

OIL & GAS CONSERVATION COMMISSION
Meeting: September 15, 1978
Mr. John Bannister, Exec. Sec.



OFFICE OF
Oil and Gas Conservation Commission
 STATE OF ARIZONA
 1645 WEST JEFFERSON, SUITE 420
 PHOENIX, ARIZONA 85007
 PHONE: (602) 271-5161

A G E N D A

Meeting
 September 15, 1978
 Department of Transportation Building
 Prescott, Arizona

*activity Dept
 prior to meeting*

10:00 A.M.

Call to order

1. Approval of minutes of meeting of June 29, 1978
2. ✓ Report of Executive Secretary
3. ✓ Report of Enforcement Section
4. ✓ Report of Geology Section
5. Old Business — *activity Rpts -*
6. New Business - Budget
7. Adjourn — *potential Energy Agency*

date of next meeting - next

IF YOU ARE UNABLE TO ATTEND THIS MEETING, PLEASE NOTIFY THIS OFFICE AS SOON AS POSSIBLE.

OIL AND GAS CONSERVATION COMMISSION
1645 West Jefferson Street
Suite 420
Phoenix, Arizona 85007

Minutes of Meeting
June 29, 1978
College of Mines
University of Arizona
Tucson, Arizona

Present:

Mr. Ralph W. Bilby, Chairman
Mr. Robert A. Gallaher, Member
Dr. J. Dale Nations, Member

Absent:

Mr. Hal Butler, Vice Chairman
Mr. Norman D. Levitt, Member

The regular Commission meeting of June 29, 1978 was called to order by Chairman Ralph Bilby at 10:00 a.m. in the conference room of the College of Mines, University of Arizona, Tucson, Arizona.

The minutes of the meeting of April 21, 1978 were approved as written.

Reports of Executive Secretary, Enforcement Section and Geology Section were accepted.

The progress of the Commission's budget for fiscal year 1979-1980 was discussed.

The Commission's regular meeting of September 15, 1978 was set for 10:00 a.m. in Prescott, Arizona.

Meeting adjourned at 11:45 a.m.

Approved September 15, 1978

Hal Butler



OFFICE OF
Oil and Gas Conservation Commission
STATE OF ARIZONA
1645 WEST JEFFERSON, SUITE 420
PHOENIX, ARIZONA 85007
PHONE: (602) 271-5161

ACTIVITY REPORT

September 6, 1978

John Bannister
Executive Secretary

The next meeting of the Commission will be held at 10:00 a.m. on Friday, September 15, 1978 in Prescott. I have made reservations for each of you at the Prescottonian Motel for the evening of the 14th (and the 15th, if you so indicated.) As you enter Prescott proper on Route 69, the motel is on your left.

I have made arrangements for all of us for dinner at the Pine Cone Inn on Thursday evening. To reach the Pine Cone Inn, please go to the far end of the Court House and turn left on Whiskey Row. The inn is located approximately a mile and a half from this point. It is on the left side of the highway.

I have made arrangements for no-host cocktails from 6:30 until 7 p.m, with dinner beginning at 7 o'clock. Dinner will include soup, salad, top sirloin, baked potato, beverage and wine. The cost will be \$11 per person. I would like to collect before we go to dinner, as this will avoid a lot of confusion. I might mention that the inn will have live music for dancing for the remainder of the evening.

The meeting of the Commission will be held in the conference room in the Arizona Department of Transportation Building at 1210 East Sheldon. This is directly across the street and in easy walking distance of the motel.

I am looking forward to seeing each of you and your wives on Thursday, September 14th. Should there be any change in your plans, please advise immediately.

Executive Secretary
September 6, 1978
Page 2

The prime business to come before the Commission is the adoption of our 1979-80 budget request. I request that you bring the copies which have been sent to you. There will be no reproduction facilities available in Prescott.

The Executive Committee of the Interstate Oil Compact Commission, of which I am a member, is meeting in Wichita, Kansas September 27 and 28, 1978. Permission to attend this meeting is requested. This is one of the four out of state trips which have been scheduled and budgeted.

The office is receiving many inquiries centering on the Anschutz leasing play. Mr. Allen will cover this more fully in his report.

As previously reported to you, I am serving on the committee to help choose a new State Geologist for the Bureau of Geology and Mineral Technology. This is at the request of Dr. William Dresher. It is my feeling that this selection will be made some time the end of September or early part of October. As soon as this is accomplished, I will advise you.



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ACTIVITY REPORT

September 6, 1978

W. E. Allen
Enforcement Section

We have been informed by Mr. Peter B. Doty, Operations Coordinator, Anschutz Corporation, that they plan to drill three or four test wells in the area of their recent leasing activity within the next six to twenty-four months. Anschutz lease play extends from just south of Las Vegas, Nevada into the southeastern corner of Arizona.

Leasing activity is still active in Cochise County. I believe that we will see some deep drilling activity in that area, probably in 1979.

Western Oil Reporter has published an article on the recent Arizona leasing play. A copy of this article is attached to this report.

According to an article in the August 16th issue of the Arizona Republic, the Navajos are again fueling with the oil companies in the Red Mesa area of Utah. This is just north of the East Boundary Butte field in Arizona. There have been several incidents where the local residents have forced oil company and governmental representatives out of the area. A short while ago, I was followed by a couple of Navajos while checking operations in the East Boundary Butte field. I wasn't aware at the time that I was "persona non grata." Daniel Descheeny, Director of the tribe's Administration Office, considers the action of the Red Mesa residents illegal and wants his compliance officers to go back into the area to open proceedings between the Indians and the operators, however he states that the compliance officers are afraid to go into the area.

Kerr-McGee Corporation has finally gotten a test on their Navajo No. 22 in the Dineh-bi-Keyah field. This well pumped

Enforcement Section
September 6, 1978
Page 2

316 barrels of oil, no water, in 17 hours. This is equivalent to 446 barrels of oil in 24 hours.

Considerable difficulty has been experienced in the drilling of their Navajo No. 21. At the last report, the drilling had progressed to 3258 feet. This is the projected total depth for this well. I would guess that they are now in the process of completing the well.

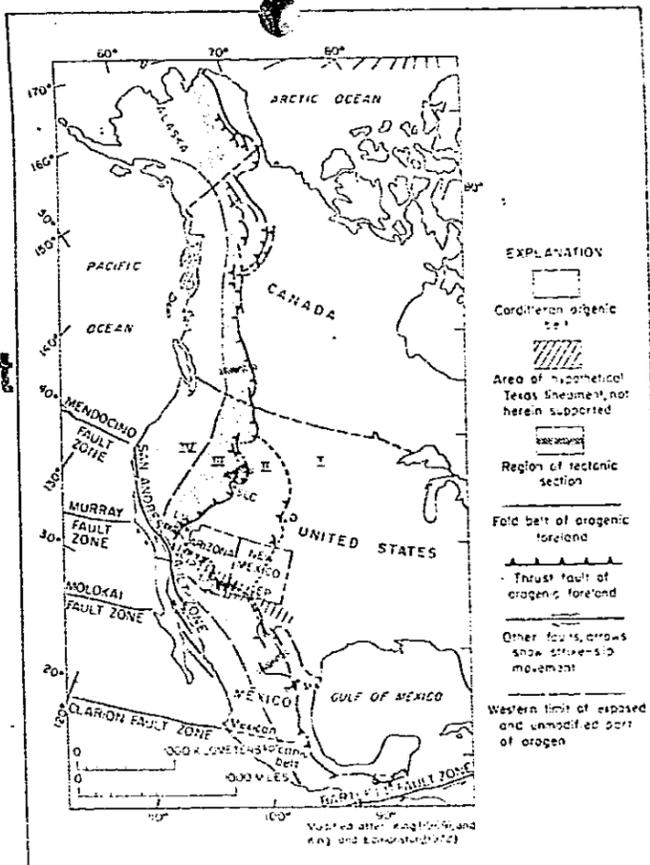
Enforcement Section
September 6, 1978
Page 2

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Emphasis:
Colorado West, Utah

Geologists say new information on Hingeline-Overthrust justifies exploration in broader area



Four years ago the Overthrust-Hingeline areas of Utah and Wyoming loomed as large question marks on oil industry maps. Now, nine field discoveries later, the northern portion of that complicated geologic feature hosts one of the hottest onshore plays in the country. The new field discoveries are listed as follows: Pineview, Ryckman Creek, Yellow Creek, Evanston, Lodgepole, Anschutz Ranch, Hogback Ridge, Painter Reservoir and Whitney Canyon.

There have been scattered attempts to find similar production south of the Wasatch Mountains, in Utah, and although there have been no commercial discoveries to date that area is also considered highly prospective.

In addition, new geological data and a reinterpretation of seismic data now indicate the Overthrust-Hingeline feature extends through southern Arizona. There are divergent opinions, but the new data is persuasive. As a result there are a growing number of companies that now view the Overthrust Hingeline play as stretching from border-to-border, Canada to Mexico. The Petroleos Mexicanos (Pemex), the government-owned exploration operations, have found many multi-trillion category gas fields on the Overthrust

play north of Monterrey, Mexico. It is rumored Pemex has several significant overthrust discoveries south of the Arizona-New Mexico border.

Very generally, the Overthrust-Hingeline feature extends from Alaska, south, to central Utah and curving west to the Las Vegas, Nev. area. The newly defined Arizona-New Mexico sector, not as pronounced, links the northern portion of the feature to the related Overthrust-Hingeline that extends into Mexico.

Significantly, oil and gas production have long been established along the complex geologic feature in both Canada and Mexico, as well as in Utah and Wyoming.

