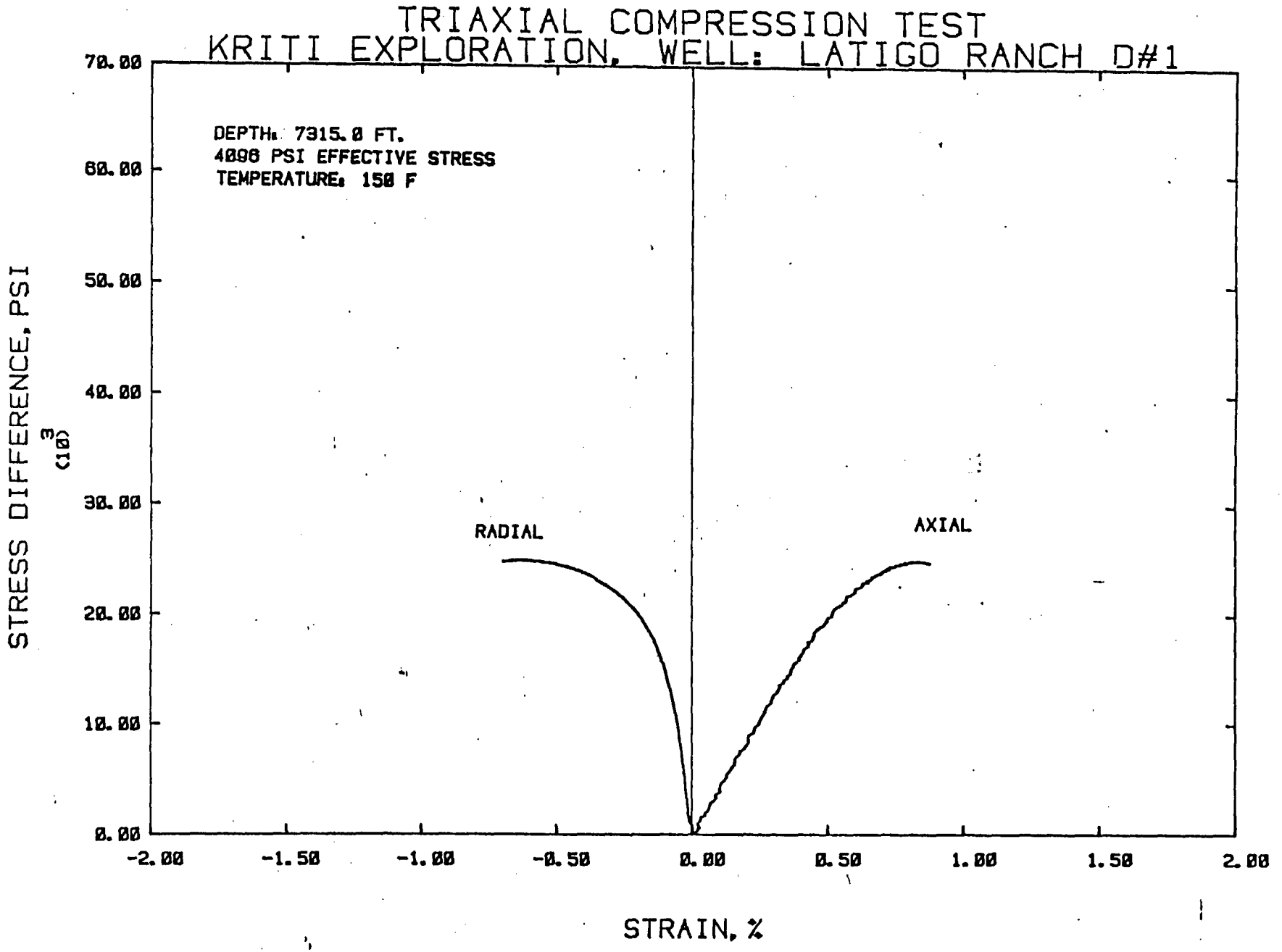

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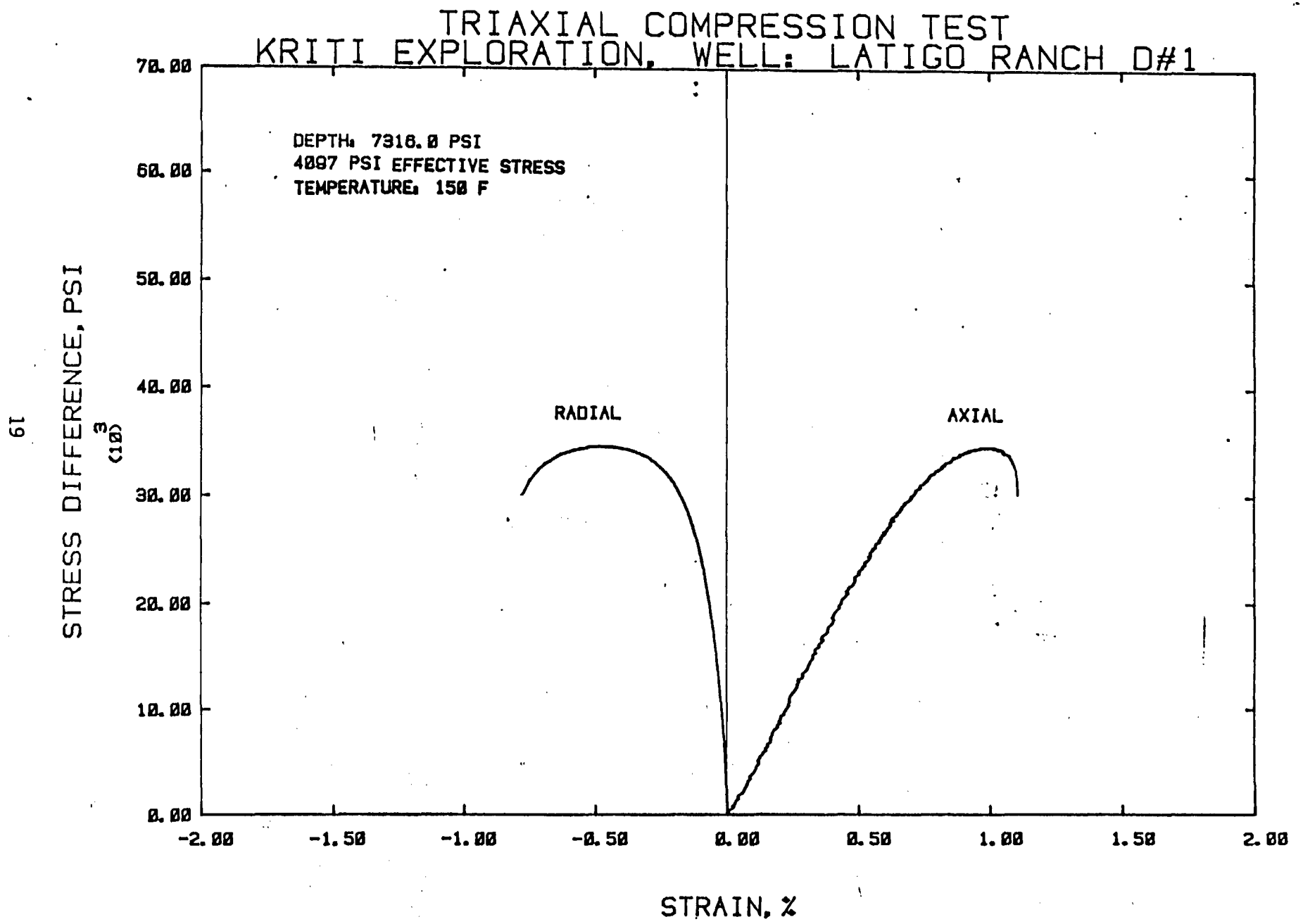

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APPENDIX B

STANDARD TRIAXIAL TEST PROCEDURES

TRIAXIAL COMPRESSION TESTS

Objective

Triaxial compression tests provide failure strength data, stress-strain data, and the elastic moduli of core material under simulated reservoir conditions of temperature, pressure and stress. Typical application of this data are described below:

Drilling Problems are better understood and often more readily solved when the strength and stress-strain properties of the formation are known. This information has been most helpful in evaluating problems associated with either unusually strong or unusually weak formations.

Hydraulic Fracture Design depends on, in part, accurate knowledge of the elastic moduli of the pay and barrier formations. For example, moduli contrasts between the barrier and pay zones are helpful in containing the fracture and should, therefore, be known and evaluated. Additionally, elastic moduli data are necessary parameters for almost all fracture codes.

Test Description

A triaxial compression test involves the application of stress to a right circular cylinder of core material as shown in Figure 1. First a hydrostatic state of stress is imposed on the sample (i.e., $\sigma_1 = \sigma_2 = \sigma_3$) after which the stress difference ($\sigma_1 - \sigma_2$) is increased to a prescribed stress level or to sample failure. Sample strain in the three principle directions is recorded throughout the test. Sample pore pressure and temperature can also be controlled and recorded.

