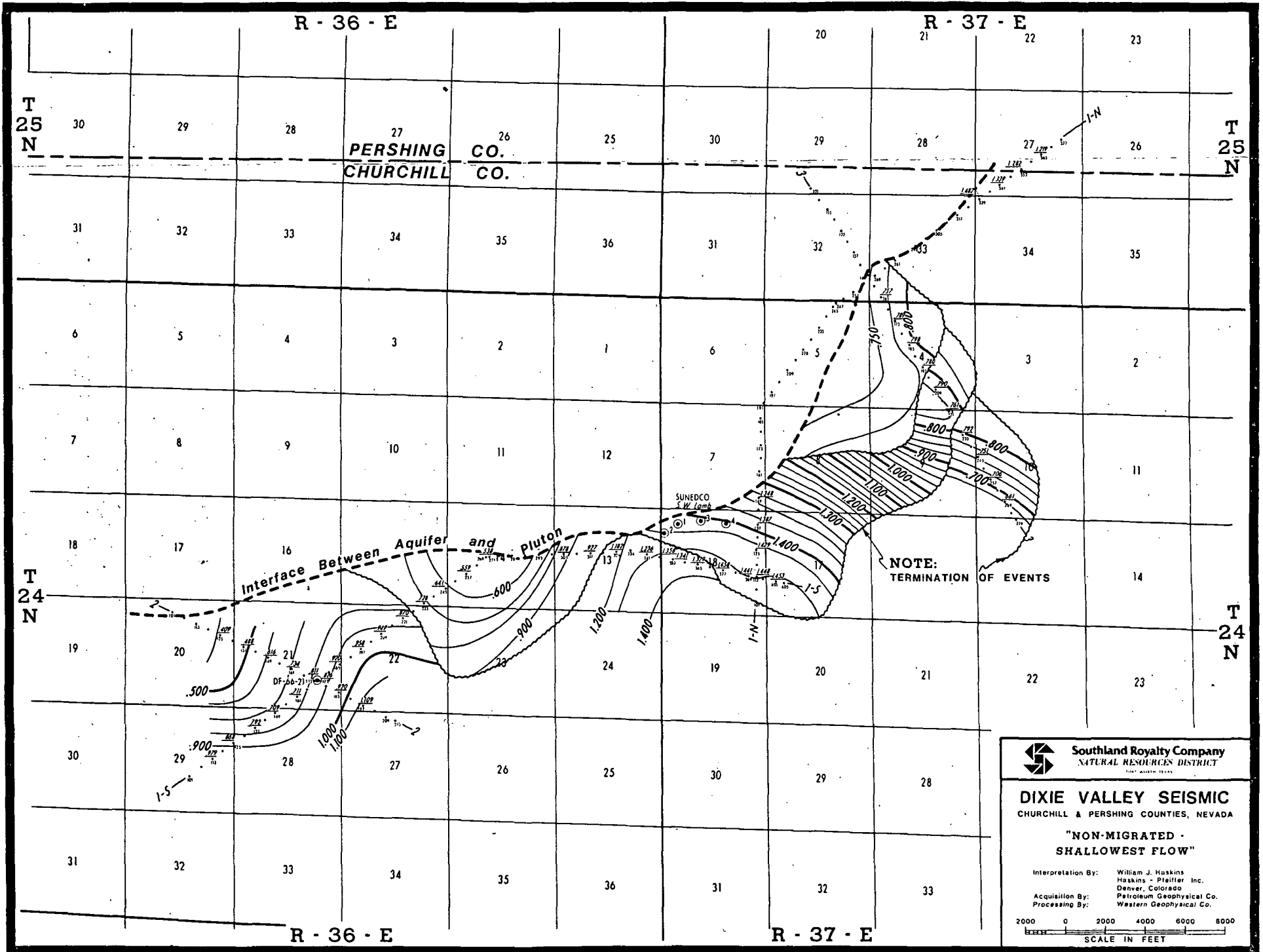


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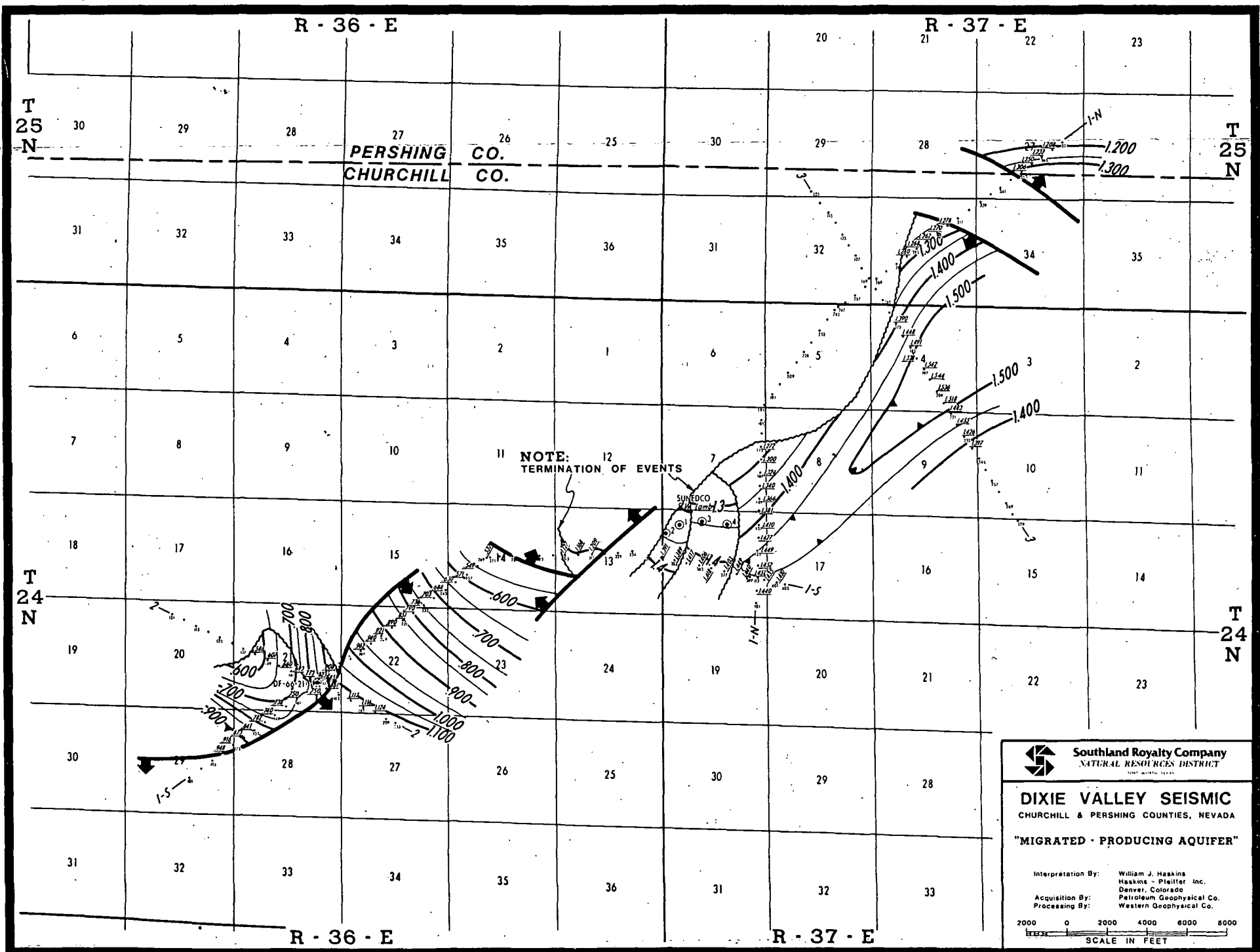


 **Southland Royalty Company**
NATURAL RESOURCES DISTRICT
INCORPORATED 1954

DIXIE VALLEY SEISMIC
CHURCHILL & PERSHING COUNTIES, NEVADA
"NON-MIGRATED -
SHALLOWEST FLOW"

Interpretation By: William J. Huskins
Huskins & Pfeiffer Inc.
Denver, Colorado
Acquisition By: Petroleum Geophysical Co.
Processing By: Western Geophysical Co.