In a classic approach for a large major oil company but highly unusual for an independent oil company, the Anschutz Corp. of Denver, after an extensive analysis of the area, then followed up with a major financing commitment to the play in the form of lease acquisitions.

Anschutz has demonstrated a strong conviction that the same rocks and similar geologic conditions exist from the Las Vegas area, south and east, through Arizona. The company has leased several million acres of lands in the trend from Idaho, through Utah,

This map of North America, shows distribution of the Cordilleran orogenic belt. Region I is craton; II is Rocky Mountains and Colorado Plateau; III is Cordilleran orogenic belt and IV is zone of younger deformation, metamorphism, volcanism and sedimentation. Designation of cities is by initials—SLC is Salt Lake City; LV is Las Vegas; P is Phoenix; T is Tucson; EL is El Paso; MA is Monterrey. (Map courtesy of the Geological Society of America Bulletin.)

by Russ Rountree

Nevada and into Arizona. They may represent the largest lease play ever undertaken in the country by one company.

The early Anschutz leasing program followed an intensive geological and geophysical study of the area. The company's findings were presented at an AAPG convention in Salt Lake City last March and at the RMAG convention in Denver in May.

The material presented, now being prepared for publication, resulted from studies by Dr. Alan R. Hansen, a consultant geologist on retainer to Anschutz, Floyd C. Moulton and Frank Owings, exploration geologists and chief

geophysicist, respectively, for the corporation.

The Anschutz studies are supported by a paper recently published by USGS geologist, Harold Drewes, in the May 1978 Geological Society of America Bulletin. Drewes, who has studied the area closely for some 16 or 17 years, said in part:

"A recent study of part of the Nevada-Chihuahua interval provides evidence that the belt is continuous, with major interruption; the complications are the result of pre-orogenic and post-orogenic tectonic events. With due regard for these complicating factors, a structure section through southeastern

Arizona and New Mexico closely resembles sections through southwestern Canada, regions near Salt Lake City in the United States, and northern Mexico."

Drewes has indicated additional work, including a large series map, is being prepared and is expected to be available within the next month.

Although Anschutz appears to hold prospective state acreage there is considerable evidence that a number of other major oil companies and land brokers are also entering into widespread leasing activity in Arizona. The Arizona Oil Gas Conservation Commission indicates it has received a number of inquiries from land owners who have had offers for fee lands.

Incidentally, the commission added it has "plenty of drilling permits, and they're not hard to get."

Ed Pendleton, president of Pendleton Land & Exploration, Inc. of Denver, said his company has acquired about 250,000 acres of federal, state and fee lands in Arizona. Pendleton indicated that several majors and independents now hold blocks of land.

Exploration drilling is expected to follow the lease play shortly. Pendleton indicated his company has been approached by a firm that has proposed drilling three 10,000-ft tests. Anschutz has indicated it may begin exploration drilling next year.

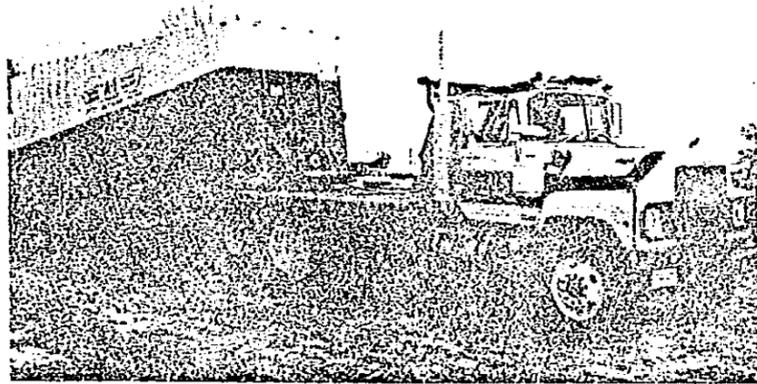
It is expected that to adequately explore the prospective horizons, tests will necessarily be much deeper than the majority of tests previously drilled in Arizona—probably below 10,000 ft and possibly to 20,000 ft or deeper in some areas. Experience in other areas of the Overthrust-Hingeline province indicates complicated, expensive drilling programs, but that is to be expected in a search for new reserves in 1978.

The mounting interest in Arizona prompted Harvey Seismic Services of Denver to initiate an extensive seismic survey through the area. In a joint operation with Pacific West Exploration Co., the company anticipates that data gathering will begin in early October.

William Harvey, president of Harvey Seismic said Pacific West will handle field acquisitions and that the proposed group shoot will extend some 2300 miles, west across Arizona, possibly into California, then north into the extreme southern portion of Nevada and the southwestern corner of Utah.

Harvey added that crews will be going into the area with 24-fold CDP, "to get it right the first time." The proposed survey is a speculative venture on the part of the two companies

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and the data will be made available to the petroleum industry. Obvious industry interest and company commitments to purchase data are the keys to the program. Support has been encouraging, said Harvey.

The seismic survey is expected to extend over a period of two to three years, employing two or three crews.

Because lands are tied up in the area of the Overthrust play to the north, by leasing and by controversial RARE II and other complications, it is expected that more companies will have a long look at the Arizona play. To date acreage negotiations have been reasonable and state regulations and restrictions are minimal, hopefully lending encouragement to oil companies to get involved in Arizona and commit capital to the search for oil and gas there.

Geologists indicate that north and south, the 80 to 150-mile wide Overthrust-Hingeline province offers a lot to explore, including the areas where production has been found.

They point out there is a tremendous potential for the entrapment of hydrocarbons in:

- The rocks immediately in front of the thrust, as demonstrated in the LaBarge area of Wyoming.
- The upper thrust plate, which has provided the production that has spurred the current play in Utah and Wyoming.
- The sub-thrust second plate that is still all but untested. (The first production from sub-thrust Frontier was recently established by Amoco Production Co. at its Whitney Canyon

field in Uinta County, Wyo.)

- The sub-thrust arches.
- The Hingeline.
- The stratigraphic potential related to the deep arches.

The deep arches have not yet been tapped and there is speculation they might reveal "the mother lode." An important factor in the development of the Arizona play are studies that indicate sub-thrust arching seen on seismic in central Utah may extend all the way through Arizona into the Hermosillo Arch in Mexico.

While most geologists and operators agree the potential for giant oil and gas accumulations is tremendous along the Overthrust-Hingeline feature, it has been demonstrated that exploration can be complicated and expensive.

The Hanson Oil-True Oil 1A-X Moroni test, in SE NW 14-15s-3e, Sanpete County, Utah, is an example. The operator has experienced multiple problems in reaching prospective objectives. At one point the well reached a depth of 19,165 ft. In early July some 3000 ft were being re-drilled due to a fish stuck in the hole. The objective is the Kaibab formation at about 20,500 ft. Unfortunately, True Oil has indicated it has found no appreciable shows, and that the well has cost in excess of \$10 million.

A Dixel Resources test to the north and west was plugged and abandoned at 15,833 ft, before reaching its deep objective, due to drilling problems. Cost of the test was about \$8.5 million. Other tests have demonstrated encouraging shows but commercial pro-

duction has been elusive south of the Wasatch Mountains.

Placid Oil Co. has recently scheduled a 14,500-ft test about 12 miles west northwest of the Dixel test, in NE NW 36-15s-1½w, Juab County. Placid said it has conducted seismic work in the area and that the location is on a structure. Seismic and gravity tests indicate the test will be some 2000 ft higher on the sub-thrust arch and observers feel it may afford an excellent test of the sub-thrust.

Another test of the Hingeline province has been scheduled by Champlin Petroleum, in the NE SW 17-11s-6e, Utah County. The well is about 28 miles northeast of the Hanson Oil-True Oil test and is scheduled to test Mississippian at about 18,500 ft. Other possible wells are rumored by Mobil, Shell, Phillips and Amoco.

Obviously a sizeable discovery along the Hingeline south of the Wasatch Mountains or in Arizona would stimulate drilling and leasing activity along the entire feature. It has been pointed out that a number of tests were drilled in the vicinity of Pineview before Pineview field was found, in Summit County, to touch off the Overthrust play to the north.

Undoubtedly the Overthrust-Hingeline feature is one of the most complex hydrocarbon provinces to challenge the petroleum industry. As several operators have indicated, "It is wild and woolly and full of fleas, but it is also the most likely place left to find an elephant possible in the entire United States."

TRUCKERS:

Our Oilfield Trucker's special issue will again run in October. We'll be updating the directory information so you'll be receiving in the mail a copy of your listing from last year's trucker's directory.

If you were not included in last year's issue, please contact us.

Please be considering your advertising plans.

WESTERN OIL REPORTER

(303) 892-1164
P.O. Box 1917
Denver, CO 80201



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PHONE: (602) 271-5161

ACTIVITY REPORT

September 5, 1978

J. N. Conley
Director, Geology Section

PUBLICATIONS

Sales since August 8 have totaled \$83.50.

ENERGY RESOURCE LEASING & EXPLORATION - INDUSTRY

Oil & Gas. Leasing -- none reported.

Exploration -- Floyd Moulton, geologist for Anschutz Corp., has informed us of a speculative group seismograph exploratory program that may be commenced this month southeast of Tucson. The overall program involves 2,380 miles of line in the Basin and Range province of Arizona, New Mexico, Nevada and Utah.

The program is being put together by Pacific West Exploration Co., a Denver-based geophysical firm. A minimum of five initial participants will be sufficient to start the program. At a July meeting in Denver, 20 representatives of energy producing companies, large independents, and utility companies expressed an interest in initial participation or subsequent purchase of the data.

Geothermal. No new exploration activity has been reported. However, Union Oil Co. has made an application to the appropriate federal agency to commence mining operations on its uranium properties near the old Anderson Mine in T. 11 N., R. 10 W., Yavapai County.