Test Procedure

Core plugs are cut to length and the ends ground flat and parallel to within ±0.003 inches. To prevent the intrusion of confining fluid into the sample pore spaces, each sample is placed between two hardened steel endcaps and surrounded with a teflon jacket. Cantilever strain transducers are positioned on the endcaps to record axial strain, and lateral strain cantilever transducers are placed across the sample diameter at the mid-point of the sample to record lateral strain. The prepared sample is placed in a heated servo-controlled triaxial test cell and a nominal confining pressure and pore pressure preload are applied to the sample. After reaching temperature equilibrium, the sample is hydrostatically compressed to the specified effective confining pressure. Deviatoric loading is next initiated and continued to sample failure at a strain rate of approximately 1.0×10^{-4}/sec. Axial strain, lateral strain, and deviatoric stress are recorded continuously during hydrostatic and triaxial compression by computer and X-Y-Y plotters.

Test Results

The results of the triaxial compression tests are presented in tabular and graphical form. Data usually includes failure strength, static Young's modulus, static Poisson's ratio, static shear modulus, and static bulk compressibility.

Failure strength is defined by the peak value of the deviatoric stress measurement. Elastic parameters are calculated at fifty percent of failure strength. The response of the sample may be non-linear, in which case several incremental moduli values are given. The elastic properties are calculated through the following relationships:

Static Young's Modulus, E

$$E = \frac{\text{axial stress}}{\text{axial strain}}$$

$$E = \frac{\sigma}{\varepsilon}$$

Static Poisson's Ratio, ν

$$\nu = - \frac{\text{lateral strain}}{\text{axial strain}}$$

$$\nu = - \frac{\varepsilon_x}{\varepsilon_y}$$

Static Shear Modulus, G

$$G = \frac{E}{2(1+\nu)}$$

Static Bulk Compressibility, B

$$B = \frac{3(1-2\nu)}{E}$$

Examples of stress-strain data for the triaxial and hydrostatic compression are presented graphically in Figures 2 and 3, respectively. Failure strength data from several triaxial compression tests performed at different effective stress (σ_2 - pore pressure) levels is presented as a Mohr-Coulomb failure envelope as shown in Figure 4. Cohesion and friction angle are calculated and presented.