2000 0 2000 4000 6000 8000
SCALE IN FEET

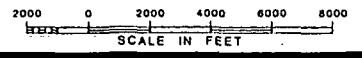


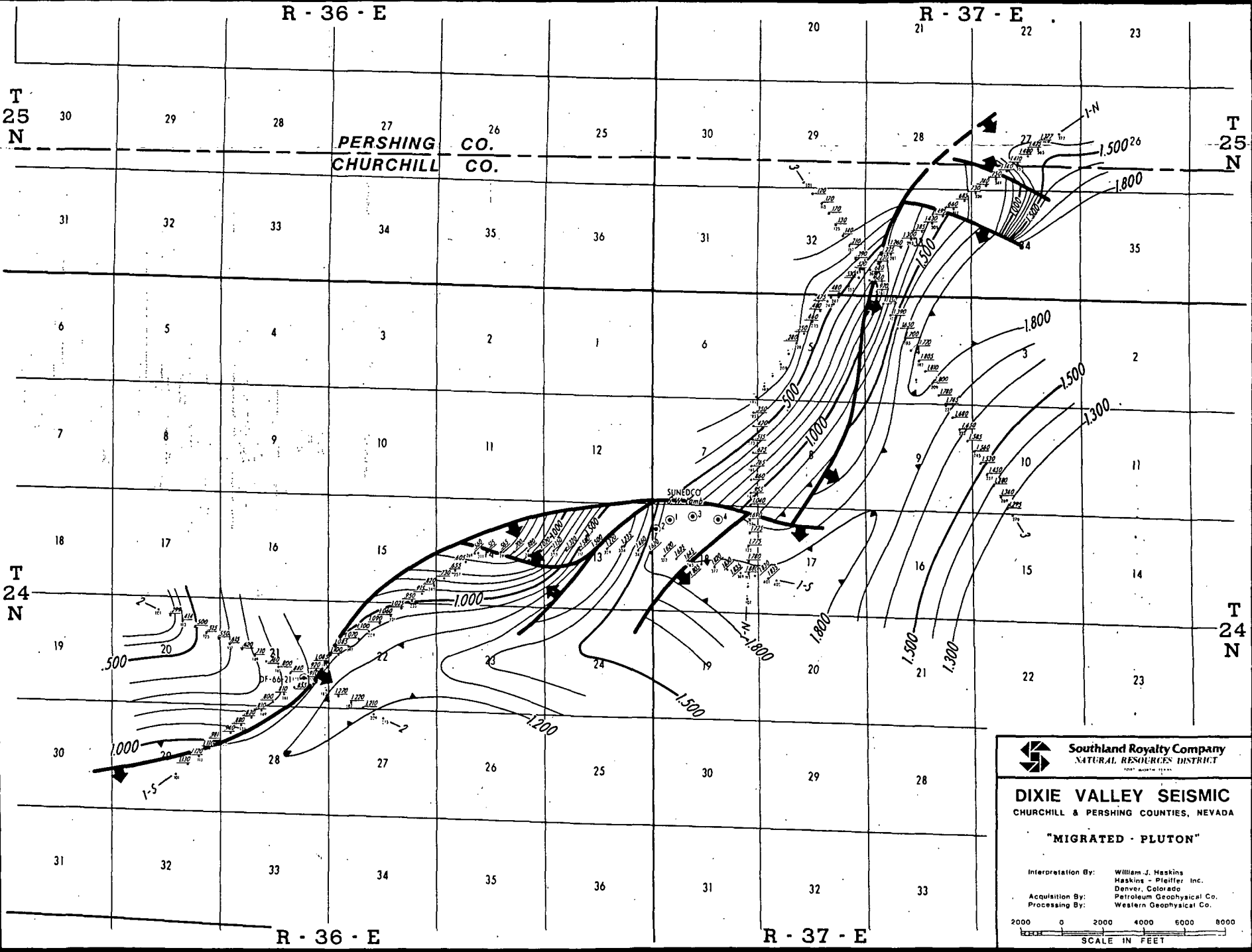
Southland Royalty Company
NATURAL RESOURCES DISTRICT
FORT WORTH, TEXAS

DIXIE VALLEY SEISMIC
CHURCHILL & PERSHING COUNTIES, NEVADA

"MIGRATED - PRODUCING AQUIFER"

Interpretation By: William J. Haskins
Haskins - Pfeiffer Inc.
Denver, Colorado
Acquisition By: Petroleum Geophysical Co.
Processing By: Western Geophysical Co.





PERSHING CO.
CHURCHILL CO.

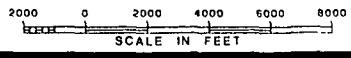
SUNEDCO

 **Southland Royalty Company**
NATURAL RESOURCES DISTRICT

DIXIE VALLEY SEISMIC
CHURCHILL & PERSHING COUNTIES, NEVADA

"MIGRATED - PLUTON"

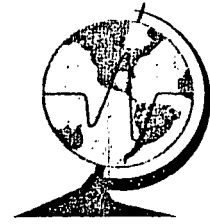
Interpretation By: William J. Haskins
Haskins - Pfeiffer Inc.
Denver, Colorado
Acquisition By: Petroleum Geophysical Co.
Processing By: Western Geophysical Co.



Haskins • Pfeiffer Inc.