GEOHERMAL & URANIUM ENERGY INVESTIGATIONS - GOVERNMENT

The Geothermal Group, Arizona Bureau of Geology & Mineral Technology, under the direction of Richard Hahman, Sr., continues its work pertaining to an evaluation of the geothermal energy potential of Arizona. Some of this work has involved making heat flow measurements in existing wells in the Springerville area, Apache County. A program of drilling heat flow test holes in this area and the Castle Hot Springs area, Yavapai County, will be initiated after January 16, 1979.

The Geological Survey Branch, Arizona Bureau of Geology & Mineral Technology, has initiated a study of the uranium energy potential in old Cenozoic rocks in the Cave Creek-Bradshaw Mountains area.

The College of Mines, University of Arizona, has completed a year's study of the potential of geothermal energy in Arizona. Funds for the study were furnished by the Department of Energy and the Four Corners Regional Development

Activity Report
September 5, 1978
Page 2

Commission. The draft copy of the report is voluminous, discussing various aspects of geothermal energy. Abstracted from the section on conclusions:

There has been very little drilling and exploration for geothermal energy in Arizona, yet the potential resources are there. It is believed that it will eventually be a factor in Arizona but it will be a matter of time, industry awareness and additional funding for exploration work before this occurs.

GEOHERMAL - GENERAL

In previous activity reports we have mentioned the research and development by the Los Alamos Scientific Laboratory (LASL) connected with obtaining steam from hot dry subsurface rocks at the Fenton Hill geothermal site in New Mexico. Present plans are to divert some of the superheated water from the proved geothermal reservoir, which became a closed loop system last year, to generate electricity to feed back into a commercial power system. The reservoir exists in crystalline (granite) rocks with a temperature of 200°C (392°F) at a depth of 9,840 feet.

Studies by the U.S. Geological Survey suggest that a hot dry rock prospect may be present within the San Francisco Mountains.

GEOLOGICAL - GENERAL

The New Mexico Geological Society annual field trip and conference this year will be in the Pedregosa basin of southeast Arizona and southwest New Mexico October 8-11. This basin has an unevaluated potential for petroleum and geothermal energy.

In northern Arizona the U.S. Geological Survey Astrogeology Center in Flagstaff was the site of a conference this past August. The theme of the conference was "Plateau Uplift - Mode and Mechanism." It was sponsored by the Lunar and Planetary Institute and the International Commission on Geodynamics.

Dr. Dale Nations presented a progress report on a paleontological survey of the Marcos Shale, Black Mesa, Arizona, at the 31st Annual Symposium on Southwestern Geology. This symposium is sponsored by the Museum of Northern Arizona. Salvatore Giardina and I attended the conference.

GENERAL

Since the days of President F. D. Roosevelt and his NRA (National Recovery Administration) and WPA (Works Progress Administration) there has been a proliferation of regulatory and other kinds of agencies at all levels of government and a concomitant proliferation of acronyms. Listed below are some of the most commonly used ones pertaining to energy matters:

COET	Crude Oil Equalization Tax	ES	Environmental Statement
DGE	Division of Geothermal Energy	FERC	Federal Energy Regulatory Commission
DOE	Department of Energy	IOCC	Interstate Oil Compact Commission
EAR	Environmental Analysis Report	LASL	Los Alamos Scientific Laboratory
EPA	Environmental Protection Agency	NEP	National Energy Plan
EP&CA	Energy Policy & Conservation Act	NRC	Nuclear Regulatory Commission
ERA	Economic Regulatory Agency	OCS	Outer Continental Shelf

JNC:os

JNC
J.N.C.

AGENCY Oil & Gas Conservation Commission

DIVISION

IDENTIFICATION CODE NO.

1	2	3	4
CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES CLASSIFICATION	CLAIMS PAID MONTH OF 19
3,115.14	71130	1 Salary: Appointed Official	1 2,076.76
	71140	2 Per Diem: Commission Members	2
10,352.85	71150	3 Salaries: Staff	3 6,901.92
120.81	71510	4 Emp. Related: Workmens Comp	4 80.54
80.85	71520	5 Unemployment Insurance	5 53.90
814.83	71530	6 F.I.C.A.	6 543.22
942.81	71542	7 Retirement	7 628.54
384.00	71551	8 Health Insurance	8 256.00
72.00	71552	9 D & L Insurance	9 72.00
134.67	71570	10 Personnel Comm. Pro Rata Charges	10 89.78
35.25	72169	11 Professional Serv: Cartographic Symbols	11 35.25
116.00	72199	12 Cartographer	12 116.00
	72511	13 Travel-State: Mileage - Private Vehicles	13
36.45	72512	14 Mileage - State Vehicles	14 36.45
210.48	72520	15 Subsistence	15 180.00
	72531	16 Air Fare	16
1.00	72543	17 Parking	17 1.00
	72549	18 Misc.	18
	72560	19 Travel-Out of State: Subsistence	19
	72571	20 Air Fare	20
	72574	21 Taxis	21
	72581	22 Registration Fees	22
	72589	23 Other-Telephone, etc.	23
2,500.00	72711	24 Occupancy: Office Rent	24 2,500.00
	72713	25 Warehouse Rent	25
	72821	26 Mtn. & Repairs: Furniture	26
	72823	27 Adders & Calculators	27
53.50	72824	28 Typewriters	28 53.50
315.00	72826	29 Copy Machine, Other	29 315.00
	72827	30 Mimeo, Reader-Printer, etc.	30
	73111	31 Office Supplies: Printed Stationery & Envelopes	31
	73113	32 Carbon & Ribbons	32
	73117	33 Reproduction Supplies	33
198.08	73119	34 Misc. & Blue Prints	34 198.08
5.25	73119,2	35 Blue Prints - FCRC	35 5.25
	73514	36 Printing - Large Maps, etc.	36
	73519	37 Misc.	37
	73524	38 Legal Advertising	38
	73531	39 Subscriptions: Newspaper	39
	73533	40 Technical Journals	40
115.00	73541	41 Postage Stamps	41 115.00
24.10	73551	42 Telephone Serv: Central System	42 24.10
85.65	73552	43 Equipment Rental	43 85.65
29.24	73553	44 Long Distance	44 29.24
26.19	73554	45 ATS Service Charge	45 26.19
1,500.00	73720	46 Organization Dues	46
	73730	47 Technical or Reference Books	47
	73741	48 Insurance	48
250.00	79220	49 Revolving Fund	49
37.50	72129	50 Notary Charges	50 37.50
	51		51
	52		52
	53		53
	54		54
	55		55
21,557.53		TOTAL	14,460.87

OFFICE

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ACTIVITY REPORT

August 11, 1978

John Bannister
Executive Secretary

The next Commission meeting will be in Prescott at 10:00 a.m. on September 15th. I would like to apologize for the mistake which was made in my last report, indicating conflict between August and September. We will assemble in Prescott on September 14th for a social gathering that evening.

I have planned to go to Prescott the week of August 21st to make the necessary arrangements for housing, meeting location and dinner for September 14th. Will you please advise this office prior to that time as to what accommodations you and your wife would like. I will advise you shortly thereafter as to hotel accommodations, location of dinner, meeting facilities, etc.

We have been "fighting" the budget for the 1979-80 year, inasmuch as a new format is being used. Many problems are being faced. Initially, it looks as if we will be requesting approximately \$290 thousand for the forthcoming budget year. We are requesting the addition of one geologist and one secretary to our staff. As you will recall, we have been authorized these positions, though they have not been funded for the past two years.

We are requesting funds to make major geological efforts next year. In order to accomplish these, the new geologist and secretarial help will be needed. Jack Conley is requesting funds for the creation of a Bouguer gravity and ground magnetic survey for the southeastern part of the State. To accomplish this, it will be necessary to use outside consultants, i.e., geophysical survey crews. In addition, structure mapping in the northeastern portion of the State is needed. This, also, will call for the hiring of outside personnel for much of the necessary groundwork. These projects were chosen by Mr. Conley in areas representing our greatest potential and there has been a lot of demand for the creation of this work.

Executive Secretary
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Page 2

As you know, the largest leasing play in the history of Arizona has recently been accomplished. We anticipate a greatly increased drilling activity and the consequential necessary increase of services rendered by the Enforcement Section.

As soon as our suggested budget has received the approval of the various budget analysts, we will furnish you with copies so that we can be prepared for budget adoption at the September 15th meeting. I have spoken to the budget authorities and indicated that the "officially adopted budget" will not be submitted until after our September 15th meeting. They have indicated that this will be acceptable, even though it is beyond the September 1st deadline.

The Executive Committee of the Interstate Oil Compact Commission will meet in Wichita, Kansas the latter part of September and I will request permission to attend this meeting. As you are aware, I am the Governor's official representative to the IOCC and I am a member of the Executive Committee. This is one of the four out-of-state trips which we have budgeted. All budgeted trips involve attendance at IOCC meetings.



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ACTIVITY REPORT

August 11, 1978

W. E. Allen
Enforcement Section

Kerr-McGee Corporation has drilled its Navajo No. 22 located in the NW/SW/4 Sec. 30, T36N, R30E. The total depth of this well is 3306 feet.

Kerr-McGee has spudded the Navajo No. 21 located in the NW/SE/4 Sec. 30, T36N, R30E. Both of these wells are in the Dineh-bi-Keyah field.

During a visit this week to the Four Corners area, these two locations were checked. The No. 22 well was in the completion stage. The 5-1/2" casing was perforated the afternoon of August 9th. A fishing job was in progress on the No. 21 well. Drilling had progressed to 634 feet. While making a connection, the hole collapsed. The operators were preparing to washover the fish. Since returning to the office, I have received no report of the progress being made on this fishing job.