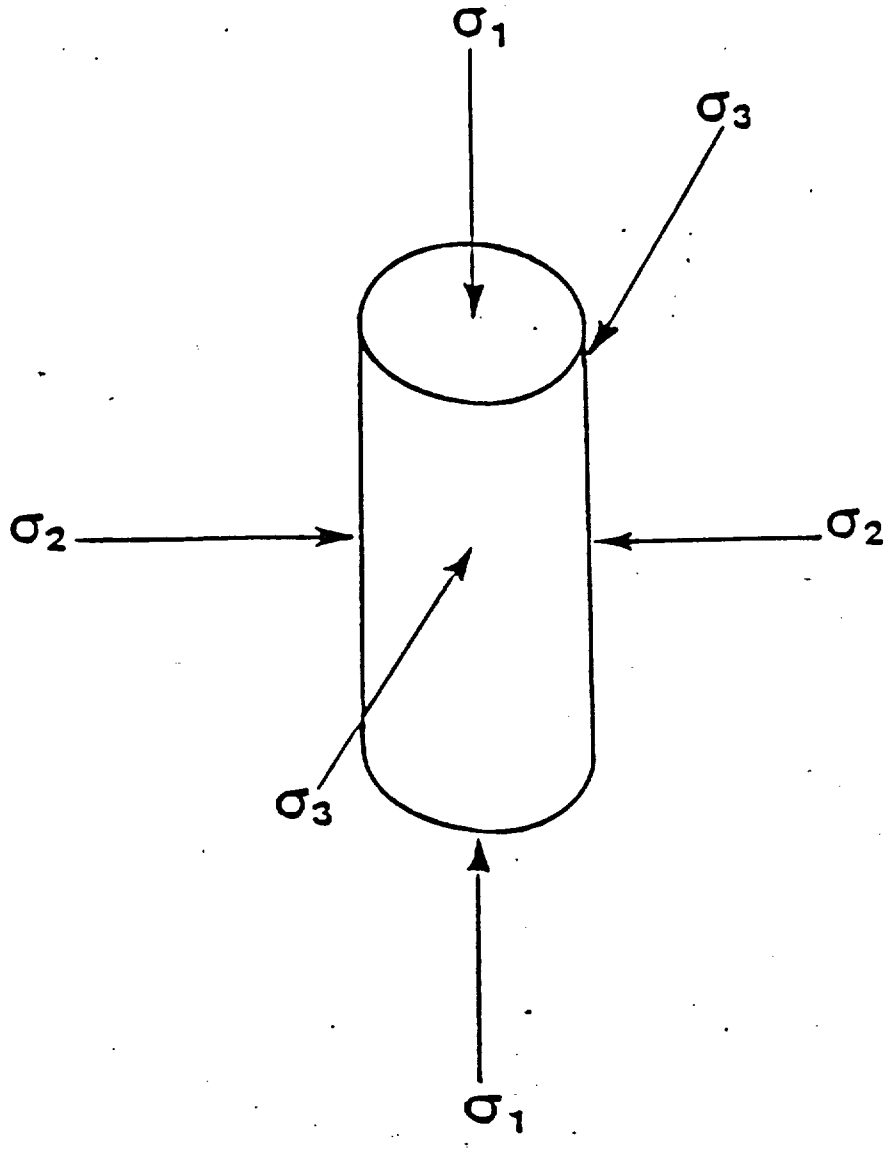


Figure 1. The Triaxial Compression test consists of:

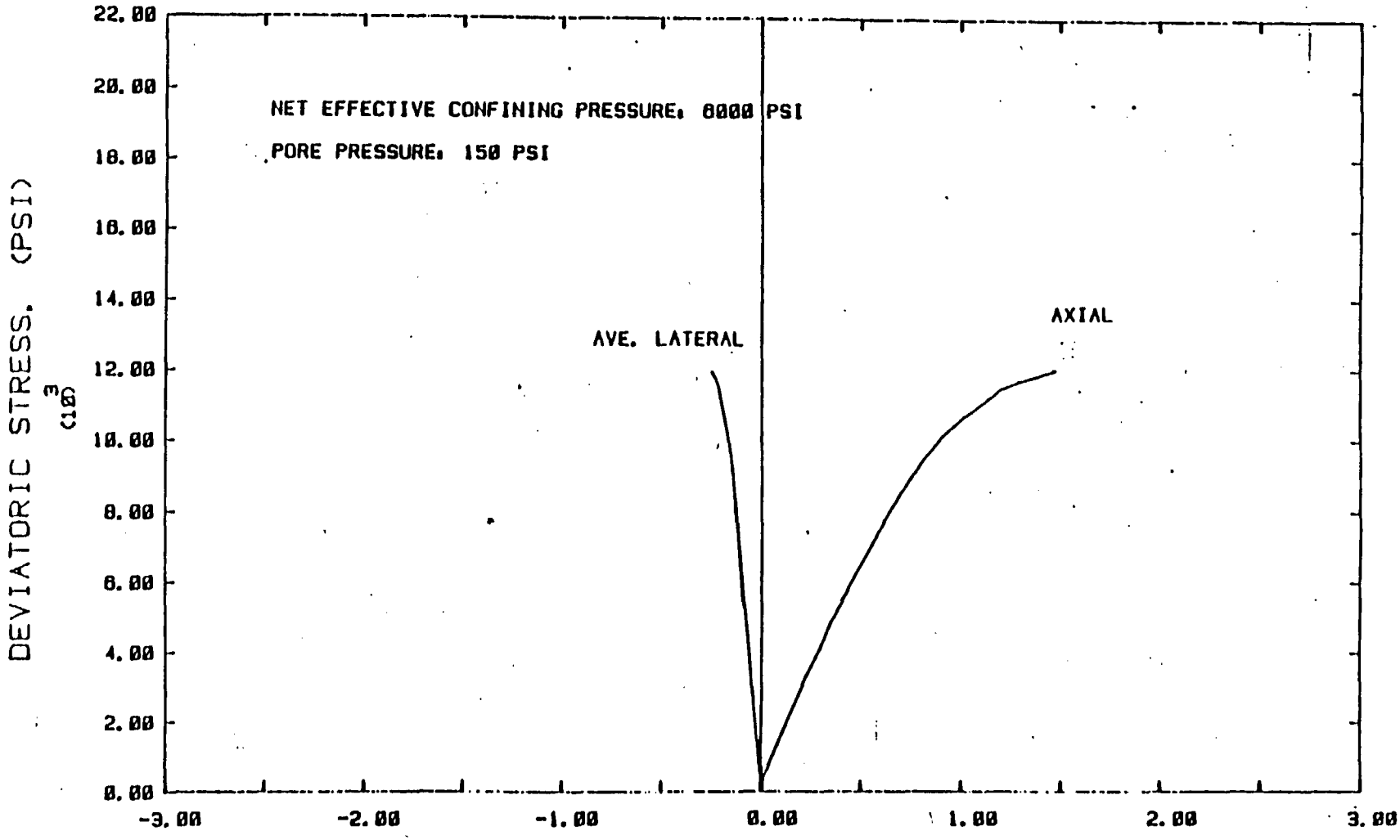
a) Hydrostatic Compression where $\sigma_1 = \sigma_2 = \sigma_3$.

b) Triaxial Compression where $\sigma_1 > \sigma_2 = \sigma_3$.