International Geophysical Consultants

1449 Denver Club Building
Denver, Colorado 80202
(303) 573-8958



October 7, 1980

Southland Royalty Company
1000 Fort Worth Club Tower
Fort Worth, Texas 76102
Attn: Mr. Jere Denton

RE: Dixie Valley Area
Churchhill & Pershing
Counties, Nevada

Dear Mr. Denton:

Seismic data for the Dixie Valley Prospect Area were acquired by Petroleum Geophysical Co. party No. 302. The data were recorded in SEG-B format by Texas Instrument's DFS-5 amplifiers. An 8-128Hz filter was used on recording at a sample rate of 2 ms.

Energy source consisted of four Mertz-11 vibrators equipped with Peltan Electronics Advance 1 Model 4 instruments. Sixteen sweeps were used per V.P. with sweep pilot of 12-60Hz. V.P. interval was 220 feet with a group interval of 110 feet. Stack is 2400% from 96 trace instruments with a spread geometry 5280'-440'-0'-440'-5280'.

Data processing was performed by Western Geophysical Co. Complex and rapidly changing geologic environment introduced difficult velocity and stacking problems. These problems were resolved by Western's diligence in the analysis of the stacking velocities and design of deconvolution parameters to equalize the frequency spectrum to attenuate short period multiples. Since the dips in the area were generally less than 20 degrees, "Finite Difference" digital migration was used to collapse diffractions generated by faulting and to place reflected energy in the true time domain position.

It should be noted that any additional shooting in the area will be more effective from the standpoint of migration techniques if line orientation is designed normal to the strike shown by existing control.

From available control, three maps have been constructed. These are :

- 1) Migrated Producing Aquifer
- 2) Migrated Pluton
- 3) Non-Migrated Shallowest Flow

Identification is from a synthetic seismogram constructed using the sonic log of the Thermal Power; Dixie Fed. 66-21 in Twp. 24N, Rge. 36E, Sec. 21, or by geologic definition of the mapped event. A discussion of the maps submitted follows:

MIGRATED PRODUCING AQUIFER

The event identified as the producing aquifer in the Thermal Power Well Dixie Fed. 66-21 is coincident with a high amplitude event generated on the synthetic seismogram from that well. A reasonable correlation exists between the synthetic and the recorded seismic data at the well. This event, in its migrated position is the basis for the map under discussion.

Because the seismic lines cross from the sedimentary basin to positions overlying the pluton, interruptions occur in the continuity of data from the aquifer. In such cases it becomes necessary to re-establish continuity through correlation across the data gaps.

The overall configuration of the event mapped indicates the Thermal Power well encountered the aquifer in an overthrust block off the forefront of the pluton. The aquifer terminates both against the pluton and basinward. A series of events with character similar to the aquifer can be noted on the sections. Because of the limited areal extent of the individual events, the map has been constructed using the event with characteristic response in the nearest equivalent stratigraphic position. Termination of events is marked by hatchers.

MIGRATED PLUTON

The purpose of this map is to show the configuration of the forefront of the pluton so that the contact between the aquifer and the pluton can be viewed in perspective. The criteria used for defining the forefront is the zone of termination of coherent energy.

NON-MIGRATED SHALLOWEST FLOW

Since no appreciable geothermal gradient is indicated in the Thermal Power well, it is possible that any potential aquifer would be suitable for production without regard to depth of burial. This map is constructed to show the shallowest position at which an event with character similar to the identified aquifer, could be expected.

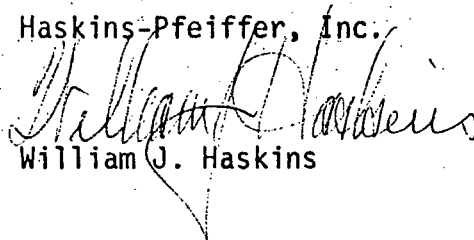
Southland Royalty Company
Page 2
October 7, 1980

RECOMMENDATIONS

At this stage of exploration, plans should be made to increase the density of seismic control in the areas available for drilling. This additional control should use parameters compatible with the existing data. Care should be taken to keep all new lines normal to strike to aid migration. Processing should be carefully supervised so that data quality will be compatible with that now at hand.

Yours truly,

Haskins-Pfeiffer, Inc.

A handwritten signature in cursive script, appearing to read "William J. Haskins", is written over the typed name below.