Western Helium Corporation was finally convinced of the necessity of plugging its Connelly KM State No. 1 located in the NE/NE/4 Sec. 36, T20N, R27E, Apache County. This well was completed in the Shinarump formation but never officially produced, due to the fact that the operators never followed through on getting a unit agreement completed on the section on which the well was drilled. Considerable difficulty was experienced in plugging this well. I spent a total of five days on this job. Normally, plugging a shallow hole such as this requires one day or less. The plugging of Western Helium's well completed all activity in the Navajo Springs helium area.

W. E. Allen
August 11, 1978
Page 2

Other than routine requests for information and some budget work, I'm sure that John will have comments on this, activity has been slow.



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ACTIVITY REPORT

August 8, 1978

J. N. Conley
Director, Geology Section

PUBLICATIONS

Total receipts from sale of publications for fiscal year 1977-78 amounted to \$1,466. Requests for 634 publications were received. A limited number of state and federal agencies, public libraries, and academic institutions are furnished complimentary copies of new publications.

In-house publications during the year consisted of:

State of Arizona Well Location Map 4 (2 maps and text)
Thermal Gradient Anomalies in Southern Arizona
Subsurface Temperature Maps, Arizona (2 maps and text)
Index of Samples of Drill-Bit Cuttings and/or Cores of Wells
Drilled in Arizona, July 1971 through April 1978
List of Available Publications

An updated geothermal energy resource map of the state, prepared in 1976-77, was incorporated into a Geothermal Energy Resources Map of Arizona compiled and published by the Geological Survey Branch, Bureau of Geology and Mineral Technology, University of Arizona.

We cooperated with the New Mexico Bureau of Mines in preparing a paper pertaining to petroleum in the Pedregosa basin in southeastern Arizona, southwestern New Mexico, and Mexico to be published in a guidebook by the New Mexico Geological Society.

Sales since July 11 amount to \$329.90. Sale of our most recent publication, State of Arizona Well Location Map, has been better than anticipated.

INVESTIGATIVE PROJECTS

Thermal Gradient Anomalies in Southern Arizona. This report of work completed in fiscal year 1977-78 was supported by funds provided by U.S. Department of Energy, Division of Geothermal Energy, to the Bureau of Geology & Mineral Technology, Geological Survey Branch, University of Arizona.

A technical assistance grant from the Four Corners Regional Commission for performance of a project entitled "Geological and Geophysical Studies Related to Determining the Energy Potential of the Central East Portions of the Colorado Plateau Province of Arizona," was approved May 12, 1978. The first phase of the contract, performed by GS Laboratories, Santa Ana, California, has been completed. The overall project is scheduled for completion next February.

Activity Report
August 8, 1978
Page Two

An extensive integrated geological and geophysical study of southeastern Arizona, designed to semi-isolate favorable areas warranting exploration for petroleum and geothermal resources will be completed and published this fiscal year. Also presently scheduled for completion is a geologic review of northwestern Arizona for petroleum exploration.

ENERGY RESOURCE LEASING & EXPLORATION

Geothermal. No leasing or exploration activity has been reported. However, the Geothermal Group, Geological Branch, Bureau of Geology & Mineral Technology, is actively engaged in heat flow measurements and other studies.

Oil & Gas. No recent leasing activity in the state has been reported. However, the large Anschutz Corp. lease play in the Basin and Range province has been extended eastward into Hidalgo County, New Mexico. Federal and state lands are being leased currently by Texaco Inc., Placid Oil (a Hunt family company), and Anschutz Corp. We have received an unconfirmed report that Anschutz has completed organization of a group of companies for a very large-scale seismic exploration program in the Basin and Range province.

GENERAL

We have received a copy of the Forest Service draft environmental impact on its RARE II (roadless area review and evaluation) program. The draft outlines 10 alternative courses of action. The proposed alternatives allocate the majority of the 1.8 million acres of land under consideration to nonwilderness use. A summary of the alternatives is attached to this report. The Forest Service endorses none of the alternatives.

It is apparent that Secretary of the Interior Cecil Andrus favors creation of wilderness areas. After a recent week's tour of Alaska he stated that the Administration should not back down from its position of setting aside vast lands and that the 92.5-million acres (in Alaska) "... is the minimum that should be set aside."

The House has already passed a measure putting 124.6-million acres in protected categories. The Senate Interior Committee is now writing its version of the bill. The bill's critics point out that 10 years ago only 17% of federally owned lands were barred from mineral development. Today the figure stands at 68%.

JNC:oa
Att.

JNC
J.N.C.

Forest Service Issues Draft EIS on RARE II. The Forest Service issued the draft environmental impact statement on its RARE II program on June 15 which includes 20 supplementary statements covering the Western states. The draft outlines 10 alternative courses of action that could be taken regarding its roadless areas but endorses none. The proposed alternatives allocate the majority of the acreage to nonwilderness uses.

Areas designated as wilderness would not be available for activities that reduce the area's wilderness potential. Although entry in areas for exploration, development and production of minerals locatable under the Mining Law of 1872 would be permitted, access and other actions requiring land use permits may be restricted. In nonwilderness areas, entry could be immediate but would be subject to current land and resource management plans. Some Forest Service officials have predicted that 20-40 percent of the areas will be put in a further planning category because of insufficient data or controversy surrounding their classification. If so, it would be managed in its roadless, undeveloped condition until the agency's regular land management planning process is complete. Development activity, except when permitted by prior rights or existing laws, would be prohibited. The agency plans to make decisions on areas in the further planning category by 1983.

The 10 alternatives are:

- no action to be taken; land management planning process continues as is;
- all 2,686 roadless areas allocated to nonwilderness uses;
- resource/commodity oriented, with consideration given to areas with high-wilderness rating; 68 percent of the areas allocated to nonwilderness uses, 26 percent designated wilderness, and 6 percent recommended for further planning;
- emphasize wilderness attributes but reflect concern for maintaining commodity output production in areas with high resource values; 64 percent nonwilderness, 22 percent wilderness, and 14 percent further planning;
- next three alternatives each meet target level defined for four characteristics to be represented in national wilderness preservation system: landform, ecosystem, presence of wilderness-associated wildlife, and accessibility and distribution: (1) 97 percent nonwilderness, 3 percent wilderness, and less than 1 percent further planning; (2) 74 percent nonwilderness, 7 percent wilderness, and 19 percent further planning; and (3) 87 percent nonwilderness, 13 percent wilderness and less than 1 percent further planning;
- reflect Forest Service's perception of regional and/or local issues, such as socioeconomic effects, need for natural resources, and concerns of special interest groups; 84 percent nonwilderness, 11 percent wilderness, and 5 percent further planning;
- emphasize wilderness attributes with secondary consideration given to very high resource outputs; 56 percent nonwilderness, 36 percent wilderness, and 8 percent further planning;
- all inventoried areas recommended for wilderness, resulting in total of 85.9 million acres of national forest lands in NWPS. The Resource Planning Act requires 25-30 million acres of wilderness by 1980.

According to the draft statement, 137 areas have proven or producing mines with critical minerals, and 81 have proven or producing reserves of oil, gas, coal or uranium. There are 461 areas with high potential for critical minerals and 398 with high potential for oil, gas, coal or uranium.

The draft EIS may be obtained from local Forest Service offices. Comments must be filed by Oct. 1, 1978, and the Forest Service is planning public hearings throughout the nation for this summer. (*Energy Information*, June 26; *AMC News Bulletin*, June 23)

MONTHLY FINANCIAL REPORT

1 RECEIPTS MONTH OF	2 RECEIPTS CLASSIFICATION	3 APPROPRIATED RECEIPTS	4 UNAPPROPRIATED RECEIPTS	5 TOTAL ALL RECEIPTS YEAR TO DATE
July 1978				
75 00	1 Permits to Drill		75 00	75 00
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
75 00	TOTAL CURRENT MONTH RECEIPTS		75 00	XXXXXX
	TRANSFERS IN			
XXXXXX	BALANCES BROUGHT FORWARD			XXXXXX
75 00	TOTALS - MONTH AND YEAR TO DATE		75 00	75 00

6 CLAIMS PAID MONTH OF	7 EXPENDITURES FUND TITLES	8 TOTAL AMOUNT AVAILABLE YEAR TO DATE	9 CLAIMS PAID YEAR TO DATE	10 OUTSTANDING ENCUMBRANCES	11 UNENCUMBERED BALANCE
July 1978					
4,489 34	1 Personal Services	27,462 00	4,489 34		22,972 66
825 99	2 Emp. Related Exp.	4,962 00	825 99		4,136 01
	3 Professional Services	893 00			893 00
31 33	4 Travel - State	1,875 00	31 33	1,268 67	575 00
	5 Travel - Out of State	2,000 00			2,000 00
1,750 00	6 Other Operating Exp.	6,301 98	1,750 00	1,068 50	3,483 48
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
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	24				
	25				
	26				
	27				
	28				
	29				
	30				
7,096 66	TOTALS	43,493 98	7,096 66	2,337 17	34,060 15