TRIAXIAL COMPRESSION TEST

CLIENT:
SAMPLE:
DEPTH:
ORIENTATION:

CONFINING PRESSURE:
PORE PRESSURE:
TEMPERATURE:



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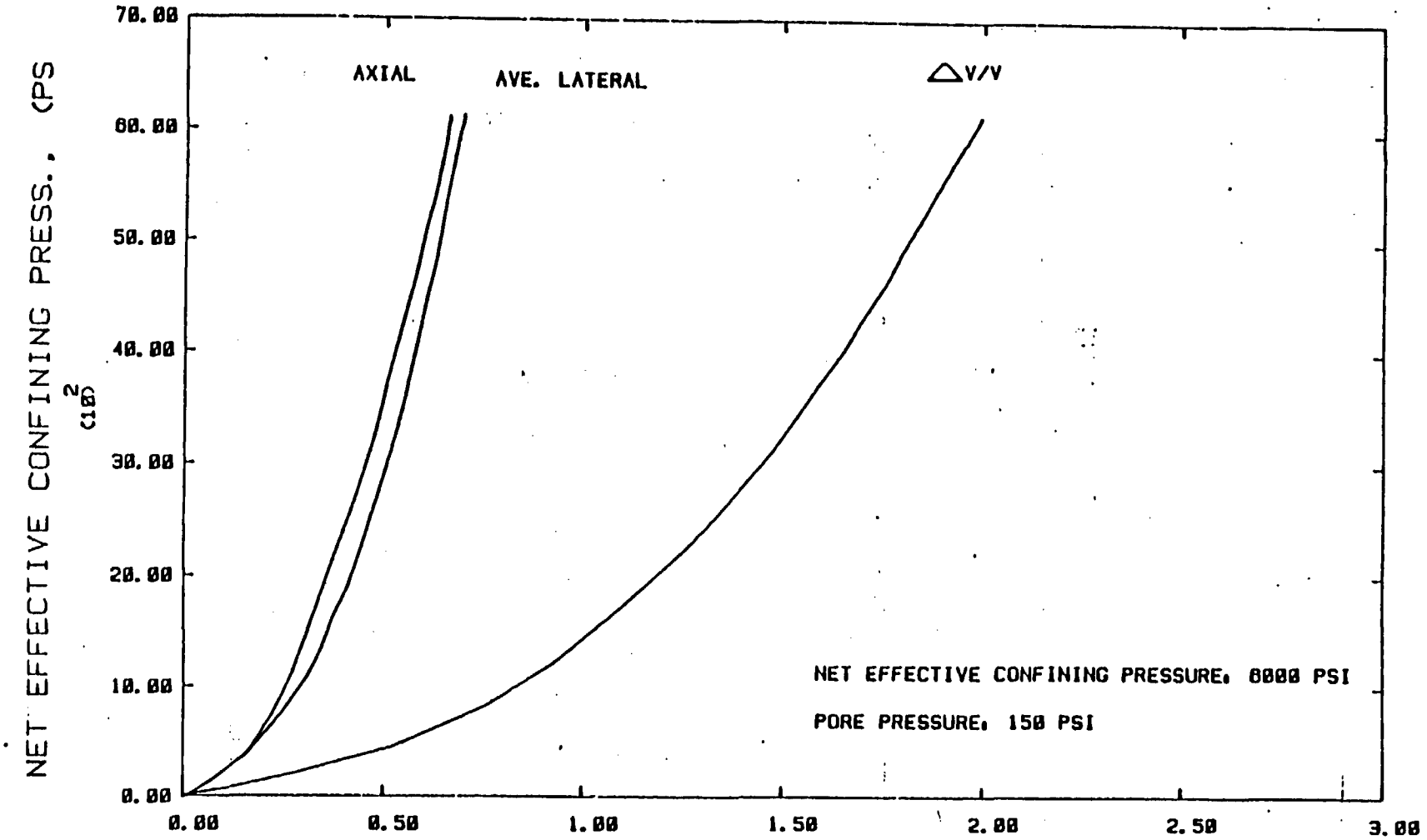
HYDROSTATIC COMPRESSION TEST

CLIENT:
SAMPLE:
DEPTH:
ORIENTATION:

CONFINING PRESSURE:
PORE PRESSURE:
TEMPERATURE:



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MOHR'S FAILURE ENVELOPE