William J. Haskins

WJH/lf

Seismic Reflection Data for Dixie Valley and Stillwater, Nevada



SE-1002 02/91

Two geothermal basins were surveyed as part of the Department of Energy's (DOE) Industry Coupled and Exploration Technology programs. The data were contributed by the University of Utah Research Institute (UURI), which managed this portion of the project for DOE. The surveys include stacked, migrated, and deconvoluted Vibroseis data.

The data, sections, and documentation which are available from the National Geophysical Data Center, together with open-file data available separately from UURI, constitute case study data that are very useful for research and educational purposes.

Dixie Valley Prospect

The Dixie Valley prospect spans three townships in Churchill and Pershing Counties (150 km east of Reno, Nevada). A report included with the documentation discusses the correlation of the seismic data with information from a thermal power well located within the survey area. The thermal fluids are heated during deep circulation along basin-and-range faults in an area of high thermal gradient. The interpretation report suggests locations of the thermal aquifer and a pluton within the basement at the edge of the basin.

Analog data include four finite-difference migrated sections, and four final stack sections. Data are available in three formats:

| Product Number | Cost | Format |
|----------------|-------|-----------------|
| 637-G18-001 | \$ 30 | Blackline paper |
| 637-G19-001 | \$ 32 | Sepia paper |
| 637-G20-001 | \$ 42 | Sepia plastic |

Digital data consist of 35 digital tapes of field data, in SEG-B format. Surveyor's notes and Vibroseis operator's reports are included with digital data.

| Product Number | Cost | Description |
|----------------|----------|--|
| 912-G07-001 | \$ 5,320 | Field data (35 magnetic tapes, SEG-B format) |

Documentation for analog and digital data consists of the interpretation report (with location maps and 3 structure contour maps); a list of geophysical and geological open file data from UURI which provide additional data for the area; and, a copy of an abstract by Howard P. Ross, William E. Glenn, and Charles M. Swift. The abstract, "Reflection Seismic Surveys for Basin and Range Geothermal Areas - An Assessment," was published in the *Book of Abstracts* of the American Association of Petroleum Geologists Annual Convention, San Francisco, 1981.



National Geophysical Data Center

Stillwater Prospect

The Stillwater prospect spans four townships in Churchill County, about 120 km east of Reno. No interpretation report is included, but the area is also a geothermal field nearing production, and thought to be in a similar setting to that of Dixie Valley.

Analog data include one relative amplitude stack section (line 2 only); three scaled final stack sections (lines 2, 3, and 4); three finite-difference migrated final stack sections (lines 2, 3, and 4); and a seismic line location map. Data are available in three formats.

| Product Number | Cost | Format |
|----------------|--------|-----------------|
| 637-H18-001 | \$ 156 | Blackline paper |
| 637-H19-001 | \$ 167 | Sepia paper |
| 637-H20-001 | \$ 217 | Sepia plastic |

Digital data include a variety of data on magnetic tape. Observer's reports, surveyor's notes, and a location map are included with the digital data.

| Product Number | Cost | Description |
|----------------|----------|--|
| 912-H07-001 | \$ 2,888 | Raw field data (19 magnetic tapes; SEG-B format) |
| 912-H07-002 | \$ 456 | Field correlated data (3 tapes, SEG-C format) |
| 912-H07-003 | \$ 152 | Final stack sections (1 tape, SEG-Y format) |

Documentation for analog and digital data includes a list of additional publications from UURI, and the AAPG abstract noted before.

How to Order

Data contributors and academic researchers should call 303-497-6120 for information about obtaining data by special arrangement.

U.S. DEPARTMENT OF COMMERCE REGULATIONS REQUIRE PREPAYMENT ON ALL NON-FEDERAL ORDERS. Please make checks and money orders payable to **COMMERCE/NOAA/NGDC**. All foreign orders must be in U.S. Dollars drawn on a U.S.A. bank. Do not send cash. Orders may be charged to American Express, MasterCard, or VISA by telephone, letter, fax, or Order Form. Please include credit card account number, expiration date, telephone number, and your signature with the order.

A ten-dollar (\$10) handling fee is required on all orders; an additional ten-dollar (\$10) charge is required for non-U.S.A. orders. Overnight delivery is available at an additional cost; please call for details.

Please direct telephone inquiries about these data to **(303) 497-6120** (fax: 303-497-6513; telex: 592811 NOAA MASC BDR). Inquiries, orders, and payment should be addressed to: **National Geophysical Data Center, NOAA, Code E/GC1, 325 Broadway, Boulder, CO 80303.**

Due to recent legislation, prices are subject to change without notice. Please call for price verification.

Mention of a commercial company or product does not imply endorsement by NOAA or the United States Department of Commerce.