AGENCY Oil & Gas Conservation Commission

DIVISION _____ IDENTIFICATION CODE NO. _____

1		2		3		4	
CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES CLASSIFICATION		CLAIMS PAID MONTH OF July 1978			
1,038	38	71130	1 Salary: Appointed Official	1	1,038	38	
		71140	2 Per Diem: Commission Members	2			
3,450	96	71150	3 Salaries: Staff	3	3,450	96	
40	27	71510	4 Emp. Related: Workmens Comp	4	40	27	
26	95	71520	5 Unemployment Insurance	5	26	95	
271	61	71530	6 F.I.C.A.	6	271	61	
314	27	71542	7 Retirement	7	314	27	
128	00	71551	8 Health Insurance	8	128	00	
		71552	9 D & L Insurance	9			
44	89	71570	10 Personnel Comm. Pro Rata Charges	10	44	89	
		72169	11 Professional Serv: Cartographic Symbols	11			
		72199	12 Cartographer	12			
		72511	13 Travel-State: Mileage - Private Vehicles	13			
		72512	14 Mileage - State Vehicles	14			
30	48	72520	15 Subsistence	15	30	48	
		72531	16 Air Fare	16			
		72543	17 Parking	17			
	85	72549	18 Misc.	18		85	
		72560	19 Travel-Out of State: Subsistence	19			
		72571	20 Air Fare	20			
		72574	21 Taxis	21			
		72581	22 Registration Fees	22			
		72589	23 Other-Telephone, etc.	23			
		72711	24 Occupancy: Office Rent	24			
		72713	25 Warehouse Rent	25			
		72821	26 Mtn. & Repairs: Furniture	26			
		72823	27 Adders & Calculators	27			
		72824	28 Typewriters	28			
		72826	29 Copy Machine, Other	29			
		72827	30 Mimeo, Reader-Printer, etc.	30			
		73111	31 Office Supplies: Printed Stationery & Envelopes	31			
		73113	32 Carbon & Ribbons	32			
		73117	33 Reproduction Supplies	33			
		73119	34 Misc. & Blue Prints	34			
		73259	35 Field Supplies: Logs, etc.	35			
		73514	36 Printing - Large Maps, etc.	36			
		73519	37 Misc.	37			
		73524	38 Legal Advertising	38			
		73531	39 Subscriptions: Newspaper	39			
		73533	40 Technical Journals	40			
		73541	41 Postage Stamps	41			
		73551	42 Telephone Serv: Central System	42			
		73552	43 Equipment Rental	43			
		73553	44 Long Distance	44			
		73554	45 ATS Service Charge	45			
1,500	00	73720	46 Organization Dues	46	1,500	00	
		73730	47 Technical or Reference Books	47			
		73741	48 Insurance	48			
250	00	79220	49 Revolving Fund	49	250	00	
			50	50			
			51	51			
			52	52			
			53	53			
			54	54			
7,096	66		55	55	7,096	66	
		TOTAL					



OFFICE OF
Oil and Gas Conservation Commission
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ACTIVITY REPORT

July 14, 1978

John Bannister
Executive Secretary

JB

As of this time, there has been no word from the Governor's Office concerning the appointment of Mr. Johnny Gregovich to this Commission.

Please note that the next Commission meeting has been called for September 15, 1978 in Prescott. Prior to that date, I will contact each of you to determine what sort of accommodations you may wish. It is hoped that we will all be able to meet in Prescott on the evening of August 14th, with our ^{Sept} wives, to have a bit of a social gathering prior to the meeting the next day. By the time official notifications come out, I will have established a meeting place, plans for dinner, etc., and you will be so notified.

Since the last Commission meeting in Tucson the office has been relatively quiet. Kerr-McGee Corporation has made application for six wells in the Dineh-bi-Keyah field, however drilling has not commenced. This, of course, will be covered in more detail in Mr. Allen's report.

I am making a talk on July 17th at ASU for a group of high school and college professors. They are going into the subject of energy and conservation.

It should be noted that the Interstate Oil Compact Commission will meet in Phoenix early in December. The dates set aside are 4, 5 and 6. There will probably be a cocktail party on Sunday evening, December 3rd. Should you be able to attend, it will be appreciated. There are many papers given during this meeting which I am sure will be of interest to you.

It should be noted that Dr. Dale Nations will give a talk on Arizona geology before the Research Committee, probably on

Executive Secretary
July 14, 1978
Page 2

Monday, December 4th. Sal Giardina of this office will present a paper on the geothermal potential of Arizona before the Geothermal Resources Committee, probably on Tuesday, December 5th.

As you know, I am Chairman of the Environmental Protection Committee of this organization and my program will be on Monday, December 4th. I am seeking to get a regional representative of the United States Geological Survey to talk to us on water and environmental protection vs. energy production on public lands.

I am looking forward to seeing all of you in Prescott this August.



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ACTIVITY REPORT

July 12, 1978

W. E. Allen
Enforcement Section

Following the hearing of April 21, 1978, requested by Kerr-McGee Corporation to obtain a modification of the rule requiring the dedication of 160 acres to each well drilled in the Dineh-bi-Keyah field, six drilling permits have been issued for the drilling of in-fill wells. Due to problems with the Navajo Tribe, no wells have been spudded. I was informed this past Monday that the Navajos have agreed to the drilling and the operators were starting to make the well locations.

Between the environmental groups, bureaucratic agencies, governmental policies and the Indians, it is amazing that we have any energy resources available at all.

We are still in the dark concerning any plans that the Anschutz Corporation has toward exploring any of their five million or so acres which they have under lease in the State.

We have been told that Anschutz is organizing a group shoot over a portion of this acreage. This information came from a representative of Peoples Gas Company of Chicago, Illinois. Peoples Gas had been approached by Anschutz to join in this geophysical effort.

At the request of the Four Corners Geological Society, I recently completed a brief history of the Navajo Springs area helium fields. This included information concerning the discovery of the fields, methods of discovery, production histories, geological and engineering information, together with various logs, graphs and maps. The Four Corners Geological Society is putting together a history of all oil and gas fields in the Four Corners area. This will be published and made available, for a price, to anyone interested in the area.

Enforcement Section
July 12, 1978
Page 2

The Oil and Gas Journal recently printed an article titled "Southeastern Arizona Oil and Gas Possibilities" by E. B. Heylman. Mr. Heylman is a consulting geologist in Tucson. Copies of this article are attached to this report. Also attached are copies of editorials from World Oil and Western Oil Reporter which I thought you might find interesting.

Southeastern Arizona: oil and gas

EDGAR B. HEYLMUN
Tucson, Ariz.

WITH oil production now firmly established at two fields in Railroad Valley, East Central Nevada, oil and gas operators must consider possibilities for oil and gas throughout the Basin and Range Province, an enormous region that extends from Oregon to Texas, south into Mexico.

Years ago, despite scattered drilling, the highly faulted, mineralized, and geologically complex province was considered a wild and unlikely place to find commercial oil and gas accumulations. Even after the Eagle Springs oil field was discovered in Nevada in 1954, few took the region seriously. However, when the Trap Spring Oil field was discovered in Railroad Valley in 1976, several miles from the Eagle Springs field, eyebrows were raised, and most operators now realize that the entire eight-state Basin and Range Province deserves closer consideration.

Southeast Arizona. One portion of the Basin and Range Province that must receive attention is southeastern Arizona.

Despite being a region far more famous for copper mining than for oil, there are nonetheless indications of oil and gas in numerous wells, and petroliferous rocks and seepage are reported on the surface at various locations. The production in Nevada is from rocks of Tertiary age, and most of the occurrences in southeastern Arizona are also in rocks of Tertiary age. Fig. 1 shows locations of deeper wells and some of the reported surface oil occurrences.

Oil and gas were encountered in some of the earliest water wells drilled in southeastern Arizona, particularly in parts of Cochise County. Oil "ruined" some of the water wells drilled at St. David in the 1880's. In 1911, oil was struck at a depth of 185 ft in a water well drilled 8 miles north of Bowie, in San Simon Valley. Later, a well was drilled specifically for oil in that area, and encountered oil and gas shows in nine zones between 719 ft and the total depth of 4,110 ft. Production could not be established. Oil and gas shows were also encountered in wells drilled near the village of San Simon, in the same valley.

Meanwhile, at the town of Willcox, on the edge of the 60 sq mile Willcox Dry Lake in Sulphur Springs Valley, 14 post holes sunk in the chicken yard

Section of Mineta Limestone (Oligocene)

Sec. 24-13s-18e, Pima, County, Ariz.

Tertiary sandstone	190 ft
Top of Mineta Limestone	
Limestone, algal	45 ft
Siltstone	218 ft
Limestone, algal	5 ft
Siltstone	10 ft
Limestone, algal	8 ft
Siltstone	16 ft
Limestone, algal, fossiliferous	8 ft
Siltstone	8 ft
Limestone, algal	39 ft
Siltstone	26 ft
Limestone, algal	68 ft
Base of Mineta Limestone	
Siltstone	21 ft
Tertiary Conglomerate	128 ft
Tertiary Rhyolite	

This section occurs on the extreme west edge of the San Pedro Valley, 30 miles east of Tucson. Most of the algal limestone beds are petroliferous and locally uraniferous. The Mineta Limestone at this locality is 451 ft thick.

Source: From Clay, 1970.

of the Lundquist residence produced over 10,000 gal of high-gravity oil (Fig. 2). The oil was sold, unprocessed, for use in lanterns. In 1925, at the ice plant in Willcox, a water well encountered asphaltum at a depth of 700 ft, and shortly thereafter, a water well drilled at the Southern Pacific Railroad depot encountered oil at 650 ft. The depot well produced several hundred barrels of high-gravity oil between the years 1928 and 1938. The oil was sold, unprocessed, for 10¢/gal, and was used locally to operate automobiles and farm machinery.

Since the oil was suitable for those purposes, it might offhand appear that it represented leakage from storage tanks near the railroad. However, the U.S. Bureau of Mines tested the oil in 1937, and reported that it was natural crude petroleum with a gravity of 42.3° API and a sulfur content of 0.11%. In 1930, another well in Willcox encountered 44° API oil, along with some gas, at a depth between 425 and 428 ft. Several other wells, initially drilled for water, encountered oil at relatively shallow depths. In 1950, the Waddell-Duncan 1 McComb, 23-13s-24e, 3 miles northwest of Willcox, was drilled to a depth of 6,865 ft. Pipe was set and 13 different zones between 3,655 and 6,250 ft were perforated, but production could not be established. There has not been a

well drilled specifically for oil or gas in the Willcox area since 1965. Aeromagnetic surveys suggest Willcox is located on a northwest-trending anticlinal structure.

Deep wells. The deepest wells in southeastern Arizona were drilled by Humble in 1972-73.

The Humble 1 State, 2-8s-8e, east of the town of Eloy, encountered one of the thickest sequences of anhydrite ever found in the U.S. Over 5,000 ft of Tertiary anhydrite was penetrated between 2,340 and 8,245 ft. The well bottomed in Precambrian rocks at a depth of 10,179 ft. The Humble 1 State, 5-16s-15e, southeast of Tucson, was the deepest test ever drilled in Arizona. It penetrated a complex sequence of Tertiary, Cretaceous, Triassic, and Paleozoic units which are faulted and repeated. The well bottomed in Tertiary igneous rocks at a depth of 12,571 ft. Neither of the Humble deep tests had any significant oil or gas shows.

Thick Tertiary. The Tertiary rocks of southeastern Arizona are thick and diversified in character.

They range from hard intrusive and extrusive igneous rocks to soft, porous sandstones. Siltstone and conglomerate are common rock types, but such rock types as gypsum, anhydrite, salt, and diatomite are not uncommon. One of the most interesting Tertiary units is the Pantano group, especially the Mineta limestone which is found near the middle of the sequence (Table 1). The Pantano group is of Eocene, Oligocene, and Miocene age and may correlate, in part, with productive units in Nevada. The Mineta Limestone, Oligocene in age, consists of interbedded algal limestone, silty limestone, siltstone, and sandstone of fluvial, paludal, and lacustrine origin. Some of the limestones are distinctly petroliferous and locally uraniferous. Since many of the limestones are algal, it would not be unreasonable to expect reef-like algal buildups.

Needless to say, such features, should they exist, could be highly productive. The Mineta crops out at only a few localities near Tucson, but it, and similar units, undoubtedly occur at depths under many of the desert valleys in southeastern Arizona. The Mineta Limestone is 451 ft thick where it crops out on the west side of San Pedro Valley, 30 miles east of Tucson. Of this total, 173 ft consists of algal limestone, much of which is petroliferous and uraniferous. Most outcrop-

possibilities

pings of Mineta Limestone are petroliferous to some degree.

Prospects. The best prospects for future oil and gas production in southeastern Arizona appear to lie under the broad desert valleys, just as at Railroad Valley, Nev.

San Simon and Sulphur Springs Valley are two such valleys in the region, bounded by complexly faulted mountain ranges. Finding structures suitable for oil and gas entrapment, concealed beneath the thick valley fill, poses a challenge to geologists and geophysicists. The interpretation of geophysical data needs refinement, as it has become increasingly apparent that it is not always desirable to drill on geophysical highs. A number of wells drilled on seismic highs in the Basin and Range Province were found to encounter Paleozoic or Precambrian structures that had been stripped bald of Tertiary petroliferous units. The Humble 1 State deep test, drilled southeast of Tucson, might represent a prime example.

Aerial photographs might prove of value. Despite thick accumulations of valley fill, underlying faults and other structural features have a way of making themselves evident through the fill, and can be mapped by experienced photogeologists. Mapping of faults is of paramount importance, as oil accumulations in Nevada are the result of fault traps, coupled with the truncation of beds. Careful studies, using aerial photographs, might reveal attractive structures for oil and gas accumulation under the broad desert valleys in the region.

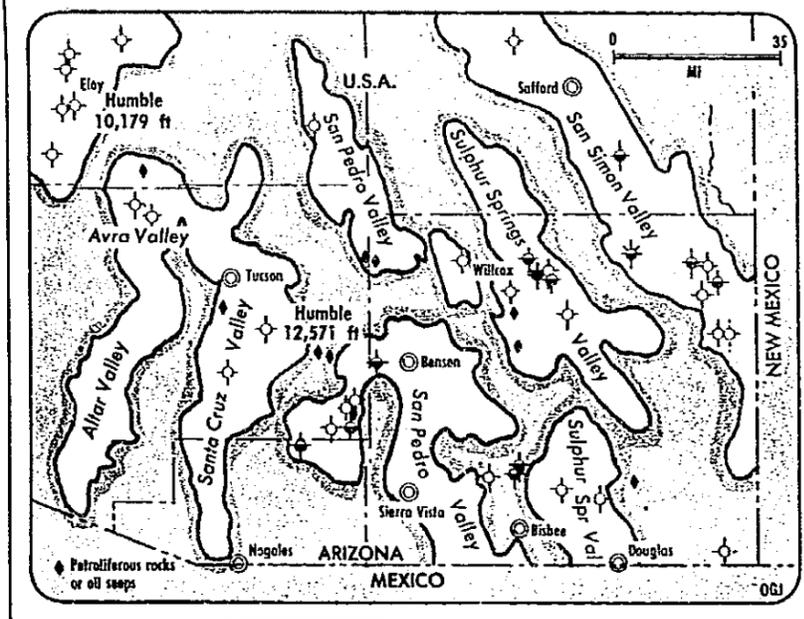
So little deep drilling has been done in southeastern Arizona that the entire region remains essentially virgin. Broad, deep desert valleys abound, and very few wells have penetrated below valley fill, into Tertiary, Cretaceous, and older rock units at depth. Means of locating viable drill sites on suitable structures concealed beneath the valley fill might pose problems in some areas, but commercial oil and gas fields probably await the drill bit in southeastern Arizona.

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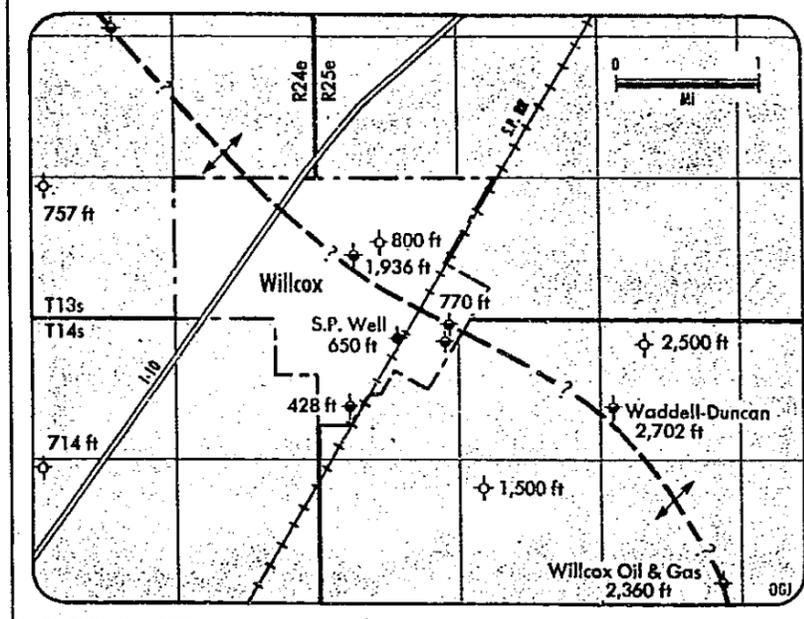
Southeastern Arizona

Fig. 1



Willcox area

Fig. 2



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The author . . .

Heylman is a Tucson consulting geologist. He began working in oil in 1949 with General Petroleum (Mobil), working primarily in Utah and Nevada. Later he was district geologist for Pubco Petroleum in Wyoming before entering the consulting field. He received his PhD degree in geology from the University of Utah in Salt Lake City, teaching for a few years. He is now consulting in oil and mining in the Southwest.

ROUNTREE REMARKS

The rules of the game boggle the mind

by Russ Rountree

It is proving extremely difficult to get the attention of the general public in matters relating to energy, let alone its understanding.

How to overcome that barrier is one of the perplexing problems of our time. Without formal instruction one should probably leave crowd psychology to the brotherhood of brain mechanics, but on the other hand, since when has opinion and analysis been restricted to those who knew what they were talking about?

It seems possible that one of the reasons for the grinding apathy on the part of the populace is the way in which energy issues are presented to the media and therefore to the public. Energy news has been categorized as being complicated and depressing, consequently it gets ignored a lot.



ROUNTREE

When the public sees headlines that bemoan "balance of trade deficits," or reports of meetings of OPEC countries, or that Congress and the administration are at odds over an energy policy, it can't believe anything that boring could really be critical.

There is a tendency on the part of the TV viewer, for instance, to believe he stands a better chance of being victimized by hijackers, demonstrators, or cancer from sugar substitutes before he will ever suffer from an energy shortage. TV news emphasis seems to bolster that belief.

Energy news also suffers when it has to compete with more immediate disasters in the front section of the newspaper, news of tax increases in the local-regional section, or stock market news in the business section. It doesn't belong in the society or fashion section, and only portions are appropriate for the comic section.

It might be possible to treat energy matters as sporting events. That approach would seem to have merit in that the search for oil and gas includes elements of risk, competition, controversy and a measure of suspense. Armchair quarterbacking and second guessing are already well established.

Admittedly contests would have a different look than football, basketball

or hockey, but would contain some of the rudiments of those games. After all, if soccer and rugby can catch on with the American public why not petroleum exploration?

Headlines might read, "Petroleum Industry Faces Divestiture Proponents in Grudge Match." How could any sports fan ignore a score such as, "Environmentalists 9,000,000 acres, Petroleum Industry zip?"

The petroleum industry would be pitted against opposition such as the Sierra Club, a team composed entirely of shortstops. Its schedule might include the Administration, a team that makes a habit of standing together somewhere way out in left field, often in the wrong ballpark, wondering what happened to the crowd.

Traditionally the sports-minded public memorizes such things as batting averages. It becomes fanatic about memorizing the new rules of a favorite sport. It would be a real challenge for fans to keep up with the rules that govern the petroleum industry.

Skulduggery in sports is sometimes overlooked if it gives the home team a slight edge, but fans would soon realize they have previously witnessed only amateur skulduggery.

The differences would be noticeable. The petroleum industry has to pay handsomely to participate. It has to pay for advance filing of game plans. Officials, often outnumbering the players, can, upon a whim, throw the petroleum industry out of the park without a refund before any kind of play gets started.

When and if activity begins it would be noticed rather quickly that officials on and off the field have a propensity for changing rules in the middle of a play, and for penalizing the petroleum industry. On the other hand the opposition is allowed to fence off any portion of the playing field simply by screaming to the referees that the grass there should remain untrammeled.

Still, petroleum industry activity would be a whole new experience for sports fans. They could share in the excitement of new discoveries, new drilling depth records and a number of intricate operations in the effort to solve energy problems.

It would certainly be a whole new experience for the petroleum industry to have some sort of cheering section, and possibly some backing for the games it has to play.

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NABORS DRILLING LIMITED



WENDY J. CLUBB

The Board of Directors of Nabors Drilling Limited is pleased to announce the appointment of Miss Wendy J. Clubb to the Office of Assistant Treasurer of the Company. Miss Clubb has more than ten years of oil industry accounting experience. She joined Nabors Drilling in 1972 and most recently filled the position of Chief Accountant. Miss Clubb will continue to be located in the Company's Calgary office, reporting to Vice-President Finance and Treasurer, John G. Montgomery.

Flower power



Scott

The clean green bunch has done it again. Late last month, the so-called environmentalists, along with the state of Massachusetts, prevailed upon a federal district judge to halt another offshore lease sale, this time in the Georges Bank area off New England. And after the original injunction was upheld on appeal, Interior Secretary Andrus canceled the sale "indefinitely"—without too much of a protest, we might add.

The petroleum industry often thinks it is singled out for attention from the flower sniffers, but that's not the case. Not only are attempts to develop more oil and gas reserves being hindered at every turn, but anything else that has practical potential as an energy source—shale oil, coal, nuclear, hydroelectric, etc. Recently, Mr. W. Doham Crawford, president of the Edison Electric Institute, made a speech he called "Energy—an endangered species." Mr. Crawford did an outstanding job of putting things in perspective. Some of his points, especially those concerning incredible bungling on the part of those in Congress who wrote and voted for environmental legislation, are well worth considering. For example:

► The endangered species list contains 637 animals, insects (that's right, insects) and reptiles. But two million species of living organisms have been identified and 10,000 new ones are discovered annually. Interior, now populated heavily with anti-everything types, estimates that 200,000 more species and 600,000 to one million additional sub-species should be listed as endangered or threatened. Any one threatened by any energy project could shut it down.

► Three major hydroelectric projects have been shut down because they "threaten" the habitat of endangered species, namely the snail darter, a small minnow of which there are 116 species; the Cumberland monkey faced mussel (you read it correctly); and the furbish lousewort, which, after *Nicotiana Glauca*, must be the second most famous weed discovered in recent years.

► Three other hydroelectric projects each have been stymied by congressional stupidity and bureaucratic procrastination. After nine years, one (a \$1-billion effort) got a construction license in 1974—only to have Congress declare the river

that it was on "wild and scenic," which stopped everything. A second \$1-billion project was proposed 16 years ago and is still in limbo waiting on a "study of fisheries." The third was initiated in 1958, and after hearings and approvals over the years, was quashed last June because of a 1975 act of Congress declaring the river it was on a "national recreation area."

► Backers of the \$500 million, 5,000 megawatt coal-fired Kaiparowits generating project threw up their hands and quit in 1976 after 14 years of hassle with Interior, endless environmental hearings, litigations and plain fooling around on the part of every government agency imaginable. A major environmental concern was that the plant would threaten the blackfooted ferret and the kangaroo rat.

► A \$2 billion, 2,300 megawatt nuclear plant that would supply 80% of New Hampshire's power needs has encountered incredible delays. After beginning an environmental study in 1969, EPA shut down work in 1976 by reversing one of its own earlier decisions—it decided cooling water discharged into the Atlantic would "threaten" clam larvae. That, too, was reversed, but environmentalists now are threatening lawsuits to keep things shut down.

► Attempts are underway to declare some 13 million acres in the west as "critical habitat" for grizzly bears—meaning any energy business planned for the area will encounter innumerable delays in getting anything done at all.

The utter foolishness of the foregoing emphasizes once again the sorry state to which government has fallen. Those responsible either pay little or no attention to their jobs and give no thought to the consequences of their actions; have lost touch with reality; or are engaged in some monstrous conspiracy to sabotage the nation. The first reason is most likely. Others may apply more to those who dream up and then take advantage of such incredible legislation to continually hinder all attempts to contribute to the national energy need.

For those of us still around, it is going to be interesting to see how the United States functions in 1990, when we will have many more megawatts of flower power than electric power. Maybe by then we'll also have drilled a well or two off New England—but don't count on it.

R W Scott



OFFICE OF

Oil and Gas Conservation Commission

STATE OF ARIZONA

1645 WEST JEFFERSON, SUITE 420

PHOENIX, ARIZONA 85007

PHONE: (602) 271-5161

ACTIVITY REPORT

July 11, 1978

J. N. Conley
Director, Geology Section

PUBLICATIONS

Sales since June 6 totaled \$350.50.

Catalog 1-A, a revision and update, has been printed. It is an index of samples of drill-bit cuttings and/or cores of wells drilled in the state since September 1975.

ENERGY RESOURCE LEASING AND EXPLORATION ACTIVITY BY INDUSTRY

Geothermal. No report.

Oil & Gas. The location of the Energy Associate 1 Dixie State was erroneously reported last month as being in T. 43 S., R. 19 W., sec. 32, Washington County, Utah. The correct range is 14 West. This places it about nine miles northwest of Pyramid Oil 1 Federal-A, T. 41 N., R. 9 W., sec. 28, Mohave County, Arizona. No information has been released on the results of pumping tests.

Pyramid 1 Federal-A currently has a temporarily abandoned status at a total depth of 4150 feet in the Devonian Martin Formation. Several zones with shows of oil and/or gas were not tested in this rank wildcat hole.

GEOTHERMAL - GENERAL

DGE Workshop. This past month I attended a one-day geothermal workshop sponsored by the Division of Energy (DGE), Department of Energy. The primary purpose of the workshop was to elicit comments as to how DGE in cooperation with federal agencies, state and local governments, private industry, and special-interest groups could implement proposed initiatives to bring about the commercial utilization of geothermal energy. According to DGE estimates, industry must make a very substantial investment (\$8 billion) to reach the goals set for the next 20 years. The primary thrust of the program proposed for the Rocky Mountain Basin & Range region is to offer incentives to stimulate this investment. These incentives range from direct financial assistance through cost sharing, to informational incentives such as technical assistance and technology transfer.

Most of the attendees were representatives of federal and state agencies and geothermal consulting firms. A summary of the comments elicited will be furnished to all attendees later this month. During the workshop, however, it was obvious that most attendees, including some federal representatives, felt that current and proposed federal regulations pertaining to leasing and exploration on public lands will seriously restrict exploration for geothermal energy resources by industry.



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Activity Report
July 11, 1978
Page 2

Other voiced retardants to fruition of a viable geothermal industry were: unknowns of the resource, the less-than-perfect technologies for utilizing and disposing of it, high-risk capital investment, and inequitable tax and price structures.

Geothermal Field. Currently there are only two geothermal fields in North America generating electric power: Cerro Prieto, Baja California, Mexico, and The Geysers, Marin County, California. The Geysers field is vapor dominated (dry steam). Cerro Prieto is water dominated. Plans have been completed for programs to produce electricity from hot waters in the East Mesa KGRA in southeastern California. Republic Geothermal, Inc., is operating the northern third of the KGRA. This firm is now drilling to establish the geothermal fuel supply to service a two-stage flash 48-Mw plant. Imperial Magma Co. is operating the southern third of the KGRA. It plans a 10-Mw plant using the so-called "Magnamax process" which is based on the binary-cycle concept. Development wells are being drilled and construction commenced on some hardware to be used at the plant.

Tentative plans have been announced for construction of a plant in the Valles Caldera geothermal field in New Mexico.

Proposed Amendments to Geothermal Leasing Regulations. The Department of the Interior has proposed several amendments to increase the efficiency of administering geothermal leasing without affecting the environmental considerations of the program. Among them:

1. Allow small acreage leasing where non-electrical utilization is contemplated.
2. Eliminate the requirement for a lessee to file a formal plan of operation before preliminary exploratory operations are conducted.
3. Allow diligent exploration expenditures to be credited against other leases in the same geothermal reservoir.
4. Allow for deferred bonus payments.

If approved, these amendments may help spur the search for non-electrical geothermal energy resources in Arizona. Also, new geothermal tax provisions, designed to remove present inequities, are pending in a House/Senate conference committee.

Environmental and Conservation Laws Impacting the Federal Geothermal Leasing and Permitting Program. A summary of these laws is attached to this report. Exploration for and exploitation of geothermal and other energy resources in Arizona may be further seriously curtailed. The Forest Service has released its draft environmental statement on the RARE II wilderness project. The Service proposes 10 alternatives for 94 tracts of land, totaling more than 1.8-million acres of land throughout the state. These alternatives range from including all 1.8-million acres in the federal wilderness area system to including none of the acreage as wilderness. A Bureau of Land Management study has not been completed.

Representative Eldon Rudd has widely distributed an analysis of the Forest Service RARE II wilderness project in the State of Arizona prepared by the Department of Energy. According to Rudd the report reveals the following vital facts about the Arizona land involved:

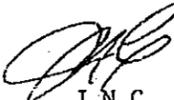
Activity Report
July 11, 1978
Page 3

- * Twenty tracts totalling 349,040 acres in the Coconino, Coronado, and Kaibab National Forests are classified in the second most important category as sources of oil and gas. Another 72 tracts totalling 1,487,990 acres in all Arizona forests were cited for their "commercial potential" for oil and gas.
- * Nine tracts totalling 97,500 acres in the Kaibab and Tonto forests were cited as "very important" as sources of uranium for nuclear power. Another 138,550 acres in the Tonto forest are among the second highest category as a uranium source. An additional 113,080 acres in the Coconino, Coronado, Prescott, and Tonto forests were cited for uranium "commercial potential."
- * One tract comprising 7,200 acres in the Tonto forest is cited by Federal energy officials as a source of hydro energy with "commercial potential." There are only 158 such tracts in the National Forest System nationwide. No hydroelectric facility would be permitted there if the area is designated by the Federal government as wilderness.

My personal belief is that the DOE analysis is overly optimistic concerning the commercial oil and gas potential. However, some of the forest lands involved do have a potential. The DOE analysis pertained only to oil and gas, coal, uranium, and hydro. It did not assess the geothermal potential, assorted minerals, and timber.

Lands eventually designated as "wilderness" lands cannot be used for anything except sightseeing on foot or horseback.

JNC:os
Att.


J.N.C.

SUMMARY OF ENVIRONMENTAL AND CONSERVATION LAWS
IMPACTING THE FEDERAL GEOTHERMAL
LEASING AND PERMITTING PROGRAM

GEOTHERMAL STEAM ACT OF 1970

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976

NATIONAL FOREST MANAGEMENT ACT OF 1976

FISH AND WILDLIFE COORDINATION ACT

ENDANGERED SPECIES ACT OF 1973

NATIONAL HISTORIC PRESERVATION ACT OF 1966

FEDERAL WATER POLLUTION CONTROL ACT, AS AMENDED

CLEAN AIR ACT, AS AMENDED

RESOURCES CONSERVATION AND RECOVERY ACT

NOISE CONTROL ACT OF 1972

COASTAL ZONE MANAGEMENT ACT OF 1972

WILD AND SCENIC RIVERS MANAGEMENT ACT

OTHER CONSERVATION STATUTES WHICH LIMIT OR
PRECLUDE DEVELOPMENT ON WILDERNESS, WILDLIFE
REFUGES, AND OTHER PROTECTED LANDS

DIVISION _____ IDENTIFICATION CODE NO. _____

1		2		3		4	
CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES CLASSIFICATION		CLAIMS PAID MONTH OF	June 1978		
1,170 00	71140	1	Per Diem: Commission Members	1	150 00		
102,837 80	71150	2	Salaries: Staff	2	12,526 89		
699 58	71510	3	Emp. Related: Workmens Comp	3	86 08		
616 94	71520	4	Unemployment Insurance	4	75 12		
5,132 96	71530	5	F.I.C.A.	5	757 83		
7,198 74	71542	6	Retirement	6	876 90		
2,713 00	71550	7	Health Insurance	7	370 00		
708 00	71552	8	D & L Insurance	8	144 00		
285 00	71570	9	Personnel Comm. Pro Rata Charges	9	-		
701 52	72169	10	Professional Serv: Cartographic Symbols	10	70 00		
97 60	72169.2	11	Cartographic Symbols	11	97 60		
2,699 88	72199	12	Cartographer	12	140 00		
341 75	72199.1	13	Cartographer (U of A)	13	-		
739 05	72511	14	Travel-State: Mileage - Private Vehicles	14	11 70		
3,949 95	72512	15	Mileage - State Vehicles	15	-		
1,307 12	72520	16	Subsistence	16	63 50		
56 00	72531	17	Air Fare	17	-		
121 84	72541	18	Registration Fees	18	-		
23 00	72543	19	Parking	19	1 00		
36 73	72549	20	Misc.	20	2 60		
816 32	72560	21	Travel-Out of State: Subsistence	21	140 37		
1,234 64	72571	22	Air Fare	22	177 00		
123 20	72574	23	Taxis	23	21 00		
120 00	72581	24	Registration Fees	24	-		
5 84	72589	25	Other-Telephone, etc.	25	-		
5,000 00	72711	26	Occupancy: Office Rent	26	-		
1 00	72713	27	Warehouse Rent	27	-		
25 13	72821	28	Mtn. & Repairs: Furniture	28	-		
-	72823	29	Adders & Calculators	29	-		
94 80	72824	30	Typewriters	30	51 00		
168 00	72826	31	Copy Machine, Other	31	-		
7 50	72827	32	Mimeo, Reader-Printer, etc.	32	-		
15 75	73111	33	Office Supplies: Printed Stationery & Envelopes	33	-		
7 56	73113	34	Carbon & Ribbons	34	-		
122 96	73117	35	Reproduction Supplies	35	4 97		
2,053 63	73119	36	Misc. & Blue Prints	36	529 72		
150 39	73119.1	37	Misc. & Blue Prints (U of A)	37	-		
82 51	73119.2	38	Misc. & Blue Prints (FCRC)	38	65 84		
747 15	73514	39	Printing - Large Maps, etc.	39	562 85		
109 90	73514.1	40	Large Maps, etc. (U of A)	40	-		
709 35	73519	41	Misc.	41	594 00		
529 84	73524	42	Legal Advertising	42	-		
39 00	73531	43	Subscriptions: Newspaper	43	8 00		
67 50	73533	44	Technical Journals	44	-		
640 00	73541	45	Postage Stamps	45	150 00		
334 54	73551	46	Telephone Service: Central System	46	34 43		
987 00	73552	47	Equipment Rental	47	85 65		
246 39	73553	48	Long Distance	48	30 57		
399 95	73554	49	ATS Service Charge	49	27 64		
1,569 50	73720	50	Organization Dues	50	-		
148 10	73730	51	Technical or Reference Books	51	49 30		
600 00	73741	52	Insurance	52	-		
- 0 -	79220	53	Revolving Fund	53	(250 00)		
502 26	74312	54	Capital Outlay: Map Cabinet	54	-		
287 96	74313	55	Light Table	55	-		

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FIELD OVER

AGENCY Oil & Gas Conservation Comm.

PAGE 2

DIVISION _____ IDENTIFICATION CODE NO. _____

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CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES		CLAIMS PAID MONTH OF <u>JUNE 1978</u>
		CLASSIFICATION		
49 95	72732	1	Pest Control	1 49 95
95 00	72737	2	Haul Trash - Warehouse	2 95 00
143 00	72122	3	Court Reporter	3 143 00
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149,671 28			TOTAL	17,943 51

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AGENCY Oil & Gas Conservation Comm.

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DIVISION _____

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CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES		CLAIMS PAID MONTH OF
		CLASSIFICATION		<u>JUNE 1978</u>
49 95	72732	1	Pest Control	1 49 95
95 00	72737	2	Haul Trash - Warehouse	2 95 00
143 00	72122	3	Court Reporter	3 143 00
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149,671 28		TOTAL		17,943 51

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CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES		CLAIMS PAID MONTH OF
		CLASSIFICATION		<u>JUNE 1978</u>
49 95	72732	1	Pest Control	49 95
95 00	72737	2	Haul Trash - Warehouse	95 00
143 00	72122	3	Court Reporter	143 00
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149,671 28		TOTAL		17,943 51

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MONTHLY FINANCIAL REPORT

1 RECEIPTS MONTH OF	2 RECEIPTS CLASSIFICATION	3 APPROPRIATED RECEIPTS	4 UNAPPROPRIATED RECEIPTS	5 TOTAL ALL RECEIPTS YEAR TO DATE
June 1978				
-0-	1 Permits to Drill			275 00
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-0-	TOTAL CURRENT MONTH RECEIPTS		-0-	XXXXXX
	TRANSFERS IN			
XXXXXX	BALANCES BROUGHT FORWARD		3,976 83	XXXXXX
-0-	TOTALS - MONTH AND YEAR TO DATE		3,976 83	275 00

6 CLAIMS PAID MONTH OF	7 EXPENDITURES FUND TITLES	8 TOTAL AMOUNT AVAILABLE YEAR TO DATE	9 CLAIMS PAID YEAR TO DATE	10 OUTSTANDING ENCUMBRANCES	11 UNENCUMBERED BALANCE
June 1978					
12,676 89	1 Personal Services	108,500 00	104,007 80		4,492 20
2,309 93	2 Emp. Related Exp.	18,700 00	17,354 22		1,345 78
450 60	3 Professional Services	4,200 00	3,983 75	164 50	51 75
78 80	4 Travel - State	7,400 00	6,233 69	1,163 68	2 63
338 37	5 Travel - Out of State	2,300 00	2,300 00		-
2,088 92	6 Other Operating Exp.	16,699 64	15,001 60	605 04	1,093 00
	7 Capital Outlay-Equipment	800 00	790 22		9 78
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17,943 51	TOTALS	158,599 64	149,671 28	1,933 22	6,995 14